HEBER CITY CORPORATION
75 North Main Street
Heber City, UT 84032
Heber City Council Meeting

August 15, 2023

4:00 p.m. Work Meeting
6:00 p.m. Regular Meeting

TIME AND ORDER OF ITEMS ARE APPROXIMATE AND MAY BE CHANGED AS TIME PERMITS

I. WORK MEETING - 4:00 P.M.

1. Presentation of Main Street Success Recommendation (Roger Brooks) - 60 minutes
2. Ordinance 2023-26, Update to the Engineering Standard Specifications and Drawings and the Storm Water Manual (Gordon Miner, Engineer) - 60 minutes

II. REGULAR MEETING - 6:00 P.M.

1. Call to Order
2. Pledge of Allegiance (Mike Johnston, Council Member)
3. Prayer/Thought by Invitation (Rachel Kahler, Council Member)

III. CONFLICT OF INTEREST DISCLOSURE:

IV. CONSENT AGENDA:

1. Approval of July 18, 2023, City Council Meeting Minutes and August 1, 2023, City Council Meeting Minutes (Trina Cooke, City Recorder)
2. Resolution 2023-12 amending the Airport Advisory Board (AAB) Bylaws (Jeremy Cook, City Attorney) -
3. Formal approval of and authorization for Staff to negotiate and enter into an agreement with Maddox Construction for an amount consistent with Maddox's bid response to the City, for the Bell Tower Renovation, and negotiate a contract amendment with FFKR to include its services as the Project Manager for said renovation. (J. Mark Smedley, Asst. City Manager)

V. PUBLIC COMMENTS: (3 min per person/20 min max)

VI. ACTION ITEMS: (Council can discuss; table; continue; or approve items)

1. Ordinance 2023-26, Update to the Engineering Standard Specifications and Drawings and the Storm Water Manual (Gordon Miner, Engineer) - 15 minutes
2. Ordinance 2023-22 adopting the Envision Central Heber Vision (Tony Kohler, Community Development Director) - 45 minutes

VII. COMMUNICATION:

VIII. ADJOURNMENT - 6:55 P.M.

Ordinance 2006-05 allows Heber City Council Members to participate in meetings via telecommunications media.

In accordance with the Americans with Disabilities Act, those needing special accommodations during this meeting or who are non-English speaking should contact Trina Cooke at the Heber City Offices 435.657.7886 at least eight hours prior to the meeting.

Posted on 8/10/2023, in the Heber City Municipal Building located at 75 North Main, the Heber City Website at www.heberut.gov, and on the Utah Public Notice Website at http://pmn.utah.gov. Notice provided to the Wasatch Wave.

Heber City Council Staff Report

MEETING DATE:	8/15/2023
SUBJECT:	Ordinance 2023-26, Update to the Engineering Standard Specifications and Drawings and the Storm Water Manual
RESPONSIBLE:	Gordon Miner
DEPARTMENT:	Engineering
STRATEGIC RELEVANCE:	Infrastructure Sustainability, Necessary Administrative Action

SUMMARY

The policy questions include the following:

Should the City Council adopt Staff's proposed updates to Engineering Standard Specifications and Drawings and Storm Water Design Manual?

RECOMMENDATION

On July 11, 2023, the Planning Commission conducted a public hearing and forwarded a positive recommendation for Staff's proposed updates to the Engineering Standard Specifications and Drawings and Storm Water Design Manual. With that recommendation, the Planning Commission added a recommendation that street light density be increased to all intersections and between intersections. Staff recommends that the City Council adopt Staff's proposed updates to the Engineering Standards Specifications and Drawings, and the Storm Water Design Manual, with direction to Staff about street light density.

Included in this packet are the Standard Plat template and Standard Amended Plat template, which are added by reference in the Standard Specifications.

Several checklists have been included with this item. They are not proposed to be codified. They are provided to invite comments from the Council about them, and to inform the Council that the checklists will be used to guide applicants, applicants' professionals, and Staff through the development entitlement process.

BACKGROUND

The subject documents have already been adopted by the City. From time to time, updates are necessary to stay abreast of current industry practices, make clarifications, and to make these documents more user-friendly. Previously, many standards were scattered in notes throughout the Drawings or throughout the Specifications.

The Engineering Department collaborated with the Public Works Department to ensure that they, as operators and maintainers of City systems, are fully-involved in the design and construction of said systems.

DISCUSSION

Several of the Specification sections and several of the Drawings remain unchanged. But, to orient you to the changes relative to the entire document, we have provided you with the entire document. Please notice the tables of contents of the Specifications and of the Drawings. The Specifications and Drawings that were changed are shown in red. The most-significant change is to put all design standards in one place (Section 00700), divide them by system, and add relevant standards, as needed. Other major changes include:

- Bolstering supporting industry standards and showing them hierarchically.
- Listing and describing engineering submittals necessary for development approval.
- Providing detailed geometric design standards for streets.
- Providing access management standards for street.
- Updating the Approved Equivalents for the Water System.
- Allowing the “Big Dipper” indoor grease trap when space does not allow outdoor equipment.
- Reworking of the Irrigation System service meter boxes.
- Emphasizing responsibility and accountability of design engineers.

FISCAL IMPACT

No direct fiscal impact. Indirectly, implementing sound standards and specifications improves the sustainability of City infrastructure and saves money over time.

CONCLUSION

We recommend these updates for the reasons described above.

ALTERNATIVES

1. Approve as proposed
2. Approve as amended
3. Continue
4. Deny

POTENTIAL MOTIONS

Alternative 1 - Approval - Staff Recommended Option

I move to **approve** the item as presented above.

Alternative 2 - Approve as Amended

I move to **approve** the item as amended, as follows.

Alternative 3 - Continue
I move to **continue** the item to another meeting on , with direction to the applicant and/or Staff on information and / or changes needed to render a decision, as follows:
Alternative 4 - Denial

I move to **deny** the item with the following findings.

ACCOUNTABILITY

Department: Engineering
Staff member: Gordon Miner, Engineer

EXHIBITS

1. Draft Storm Water Design Manual 230815
2. Draft Standard Drawings 230815
3. Draft Full Specifications 230815
4. Final Plan Engineering Review Checklist 230815
5. Preliminary Plan Engineering Review Checklist 230815
6. Standard Plat Template 230815
7. Standard Plat Amendment Template 230815

HEBER CITY

HEART OF THE WASATCH BACK

HEBER CITY STORM WATER DESIGN MANUAL

Heber City Engineering

JULY 2023

~~SEPTEMBER 20, 2022~~

HEBER CITY
75 N Main Street
Heber City, UT 84032

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Introduction

Purpose of document

The purpose of this document is to establish design standards and guidelines for storm drainage infrastructure within Heber City. This document also promotes uniformity among development design submittals and drainage reports.

The design criteria in this document are for use on public and private projects within the city. There are other adopted City documents that also reference requirements related to storm drain systems within the city. These documents include the Heber City Standard Specifications and Drawings, the Heber City Master Plans, and the Heber City Municipal Code. This document is designed to work in collaboration with these other stated references, however, in the case of discrepancies the more stringent standard will apply. All requirements and the intent of design requirements in this document shall be met unless otherwise approved by the City Engineer.

Definitions

cfs	*Cubic feet per second (449 gallons per minute)*
Ac-Ft	*Acre-foot (volume of water required to cover an acre of land to a depth of one foot)*
Detention	*Short term storage of runoff provided by a pond or similar facility. An outlet is provided that allows water to be released from the facility at a predetermined rate.*
LID	*Low Impact Development is an approach to improving water quality by reducing the amount of storm runoff generated by a project and relying on infiltration or evaporation to handle runoff where it is generated.*
Retention	*Long term storage of storm water provided by a pond or similar facility that does not allow water to be discharged. Water will stay in a retention pond after a storm event until it either evaporates or infiltrates into the bottom of the pond.*

Approval Procedure

Preliminary Drainage Plan and Report

i. A preliminary drainage plan and report are required for all site plan and subdivision developments within the city. The preliminary drainage plan must include the following as applicable:
    1. Existing topography (2-foot contours or finer) extending at least 100 feet beyond the site
    2. Existing drainage infrastructure and features
    3. Existing drainage and gravity irrigation channel/canal features
    4. Watershed delineations and existing drainage patterns/flow paths
    5. Proposed drainage infrastructure and features (onsite and offsite)
    6. Proposed drainage patterns/flow paths

ii. The preliminary drainage report must include the following as applicable:
    1. Introduction
    2. Project Scope
    3. Project Location
    4. Description of Existing Conditions
    5. Drainage Design Criteria
    6. Off-Site Watershed Drainage and Hydrology
        a. Preliminary Upstream/Downstream Flood Analysis
        b. Preliminary Hazards & Debris-Flow Analysis
    7. On-Site Area Drainage and Hydrology and Hydraulics
    8. LID features
    9. Detention and/or Retention Facilities
    10. Water Quality Features (e.g., LID, HDS, pretreatment etc.)
    11. Major Stream Crossings
    12. Non-pressurized Irrigation Systems

Final Drainage Plan and Report

iii. Final drainage plans and report are required for all site plan and subdivision developments within the City shall be submitted after acceptance/approval of the preliminary submittal. The final drainage report shall be submitted for review prior to final site plan or subdivision approval.

iv. Final Drainage Plans must include the following as applicable:
    1. Existing and proposed topography (2-foot contours or finer) extending at least 100 feet beyond the site
    2. Existing drainage infrastructure and features
        a. Onsite features (channels, flow control, etc.)
        b. Offsite features (debris basins, etc.)
    3. Existing drainage and gravity irrigation channel/canal features
    4. Watershed delineations and existing drainage patterns/flow paths
    5. Location of all proposed drainage features
        a. Onsite features (channels, flow control, etc.)
        b. Offsite features (debris basins, etc.)

6. Proposed drainage patterns/flow paths
7. Proposed drainage details
8. Improvements to city facilities
9. LID, water quality and retention features

v. Final Drainage Report must include as applicable:
1. Introduction
2. Project Scope
3. Project Location
4. Detailed Description of Existing Conditions
5. Drainage Design Criteria
6. Off-Site Drainage and Hydrology with Final Calculations
    a. Final Upstream/Downstream Flood Analysis
    b. Final Hazards & Debris-Flow Analysis
    c. Recommended Mitigation
7. On-Site Drainage Hydrology and Hydraulics with Final Calculations
8. Description of LID Measures
    a. Justification for products selected and why they are most appropriate
    b. Compliance with on-site retention rules
9. Detailed Description of Detention and/or Retention Facilities
10. Major Stream Crossing
11. Non-pressured Irrigation Systems
12. Permanent Erosion Control Features
13. Water Quality Features (e.g., LID, HDS, pretreatment etc.)
14. Storm Drain System Calculations

All plans and reports are subject to review and approved by Provo River Watershed Council. See Appendix A for list of resources for drainage design in Heber City.

Design Standards and Analysis Methods

These standards apply to all developments within Heber City including the North Village area or other areas that may annex into the City in the future. Heber City may establish additional storm drain design criteria for certain development areas through a new Storm Drain Master Plan and/or Master Plan update. All developments shall comply with the City Storm Drain Master Plan that is applicable for the respective development.

Design Storms for Conveyance

New developments within Heber City must have an initial and a major storm drain system for storm water conveyance. The initial system's purpose is to reduce the frequency of street flooding, reduce maintenance costs, and provide protection against regularly recurring damage from storm runoff. The initial conveyance system must handle the 10-year storm event at a duration equal to or less than the time of concentration (T_c), and typically consists of pipe, storm drain inlets, curb and gutter, or drainage swales that convey the storm water.

The purpose of the major conveyance system is to avoid major property damage or loss of life during flood level runoff conditions. The major system is comprised of the initial conveyance system elements but also includes the entire roadway cross section, including park strip and sidewalk, or other safe surface routes. The major system must protect against flooding during the 100-year storm event at a duration equal to or less than the T_c.

Every effort shall be made to keep the major system above ground. But, where that is impractical, the City Engineer may approve the major system to be underground if it is designed for it from the top of the catchment. "Funneling" at the bottom of a catchment is not allowed. The following figure details how the initial and major systems must function.

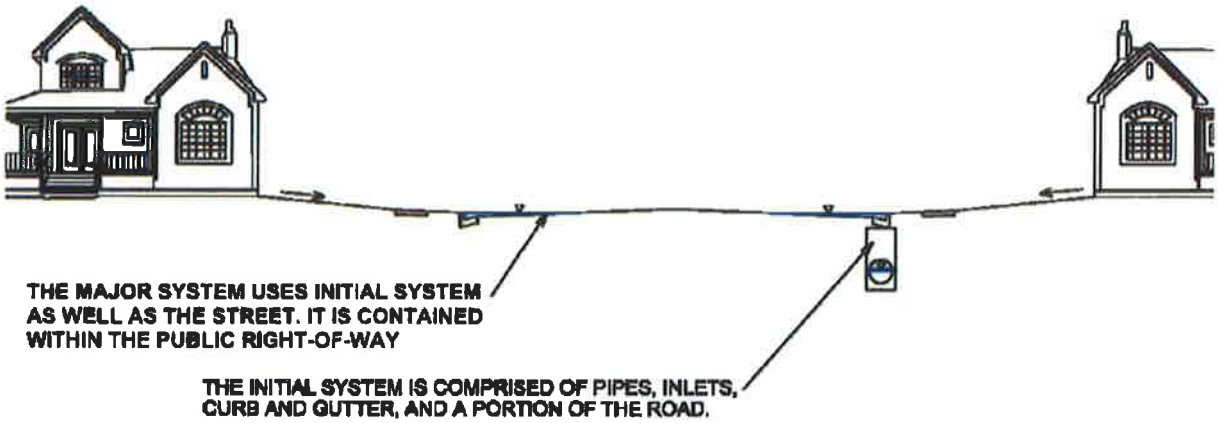


Figure 1. Initial and Major Drainage Systems

Directly connected impervious areas should be independent watershed basins and should not be combined and averaged with pervious areas.

Storage Facilities

100

Storm drain storage facilities are required for flood control and water quality purposes. Storage facilities may be above ground basins/ponds or below ground storage systems. Detention storage facilities require an approved suitable discharge location approved by the City Engineer. Retention facilities are required when no suitable discharge location is available. Detention facilities must be designed to store and detain the ~~25~~-year event with a maximum release rate of ~~the lesser~~ of 0.1 cfs/acre ~~or historic flows in the 2-year, 10-year and 25-year events~~. See the Post Construction Peak Discharge section for more detailed requirements. Retention storage facilities must provide retention volume for the 100-year, 24-hour event. Infiltration may be considered as outflow when sizing retention facilities. See the section on

If downstream conveyance capacities are limited, storm runoff peak flow rates shall be reduced to offset the impacts to the downstream system capacity.

former

Infiltration in this document for details regarding infiltration requirements. However, if infiltration is utilized for facility sizing design, shorter storm durations with higher intensities must be checked (i.e., rational spreadsheet), and the controlling or largest volume, minus the infiltration, shall be used to size the storage facility. Therefore, the 24-hour storm may not result in the largest storage volume. When utilizing the SCS Type II 24-hour storm for sizing storage facilities with infiltration, the storm distribution must provide a peak intensity where the majority of the rainfall occurs during a shorter period of time.

Storm Drain System Hydraulic Requirements

Pipe systems used for conveyance must be designed such that they flow unpressurized during the required design event. Minimum pipe diameter for public storm drain pipes within City right-of-way is 18 inches but may be reduced to 15 inches for pipes from a single inlet box. Private storm drain pipe may be reduced to 10 inches but must still adhere to conveyance design storm requirements. Pipe material must adhere to Heber City Standard Specifications and Drawings. Junction boxes or manholes should be placed such that the maximum pipe length between two structures does not exceed 400 feet.

Apply an inlet clogging factor of 30% for inlets on grade and 50% for inlets in sags.

The minimum pipe slopes shall be pursuant to HEC 22 Table 7-7. The n-values shall be 0.012 for plastic pipe and 0.013 for concrete pipe.

On steeper slopes, provide a sufficient number of inlets to reduce inlet bypass to less than 0.2 cfs and to reduce risk of water sweeping pedestrians off their feet.

Design storm drain system per HEC-22.

Channel Hydraulic Requirements

Open channels that are part of the initial conveyance system shall be designed to convey the 10-year flow while maintaining one-foot of freeboard. Channels that are located within a FEMA Special Flood Hazard Area, open channels that are the major conveyance system, and natural drainage channels shall be designed to convey the 100-year flow with one foot of freeboard. All channel sections must be adequately designed, detailed, and constructed, pursuant to the latest edition of HEC 15, to prevent erosion of the channel bed and banks.

for the 10-year event.

Above Ground Storage Basins (Ponds)

Above ground storage basins (ponds) shall be designed as attractive and usable spaces. Water depth should be five feet or less where feasible, appropriate landscaping shall be incorporated, and include elements that eliminate standing water and low flow impacts. Detention ponds shall include a low-flow surface channel, or underdrain that is sized for the 2-year storm event.

The required freeboard for detention basins is two feet in areas where any portion of the pond is constructed above existing ground and one foot when the pond is excavated in existing ground.

Basins that are not acting as a biofilter, or which have natural flow only, shall include at least one sump manhole to help facilitate infiltration of storm water, and the inlet into the basin shall be connected directly to the sump manhole.

Side slopes on City owned and maintained basins shall be 5H:1V or flatter on two or more sides, 4H:1V or flatter slopes on remaining sides, with a minimum 1% bottom slope. If the natural existing slope is

greater than 8% then basin side slopes may be increased to 3H:1V. A suitable location for ingress and egress shall be incorporated for ponds deeper than three feet, and this must include an access at least 15-feet wide at less than 15% grade. A minimum five-foot buffer between any pond grading and the property lines shall be provided.

Landscaping: Grass or other suitable landscaping materials should be used, and turf irrigation systems shall be installed for ponds that will be maintained by City personnel, unless a low-maintenance landscaping alternative is approved. Irrigating methods and practices must be accounted for in the hydrologic and infiltration calculations when designing and sizing ponds. Developers will be required to escrow funds to landscape ponds when located on private lots for future reimbursement to the owner who completes the landscaping at a future time. Developers will not use landscaping that may hinder infiltration if it is used in the sizing of the pond or required for Municipal Separate Storm Sewer (MS4) compliance. See infiltration section for more information on infiltration and landscaping requirements.

Easements: If basins are placed on private property, a minimum 20-foot easement for all underground lineal pipeline facilities and access to maintain ponds must be provided. Additionally, an easement must be provided over the pond area and a minimum of five feet beyond the pond top of slope perimeter. The easement shall be ten feet beyond the pond perimeter when an access along the pond edge is required. Pond easements shown on subdivision plats shall have restrictive language labeled with dimensions to facilitate locating in the field.

Basins shall be designed with provisions for an emergency overflow that will avoid flood damage to surrounding properties in the event of a storm exceeding the design capacity of the basin.

Retention basins shall be designed with mechanisms to ensure that the basin will completely drain within 48 hours after the 24-hour event with additional precipitation. (Verify a 72-hour storm will not overtop the basin). See the section on Infiltration in this document for details regarding infiltration requirements.

Basin inlets and outlets shall have trash racks or grates installed. A storm water pretreatment device, approved by the City, shall be installed upstream of the pond or sump inlets. See the Water Quality section of this report for requirements.

Culverts

Culverts that convey off-site flows through a project or beneath a road shall be designed for the 100-year event. Culverts shall be designed so the headwater elevation does not exceed 1.5 times the culvert diameter, or one foot below the elevation where water spills over the road or out of the channel. Concrete box culverts shall have a minimum 5-feet height from floor to ceiling, and multi-barrel culverts may not be used where high amounts of debris is expected. If multi-barrel culverts are used in other locations, designers must consider elevations of roads, buildings, driveways, and other features to prevent adverse impacts. Normal depth equations (Manning's Equations) cannot be used for culvert analysis. Inlet and outlet control shall be checked, and culvert hydraulic calculations provided.

Roadway Drainage

Inlets within roadways should be placed to control spread, or the amount of water flowing along the side of the road and in the gutter. Allowable spread is determined by the roadway classification as follows:

Table 1. Design Spread for Roadways

Design Frequency and Spread		
Roadway Classification	**Design Frequency**	**Design Spread**
Highway or Major Collector > 35 MPH	10-Year @ T_c	Shoulder (Outside of travel lane)
Highway or Major Collector ≤ 35 MPH	10-Year @ T_c	Shoulder + three feet
Local Street	10-Year @ T_c	½ Driving Lane

Inlets should also be placed upstream of intersections and pedestrian ramps to reduce bypass flows. Spread calculations shall be checked using HEC 22, Appendix A, Chart 1B.

Rainfall Runoff Computation Methods

Precipitation data obtained from the NOAA ATLAS 14 Point Precipitation Frequency website including intensity and depth data for Heber City is contained in Appendix B. This information shall be used for all development within Heber City.

Several hydrologic methods may be applicable depending on what type of analysis is required. The Rational Method is the most common method and may be used for sizing pipes, checking inlet spread and estimating peak flow rates for areas up to 100 acres.

Rational Method runoff coefficients are shown in Table 2. The runoff coefficients listed in Table 2 are the minimum values to be used in Heber City. Any runoff coefficients for other characteristics should be adjusted to account for the 100-year rainfall.

Table 2. Rational Runoff Coefficients

Surface or Cover Type *	**Runoff Coefficient (C)**
Asphalt or Concrete Pavement	0.90 (asphalt) 0.95 (concrete)
Roofs of Buildings (type dependent)	0.90 (asphalt shingles) 0.95 (steel)
Grass-covered Sandy Soils, Slopes 2% or less	0.13
Grass-covered Sandy Soils, Slopes > 2%	0.20
Grass-covered Clay Soils, Slopes 2% or less	0.22
Grass-covered Clay Soils, Slopes > 2%	0.49

* Surfaces not addressed in this table shall be approved by the City Engineer.

For storm analyses that require developing a volume or routing a volume of runoff, a dynamic hydrograph simulation model is required using AutoDesk SSA, HEC-HMS, or SWMM. Within dynamic hydrograph simulation models, the transform method shall be the NRCS Unit Hydrograph Method, and the routing method for runoff hydrographs shall be the Muskinghum-Cunge Method. Multiple hydrographs were developed by the Soil Conservation Service (SCS), now known as Natural Resources Conservation Service (NRCS). The SCS Type II 24-hour storm distribution should be used for estimating the precipitation for developments within Heber City.

The SCS method uses the Curve Number Method for determining rainfall runoff. Curve Numbers are determined by using a land cover type in conjunction with a hydrologic soil group. Land cover information can be obtained by means of aerial topography or GIS data. Hydrologic soil group information may be obtained from NRCS's Web Soil Survey website. The land cover and hydrologic soil group information are used to select an appropriate curve number using the manual titled *TR-55 Urban Hydrology for Small Watersheds*. TR-55 worksheets and calculation methods are provided in Appendix G and shall be utilized for developments that use the SCS method to estimate run-off. Typical CN values are included in Appendix C. Engineering judgement should be used when selecting curve numbers. Part 630 of the National Engineering Handbook says, "As a result of construction and other disturbances, the soil profile can be altered from its natural state and the listed group assignments generally no longer apply, nor can any supposition based on the natural soil be made that will accurately describe the hydrologic properties of the disturbed soil. In these circumstances, an onsite investigation should be made to determine the hydrologic soil group." Site specific factors such as terrain, potential precipitation on frozen ground, future conditions and other factors should be considered when selecting curve numbers. The SCS method shall only be used for estimating the run-off for development which are greater than 10 acres.

But, it still may be used if the Guo Averaging Parameter is included. The FAA Method

The Federal Aviation Administration (FAA) Method for estimating detention or retention volumes ~~may also be used for approximating storage facility volume requirements for developments. It~~ is outdated because it does not model the release rate correctly. ~~However, with the Guo Averaging Parameter, it is valid and can be used. However, it~~ is not applicable to in-series (cascading) ponds. This method is applicable for developments less than 100 acres, and the SCS method is required for developments larger than 100 acres. The FAA Method uses a spreadsheet to evaluate several storm durations for a given return period for ~~either~~ the 100-year storm ~~(retention) or 25-year storm (detention).~~ The total inflow volume for a storm duration is developed by multiplying the peak flow rate by the storm duration. The volume out is developed by utilizing a controlled discharge amount (discharge with detention only), and/or exfiltration from the detention pond when conditions permit. The required volume is equal to the inflow volume minus the outflow volume. This is evaluated for all storm durations to determine which storm duration provides the maximum required volume. Developments that use the FAA Method for estimating storage facility volumes shall use the spreadsheets provided by the City including the Guo Averaging Parameter when off-site discharge is utilized. An example is shown in Appendix I, or other approved spreadsheet formats.

Several methods for estimating time of concentration exist. They were each developed for specific parameters such as watershed size, slope, etc. Time of concentration methods used should be applicable to the areas in which they are being analyzed. The minimum time of concentration value should be 5 minutes.

For all software models, input and output data shall be provided so that it can be reviewed by the City. A copy of the model file shall also be provided to the City for review. Models must be provided to the City in Civil 3D Storm and Sanitary Analysis. City may consider other software models based on prior approval from the City Engineer.

Post Construction Peak Discharge

Heber City has adopted a 0.10 cfs/acre maximum release standard for undeveloped areas, i.e., areas outside Central Heber. This rate is assumed to be the historical undeveloped flow. For example, a 10-acre housing development would be able to have a post-development discharge rate of 1.0 cfs (10 acres

x 0.10 cfs/acre) provided there is a suitable point to discharge to. If the historic flow is found to be less than the 0.1 cfs/acre, this shall be used as the maximum allowed post-development discharge. Moreover, if the downstream system does not have capacity for the 0.1 cfs/acre discharge rate, the available capacity will become the controlling factor. To ensure that flow from new developments do not exceed 0.10 cfs/acre, detention facilities with controlled discharge are required. In cases where there is no suitable point to discharge to, retention facilities are required. See storage facilities section for more information.

Infiltration

Infiltration of treated storm water into the ground is encouraged. Detention and retention basin volumes may be sized by considering infiltration as an outflow component. Prior to assuming infiltration is a viable option, infiltration tests shall be conducted by a professional geotechnical engineer, geologist, or soil scientist licensed in Utah that determines the infiltration rate and demonstrates that the proposed soil profile is suitable for infiltration and will readily accept the water. Infiltration tests shall be performed using the double ring infiltrometer test in accordance with ASTM D 3385, and shall be performed at the location of where the result will be applied and at the elevation of the bottom of the facility where infiltration will occur. A minimum of two tests shall be performed with a minimum of one test per 10,000 square feet of the infiltration area. The slower or the average of the infiltration rates shall be used for design purposes.

Groundwater elevations shall be determined. Potential ground water level fluctuations shall be considered, and the lowest elevation of any detention basin should be at least two feet higher than the highest seasonal groundwater elevation. All design infiltration rates shall have a safety factor of two (2) or higher applied to the actual rate measured by the official infiltration test.

Only the wetted area when the storage volume (excluding freeboard) is at half depth

~~Only the plan view area at the bottom of the storage facility~~ may be used as an infiltration surface in infiltration calculations unless stage-volume-discharge curves are created and used. Infiltration must not be considered as an outflow prior to the storm water entering the pond, as this could create negative storage volume. Where infiltration galleries are located beneath surface ponds, the infiltration surface shall be the surface pond only.

Infiltration rates shall only be applied to the same soil that has been tested. If topsoil or other less permeable soil is added to a storage facility where percolation is being applied, the infiltration rate used in the design shall match rate of the less permeable soil. Alternatively, a permeable layer of gravel shall be used in the entire infiltration area.

An infiltration rate map is included in Appendix D. It is included to provide general infiltration information but shall not replace actual field tests.

Comply with all State groundwater protection regulations, guidelines and permits such as those associated with infiltration, infiltration wells, Class V injection wells and any others applicable to the site.

Long-Term Storm Drain Facility Maintenance

All public storm drain facilities will be maintained by Heber City unless otherwise specified in the development agreements. Developers, property owners, or their representatives such as a Homeowners Association, shall enter into a post-construction storm water management agreement with the City for all privately owned storm drain facilities, and/or publicly owned storm drain facilities that convey storm water from private roads and facilities. See Appendix J for template agreements.

Low Impact Development

Low Impact Development (LID) is a method of reducing storm runoff by capturing, treating, and retaining it on a very local level within each individual development. Although Heber City is not currently on the Utah MS4 list, it is anticipated to become an MS4 community in the future. LID is required by the Utah Department of Environmental Quality as part of an MS4 Program. To prepare for future compliance with the MS4 storm water discharge program and to reduce post-development storm water run-off in general, developments within Heber City must retain and treat the 80th percentile rainfall event as part of LID requirements. LID measures can also help achieve the onsite retention and treatment requirements. The 80th percentile depth for Heber City has been determined to be 0.47 inches. See Appendix E for this calculation. The Reese method, as shown in Appendix E, shall be used to calculate the volumetric runoff coefficient used for determining the 80th percentile volume. For developments larger than 10 acres use SCS Method to determine 80th percentile volume.

Localized LID methods are encouraged, however, the 80th percentile volume may be incorporated into larger detention or retention storage facilities if those facilities are located on site within the development area, or adjacent to, and if approved by the City Engineer.

Several typical LID measures are described in the following paragraphs. Portions of the LID descriptions have been taken from the Utah City Engineers Association (UCEA) and Utah DEQ LID Manual. See Appendix F for LID general details. The following LID descriptions are the approved LID measures to be used in Heber City. Any other proposed LID measures shall be approved by the City Engineer on a case-by-case basis. Please see the DEQ "Guide to Low Impact Development with Utah" for additional LID design guidelines and design flow-chart requirements.

Vegetated Swales

Vegetated swales may be considered dry or wet swales, and serve as a vegetative buffer between paved areas and storm drain facilities. The main advantages of vegetated swales are the degree of velocity reduction, detention, infiltration, and reduction of hard surface runoff. Storm runoff flows through the swale, where sediment and pollutants may settle out prior to entering downstream drainage facilities. A curb cut is one means of directing flow into swales where changes in elevation are limited.

Swales are often an attractive BMP solution because they can take advantage of already planned park strips. It should be noted that studies have shown that vegetated swales have a moderate ability to remove pollutants from storm water.

Dry Swales

A dry swale is a shallow, gently sloping drainage channel with broad, vegetated, side slopes. Dry swales provide temporary storage, filtration, and infiltration of storm runoff. A dry swale is versatile because it requires a relatively small area. Reduced channel velocities increase infiltration and water quality treatment and may reduce peak runoff. Channel vegetation can include turf, meadow grass, shrubs, and in limited quantities, small trees. Dry swales must be located above the water table to provide drainage. Dry swales are only allowed when groundwater is equal to or greater than 2-feet below the swale bottom elevation. When infiltrations rates are greater than 6.0 in/hour, dry swales shall either be designed as a biofilter for treatment of storm water or be preceded by an approved pre-treatment system. See the Water Quality section in this report for requirements. Retention LIDs shall provide treatment through settling, decreased flow rate, and bioretention with a designed release time.

Wet Swales

Wet swales are a type of filtration BMP and occur when the water table is located close to the surface. Wet swales act as a long and linear shallow treatment system. Like dry swales, check dams can be used as needed to create cells and contain the entire water quality treatment volume. Cells may be planted with emergent wetland plant species to improve pollutant removal. Wet swales, at a minimum, shall be preceded by a pre-treatment device to capture and remove pollutants and coarse sediment particles, see the Water Quality section below.

Infiltration Basin/Galleries

An infiltration basin is essentially a detention basin that is constructed such that storm water can exit the basin by means of infiltration into the surrounding ground. These include underground pipe and chamber systems. These systems can reduce pollutants by settling out or filtering materials and any pollutants that may be bound to those materials. They are also effective at reducing nutrients, metals and other pollutants.

Basins with no outlet or highly restricted outlets can be effective at eliminating pollutants, but there is some risk of concentrating pollutants or introduction of pollutants to groundwater that must be considered. One way to address this is by the utilization of a biofilter, hydrodynamic separator (HDS), or other pollutant removal measures within or upstream of a basin that is sized to handle the water quality design storm. All infiltration basins shall be preceded by a pre-treatment or treatment system to capture and remove pollutants and coarse sediment particles, see requirements in the Water Quality section below.

Basins and galleries must be sized to drain within 48 hours after the end of the design storm and to not overtop in the 72-hour storm.

Underground injection wells are included in this category, but water quality and applicable regulations must be considered and utilized.

Rain Gardens

A rain garden is a planted depression or similar feature that allows storm runoff from impervious urban areas like roofs, driveways, walkways, parking lots, and compacted lawn areas the opportunity to infiltrate into the soil.

Rain gardens are an LID tool that can be used in new or established developments. Rain gardens can be constructed in commercial and residential sites. The garden may be located near a street or parking lot in a shallow depression where runoff can be diverted into it. Native perennial plants are recommended in rain gardens with a barrier to reduce weeds. Nutrients in the storm runoff are reduced as plants or other growing media make use of them to grow.

Rain gardens can be constructed to allow infiltration. Where complete infiltration is not desired or is not feasible due to existing soil conditions, an underdrain may be installed to convey excess water to a storm drain retention system.

Studies underway at Utah State University have identified common reed and sedges are the optimal plant for use in northern Utah to remove nutrients, metals, and other pollutants (Dupont and McLean), but it must be harvested and disposed of elsewhere at regular intervals to prevent concentration of

pollutants in the soil or in the biofilters. Mulching and leaving in place does not address this. Whether such concentrations are critical depends on the contact with groundwater, and is still under study.

Root zone soil media must be shallow and water must pool or move slowly through the system or the pollutant removal is ineffective.

Rain garden filtration media shall meet the specification for biofilters (see Water Quality section below), are only allowed in private areas, and shall be maintained by the property owner.

Water Quality

Water quality is of utmost importance to Heber City. There are a variety of mechanisms to protect water quality from storm drain discharge systems. All storm water must pass through a pre-treatment or treatment system prior to discharging to a storage facility (above or below ground) that captures the 25-year to 100-year storm events. LID measures are intended to reduce storm runoff and to improve overall water quality. However, as most LID measures rely on infiltration, water quality must also be considered during design and implementation. Unless the native soil infiltration rate is less than 6.0 in/hr and/or the LID facility is designed and determined to treat the storm water (biofilter treatment), an approved hydrodynamic separator (HDS) pre-treatment device shall be used prior discharging to LID systems. All storm water that flows over an impervious surface must be treated.

Pre-treatment and Treatment Systems

Pre-treatment and treatment systems shall be sized, at a minimum, to treat the 2-year storm event at the duration that produces the highest flow rate while also being able to by-pass the peak conveyance storm at the time of concentration (T_c) without disrupting the treatment system. The peak conveyance storm represents the actual capacity of the initial conveyance system and may be larger than the 10-year event. Note, treatment systems that also serve as LID retention areas may be sized for the 80th percentile storm event but shall adhere to the by-pass requirements stated above. Requirements for pre-treatment and treatment are listed below.

Oil-Water and Hydrodynamic Separators (HDS) Pre-Treatment Devices:

All developments are required to install an appropriately sized hydrodynamic separator (HDS) prior to discharging to the retention/detention storage facility that captures the 25-year to 100-year storm events unless the LID methods utilized in the development incorporate a sized biofilter per the specification listed below and the storm water is not re-introduced to a source of pollution after it flows through the localized LID methods. Pre-treatment devices shall be maintained at least twice per year and per the guidelines provided by the manufacturer. All HDS devices must achieve, at a minimum, the following treatment levels:

- The HDS system shall be required to have a General Use Level Designation (GULD) performance verification through the TAPE program (Emerging stormwater treatment technologies (TAPE) - Washington State Department of Ecology). The device shall be sized to treat the peak runoff flow rate generated by the 2-year storm event at the Tc, when using Rational Method. Use the storm duration and distribution that creates the highest flow rate during a 2-year storm event when using other run-off computation methods.The proposed hydraulic loading rate (HLR) must not exceed the design HLR of the proposed device to be used. TAPE approval letters can be fou

Add bullet item: "The HDS system shall be designed to remove 80% of the total suspended solids (TSS) 110 microns or larger from the storm water.

found on the website and provide the design HLR and/or the maximum treatment flow rate for each model.

- The HDS system shall be concrete unless otherwise approved by the City Engineer
- The HDS system shall provide 90% removal of trash and ~~neutrally buoyant material~~ other particles larger than 5mm at the design treatment flow rate. Adding a screen to the tested system is not allowed to meet this spec, as modifying a TAPE verified system with a screen can significantly affect hydraulics, and thus water quality performance.
- The HDS system shall be designed to by-pass the peak conveyance storm event and prevent these larger storm events from washing out the oil, debris, and sediment that has been previously captured (off-line storage).
- The HDS system shall provide a minimum sump and oil storage capacity as follows:

Treatment Capacity Range (cfs)	Minimum Sump Storage Capacity (yd^3)	Minimum Oil Capacity (gal)
0-4	> 0.4	> 60
4-9	> 2	> 200
9-20	> 4	> 500
> 20	> 8	> 1000

Biofilter Treatment Systems: Biofilter is a generic description for bioswales, vegetated filter strips, rain gardens, or other structures that use a filtration media to capture storm water pollutants. The pollutants are decomposed by a biomass such as plants, a tree, or a specially designed biofilter media. These systems are typically connected to a storm drain system and if used shall be combined with detention/retention facilities.

All biofilters shall be sized to treat the 2-year T_c storm event flow rate while also be sized to by-pass larger flows without disrupting the treatment system. Biofilters shall treat the storm water prior to infiltrating into the native soils with infiltration rates greater than 6.0 in/hr and/or prior to discharging to a detention/retention facility unless a sized HDS system is properly incorporated as pre-treatment.

The growing media of the biofilter and shall be designed and certified to meet the following specifications.

RAIN GARDEN AND BIOFILTER GROWING MEDIA (Soil + Organics)

Assume a saturated hydraulic conductivity rate of 2.0 in/hr. Then, divide it by a safety factor of 2.0. So, the net rate is 1.0 in/hr.

RAIN GARDEN AND BIOFILTER SOIL

Particle Size Distribution

sand: 70-80%

silt: 0-30%

clay: 0-15%

Chemical Attribute and Nutrient Analysis

pH: 6.8-7.5

organic matter: < 1.5%

nitrogen: < 15 ppm

phosphorous: < 15 ppm

salinity: < 6 mmhos/cm

RAIN GARDEN AND BIOFILTER ORGANICS

shredded mulch: 3-5% (by weight of growing media)

VEGETATION

The filter area shall be vegetated with drought tolerant species that thrive in sandy soils. Table 3 provides a suggested seed mix for sites that will not need to be irrigated after the grass has been established.

Table 3. Suggested Seed Mix

Common Name	Scientific Name	Variety	PLS[2] lbs per Acre	Ounces per Acre
Sand bluestem	Andropogon hallii	Garden	3.5	
Sideoats grama	Bouteloua curtipendula	Butte	3	
Prairie sandreed	Calamovilfa longifolia	Goshen	3	
Indian ricegrass	Oryzopsis hymenoides	Paloma	3	
Switchgrass	Panicum virgatum	Blackwell	4	
Western wheatgrass	Pascopyrum smithii	Ariba	3	
Little bluestem	Schizachyrium scoparium	Patura	3	
Alkali sacaton	Sporobolus airoides		3	
Sand dropseed	Sporobolus cryptandrus		3	
Pasture sage[1]	Artemisia frigida			2
Blue aster[1]	Aster laevis			4
Blanket flower[1]	Gaillardia aristata			8
Prairie coneflower[1]	Ratibida columnifera			4
Purple prairieclover[1]	Dalea (Petalostemum) purpurea			4
Sub-Totals:			27.5	22
Total lbs per acre:			28.9	

[1] Wildflower seed (optional) for a more diverse and natural look.
[2] PLS = Pure Live Seed.

EXECUTION

thickness: >/= 18 inches

compaction: 80-85% of maximum dry density as measured by AASHTO T-99 (ASTM D698)

vegetation: Mix seed well and broadcast, followed by hand raking to cover seed and then mulched. Hydromulching can be effective for large areas. Do not place seed when standing water or snow is present or if the ground is frozen. Weed control is critical in the first two to three years, especially when starting with seed. When using sod, specify sand–grown sod. Do not use conventional sod. Conventional sod is grown in clay soil that will seal the filter area, greatly reducing overall function of the BMP.

Irrigation: Provide spray irrigation at or above the WQCV elevation or place temporary irrigation on top of the rain garden surface. Do not place sprinkler heads on the flat surface. Remove temporary irrigation when vegetation is established. If left in place this will become buried over time and will be damaged during maintenance operations. Adjust irrigation schedules during the growing season to provide the minimum water necessary to maintain plant health and to maintain the available pore space for infiltration.

Water Quality Control Measures

Other water quality control requirements are listed below.

Detention/Retention Facilities (Pollutant Control, LID): Detention basins are used to attenuate peak flow rates of a runoff hydrograph. They also can be designed to allow sediment, debris, and other contaminants to settle out by reducing water velocity or holding the water until it infiltrates or evaporates.

Retention facilities have no outlet and water is removed by infiltration or evaporation. Retention basins still function as a BMP the same way a detention basin does. Detention and retention facilities shall be used in combination with hydrodynamic separators or biofiltration systems.

These facilities require regular maintenance to remove debris, contaminants, and sediment build-up.

Outlet Protection/Energy Dissipation Devices: Outlet protection reduces or eliminates soil erosion thereby preventing the migration of soil to downstream channels. Outlet protection, pursuant to HEC 14, is required at all open discharge points.

Slope Protection: Slope protection ensures slopes will be stable during and after construction. The primary means of stabilization of a slope is establishing permanent vegetation, but may also consist of temporary or permanent rock, mulch, erosion control blankets, check dams, diversion dikes, or other means of protection. All slopes shall be stabilized after disturbance. Slopes of 3H:1V and steeper require permanent slope stabilization.

Source Protection

The Utah Division of Drinking Water requires that each well and spring serving a public drinking water system must have a source protection plan. Part of that plan includes the protection of groundwater from point and non-point sources. Developers within Heber must certify that all private and public

source protection zones are protected from storm water pollutants. Source protection zones for Heber City culinary water sources are shown on the source protection maps in Appendix H.

Storm water infiltration, drainage wells, or storm water injection wells are prohibited within 100 feet of Zone 1 of any source protection area. All storm drain storage facilities within 100 feet of a Zone 1 area shall be lined with an approved waterproof liner to prevent all storm water infiltration.

Natural Channels

All major natural channels in newly developed areas must maintain a buffer of open space and offset from development. This buffer is intended to help maintain water quality, prevent damage from flooding events, and maintain habitat and aesthetics. A minimum buffer width of 100-ft generally centered on the major natural drainage channel should be maintained. When natural topography or existing conditions favor a shift of the overall buffer area in one direction or another from the channel centerline, the City may approve a buffer zone shift with adequate justification. Development (including individual lots and buildings) is not allowed in the buffer zone. The drainage channel shall be protected and remain undisturbed where possible and with the exception of road or other crossings. Crossings of the natural channels shall be a minimum distance of 200-feet measured along the channel. Exceptions may be granted where proposed road crossings are adjacent to canal crossings or collector roads. Additional landscaping, green space, trails, or other amenities may be allowed if it is shown they will not negatively affect water quality or compromise the other goals of the buffer area. All improvements proposed in the natural drainages shall be approved by the City.

When existing developed areas are redeveloped and prior encroachment along or piping of historic channels has already taken place, a minimum buffer width of 50-ft generally centered on the major natural drainage channel shall be provided. No structures are allowed in the buffer area. Other improvements such as fencing, landscaping, hardscape, etc. may be allowed with written City approval and if adequate access along the channel is not compromised.

All development along natural channels, including proposals to relocate, alter, or pipe existing natural channels shall follow the National Flood Insurance Policy (NFIP) requirements and related City policies.

Where major historic channels are being re-established below the existing irrigation canals due to changes in the upstream drainage patterns (specifically as required in the North Village area), the buffer required along the re-established portion of the historic channel may be reduced by up to 40 ft, conditioned upon the following criteria:

- The re-established channel must be designed to convey the historic 100-year storm event considering no upstream retention/detention with a free board of 2 ft independent of the buffer area.
- Buffer area outside of the defined channel (on both sides) shall be a minimum of 20 feet wide, be designed to slope toward the channel, and allow for maintenance access along each side.
- Unless otherwise approved by the City, the re-established channels shall be constructed in a manner to appear as natural as possible with side slopes no steeper than 3H:1V.
- All provisions of this manual regarding natural channels and buffer areas with the exception of buffer area width shall still apply.

All buffer areas for natural channels shall have an easement dedicated to Heber City for emergency use.

Flood and Debris Flow Hazards

FEMA Flood Analysis

Ensure all pertinent FEMA flood mapping data is incorporated into plans and plats maps. Ensure all FEMA guidelines from https://www.fema.gov are followed including the sections on Floods & Maps, Floodplain Management, and Flood Insurance. FEMA uses the most accurate flood hazard information available and applies rigorous standards in developing Flood Insurance Rate Maps (FIRMs). All areas within Flood Hazard Areas shall be shown on plans and plats, and all Base Flood Elevation (BFE) data pertinent to the development must be provided.

To change the FIRM designation of a property, a Letter of Map Amendment (LOMA) and/or the Letter of Map Revision-Based on Fill (LOMR-F) processes must be strictly followed.

Debris-Flow Flood Hazard Analysis

The Western Unities states is beginning to see increased precipitation intensity and increasing fire size and frequency (Kean and Staley et al, 2021). Generally, there is not adequate time to prevent or mitigate a debris flow hazard *after* a wildfire has taken place. The USGS has found that 1-year storm events will typically trigger a post-wildfire debris flow event. Therefore, if a wildfire takes place, some type of debris flow is likely to happen within 1-year of the fire. These types of hazards should be prevented or controlled as deemed feasible. New development with undeveloped land upstream or downstream of the property containing natural slopes 30% and greater and/or where the City Engineer determines there could be a potential debris-flow risk, requires a specialized post wild-fire debris-flow analysis of the site including an estimated post-fire hazard assessment with mitigation measures.

Flood and Debris-flow hazard analysis reports shall include but shall not be limited to the following information for the areas to be developed:

- FEMA Flood Mapping Data including 100-year flood hazard zones
- Include and label the drainageways susceptible to periodic flooding associated with storm events or rapid snowmelt that are outside the FEMA designated flood zones
- U.S. Geological Survey Map
- Aerial Map
- Contour map with slopes labeled
- Geotechnical Test pit data
- Geologic Mapping Data to include historic upstream and downstream alluvial fan deposits and historic upstream or pass-through debris/mud flows as data is available.
- Vegetative cover type and percentage analysis
- Utah Division of Water Rights – Dam Safety requirements
- Post-fire debris-flow volume calculations with flood and post-fire debris-flow hazard assessment and mitigation

Flood and post-fire debris-flow hazard assessment and mitigation recommendations shall adhere to the following guidelines:

The storage volume fordebris and sediment shall be calculated using model equation (2) from the 2010 Cannon study (Cannon et al,, 2010) using a minimum 80% burn of slopes 30% and greater. The entire

drainage basin shall be modeled. Methods from the Gartner 2014 study and equation (3) may also be used until another model paper is published and adopted by USGS. (Gartner et al., 2014).

The minimum storm event interval shall be a 10-year occurrence with a T_c peak rainfall depth, unless otherwise approved by the City Engineer. Intensity is used for the Gartner method.

When the Gartner method is used, the watershed area burned at moderate to high severity shall be calculated based on a vegetation type assessment of the entire drainage basin. Vegetation type and coverage area data shall be obtained and summarized under the direction of a licensed Professional Engineer or other approved licensed professional. Forested areas and other areas with small or large tree species (deciduous or evergreen) and/or thick brush, such as Gambel Oak shall be assumed to burn at moderate to high severity. Staley et al. (2018) spells out further guidance on vegetation types and burn severity per vegetation type.

Debris flow is difficult to accurately model due to the nature of the material being carried by the storm water, especially if the natural channel that the debris flow will enter and travel through is altered by road crossings, culverts, or other diversions/obstructions over and through the natural channel. Unless the natural channel is undisturbed and can be accurately modeled to safely convey the debris flow without having to travel through any obstructions, culverts, roads, etc. that would otherwise plug or divert the flow off-course, the estimated debris volume needs to be contained in a debris-basin upstream from development. Road or other crossings shall be designed to allow and divert debris flow and/or flood water over the crossing using depression or other mechanism to allow the flow to pass the crossing continue down the natural channel. Other measures to contain and/or divert the debris volume may be considered, as approved by the City Engineer.

References

Cannon, S.H., Gartner, J.E., Rupert, M.G., Michael, J.A., Rea, A.H., & Parrett, C. (2010). Predicting the probability and volume of postwildfire debris flows in the intermountain western United States. *GSA Bulletin, v. 122*(1-2), 127-144. https://doi.org/10.1130/B26459.1

Gartner, J.E., Cannon, S.H., & Santi, P.M. (2014). Empirical models for predicting volumes of sediment deposited by debris flows and sediment-laden floods in the transverse ranges of southern California. *Engineering Geology, 176*, 45-56. https://doi.org/10.1016/j.enggeo.2014.04.008

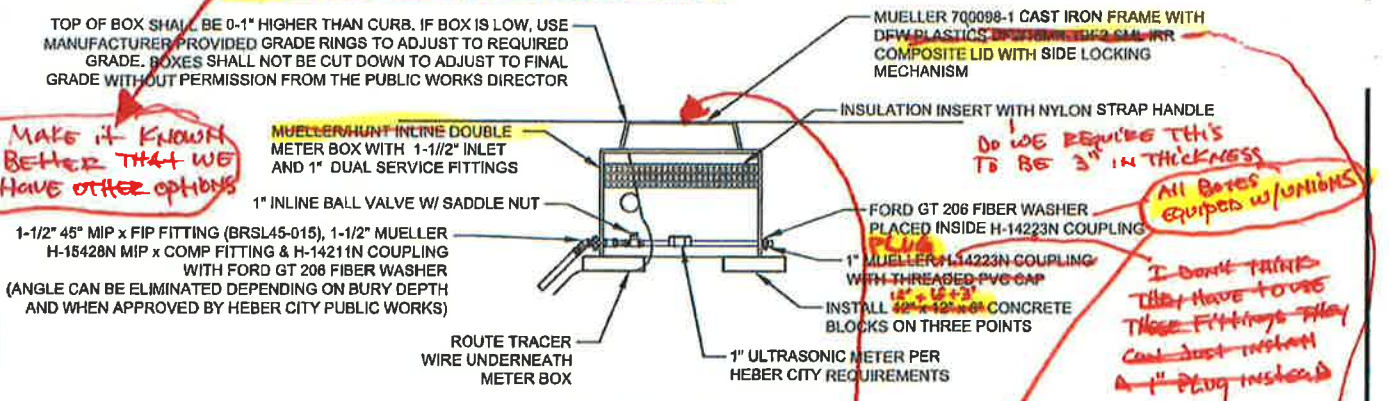
Kean, J.W., & Staley, D.M. (2021). Forecasting the frequency and magnitude of postfire debris flows across southern California. *Earth's Future, 9*(3), e2020EF001735. https://doi.org/10.1029/2020EF001735

Staley, D.M., Tillery, A.C., Kean, J.W., McGuire, L.A., Pauling, H.E., Rengers, F.K., & Smith, J.B. (2018). Estimating post-fire debris-flow hazards prior to wildfire using a statistical analysis of historical distributions of fire severity from remote sensing data. *International Journal of Wildland Fire, 27*(9), 595-608. https://doi.org/10.1071/WF17122

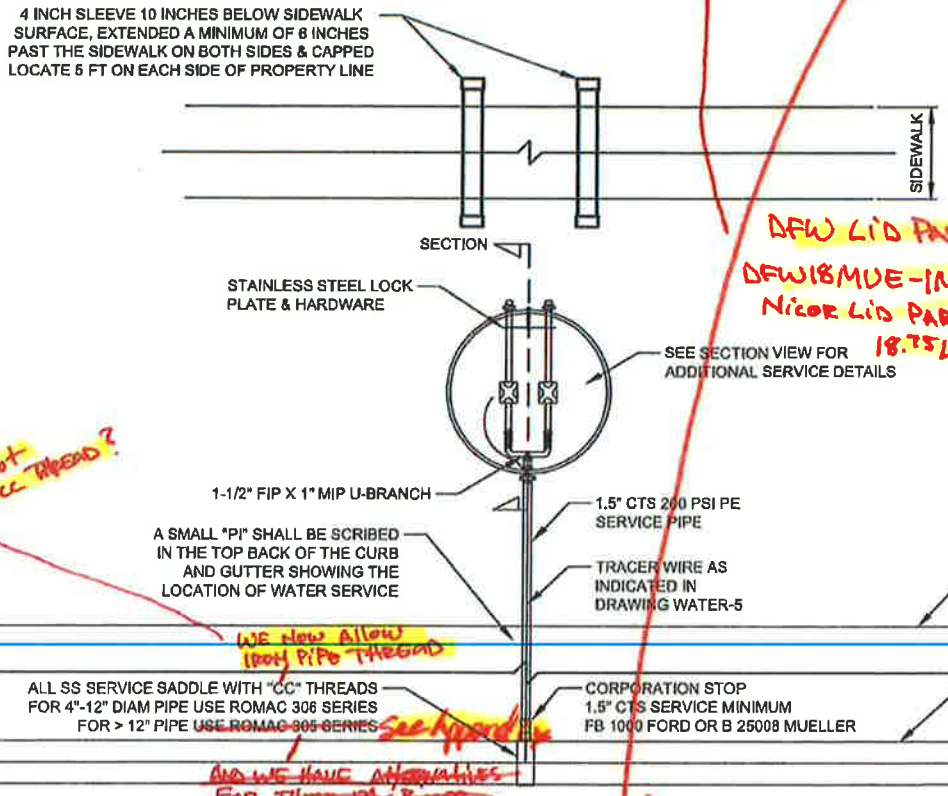
TABLE 1				
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	LID / FRAME MODEL	COMMENTS
1 INCH	27" x 18"	330ID2718FAB000650N	~~DFW PLASTICS DFW2 SML IRR~~ / 700098-1	NEW SERVICES

NOTE 1: FOR LARGER SIZES, USE SINGLE SERVICE DETAIL AND CONFIGURATION.

~~NOTE 2: SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.~~



SECTION VIEW



NOTES:
1. ALL COMPONENTS SHOWN TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WHEN METER BOXES ARE INSTALLED WITHIN DRIVEWAY ZONES OR WITHIN OTHER PAVED SURFACES, DIFFERENT TRAFFIC RATED LIDS & FRAMES MAY BE REQUIRED PER THE DIRECTION OF THE PUBLIC WORKS DIRECTOR.
5. IRRIGATION METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER. 4" SLEEVE REQUIRED ON ALL INSTALLATIONS INCLUDING EXISTING SIDEWALK.
6. IRRIGATION SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF OF SERVICE LINES.
7. METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
8. BEDDING OF ALL PIPE SHALL CONFORM TO HEBER CITY BEDDING STANDARDS FOR CULINARY WATER.
9. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.

IRRIGATION SERVICE - TWO LOTS

HORROCKS ENGINEERS
726 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2226

DATE: APRIL 2015
SCALE: N.T.S.

HEBER CITY CORPORATION
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY STANDARD DRAWING

IRRIGATION-1A

H:\Heber City\Std Dwgs\2022 March\Updated drawings\IRRIGATION-1A_Updated.dwg, IrrServ 2 Lots - 3/24/2022 9:42:09 am, alexandria.lewallen

TABLE 1				
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	LID / FRAME MODEL	COMMENTS
1" MINIMUM	18" x 18"	330IS1818FABS000646N	~~DFW18MR-1BF1 SML IRR (NO FRAME)~~	NEW SERVICES
1.5"	27" x 24"	500IS2724FAB000666N	~~DPW18MR-1BF1 SML IRR~~ / 700098-1	NEW SERVICES
2"	36" x 36"	550IS3636FAB000666N	SAME AS ABOVE w/ 790138 EXP RING	NEW SERVICES

NOTE 1: FOR LARGER SIZES CONTACT PUBLIC WORKS FOR REQUIREMENTS.

~~NOTE 2: SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.~~

TOP OF BOX SHALL BE 0-1" HIGHER THAN CURB. IF BOX IS LOW, USE MANUFACTURER PROVIDED GRADE RINGS TO ADJUST TO REQUIRED GRADE. BOXES SHALL NOT BE CUT DOWN TO ADJUST TO FINAL GRADE WITHOUT PERMISSION FROM THE PUBLIC WORKS DIRECTOR

~~MUELLER/HUNT INLINE EZ-SETTER~~ METER BOX WITH 1" FITTINGS

1" INLINE BALL VALVE W/ SADDLE NUT

1" MUELLER H-15529N 45° MIP x COMP FITTING & H-14211N COUPLING WITH FORD GT 206 FIBER WASHER (ANGLE CAN BE ELIMINATED DEPENDING ON BURY DEPTH AND WHEN APPROVED BY HEBER CITY PUBLIC WORKS)

ROUTE TRACER WIRE UNDERNEATH METER BOX

MUELLER 700098 CAST IRON FRAME WITH 311955 COMPOSITE LID OR DFW PLASTICS ~~DFW18MR-1BF1 SML IRR COMPOSITE LID~~ WITH SIDE LOCKING MECHANISM

INSULATION INSERT WITH NYLON STRAP HANDLE

FORD GT 206 FIBER WASHER PLACED INSIDE H-14223N COUPLING

1" MUELLER H-14223N COUPLING WITH THREADED PVC CAP

INSTALL ~~12" x 12" x 6"~~ CONCRETE BLOCKS ON THREE POINTS

1" ULTRASONIC METER PER HEBER CITY SPECIFICATIONS

SECTION VIEW

4 INCH SLEEVE 10 INCHES BELOW SIDEWALK SURFACE, EXTENDED A MINIMUM OF 6 INCHES PAST THE SIDEWALK ON BOTH SIDES & CAPPED

SIDEWALK

SECTION

SEE SECTION VIEW FOR SERVICE DETAILS

1" CTS 200 PSI PE SERVICE PIPE

A SMALL "PI" SHALL BE SCRIBED IN THE TOP BACK OF THE CURB AND GUTTER SHOWING THE LOCATION OF WATER SERVICE

TRACER WIRE AS INDICATED IN DRAWING WATER-5

TOP BACK OF CURB

ALL SS SERVICE SADDLE WITH "CC" THREADS
FOR 4"-12" DIAM PIPE USE ROMAC 308 SERIES
FOR > 12" PIPE ~~USE ROMAC 305 SERIES~~ See Appendix "A"

CORPORATION STOP
1" CTS SERVICE MINIMUM
FB 1000 FORD OR B 25008 MUELLER

PVC C900 PURPLE IRRIGATION PIPE

NOTES:
1. ALL COMPONENTS SHOWN TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WHEN METER BOXES ARE INSTALLED WITHIN DRIVEWAY ZONES OR WITHIN OTHER PAVED SURFACES, DIFFERENT TRAFFIC RATED LIDS & FRAMES MAY BE REQUIRED PER THE DIRECTION OF THE PUBLIC WORKS DIRECTOR.
5. IRRIGATION METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER. 4" SLEEVE REQUIRED ON ALL INSTALLATIONS INCLUDING EXISTING SIDEWALK.
6. IRRIGATION SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF OF SERVICE LINES.
7. METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
8. BEDDING OF ALL PIPE SHALL CONFORM TO HEBER CITY BEDDING STANDARDS FOR CULINARY WATER.
9. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.

IRRIGATION SERVICE - ONE LOT

HORROCKS ENGINEERS
728 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2226

DATE: APRIL 2015
SCALE: N.T.S.

HEBER CITY CORPORATION
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY STANDARD DRAWING

IRRIGATION-1B

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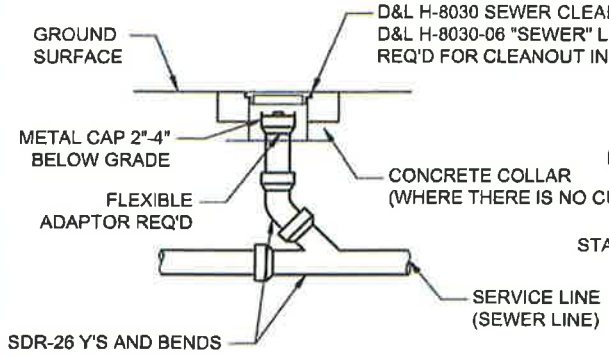
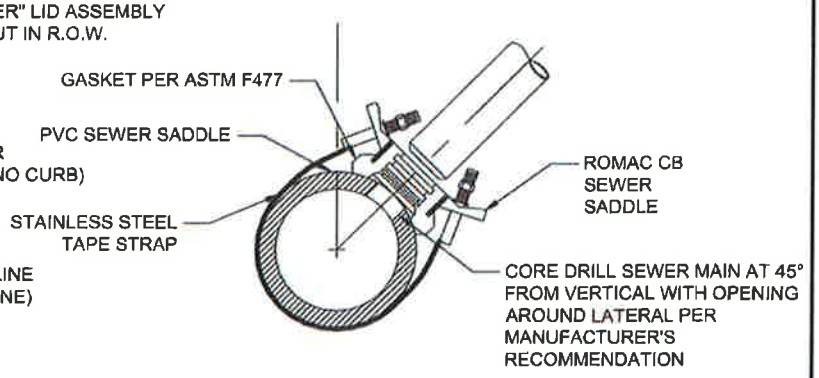
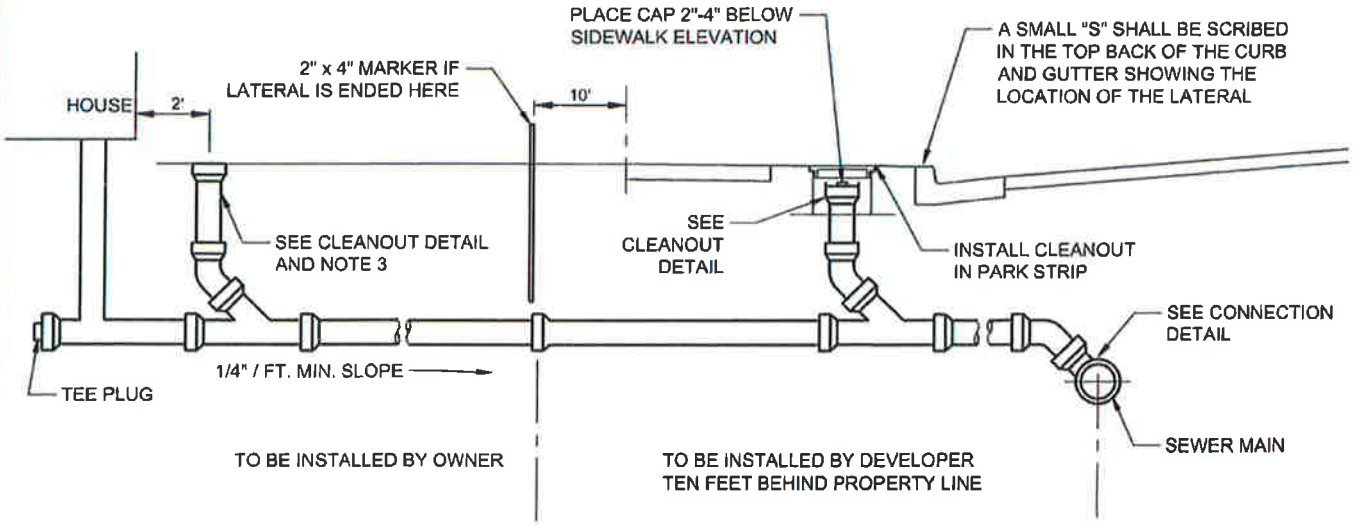


CLEANOUT DETAIL



CONNECTION DETAIL
ON EXISTING MAIN LINES
(SEE NOTE 6)



NOTES:

1. PIPE GRAPHICS DO NOT NECESSARILY INDICATE TYPE OF PIPE TO BE USED.
2. ALL PVC SEWER LATERAL PIPE AND FITTINGS WITHIN THE R.O.W. SHALL BE A MINIMUM OF SDR-26.
3. MAXIMUM SPACING BETWEEN CLEANOUTS IS 100' AND AT ALL BENDS.
4. MAXIMUM ALLOWED BEND IN LATERAL IS 22 1/2 DEGREES.
5. SEWER & WATER LATERALS ARE PROHIBITED IN COMMON TRENCH PER STATE CODE R 309-550-7.
6. "INSERTA TEE" MAY BE USED FOR CERTAIN CONDITIONS WITH PRIOR CITY ENGINEER APPROVAL.
7. WHEN APPROVED, "INSERTA TEE" INSTALLATION MUST BE WITNESSED, INSPECTED AND CERTIFIED BY AUTHORIZED CITY AGENTS
8. IN CERTAIN AREAS WHERE CONCERN FOR SEWER BACKUP EXISTS, A SEWER BACKFLOW PREVENTER (RECTORSEAL 97034) SHALL BE REQUIRED.
9. PIPE SLOPE SHALL BE 1/4" / FT MIN. ~~UNLESS OTHERWISE APPROVED BY HEBER CITY~~

	DATE: JUNE 2023 SCALE: N.T.S. 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY HEART OF THE WASATCH BACK	SEWER LATERAL & DETAILS SEWER-1

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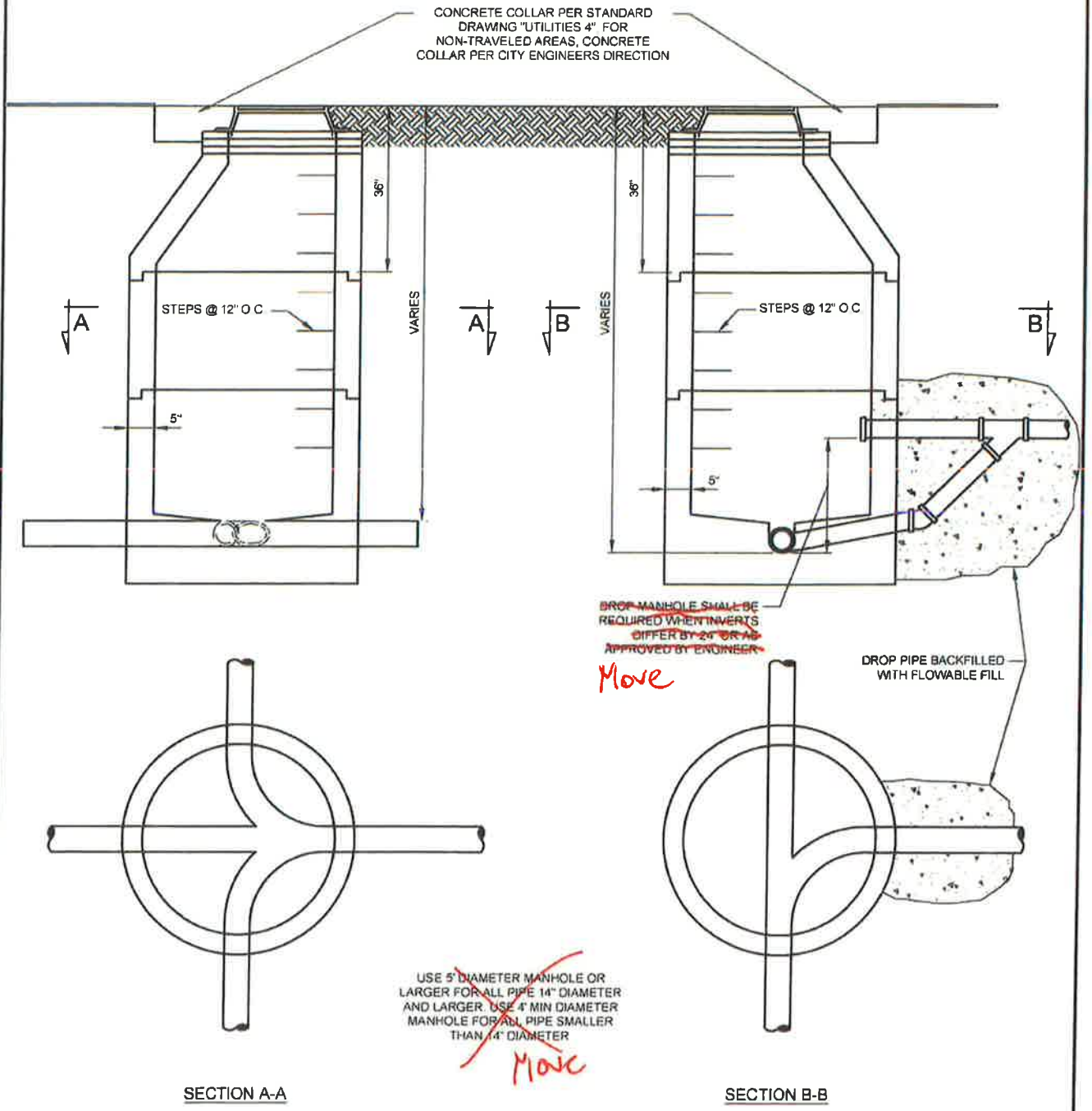


JUNCTION & DROP MANHOLES

H:\Heber City\Std Dwgs\2022 March\Updated drawings\SEWER-3_Updated.dwg - Manhole Junc Drop - 3/22/2022 02:28pm, alexandria lewallen

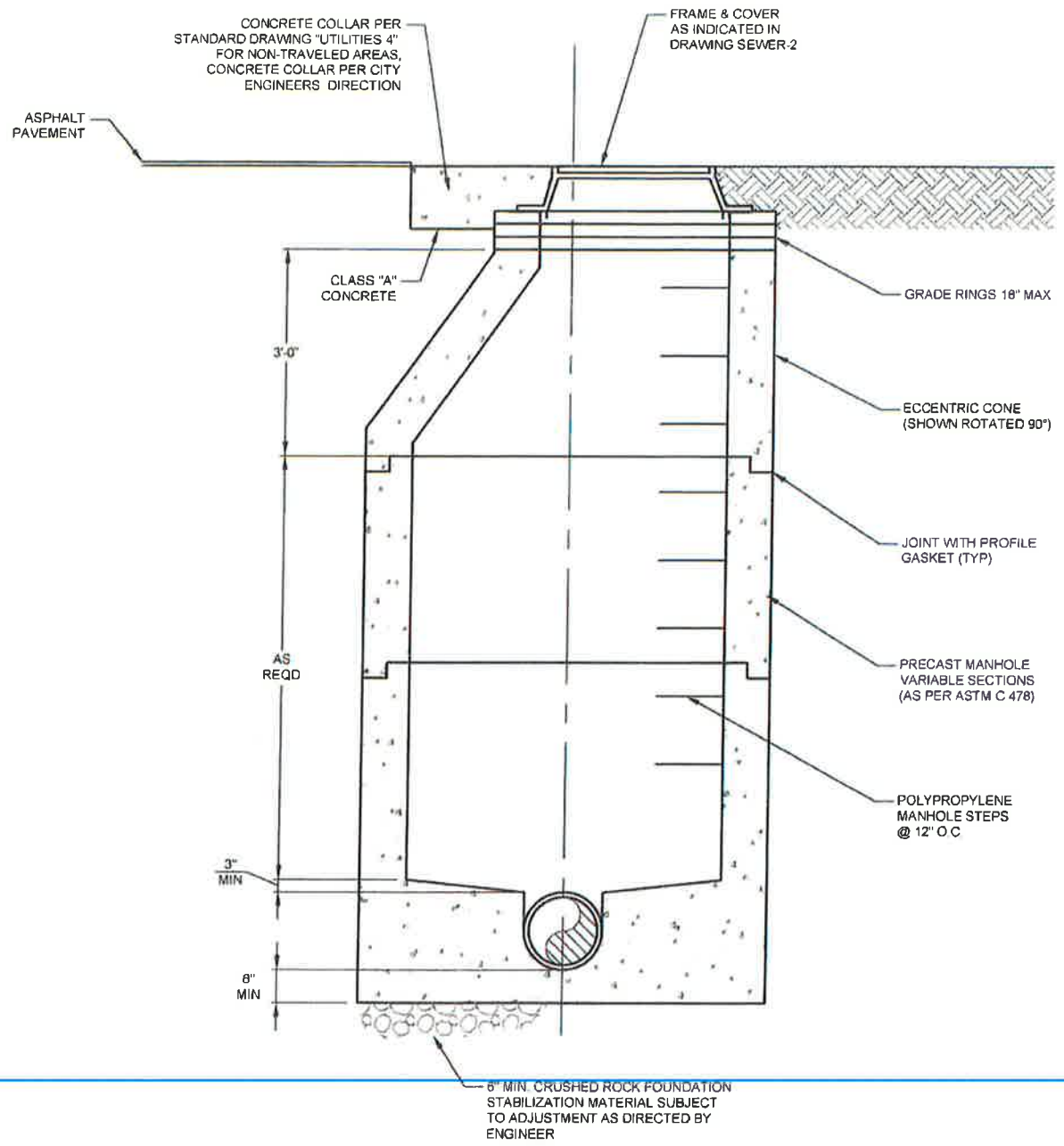
HORROCKS ENGINEERS
728 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2226

DATE: APRIL 2015
SCALE: N.T.S.

HEBER CITY CORPORATION
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY STANDARD DRAWING

SEWER-3



NOTES:

1. LOCATE MANHOLE COVER ON SIDE OF MANHOLE AS SHOWN ABOVE SET MANHOLE FRAME IN GROUT
2. ALL MANHOLES TO BE WATER TIGHT AND TESTED AS PER STD SPEC 02660
3. MANHOLE BASE AND 1ST SECTION OF MANHOLE TO BE FABRICATED AS AN INTEGRAL UNIT
4. ~~USE 5' DIAMETER OR LARGER MANHOLE FOR PIPES 14" DIAMETER AND LARGER~~
5. ~~USE 4' DIAMETER MANHOLE FOR ALL PIPES SMALLER THAN 14" DIAMETER~~

Move

PRECAST CONCRETE SEWER MANHOLE

HORROCKS ENGINEERS
726 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2226

DATE: FEBRUARY 2019
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY

HEBER CITY STANDARD DRAWING

SEWER-5

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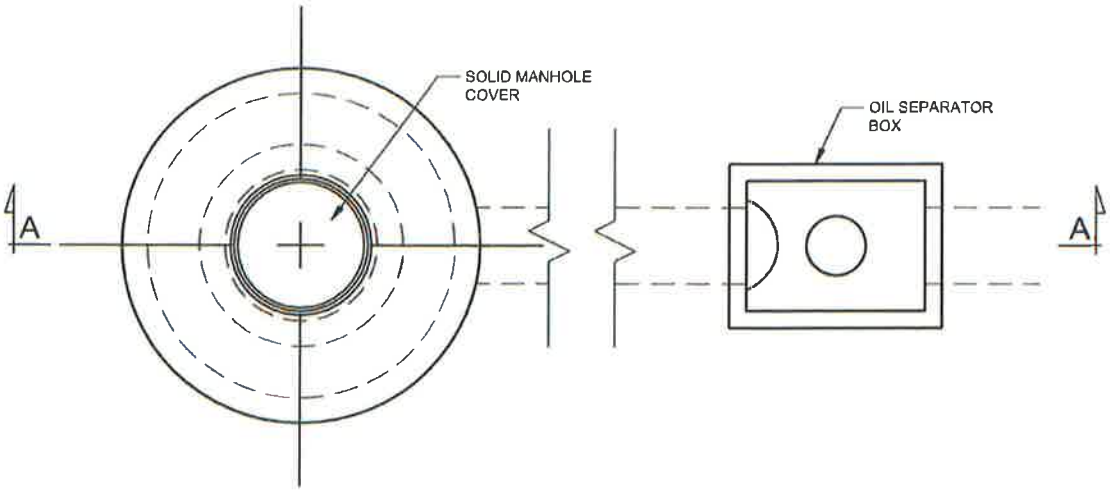

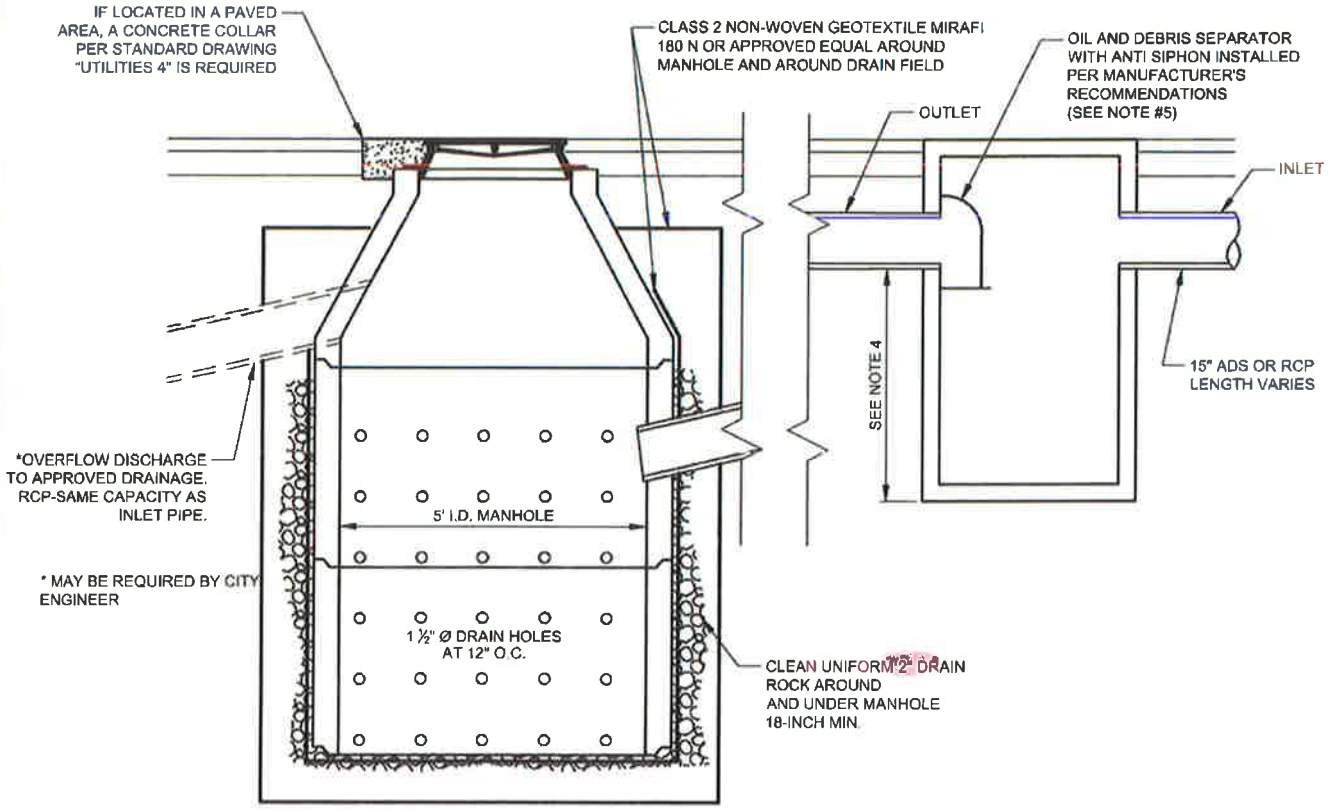

SECTION A-A

NOTES:

1. CONSTRUCT DROP INLET BOX TO MATCH WIDTH OF CURB & GUTTER. MATCH INSIDE LENGTH OF BOX TO INSIDE LENGTH OF FRAME.
2. D & L I-3516 WITH ADJUSTABLE CURB BOX.
3. STANDARD CAST IRON MANHOLE RING & LID.
4. SUMP DEPTH = 36" MIN. FOR 12" DIAMETER OUTLET AND SMALLER, FOR OUTLET DIAMETER 15" AND LARGER, DEPTH = 2.5 TO 3 TIMES THE DIAMETER.
5. SEE STANDARD SPECIFICATION 02772 PONDS.

DATE	JUNE 2023
SCALE	N.T.S.
	75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

SUMP DISPOSAL & OIL SEPARATOR

DRAIN-3

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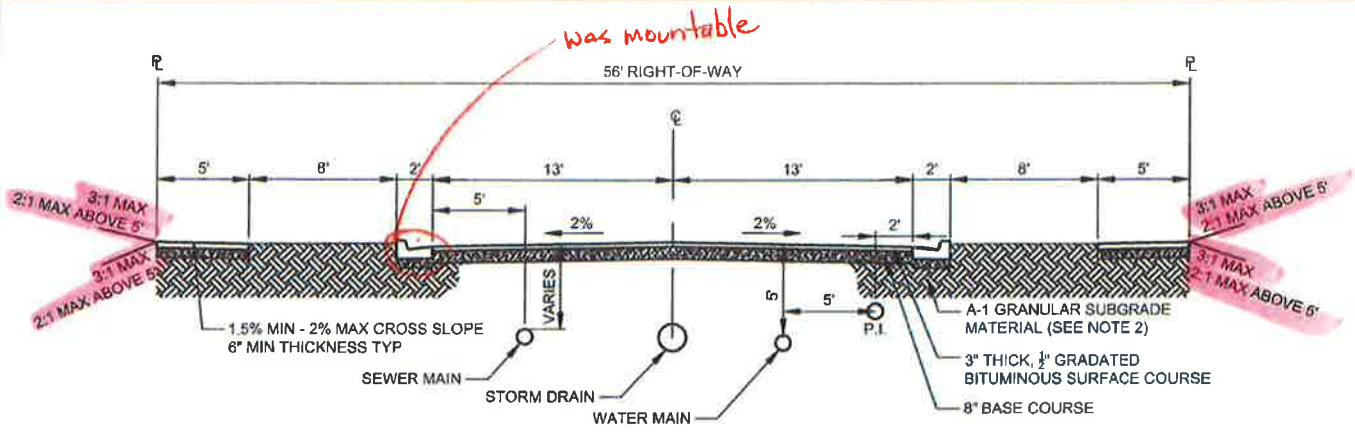
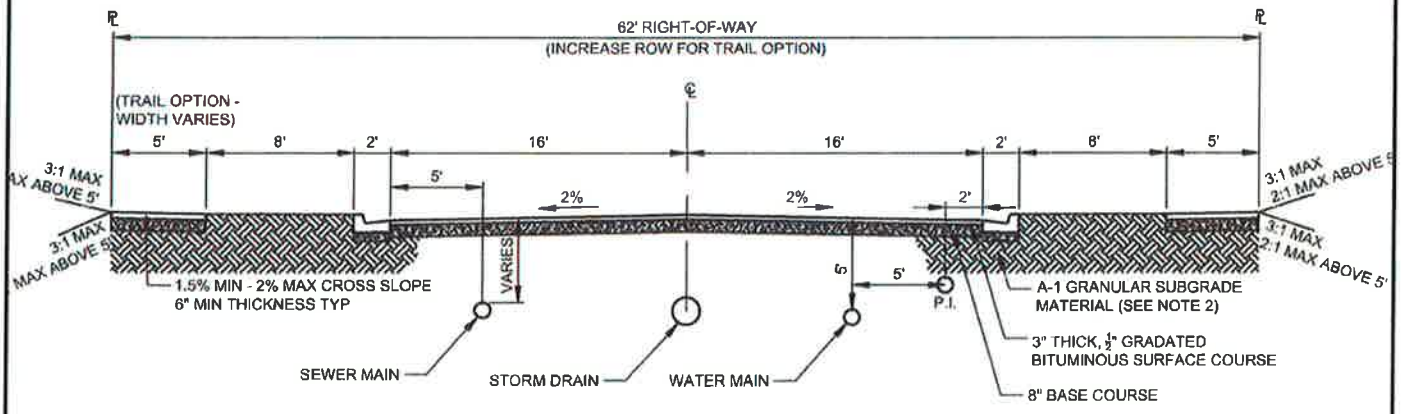


TYPICAL CRITERIA FOR USE OF MINOR RESIDENTIAL LOCAL STREET:

1. THE MAXIMUM AVERAGE DAILY TRIPS SHALL NOT EXCEED 500.
2. THE TOTAL NUMBER OF UNITS MUST BE LESS THAN 100.
3. PARKING TO BE RESTRICTED AS DIRECTED BY THE CITY ENGINEER.

MINOR RESIDENTIAL LOCAL



TYPICAL CRITERIA FOR USE OF MAJOR RESIDENTIAL LOCAL STREET:

1. THE MAXIMUM AVERAGE DAILY TRIPS SHALL NOT EXCEED 2000.
2. THE TOTAL NUMBER OF UNITS MUST BE LESS THAN 200.

MAJOR RESIDENTIAL LOCAL

NOTES FOR RESIDENTIAL STREETS:

1. SUBGRADE SHALL BE A-1 GRANULAR MATERIAL PER SECTION 02225.
2. MAXIMUM ROAD GRADE IS 8% WITHOUT CITY ENGINEER'S APPROVAL.
3. PARK STRIPS TO BE FILLED TO WITHIN ONE INCH OF T.B.C. AND TOP OF SIDEWALK.
4. WHERE HEBER CITY APPROVES INSTALLING A TRAIL OR SIDEWALK ON ONLY ONE SIDE, THE FULL RIGHT-OF-WAY DEDICATION IS STILL REQUIRED TO ALLOW FOR FUTURE INSTALLATION OF SIDEWALK.
5. TRAIL OPTION AND WIDTH IS DETERMINED BY HEBER CITY ACCORDING TO THE CURRENT TRAILS MASTER PLAN.

	DATE: JUNE 2023 SCALE: N.T.S.	HEBER CITY HEART OF THE WASATCH BACK	MAJOR & MINOR RESIDENTIAL LOCAL
	75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		STREETS-1

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75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

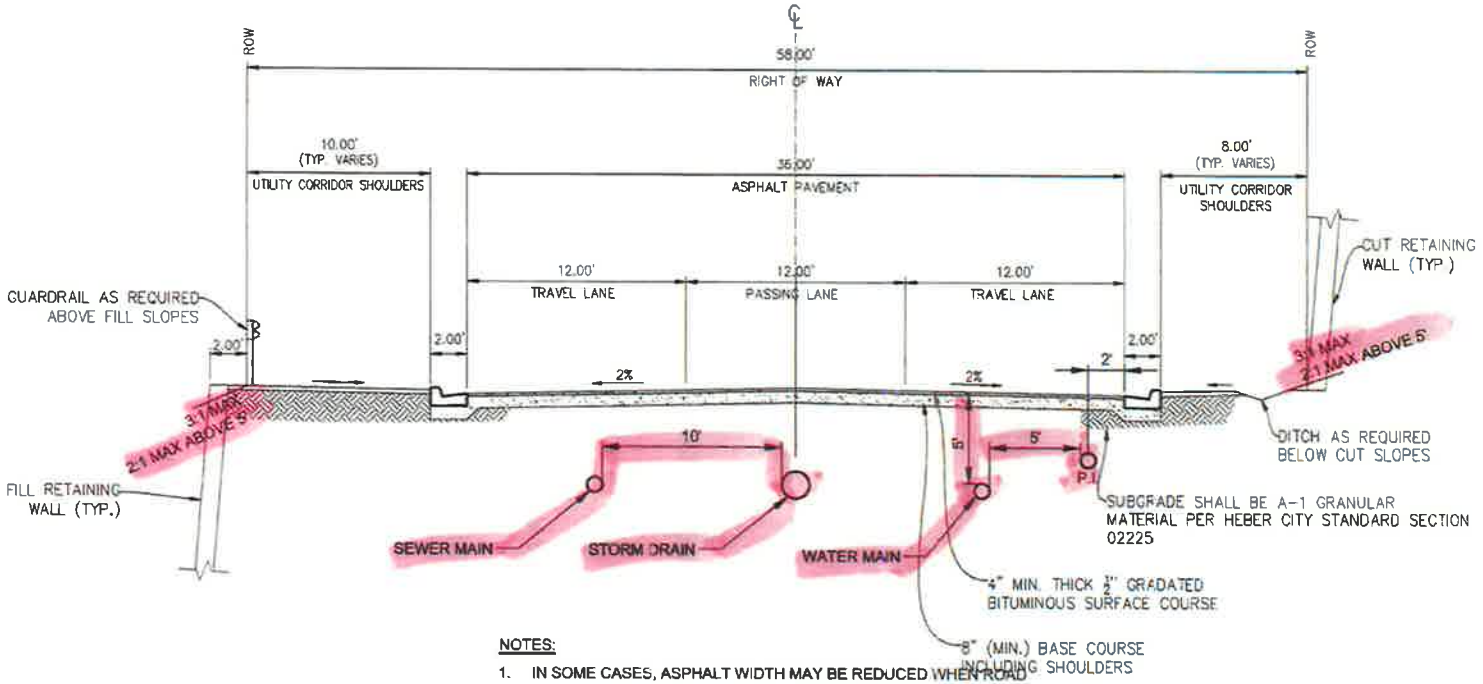
SCALE: N.T.S

DATE: JUNE 2023

HEBER CITY

NO-ACCESS MOUNTAIN COLLECTOR

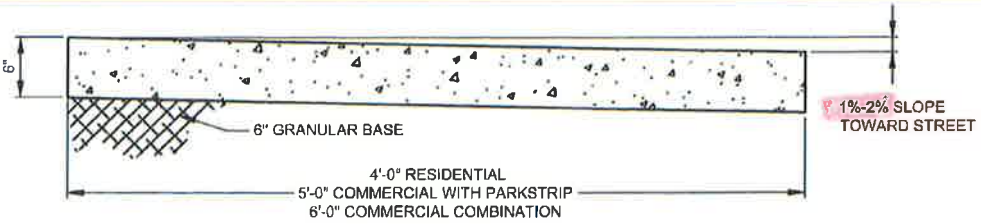
STREETS-2B



NOTES:

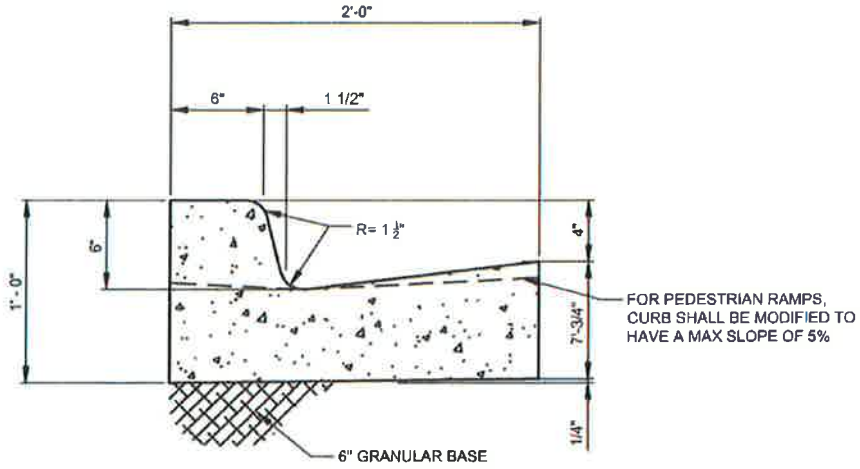
1. IN SOME CASES, ASPHALT WIDTH MAY BE REDUCED WHEN ROAD GRADE IS LESS THAN 4% WITH PRIOR CITY ENGINEER APPROVAL.
2. SUBGRADE SHALL BE A-1 GRANULAR MATERIAL PER SECTION 02225.
3. SHOULDERS TO BE FILLED TO WITHIN ONE INCH OF T.B.C.
4. NO PARKING.
5. NO RESIDENTIAL DRIVEWAYS.
6. TRAVERSES NON-DEVELOPABLE TERRAIN.
7. ENCROACHMENT EASEMENTS REQUIRED FOR WALLS/SLOPES OUTSIDE OF ROW.
8. TRAILS SHALL BE LOCATED OUTSIDE OF THE ROW.

NO ACCESS MOUNTAIN COLLECTOR



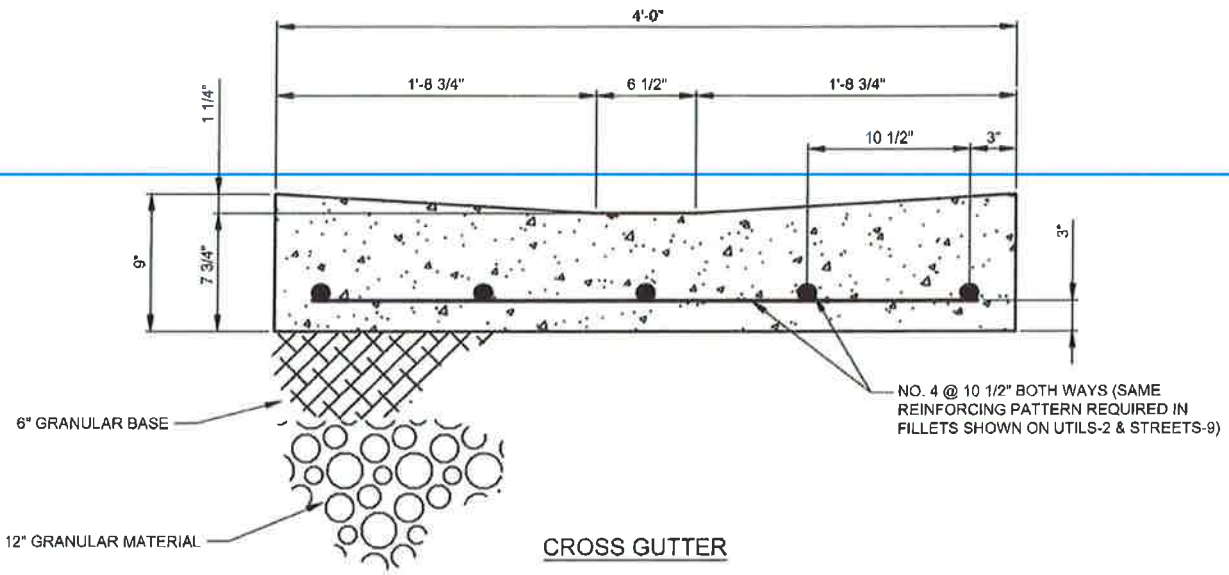
NOTE: WHEN REPLACING SIDEWALK, THICKNESS MAY BE REDUCED TO 4" WITH CITY ENGINEER APPROVAL.

SIDEWALK



NOTES:THE TOP BACK OF CURB SHALL BE STAMPED ACCORDING TO SECTION 700 - 1.02 - L.

HIGH BACK CURB & GUTTER



CROSS GUTTER

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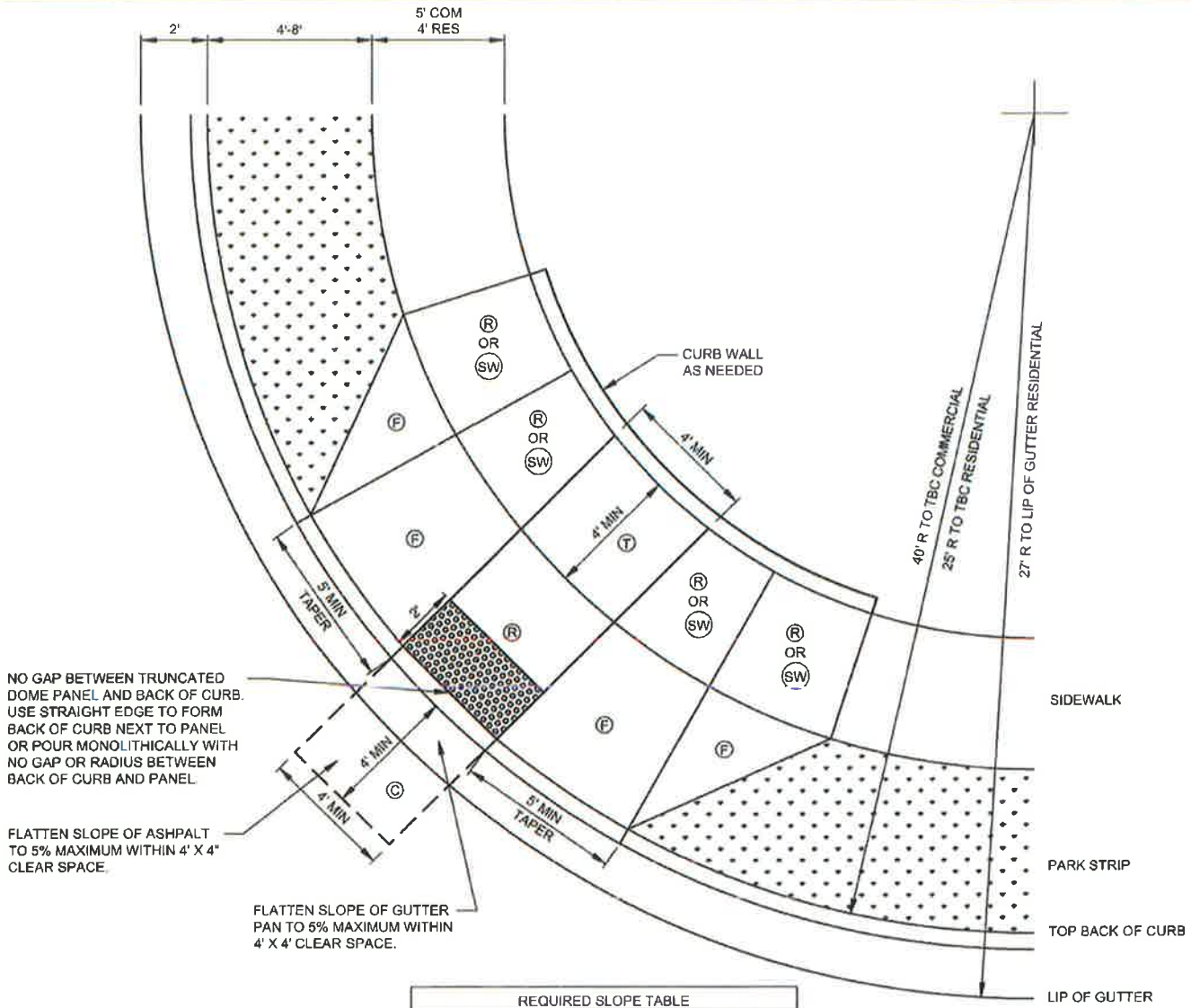
DATE: JUNE 2023 SCALE: N.T.S.	HEBER CITY HEART OF THE WASATCH BACK	SIDEWALK, HIGH-BACK CURB & CROSS-GUTTER	
75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		STREETS-4	



REQUIRED SLOPE TABLE		
LOCATION	RUNNING SLOPE	CROSS SLOPE
C	5% MAX	2% MAX *
F	10% MAX	-
R	5.1% MIN TO 8.3% MAX	2% MAX *
T	2% MAX	2% MAX *
SW	-	2% MAX

* DO NOT EXCEED THE ROADWAY PROFILE GRADE FOR THE CROSS SLOPE AT LOCATIONS WITHOUT A STOP OR YIELD SIGN OR AT MID-BLOCK RAMPS.

NOTES:

1. RAMP TO INCLUDE ADA DETECTABLE WARNING STRIP; IE. ADA SOLUTIONS, ARMOR-TILE CAST-IN-PLACE, MASCO CASTINTACT, WAUSAU, OR TEKWAY.
2. COLOR OF ADA DETECTABLE WARNING STRIP SHALL BE DARK RED OR GRAY.
3. TRUNCATED DOME PANEL WIDTH SHALL MATCH THE WIDTH OF THE CONNECTING SIDEWALK OR TRAIL.
4. CURB TAPER SLOPE SHALL BE 10% MAXIMUM.
5. NO LIPS ALLOWED. AT THE CURB CUT, A LIP IS A VERTICAL DISCONTINUITY GREATER THAN 1/4". AT THE GUTTER/ROAD TRANSITION, A LIP IS A VERTICAL DISCONTINUITY GREATER THAN 1/2". VERTICAL DISCONTINUITIES GREATER THAN 1/4" SHALL BE BEVELED WITH A SLOPE NOT GREATER THAN 50%.
6. ALL PEDESTRIAN RAMPS ON ADA-ACCESSIBLE ROUTES ARE SUBJECT TO THE REQUIREMENTS SHOWN ON THE UDOT PEDESTRIAN ACCESS STANDARD DRAWINGS. WHERE CONFLICTS EXIST, THE MORE STRINGENT SHALL GOVERN.

DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

CORNER PEDESTRIAN RAMPS

STREETS-5

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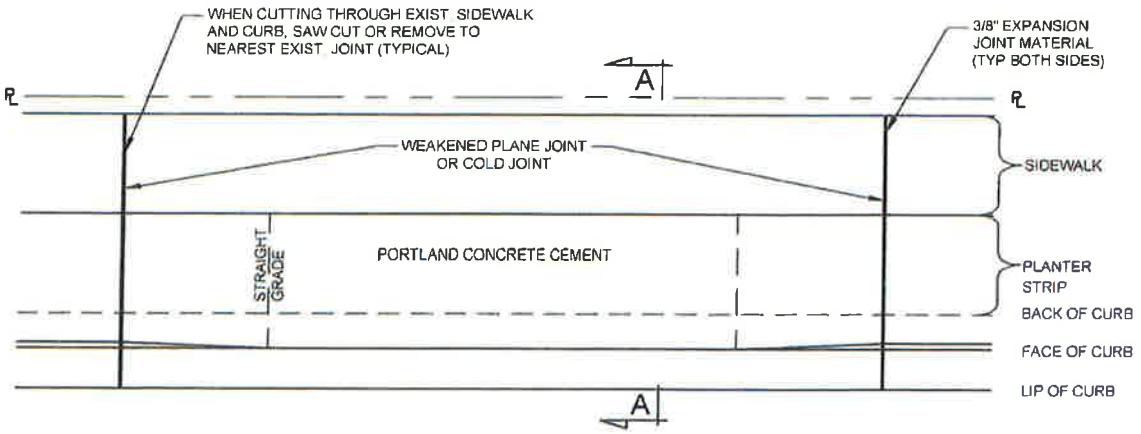
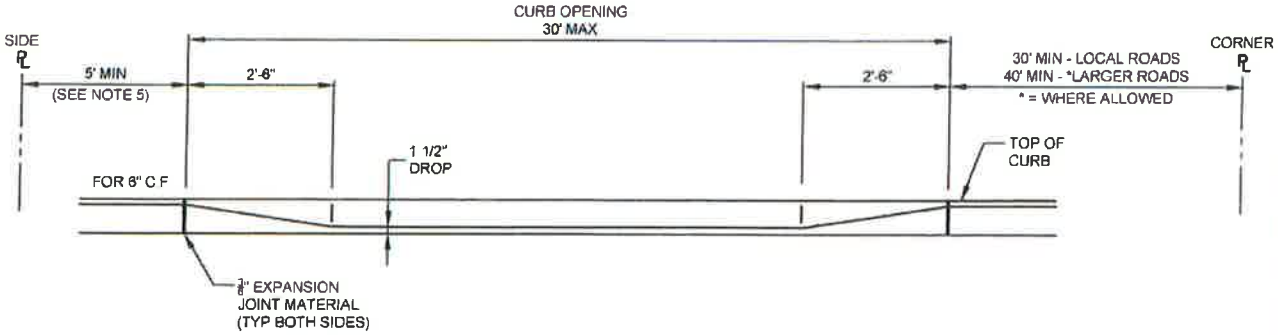
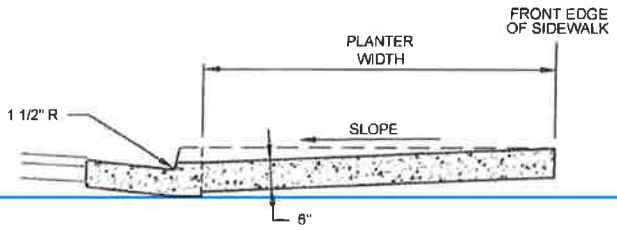


PLAN



ELEVATION



SECTION A-A

NOTES:

1. CURB OPENING SHALL HAVE A COURSE BROOM FINISH
2. C F = CURB FACE
3. INSTALL 4" PVC SLEEVE UNDER DRIVEWAY AND 10" BELOW SIDEWALK FOR PI SERVICE
4. DRIVEWAY APPROACHES SHALL NOT BE CLOSER THAN 10' TO ANOTHER DRIVEWAY APPROACH ON LOCAL ROADS
5. CURB OPENING SHALL NOT BEGIN WITHIN 5 FT OF THE PROPERTY LINE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER
6. ~~WHEN PERMITTED ON ROADS WITH HIGHER CLASSIFICATIONS, APPROACHES SHALL NOT BE CLOSER THAN 50' TO ANOTHER DRIVEWAY APPROACH.~~

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OK

kept, but moved.

RESIDENTIAL DRIVEWAY APPROACH

DATE: JUNE 2021 SCALE: N.T.S	HEBER CITY	HEBER CITY STREETS-7
75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		

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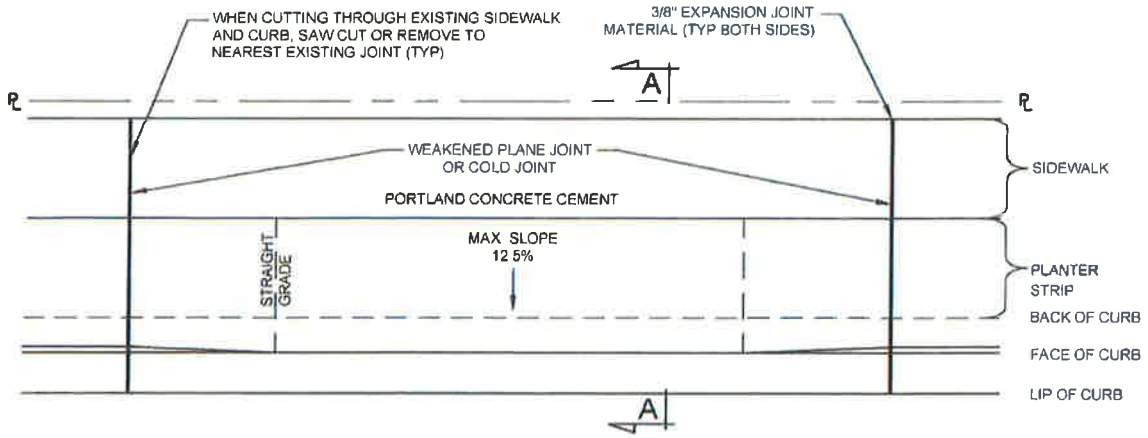
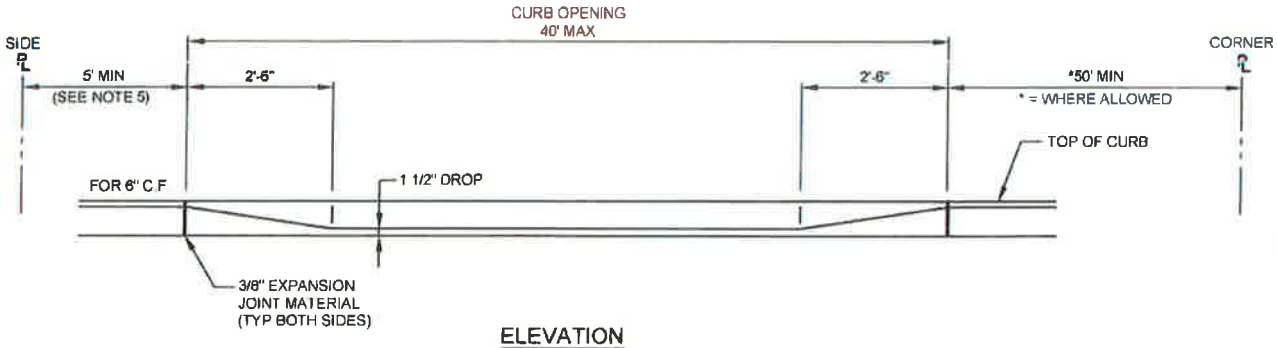


PLAN



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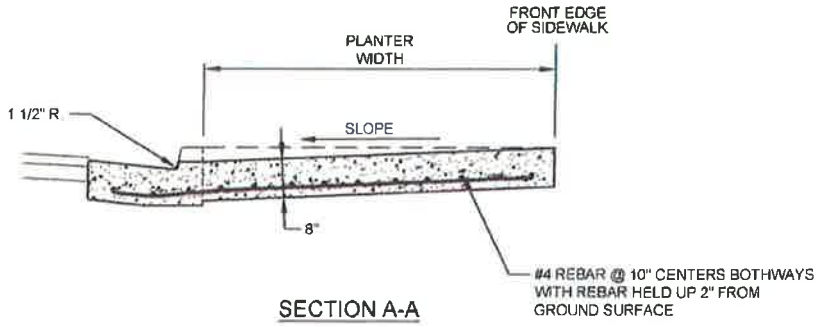

SECTION A-A

NOTES:

1. CURB OPENING SHALL HAVE A COURSE BROOM FINISH
2. C F = CURB FACE
3. DRIVEWAY APPROACHES SHALL NOT BE CLOSER THAN 10' TO ANOTHER DRIVEWAY APPROACH ON LOCAL ROADS
4. WHEN PERMITTED ON ROADS WITH HIGHER CLASSIFICATIONS, APPROACHES SHALL NOT BE CLOSER THAN 50' TO ANOTHER DRIVEWAY APPROACH
5. CURB OPENING SHALL NOT BEGIN WITHIN 5 FT OF THE PROPERTY LINE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER

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COMMERCIAL DRIVEWAY APPROACH

	DATE: JUNE 2021 SCALE: N.T.S.	HEBER CITY	HEBER CITY STREETS-8
	75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		

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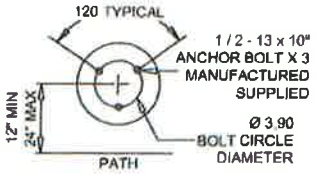
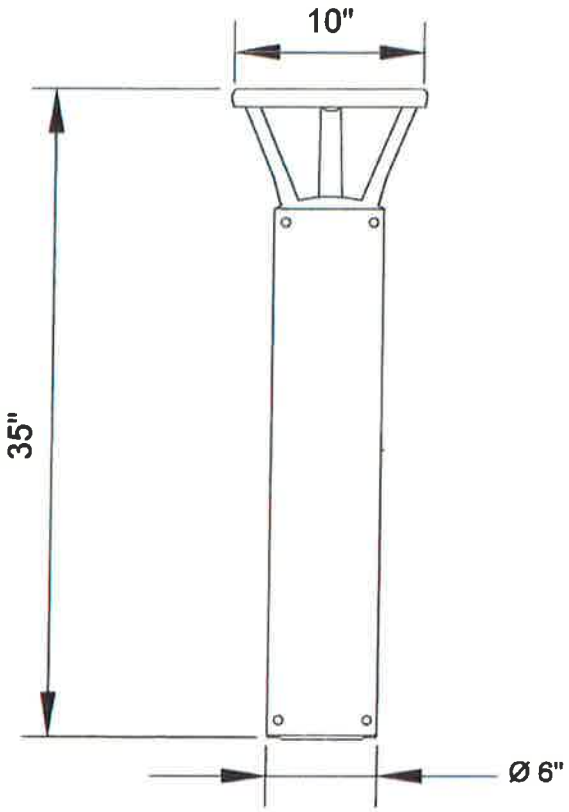
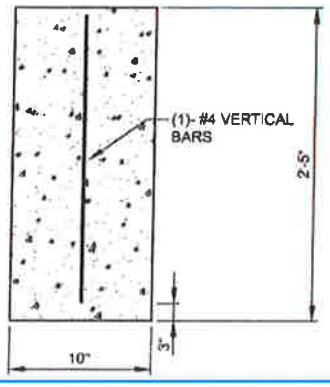


ANCHOR BOLT DETAIL



PLB - 102

NOTES:
1 TRAIL BOLLAR SHALL BE PLB SERIES SOLAR POWERED LED BOLLARD MODEL PLB 102 BK ASM WW 00 SEC BY FIRSTLIGHT TECHNOLOGIES



CONCRETE BASE

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NOTES
1 TRAIL LIGHTS SHALL BE INSTALLED ALONG ALL MASTER PLANNED TRAIL SYSTEMS AT 200 FT MAXIMUM INTERVALS AND AT ENTRANCES TO PARKS, TRAIL INTERSECTIONS, BRIDGES AND ROAD CROSSINGS.
2 CONCRETE SAHLL BE CLASS 3000 MIN PER SECTION 033014
3 CONCRETE BASES SHALL BE BACKFILLED WITH SUITABLE MATERIAL COMPACTED TO 95 PERCENT
4 THE TOP OF THE CONCRETE BASE SHALL BE 1 TO 2 INCHES ABOVE THE ADJACENT GRADE

TRAIL LIGHTING

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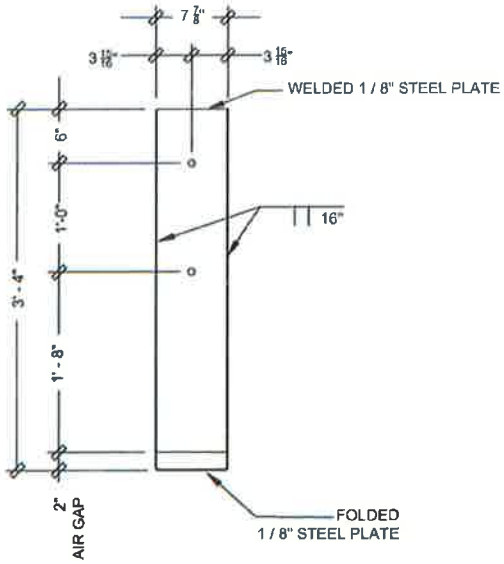
DATE: JUNE 2021
SCALE: N.T.S.

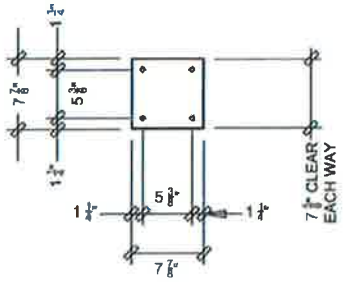
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

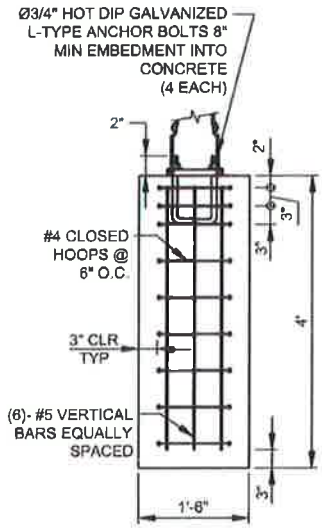
HEBER CITY

HEBER CITY

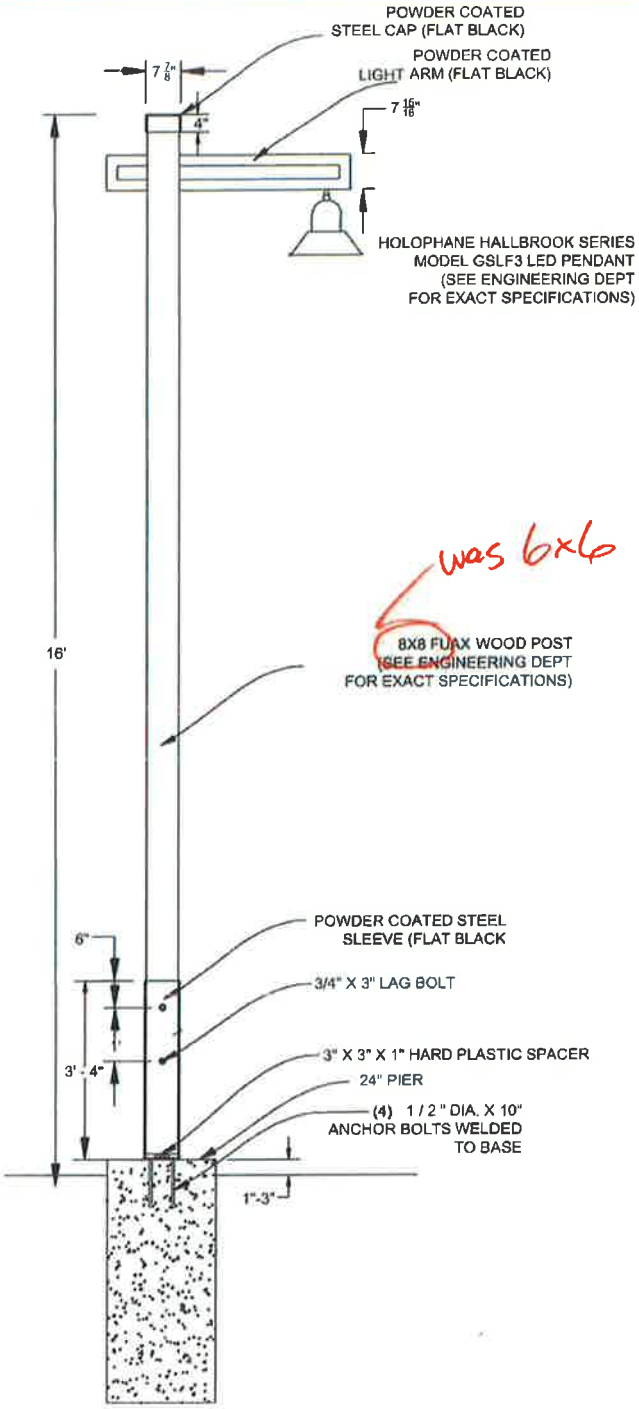
STREETS-14







CONCRETE BASE



NOTES:

1. LOADING CAPACITY OF POLE SHALL BE 100 POUND RATED FOR A STEADY WIND OF 90 MPH MINIMUM.
2. CONCRETE BASES SHALL BE BACKFILLED WITH SUITABLE MATERIAL COMPACTED TO 95 PERCENT.
3. CONCRETE BASES SHALL INCLUDE CONDUIT AND GROUNDING WIRE PER HEBER LIGHT & POWER REQUIREMENTS.
4. CONCRETE COMPRESSIVE STRENGTH (f'c) SHALL BE 4000 PSI.
5. THE TOP OF CONCRETE BASES SHALL BE BETWEEN 1 AND 3 INCHES ABOVE GRADE.

DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 854-0757

HEBER CITY
HEART OF THE WASATCH BACK

NORTH VILLAGE LIGHTING

STREETS-15

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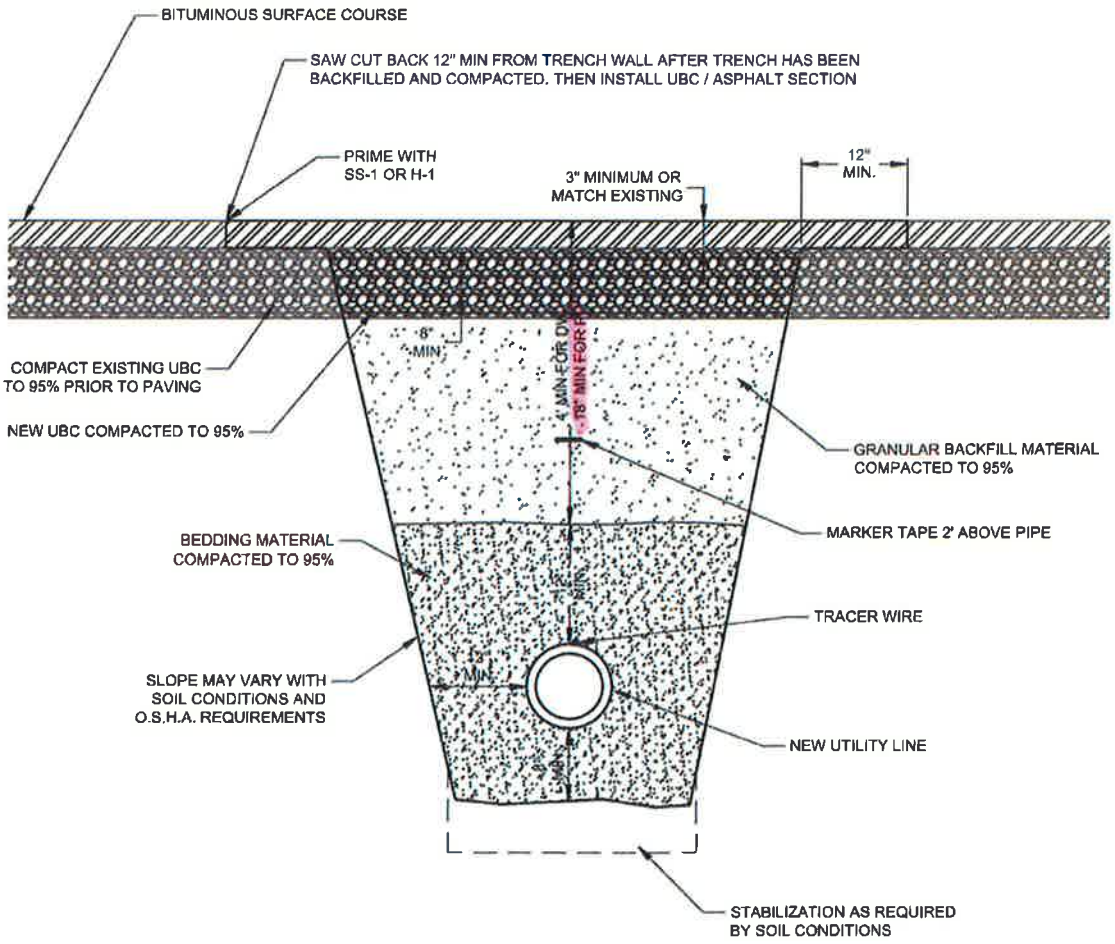

NOTES:

1. COMPACTED BEDDING MATERIAL SHALL NORMALLY CONSIST OF BEDDING SAND.
2. IF APPROVED BY CITY ENGINEER, 3/4" DRAIN ROCK MAY BE USED FOR BEDDING MATERIAL AND SHALL BE WRAPPED IN APPROVED FILTER FABRIC (SEE HEBER CITY SPECIFICATION 02772.2.02), UNLESS OTHERWISE APPROVED.
3. MATERIALS, METHOD & COMPACTION SHALL BE APPROVED BY ENGINEER.
4. USE OF PEA GRAVEL OR COURSE SAND FOR BEDDING MATERIAL IS PROHIBITED UNLESS OTHERWISE APPROVED BY THE CITY ENGINGEER.
5. USE OF NATIVE MATERIAL FOR BACKFILL IS PROHIBITED (EXCEPT AS APPROVED BY THE CITY ENGINEER WITH FULL TIME TESTING AND INSPECTION).
6. USE PROPER MARKER TAPE AS APPROVED BY CITY ENGINEER.
7. INSTALL TRACER WIRE AS PER WATER-5.
8. FLOWABLE FILL IS PROHIBITED AS BACKFILL MATERIAL UNLESS OTHERWISE APPROVED BY CITY ENGINEER. WHEN APPROVED, SURFACE FINISHES MUST STILL BE MATCHED.

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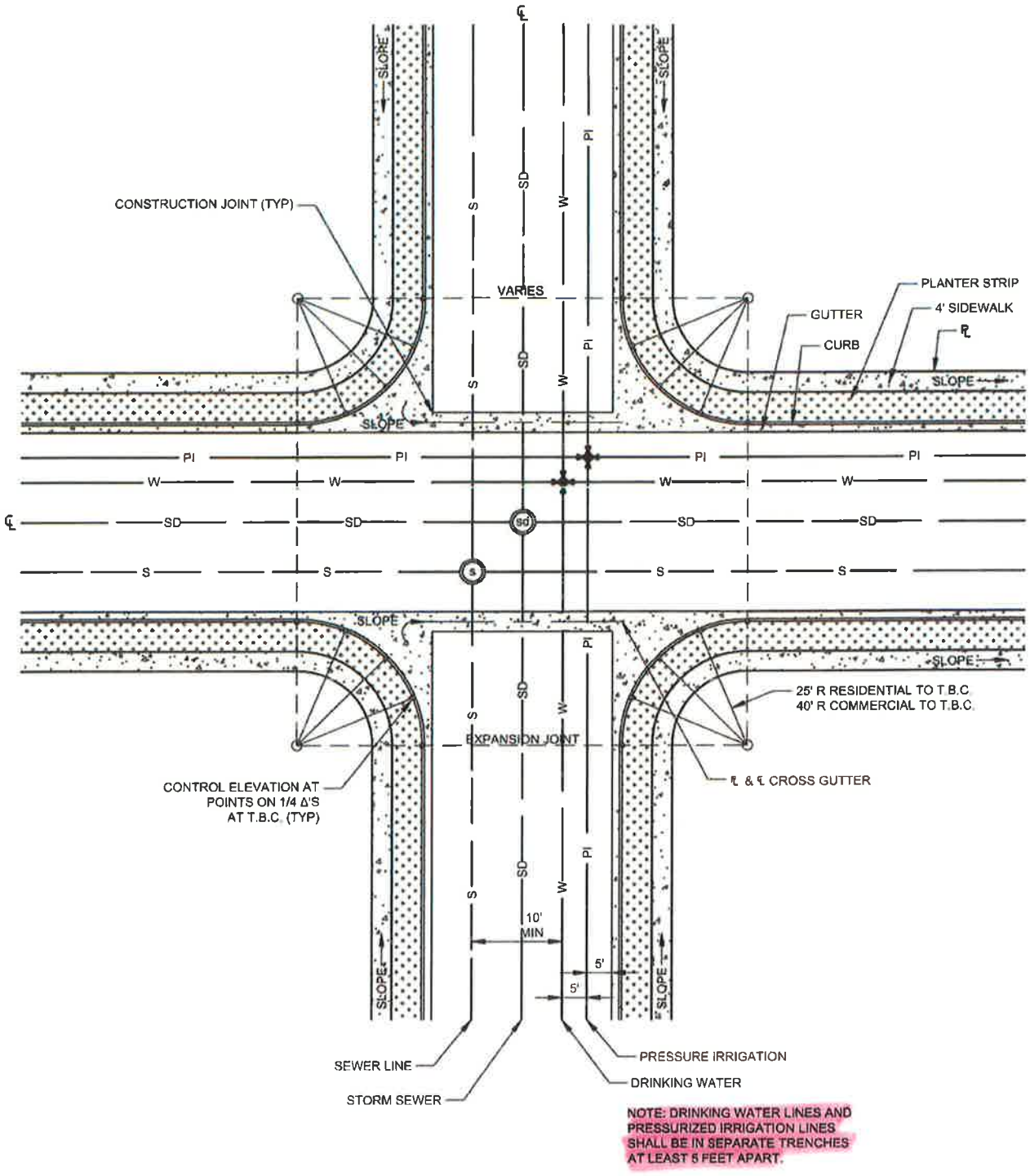
DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

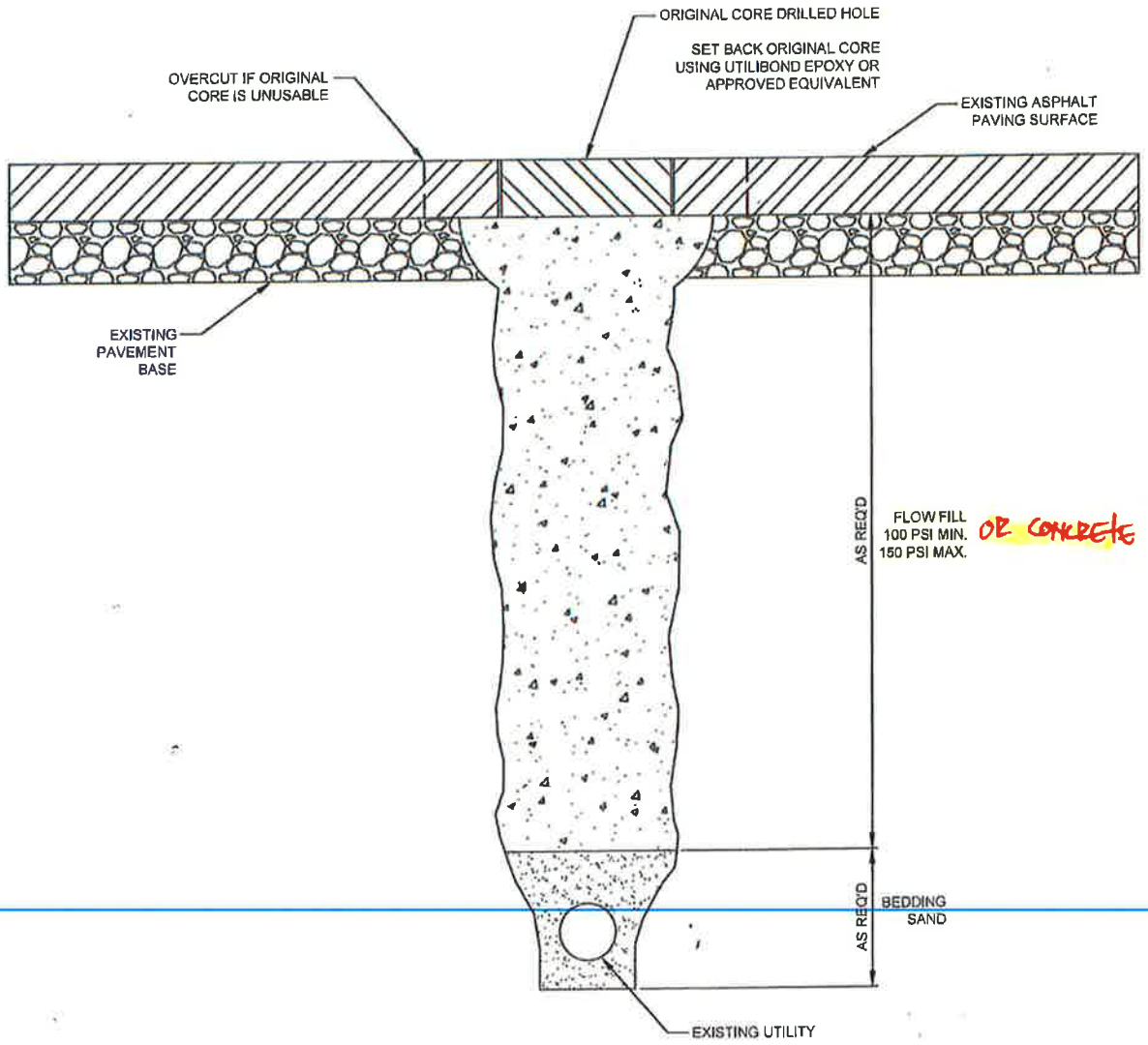
UTILITY INSTALLATION TRENCH DETAIL

UTIL-1



DATE: JUNE 2023 SCALE: N.T.S.	75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY HEART OF THE WASATCH BACK	STANDARD STREET INTERSECTION & UTILITY LOCATION UTIL-2

H:\Heber City\Std Dwgs\2023 April\Std Dwgs\UTILITIES-2 Updated.dwg - Loc Util Intersection - 6/29/2023 10:03am, natalier



NOTES:

1. IF ORIGINAL CORE CANNOT BE USED, THEN CORE MUST BE OVERCUT 12" MIN. AND THEN FILLED WITH HOT MIX ASPHALT.

UTILITY POTHOLE REPAIR

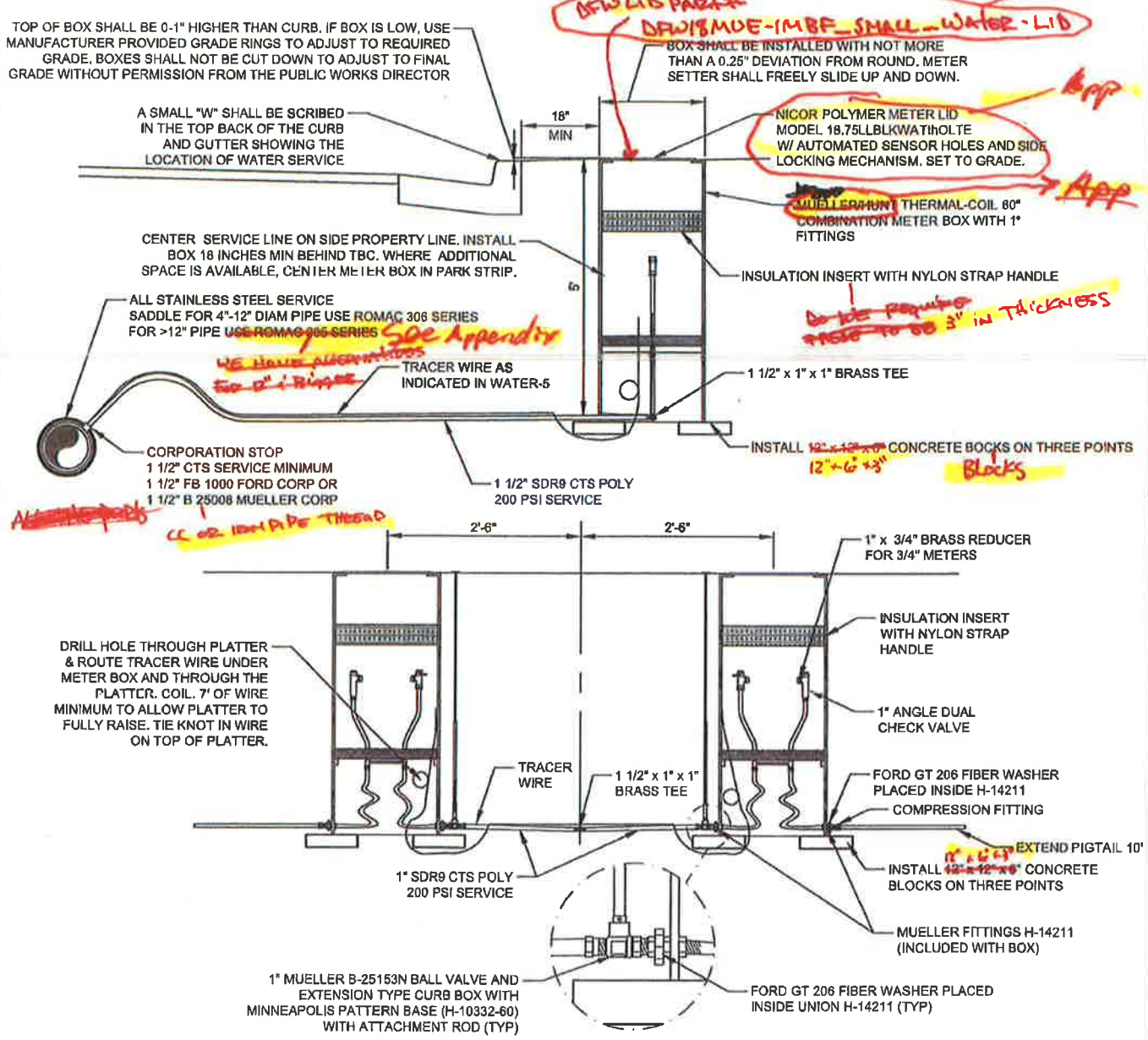
DATE: JUNE 2021 SCALE: N.T.S.	HEBER CITY	HEBER CITY UTILITIES-5
75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		

V:\ENGR\Stds\StdSpecStdDwg\Dwg Files\UTILITIES-5B.dwg - Pothole Rpr - 6/09/2021 06:35pm, rhunk

TABLE 1					
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	FRAME MODEL	COMMENTS	INSULATION INSERT
1 INCH	18" x 60"	330CS1860RSBS000390N	N/A	NEW SERVICES	790153

NOTE 1: FOR LARGER SIZES , USE SINGLE SERVICE DETAIL AND CONFIGURATION

NOTE 2: THIS ALTERNATE DUAL METER BOX CONFIGURATION SHALL ONLY BE USED WHEN THE DUAL METER SINGLE BOX CONFIGURATION (SEE DWG WATER-6A) IS NOT COMMERCIALLY AVAILABLE AND WHEN APPROVED BY THE CITY ENGINEER.



NOTES:

1. METER BOX, COVER, COPPER SETTER, CORPORATION STOP, & SERVICE LINES TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WATER METER WILL BE INSTALLED BY HEBER CITY.
5. SEE UTILS-3 FOR PLAN VIEW.
6. WATER METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER.
7. WATER SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF FIRE HYDRANT LINE OR SERVICE LINES.
8. WATER METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
9. ANY NIPPLES USED IN SERVICE SHALL BE STAINLESS STEEL.
10. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.
11. SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.

WATER SERVICE - TWO LOTS

HORROCKS ENGINEERS
728 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2228

DATE: APRIL 2015
SCALE: N.T.S.

HEBER CITY CORPORATION
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

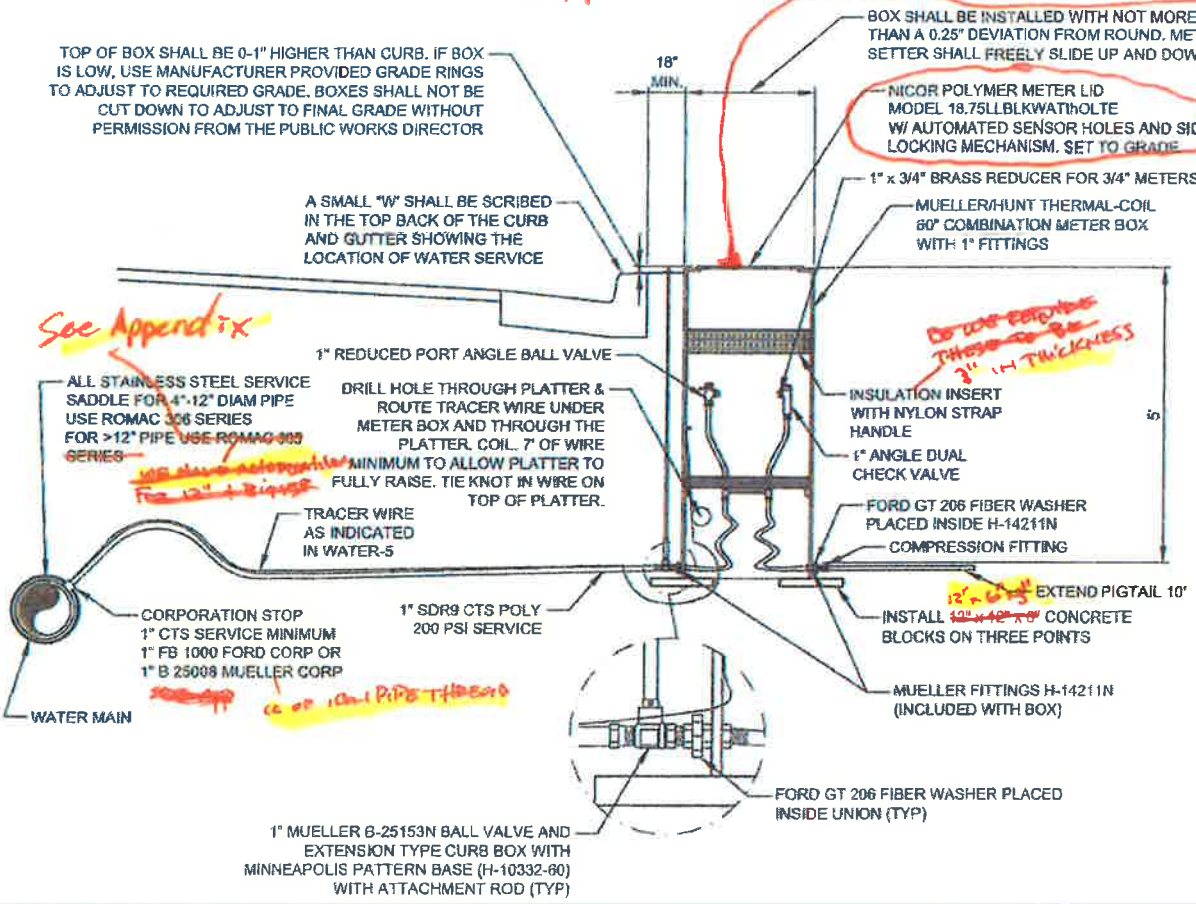
HEBER CITY STANDARD DRAWING

WATER-6A

H:\Heber City\Std Dwgs\2022 March\Updated drawings\WATER-6A_Updated.dwg - Service 2 Lots - 4/05/2022 08:23am, alexandria.lewallen

TABLE 1					
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	FRAME MODEL	COMMENTS	INSULATION INSERTS
1" MINIMUM	18" x 60"	330CS1860RSBS000390N	NA	NEW SERVICES	790153
1 1/2"	24" x 60"	500VS2460RVB000520N	700098-1	" "	790325
2"	27" x 60"	550VS2760RVB000520N	700098-1	" "	790327

NOTE 1: FOR LARGER SIZES CONTACT PUBLIC WORKS FOR REQUIREMENTS

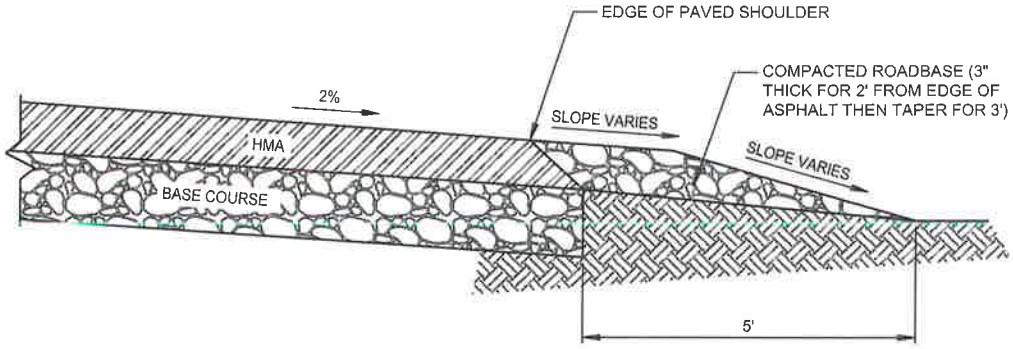


NOTES:
1. METER BOX, COVER, COPPER SETTER, CORPORATION STOP, & SERVICE LINES TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ARE ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WATER METER WILL BE INSTALLED BY HEBER CITY.
5. SEE UTILS-3 FOR PLAN VIEW.
6. WATER METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER.
7. WATER SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF FIRE HYDRANT LINE OR SERVICE LINES.
8. WATER METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
9. ANY NIPPLES USED FOR SERVICE SHALL BE STAINLESS STEEL.
10. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.
11. SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.

WATER SERVICE - SINGLE LOTS

HORROCKS ENGINEERS 728 WEST 100 SOUTH #2 HEBER CITY, UTAH 84032 (435) 654-2226	DATE: APRIL 2015 SCALE: N.T.S.	HEBER CITY CORPORATION 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY STANDARD DRAWING WATER-6B

H:\Heber City\Std Dwgs\2022 March\Updated drawings\WATER-6B_Updates.dwg - Service 1 Lot - 4/05/2022 08:25am, alexandria.wallen



NOTES:

1. MAINTAIN POSITIVE DRAINAGE AWAY FROM ROAD AT THE SHOULDER.
2. ROADBASE MATERIAL REQUIREMENTS - FOLLOW HEBER CITY STANDARD SPECIFICATIONS SECTION 02206 (SELECT FILL) FOR UNTREATED BASE COARSE.
3. COMPACTION REQUIREMENTS:
   A. MAINTAIN OPTIMUM MOISTURE CONTENT +/- 2%.
   B. USE A MINIMUM OF TWO PASSES WITH A ROLLER OR AS DIRECTED BY THE ENGINEER.

DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

RESIDENTIAL ROAD SHOULDER WITHOUT CURB & GUTTER

STREETS-16

H:\Heber City\Std Dwgs\2023 April\Std Dwgs\STREETS-16.dwg - ST-16 - 7/26/2023 02:55pm, natalier

HEBER CITY STANDARD SPECIFICATIONS AND DRAWINGS

HEBER CITY

HEART OF THE WASATCH BACK

July 2023

Prepared by:

HEBER CITY CORPORTATION
75 North Main Street
Heber City, UT 84032

STANDARD SPECIFICATIONS
TABLE OF CONTENTS

Spec. No.	Last Rev.	Specification Name
00200	06/21	Permit Requirements
00700	08/23	General Improvement Requirements
00900	06/21	Procedural Policy for the Water and Sewer
01450	06/21	Testing and Process Control
02150	03/17	Shoring and Underpinning
02205	03/17	Common Fill
02206	03/17	Select Fill
02225	03/17	Excavation and Backfill Operations
02245	03/17	Low Density Concrete Backfill (Flowable Fill)
02250	03/17	Soil Compaction
02504	06/20	Asphalt Concrete
02505	03/17	Emulsified Asphalt Slurry Seal
02510	06/21	Asphalt Paving
02512	03/17	Restoration of Surface Improvements
02513	06/21	Utility Pothole Repair – Keyhole Method
02607	08/23	Manholes and Covers
02609	08/23	Grease and Sand Interceptor
02660	03/17	Pipeline Testing
02668	08/23	Water Transmission and Distribution Systems
02675	06/21	Disinfection
02720	08/23	Sanitary Sewer and Storm Drain Systems
02772	08/23	Ponds & Sumps
02832	03/17	Fences
03200	03/17	Concrete Reinforcement
03216	06/21	Concrete Structures, Driveway, Sidewalk, Curb and Gutter
03304	03/17	Portland Cement Concrete
03310	06/21	Concrete Work
03345	03/17	Concrete Finishing
16530	08/23	Street Lighting
16532	08/23	Commercial Business Street Lighting (Historic)
16533	08/23	North Village Zone Street Lighting
APPENDIX A	04/22	Approved Equivalents

STANDARD DRAWINGS FOLLOW SPECIFICATIONS

STANDARD DRAWINGS
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Note: In some instances, alternative products are accepted. See the Appendix for alternative products.

Drawing No.	Last Rev.	Drawing Name
IRR-1A	08/23	Irrigation Service – Two Lots
IRR-1B	08/23	Irrigation Service – Single Lot
SEWER-1	08/23	Sewer Lateral
SEWER-2	03/17	Manhole Ring and Cover
SEWER-3	08/23	Junction Manhole, Drop Manhole
SEWER-4	03/17	Pre-Fabricated Sewer Lateral
SEWER-5	08/23	Precast Concrete Sewer Manhole
SEWER-6	02/19	Grease Interceptor
DRAIN-1	08/23	Curb Drop Inlet Box
DRAIN-2	03/17	Grate and Frame
DRAIN-3	08/23	Sump Disposal and Oil Separator
DRAIN-4	03/17	Curb Face Drop Inlet Box
STREETS-1	08/23	Street Cross-Sections & Utility Locations - Locals
STREETS-2A	06/20	Street Cross-Sections & Utility Locations - Collectors
STREETS-2B	08/23	Street Cross-Section - No Access Mountain Collector
STREETS-3A	06/20	Street Cross-Sections - Historic Business Core
STREETS-3B	06/20	Street Cross-Sections - Historic Business Core - Major Intersection
STREETS-4	08/23	Sidewalk, High Back Curb & Gutter, Cross Gutters
STREETS-5	08/23	Corner Pedestrian Ramps
STREETS-6	06/21	Mid-Block Pedestrian Ramps
STREETS-7	08/23	Residential Driveway Approach
STREETS-8	08/23	Commercial Driveway Approach
STREETS-9	03/18	Cul-De-Sacs
STREETS-10	02/19	Street Address Signs
STREETS-11	03/17	Survey Monuments
STREETS-12	06/21	Street Lighting
STREETS-13	06/21	Commercial Historic Street Lighting
STREETS-14	08/23	Trail Lighting
STREETS-15	08/23	North Village Street Lighting
STREETS-16	08/23	Residential Road Shoulder without Curb and Gutter
UTIL-1	08/23	Utility Installation Trench Detail
UTIL-2	08/23	Standard Street Intersection and Utility Location
UTIL-3	03/17	Lateral and Utility Location
UTIL-4	03/17	Utility Concrete Collars
UTIL-5	08/23	Utility Pothole Repair
WATER-1	04/22	Fire Hydrants
WATER-2	06/21	Typical Pipe Thrust Blocking
WATER-3	04/22	Valve Boxes & Collars
WATER-4	03/17	1" Service Trench
WATER-5	03/17	Tracer Wire Installation

WATER-6A	08/23	Water Service – Two Lots
WATER-6B	08/23	Water Service – Single Lot
WATER-7	03/17	Air Release Station
WATER-8	04/22	Blowoff / Flush Valve

SECTION 00200

PERMIT REQUIREMENTS

PART 1 GENERAL

1.01 PURPOSE OF INTENT

A. The purpose of this section is to describe Heber City's Department of Public Work's policies for issuing permits and to control any excavation and construction operations in the public way in Heber City. All contractors and utility companies proposing to construct, repair or replace any facility within the public way, shall contact the Heber City Department of Public Works and complete all permit requirements prior to commencing proposed work as outlined in this section.

B. Utility companies and contractors constructing approved facilities in new subdivision streets shall not be required to obtain a "Street cut and/or Excavation Permit", but will still be subject to City inspection and compliance with subdivision requirements.

1.02 POLICIES

A. Permittee must be licensed with the State of Utah. It is the Policy of Heber City that contractors desiring to perform work in the City's public way shall be properly licensed in the State of Utah. The acceptable licenses include:

TYPE OF WORK	LICENSE
Any type of concrete work	E100 or S260
Paving	E100 or S260
Landscaping	E100 or S330
Buried gas, telephone, water, irrigation and power lines	E100 or S410
Sanitary sewer and storm drains	E100 or S410
Asphalt patching	E100, or S260
Trenching	E100
Highway sign installation	E100 or S440
Manhole covers	E100
Paint striping highways	E100, S260, or S270

Exceptions: A license shall not be required when the Permittee is a public utility company.

B. Policy for determining when "permit waivers" can be granted. Working within the public way without a permit violates Heber City ordinances unless the permit is waived by the Public Works Department. Waivers can be granted by the Public Works Department when any of the following conditions occur:

1. When routine maintenance work which is being done by the City, State and utility personnel does not involve excavations in the City's public way, i.e., crack sealing, street

resurfacing and repair, snow plowing, sanding, sweeping, garbage collection, storm drain cleaning, leaves pickup, above grade work, etc.

2. When a Permittee allows other contractors or utility companies to perform work in the permitted trench limits.

3. When utilities must be relocated or adjusted in conjunction with a City Public Works Department sponsored project provided the utility work is being accomplished within one week of the time the City or its Contractor is scheduled to begin construction at that location and provided the work is coordinated and approved by the City's Public Works Department.

C. Policy for issuing no fee permits. The Public Works Department reserves the right to issue "no fee permits" for work in the public way when the following conditions are met:

1. When utility companies are doing excavation work and such work is required in conjunction with a City Public Works Department project, and the work is required to be accomplished prior to the execution of the Public Works Department contract.

2. When the City Public Works Department is repairing or maintaining public way facilities such as curbs, gutters, cross drains, storm drains, traffic facilities, driveway, sidewalk, etc, and such work requires excavation.

3. When frames and lids in paved surfaces are raised or lowered providing the work does not disturb the underlying roadbase material.

4. When the work is otherwise covered under a separate bond in favor of Heber City and approval for a "No Fee Permit" is authorized by the Heber City Engineer.

D. Policy for revoking "Permit Waivers" and "No Fee Permits". "Permits Waivers" and "No Fee Permits" will be revoked by the Public Works Department if the work is defective or requires action or supplemental inspection by the Public Works Department. In the revocation proceedings, the Public Works Department shall serve written notice which defines the problems encountered and the time (at least one day) the Permittee has to correct the problem. If the work is not satisfactorily completed within the time specified, the "Permit Waiver" or the "No Fee Permit" shall be revoked. The Permittee will be required to secure a Fee Permit before proceeding to complete the work.

E. Policy for extending permit construction time limits. Subject to the Public Works Department's approval, permits which expire may be extended but may also be subject to payment of a permit extension fee as shown in the current Heber City Consolidated Fee Schedule. The length of the extension determined by the Permittee shall be subject to the approval of the Public Works Department.

1.03 GENERAL CONDITIONS

A. Permit: When the work is in progress, the Permittee shall have at the work site a copy of the permit and the Contractor's License Number under which the work is being performed.

B. Emergency work: Maintenance of pipelines or facilities in the public way may proceed without a permit when emergency circumstances demand the work be done immediately, provided a permit could not reasonably and practicably have been obtained beforehand.

In the event that emergency work is commenced on or within any public way of the City, the Public Works Department shall be notified within one-half hour when the work commences or as soon as possible from the time the work is commenced. If emergency work is commenced during

off business hours, the Public Works Department will be notified within one (1) hour of the start of work on the first regular business day on which City offices are open after such work commences, and, at the discretion of the Public Works Department, a permit may be issued which shall be retroactive to the date when the work was begun. Before commencing and while conducting emergency work, all necessary safety precautions for the protection of the public and the direction and control of traffic shall be taken. None of the provisions of these regulations are waived for emergency situations except the prior permit requirements.

C. Private access: Temporary, all weather roadways, driveway, walks, and right-of-ways for vehicles and pedestrians shall be constructed and continuously maintained where required.

D. Existing utilities: The Contractor shall use extreme caution to avoid a conflict, contact or damage to existing utilities, such as power lines, sewer lines, storm drains, street lights, telephone lines, television lines water lines, gas lines, poles or other appurtenances during the course of construction of this project. Any such conflict, contact or damage shall be immediately communicated to the Public Works Department.

E. Preconstruction pictures of existing public way improvements: The Permittee may secure pictures of the conditions of the existing public way improvements such as curbing, sidewalk, landscaping, asphalt surfaces, etc. In the event that public way improvements are damaged and no pictures are taken, the Public Works Department will assume the correction of the damage is the responsibility of the Permittee.

PART 2 REQUIREMENTS

2.01 STREET CUT AND/OR EXCAVATION PERMIT REQUIREMENTS

A. No excavations or street cuts shall be performed within the public right of way without first obtaining a permit from the City. Cut permits shall be valid for a period of 30 calendar days from the date of issuance. Such permits shall be issued by the Public Works Department upon the applicant meeting the conditions and making the commitments outlined below:

1. Show proof that a competent, responsible, and licensed contractor will do the work.

2. Present evidence of public liability insurance in an amount of not less than $200,000.

3. Post a $3,000 cash bond, an adequate performance bond, or a $10,000 blanket license and permit bond. The cash bond or performance bond will be held by the City to guarantee that the required improvements, restoration work, surface and every part thereof, will remain in good condition for a period of 2 years after final acceptance.

4. Agree, at no cost to the City, to make all repairs and to maintain the improvements, the trench, the surface, and every part thereof in good condition during the two (2) year warranty period.

5. Provide proper traffic signage in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and provide for and maintain through traffic in a form approved by the City Engineer at all times throughout the duration of the work.

6. Obtain approval from the City Engineer for any required road closures and provide 48 hours notice to those responsible for emergency services: e.g. school authority, law enforcement and fire protection officials.

7. Properly backfill or plate all cuts and excavations at the end of each working day.

8. Obtain City inspection of the work. Calls for inspection need to be made 24 hours in advance.

9. Repair roadway surfaces with temporary "cold mix" asphalt surfacing, two (2) inches thick, if permanent "hot mix" asphalt paving cannot be completed within 2 days of backfilling the trench. Temporary surfaces must remain smooth and flush with the road surface, and repaired as necessary by the contractor to maintain this condition, until permanent paving is complete.

10. Backfill with untreated base course material compacted to 95 percent of the maximum dry density, starting from the pipe bedding and continuing up to the bottom of the pavement. Excavated material is not to be used for backfill unless contractor can provide density testing, and material is in compliance with Section 02225.3.09 of the City Standard Specifications.

11. Permanent resurfacing shall be per Heber City Standard Specifications and a minimum of 4 inches thick. Paving width shall extend 12 inches beyond each side of the re-compacted width of the trench. Existing pavement edges shall be saw cut to form a clean line. Asphalt edges shall be tacked and rolled with a steel drum roller to achieve a smooth level surface.

12. Fees: The application for a permit authorizing excavation and street cuts shall be accompanied by the fee established by the most current Heber City fee schedule that has been approved and adopted by the Heber City Council.

13. Temperatures must be warm enough to avoid the risk of frost damage to existing utilities and assure proper compaction. Road cut permits will be allowed between April 1st and October 15th. Road Cuts outside of these dates will be prohibited by the City once the temperature drops below 32° night or day, ground is frozen, or compaction cannot be obtained. This does not apply to borings, emergencies and excavations beyond 5 feet from edge of asphalt.

2.02 EXCAVATION OPERATIONS

A. Blue stakes: Before commencing excavation operations, the Permittee shall call "Blue Stakes" and Heber City Public Works Department.

B. Traffic control devices: Traffic control devices such as barricades, signs and cones must be in place before excavation begins.

C. Protection of paved surfaces outside of excavation area: In order to avoid unnecessary damage to paved surfaces, backhoes, outriggers, track equipment or any other construction equipment that may prove damaging to asphalt shall use rubber cleats or paving pads when operating on or crossing said surfaces.

2.03 ENVIRONMENTAL CONTROL

A. Dust and debris: The Permittee or Contractor shall keep dust and debris controlled at the work site at all times. If necessary, wet down dusty areas with water and provide containers for debris. The City Engineer reserves the right to shut down the work or issue a citation if dust is not controlled.

B. Noise: The Permittee or Contractor shall keep neighborhood free of noise nuisance in accordance with the Noise Ordinance.

C. Cleanup: The Permittee or Contractor shall remove all equipment, material, barricades and similar items from the right-of-way. Areas used for storage of excavated material will be smoothed and returned to their original contour.

D. Vacuum sweeping or hand sweeping shall be required when the Public Works Department determines cleaning equipment is ineffective.

2.04 ENFORCEMENT

A. Violators of these regulations of working within the Public Way shall be subject to the provisions of Heber City Ordinances.

END OF SECTION

SECTION 00700

~~GENERAL~~ IMPROVEMENT REQUIREMENTS

PART 1 GENERAL

This section defines the general requirements for improvements to be built by the Developer. The Developer is responsible to comply with these Standard Specifications. Alterations, substitutions, or changes from these Standard Specifications shall not be allowed unless prior authorization is obtained from the City Engineer. The developer is responsible for providing all documentation and research supporting requests for changes to these Standards, and the associated costs.

1.01 Street and utility improvements are required along the entire frontage of property being developed, extending to property lines to accommodate future development.

1.02 Public pipelines through private property shall be in dedicated home-owner-association or business-owner-association open space centered in a 20-feet-wide easement in favor of the City. Easements must extend 10 feet beyond the end of the utility. Show easements on the development plat and on the City's Standard Easement forms, which grant the easements to the City. Easements must be executed and returned to the City Office prior to acceptance being granted. Easements in the name of the City shall not be recorded by anyone except the City.

1.03 All parcels receiving water, sewer, or irrigation service shall have their own independent services and laterals. These laterals or services shall be contained within the parcel or along the frontage of the property for which the service is intended to eliminate special utility easements crossing adjacent properties.

1.04 ~~Public utility easements shall be 10 feet wide around perimeter of standard lots. Cottage lots shall have the side lot PUE's reduced to 5 feet.~~ For residential subdivisions, public utility easements, of not less than ten feet in width, are required on front lot lines. Public utility and/or drainage easements, of not less than 10 feet, are required on side lot lines and on rear lot lines where needed, when requested by public utility companies, or as otherwise required or approved by the City Engineer. City utilities shall normally be placed in City rights-of-way. When approved by the City Engineer, City utilities may be placed beneath private streets, private parking areas, or in other common open space in an exclusive City utility easement of not less than 20 feet in width. Easements shall be provided to the City using the City's standard utility easement language in use at the time such easements are provided. Easements for commercial or industrial development shall generally follow the same requirements.

1.05 DEFINITIONS

ACCESS: Any driveway or other point of entry or exit, such as a street, road, or highway that connects to the general street system. Where two public streets intersect, the secondary street is considered the access.

ACKNOWLEDGEMENT (Acceptance of Plans): Recognition by the City that the Engineer of Record, has certified his or her construction plans and supporting information to be in compliance with the Heber City Code and Standard Specifications and Drawings.

APPLICANT: Any person, corporation, entity, designee, or agency applying for a permit.

APPROVED EQUAL: Equipment or material which, in the opinion of the City's Representative, is equal in quality, durability, appearance, strength, design, performance, physical dimensions, and arrangement to the equipment or material specified, and will function adequately in accordance with the general design.

AS-BUILT DRAWINGS: Drawings which show the Project as actually-constructed, and which include any and all changes made to the construction plans before and during construction.

BEST MANAGEMENT PRACTICE (BMP): Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the State.

CITY INSPECTOR: The authorized representative of the City or Engineer assigned to observe the Work performed, or materials furnished by the Contractor in an effort to ensure compliance with City requirements.

CITY/OWNER: Wherever the word "City" or "Owner" appears, it shall be interpreted to mean "Heber City", unless otherwise denoted.

CONSTRUCTION ACTIVITIES: Clearing, dredging, excavating, and grading of land and other activities associated with buildings, structures or other types of real property such as utilities, bridges, dams, and roads. Includes mobilization/demobilization and any other activity that occurs on site.

DRIVEWAY: A grade-separated access constructed within the right-of-way connecting the public street with adjacent property.

EASEMENT: An interest in real property that conveys use, but not ownership, of a portion of an owner's property.

ENGINEER: The City Engineer, or his or her representative.

ENGINEER-OF-RECORD: The professional engineer, licensed in the State of Utah, who prepared, or directly supervised the preparation of the engineering drawings and documents presented to the City for acknowledgement, and who shall accept sole responsibility for the completeness and accuracy of the drawings and documents presented to the City.

ESSENTIAL INFRASTRUCTURE: Essential infrastructure includes: water, sewer, irrigation, storm drain, curb, pavement, and street signs for emergency wayfinding. The access requirements of IFC Chapter 5 and Appendix D must be installed and approved prior to final inspection and the issuance of a Certificate of Occupancy. Temporary roads, where approved, are required to be capable of supporting vehicle loading under all weather conditions, and must meet the following criteria:

A. The surface of the road should be capable of carrying the load of the anticipated emergency response vehicles and be drivable in all kinds of weather.
B. Asphalt pavement.
C. Access roads shall be maintained for emergency and fire access throughout the duration of the project.
D. Fire hydrants must be installed and functional prior to combustible materials arrival on the site.

FINAL ACCEPTANCE OF PUBLIC INFRASTRUCTURE: The date specified in writing by the Engineer when all work, including all punch list work designated by the Engineer, is complete and accepted by the City after the completion of the warranty period.

INSPECTED AND ACCEPTED or ACCEPTANCE: City recognition of infrastructure conformance to all applicable City Standards.

INSPECTION: A review of the project, including but not limited to a visual review of the work completed to date. It does not include or imply an exhaustive or detailed review of the Work nor does it create a duty on the part of the Engineer or Owner to detect latent defects.

INTERSECTION: The general area where two or more streets join or cross at grade.

LAW: Any applicable City, County, State, or federal statutes or regulations governing anything relating to

the Work embodied in the Agreement.

LOW-IMPACT DEVELOPMENT (LID): An approach to land development, or redevelopment, that works with nature to more closely mimic pre-development hydrologic functions.

PARTIAL STREET: A street that has full frontage improvements on the near side, the full width of pavement, and curb on the opposite side.

PAVEMENT: The uppermost layer of bituminous or Portland-cement concrete material placed on the traveled way or shoulders for a riding surface, whether rigid or flexible in composition. This term is used interchangeably with "surfacing."

PROFESSIONAL ENGINEER: An engineer who is licensed to practice in the State of Utah.

PROFESSIONAL LAND SURVEYOR: A land surveyor who is licensed to practice in the State of Utah.

PUBLIC UTILITY EASEMENT (PUE): A property right provided for "dry" utilities (gas, power, telecom) that are regulated by the Public Service Commission. City utilities are not public utilities.

RECOGNIZED-AND-GENERALLY-ACCEPTED GOOD ENGINEERING PRACTICES (RAGAGEPs): Practices that are based on established codes, standards, published technical reports or recommended practices or similar documents. RAGAGEPs are not practices from other cities or practices promoted by individuals based on their individual professional judgement.

RIGHT-OF-WAY (ROW): All public rights-of-way and easements, public footpaths, walkways and sidewalks, streets, roads, highways, alleys, and water or drainage ways. It does not, however, include Public Utility easements not within Public Ways of the City.

STANDARD SPECIFICATIONS: The Standard Specifications and Drawings for Heber City.

STREET: A general term for denoting a public way or private way for the purpose of transporting people, materials, and goods.

SUBGRADE: That portion of the roadbed surface which has been prepared, as specified, and upon which a layer of specified roadbed material or base, or sub-surfacing, or pavement is to be placed.

SUBSTANTIVE REVIEW: A general evaluation of the overall design and general compliance with the City Code and engineering standards. It is not an exhaustive review for compliance with each specific provision of the City Code, other applicable standards or regulations, or RAGAGEPs. Substantive review shall not shift the responsibility and liability for the completeness and accuracy of the plans and related designs from the Engineer-of-Record to the City.

SURFACE OR SURFACING: The uppermost layer of material placed on the traveled way or shoulders, and is usually of asphalt or concrete. This term is used interchangeably with "pavement."

WORK: The construction services performed including materials on City infrastructure and includes all labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations to construct a project. The term also includes the supervision, inspection, and other on-site functions incidental to the actual construction.

1.06 ADOPTION OF HEBER CITY STANDARD SPECIFICATIONS AND PLANS MANUAL

Heber City has adopted the following as the basis for the Heber City Standard Specifications and Drawings:

A. Heber City Standard Specifications and Drawings Manual, as included herein.

B. Heber City Storm Water Design Manual. All storm-drainage-related work not specifically described in said Manual shall conform to Mile High Flood District Urban Storm Drainage Manual, current edition (MHFD Manual).
C. International Fire Code (IFC), current edition, Appendix D.
D. All transportation-related work not specifically described in these Standards shall conform to the latest editions of: policies and practices published by the American Association of State Highway Transportation Officials (AASHTO), or the Institute of Transportation Engineers (ITE), or the Utah Department of Transportation (UDOT) Roadway Design Manual, the selection of which shall be at the sole discretion of the City Engineer.
E. FHWA and Utah Manual on Uniform Traffic Control Devices for Highways and Streets (MUTCD).
F. All work not specifically described in these Standards, MHFD Manual, AASHTO, ITE, IFC Appendix D, and MUTCD shall conform to RAGAGEPs. When none of the above-referenced standards apply or are otherwise determined as acceptable by the City. **The City Engineer will be allowed two weeks to provide an adequate specification to control and provide guidelines for construction.**

The Heber City Standard Specifications and Drawings Manual is available for download at www.heberut.gov.

1.07 CITY ENGINEER'S AUTHORITY

A. The City Engineer has the authority to provide Substantive Review of submitted Construction Drawings, studies, and supporting documentation.
B. The City Engineer shall provide feedback pursuant to his/her Substantive Review of the Construction Drawings, studies, and supporting documentation.
C. Changes to address the City Engineer's feedback shall be made to the Construction Drawings and returned to the City Engineer for City acknowledgement of the Construction Drawings.
D. The City Engineer has authority to issue Stop Work Orders when construction is progressing contrary to the City Code, the City's Standard Specifications and Drawings, or an acknowledged set of construction drawings.
E. **The City Engineer will make the decision relating to all questions which may arise as to the quality and acceptability of alterations, substitutions, or changes proposed. In case any question should arise, relative to these Standards, the final determination or decision of the City Engineer shall be complied with as a condition of the Developer receiving final** acceptance ~~approval~~ **of the work in question.**
F. The City Engineer has additional authority such as is stated in these Standards and the City Code.

1.08 CONSTRUCTION NOTES

The following are the Standard City Construction Notes. Additional notes may be required for specific projects at the discretion of the City Engineer.

A. TYPICAL

1. Contractor assumes all responsibility for job site conditions during construction of this project, including the safety and well-being of all persons and property. This responsibility shall apply continuously and not be limited to normal working hours.
2. Contractor shall obtain all applicable permits and/or written agreements necessary to complete the work.
3. Contractor shall schedule a pre-construction meeting with the City's Engineering Department at least 5 business days prior to the start of construction. Contractor must attend and bring one set of the Acknowledged construction drawings and a copy of the current Heber City Standard Specifications and Drawings Manual (available at heberut.gov).
4. Contractor shall have in possession and on-site at all times one copy of the current

acknowledged construction plans stamped, signed, and dated by the Engineer of Record, the Applicant, and the City.

5. Developer's Engineers (Civil and Geotechnical) shall perform sufficient inspections and surveys during grading and construction to render an opinion in writing as to adherence tothe accepted plans and compliance with Heber City Standard Specifications and Drawings Manual.
6. ~~On construction requiring approval prior to proceeding with the work, a~~Any work done in the absence of an inspector's approval shall be subject to rejection. All underground GPS data must be collected by a City representative prior to backfill. Inspectors may request the contractor to expose work that has been backfilled without prior inspection or collection of GPS data. All such rework shall be completed at the Developer's or Owner's expense.
7. Survey monuments must be installed in accordance with the current Heber City and Wasatch County Surveyor's Office requirements.
8. All disturbed property survey markers shall be reset in their original locationsupon completion of all construction activities.
9. Contractor shall provide all traffic control which must conform to the current MUTCD. Provide site-specific Traffic Control Plans [prepared by an American Traffic Safety Services Association (ATSSA) or AGC-Certified Individual] prior to installation of any traffic control device. Traffic Control Plans must be Accepted by the City prior to implementation and before any shoulder, lane, or street closure.

B. TRENCHES AND UTILITIES

1. Trenches shall be completed and restored per City Standard Drawing UTIL-1.
2. Pothole existing utilities in accordance with City Standard Drawing UTIL-5.
3. Contractor is responsible to locate, avoid, protect, and repair all utilities encountered during construction, whether or not they are shown on the plans. Locations of underground utilities shown on plans are approximate and require field verification by Contractor.
4. All trenches within public right-of-way must be backfilled or securely plated during non-working hours. Trenches outside these areas shall be back-filled or protected by approved temporary fencing and/or barricades during non-working hours. Trenches in the roadway must be backfilled, compacted, and paved within 48 hours of road-cut. Paint striping shall be replaced in accordance to City Standards within 48-hours of restoration of pavement.

C. ROADWAY CONSTRUCTION AND RESTORATION

1. Subgrade must be approved prior to construction of untreated base course and pavement sections. Subgrade approval requires that a proof-roll be completed and verified by a City inspector, and that all utilities be installed, inspected with connections to main lines completed, and accepted by the City.
2. Asphalt patching to roads between October 15 and April 15 will be considered temporary only, and must be replaced according to City Standards and Specifications between the following April 15 and July 1.
3. Material Submittals are required for all items placed within the City right-of-way. All submittals must be dated within 90 days of the Construction Start Date (unless specified otherwise) and be submitted prior to the start of construction activities.
4. Moratorium Standard (New, Reconstructed, and Overlaid Streets): No cuts permitted for two (2) years from the time of construction/ reconstruction/overlay)
5. Special Restoration Standard: This standard applies to new, reconstructed, overlaid, and chip/slurry-sealed streets:

a. New, Reconstructed, and Overlaid Streets (for 5 years after end of moratorium): The asphalt surface shall be milled a minimum depth of two (2) inches, and fifteen (15) feet each way from the edge of the cut. Milling shall be done in widths equivalent to existing striped traffic lanes. The City Engineer reserves the right to require additional area and/or depth if deemed appropriate to restore roadway to original condition. Approved fabric is required when existing pavement included a fabric prior to the permitted cut.

b. Chip/Slurry-Sealed Streets (for one year after cip/slurry application): The asphalt surface shall be re-chipped/slurried a minimum of fifteen (15) feet each way from the edge of the cut, in widths equivalent to existing striped traffic lanes.

6. Roads shall be opened for traffic during peak hours. Lane closures may only be in effect from 9am-2pm, and 7pm-7am when night work is approved. Contractors shall accommodate all special school or local government schedules and events. Paint striping shall be replaced in accordance with City Standards within 48-hours of restoration of pavement.

7. All road closures must be approved by the City Engineer. All requests for road closures shall be made in writing and include a site-specific Traffic Control Plan for the proposed closure. When approved, closures of Collector Streets will require a 2-week advance notice to the public informing them of the upcoming closure. The notice shall be provided using on-site Variable Message Sign (VMS) boards indicating the anticipated start date and duration of the closure. VMS boards shall remain on site for the full two-week advance-notice period. If the duration of the closure is extended beyond the approved period, the extension shall be coordinated with the City Engineer and shall require additional VMS board notification to the public.

1.09 SUBMITTALS REQUIRED FOR DEVELOPMENT ACKNOWLEDGEMENT

A. ENGINEERING PLAN REVIEW CHECKLIST – The City provides Engineering Plan Review Checklists to assist developers and their professionals in the preparation of the engineering submittals for the acceptance of a development project. The Engineering Checklist does not replace the City Code or Engineering Standards and Specifications. The Engineering Checklist must be completed and signed by the Applicant and the Engineer-of-Record at the time of application submittal.

B. SUPPLEMENTAL ENGINEERING REPORTS – All engineering reports submitted for final acknowledgment shall be stamped, signed, and dated by a professional engineer ON THE FIRST SUBMITTAL.

1. Drainage Report – Drainage reports must be prepared in accordance with the design criteria and methodologies specified in the Heber City Storm Water Design Manual. Drainage reports shall include an LID Evaluation to identify feasible BMPs, and an Infiltration Feasibility Determination. In addition to the required engineer's stamp, signature, and date, drainage reports must include a certification from the engineer stating:

> I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept the sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. . I understand that the City assumes no responsibility or liability for this report.

2. Geotechnical Report – Geotechnical reports shall include:

~~2.~~

a. Summary of Proposed Construction
b. Pavement designs that comply with City Standards.
c. Double-Ring Infiltrometer Tests that are performed pursuant to ASTM D 3385 and the City

Storm Drain Manual.

d. Evaluation of Geologic Hazards and Proposed Mitigation Measures
e. Subsurface Soil Profiles
f. Groundwater Considerations and Proposed Mitigation Measures
g. Soil Classifications
h. Soil Properties, including Corrosivity and Proposed Mitigation Measures
i. Design Recommendations
~~j.~~ Construction Recommendations

3. Traffic Impact Study (TIS) – A traffic study is necessary to identify, review, and make recommendations for mitigation of the potential impacts a development may have on the roadway system. Identification of impacts and appropriate mitigation measures allows the City to assess the existing and future system safety, performance, maintenance, and capacity needs. TISs shall follow the Utah Department of Transportation's TIS Requirements, including the Levels of Study and associated thresholds. Additional requirements and investigation may be imposed upon the applicant as necessary. Likely information presented in a TIS may include, but is not limited to, site location and proposed access point(s), phased and/or full development trip generation, connection point design elements, adjacent and relevant development, existing and future traffic volumes, assessment of the system impacts, AND mitigation measures as appropriate.

4. Engineer's Estimate of Probable Costs – An Engineer's Estimate of Probable Costs shall be submitted to the City AFTER, not before, the engineering drawings have been accepted by the City. It shall include quantities, unit prices, and total prices of each landscaping and infrastructure improvement required as a condition precedent to recording a subdivision plat or the development of a commercial, industrial, mixed use, or multi-family project. When determining the assurance and warranty bond amounts, the City Engineer may change the unit prices in the estimate according to the City's research of market pricing.

5. Reimbursement Agreement Exhibits – Reimbursement requests for all infrastructure upsizing (system improvements) beyond the project improvement needs must be presented to the City at the Preliminary Plat or Commercial Initial Site Plan step to allow City staff advance time to work on a reimbursement agreement with the applicant. Reimbursement agreements must be accepted by the City and be executed by both parties before construction can begin on the project. All reimbursements that have not already been approved by the City Council in the City's approved and adopted budget require specific approval by the City Council.

   If the applicant wishes to begin construction before there is an agreement in place with the City, they must sign a waiver stating they accept the risk that they may not be reimbursed for any improvements installed, even if they are system improvements.

   The following exhibits are required to initiate a reimbursement agreement:

   a. Exhibit A -- Itemized Schedule of Values – Include quantities and unit prices of reimbursable items. Correlate it with an accompanying map. It shall be stamped, signed, and dated by the Engineer-of-Record.
   b. Exhibit B – Contractor bids or engineer estimates that support the prices shown in the Itemized Schedule of Values.
   c. Exhibit C -- Map of Reimbursable Items – Show the locations of all of the reimbursable items. Correlate it with the accompanying Itemized Schedule of Values.

C. BOUNDARY SURVEY – Boundary surveys, also known as record of survey, shall be stamped, signed, and dated by a professional land surveyor ON THE FIRST SUBMITTAL. If performed within the last 90 days, the survey shall have been filed in the Office of the County Surveyor and include evidence of filing.

D. EASEMENT AGREEMENT – All easement agreements shall be submitted to the City Engineer on the City's Standard Easement templates (available upon request from the City Engineer) for City acceptance. Easements in the name of the City shall not be recorded by anyone except the City. After

City acceptance and the recordation at the County Recorder's Office, the recordation shall be referenced on the subject plat. Right-of-Discharge easements (available upon request from the City Engineer) shall be granted to and indemnify the City whenever storm water drainage from City ROW discharges onto private property.

E. WATER RIGHT ACTION REPORT – Water rights to be used in development shall be summarized on a Water Right Action Report that is prepared by the Developer and approved by the City Engineer. A standard template for this the Report is available from the City Engineer upon request.

F. SUBDIVISION PLAT – Subdivision plats submitted for final acceptance shall be stamped, signed, and dated by a professional land surveyor ON THE FIRST SUBMITTAL.

G. DRY UTILITIES CONCEPTUAL PLAN

H. LEGAL DESCRIPTION – Legal descriptions submitted for final acceptance shall be accompanied by an illustration of the legal description, both of which shall be stamped, signed, and dated by a professional land surveyor ON THE FIRST SUBMITTAL.

I. NOTICE OF INTENT (NOI) – An NOI to the Utah Division of Water Quality for Storm Water Discharges Associated with Construction Activity shall be required prior to starting any construction activity.

J. FLOODPLAIN DEVELOPMENT PERMIT – The Floodplain Development Permit is the mechanism by which the City evaluates any and all impacts of activities proposed within regulated floodplains in the City. Contact the City Engineer for the Permit application when proposing activities within a regulated floodplain.

K. ENGINEERING DESIGN DRAWINGS –Accepted Engineering Design Drawings shall be valid for one~~2~~ years from the date of legislative approval~~Acceptance~~. If construction has not begun within one~~2~~ years from the date of legislative approval~~Acceptance~~, the Engineering Design Drawings shall become null and void unless an extension is granted by the City. Expired drawings must be re-checked by the City as part of a new application under the current ordinances in order to be Accepted again. Engineering Design Drawings must include, but are not limited to:

1. Reference to the City's Construction Notes (Section 1.04)
2. Boundary Survey
3. Topographical (existing conditions) Survey
4. Subdivision Plat
5. Demolition Plan (as necessary)
6. Impact-to-Private-Irrigation Plan (as necessary)
7. Site Plan
8. Grading and Drainage Plan
9. Utility Plan
10. Signing and Striping Plan, including a Safe Routes to School Plan (Coordinate with WCSD.)
11. Plan/Profile Sheets
12. Detail Sheets (not including copies of City Standard Drawings). City Standard Drawings shall be referenced in ONE place for all applicable infrastructure.

The Impact-to-Private-Irrigation Plan shall include a certification, signed by the Applicant stating:

As the developer of this property, I hereby certify that I understand: (1) how the existing gravity irrigation system works in the vicinity of this property, (2) how my development of this property will affect this system and associated stakeholders, (3) that I have coordinated with and have approval from the subject irrigation company(ies), (4) that I take full responsibility for the changes I am making to this system, (5) Heber City does not assume responsibility or liability for changes I make to this system.

The Grading and Drainage Plan shall include a certification from the Engineer-of-Record stating:

I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept the sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report.

Engineering Design Drawings submitted for Final Acceptance shall be certified on the cover sheet by the Engineer-of-Record, ON THE FIRST SUBMITTAL with the following language:

Engineer's Certification

As the Engineer-of-Record, I hereby certify that these construction drawings and supporting information ("Plans") comply with the Heber City Code and Standard Specifications and Drawings ("Standards"). I understand and agree that:

1. The City's Acknowledgment of these plans shall not be construed to be a permit for, or an approval of, any variance from any of the provisions of the Standards, unless a separate written approval authorizing a specific deviation has been provided by the City Engineer.
2. The City's Acknowledgement of these Plans, or feedback from the City on whether the Plans meet the Standards, shall not prevent the City from requiring the correction of errors in the Plans at any time, including after construction of improvements.
3. The City's Acknowledgement of these Plans does not constitute a permit from the Federal or State Government or permission to deviate from Federal or State Laws or Regulations.
4. The City's Acknowledgement of these Plans does not grant permission to work on the properties of others.

1.10 STORM DRAIN SYSTEM

A. SEE THE HEBER CITY STORM WATER DESIGN MANUAL.

B. IRRIGATION DITCHES

1. Private irrigation ditches within developments shall remain open, or be piped, pursuant to the affected stakeholders' specifications. Such changes to existing irrigation systems shall be included in the engineering plans.
2. Provide irrigation easements on the subject plat "for the benefit of the upstream and downstream users" to formalize prescriptive easements.
3. City-operated-and-maintained irrigation ditches shall remain open, unless otherwise approved by the City Engineer. Any City irrigation ditches that are piped shall follow the applicable City standards.

1.11 SANITARY SEWER SYSTEM

A. The impact of any proposed sewer system, on the existing sewer system, will be reviewed by the City Engineer. The developer may be required to add additional off-site sewer improvements in order to provide adequate sewer service for the proposed development.

1. Areas that will be serviced through the proposed development will be considered and the method of service to those areas will be determined by the City Engineer. Increased system size may be required by the City Engineer for future development.
2. City-owned sewer lift stations are prohibited.

B. Sewer mains shall be as shown in the City's current Capital Facilities Plan or Master Plan.

C. The minimum size of any sewer main line shall be 8-inch diameter.

D. All sewer pipe between manholes shall be of the same SDR and classification, and shall be the highest SDR and classification required along the section.

E. The minimum size of sewer laterals shall be 4 inches.

F. All sewer pipes shall be sized to a maximum of 75 percent of their capacity.

G. Sewer lines shall be designed according to the minimum slopes below. The design flow shall be calculated based on equivalent residential connections in addition to a peaking factor depending on the size of sewer pipe. For 8-inch pipe, the peaking factor shall be 4.0. For pipe larger than 8-inches the peaking factor shall be 2.5. The minimum sewer slopes shall be as follows (foot/foot):

1. 8-inch – 0.004
2. 10-inch – 0.0028
3. 12-inch – 0.0022
4. 15-inch – 0.0015
5. 18-inch – 0.0012
6. >/= 21-inch – 0.001

H. The minimum sewer depth shall be 13.0 feet under normal conditions. In areas of shallower sewer, the following note shall be added to the development plat: "Shallow Sewer Depths! Contractor shall verify sewer depths before excavating for basement. Home(s) with basement may not have sewer service available for basement."

I. A minimum of 5 feet of cover shall be required over all sewer lines.

J. Sewer shall be located at 10-foot minimum horizontal distance from drinking water lines.

K. Manholes must be constructed at the end of all sewer lines. Cleanouts shall not be substituted for manholes nor installed at the ends of lines. Stubs for future sewer extension may be installed without a manhole or cleanout. But, no sewer services shall be connected to the sewer stub until the line is extended and a manhole has been installed at the end of the line.

L. The minimum size manhole shall be 4-foot diameter. 5-foot diameter manholes shall be used in the following situations:

1. At all intersections of four or more 8-inch or larger pipelines.
2. Where any connecting pipe size is 14 inches in diameter or larger.
3. Where the deflection angle of the pipeline exceeds 90 degrees.
4. When both items "1" and "2" occur in the same manhole, a 6-feet manhole is required.

M. A 12-feet access road shall be constructed to all manholes and shall be capable of supporting H-20 loading.

N. Where new sewer lines are connected to existing sewer lines, a 5-feet-diameter manhole shall be constructed over the existing sewer line.

O. Manhole Spacing: The maximum span between manholes shall be 400 feet.

P. Six-inch and larger laterals shall connect to the main line through sewer manholes.

Q. The minimum drops through manholes shall be as follows:

1. Deflection Greater than 90° - 0.3 foot drop
2. Deflection of 75° - 90° – 0.2 foot drop
3. Deflection of 0° - 74° – 0.1 foot drop, not exceeding 0.20 feet across the manhole.

R. Drop manholes are required when the inverts differ by 24 inches or more.

S. Deflections in manholes on steep grades:

1. Where incoming slopes at manholes are greater than or equal to 5 percent and the deflection angle within the manhole is greater than or equal to 45 degrees but less than 90 degrees, a five-feet manhole with an extra deep trough is required.
2. Where incoming slopes at manholes are greater than or equal to 5 percent and the deflection angle within the manhole is greater than 90 degrees, a six-feet manhole with an extra deep trough is required.
3. The benching of the extra-deep trough shall be located 25 percent higher than the diameter of the incoming pipe.

T. Each non-single-family building or unit of separate ownership shall require a separate sanitary sewer lateral.

U. Grease interceptors, pursuant to the City Code and City Standard Specifications, shall be required on all commercial development where food service uses are anticipated.

1. Sampling manholes shall be installed downstream of all grease traps.
2. Sampling manholes and grease interceptors shall be inspected and maintained per the Utah Health Code, the City's Kitchen Best Management Practices Ordinance, and Wasatch County Health Department Regulations.

1.12 DRINKING WATER SYSTEM

Private systems shall be designed and inspected the same as public systems.

A. PIPELINES

1. Pipelines shall be as shown in the City's current Capital Facilities Plan or Master Plan, and be at least 8 inches in diameter, unless approved otherwise by the City Engineer for water quality purposes in dead-end lines. Pipelines that supply fire hyrdrants shall be at least 8 inches in diameter.
2. Fire hydrants shall be located on the same side of the street as the drinking water main line. The horizontal distance between the drinking water lines and pressurized irrigation lines shall be at least 5 feet.
3. Pipelines in private streets shall be on the same sides as in public streets unless approved otherwise by the City Engineer.
4. The horizontal distance between drinking water lines and sanitary sewer lines shall be at least 10 feet. Where a water main and sewer line must cross, the water main shall be at least 18 inches above the sewer line. Separation distances shall be measured from pipe edge to pipe edge. Adherence to all separation requirements included in Sections R309-550-7 and R309-550-12 shall be required unless a written variance is requested and granted from the Utah Division of Drinking Water and Heber City.
5. Special design and construction considerations in accordance with Section R309-550-5(6) of the Utah Administrative Code shall be required for water mains located in areas of geologic hazard (e.g., slide zones, fault zones, river crossings, etc.)
6. Surface water crossings are generally prohibited and will only be allowed when no other practical alternatives exist and when specifically approved in writing by the City Engineer. If allowed,

surface water crossings shall be designed and constructed in accordance with Section R309-550-8(8) of the Utah Administrative Code.

7. The minimum fire flow and pressure requirements shall be pursuant to State Standards, or more if determined by the Fire Marshall.
8. The minimum operating pressure in all parts of the system shall be 30 pounds per square inch during peak instantaneous demand.
9. The maximum static pressure in all parts of the system shall be 130 pounds per square inch.
10. Systems shall be designed so that pressures conform to the pressure zones shown in the City's Capital Facilities Plan.
11. The maximum flow velocity shall be 5 feet per second.
12. The impact of any proposed system on the existing system will be reviewed by the City Engineer. The developer may be required to add offsite infrastructure to mitigate impacts to the existing system and provide adequate water supply to their development.
13. If required by the City Engineer, the Engineer-of-Record shall provide a computer network model, for the City Engineer's review, of the proposed system showing compliance with this Standard. The City will provide boundary conditions, based on the system, for the model.
14. Individual booster pumps are not allowed, except in buildings with more than two stories above ground.
15. To provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins and "looping" of the drinking water system ~~whenever practical~~. Where dead-end mains do occur (permanent or temporary), a fire hydrant or approved blow-off assembly shall be installed for flushing purposes as directed by the City Engineer. Flushing devices must have the minimum sizes shown on Heber City Standard Drawing "Water-8", but must also be sized to provide a minimum velocity of 2.5 fps in the water main.
16. Permanent dead-ends shall not be longer than 600 feet.
17. The maximum allowable deflection of pipe joints shall be less than or equal to half of the manufacturer recommended maximum deflection.

B. VALVES

1. Valves smaller than 14 inches shall be gate valves. Valves 14 inches and larger shall be butterfly valves.
2. Valves shall be placed at intervals not exceeding 800 feet.
3. At junctions, valves shall be placed on all legs.
4. Valves shall be placed within 5 feet to 10 feet of the ends of casings.
5. Valves shall be placed at connections to the existing system.
6. When approved by the City, tapping sleeves may be used for fire lines or other branch connections. Tapping sleeves shall not be used for size-on-size applications. Branch lines must be at least one nominal pipe size smaller than the line being connected to.
7. Blow-offs shall be placed at the ends of and low points in pipelines. Fire hydrants may be used as blow-offs.
8. Air releases shall be installed at all peaks and sharp changes in gradient with a difference in elevation greater than 15 feet. If the water line has service connections within the location of the peak or change in gradient, the air release may be eliminated at the City Engineer's discretion.

C. FIRE HYDRANTS

1. Fire hydrants shall be placed at the ends of cul-de-sacs, the ends of dead-end streets, and at least every 1000 feet of off-site pipelines.
2. Fire hydrants shall be placed not more than 500 feet apart, or as directed by the Fire Marshall.
3. The minimum fire flow shall be pursuant to State Standards, or more if required by the Fire Marshall.
4. Fire hydrants shall be placed on the same side of the street at the water main pipeline.

1.13 PRESSURIZED IRRIGATION SYSTEM

A. PIPELINES

1. Pipelines shall be as shown in the Capital Facilities Plan or Master Plan, and be at least 6 inches in diameter.
2. Pipelines in private streets shall be on the same sides as in public streets.
3. The minimum operating pressure in all parts of the system shall be 30 pounds per square inch during peak instantaneous demand.
4. The maximum static pressure in all parts of the system shall be 120 pounds per square inch.
5. Systems shall be designed so that pressures conform to the pressure zones shown in the City's Capital Facilities Plan.
6. The maximum peak day flow velocity shall be 5 feet per second.
7. The impact of any proposed system on the existing system will be reviewed by the City Engineer. The developer may be required to add offsite infrastructure to mitigate impacts to the existing system and provide adequate water supply to their development.
8. If required by the City Engineer, the Engineer-of-Record shall provide a computer network model, for the City Engineer's review, of the proposed system showing compliance with this Standard. The City will provide boundary conditions, based on the system, for the model.
9. The maximum allowable deflection of pipe joints shall be less than or equal to half of the manufacturer recommended maximum deflection.
10. Public pipelines through private property, if approved, shall be in dedicated home-owner-association or business-owner-association open space centered in a 20-feet-wide easement in favor of the City.
11. All pipelines shall be designed such that the system can be easily drained to surface ditches or storm drain systems.

B. VALVES

1. Valves smaller than 14 inches shall be gate valves. Valves 14 inches and larger shall be butterfly valves.
2. Valves shall be placed at intervals not exceeding 800 feet.
3. At junctions, valves shall be placed on all legs.
4. Valves shall be placed within 5 feet to 10 feet of the ends of casings.
5. Valves shall be placed at connections to the existing system.
6. When approved by the City, tapping sleeves may be used for branch connections. Tapping sleeves shall not be used for size-on-size applications. Branch lines must be at least one nominal pipe size smaller than the line being connected to.
7. Blow-offs shall be placed at the ends of and low points in pipelines.
8. Air releases shall be installed at all peaks and sharp changes in gradient with a difference in elevation greater than 15 feet. If the water line has service connections within the location of the peak or change in gradient, the air release may be eliminated at the City Engineer's discretion.
9. Drains shall be installed at low points in the system.

1.14 STREET SYSTEM

Private streets shall be privately-owned-and-maintained.

A. DESIGN REQUIREMENTS

1. The pavement design (subbase, roadbase, and asphalt) for private streets shall be at least the same as public streets.
2. The pavement width of private streets shall be at least as wide as required by the latest edition of Appendix D of the International Fire Code.
3. Normally, sidewalk, park strip, curb, and strip paving are required along redeveloping properties. In the event that the requirement for such is delayed by deed restriction, the shoulder of the road shall be improved with 3 inches of roadbase for a distance of 4 feet from the edge of asphalt. The surface of the roadbase shall tie in with the surface of the asphalt. Beyond the roadbase, the

surface of the soil shall be graded to a swale and then slope up to the edge of the right-of-way.

4. Roundabouts, following Federal Highway Administration Design Guidelines, are required where feasible and practical, pursuant to the following criteria:
   a. Minimum inscribed diameter of 110 feet, using a WB-62 design vehicle for City roads of lower classification than major collector.
   b. Minimum inscribed diameter of 120 feet, using a WB-67 design vehicle for single-lane major collectors.
   c. Islands shall include mountable curb and decorative (stamped, colored, etc.) concrete aprons approved by Heber City.
   d. Minimum inscribed diameter of 150 feet for double-lane applications.
   e. Refuge areas shall be incorporated into intersection leg islands with crosswalks and ADA panels.
   f. Raised landscaped center islands with an additional feature/sculpture approved by Heber City.
5. Because preference is given to pedestrians, a driveway approach is required for all private accesses unless recommended otherwise by the City Engineer, based on site-specific considerations, such as:
   a. speed, slope, and functional classification of the adjacent street
   b. width of the proposed access
   c. volume of the proposed access
   d. drainage
6. Curb returns adjacent to ADA ramps shall have a maximum slope of 2 percent where possible. Where the base of the curb ramp, or the edge of the flush landing must join an intersection of two streets with running grades greater than 2 percent, the base of the curb ramp or the edge of the flush landing may be warped to meet the street running grade. Every effort shall be made to minimize this grade by warping the street cross slope plus or minus 4 percent on both legs of the intersection.
7. The following Table 1 serves as a guide to design professionals by providing a summary of the City's Street Design Standards.
8. A physical traffic calming measure is required on local street segments longer than 1000 feet without at least a 45-degree turn.
9. School crosswalks and associated STOP bars and signage shall be placed along Safe-Routes-to-School routes. Other crosswalks shall be placed as directed by the City Engineer.
10. Access management of public streets shall follow Table 2.
11. The developer is required to complete a type II slurry seal on all street improvements one year after final inspection and prior to the expiration of the warranty period.
12. Temporary paved ~~hard-surfaced~~ turnarounds ~~cul-de-sacs~~ are required on all dead end public streets that will be extended and are greater than one-and-a-half lots in length. The cost of installing the future curb, gutter, sidewalk, driveway extension etc., when the temporary cul-de-sac is removed, shall be escrowed with the City.
13. The top back of curb shall be stamped, showing locations of water, sewer, and secondary irrigation lateral service pipes:
   a. "W" for drinking water.
   b. "S" for sewer.
   c. "I" for pressurized irrigation.
14. A brass pin shall be imbedded in the curb marking the location of each property line.

TABLE 1 – GEOMETRIC DESIGN OF STREETS

DESIGN ELEMENT	MINOR LOCAL	LOCAL	MINOR COLLECTOR	MAJOR COLLECTOR	MOUNTAIN COLLECTOR	HISTORIC BUSINESS CORE
Posted/Design Speed	25		30	35	35	25
Typical Section Elements						
ROW Width	56'	62'	68'	80' or 85'[a]	58'	92'[b]
Pavement Width	26'	32'	38'	38'-50'[c]	36'	48'/58'
Number of Lanes	2[g]			3	3	2
Side Cut/Fill Slopes	3:1 up to 5 feet high and 2:1 above 5 feet high					
20 Year ESAL Requirement	60,000	60,000	250,000			
VERTICAL DESIGN ELEMENTS						
Vehicle Design	Passenger, School Buses, Delivery trucks, dump Trucks	Passenger, School Buses, Delivery trucks, dump Trucks	Passenger, School Buses, Delivery trucks, Dump/Concrete Trucks	Passenger, School Buses, Delivery trucks, Dump/Concrete Trucks	Passenger, School Buses, Delivery Trucks, Dump / Concrete Trucks	Passenger, School Buses, Delivery Trucks, Dump/Concrete Trucks, Semi Loads
Minimum Centerline Grade	0.5%					
Maximum Centerline Grade	10%	8%[d]				5%
Maximum Centerline Grade Across Designated Crosswalks	2% with stop or yield control 5% without stop or yield control[h]		2% with stop or yield control 5% without stop or yield control[h]			
Max. Grade in Cul-de-Sacs	5%	Not Allowed				
Maximum Centerline Grade Break w/o Vertical Curve	1%		0.5%			0.5%
Maximum TBC Grade Break w/o a Vertical Curve[e]	2%					
Minimum Crest Vertical Curve "K" Value	12		19	29		
Minimum Sag Vertical Curve "K" Value	26		37	49		
Minimum Length of a Vertical Curve	60'		90'			
HORIZONTAL DESIGN ELEMENTS						
Minimum Mid-Block Centerline Curve Radius	198'		333'	510'		198'
Superelevation	Not Allowed					
INTERSECTIONS						
Intersection Sight Distance	Refer to AASHTO: A Policy on Geometric Design of Highways and Streets, Latest Edition					
Corner Curb Radius	25'		40'			40'
Minimum Angle of Intersection	60° for at least 100'		80° for at least 100'			
Maximum Centerline Offset	5'		2'			
Maximum Centerline Grade[f]	5%		4%			
Vertical Tie-In	Lower streets shall match the centerline crowns in an intersection. Higher streets shall tie in 12' off the centerline of local streets or at the edge of the outside travel lane of other streets.					

a. If a 10-feet trail is used, 5 feet more is required.
b. An 82.5-feet right-of-way may be used with City approval.
c. Depending on whether a landscaped median is used, and whether on-street parking is allowed.
d. Under special circumstances, grades up to 10 percent may be approved, if grades would exceed 8 percent in order to maintain 4 percent through the intersections, and conditioned upon providing individual designs to construct ADA-compliant ramps.
e. Maximum grade break of 2% along TBC with Minimum length of 25 feet between breaks.
f. Grade must extend at least 50 feet beyond the side of the lane of the intersecting street.
g. Turn lanes with appropriate stacking lengths may be required (per the TIS).
h. In some instances, the cross slope of pedestrian crossings may be increased to match the slope of the road in accordance with PROWAG R304.5.3.

TABLE 2 – ACCESS MANAGEMENT

Heber City Access Management Standards

Functional Classification	Minimum Driveway Spacing (feet)[1,2,3,4]			Cross Street Unsignalized Intersection Spacing (feet)	Geometric Design of Driveway Access[5]					Minimum Signal Spacing (feet)
					Single-Family Residential Driveways			Other Driveways		
	Upstream and Downstream (feet)	Opposing Upstream (feet)	Opposing Downstream (feet)		Approach Width (feet)[6]	Edge Clearance (feet)[7]	Curb Return Radius (feet)	Approach Width (feet)[6]	Edge Clearance (feet)[7]	
Major Arterial w/o Median Barrier	350	175	160	660	12 min	5 min	10 min	Two Way 25 min 40 max	20 min	2640
Major Arterial w/ Median Barrier	200	130	160	400						2640
Minor Arterial w/o Median Barrier	200	115	105	660						1320
Minor Arterial w/ Median Barrier	150	65	105	400						1320
Collector w/o Median Barrier	150	105	90	250			15 max	One Way 16 min 30 max		1320
Collector w/ Median Barrier	85	50	70	150	30 max					1320
Minor Collector w/o Median Barrier	85	105	90	250						1320
Minor Collector w/ Median Barrier	50	50	70	150						1320
Local w/ or w/o Median Barrier	10	-	-	150						N/A

1. Driveway spacing is measured as shown in Figure 1. For Local streets, the spacing is measured from edge-to-edge.
2. Corner clearance requirements for access points should meet or exceed the minimum driveway spacing requirements. Curb cuts on major arterials should be spaced at distances greater than 230 feet apart, measured from face-of-curb to face-of-curb, with the preferred distance being 300 feet.
3. For corner properties, access to public streets should be provided from the lesser (lowest functional classification) street.
4. Driveways in right-turn lane transition areas are discouraged.
5. For the benefit of traffic safety and flow, access points may be required to be designed to prohibit certain types of turning movements.
6. Wider driveway widths may be permitted to accommodate additional turning and/or acceptance lanes.
7. Distance between side property line and edge nearest drive as measured along traveled way.

Figure 1: Measurements for Minimum Access Spacing Standards

B. MORATORIUM STANDARD (New, Reconstructed, and Overlaid Streets) -- No cuts permitted for two years from the time of the construction/restoration/overlay.

C. SPECIAL RESTORATION STANDARD (New, Reconstructed, Overlaid, and Chip/Slurry-Sealed Streets)

1. New, Reconstructed, and Overlaid Streets (for 5 years after end of moratorium): The asphalt surface shall be milled a minimum depth of two (2) inches, and fifteen (15) feet each way from the edge of the cut. Milling shall be done in widths equivalent to existing striped traffic lanes. The City Engineer reserves the right to require additional area and/or depth if deemed appropriate to restore roadway to original condition. Approved fabric is required when existing pavement included a fabric prior to the permitted cut.
2. Chip/Slurry-Sealed Streets (for one year after chip/slurry application): The asphalt surface shall be re-chipped/slurried a minimum of 15 feet each way from the edge of the cut, in widths equivalent to existing striped traffic lanes.

1.15 TRAILS SYSTEM

A. DESIGN REQUIREMENTS

1. Trails shall be as shown in the City's current Parks and Trails Capital Facilties Plan or Master Plan.
2. Additional trails are encouraged and shall be provided in accordance and shall be provided in accordance with the City's adopted trail plans and standards.
3. Trails shall comply with the requirements of the Americans with Disabilities Act (ADA) where reasonably appropriate and feasible. A trail is considered ADA-accessible if it meets the following criteria:
   a. 5-feet minimum width
   b. Hard surface – Asphalt and concrete are the most accessible. Compacted crushed stone with a diameter less than 3/8-inch is also acceptable.
   c. Longitudinal grade less than 5 percent.
   d. Ramps, not stairs, should be provided for grades exceeding the 5-percent maximum.
   e. Ramp grades should not exceed 8 percent, and have a level landing for every 30 inches of vertical rise, and have a slip-resistant surface.
   f. 32-inch-high handrails should be installed on all ramps and bridges.
   g. Trails should have a rest area every 300 feet, preferably cleared with a bench.
4. Grades – Trail grades shall not exceed one-half of the grade of the hillside being traversed. The following table identifies maximum lengths for trail sections with longitudinal grades greater than 5 percent.

Grade (percent)	Max. Length (ft)
<5	None
5-6	800
6-7	400
7-8	200
8-9	100
9-10	50
>10	0

5. Maintain a minimum clear view for cyclists of 150 feet. If this distance cannot be met, signing pursuant to MUTCD shall be used. Signs shall be installed 50-60 feet ahead of sight-obstructing changes in alignment.
6. Maintain a vertical clearance of at least 10 feet. The vertical clearance on trails used during winter

months shall be at least 16 feet due to snow.

7. Lengths of Vertical Curves

Grade Break (percent)	Min. Length (ft)
<3	0
3	10
4	75
5	120
6	150
7	171
8	188
9	200
10	210
11	218
12	225
12-20	264

8. The minimum horizontal curve radius shall be 74 feet.
9. The maximum grade through trail intersections is 3 percent.
10. Construction Standards

The trail cross slope shall be 1.5 percent to 2 percent. Where trails cross streets, the cross lsope may be increased to match the cross slope of the road in accordance with PROWAG R304.5.3.

Trail Type	Width (ft)	Materials
Improved Multi-Use	10-14 with a 20 easement, depending on regional connections per Staff and the Trails Map, plus 2-wide shoulders	Asphalt – Properly-Prepared Subgrade, Weed barrier, 6 inches of Roadbase, 3 inches of Asphalt. Concrete and pavers can be used to appropriate areas.
Improved Pedestrian	8 with a 20 easement, plus 2-wide shoulders	Concrete – Properly-Prepared Subgrade, Weed barrier, 6 inches of ¾-inch Gravel, 4 inches of Concrete.
Back Country	4 with a 20 easement, plus 2-wide shoulders	Natural Surface

11. Easements – All public trails will require a recorded easement using the City's standard easement language in use at the time the easement is recorded. Trail easements shall normally be included on associated plats. When separate trail easements have been recorded, they shall be referenced on applicable plats.
12. Bridges
    a. A building permit is required for bridges.
    b. Widths of bridges shall be the same as the associated trails.
13. Trailheads – Trailheads shall be provided in accordance with the Parks and Trails Master Plan and associated trail design guidelines.
14. Fences – Fencing should be installed only where physical separation is necessary for safety or to preserve adjacent landowner privacy. Fences should normally be 5 feet from the trail edge and must also be located within the trail easement.

1.15 STREET AND TRAILS LIGHTING SYSTEMS

A. Street lights shall be located at cul-de-sac ends, street intersections with collector streets or larger, and critical points as determined by the City Engineer. On street intersections, there shall be two lights located kitty-corner on the through street around the corners from the STOP signs.

B. Commercial Historic street lights shall be installed on Main Street between 400 South and 300 North, spaced four per block on both sides.

C. Trail lights shall be installed along all master-planned trail systems at 200-feet maximum intervals and at entrances to parks, trail intersections, bridges, and road crossings.

1.02 GENERAL REQUIREMENTS

A. ~~The Developer is responsible to comply with these standard specifications. Alterations, substitutions, or changes from these standard specifications shall not be allowed unless prior authorization is obtained from the City Engineer. The developer is responsible for providing all documentation and research supporting requests for changes to these standards, and the associated costs.The City Engineer will make the decision relating to all questions which may arise as to the quality and acceptability of alterations, substitutions, or changes proposed. In case any question should arise, relative to these standards, the final determination or decision of the City Engineer shall be complied with as a condition of the Developer receiving final approval of the work being questioned.~~

B. ~~The improvements shall include all street improvements in front of all lots and along all dedicated streets to a connection with existing improvements of the same kind or to the boundary of the subdivision nearest existing improvements.~~

C. ~~Public roads shall not exceed a grade of 8% without approval from the City Engineer. Under special circumstances grades up to 10% may be approved, conditioned upon 1) providing individual designs to construct ADA compliant handicap ramps, and 2) incorporating a 60' minimum transition to a 4% grade at intersections.~~

D. ~~The developer is required to complete a type II slurry seal on all street improvements one year after final inspection and prior to the expiration of the guarantee period.~~

E. ~~Layout must provide for future extension to adjacent development and be compatible with the contour of the ground for proper drainage.~~

F. ~~All water, sewer, irrigation and any other buried utility or conduit shall be installed to the boundary lines of the subdivision. For existing lots of record, the utility for which service is needed shall be extended through the entire frontage of the property unless otherwise directed by the City Engineer.~~

G. ~~All parcels receiving water, sewer, or irrigation service shall have their own independent services and laterals. These laterals or services shall be contained within the parcel or property for which the service is intended to eliminate special utility easements crossing adjacent properties. Deviation from this requirement, regardless of how or when it is determined to be in violation, shall be at the complete discretion of the City Engineer and Public Works Director.~~

H. ~~If construction requires a specification not found herewith and is deemed necessary by City Engineer, the City Engineer will be allowed two weeks to provide an adequate specification to control and provide guidelines for construction.~~

I. Inspection: The term "inspection" (or its derivatives) means a review of the project, including but not limited to a visual review of the work completed to date. It does not include or imply an exhaustive or detailed review of the Work nor does it create a duty on the part of the Engineer or Owner to detect latent defects.

J. Temporary hard surfaced cul-de-sacs are required on all dead end public streets that will be extended and are greater than one and a half lots in length. The cost of installing the future curb, gutter, sidewalk, driveway extension etc., when the temporary cul-de-sac is removed, shall be escrowed with the City.

K. Adequate facilities for drainage shall be provided and may not adversely impact adjacent properties.

L. Easements for water, sewer, or storm drains not in the public right of way shall be a minimum of 20 feet wide for a single utility and dedicated solely to Heber City for the given use. Public Utility Easement's shall not be used in lieu of dedicated easements for new utilities and access.

M. Public utility easements (PUE's) shall be 10ft wide around perimeter of standard lots. Cottage lots shall have the side lot PUE's reduced to 5 feet.

N. The top back of curb shall be stamped in the following manner, showing locations of water, sewer, and secondary irrigation stub pipes:

a. A "W" stamp for culinary water.
b. An "S" stamp for sewer.
c. An "I" stamp for secondary irrigation.
d. A brass pin will be imbedded in the curb marking the location of each property line.

O. A landscaping plan including details of proposed irrigation systems shall be submitted for all parks or other landscaped areas which are to become the responsibility of the City to operate and maintain. These plans shall meet the requirements of and be approved by the Director of the Parks Department.

P. Heber City requires roundabouts for new development where feasible and practical. Roundabouts shall be designed with the following criteria:

a. Min inscribed diameter of 120 ft using a WB-67 design vehicle for single lane major collectors.
b. Min inscribed diameter of 110 ft using a WB-62 design vehicle for City roads of lower classification than major collector.
c. Min inscribed diameter of 150 ft for double lane applications.
d. Roundabouts shall follow FHWA Design Guidelines.
e. Mini and urban compact roundabouts may be approved for private roads at the discretion of the City Engineer.
f. Islands shall include mountable curb and decorative (stamped, colored, etc.) concrete aprons approved by Heber City.
g. Refuge areas shall be incorporated into intersection leg islands with crosswalks and ADA panels.
h. Roundabouts shall include raised landscaped center islands with an additional feature/sculpture approved by Heber City.

PART 2 SUBMITTALS

2.01 DRAWINGS

A. Complete and detailed construction plans and drawings of improvements shall be submitted as an electronic PDF to the City Engineer for signature prior to final approval of the project by City Council. The construction drawings will not be signed by the City Engineer until the following items have also been completed:

1. The plan check procedure has been completed.

2. All required easements have been designated on the subdivision plat or dedicated by separate document to the City.

3. An Engineers Estimate of the improvement costs has been submitted to the City.

B. The Mylar plat map will not be signed by the City Engineer for recordation until the following items have also been completed:

1. The performance agreement has been completed and executed.

2. All required water rights or shares have been transferred to the city.

3. The City escrow deposits have been paid in full.

4. If requested, three (3) sets of hard copy final approved construction plans have been provided to the City.

C. The signed construction drawings will be valid for two (2) years from the date of City approval. If construction has not begun within two (2) years from the approval date, the drawings shall become null and void. Expired drawings will require rechecking by the City.

PART 3 REQUIREMENTS

3.01 STANDARDS FOR CONSTRUCTION DRAWINGS: The following instructions are for the purpose of standardizing the preparation of drawings to obtain uniformity in appearance, clarity, size and styl.

A. One hard copy approved set shall be kept available at the construction site.

B. The plans and designs shall meet the standards defined in the Specifications and Drawings. The minimum information required on drawings for improvements are as follows:

1. All drawings and/or prints shall be clear and legible and conform to good engineering and drafting room practice.

2. Size of drawings shall be 24" x 36" and 11" x 17" (trim line) with minimum borders of ½" on top, bottom, and right sides, left side 1 ½".

3. North arrow (plan).

4. Scale and elevations referenced to U.S.G.S. datum.

5. Stationing and elevations for profiles.

6. Title block, located in lower right corner of sheet to include:
   a. Name of City.
   b. Project title (subdivision, etc.).
   c. Specific type and location of work.
   d. Space for approval signature of City Engineer and date.
   e. Name of engineer or firm preparing drawings with license number.

3.02 CURB AND GUTTER, DRAINS AND DRAINAGE STRUCTURES, SIDEWALKS, SITE GRADING IMPROVEMENTS, AND STREET SURFACING DRAWING REQUIREMENTS

A. Scale: 1"=50' horizontal; 1"=5' or 10' vertical.

B. Plans and profiles for each side of the street whether existing or proposed with elevations clearly indicated. Centerline profile may be eliminated.

C. Stationing and top of curb elevations with curve data for all curb returns.

D. Flow direction and type of cross drainage structures at intersections with adequate flow line elevations.

E. B.M. location and elevation (use U.S.G.S. datum).

F. Type of curb and gutter and distance from front to back of curb.

G. Cross slopes to gutter as shown on the standard cross section drawings.

H. Vertical curves for grade breaks equal to or greater than 1%.

I. Typical street cross section for all street sizes and variations.

J. Street survey monument locations.

K. Plan and profile of existing ground and purposed profiles extending 200' beyond the proposed project.

L. Profile drawings for all storm drainage infrastructure.

M. Requirement to install reference pins in curb identifying location of property lines.

N. Street address and regulatory signs at each intersection.

O. Sleeves for all utility crossings i.e. phone, power, gas, and cable.

P. Street Lights

Q. Storm Water Pollution Prevention Plan according to State requirements and best management practices for the site.

3.03 SEWER DRAWING REQUIREMENTS

A. Scale: 1"=50' horizontal; 1"=5' or 1"=10' vertical.

B. Location, size and grade of mains and laterals.

C. Manhole size, location and flowline elevation.

D. Type of pipe.

E. B.M. location and elevation (use U.S.G.S. datum).

F. Profile Drawing

3.04 CULINARY WATER DRAWING REQUIREMENTS

A. Scale: 1"=50' horizontal; 1"=5' or 1"=10' vertical.

B. Size and location of water mains, valves, hydrants, and related appurtenances.

C. Type of pipe.

D. Minimum cover.

E. Details of all utility conflicts.

F. Profile Drawings, unless waived by the City Engineer.

3.05 IRRIGATION PIPE

A. Scale: 1"=50' horizontal; 1"=10' vertical.

B. Location, size and grade of mains. The mains shall be sloped to drain.

C. Elevations of main shall provide minimum 3 feet of cover on transmission lines and 2 feet of cover on distribution lines.

D. Type of pipe

E. B.M. location and elevation (use U.S.G.S. datum)

F. Profile Drawings, unless waived by the City Engineer.

3.06 STRUCTURES

A. Each set of plans shall be accompanied by a separate sheet of details for structures which are to be constructed.

B. All structures shall be designed in accordance with minimum requirements established by the Heber City Standard Specifications.

C. All structural drawings shall contain the following:

1. Scale of each detail.

2. Title block, lower right hand corner on all sheets, include name of subdivision.

3. Completely dimensioned and described.

PART 4 EXECUTION

4.01 GENERAL

A. All construction work involving the installation of improvements in subdivisions shall be subject to inspection by the City.

B. Certain types of construction require approval prior to proceeding with the work while other types only require periodic inspection while the work is occurring.

1. Approval is required prior to proceeding with the following types of work:
   a. Placing concrete for curb, gutter, sidewalks, thrust blocks, collars and other structures.
   b. Connections or tie-in's to existing water, sewer, storm drain, and irrigation systems
   c. Pipe line flushing, pressure testing, and videoing of water, sewer, storm drain, and irrigation lines.
   d. Street subgrade proof roll, placing subbase, and laying street asphalt.

2. Periodic inspections shall be required on the following:
   a. Street grading and gravel base.
   b. Excavations for curb and gutter and sidewalks.
   c. Excavations for structures.
   d. Trenches for laying pipe.
   e. Forms for curb and gutter, sidewalks and structures.
   f. Laying of street surfacing.

C. On construction requiring approval prior to proceeding with the work, any work done in the absence of an inspector's approval shall be subject to rejection. All underground GPS data must be collected prior to backfill. Inspector may request contractor to expose work that has been backfilled without prior inspection or to collect GPS data.

4.02 PRECONSTRUCTION CONFERENCE

A. A preconstruction conference shall be held before any excavation or other work is begun in the subdivision or project. The meeting will be held at a location specified by the City Engineer and will include: (a) City Engineer; (b) Developer or Project Manager; (c) Subdivision or Project Engineer; (d) all Contractors and Subcontractors involved with installing the subdivision or project improvements; (e) a representative of Heber City Inspection Department; (f) representatives of local utility companies as may be required by Heber City. Items pertaining to the construction and inspection of the subdivision or Project Improvements will be discussed. Upon request, one (1) copy of the Heber City Standard Specification and Drawings will be issued to the contractor during this meeting. Additional copies may be obtained for $20.00 each.

4.03 REQUESTS FOR INSPECTION

A. Requests for inspections shall be made to the City, in writing or by personal contact with the inspector assigned to the project, by the person responsible for construction.

B. Requests for inspection on work requiring continuous inspection shall be made at least three (3) days prior to the commencing of the work.

C. Notice for all other inspections shall be given one (1) working day in advance of the required inspection (subsequent inspections and re-inspection shall require the same notification period.

D. After hour and/or weekend inspections are available under extreme conditions, but are subject to payment of after hour inspection fees as shown in the Heber City Consolidated Fee Schedule. .

E. The Contractor/Developer shall GPS surface features (i.e. valves, meter cans, hydrants, cleanouts, manholes, irrigation boxes, etc.) for the Record Drawings. The Contractor/Developer shall coordinate with the Heber City Public Works Department to expose and GPS all underground features and connections to mains (i.e. corp. stops, sewer lateral connections to main, cleanouts, transitions and/or fittings, etc.) for City Mapping of the utilities.

4.04 REQUESTS FOR WATER SHUT DOWN

A. Request for water shut down shall be made a minimum of ~~24~~48 hours prior to the desired shut down.

B. Requests shall be made to the Public Works Superintendent and include, date, time and location.

C. Valves are to be opened and closed by City personnel only.

D. Contractor is to provide a minimum of 24 hour notification to all customers affected by the shutdown including but not limited to door to door contact and a flyer or handout describing the estimated date, time, location of the shut down, and emergency phone number. Contractor shall also notify the City 48 hours in advance so that a Parlant notification can be sent to affected customers.

4.05 CONSTRUCTION COMPLETION INSPECTION

A. An inspection shall be made by the City Engineer after all construction work is completed.

B. Any faulty or defective work shall be corrected by the persons responsible for the work within a period of thirty (30) days of the date of City Engineers Inspection Report defining the faulty or defective work.

C. The Developer shall furnish "Record" drawings of all improvements prior to subdivision final approval. Record drawings shall be submitted via~~include~~ electronic PDF. ~~and~~ AutoCAD files. ~~A~~and/or a printed mylar shall also be submitted when requested. Record drawings shall be the original drawings, signed by the City and engineer of record, with corrections of minor changes that occurred during construction noted. Major changes that significantly change a drawing sheet will have a new design sheet created during construction and resigned by the City Engineer. All changes made to the design during construction shall be recorded and include, but not be limited to changes to alignments, elevations, utility main line locations, service lateral locations, and any other changes made during construction.

4.06 GUARANTEE OF WORK

A. The Developer shall warrant and guarantee the improvements by executing Heber City's Standard Performance Agreement and posting a bond, acceptable to the City, for ~~up to 20%~~100 percent of the ~~value~~estimated cost of the improvements to be constructed. The City will add 10 percent to the estimated cost to cover administrative costs incurred by the City to complete the improvements, if necessary. The improvements provided for hereunder, and every part thereof, will be guaranteed to remain in good condition for a period of ~~two (2)~~one ye~~ars~~, after the date of Final Acceptance by the City Engineer. Developer agrees to make all repairs to the improvements during the guarantee period at no cost to the City. ~~The guarantee period may be reduced to one (1) year if final acceptance occurs between April 30th and November 1st and, if in the opinion of the City, the developer or the contractor's past performance has been excellent.~~ The improvement warranty period may be extended by the City if the City determines for good cause that the one-year period

would be inadequate to protect the public health, safety, and welfare; and if the City has substantial evidence on record of prior poor performance by the applicant, or that the area upon which the infrastructure will be constructed contains suspect soil that the City has not required the applicant to mitigate.

B. Final Acceptance shall not be granted and the guarantee period shall not commence until all of the items noted on the project punch list have been completed.

C. The determination for necessity of repairs and maintenance of the work rests with the City Engineer. His decision upon the matter shall be final and binding upon the Developer, and the guarantee hereby stipulated shall extend to and include, but shall not be limited to the entire street base, and all pipe, joints, valves, backfill, and compaction as well as the working surface, curbs, gutter, sidewalks, and other accessories that are, or may be affected by the construction operations, and whenever, in the judgment of the City Engineer, said work shall be in need of repair or rebuilding.

D. If the Developer fails to begin making repairs within ten (10) days from the date of the service of such notice, the City Engineer shall have such repairs made and the cost of such repairs shall be paid by the Developer together with an additional 25 percent for stipulated damages for failure on the part of the Developer to make the repairs.

4.07 SUBDIVISION ORDINANCES

A. The Developer and his Engineer must familiarize themselves with the existing subdivision ordinances, requirements of which maya~~re~~ not be included in these Sstandards.

4.08 ROADWAY PERMITS

A. For construction material and procedures not addressed by the specifications, the most recent revision of the standard specification of the following agencies shall apply:

1. American Association of State Highway & Transportation Officials. (AASHTO).
2. American Society for Testing & Material (ASTM).
3. American Waterworks Association (AWWA).
4. Uniform Building Code of the International Conference of Building Officials (UBC).
5. Utah Department of Transportation (UDOT) Standard Specifications and Standard Plans.
6. Manual on Uniform Traffic Control Devices (MUTCD).

4.09 BUILDING PERMIT AND OCCUPANCY

A. Subdivisions and other large scale development shall be nearly complete with essential facilities (as defined in Heber City ordinances) being constructed pursuant to the accepted drawings~~in place~~ and operational before a building permit will be issued. Such completion shall be ~~certified in writing~~ verified by the City Engineer or their designee. ~~The certification shall verify that the project has been built as per approved plans.~~

B. Occupancy will be allowed within any subdivision or development only upon compliance with Heber City Ordinances.

4.10 UNUSUAL LOADINGS

A. In unusual circumstances of structural loading, the City Engineer shall have the authority to require measures to strengthen structure and/or foundations as needed to protect the City's interests.

4.11 SNOW REMOVAL FOR ROADS AND FIRE HYDRANTS

A. The owner of the subdivision or other large scale development shall be responsible to keep the roads and the fire hydrants cleared of snow until the roads are accepted by the City Engineer.

B. The fire hydrants shall be cleared for at least three (3) feet in all directions.

END OF SECTION

SECTION 00900

PROCEDURAL POLICY FOR WATER & SEWER

PART 1 HOOKUP FEES

1.01 SECTION INCLUDES

A. This section defines water and sewer hookup fees, billing procedures and policies.

1.02 WATER HOOKUP FEES

A.

LINE SIZE	HOOKUP FEE	IMPACT FEE**	MAX RATE *
3/4" Water Hookup	See Heber City Consolidated Fee Schedule	See Heber City Consolidated Fee Schedule	30 GPM
1" Water Hookup			50 GPM
1 1/2" Water Hookup			100 GPM
2" Water Hookup			160 GPM
3" Water Hookup			350 GPM
4" Water Hookup			1000 GPM

* Estimated at 80% of manufacturer's maximum rating. Meters 3-inches and above are compound meters which are determined separately.

** Impact Fees are adjusted annually based on the ENR index.

B. Apartment Complexes and other Multiple Dwelling units are responsible to pay a hookup fee for each separate meter servicing said units.

1.03 SEWER HOOKUP FEES

A.

TYPE	IMPACT FEE*
Residential	See Heber City Consolidated Fee Schedule
Non-Residential	Commercial development charges are based on Equivalent Residential Units (ERU's) calculated from average water usage and the number of fixture units.

* These are adjusted annually based on the ENR index.

PART 2 BILLING PROCEDURES

After completion of hookup, billing for Water and Sewer service will begin. Sewer will be billed at the base rate until the home is occupied. When the home becomes occupied, the Sewer will be billed using the State averages of usage based on the number of persons occupying the home until a history is obtained.

2.01 WATER BILLING PROCEDURES

A. Water fees will be set by resolution and may change as the City Council deems necessary. Water billings are billed in arrears. Current base fees based on line size are per Heber City Consolidated Fee Schedule.

B. County Residents who are permitted to hook onto Heber City's Water System will be billed 1 ½ times the normal rates.

C. The base fee will entitle each user to the number of gallons of water included in the base fee as shown in the current Heber City Consolidated Fee Schedule. Additional usage over the base amount will be billed at a higher rate per thousand gallons as indicated in the Heber City Consolidated Fee Schedule.

2.02 TEMPORARY/CONSTRUCTION WATER

A. Temporary water for construction or other similar purposes will be served from the local irrigation company when available. Culinary water may be obtained if the City determines that irrigation water is unavailable. Temporary water may be discontinued at any time if deemed necessary by the City. Persons wishing to obtain temporary water may apply for a construction meter at the City Public Works Office and submit a deposit identified in the Heber City Consolidated Fee Schedule. The City Public Works Department will install a meter at the fire hydrant location requested (unless installation by the Contractor is approved by Public Works) and periodically bill the applicant for water used at a rate identified in the Heber City Consolidated Fee Schedule per thousand gallons. Upon notification to discontinue service the City Public Works Department will remove the construction meter (unless removal by the Contractor is approved by Public Works) and, if in good condition refund the applicants deposit. Applicant is responsible for all water usage registered on the meter.

B. The City may issue one time water permits to users requiring minimal quantities of water. Water for these permits will only be provided from the hydrant located at the City's Public Works Yard. Users must have a permit in their possession and available for inspection at all times when transporting water.

C. If access to construction water through the meter service box is wanted during construction of new buildings, the contractor or owner will need to sign up for water service through the City and have the meter set by Public Works. Occupancy will not be granted until a water meter has been properly set by the City.

Upon receiving a request for final inspection, the Building Department personnel will check the water meter vault and determine if a meter has been set. If the meter is in place then the inspector will proceed with the inspection, if not then the inspection will cease until the meter has been installed. It is the responsibility of the individual(s) requesting occupancy to set up the water service account and request the meter be set.

2.03 POLICY REGARDING LEAKS

A. When a leak is discovered by the owner or the City, adjustments to billings will be given when proof of repair is provided. Repairs must take place within 10 days of the leak discovery or no adjustment will be made. Adjustments will be given to approximate the previous history of a similar period.

2.04 WINTER FREEZE UP POLICY

A. In certain circumstances the Public Works Director may authorize individuals to leave water running in their homes during the winter months to prevent water lines from freezing. If an individual is thus authorized, their water billing will be adjusted to the base rate. If individuals

leave water running without permission from the Public Works Director, no adjustment will be made to the billing.

2.05 SEWER BILLING PROCEDURES

A. Sewer fees will be set by resolution and may be changed as the City Council deems necessary. Sewer billings are billed one month in advance. Current base monthly fees are identified in the Heber City Consolidated Fee Schedule:

B. Sewer flow charges are based on the winter water usage from approximately October 10th to April 10th, of each year. Flow charges over the base rate are calculated as follows:

Water Usage / 6 months = Average Monthly Use

Average Monthly Use x $ Rate per Thousand Gallons = Flow Charge

C. Flow charges are then added to the base fee to equal your monthly bill.

D. If no sewer history exists, the City will use the formula below for the first year.

Base Rate + (Per Person Charge x #of People)

2.06 POLICY REGARDING WINTER WATER LEAKS

A. When a water leak is discovered during the winter months by the owner or a City employee, Heber City will use the State average usage for the number of persons living in the home for determining the flow charges for the April billing.

2.07 LIVESTOCK METERS

A. Persons who water livestock will be required to install a separate meter in order for Heber City to deduct water used for watering livestock before calculating flow charges for the Sewer billing.

2.08 SPRINKLER SYSTEMS

A. Persons wishing to install sprinkler systems attached to the culinary water system will be required to connect onto their water line between the home and the water meter, unless a hardship exists. The Public Works Director will determine if a hardship exists. The City Manager will give final approval. If a hardship exists, a separate meter can be installed and will be billed as a normal connection. Those who receive permission to have a separate connection will be required to pay the appropriate hook up fee as determined in section 1.02 A. These connections are not transferable to another property if they are abandoned.

All necessary backflow prevention devices are to be installed per the International Uniform Plumbing Code and City Ordinance. Backflow devices for sprinkler systems shall be Reduced Pressure Zone Backflow Prevention Assemblies (RP Devices). RP Devices will need to be accompanied by a certification from a licensed tester that the device is functioning properly prior to city acceptance.

2.09 ABANDONMENT OF SERVICES AND LATERALS

A. Existing water services shall be abandoned to the city's main line. The "corp" valve shall be removed and the tap plugged. All abandonments shall be coordinated with the Public Works Director.

B. Existing sewer laterals shall be abandoned by capping the lateral with a water tight plug at the main line. If the lateral ties into a manhole, the water tight plug may be placed inside the manhole.

2.10 WATER METER LOCATIONS

A. Water meters shall be installed in the public right-of-way perpendicular to the water main. The meters will normally be located in the park strip, or in cases where no park strip exists, may be installed on the city side of the property line. In the case of services tapped off water mains in easements, the meter shall be within the easement and adjacent to the main.

B. Water meters located within the driveway or driveway approach shall be flush with the concrete surface and shall be inspected and approved by the Public Works Department.

PART 3 CUTOFF POLICY

3.01 Heber City's policy regarding disconnection of services for delinquent payment is as follows:

A. When an account become 30 days past due, billings will be marked as past due with payment required in 10 days or service will be disconnected.

B. If no response is received within the first ten day period, a Notice of Disconnection will be mailed. This notice will allow ten additional days before disconnection will take place.

C. If no response is received within the 10 day period the water will be disconnected.

D. Before water services are restored, the bill must be paid in full and payment for a reconnect fee must be paid as identified in the Heber City Consolidated Fee Schedule.

END OF SECTION

SECTION 01450

TESTING AND PROCESS CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section defines the responsibility of the Developer or Contractor to adequately test native materials and construction materials, and to furnish the City with manufacturer's certifications of material quality.

1.02 QUALITY ASSURANCE

A. The developer or Contractor shall be responsible for all sampling, delivery of samples to a qualified testing agency, testing, and delivery of test results or materials certifications to City at no charge to the City. Testing and certifications reports shall be approved by the City as to conformance to City construction specifications prior to final inspection and/or acceptance by the City of any materials or workmanship.

1.03 SUBMITTALS

A. Field Test Report: When possible submit original reports immediately to Engineer or inspector, but in no case later than end of following day.

B. Laboratory Test Report: Submit original report to Engineer within 48 hours after test results are determined.

PART 2 EXECUTION

2.01 SAMPLING

A. Sampling of materials shall be as specified in each test.

B. The City Engineer or City Inspector may require that sampling be performed in their presence, in which case the Developer or Contractor shall be notified of this requirement in writing at the time the building permit is issued, or at the preconstruction meeting, or when construction drawings are released by the City for construction, as applicable.

C. The presence of a City Inspector shall not relieve the Developer/Contractor of any requirement in this Section.

D. Each sample or test shall be accompanied by the following written data, which shall be reported to the City with test results:

1. Name of Project.
2. Name of Developer/Contractor.
3. Project Street Address.
4. Appropriate Test Name.

5. Date of Sampling.

6. Sample Number (if more than one sample per day).

7. Name of technician who performed the testing.

8. Location of sample.

2.02 TESTING AGENCY

A. All materials testing, whether in a laboratory or in the field, shall be conducted by a certified independent testing agency approved by the City.

2.03 SOIL CLASSIFICATION TEST

A. The soil classification test shall be conducted to determine the suitability of native soils for road subbase and building foundations.

B. The soil classification test shall conform to AASHTO M-146 of latest revision.

C. The soil shall be classified according to AASHTO soil classifications.

D. One soil classification test shall be required for each test area. A test area shall be limited to one parcel of one soil type, a maximum 1,000 feet long and maximum 5 acres.

E. In test areas of less than 2 acres, the City Engineer may waive this requirement.

F. The soil sample shall be taken from a test area at a minimum depth of 24 inches below the future design grades, of native soil, and shall be free from foreign material, asphalt, concrete, ice or manmade materials.

G. Where deep footings or pile foundations are proposed, soil classification tests at several depths may be required in each test area.

H. The results of all determinations shall be reported in writing to City Engineer.

2.04 COMPACTION TEST OF SOIL AND UNTREATED BASE COURSE

A. Laboratory tests to establish maximum laboratory density shall be determined in accordance with AASHTO T-180, Method D for A-1 classification soils and AASHTO T-99, Method D for all other soils.

B. Samples to determine laboratory density shall be taken from the stockpiled backfill or from the uncompacted base course in place.

The acceptance of soil and base course with respect to compaction shall be based upon all density tests made in a lot meeting the density required.

ROADS

1. Field density tests shall be as specified by AASHTO T-191 or by use of a portable nuclear density testing device. Field density tests shall be taken at a depth equal to ½ the maximum depth of the lift tested.

2. A lot shall equal the amount of soil or untreated base course compacted in each production day.

3. A test lot shall be divided into sublots and one density test shall be taken within each sublot.

4. The location of sampling sites within the sublot shall be chosen on a random basis by use of a suitable random number table.

5. Each test lot shall have a minimum of two (2) sublots. A sublot shall be no larger than 1,000 cubic yards for embankment, no larger than 200 cubic yards for backfill over pipe or against structures and no larger 1,000 tons for untreated road base.

UTLITY PIPE

1. Main line utility trenches shall have a passing compaction test every 200 feet at each lift.

2. Lateral line utility trenches shall have a minimum of one passing compaction test.

3. Each manhole, inlet, water valve cluster, or any other utility which is raised to grade shall have a minimum of one passing compaction test.

4. All tests, whether they are pass or fail, shall be recorded and submitted by testing company each day.

5. If two sequential tests fail, the frequency of the tests may be increased at the City Engineer's discretion.

C. The test results of all samples tested shall be reported to the City Engineer. A test lot shall be accepted when the average of the density determinations is not less than the density required for that improvement in these specifications and when no one density determination is less than 95% of the density required by these specifications.

D. Compaction tests not conforming to required specifications may be rejected and re-compaction or related construction efforts to obtain compaction shall be at the Developer's expense.

2.05 TEST ROLL OF ROADWAY SUBGRADE

A. Roll Test shall be performed when required by City Engineer to determine the structural integrity of the subgrade and street section.

B. The Roll Test shall be performed as follows:

1. The contractor shall provide a loaded 10 wheel dump truck or water truck to drive over the subgrade material within the roadway.

2. The loaded truck shall be driven slowly over the subgrade to locate soft spots in the subgrade surface.

3. Soft spots in the subgrade shall be identified and marked by the City Engineer or Inspector.

4. It shall be the developer's responsibility to remove the rejected subgrade material to depth determined by City Engineer. The rejected material shall be replaced with A-1 granular backfill approved by City Engineer.

2.06 GRADATION TEST OF UNTREATED BASE COURSE

A. The gradation of untreated base course shall be determined in accordance with AASHTO T-27.

B. The total amount of material passing the No. 200 sieve shall be determined by washing in water in accordance with AASHTO T-11.

C. The acceptance of road base with respect to gradation shall be based upon the average of all determinations in a lot. A lot shall be limited to one source of borrow and limited to one subdivision plat or one development. One sample shall be required for each 1,000 tons of untreated base course in a test lot. When the test lot is less than 100 tons, the requirement for the gradation test may be waived by the City Engineer.

D. The location of sampling sites within a test lot shall be chosen on a random basis by a suitable random number table.

E. All material not conforming to the specified gradations may be rejected at the Developer's expense.

2.07 EXTRACTION - GRADATION TESTING OF BITUMINOUS SURFACE COURSE

A. Samples of the bituminous surface course or asphalt concrete shall be tested with respect to asphalt binder, sieve analysis, theoretical maximum specific gravity, and VMA in accordance with Utah Department of Highways Test Procedures.

B. Mix design shall be submitted to the City Engineer for approval a minimum of 5 working days before work is to begin.

C. Acceptance of bituminous surface course with respect to gradation and bitumen content shall be based upon the average of the determinations made in a lot.

1. A lot shall equal the amount of bituminous surface course placed in each production day.

2. When a lot exceeds 1,000 tons, a minimum of three (3) samples shall be taken in each lot.

3. When a lot is 1,000 tons or less, a minimum of two (2) samples shall be taken.

4. Samples shall be taken at the time of lay-down of bituminous surface course and before compaction. Samples shall be taken from the mat behind the lay-down machine.

5. Sampling shall be timed to represent the entire production day. The time of day, date of sample, station and offset location shall be clearly marked with the sample.

6. If the average asphalt is less than 2.5% of optimal content, the Contractor may be required to lay an additional lift or slurry seal, based on the City Engineer's recommendation.

2.08 COMPACTION TESTING OF BITUMINOUS SURFACE COURSE

A. Laboratory tests to establish the Theoretical Maximum Specific Gravity of the bituminous surface course shall be determined in accordance with ASTM D2041 and ASTM D1559.

B. Samples to determine maximum laboratory density shall be taken at the time of lay-down of bituminous surface course and before compaction.

C. Acceptance of bituminous surface course with respect to compaction shall be based upon the average determination of field density tests made in a lot.

1. Field density tests shall be by a portable nuclear density testing device and by laboratory density analysis of core samples. At a minimum, one core sample shall be taken every 2,000 tons or at each change in mix design to calibrate the portable nuclear density testing device(s). The location of the core shall be at a location also tested with the portable nuclear testing device. Each portable nuclear testing device shall be calibrated to the density of a core test at the same location as the core was taken. Additional core tests shall be completed per the direction of the City Engineer.

2. A test lot shall be the quantity of surface course placed and compacted in each construction day.

3. The test lot shall be subdivided into sublot(s) of approximately equal size and no larger than 1,600 square yards in area.

4. One field density test shall be taken in each sublot, randomly located in the test lot by use of a suitable random number table.

D. Test lots shall be accepted with respect to density when the average in place density meets the requirements of Section 02510. Entire test lots or individual areas not meeting these requirements are subject to removal and replacement at the discretion of the City Engineer.

E. Core Tests

1. Acceptance of the completed bituminous surface course with respect to thickness shall be based on the average thickness of a test lot.
   a. A test lot shall equal approximately 4,000 square yards of completed roadway.
   b. A lot shall be divided into sublots of approximately 2,000 square yards.

2. One thickness test, randomly selected by use of a random number table, shall be taken within each sublot. A minimum of three core tests will be taken.

3. A lot shall be accepted when the average thickness of all sublots is not less than 3/8 inch the total designated bituminous surface course thickness and when no individual sublot shows a deficient thickness of more than ½ inch.

4. Lots or sublots that are not acceptable because of deficient thickness shall be brought into compliance by placing additional surface course as directed by the Engineer.

5. The removed core will be replaced with low strength concrete.

2.09 COMPRESSIVE STRENGTH TESTING OF CONCRETE CYLINDERS

A. Samples of concrete shall be taken at the construction site, molded in standard cylinder shapes, allowed to cure, and tested with respect to comprehensive strength when required by the City Engineer.

B. All samples of concrete shall be taken in conformance to AASHTO T-141 of the latest revision.

C. Acceptance of concrete with respect to compressive strength shall be based upon the average determination of all "strength tests" made in a lot.

1. A test lot shall be the quantity of concrete placed at one job in a construction day.

2. For each 50 cubic yards of concrete in a test lot, a minimum of three (3) compressive "strength tests" shall be run, except that for lots of less than 5 cubic yards, the number of "strength tests" per lot shall be the average strength of three standard cylinders.

3. The making, curing and compressive strength testing of concrete cylinders shall conform to AASHTO T-22 and AASHTO T-23.

D. Concrete may be rejected if desired strengths are not obtained at the Developer's expense.

2.10 ADDITIONAL CONCRETE TESTING

A. Slump Test: Determine slump in accordance with AASHTO T-152. One slump test is required for every 50 yards with a minimum of one test per day.

B. Air Test: Determine normal weight concrete air content; AASHTO T-152 and light weight concrete air content; AASHTO T-196.

C. When requested by Engineer, test concrete in place by impact hammer, sonoscope, or other nondestructive device:

1. To determine relative strengths in various locations in Work.

2. To aid in evaluating concrete strength.

3. To select areas to be cored.

2.11 CERTIFICATIONS FOR WATER SYSTEM VALVES

A. In certain water system equipment, steel items and pipe listed below, a manufacturer's certificate shall be furnished with each unit of equipment, certifying conformance to the applicable requirements of City Standard Specifications:

1. Gate Valves.

2. Butterfly Valves.

3. Steel Reinforcing Bars.

4. Structural Steel.

5. Corrugated Metal Pipe.

6. Polyvinyl Chloride Pipe.

7. ABS Composite (Truss) and Solid Wall Pipe.

2.12 SUMMARY TABLE OF TESTS AND CERTIFICATIONS

A. The following is a summary of the tests, number of samples per test and certificates that are required for construction work and developments in Heber City. This summary is provided as a reference guide. For details governing each item, refer to the appropriate test specification herein.

TEST SUBJECT	SPECIFIC TEST	NUMBER OF TESTS
Soil Classification	AASHTO M-145	1 test per test area of uniform soil type and 5 acres maximum.
Compaction of Soil & Base Course	Lab Density- AASHTO T-99 Method D or AASHTO T-180 Method D Embankment & Base Course Field Density- Portable Nuclear	As needed to establish laboratory density 1 test plus minimum one test per 1,000 cu.yds.

TEST SUBJECT	SPECIFIC TEST	NUMBER OF TESTS
	Equipment or AASHTO T-191 Backfill Field Density- Portable Nuclear Equipment or AASHTO T-191	1 test plus minimum one test per 200 cu.yds.
Base Course Gradation	Sieve Analysis- AASHTO T-27 Passing No. 200 Sieve- AASHTO T-11 Utility Pipe	1 test per 1,000 tons Every 200 linear feet of main line trench at each lift. One test per lateral trench and at each utility (MH, Valve, box, etc.)
Extraction-Gradation Test of Bituminous Surface Course	UDOT Test Procedure 8-946 & 8-947	3 tests per pavement construction day
Compaction of Bituminous Surface Course	Lab Density- Marshall Test, ASTM D-1559 Field Density- Portable Nuclear Equipment	1 test per pavement construction day 1 test per 1600 square yards sublot
Core Tests	4" Core Sample	1 thickness test per 2,000 square yards or 3 test minimum
Concrete Test Cylinders Air & Slump Test	AASHTO T-23	3 cylinders per 50 cubic yards or minimum of 3 cylinders on placements less than 50 cubic yards
Pressure Reducing & Regulating Valves	Manufacturer's Certificate	1 for each valve
Gate Valves	Manufacturer's Certificate	1 for each valve over 12" diameter
Back Flow Reduced Pressure Zone Assembly (RP)	Field Test Certificate by licensed technician	
Butterfly Valves	Manufacturer's Certificate	1 for each valve
Steel Re-Bar	Manufacturer's Certificate	1 for each 1,000 pounds of one grade
Structural Steel	Manufacturer's Certificate	1 for each lot of one shape, one grade
Corrugated Metal Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class
Polyvinyl Chloride Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class
A.B.S. Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class

END OF SECTION

SECTION 02150

SHORING AND UNDERPINNING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shoring for open excavations requiring a protective system.

1.02 REFERENCES

A. OSHA Construction Standards Chapter P: Excavations, Trenching, and Shoring.

1.03 RESPONSIBILITY

A. Contractor/Developer is solely responsible for safety. It is the Contractor/Developer's responsibility to adhere to all of OSHA's current regulations.

1.04 DEFINITIONS

A. Accepted Engineering Practices: Those requirements or practices which are compatible with standards required by a duly licensed or recognized authority.

B. Benching: A method of protecting persons and property against cave-ins by excavation the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

C. Excavation: Any man-made cut, cavity, or depression in an earth surface, including trenches, formed by earth removal and producing unsupported earth conditions (sides). If installed forms or similar structures reduce the depth-to-width relationship, and excavation may become a trench.

D. Failure: The permanent deformation or breakage of a structural member or connection; or the collapse of all or part of an excavation.

E. Protective System: Any recognized method of protecting persons and property against cave-ins, the collapse of adjacent structures, or material that may fall or roll from an excavation side or into and excavation. Protective systems include support systems, sloping and benching systems and shield systems.

F. Shield/Trenchbox : A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect persons and property within the structure without preventing a cave-in. Shields may be permanent structures or may be designed to be portable and moved along as work progresses. Portable shields used in trenches are usually referred to as "trench boxes" or "trench shields".

G. Shoring: A structure that supports the sides of an excavation and thereby protects persons and property by preventing cave-ins.

H. Sides: A vertical or inclined earth surfaces formed at the outer edges of an excavation.

I. Sloping: A method of protecting persons and property against cave-ins by excavation to form sides that are inclined away from the excavation, the angle on incline being of such a degree for the conditions of exposure that a cave-in will not occur.

J. Support System: A structure which protects persons and property by providing support to an adjacent structure, underground installation, or the sides of an excavation.

K. Trench: A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.

1.05 DESIGN OF PROTECTIVE SYSTEMS

A. Use professional engineer to design support systems, shield systems, and the structural components of these systems, and sloping and benching systems to resist without failure all loads that are intended to be imposed or transmitted to them.

B. Fully compensate in design procedures for hydrostatic pressure in the excavation sides.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials shall be as per 1.05 of this section.

PART 3 EXECUTION

3.01 STABILITY OF ADJACENT STRUCTURES

A. Use support systems such as shoring, bracing, or underpinning where stability of adjoining buildings, walls, sidewalks, pavements, or other structures is endangered by excavation operations.

3.02 INSPECTIONS

A. Contractor/Developer shall employ and have on site at all times a competent person, as defined be OSHA, who is responsible for excavation inspection.

B. Inspect excavations daily for evidence of possible cave-ins, indications of failure of protective systems, or other hazardous conditions.

C. Upon discovery of hazardous conditions, cease all work in the excavations until additional precautions have been taken to ensure persons and property safety.

3.03 ADDITIONAL REQUIREMENT FOR TRENCH EXCAVATION

A. Do not excavate material to a level greater than 2 feet below the bottom of the members of a support system if the system is designed to resist the forces calculated for the full depth of the trench, and indications of a possible cave-in below the bottom of the support system are not evident while the trench is open.

END OF SECTION

SECTION 02205

COMMON FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Common fill material requirements.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

B. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.03 DEFINITIONS

A. Common Fill: Backfill material which is not mechanically graded.

1.04 ACCEPTANCE

A. Acceptance of common fill shall be determined by Engineer and will be based upon sublots of 500 tons.

B. Engineer reserves the right to select and test backfill on a random basis from any location in the Work, on the site or from the backfill source.

PART 2 PRODUCTS

2.01 GRANULAR FILL

A. Classification A-1-a. Refer to AASHTO M145

B. Non-Plastic and well graded.

C. Bank run material: free of shale, clay, slag, friable material and debris.

D. The material must be within the following limits:

SIEVE SIZE	PERCENT BY WEIGHT PASSING SIEVE
4 inches	99
No. 4 (4.75 mm)	30 to 70
No. 200 (75 micro m)	3 to 15

2.02 BORROW

A. Sound, earthen material with 95% passing the 4 inch sieve.

B. Classifications A-1-a through A-4. Refer to AASHTO M145.

2.03 SAND

A. Clean, coarse, natural sand.

B. Nonplastic when tested in accordance with ASTM D 4318.

C. 100 percent shall pass a ½ inch screen.

D. No more than 20 percent shall pass a number 200 screen.

2.04 SOURCE QUALITY CONTROL

A. Verify gradation compliance in accordance with AASHTO T-27. Select samples uniformly in time on a random basis.

PART 3 EXECUTION

3.01 INSTALLATION

B. Excavation and Backfill Operations: In accordance with Section 02225.

END OF SECTION

SECTION 02206

SELECT FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Select fill material requirements.

1.02 REFERENCES

A. AASHTO T-96: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

B. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.03 DEFINITIONS

A. Select Fill: Backfill material which is mechanically graded.

1.04 SUBMITTALS

A. Material analyses of each select fill material to be used.

1.05 ACCEPTANCE

A. Engineer reserves the right to select, reject, and test backfill on a random basis from any location in the Work or from the backfill source.

PART 2 PRODUCTS

2.01 AGGREGATES – UNTREATED BASE COURSE

A. Clean, hard, tough, durable and sound mineral aggregates that consists of 95% crushed stone, crushed gravel or crushed slag; free of deleterious and organic matter; and complies with the following:

1. Aggregate Wear Under AASHTO T-96: Less than 50 percent.

2. Material shall be classified as A-1 material.

3. Two fractured faces Under AASHTO T-335: A minimum of 50 percent.

4. Dry Rodded Weight Under AASHTO T-19: Not be less than 75 lb/ft^3.

5. Gradation Limits: Establish the job mix target gradation for each sieve. Target grading curve must lie within the gradation limits of the Master Grading Band Limits. The Job Mix Gradation Tolerance is the allowable deviation from the job mix target gradation on the applicable sieves. The following limits are based on fine and course aggregate having approximately the same bulk specific gravities. Sieve gradations are based upon percent of aggregate passing by weight in accordance with AASHTO T-27 and T-11.

MASTER GRADING BAND LIMITS – UNTREATED BASE COURSE

SIEVE SIZE	Type 1-1/2 Min	Max	Type 1 Min	Max	Type 3/4 Min	Max	JOB MIX GRADATION TOLERANCE
1-1/2"	100	--	--	--	--	--	
1"	90	100	100	--	--	--	±9.0 (1-1/2")
3/4"	70	85	--	--	100	--	±9.0 (1-1/2 &1")
½"	65	80	79	91	--	--	±9.0
3/8"	55	75	--	--	78	92	±9.0
No. 4	40	65	49	61	55	67	±7.0
No. 16	25	40	27	35	28	38	±5.0
No. 200	7	11	7	11	7	11	±3.0

6. Source quality control shall be in accordance with AASHTO T-27. Verify job-mix grading band material compliance by selecting samples uniformly in time on a random basis.

2.02 DRAIN ROCK

A. Consist of hard, durable particles of stone or gravel, screened or crushed to specified size and gradation.

B. Free from vegetable matter, lumps or balls of clay, or other deleterious matter.

C. Crush or waste coarse material and waste fine material as required to meet gradation requirements.

D. Aggregate Wear: Percentage of wear not greater than 50 percent when tested in accordance with AASHTO T-96.

E. Conform to size and grade within the limits as follows when tested in accordance with AASHTO T-27.

	¾ " Drain Rock	1-1/2" Drain Rock	3" Drain Rock
SIEVE SIZE (Square Openings)	PERCENT BY WEIGHT PASSING SIEVE	PERCENT BY WEIGHT PASSING SIEVE	PERCENT BY WEIGHT PASSING SIEVE
4 inch	100	100	100
3 inch	100	100	95-100
2 inch	100	100	50-100
1-1/2 inch	100	95-100	15-55
3/4 inch	95-100	50-100	0-20
3/8 inch	15-55	15-55	0-15
Number 4	0-10	0-25	0-10
Number 8	0-5	0-5	0-5
Number 200	0-2	0-2	0-2

2.03 GRAVEL

A. Consist of hard, durable particles or fragments of stone or gravel, screened or crushed to specified sizes and gradations.

B. Free from vegetable matter, lumps or balls of clay, alkali, adobe, or other deleterious matter.

C. When sampled and tested in accordance with specified test methods, material shall comply with the following requirements:

1. Durability index: Percentage of wear not greater than 40 percent after 500 revolutions when tested in accordance with ASTM C 131.

2. Plasticity Index: Not greater than 5 when tested in accordance with ASTM D 4318.

3. Liquid limit: Not greater than 25 percent when tested in accordance with ASTM D 4318.

D. Conform to sizes and grade within the limits as follows when tested in accordance with ASTM C 136 and ASTM C 117:

SIEVE SIZE (Square Openings)	PERCENT BY WEIGHT PASSING SIEVE
3 inch	--
1-1/2 inch	100
Number 4	30-70
Number 8	20-60
Number 30	10-40
Number 200	0-12

2.04 PEA GRAVEL

A. Consists of hard, durable particles or fragments of stone or gravel, screen or crushed to specified sizes and gradations. Pea gravel shall only be used with Engineer's approval.

SIEVE	PERCENT PASSING BY WEIGHT
1/2 inch	100
3/8 inch	95-100
Number 4	0-3
Number 16	0-2
Number 200	0-1

2.05 COARSE SAND

A. Consists of hard, durable particles or fragments of stone or gravel, screen or crushed to specified sizes and gradations. Coarse sand shall only be used with Engineer's approval.

SIEVE	PERCENT PASSING BY WEIGHT
3/8 inch	100
Number 4	95-50
Number 16	0-5
Number 200	0-3

2.06 BEDDING SAND

A. Friable river or bank aggregate, free of loam and organic matter. Graded as follows.

SIEVE	PERCENT PASSING BY WEIGHT
3/8 inch	100
Number 4	95-100
Number 50	0-70
Number 100	0-30
Number 200	0-20

PART 3 EXECUTION

3.01 INSTALLATION

A. Excavation and Backfill Operations: In accordance with Section 02225.

END OF SECTION

SECTION 02225

EXCAVATION AND BACKFILL OPERATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for trenching and backfilling for underground pipelines.

B. Excavating and backfilling operations adjacent to and under structures including boxes, headwalls, or other structures as required by City Engineer.

C. Backfilling and compacting operation for construction and reconstruction of roadways, embankments, streets, parking lots, and other paved surface areas.

D. Excavation permit requirements.

1.02 DEFINITIONS

A. Pipe Zone: That zone in an excavation which supports, surrounds, and extends to 1 foot above the top of the pipe barrel.

B. Bedding: Process of preparing the trench bottom to receive the pipe and the backfilling on each side of the pipe to 12 inches over the top of the pipe.

C. Roadway: Area within the street right-of-way, including the area under the street, curb, gutter, and one (1) foot behind curb.

1.03 SUBMITTALS

A. Cut Sheets: In accordance with Section 00700.

B. Material Analysis Reports: In accordance with Sections 02205 or 02206 as applicable.

C. Density Test Reports: In accordance with Section 02250.

D. Depth of backfill lift. This information shall be contingent upon type of equipment used in compaction operation. Engineer may order lesser thickness if compaction is not achieved.

1.04 STORAGE AND HANDLING

A. Stockpile excavated material in a manner as to cause a minimum of inconvenience to public travel and provide for emergency traffic as necessary.

B. Maintain free access to all existing fire hydrants, water valves, irrigation valves, gas valves, manholes, cleanouts, and meters.

C. Maintain clearance for free flow of storm water in all gutters, conduits, and natural water courses.

D. Utilize appropriate traffic signs, markers, and procedures in all product storage and handling activities.

E. Promptly remove all other material from site.

1.05 SITE CONDITIONS

A. Unsuitable Weather Limitations: Do not place, spread, or roll any fill material during unsuitable weather conditions. Do not resume operations until moisture content of material is satisfactory.

B. Protection of Graded Areas: Protect graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or unsuitable weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Prior to excavation operations, photograph existing surfaces along which Work may take place in order to determine, after construction is completed, whether any damage of existing improvements occurred prior to construction operations.

E. Grading: In compaction operations, do not vary the surface of finished aggregate base course more than 1/4" above or below grade.

PART 2 PRODUCTS

2.01 WATER

A. Make arrangements for source of water during construction and make arrangements for delivery of water to site. Comply with all local laws and regulations when securing water from water utility company at no additional cost to City.

2.02 SOIL MATERIALS

A. Over-excavation Fill: Select Fill: in accordance with Section 02206.

B. Common Fill: in accordance with Section 02205.

C. Select Fill: in accordance with Section 02206.

D. Native Backfill:

1. When approved by City Engineer, native backfill material obtained from project excavations may be used as backfill, provided organic material, rubbish, debris, rocks larger than 8 inches, and other objectionable materials are removed.

2. Bituminous pavement obtained from project excavations will not be permitted as backfill except for the following:
   a. May be mixed with road sub-base if material meets section 02205.2.01 gradation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify areas to be backfilled are free of debris, snow, ice, or water and ground surfaces are not frozen.

B. Verify foundation of basement walls are braced to support surcharge forces imposed by backfilling operations and that required concrete compressive strengths have been achieved.

C. Immediately prior to suspension of construction operations for any reason, provide proper and necessary drainage of work area.

3.02 PREPARATION

A. For pipelines, use means necessary to avoid displacement, and injury to, pipe and structures while compacting soil or operating equipment next to pipeline.

B. Movement of construction machinery over a pipeline at any stage is solely at Contractor's risk.

C. When excavation is required in jurisdictions other than City, satisfy all conditions of the appropriate agencies.

D. Identify required lines, grades, contours, and benchmarks.

E. Notify all affected utility companies and Blue Stakes prior to commencing excavation operation.

F. Support and protect from damage, until completion of the Work, any existing facilities and structures which exist in, pass through, or pass under the site.

3.03 CONTROL OF GROUNDWATER

A. All trenches shall be kept free from water during excavation, fine grading, pipe laying, jointing, and embedment operations.

B. Where the trench bottom is mucky or otherwise unstable because of the presence of groundwater, and in cases where the static groundwater elevation is above the bottom of any trench or bell holed excavation, such groundwater shall be lowered to the extent necessary to keep the trench free from water and the trench bottom stable when the work within the trench is in progress.

3.04 SHORING

A. Comply with Section 02150 when required by field condition.

3.05 GENERAL EXCAVATION OPERATIONS

A. If topsoil is on site, remove and store it for later use on site.

B. Excavate site to required grade for Work. Use all means necessary to control dust on or near Work and on or near all off-site borrow and disposal areas.

C. Notify Engineer of unexpected subsurface conditions.

D. Underpin adjacent structure which may be damaged by excavation work, including service utilities and pipe chases.

E. If unstable material is encountered at the bottom or face of excavation, suspend excavation and consult with Engineer. Obtain written approval from Engineer before proceeding. Correct unauthorized excavation at no cost to City.

F. Provide necessary protection to excavation walls as required. If conditions permit, slope excavation side to maintain a safe and clean working area. Remove loose materials.

G. Correct excavation beyond the specified lines and grades by filling the resulting voids with approved compacted fill. If the fill is to become the subgrade for other fill, use material approved by Engineer. Do not proceed until Engineer has approved the material and the proposed method of backfilling for over excavation errors.

3.06 EXCAVATION FOR PIPELINES

A. Trenches shall be excavated to the depths and widths required to accommodate the construction of the pipelines, as follows:

1. Except in ledge rock, cobble rock, stones or water saturated earth, mechanical excavation of trenches shall not extend below an elevation of 4 inches below the bottom of the pipe after placement in its final position.

2. All additional excavation necessary for preparation of the trench bottom shall be made manually.

3. Excavation for trenches in ledge rock, cobble rock, stones, mud or other material unsatisfactory for pipe foundation, shall extend to a depth of at least 4 inches below the bottom of the pipe.

4. A bedding of special material shall be placed and thoroughly compacted with pneumatic tampers in 4-inch lifts to provide a smooth, stable foundation.

5. Special foundation material shall consist of suitable earth material free from roots, sod, vegetation, or other organic matter.

6. Trench bottoms shall be hand shaped as specified in paragraph (2) above.

7. The maximum width of trench, measured at the top of the pipe, shall be as narrow as possible but a minimum of 6 inches on each side of the pipe.

8. Where ground water is encountered, clay dikes and/or filter fabric may be required at minimum100 foot intervals or as directed by the City Engineer.

B. Grade bottom of trenches to provide uniform bearing surface.

C. If necessary, make bell holes and depressions required to complete joining of pipe or box.

D. In public thoroughfares and regardless of trench depth, safely barricade and limit open trenches to a maximum of 200 lineal feet in the daytime, except in traveled roadways where a maximum of 80 lineal feet of open trench will be allowed.

E. Close trenches during nighttime conditions.

3.07 GRAVEL FOUNDATION FOR PIPE

A. Wherever the subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load; where water must be drained to maintain a dry bottom for pipe installation and at other locations as previously defined, the subgrade shall be excavated to a minimum of 12 inches and replaced with crushed rock or gravel.

B. Gravel for pipe foundations shall conform to the requirements of Drain Rock in Section 02206.

C. Drain Rock material shall be deposited over the entire trench width in 18-inch maximum layers, each layer shall be compacted by tamping, rolling, or vibrating.

D. The material shall be graded to produce a uniform and continuous support for the installed pipe.

3.08 BEDDING & PIPE ZONE

A. Excavate pipe trench in accordance with this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Form and place concrete for pipe thrust restraints at any change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide thrust restraint bearing on native subsoil according to standard drawings.

C. Place bedding material at trench bottom in one continuous layer not exceeding 8 inches compacted depth; compact to 95 percent.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact to 95 percent.

E. Backfill shall be carefully placed around and over pipes and shall not be permitted to fall directly on a pipe from such a height or in such a manner as to cause damage.

F. Maintain optimum moisture content of bedding material to attain required compaction density.

3. 09 BACKFILLING FOR PIPELINES

A. Lift thickness for trench backfill shall not exceed 8 inches compacted depth.

B. Trench backfilling above the level of the pipe bedding shall normally be accomplished with A-1 material. Native excavated materials may be used when approved by Heber City and shall be free from rocks larger than 8-inches in diameter.

C. Compaction Requirements

1. Under pavements, shoulders, or other surface improvements the in-place density shall be a minimum of 95% of laboratory maximum dry density as determined by AASHTO T-180 (ASTM D1557) for A-1 soils and AASHTO T-99 (ASTM D698) for all other soils.

2. In other areas the in-place density shall be a minimum of 92% of the maximum dry density as determined by the same laboratory method.

3. See Section 01450.2.04.C.6.

D. Clay cut off dikes shall be constructed as required by City Engineer.

3.10 STRUCTURAL EXCAVATION

A. Provide all required shoring, cribs, cofferdams, and caissons including all pumping, bailing, draining, sheathing, bracing, and related items.

B. Slope excavation sides as excavation progress to maintain a safe and clean working area as required by OSHA.

C. Support excavation. Do not interfere with the bearing of adjacent foundations, pipelines, etc.

D. All unauthorized excavation below the specified structure subgrade shall be replaced with concrete, monolithic with that of the slab above or with coarse gravel thoroughly compacted into place.

E. Subgrade soil for all concrete structures shall be firm, dense, thoroughly compacted, and consolidated.

F. Subgrade soil shall be free from mud and muck; and shall be sufficiently stable to remain firm and intact under the feet of the workmen engaged in subgrade surfacing, laying reinforcing steel, and depositing concrete.

G. Coarse gravel or crushed stone may be used for subsoil reinforcement if results satisfactory to the City Engineer can be obtained thereby.

1. Material shall be applied in lifts of 6" or less.

2. Each lift shall be embedded in the subsoil by thorough tamping.

3. All excess soil shall be removed to compensate for the displacement of the gravel or crushed stone and the finished elevation of any subsoil reinforced in this manner shall not be above the specified subgrade.

3. 11 BACKFILLING FOR STRUCTURES

A. Do not fill adjacent to structures until approval is obtained from Engineer.

B. All forms shall be removed and the excavation shall be cleaned of all trash and debris.

C. Backfill areas to contours and elevations indicated. Do not use frozen materials.

D. Do not use compaction equipment adjacent to walls or retaining walls that may cause wall to become overstressed or moved from final alignment.

E. Place select fill a minimum of 3 feet around the outside of structures.

F. Place and compact select fill materials in continuous lifts not exceeding 12" loose depth.

G. Place and compact common fill material in continuous lifts not exceeding 8" loose depth.

H. Do not disturb or damage foundation perimeter drainage, foundation, damp proofing, foundation waterproofing and protective cover, or utilities in trenches.

I. Backfill against foundation walls simultaneously on each side. Do not backfill against walls until concrete has obtained required 7 day strength.

J. Make smooth changes in grade. Blend slopes into level areas.

K. Remove surplus backfill materials from site.

L. Leave stockpile areas completely free of excess fill materials.

M. Slope grade away from structure at a minimum of 3" in 10 feet unless otherwise indicated.

N. Compaction: Each layer of material shall be compacted by hand or machines tampers or by other suitable equipment to a density equal to 95% of maximum dry density as measured by AASHTO T-180 (ASTM D1557) for A-1 soils and AASHTO T-99 (ASTM D698) for all other soils.

O. Restore any damaged structure to its original strength and condition and re-backfill to specifications.

3. 12 ROADWAY EXCAVATIONS

A. In advance of setting line and grade stakes, clean subgrade area of brush, weeds, vegetation, grass, and debris. Drain all depressions or ruts which contain water.

B. A soils classification, as determined by AASHTO T-27, shall be made on the proposed subgrade, and the following shall be required based on that classification:

SOIL CLASSIFICATIONS	REQUIREMENT
A-1	The subgrade shall be scarified to a depth of 12" and the loosened material shall be moistened and compacted to the equivalent of 95% of maximum dry density as measured by AASHTO T-180.
A-2, A-3, A-4 or A-5	The subgrade shall be over-excavated a minimum of 12" subgrade scarified and compacted, replaced with A-1 granular material, and be moistened and compacted as above.
A-6 or A-7	The subgrade shall be over-excavated a minimum of 18" subgrade scarified and compacted, replaced with A-1 granular material, and be moistened and compacted as above.

C. No organic material, soft clay, spongy material, or other deleterious material will be permitted in the scarified or imported subgrade layer.

D. Rough sub-grades shall be shaped and graded to within a tolerance of 0.15 feet of design grade and drainage shall be maintained at all times.

E. Moisture content of the subgrade layer shall be maintained at not less than 95% or more than 105% of optimum moisture content, during the compaction process. The entire roadbed, to one foot behind the back of curb, must be compacted to the specified density to a minimum depth of 8 inches.

F. If removal of boulders, rubble, or existing improvements, found within the excavated area results in a lower excavation elevation than indicated, backfill over excavation in a manner approved by Engineer.

G. Remove all deposits susceptible to frost heave.

H. Excavations through or under City streets, sidewalks, street shoulders, driveways, etc. shall comply with the following requirements:

1. Material removed by excavation is not to be used as backfill or placed back into the trench under any paved portion of the street. However, sand may be used for backfill up to one foot above top of pipe.

2. The remaining trench shall be filled with select fill as per section 02206.

3. The trench shall be filled to the existing asphalt level and guarded from traffic until set.

4. Within 10 days of the fill, sufficient fill material shall be removed and replaced with material comparable to the adjacent surface material shall meet the requirements of Section 02504 of these specifications.

5. The City Engineer shall inspect all work.

3. 13 SUBGRADE PREPARATION

A. Compact subgrade surfaces to density specified for overlying backfills. Refer to Section 02250.

B. If areas of subgrade are not readily capable of in-situ compaction, secure City Engineer's authorization for extra excavation and backfill.

C. Maintain minimum overburden cover of 2 feet over pipelines or conduits during subgrade preparation.

3. 14 BACKFILLING FOR PAVEMENT

A. Before beginning backfilling operations obtain Engineer's approval of excavation operation.

B. Do not damage subsurface structures, utility mains, or service lines.

C. Process backfill and avoid segregation. Keep base course free from pockets of coarse or fine material.

D. Deposit base course on the roadbed in a uniform manner which will provide the required compacted thickness. Maintain moisture content.

E. Shoulders are an integral part of the embankment. Do not build shoulders to a grade higher than that of the adjacent granular base course. Maintain efficient surface runoff at all times.

F. Compaction: in accordance with Section 02250.

G. Prior to placing pavements, proof roll in accordance with Section 01450.

3. 15 BLASTING

A. Blasting will not be allowed except by permission from the City Engineer.

B. The Contractor shall comply with all laws, ordinances, and applicable safety code requirements and regulations relative to the handling, storage, and use of explosives and protection of life and property.

C. If allowed, Contractor shall be fully responsible for all damage attributable to his blasting operations.

D. Excessive blasting or overshooting will not be permitted and any material outside the authorized cross-section which may be shattered or loosened by blasting shall be removed by the Contractor.

3. 16 COMPACTION OF BACKFILL

A. In accordance with Section 02250.

3. 17 IMPORTED BACKFILL MATERIAL

A. In the event the native excavated material is not satisfactory for backfilling as determined by the City Engineer, the Contractor shall provide imported granular fill in accordance with Section 02205.

3. 18 DISPOSAL OF EXCESS MATERIALS

A. All excess material shall be hauled away from the construction site and disposed of by the Contractor.

END OF SECTION

SECTION 02245

LOW DENSITY CONCRETE BACKFILL (FLOWABLE FILL)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Low density concrete backfill.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 150 - Specification for Portland Cement.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements

1. Low Density Concrete Backfill:
   a. 28 day compressive strength shall be between 100 psi and 150 psi. (1 bag mix)

1.04 SUBMITTALS

A. Proposed mix design.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Pregenerated foam: One of the following or equal:

1. Mearl Corporation, Roselle Park, N.J., Mearl Geofoam Liquid.

2.02 MATERIALS

A. Low Density Concrete Backfill Components:

1. Type II low alkali Portland cement.

2. Water.

3. Aggregate: Pregenerated foam, vermiculite, or other low weight aggregate material which will conform to the strength and density requirements specified herein.

PART 3 EXECUTION

3.01 INSTALLATION

A. General

1. Low density concrete (flowable fill) may only be used for backfill when approved by the City Engineer.

2. Install low density concrete backfill as a nonstructural backfill material as indicated on the submitted Drawings.

3. Place low density concrete backfill in a manner so that minimal consolidation of the material occurs during and after placement.

B. Metal plates shall be placed over trench for 48 hours to protect concrete.

END OF SECTION

SECTION 02250

SOIL COMPACTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Compaction control of native and imported backfill material.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

B. AASHTO T-99: Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Hammer and 12-In. (305-mm) Drop.

C. AASHTO T-180: Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using a 10-lb (4.54-kg) Hammer and an 18-In. (457-mm) Drop.

D. AASHTO T-238: Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.03 DEFINITIONS

A. A-1 Soils: AASHTO M 145 describes the nature of these soils.

B. Modified Proctor: The test method used for moisture-density relationship of soils as determined by the ASTM D 1557 test method.

C. Percent Compaction or Percent Density: The ratio of the field dry density to the laboratory maximum dry density expressed as a percentage.

D. Standard Proctor: The test method used for moisture-density relationship of soils as determined by the ASTM D 698 test method.

1.04 WARRANTY

A. Correct deficient conditions. Replace or repair surfacing materials and damaged facilities.

B. The method of construction repair shall be proposed in writing by Contractor for approval by Engineer prior to correcting the failed condition.

C. Failure to detect any defective work or material does not prevent later rejection of the work nor obligate Engineer for final acceptance when such defective work or material is discovered.

PART 2 EXECUTION

2.01 COMPACTION REQUIREMENTS

A. The Developer\Contractor shall be responsible to perform and pay for all testing of earth materials.

B. Moisten or de-water backfill material to obtain optimum moisture for compaction compliance.

C. The material shall be deposited in horizontal layers having a compacted thickness of no more than 12 inches for roadway and 6 inches for trenches.

D. The distribution of materials shall be such that the compacted material will be homogeneous and free from lenses, pockets, or other imperfections.

E. The material shall have the optimum moisture content required for the purpose of compaction and the moisture content shall be uniform throughout the layer, insofar as practicable.

F. Backfill shall be compacted by means of sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers of a size and type approved by the City Engineer.

G. If the required relative density is not attained, test sections will be required to determine any adjustments in compacting equipment, thickness of layers, moisture content and compactive effort necessary to attain the specified minimum relative density.

H. Approval of equipment, thickness of layers, moisture content and compactive effort shall not be deemed to relieve the Contractor of the responsibility for attaining the specified minimum relative densities.

I. The Contractor in planning his work shall allow sufficient time to perform the work connected with test sections and to permit the City Engineer to make tests for relative densities.

J. The Contractor shall take care not to overwork soils and exceed maximum compaction percentages when such percentages are defined. Contractor shall be responsible to adjust work methods and equipment necessary to meet compaction requirements without additional costs to the City.

2.02 FIELD QUALITY CONTROL

A. Optimum Soil Density: Unless indicated otherwise.

1. In accordance with AASHTO T-180 Method D test (Modified Proctor).

2.03 COMPACTION UNDER ROADWAYS

A. Fill or embankment material shall normally consist of A-1 materials and be compacted to not less than 95% of maximum dry density as measured by AASHTO T-180 (ASTM D1557).

B. Compaction shall extend one foot beyond proposed back of curb line.

2.04 COMPACTION UNDER SIDEWALKS, CURB AND GUTTER, AND DRIVEWAYS

A. Fill or embankment material shall normally consist of A-1 materials and be compacted to not less than 95% of maximum dry density as measured by AASHTO T-180 (ASTM D1557).

B. Compaction of material shall extend to at least one foot each side of the edge of the slab.

2.05 COMPACTION OF OTHER FILLS AND EMBANKMENTS

A. Fill or embankment materials other than those mentioned above shall be compacted to not less than 92% of maximum dry density as measured by AASHTO T-180 (ASTM D1557) for A-1 soils and by AASHTO T-99 (ASTM D698) for all other soils.

END OF SECTION

SECTION 02504

ASPHALT CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This is a material specification for hot mix and cold mix bituminous paving mixtures.

1.02 REFERENCES

A. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregate.

B. AASHTO M-17: Standard Specification for Mineral Filler for Bituminous Paving Mixtures.

C. AASHTO T-165: Standard Test Method for Effect of Water on Cohesion of Compacted Bituminous Mixtures.

D. AASHTO T-245: Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

E. AASHTO T-246: Standard Test Methods for Resistance to Deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus.

F. AASHTO T-182: Standard Test Method for Coating and Stripping of Bitumen-Aggregate Mixtures.

G. AASHTO M-156: Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.

H. ASTM D 4215: Standard Specification for Cold-Mixed, Cold-Laid Bituminous Paving Mixture.

1.03 DEFINITIONS

A. Traffic Classifications:

1. Class I: Parking lots, driveways, light traffic residential streets, light traffic farm roads.

2. Class II: Residential streets, rural farm and residential roads.

3. Class III: Urban minor collector streets, rural minor collector roads.

4. Class IV: Urban minor arterial and light industrial and light industrial streets, rural major collector and minor arterial highways.

5. Class V: Urban freeways, expressways and principal arterial highways, rural interstate and other principal arterial highways.

1.04 SUBMITTALS

A. Mix Design: Submit each proposed mix design 14 days prior to use in the Work. Include in the report the following information.

1. Mix design method: A Marshal Mix Design or Superpave Mix Design shall be used for Class I and Class II roads. Superpave Mix Design shall be used for Class III, Class IV, and Class V roads.
   a. For Marshall: use a five (5) point design using a four (4) point binder series with a one (1) point verification at the optimum binder content.
   b. For Superpave Mix Design: follow the 2017 Utah Department of Transportation (UDOT) Standard Specification section 02741 Hot Mix Asphalt (HMA) requirements for aggregates and volumetric mix design. All designs gyrations and compaction parameters shall meet the 20 year design ESALS 0.3 to < 3 Million. (N_{design}/% of G_{mm} = 75/97), 3% Air Voids. Super Pave Mix shall be ½" Fine Mix with 15% maximum Reclaimed Asphalt Pavement (RAP) content.
2. Job control target data for aggregate ideal grading.
3. Permissible range limits of bitumen content in mixture.
4. Mixture's index of retained strength, AASHTO T-165
5. Additives. If none, state none are required.
6. Percent voids.

B. Source Aggregate Sample Report. Indicate rodded weight of aggregate, percentage of wear, weight loss, sand equivalent value, percent of fractured faces, amount of organic matter, plasticity of fines, and percentage of fines retained on the aggregate.

C. Pre-Approved Mix Design Data: If supplier has on record, a City approved mix design, submit name and address of supplier for each mix design 3 days prior to using asphalt concrete mix.

1.05 QUALITY ASSURANCE

A. Bitumen weights shall be determined by the mix design.

B. Use asphalt cement when recycled asphalt mixtures are indicated.

C. Do not change source of supply of paving asphalt or aggregate without Engineer's written approval.

D. Each shipment of bituminous material shall be uniform in appearance and consistency with no foaming when heated to the specified mixing temperature.

E. Do not use storage containers contaminated with other asphalt types or grades.

F. Gradation, density, and maximum density shall be determined by extraction tests, ASTM D 5444. Asphalt binder content shall be determined by using a burn-off oven, ASTM D 6307.

G. Validate binder grade received from the supplier.

PART 2 PRODUCTS

2.01 ASPHALT BINDER

A. Class I and II Streets, Trails and patches: Performance Grade (PG) of virgin asphalt binder shall be PG 58-28.

B. Class III, IV, & V Streets: Performance Grade (PG) of virgin asphalt binder shall be PG 64-34.

2.02 AGGREGATES - MATERIALS

A. Clean, hard, tough, durable and sound mineral aggregates that consist of crushed stone, crushed gravel, crushed RAP or RAP blend, or crushed slag conforming to the following requirements:

1. Rodded Weight density; not less than 75 pounds per cubic foot.

2. Percentage of wear of coarse aggregate retained on the No. 8 sieve; not exceeding 40 unless specific aggregates having higher values are known to be satisfactory.

3. Weight loss; not exceeding 16 percent by weight when subject to 5 cycles of sodium sulfate.

4. The combined aggregate after going through the dryer shall have a sand equivalent value of not less than 60 percent.

B. Coarse Aggregate: Use an aggregate that the portion retained on the No. 4 sieve has not less than 50 percent of particles by weight with at least two mechanically fractured faces or clean angular faces.

C. Fine Aggregate: Fine Aggregate Angularity per AASHTO T304 shall be 40% minimum.

D. Fine aggregate passing the No. 4 sieve may be either a natural or manufactured product containing not more than 2 percent by weight of organic matter or other deleterious substances.

1. Aggregate passing the No. 40 sieve is nonplastic.

2. Natural sand shall be a maximum of 15%.

3. Mineral Filler: When mix design indicates need, add as separate ingredient; AASHTO M-17.

2.03 AGGREGATES - MASTER GRADING BAND LIMITS FOR MARSHAL MIX DESIGN

A. Maximum particle size of ½ compacted lift thickness. DM-1/2" mix shall be used unless otherwise specified on the plans and/or standard drawings.

B. The following gradations describe the total percent passing by weight, AASHTO T-27, and is based on fine and coarse aggregate having approximately the same bulk specific gravities.

C. Target Grading Curve must lie within one of the Master Grading Bands in the following table.

MASTER GRADING BAND LIMITS FOR MARSHALL MIX DESIGN				
Sieve Size	DENSE MIXTURES			
	Type DM-3/4		Type DM-1/2	
	Min	Max	Min	Max
1"				
3/4"	100	-----		
½"	-----	-----	100	-----
3/8"	75	91	-----	-----
# 4	46	62	60	80
# 8	-----	-----	-----	-----
# 16	22	34	28	42
# 50	11	23	11	23
# 200	5	7	5	7

2.04 AGGREGATES - JOB-CONTROL GRADING BAND LIMITS

A. The job control formula shall produce a smooth curve approximately paralleling the master grading band limits for the designated mix. If application of the tolerances results in a job control grading band outside the master grading band, the full job control tolerances shall apply. The following describes the job control grading bands.

JOB-CONTROL GRADING BAND LIMITS					
Sieve Size	Amount Passing Sieve, weight %				
	1 Test	2 Tests	3 Tests	4 Tests	5 Tests
≥ ½	± 10	± 7.3	± 6.3	± 5.6	± 5.2
3/8	± 9	± 6.9	± 5.9	± 5.3	± 4.9
No. 4	± 9	± 6.7	± 5.7	± 5.2	± 4.8
No. 8	± 7	± 5.6	± 4.8	± 4.3	± 4.0
No. 16	± 7	± 5.2	± 4.6	± 4.2	± 3.9
No. 50	± 6	± 4.3	± 3.8	± 3.4	± 3.2
No. 200	± 3	± 2.4	± 2.0	± 1.8	± 1.7

2.05 MARSHALL MIX DESIGN

A. The Marshall mix design shall be based upon AASHTO T-245, traffic classifications, and the following:

MARSHALL MIX DESIGN REQUIREMENTS						
	CLASS I		CLASS II		CLASS III to V	
	Min	Max	Min	Max	Min	Max
Number of Compaction Blows (each end of specimen)	35	34	50	50	NA	NA
Stability, lb (ASTM D 6927)	1500	-----	1500	-----	NA	-----
Flow, in 0.01 in. units	8	20	8	18	NA	NA
% Voids in Mineral Aggregate (VMA), (ASTM D 3203)						
½" nominal maximum particle size	15		15		NA	
¾" nominal maximum particle size	14		14		NA	
% Air Voids,	3	3.5	3	3.5	NA	NA
Unconfined Compression Strength Retention, % (AASHTO T-165)	80	-----	80	-----	NA	-----

B. Compensate for specific gravity and absorption of aggregate to determine bitumen content by laboratory testing.

C. Recycled Asphalt Pavement (RAP) for Marshall Mix and Superpave Mixes: A maximum 15% Reclaimed Asphalt Pavement (RAP) by total weight of the mix is allowed in asphalt concrete mix, and a maximum 15% of the total binder content of the mix may be RAP asphalt binder.

D. Dust to Binder ratio should not be more than 1.4.

E. The mix design air voids shall be between 3% and 3.5%, where mix shall not exceed 3.5% air voids per ASTM D 3203. However, the percent asphalt or fines may need to be adjusted to achieve optimal strength.

F. If mix design is older than 365 days from date of submission, mix shall be recertified.

G. Voids in the Mineral Aggregate (VMA) shall be calculated using Gsb dry for both virgin and rap aggregates.

2.06 MIXING PLANT

A. Hot-mixed, hot-laid paving mixtures; AASHTO M-156.

2.07 SOURCE QUALITY CONTROL

A. Unconfined Compression Strength Retention: When crushed mineral aggregate which is thoroughly coated with bitumen has an index of retained strength less than 80 percent bring the strength into compliance by adding any of the following additives to the mix.

1. Anti-stripping agent.

2. Hydrated lime.

3. Portland cement.

B. Coating and Stripping of Bitumen-Aggregate Mixture: Immediately after mixing, the mixing shall meet the requirements of AASHTO T-182, whereby not more than 5 percent of the aggregate particles shall remain uncoated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Plant Mix Bituminous Paving: In accordance with Section 02510.

END OF SECTION

SECTION 02505

EMULSIFIED ASPHALT SLURRY SEAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This is a material specification and application specification for emulsified asphalt slurry seal.

1.02 REFERENCES

A.	ASHTO T-27:	Standard Method for Sieve Analysis of Fine and Coarse Aggregate.
B.	AASHTO T-2:	Sampling Mineral Aggregates.
C.	AASHTO T-11:	Materials Finer than No. 200 in Mineral Aggregate.
D.	AASHTO 176:	Sand Equivalent Value of Soils and Fine Aggregate.
E.	AASHTO T-84:	Specific Gravity and Absorption of Fine.
F.	AASHTO T-19:	Unit Weight Aggregate.
G.	AASHTO T-96:	Resistance to Abrasion of Small Size Coarse Aggregate by use of the Los Angeles Machine.
H.	AASHTO T-37:	Sieve Analysis of Mineral Filler.
I.	AASHTO T-40:	Sampling Bituminous Materials.
J.	AASHTO T-59:	Testing Emulsified Asphalt.
K.	AASHTO M-140:	Specification for Emulsified Asphalt.
L.	AASHTO T-49:	Penetration 100 gm at 5 sec. 77°F(25°C).
M.	ASTM D242:	Mineral Filler for Bituminous Paving Mixtures.

1.03 DEFINITIONS

A. The slurry seal shall consist of a mixture of an approved emulsified asphalt, mineral aggregate, water and specified additives, proportioned, mixed and uniformly spread over a properly prepared surface. The completed slurry seal shall leave a homogeneous mat, adhere firmly to the prepared surface, and have a friction resistant surface texture throughout its service life.

1.04 SUBMITTALS

A. Mix Design: Submit each proposed mix design 14 days prior to use in the Work.

PART 2 PRODUCTS

2.01 EMULSIFIED ASPHALT

A. POLYMER MODIFIED EMULSION The emulsified asphalt shall be CQS-1HL, CQS-1HP, QS-1HL, or QS-1HP as specified in AASHTO M-140. The polymer modifier shall be either a solid synthetic rubber or latex material. The polymer modifier shall be combined with the base asphalt or asphalt emulsion at a minimum rate of 3% solids by weight of asphalt prior to loading at the manufacturing plant. The polymer modified emulsion shall be compatible with the mix design developed for the conventional slurry seal. Each shipment of emulsified asphalt shall be accompanied by a certificate of analysis / compliance from the manufacturer.

2.02 AGGREGATES - MATERIALS

A. The mineral aggregate shall be manufactured (100% crushed) stone such as granite, slag, limestone, chat, or other high quality aggregate that is free from dirt, organic matter, clay balls, adherent films of clay, dust, or other objectionable matter.

B. The Contractor shall insure that all oversize aggregate and other objectionable matter are removed from the mineral aggregate utilized in the slurry seal mixture. Screening shall be required at the stockpile if there are problems created by oversize materials in the mixture.

2.03 AGGREGATES - GRADING BAND LIMITS

A. Gradation Type II will be used unless otherwise specified.

B. The following gradations describe the total percent passing by weight, AASHTO T-27, and is based on fine and coarse aggregate having approximately the same bulk specific gravities.

GRADING BAND LIMITS						
Sieve Size	DENSE MIXTURES					Stockpile Tolerance
	Type I Min Max		Type II Min Max		Type III Min Max	
3/8"	100	-----	100	-----	100	-----	
# 4	100	-----	90	100	70	90	+ or - 5%
# 8	90	100	65	90	45	70	+ or - 5%
# 16	65	90	45	70	28	50	+ or - 5%
# 30	40	65	30	50	19	34	+ or - 5%
# 50	25	42	18	30	12	28	+ or - 4%
# 100	15	30	10	21	7	18	+ or - 3%
# 200	10	20	6	15	5	15	+ or - 2%

2.04 AGGREGATES - JOB-CONTROL GRADING BAND LIMITS

A. The job mix gradation shall be within the gradation band for the desired type. After the target gradation has been submitted, then the percent passing each sieve shall not vary by more than the stockpile tolerance and still remain within the gradation band.

2.05 MINERAL FILLER

A. Portland Cement, hydrated lime, limestone dust, flyash, Aluminum sulfate, or other approved filler meeting the requirements of ASTM D242 shall be used if required by the mix design. They shall be considered as part of the dry aggregate. The quantity and type of filler, if required, shall be determined by the job mix design. It shall be used for one or more of the following reasons only: to improve the gradation of the aggregate to provide improved stability and workability of the slurry, or the increase the durability of the cured slurry.

2.06 WATER

A. Water for the slurry mixture shall be clear, potable, free from harmful soluble salts, and compatible with the slurry mixture. If the water is obtained from a source other than sanitary systems, such as a river, stream, or pond, a sample of the water must be tested and approved by the laboratory performing the mix design.

2.07 MIX DESIGN

A. The mix design shall be made with the same aggregate gradation that the Contractor will provide on the project. Sources of all materials shall be selected prior to the time when the mix design is prepared and the materials are required to be used in the work. Slurry seal mixture shall not be placed until a mix design, submitted by the Contractor, has been approved by the Project Manager. The exact proportions of asphalt emulsion, aggregate, mineral filler, additives, and water to be used in the preparation of the slurry seal shall be determined by an approved testing laboratory experienced in slurry seal mix design procedures.

The approved slurry mix shall be a homogeneous mixture, sufficiently stable during the entire mixing/spreading period so that the emulsion does not break, there are no segregation of the fines from the coarse aggregate, and the liquid portion of the mix does not float to the surface. The amount and type of asphalt emulsion to be blended with aggregate shall be determined by the laboratory mix design. The set control additive shall be introduced into the slurry seal mixture by an approved method that will assure uniform distribution and proper control. The exact amount shall be determined by conditions in the field and indicated in the mix design. A minimum amount of water shall be used as necessary to obtain a workable and homogeneous mixture. The slurry seal mixture shall show no signs of uncoated aggregate or premature breaking of emulsion when applied to the pavement surface.

B. The mix design and all slurry seal materials shall be approved by the City Engineer prior to use. The component materials shall be within the following limits:

1.	Residual Asphalt	Type I: 10% - 16% Type II: 7.5% - 13.5% Type III: 6.5% - 12% Based on dry weight of aggregate
2.	Mineral Filler	0.5% - 2.0% Based on dry weight of aggregate
3.	Additives	As needed
4.	Water	As needed to achieve proper mix consistency

2.06 ADDITIVES

A. Additives may be used to accelerate or retard the break-set of the slurry seal, or improve the resulting finished surface. The quantity and type of set control additive, if required, shall be determined by the job mix design and conform to the applicable sections of ASTM D3910 and ISSA T102. The use of additives in the slurry mix shall be made initially in quantities predetermined by the mix design with field adjustments if required, after approval by the City Engineer.

PART 3 EXECUTION

3.01 EQUIPMENT - GENERAL

A. All equipment, tools, and machines used in performance of this work shall be maintained in satisfactory working condition.

3.02 MIXING EQUIPMENT

A. Mixing Unit. The slurry seal shall be mixed and applied with a machine designed and manufactured to lay slurry seal with a minimum aggregate capacity of eight (8) cubic yards to reduce the number of transverse joints. The slurry seal mixing machine shall be a continuous flow mixing unit, capable of delivering accurately predetermined proportions of aggregate, asphalt emulsion, and mineral filler (if required) to a revolving spiraled multi-blade mixer and of discharging the thoroughly mixed product on a continuous basis. The mixing unit shall be capable of thoroughly blending all ingredients together without violent action. The mixing machine shall be equipped with an approved fines feeder that provides an accurate metering device or method of introducing a predetermined proportion of mineral filler to the aggregate. The fines feeder shall be used only when mineral filler is part of the mix design. The mixing machine shall be equipped with a water pressure system and fog type spray bar. The machine shall be capable of mixing materials at preset proportions regardless of the speed of the machine and without changing machine settings.

Each mixing unit to be used in performance of the work shall be calibrated prior to construction. Previous calibration documentation covering the exact materials to be used may be accepted, provided it was made during the current calendar year. The documentation shall include an individual calibration of each material at various settings which can be related to the machine metering device(s).

Attached to the mixing machine shall be a mechanical squeegee distributor (spreader box) having a rubber-like material in contact with the surface to prevent unwanted egress of slurry. It shall prevent loss of slurry on varying grades and crown by adjustments to assure uniform spread. An appropriate mechanical device for lateral distribution of the slurry shall be operated within the spreader box. There shall be a steering device, a flexible strike-off, and a burlap or other approved drag. The spreader box shall be adjustable to widths from eight (8) to fifteen (15) feet to minimize the number of longitudinal joints. Broken slurry seal mixture shall not be allowed to collect in the spreader box or on the flexible strike-off.

3.03 SPREADING EQUIPMENT

A. The mixture shall be spread uniformly by means of a conventional surfacing spreader box attached to the mixer and equipped to agitate and spread the material evenly throughout the box. A front seal shall be provided to insure no loss of the mixture at the road contact point.

3.04 WEATHER LIMITATIONS

A. The slurry seal shall not be applied if either the pavement or air temperature is below 50°F(10°C) and falling, but may be applied when both pavement and air temperature are above 45°F(7°C) and rising. No slurry seal shall be applied when there is danger that the finished product will freeze before 24 hours. The mixture shall not be applied when weather conditions prolong opening to traffic beyond a reasonable time.

3.05 NOTIFICATION AND TRAFFIC CONTROL

A. All homeowners and business affected by the paving shall be notified one day in advance of the surfacing. Should work not occur on the specified day, a new notification will be distributed.

B. Suitable methods shall be used by the contractor to protect the slurry seal from all types of

vehicular traffic without damage. Opening to traffic does not constitute acceptance of the work. Traffic control shall in accordance with the MUTCD manual.

3.06 SURFACE PREPARATION

A. Immediately prior to applying the slurry seal the surface shall be cleared of all loose material, oil spots, vegetation, and other objectionable material. Any standard cleaning method will be acceptable. If water is used, cracks shall be allowed to dry thoroughly before slurry surfacing. Manholes, valve boxes, drop inlets and other service entrances shall be protected from the slurry seal by a suitable method. The City Engineer shall approve the surface preparation prior to surfacing.

B. It is advisable to pre-treat cracks in the pavement surface with an acceptable crack sealer prior to application of the slurry seal. Crack sealing shall be completed a minimum of 3 months prior to slurry seal.

3.07 APPLICATION

A. When required by local conditions, the surface shall be pre-wetted by fogging ahead of the spreader box.

B. The slurry seal shall be of the desired consistency upon leaving the mixer. A sufficient amount of material shall be carried in all parts of the spreader at all times so that a complete coverage is obtained.

C. No streaks, such as those caused by oversized aggregate shall be left in the finished surface.

D. No excess buildup, uncovered areas, or unsightly appearance shall be permitted on longitudinal or transverse joints. The Contractor shall provide suitable width spreading equipment to produce a minimum number of longitudinal joints throughout the project. When possible, longitudinal joints shall be placed on lane lines. Half passes and odd width passes will be used only in minimum amounts. If half passes are used, they shall not be the last pass of any paved area. A maximum of six inches (6") shall be allowed for overlap of longitudinal lane line joints.

E. Areas which cannot be reached with slurry seal machines shall be surfaced using hand squeegees to provide complete and uniform coverage. The area to be handworked shall be lightly dampened prior to mix placement and the slurry worked immediately. Care shall be exercised to leave no unsightly appearance from handwork. The same type finish as applied by the spreader box shall be required. Handwork shall be completed during machine applying process.

F. Care shall be taken to insure straight lines along curbs and shoulders. No runoff on these areas will be permitted. Lines at intersections will be kept straight to provide good appearance.

G. All areas, such as manways, gutters and intersections, shall have the slurry seal removed as specified by the City Engineer. The Contractor shall remove any debris associated with the performance of the work on a daily basis.

H. Rate of Application measured in pounds of dry aggregate per square yard:

APPLICATION RATE

Type I	8-12#/SY
Type II	12-20#/SY
Type III	18-30#/SY

I. The longitudinal joint between adjacent lanes shall have no visible lap, pinholes, or uncovered areas. Thick application caused by overlapping shall be smoothed immediately with hand squeegees before the slurry seal mixture breaks. When possible, longitudinal joints shall be placed on lane lines. The Contractor shall provide suitable spreading equipment to minimize the number of longitudinal joints. Overlays that occur at transverse joints shall be smoothed before the slurry seal mixture breaks, so that a uniform surface is obtained.

J. Care shall be taken to insure straight lines along curbs and shoulders. No runoff on these areas will be permitted. Lines at intersections shall be kept straight to provide a good appearance.

3.08 SAMPLING AND TESTING

A. Suitable sized samples of aggregate, asphalt emulsion, and mineral filler (if required) shall be submitted, when requested by the Project Manager, for approval not less than ten (10) days before the work starts. All samples of materials shall be supplied by the Contractor at his expense, and all tests necessary to determine conformance with requirements specified shall be performed without cost to the Contractor. Additional samples of materials shall be furnished as directed by the Project Manager during progress of the work. The owner will notify the Contractor immediately if any test fails to meet the specifications.

If it is established that a satisfactory slurry seal mixture meeting the requirements specified herein cannot be produced from the materials furnished, the materials shall be rejected and the Contractor shall submit new samples.

END OF SECTION

SECTION 02510

ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section covers the requirements for bituminous surface paving on roads and trails.

PART 2 SUBMITTALS

A. Contractor shall establish a mix gradation and the amount of bituminous material shall be submitted fourteen (14) working days prior to surfacing for the approval by the City Engineer and shall meet the requirements of the gradation selected.

B. Test Reports: Submit test reports as requested by City Engineer verifying compliance with specified standards.

PART 3 EXECUTION

3.01 ALL STREETS AND TRAILS SHALL BE SURFACED IN ACCORDANCE WITH THE FOLLOWING:

A. Streets:
1. 8-inch minimum untreated base course over prepared and approved subgrade.
2. 3-inch minimum compacted thickness plant mix asphalt surfacing on all local streets.
3. 4-inch minimum compacted thickness plant mix asphalt surfacing on all collector and arterial streets.
4. 2-lift minimum for plant mix asphalt surfacing when final compacted pavement thickness is greater than 3 inches unless otherwise approved by the City Engineer.

B. Trails:
1. 6-inch minimum untreated base course over prepared and approved subgrade and weed barrier geotextile.
2. 3-inch minimum compacted thickness plant mix asphalt surfacing on all trails.
3. Weed barrier geotextile according to the following:

Table 7 – Weed Barrier Geotextile

Property	ASTM	MARV Standard
Grab tensile strength, lbs.	D 4632	315
Grab elongation, percent, minimum	D 4632	50
Puncture strength, lbs.	D 4833	900
Trapezoid tear, lbs.	D 4533	100
Apparent opening size (AOS), US sieve, minimum	D 4751	40
Ultraviolet degradation, percent	D 4355	70
NOTES (a) Percent of grab elongation retained determined after ultraviolet weathering, ASTM D 4355 for 500 hours.		

3.02 BASE COURSE

A. Base for all streets shall consist of select material, as specified in Section 02206.

B. Base shall be laid in accordance with Section 02225.

C. Surfaces shall be true to the established grade with thickness being not less than 1/4 inch from the required layer thickness and with the surface elevation varying not more than 3/8 inch in ten feet from the true profile and cross section.

3.03 BITUMINOUS SURFACE COURSE

A. Base course shall be free of any contamination prior to laying surface course.

B. The surface course shall consist of a mixture of mineral aggregate and binder conforming to Section 02504.

C. Gradation of aggregate shall conform to Section 02504.

D. The Contractor shall apply a tack coat to all new or existing asphalt or concrete edges and surfaces that will be in contact with the new bituminous surface course. This includes all longitudinal and transverse joints regardless of the joint temperature.

1. Tack coat shall be SS-1 or 1-H.

E. The bituminous surface course shall be mixed at a mixing plant and spread and compacted on the prepared base in conformance with the lines and dimensions shown on the plans and in accordance with these Specifications.

F. All existing asphalt shall be saw cut to remove fractures, cracked or damaged asphalt.

1. Asphalt shall be saw cut in straight lines.

3.04 CONSTRUCTION METHODS AND EQUIPMENT

A. All asphalt will be laid using a lay down machine unless written approval is granted by City Engineer.

B. The methods employed in performing the work, all equipment, tools and machinery and other appliances used in handling the materials and executing the work shall be the responsibility of the Contractor.

C. At no cost to the City, the Contractor shall make such changes in the methods employed and in the equipment used as are necessary whenever the bituminous being produced does not meet the specification herein established.

D. Provide necessary survey stakes for horizontal control and vertical control on roads and trails. Furnish, place, and maintain supports, wire devices, and materials as required to provide continuous line and grade reference control for placing pavement and matching existing pavement surfaces on roads and trails.

3.05 SPREADING

A. The bituminous mixtures shall be spread with self-propelled mechanical spreading and conditioning equipment capable of distributing at least a 12-foot width.

B. The City Engineer shall determine whether or not the bituminous surface course shall be spread in one or more courses.

C. No surface course shall be placed less than 1 inch in thickness.

D. The mixture shall be spread and struck off in such a manner that the finished surface shall result in a uniform smooth surface.

E. The longitudinal joints in any succeeding courses shall be offset at least 6 inches transversely to avoid a vertical joint through more than one course.

F. The temperature of the bituminous mix shall be between 250° F and 325° F when placing.

G. Asphalt joints and seams shall be placed at lane lines when possible, and shall not be placed in wheel lines without written approval from the City Engineer.

3.06 COMPACTION

A. After the mixture has been spread, the surface shall be rolled in longitudinal direction commencing at the outside edge or lower side and preceding to the higher side.

B. Each pass of the roller shall overlap the preceding pass at least one-half the width of the roller.

C. The average in place density shall be in the range of 94% to 96% of the Theoretical Maximum Specific Gravity determined by the testing methods outlined in Section 01450 with no individual areas falling below 92% or above 97.5% of the Theoretical Specific Gravity.

D. Rolling operations shall be conducted in such a manner that shoving or distortion will not develop beneath the roller.

E. Do not over compact the asphalt pavement nor under compact. Complete compaction before the following temperatures are reached: 180 degrees F for hot mixes, and 140 degrees F for warm mixes.

F. Quality Control

1. The surface of the pavement, after compaction, shall be uniform and true to the established crown and grade.

2. The Developer/Contractor shall be responsible to test bituminous mixtures for compaction in accordance with Section 01450, TESTING AND PROCESS CONTROL.

3. Traffic shall not be allowed to travel on new asphalt surface until pavement temperature has reached 120° F or lower.

3.07 WEATHER LIMITATIONS

A. No bituminous surface shall be placed when the temperature of the air or road bed is 50° F or below, during rainy weather, when the base is wet or during other unfavorable weather conditions as determined by the City Engineer.

B. The air temperature shall be measured in the shade.

3.08 FLAGGING

A. Flaggers shall be required as directed to facilitate the safe control of traffic over highways and streets under construction at such locations as required and directed by the City Engineer.

B. Flagging shall be performed by certified, trained, and properly equipped flaggers.

C. All flagging shall be done as described in the Safety Orders covering flaggers of the Industrial Commission of Utah and in accordance with the MUTCD manual.

3.09 ROUGHNESS TOLERANCE

A. When tested with a ten (10) foot straight edge placed parallel to the center line of the pavement, the surface of the pavement at any point shall not deviate from the lower edge of the straight edge by more than one-quarter of an inch. If any part of the pavement fails the 10 foot straight edge test, roughness shall be determined using a certified profilograph or profiler.

B. The following table shall be used to verify roughness tolerances.

ROUGHNESS TOLERANCE						
Speed MPH	Traffic Class	Profile Roughness Index (PRI), Inches / Mile				Profile Deviation Inches/25 feet Maximum
		IRI		PI		
		Min	Max	Min	Max	
25 to 30	II	--	--	--	110	0.4
	III or IV	129	177	46	66	0.4
31 to 45	I or II	90	155	35	50	0.4
	III or IV	70	90	21	35	0.4
45 +	All Classes	--	70	--	21	0.4

Notes:
a) IRI (International Roughness Index), ASTM E 950. Use a ¼ car.
b) PI (Profile Index), ASTM E 1274. Use a zero blanking band.
c) Profile deviation applies to bump and depression measurements.
d) As a minimum, trace right wheel path in direction of travel.

C. Profile Roughness Index (PRI): Verify bumps and depressions are removed so profile index in each lot meets tolerance: Lot is 0.1 lane mile (528 feet long one lane wide). Add segments shorter than 250 feet to preceding lot. Treat partial segments longer than 250 feet as a lot. Excluded from the lot are turn lanes, parking lanes, medians, street fixtures, crowns of intersecting streets, bridge decks, grades greater than eight (8) percent, and vertical curves less than 1,000 feet radius.

D. Profile Deviation: Verify "must grind" bumps and depressions are removed from the lot surface where lot is the total pavement area placed, no area excluded. Begin traces 50 feet before edge of new pavement and end traces 50 feet after edge of new pavement. Areas (including the 50 feet end of traces) exceeding the profile deviation tolerance are "must grind" areas.

E. Mark all "must grind" areas on pavement to identify locations to be corrected.

F. Repair: Grinding is an acceptable method for correcting "must grind" areas. Skin patching with feather edge for depressions is NOT acceptable. Raise depressions by milling and inlay or remove and replace repair. Re-profile corrected segments to verify index meets tolerance. Apply GSB-88 orother approved emulsion to grind areas at a rate of 0.11± 0.01 gal/yd^2, using approximately 40% residual asphalt.

G. Notify the Engineer in writing when corrective work will be performed and at least two working days before re-profile will be completed.

H. When thickness is deficient, place additional material over deficient areas. Do not skin patch. Mill for inlay as necessary.

END OF SECTION

SECTION 02512

RESTORATION OF SURFACE IMPROVEMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Restoration of surface improvement requirements.

1.02 GENERAL IMPROVEMENT REQUIREMENTS

A. The Contractor shall be responsible for the protection and the restoration or replacement of any improvements existing on public or private property at the start of work or placed there during the progress of work.

B. Existing improvements shall include but are not limited to landscaping, permanent surfacing, curbs, ditches, driveways, culverts, fences and walls. All improvements shall be reconstructed to equal or better, in all respects, to the existing improvements removed.

PART 2 PRODUCTS

A. Select Fill: In accordance with Section 02206.

B. Asphalt Concrete: In accordance with Section 02510.

C. Concrete: In accordance with Section 03304.

PART 3 EXECUTION

3.01 ROAD BASE REPAIR

A. Where trenches are excavated through gravel surfaced areas such as roads and driveways, etc., the gravel surface shall be restored and maintained as follows:

1. The gravel shall be placed deep enough to provide a minimum of 6-inches of material.

2. The gravel shall be placed in the trench at the time it is backfilled. The surface shall be maintained by blading, sprinkling, rolling, adding gravel, etc., to maintain a safe uniform surface satisfactory to the Engineer. Excess material shall be removed from the premises immediately.

3. Material for use on gravel surfaces shall be obtained from sound tough durable gravel or rock meeting the requirements of Section 02206.

3.02 BITUMINOUS SURFACE REPAIR

A. Where trenches are excavated through bituminous surfaced roads, driveways or parking areas, the surface shall be restored and maintained as follows:

1. Trenches shall be backfilled with untreated base course from the pipe bedding to 3 inches from the top of existing asphalt.

2. Asphalt shall be saw cut back 12 inches from existing trench wall's and the exposed road base surface shall be compacted as shown on standard drawing.

3. Pavement restoration shall include priming of pavement edges with bituminous material and placing and rolling plant mix bituminous material to the level of the adjacent pavement surfaces. Proper compaction of the bituminous material shall be verified per the requirements of Section 02510.

3.03 CONCRETE REPAIR

See Section 03310 Concrete Work

END OF SECTION

SECTION 02513

UTILITY POTHOLE REPAIR-KEYHOLE METHOD

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This specification covers the requirements for keyhole coring, vacuum excavation, backfilling, and reinstatement of the keyhole core in asphalt or concrete pavements to allow for underground utility repairs and underground exploratory potholing. Keyhole coring shall be defined as follows: The operation of coring a circular hole through the roadway pavement using diamond tipped core drilling equipment.

1.02 Pothole Excavation:

A. The vertical alignment of the keyhole coring shall be perpendicular to the horizon, and the cutting shall extend to the full depth of the existing pavement section.

B. Unless otherwise approved by the Engineer, keyhole cores shall be no less than 6 –inches and no greater than 18- inches in diameter. Adjacent cores shall not be closer than 3 feet from each other (edge to edge), shall not contain a joint or any pavement cracks greater than 1/8-inch wide, and shall not be performed in pavements where the section is less than 3-inches thick. Coring shall be performed with a keyhole coring saw with high strength steel diamond tipped core drill bits.

C. The Contractor shall place a temporary mark on the keyhole core prior to cutting to insure that the removed section is replaced in the same orientation as originally found in the pavement.

D. Soils within potholes shall be removed by air/vacuum extraction methods to expose utilities. The zone of soil removal shall remain essentially within a vertical plane extending below the edges of the removed pavement. The Contractor shall remove all excess materials excavated from the site.

PART 2 PRODUCTS

A. Bonding Agent: The bonding agent is material required to bond asphalt pavement cores to the asphalt concrete pavement from which it was originally removed. Bonding material shall be a single component cementitious, rapid hardening, high strength, waterproof bonding agent conforming to the physical properties shown in Table-1 below, and Section 3.01 B

TABLE 1 – BONDING MATERIAL PROPERTIES

Property	ASTM Test method	Requirements
Bond Strength (Slant Shear), psi (70° F., 30 minute cure)	C882	200 minimum
Strength, psi (70° F., 60 minute cure)	C109	1500 minimum

1) Bonding material shall be impervious to water penetration at the joint after curing.
2) Bonding material shall, within 30 minutes at minimum ambient temperature of 70 degrees F., allow an 18" diameter core to support a traffic load equivalent to at least three (3) times the AASHTO H-25 standard wheel load.
3) The bonding material is required to securely bond the asphalt concrete core to asphalt concrete pavement and to fill all voids between the core and pavement and within the core.
4) Specifications and test results for the bonding material shall be submitted to the City for review and approval before use.

PART 3 EXECUTION

3.01 Pavement Restoration:

A. Pothole Backfill: The Contractor shall place 1 ft of compacted bedding sand over utility. The remainder of the hole shall be filled with flowable fill in accordance with Section 02245 – Flowable Fill, to the bottom of the pavement surface

B. The surface cut by keyhole coring restored to its original condition with the reinstated core flush with and in the original orientation as the existing surface, matching existing pavement surface appearance.

C. A bonding agent shall be a single component cementitious, rapid hardening, high strength, water proofed application such as Utilibond, manufactured by Utilicor Technologies, Inc., or an Engineer approved equal shall be used for pavement core reinstatement. Excess bonding material shall be removed from the restored surface. A patched appearance shall be avoided in surface restoration wherever possible.

D. Unless otherwise approved by the Engineer, the Contractor shall reinstate the bonded keyhole core within 24 hours of cutting the pavement. Openings allowed to be left open greater than 24 hours shall be covered with an approved steel road plate capable of supporting traffic loads.

3.02 Surface Tolerances:

A. The reinstated core shall be flush and level with the adjacent pavement. Gaps attributable to the positioning of the core shall be less than 1/16-inch between the bottom of a minimum 3- foot long straightedge and the surface of the pavement in any direction on the surface of the keyhole core, except across the pavement crown or drainage gutters.

B. Deficiencies:
1. Where the pavement core is found to be fractured or defective upon removal, or becomes damaged after removal and prior to reinstating, the defective or damaged core shall not be used to reinstate the pavement. Pavement repair shall be performed in accordance with Section 02512.

2. A pavement core is considered unacceptable when one of the following conditions exist:

1) The core contains any vertical cracks wider than 1/8-inch extending full depth or partial depth through the core; or

2) Any deteriorated piece of the core is larger than 10 percent of the overall area of the core.

3) Two or more successive layers of asphalt concrete in the core become horizontally delaminated and cannot be rebounded to each other with the bonding compound.

3. All unacceptable pavement cores shall be removed from the job site.

4. If another equivalent core of sound condition and matching existing pavement of the same diameter, depth and composition as the defective core is available, it may be reinstated in substitution of the defective core.

END OF SECTION

SECTION 02607

MANHOLES AND COVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modular precast concrete manhole sections with tongue-and-groove joints, covers, anchorage, and accessories.

1.02 RELATED SECTIONS

1.03 REFERENCES

A. AASHTO M-105: Gray Iron Castings.

B. ASTM C478: Precast Reinforced Concrete Manhole Sections.

C. ASTM C923: Resilient Connectors between Reinforced Concrete Manhole Structures and Pipes.

1.04 SUBMITTALS FOR REVIEW

A. Shop Drawings: Indicate manhole locations, elevations, piping, and sizes and elevations of penetrations.

B. Product Data: Provide manhole covers, component construction, features, configuration, and dimensions.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 GENERAL REQUIREMENTS

A. The Contractor shall furnish and install watertight cast-in-place or precast concrete manholes at the locations shown on the Drawings approved by the City Engineer. All new manholes shall be precast unless the manhole is being installed on an existing line, unless otherwise approved in writing by the City Engineer. All precast manholes shall have flexible watertight pipe-to-manhole boot connectors. All cast-in-place manholes shall have a hydrophilic water stop at pipe-to-manhole connections.

B. Manholes shall be furnished complete with cast iron rings and covers.

~~C. Manhole spacing shall not exceed 400 lineal feet unless approved by City Engineer.~~

~~D. Manholes shall be installed at the end of each line exceeding 15 feet in length.~~

~~E.~~C. ~~Cleanouts shall not be substituted for manholes nor installed at the end of lines.~~

~~F.~~D. Cleanouts on sewer laterals shall be placed every 100 feet and at all bends.

~~G.~~E. Flow Channels:

1. The flow channel through manholes shall conform to the inlet and outlet pipe.

2. The depth of flow channels should be one-half to three-quarters of the diameter of the pipe.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:

1. Materials and Equipment: Product options and substitutions. Substitutions: Permitted.

2. Materials shall be manufactured by a Concrete Precast Association (CPA) approved facility.

B. Manhole Sections: Reinforced precast concrete in accordance with AASHTO M-199 and ASTM C923. Mortar and Grout: Type S.

2.02 COMPONENTS

A. Wall and Cone Sections:

1. Manhole walls shall be constructed of 48" I.D. precast sectional, reinforced concrete pipe.

2. For pipelines of 14" diameter or larger, the manholes shall be 60" minimum I.D.
   a. The throat section of the manhole shall be adjustable by use of pipe sections up to 18 inches in height.
   b. The taper section shall be a maximum of 3 feet in height, shall be of eccentric conical design, and shall taper uniformly from 48 inches to 30 inches inside diameter.
   c. The 48-inch inside diameter pipe used in the base section shall be furnished in section lengths of 1, 2, 3 and 4 feet as required.
   d. Reinforcing steel shall consist of a circular cage with a minimum cross sectional area of three-tenths (0.3) of a square inch of steel per foot in both directions.
   e. 18" space maximum between cone and lid.

3. All joint surfaces of precast sections and the face of the manhole base shall be thoroughly cleaned and wet prior to setting precast sections.

4. All manhole joints, including grade rings, shall be sealed with a butyl rubber sealant (mastic) that is permanently flexible and non-shrinking, similar to Brandt No. 95 Cold Weather Vault Sealant.

5. Mortar can be used for repairs and additional sealing of joints including grade rings and manhole rings. The mortar shall consist of 1 part cement and 1-1/2 parts sand with sufficient water added to bring mixture to workable consistency.

B. Manhole Steps:

1. 12" Copolymer Polypropylene Plastic Steps.

2. Reinforcement: ½" grade 60 steel reinforcement.

3. Steps must meet requirements outlined in ASTM C478 and ASTM C497.

C. Concrete Base Pad:

1. Except as noted below, manhole bases shall be pre-cast concrete conforming to the requirements of Section 03310 of these Specifications.

2. Where sewer lines pass through or enter manholes the invert channels shall be smooth and semi-circular in cross section.

3. Changes of direction of flow within the manholes shall be made with a smooth curve with as long a radius as possible and a minimum of 0.2 feet of fall.

4. The floor of the manhole outside the flow channels shall be smooth and slope toward the channel at not less than ½ inch per foot.

5. For high ground water areas, precast manholes and bases shall be required.

D. Lid and Frame:

1. All iron castings shall conform to the requirements of AASHTO M-105 for grey iron castings.

2. Rings and covers shall have machined bearing surfaces and a minimum cover weight of 150 pounds and minimum ring weight of 233 pounds.

3. The foundry name, year of manufacture, and "WATER", "SEWER", "STORM DRAIN", or "IRRIGATION" shall be marked on the cover.

4. All manhole rings shall be carefully set to the grade shown on the approved drawings or as directed by the City Engineer.

5. The manhole covers shall be so installed to be within 1/4" from the asphalt surface.

6. A concrete ring 12" wide, but no greater than 18" wide, and 8" thick will be poured around lid in accordance with Section 03304. Asphalt concrete collars are prohibited.

7. All manhole lids should be vented unless directed otherwise by the City Engineer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify that built-in items are in proper location and ready for roughing into Work.

C. Verify excavation for manholes is correct.

3.02 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.03 PLACING MANHOLE SECTIONS

A. Place base pad, with top surface level.

B. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

C. Cut and fit for pipe as required.

D. Grout vase of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.

E. Set cover frames and covers level without tipping, to correct elevations.

3.04 DROP TYPE MANHOLES

~~A. A drop pipe should be provided for a sewer entering a manhole at an elevation of 24 inches or more above the manhole invert.~~

~~B.~~A. Where the difference in elevation between the incoming sewer and manhole invert is less than 24 inches, the invert shall be filleted to prevent solids deposition.

~~C.~~B. Drop manholes should be constructed with an outside wye drop connection. If an inside drop connection is necessary, it shall be secured to the interior wall of the manhole and provide access for cleaning. Inside drop connections will not be allowed without written approval from the Heber City Engineer.

~~D.~~C. Due to the unequal earth pressures that would result from the backfilling operation in the vicinity of the manhole, the entire outside drop connection shall be encased in low density concrete.

3.05 SCHEDULES

A. Storm Sewer Manholes: Precast concrete sections, copolymer polypropylene plastic steps, 48 inch inside dimension, to depth indicated, with bolted lid.

END OF SECTION

SECTION 02609

GREASE AND SAND INTERCEPTOR

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modular precast concrete grease interceptor sections with joint covers, access holes, anchorage, cast iron ring, grate, and accessories.

B. Modular precast concrete sand interceptor sections with joint covers, access holes anchorage, cast iron ring, grate, and accessories.

C. Injection molded thermoplastic hydromechanical grease interceptors with covers, access holes, and accessories.

1.02 RELATED SECTIONS

1.03 REFERENCES

A. AASHTO M-105: Gray Iron Castings.

B. AASHTO M-199: Precast Reinforced Concrete.

C. ASTM C-923: Resilient Connectors between Reinforced Concrete Structures and Pipes.

1.04 SUBMITTALS FOR REVIEW

A. Product Data: Provide ring & covers, component construction, features, configuration, and dimensions.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 GENERAL REQUIREMENTS

A. Grease and sand interceptors are required as pre-treatment before discharging into the sanitary sewer system from car washes, automobile service stations, any non-residential facility with a floor drain, and all non-residential food preparation facilities. ~~When determined by the City Engineer that grease control is required, per~~ Follow Chapter 10 of the International Plumbing Code~~, the following control shall be used~~. Grease interceptors, indoor and outdoor, shall be sized by the applicant, and a sizing certification from a professional engineer shall be provided to the City upon request.

1. Standard Grease Interceptors (outdoor, gravity):

   a. Grease interceptors are required on all new non-residential building construction or retrofits which include food preparation and serving areas
   b. A sampling manhole shall be located below the downstream outlet.

2. Hydromechanical Grease Interceptors (HGIs) (outdoor)

a. When approved by the City Engineer, approved HGIs may be used in low-grease/fat food service applications with less than 8 total fixture unit equivalents.

b. HGIs shall be properly sized EnduraXL models by Canplas Industries or approved equivalent.

c. Must include a separate sampling manhole or built in port that can be used for sampling.

~~c.~~

3. Indoor Grease Interceptors

a. For retrofit or remodel commercial construction, when approved by the City, an indoor Big Dipper Grease Interceptor system (or approved equivalent) may be installed inside the building.

b. Indoor grease interceptors will only be approved when, in the opinion of the City, space constraints make outdoor interceptors impractical or infeasible.

c. Access shall be provided upon request to City personnel for system inspection.

~~3.~~

B. The Contractor shall furnish and install watertight cast-in-place or precast concrete grease interceptors and sand interceptors as required by the City Engineer or City Officials.

C. Grease interceptors and sand interceptors shall be furnished complete with cast iron rings and covers.

D. Design of grease/sand interceptors and grease traps need to be approved by City Engineer.

E. Flow Channels

1. The flow channel through Grease interceptors shall conform with the slope of the sewer.

2. Adjacent floor area should drain to the channel with the minimum slope of 1 inch per foot.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:

1. Amcor.

2. Geneva Pipe.

3. Dura-crete.

B. Grease interceptor Sections and sand interceptor: Reinforced precast concrete in accordance with AASHTO M-199 with gaskets in accordance with ASTM C923.

C. Mortar and Grout: Type S.

2.02 COMPONENTS

A. Standard Grease Interceptors

1. Outdoor gravity grease interceptors shall have a minimum of two compartments.

2. The minimum size for grease interceptors shall be 750 gallons, unless otherwise approved

3. Wall Sections to be designed to meet ASTM C913 with AASHTO HS-20 loading:

   a. Interceptors shall be constructed of 6" thick precast reinforced concrete. Box size to be 3-foot by 3-foot and the height as shown on plans. Provide grade rings as needed.

   b. Grease interceptor shall be designed to meet ASTM C-857 "minimum structural design loading for underground precast concrete utility structures. Provide grade rings as needed.

   c. All joint surfaces of precast sections and the face of the walls, base, and grade rings shall be thoroughly cleaned and wet prior to setting precast sections.

   d. All joints including grade rings shall be set in mortar consisting of 1 part cement and 1 ½ parts sand with sufficient water added to bring the mixture to workable consistency, or the joints shall be sealed with butyl rubber gasket that is permanently flexible and non-shrinking, similar to Brandt No. 95 Cold Weather Vault Sealant.

4. Lid and Frame:

   a. All iron castings shall conform to the requirements of H-20 loading for grey iron castings.

   b. Rings and grates shall have machined bearing surfaces and a minimum cover weight of 150 pounds and minimum ring weight of 233 pounds.

   c. The foundry name, year of manufacture, and "SEWER"shall be marked on the cover.

   d. All Grease interceptor and clean-out box rings shall be carefully set to the grade as shown on the approved drawings or as directed by the Engineer.

   e. Grate covers shall be so installed to be within 1/4" below the finished surface.

   f. A concrete ring 12" wide and 8" thick will be poured around lid in accordance with Section 03304.

2.03 CONFIGURATION

A. Shape: rectangular.

B. Design Size: design criteria to be submitted to the City Engineer for review.

C. Clear Grate and Lid Opening: 24 inches diameter.

D. Pipe Inlet and Outlet: Pipe inlet and outlet to be grouted to eliminate infiltration and leakage.

PART 3 EXECUTION

3.01 PLACING CONCRETE SECTIONS

A. Place base pad, trowel top surface level.

B. Place Grease interceptor or sand interceptor plumb and level, trim to correct elevations, anchor to base pad.

C. Cut and fit for pipe as required.

D. Grout base of shaft sections to achieve slope to exit piping.

E. Provide grade rings and Trowel smooth. Contour as required.

F. Set cover frames and covers level without tipping, and to correct elevations.

3.02 SCHEDULES

A. Grease interceptors and sand interceptors: Precast concrete sections, copolymer polypropylene plastic steps, to depth indicated, with tamper proof lid.

END OF SECTION

SECTION 02660

PIPELINE TESTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing requirements for potable and non-potable water piping systems and sanitary sewers.

1.02 DEFINITIONS

A. Leakage: The quantity of water required to maintain the specified hydrostatic test pressure after the pipeline has been filled with water and the air expelled.

B. Non-rigid Pipe: Any pipe which requires bedding and backfill material for structural support.

1.03 SUBMITTALS

A. Pipeline Test Report: Include the following items:

1. Type of test.

2. Identification of pipe system.

3. Size, type, location and length of pipe in test section.

4. Test pressure and time.

5. Amount of leakage versus allowable.

6. Date of test approval.

7. Signature of test supervisor.

8. Signature of the City Engineer, Inspector, or City Water Superintendent witnessing and approving the test.

9. One copy of video tape.

1.04 PROJECT CONDITIONS

A. After construction of sanitary or storm sewer lines, they shall be thoroughly cleaned, tested for leakage and alignment, and closed circuit television inspected in the presence of the City Engineer or the City Inspector before acceptance by the City. If directional drilling or underground boring takes place after sewer and/or storm drain lines have been installed, inspected, and tested, the sewer and/or storm drain lines near the drilling/boring shall be inspected a second time with a closed circuit television inspection per Section 2660 - 3.09.

B. Repair pipeline system at no additional cost to City until it passes subsequent retesting.

C. Recording Equipment:

1. Supply all necessary equipment to perform pressure testing.

2. Secure City's approval of pressure gages.

3. Locate all gages and recording equipment away from affects of sunshine or other weather conditions.

4. Place, vents, pressure taps and drains for the test. Repair pipeline at the completion of the test at no cost to City.

PART 2 PRODUCTS

2.01 TESTING MATERIALS

A. Medium: Water or air, as required by test.

B. Equipment: Temporary motors, pumps, pumping apparatus, pressure gages, connections, power, etc. for making the tests.

PART 3 EXECUTION

3.01 PREPARATION

A. Notify City Engineer or City Water Superintendent 48 hours in advance of test.

B. Carry out tests as pipeline construction progresses to ensure construction methods are producing satisfactory results.

C. Disinfect potable water pipelines per Section 2675 prior to pressure testing if connected to an existing system.

3.02 PRESSURE TESTING FOR PRESSURIZED WATER PIPELINES

A. Test shall be performed only after the pipeline has been properly filled, flushed, and purged of air. Provide air release taps at points of highest elevations as needed before testing. Insert permanent plugs after test has been completed. The test pressure shall be applied by means of an approved and disinfectedpumping assembly connected to the pipe in a manner satisfactory to the City.

B. The test pressure shall not exceed the thrust restraint design pressure or 50 psi in excess of the pressure class of the pipe, fittings, or valves, whichever is less (as specified by the manufacturer). During the tests, the system and any exposed pipe, fittings, valves, and hydrants shall be carefully examined for leakage.

C. Test pressure and duration: The duration of the hydrostatic test shall be 2 hr. The hydrostatic test pressure shall be set to 50 psi in excess of the lowest class rating of any pipe, saddle, fitting, or valve within the section being tested at the highest pressure along the test section. The test pressure shall not vary by more than 5 psi (plus or minus) for the duration of the test. If necessary, the test pressure shall be maintained by additional pumping during the 2 hr test duration. The pressure reading shall be noted every 10 minutes during the test.

D. The testing allowance: The testing allowance shall be defined as the quantity of water that must be supplied to the pipe section being tested to maintain a pressure within 5 psi of the specified hydrostatic test pressure. The quantity of water shall be accurately measured in gallons by suitable methods. No installation will be accepted if the quantity of makeup water is greater than that determined by the formula:

$$Q = \frac{LD\sqrt{P}}{148{,}000}$$

Where:
Q = quantity of makeup water in gallons per hour
L = length of pipe section being tested, in feet
D = nominal diameter of pipe, in inches
P = average test pressure during the hydrostatic test, in pounds per square inch (gauge)

E. Provide suitable means for determining water lost by leakage under the test pressure.

F. Locate and repair the defective elements and retest until the leakage is within the specified allowance.

G. Repair any noticeable leakage even if total leakage is less than allowable.

H. Service Lines:

1. Potable water service lines shall be connected to a potable water line before disinfection and bacteriological testing of the line is completed in accordance with Section 2675 Part 3.06, unless the service line needs to remain active during a replacement project, or as otherwise approved by the City Engineer. Service lines must be flushed in accordance with Section 2675 Part 3.06.

2. All service lines shall be pressure tested up to the curb stop in accordance with this section.

3. The connection between the water meter box and curb stop shall be either pressure tested in accordance with the guidelines in this section or visually inspected for leaks once the working water pressure is turned into the service line.

3.03 ALIGNMENT AND GRADE TEST

A. No variance will be allowed from line and grade in excess of 1/32" per inch of pipe diameter or ½" maximum provided that such variation shall not result in a level or reverse sloping invert.

B. Variations in invert elevations between adjoining ends of pipe due to eccentricity of joining surface and pipe interior surface shall not exceed 1/64" per inch of pipe diameter, or ½" maximum.

3.04 OBSTRUCTION TEST

A. Visually examine pipe internally for obstructions by use high power light or mirror.

B. When required by the City Engineer, a round incompressible mandrel 1" less in diameter than the internal pipeline diameter and 2 times the diameter in length will be passed through the pipeline.

3.05 NON-RIGID PIPE DEFLECTION TEST

A. When required by the City Engineer, test installed sections of non-rigid pipeline to ensure that circumferential deflection does not exceed 5 percent of the average inside diameter using a rigid mandrel with a circular cross section pulled through the pipe by hand.

3.06 INFILTRATION TEST

A. No pipe section will be accepted if the infiltration rate exceeds 100 gallons per inch diameter per mile per 24 hours.

3.07 FLUSHING OF SANITARY SEWERS

A. All sanitary sewer lines shall be flushed and cleared prior to acceptance by the City.

B. Flushing:

1. Laterals and trunk lines shall be flushed by water with a high pressure sewer jet to remove all foreign material. Flushing shall be completed prior to television inspection.

2. All debris located at the bottom of each manhole shall be removed. Dirt grease, sand, and gravel shall be removed so that the walls of the sewer pipe can be inspected.

3. Wastewater and debris shall not be permitted to enter sewer lines in service, but shall be removed at the lowest manhole of the extension.

4. Other methods of cleaning may be used upon approval of the City Engineer.

5. After the lines have been thoroughly cleaned, they shall be tested between all manholes for displacement.

3.08 LEAKAGE TESTS FOR SANITARY SEWERS

A. General Requirements:

1. The contractor shall test all sanitary sewers by means of an exfiltration test.

2. Length of line tested at one time shall be limited to the length between adjacent manholes.

B. Testing with Water:

1. Each section of the sewer shall be tested between successive manholes by closing the lower end of the sewer to be tested and the inlet of the upper manhole with stoppers.

2. The pipe and manhole shall be filled with water to a point approximately 4-feet above the invert of the sewer at the center of the upper manhole.

3. The allowable leakage will be computed by the formula:

$$E = 0.25\ D\ H$$

Where: E = Allowable leakage in gallons per minute per 1000 feet of sewer tested.
D = Internal diameter of the pipe in inches.
H = Difference in elevation in the water surface in the upper manhole and the invert of the pipe at the lower manhole (feet).

4. Leakage from the sewer, as shown by the test, which exceeds that allowed by the formula will be corrected by the Contractor to reduce the exfiltration to within permissible limits.

5. Where the difference in elevation between inverts of adjacent manholes exceeds 10-feet, the exfiltration leakage test will be modified as directed by the City Engineer.

6. House surface laterals shall be considered part of the main sewer to which they are connected and shall be tested with the main line sewer.

C. Testing with air:

1. Air pressure may be used in lieu of the water exfiltration test subject to the approval of the City Engineer.

2. The low pressure air test shall be conducted by the following method under the direction of the City Engineer or City Inspector with equipment equal to Cherne Industrial, Inc.

3. All wyes, tees, or ends of lateral stubs shall be suitably capped and braced to withstand the internal test pressures. Caps shall be easily removable for future lateral extensions.

4. After a manhole to manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs. One of the plugs shall have three hose connections. Air for inflation of the triple connection pneumatic plug shall be supplied through a factory-equipped control panel. There shall be three hose connections from the control panel to the pneumatic plug. One hose shall be used for inflation of the plug. The second hose shall be used for continuously reading the air pressure in the sealed line. The third hose shall be used for introducing low pressure air into the sealed line.

5. There shall be a 3-1/2" or larger diameter, 0.30 psig gauge mounted on the control panel for reading of the internal pressure in the line being tested. Calibrations from the 0-10 psig range shall be in tenths of pounds and the 0-10 psig portion shall cover 90% of the complete dial range.

6. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any ground water that may be over the pipe.

7. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period (3.5 psig minimum pressure in the pipe), the third hose shall be disconnected from the control panel.

8. The pipe and joints shall also be considered acceptable when the time required in minutes for pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time shown for the given diameters in the following tables:

PIPE DIAMETER (Inches)	MINUTES
4	2.0
6	3.0
8	4.0
10	5.0
12	5.5
15	7.5
18	8.5
21	10.0
24	11.5

9. If the installation fails to meet this requirement, the Contractor shall determine at his own expense the source of leakage.

10. The Contractor shall repair or replace all defective materials and/or workmanship.

11. Pressure test concrete sewer manholes by the negative air pressure (vacuum) test as per ASTM C1244.

3.09 CLOSED CIRCUIT TELEVISION INSPECTION

A. Contractor shall inspect the sewer and storm drain lines with a color television camera. The camera test shall be supervised and witnessed by the City Engineer or the City Inspector and shall be done as follows:

1. The lines and lateral connections will be televised at the cost of the Developer until the lines are accepted by the City.

2. The camera shall have "PAN and TILT" capability for detailed wall, joint, and service inspection. The camera shall be pulled through the sewer line or propelled with a tractor.

3. The light intensity and camera focus shall be adjusted to obtain a good clear picture at all times.

4. The operator shall control the travel speed of the camera so that the walls of the pipe can be clearly viewed. The speed shall not be greater than 20 feet per minute. The operator shall stop and inspect each service, obstruction, or pipe deformation. Locations of each shall be noted and included in the final Inspection Report.

5. Defects such as high and low spots, joint separations, offset joints, chipped ends, cracked or damaged pipe, infiltration points and debris in lines shall be corrected . The maximum acceptable limits for 8 to 10 inch pipes are: 0.25 inches for joint separations, 0.5 inches for low spots, and 0.25 inches for chipped ends.

6. A flat or reverse grade will not be acceptable.

7. If the pipeline is found unacceptable, the problem shall be corrected by the contractor and re-televised.

8. The television inspection process shall be done immediately after running water in the pipe and no visible discharge occurs at the downstream manhole.

9. Television inspection must be scheduled with the City at least one (1) week in advance of inspection.

10. A typed log of the closed circuit television inspection with a digital CD/DVD video shall be turned over and become the property of the City. The Inspection Report shall contain the following:

    a. Location of sewer line and direction of flows
    b. Connecting manhole numbers with starting and ending manhole
    c. Manhole condition, flowline condition, and cover conditions
    d. Pipeline size, material, and condition, with defect locations noted from center of manhole
    e. Location of services located as to distance from center of manhole
    f. Date of inspection, name of contractor, and signature of operator/logger

11. After cleaning and inspection have been completed and any defects are corrected and accepted, the lines shall be tested for leakage by methods discussed in Section 3.08.

3.10 PIPE TESTING SCHEDULE

A. Irrigation:

1. Alignment and grade test.

2. Pressure test.

3. Operational Testing:
   a. Perform operational testing after hydrostatic test is complete, backfill is in place and sprinkler heads adjusted to final position.
   b. Demonstrate system meets coverage requirements and automatic controls function properly.
   c. Coverage requirements are based on operation of 1 circuit at a time.

B. Sanitary Sewers:

1. Displacement test.

2. Pressure test for gravity pipeline systems.

3. Pressure test for pressure pipeline systems.

4. Video test for sanitary sewers.

5. Pressure test manholes.

C. Subdrains:

1. Alignment and grade test.

2. Obstruction test.

3. Non-rigid pipe deflection test (if applicable)

D. Storm Drains:

1. Alignment and grade test.

2. Obstruction test.

3. Non-rigid pipe deflection test (if applicable).

4. Pressure test for pressure pipeline systems.

5. Video test for storm drain per 1.04 Project Conditions paragraph A.

E. Potable Water System:

1. Obstruction test.

2. Bacteria test.

3. Pressure test.

4. If pressure test fails and line is repaired, the bacteria test shall be repeated.

END OF SECTION

SECTION 02668

WATER TRANSMISSION AND DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe and fittings for culinary water line.

B. Valves, fire hydrants and water meters.

1.02 RELATED SECTIONS

A. Section 02205: Common Fill.

B. Section 02206: Select Fill.

C. Section 02225: Excavating and Backfill Operations.

D. Section 02250: Soil Compaction.

E. Section 02660: Pipeline Testing.

F. Section 02675: Disinfection.

G. Section 03300: Cast-in-Place Concrete: Concrete for thrust restraints.

1.03 REFERENCES

A. ASME B16.18: Cast Copper Alloy Solder Joint Pressure Fittings.

B. ASME B16.22: Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

C. ASTM B88: Seamless Copper Water Tube.

D. ASTM D2241: Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).

E. ASTM D2855: Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and fittings.

F. AWWA C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

G. AWWA C105: Polyethylene Encasement for Ductile Iron Piping for Water and Other liquids.

H. AWWA C110: American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids.

I. AWWA C111: Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.

J. AWWA C151: Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

K. AWWA C500: Gate Valves, 3 through 48 in NPS, for Water and Sewage Systems.

L. AWWA C502: Dry Barrel Fire Hydrants.

M. AWWA C504: Rubber Seated Butterfly Valves.

N. AWWA C600: Installation of Ductile-Iron Water Mains and Appurtenances.

O. AWWA C900: Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.

P. AWWA C906: Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 63 In. for Water Distribution and Transmission

Q. UL 246: Hydrants for Fire - Protection Service.

1.04 SUBMITTALS

A. Prior to construction, submit 6 copies of the manufacturers specification for all products to the engineer for approval.

1.05 SUBMITTALS AT PROJECT CLOSEOUT

A. Record and submit actual locations of piping, valves, connections, thrust restraints, and invert elevations.

B. Identify and describe unexpected variations in subsoil conditions or utilities.

1.06 SPECIAL REQUIREMENTS & CONSIDERATIONS

A. All materials which may contact drinking water, including pipes, gaskets, lubricants, and O-Rings, shall be ANSI-certified as meeting the requirements of ANSI/NSF Standard 61, Drinking Water System Components – Health Effects. To permit field-verification of this certification, all components shall be appropriately stamped with the NSF logo.

B. Pipe, joints, fittings, valves, and fire hydrants shall conform to applicable sections of AWWA Standards C104-A21.4-08 through C550-05 and C900-07 through C950-07.

C. All pipe materials and fittings shall be "lead free" in accordance with Section 1417 of the Federal Safe Drinking Water Act. They shall be certified as meeting ANSI/NSF 372 or Annex G of ANSI/SNF 61.

~~D. The standard horizontal distance between water lines and sanitary sewer lines shall be at least 10 feet. Where a water main and sewer line must cross, the water main shall be at least 18 inches above the sewer line. Separation distances shall be measured from pipe edge to pipe edge. Adherence to all separation requirements included in Sections R309-550-7 and R309-550-12 shall be required unless a written variance is requested and granted from the Utah Division of Drinking Water and Heber City.~~

~~E. Special design and construction considerations in accordance with Section R309-550-5(6) of the Utah Administrative Code shall be required for water mains located in areas of geologic hazard (e.g., slide zones, fault zones, river crossings, etc.)~~

~~F. Surface water crossings are generally prohibited and will only be allowed when no other practical alternatives exist and when specifically approved in writing by the City Engineer. If allowed, surface water crossings shall be designed and constructed in accordance with Section R309-550-8(8) of the Utah Administrative Code.~~

~~G. To provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins and "looping" of the water system whenever practical. Where dead-~~

~~end mains do occur (permanent or temporary), a fire hydrant or approved blow-off assembly shall be installed for flushing purposes as directed by the City Engineer. Flushing devices must have the minimum sizes shown on Heber City Standard Drawing "Water-8", but must also be sized to provide a minimum velocity of 2.5 fps in the water main.~~

PART 2 PRODUCTS

2.01 DUCTILE IRON WATER PIPE

A. Ductile Iron Water pipe shall be Class 50 for slip-on joint piping (Class 51 for 4-inch size) and Class 53 for mechanical joint and flanged joint piping.

B. All piping shall conform to AWWA Specification C151 of the latest revision.

C. Pipe joints shall be the push-on rubber gasket type of mechanical joint type with rubber gaskets conforming to AWWA C111 of latest revision or flanged connections conforming to AWWA C115 of latest revision.

D. All Ductile Iron Pipe wall thickness shall conform to AWWA C150.

E. Fittings: Fittings shall conform to AWWA Specification C110, or C153 and shall have mechanical, flanged or push-on rubber gasket joints.

F. Coatings and Linings for Ductile Iron Pipe:

1. All exterior surfaces of pipe and fittings shall be coated with hot coal tar approximately 1 mil thick or polyethylene encasement (AWWA C105) when soils conditions require additional protection.

2. All interior surfaces of pipe and fittings shall be coated with the standard thickness cement mortar lining in conformity with the requirements of AWWA C104

G. Markings:

1. Pipe markings shall include the following, marked continuously down the length:
   a. Manufacturer's Name.
   b. Nominal Size.
   c. Class Pressure Rating.
   d. NSF Logo.
   e. Identification Code.

~~H. Minimum water main size is 8 inches for culinary and 6 inches for secondary irrigation.~~

2.02 POLYVINYL CHLORIDE PIPE (PVC)

A. All PVC pipe used for transmission lines shall be AWWA C900, DR-18 or as determined by the City Engineer. All PVC pipe used for secondary irrigation lines shall be AWWA C900, DR-18 Purple pipe or as determined by the City Engineer.

B. Conformance: All PVC pipe shall conform to the latest revisions of the following specifications.

1. AWWA Spec. C900 (PVC pressure pipe for water).

2. ASTM Spec. D-2241 (Dimensions, Class, SDR, and tolerances).

3. National Sanitation Foundation Testing Laboratories (NFS).

4. Rubber Gasketing shall conform to ASTM F477.

5. Joints in compliance with ASTM D3139.

C. Pipe Dimensions:

1. Standard lengths shall be 20 feet.

2. Wall thickness shall be in accordance with ASTM d-2241.

3. Pipe ends shall be beveled to accept the gasketed coupling (4" and larger).

~~4. Minimum water main size is 8 inches for culinary and 6 inches for secondary irrigation.~~

D. Couplings and Fittings:

1. For pipelines over 2 inches in diameter, ductile iron fittings in conformance with AWWA C110 or C153 shall be used on PVC pipelines and shall have mechanical, flanged or push-on rubber gasket joints.

2. Where PVC fittings or couplings are used, they shall be furnished by the pipe manufacturer and shall accommodate the pipe for which they are to be used.

3. They shall have a minimum pressure rating of 200 psi.

4. Insertion depth of the pipe in the coupling shall be controlled by a gauge mark or mechanical stop in the coupling which will allow for a thermal expansion and contraction.

E. Lubrication: Lubrication shall be water soluble, non-toxic, be non-objectionable in taste and odor imparted to the fluid, be non-supporting of bacteria growth, and have no deteriorating effect on the PVC or rubber gaskets.

F. Concrete Blocking:

1. All fittings at bends and branches in water pipe lines shall be provided with concrete thrust blocking as shown on the Standard Drawings in addition to mechanical restraints.

~~2. All bolts shall be greased and bends will be wrapped with 8 mil plastic.~~

3. Blocking shall be of concrete specified in Section 03300, poured in place and shall bear against solid undisturbed earth at the sides and bottom of the trench excavation and shall be shaped so as to not obstruct access to the joints of the pipe or fitting.

2.03___-HIGH-DENSITY POLYETHYLENE (HDPE)

A. HDPE pipe shall only be used under certain design conditions with prior approval from City Engineer. All HDPE pipe used for culinary water transmission lines shall be AWWA C906, DR-11 with blue stripe or as determined by the City Engineer. All HDPE pipe used for secondary irrigation lines shall be AWWA C906, DR-11 with purple pipe or as determined by the City Engineer.

B. Conformance: All HDPE pipe shall conform to the latest revisions of the following specifications.

1. AWWA Spec. C906 (Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 63 In., for Water Distribution and Transmission).

2. ASTM D-2239 (Standard Spec for Polyethylene (PE) Plastic Pipe), ASTM D2737, ASTM D3035, and F714 (PVC plastic pipe SDR-PR and Class T).

G. Pipe Dimensions:

1. D.I.P.S shall be used unless otherwise stated.

2. Standard lengths shall be 40 or 50 feet.

~~3. Minimum water main size is 8 inches I.D. for culinary and 6 inches I.D. for secondary irrigation.~~

2.04 GATE VALVES

A. Gate valves shall be used for all applications. In cases where there is limited vertical clearance or when the operating nut of the gate valve would be less than three (3) feet from the surface, horizontal gate valves shall be used.

B. Furnish gate valves that conform to the requirements of AWWA C509~~, for applications less than 14" diameter and AWWA C515 for applications 14" diameter and greater, with cast iron body, bronze mounted, resilient wedge, parallel seat, non-rising stem design with "O" ring seals.~~

C. Operating Direction: Open counterclockwise.

D. Buried Valves: Unless otherwise shown or specified, in line valves shall be of Mechanical Joint connection design for buried service. Flange connections shall be used connecting valves to tees or crosses for buried service.

E. Buried Valves shall have 2" operation nuts.

F. Horizontal gate valves shall have 2:1 beveled gear reduction, unless otherwise approved by the City Engineer.

2.05 BUTTERFLY VALVES ~~(PROHIBITED UNLESS APPROVED BY THE CITY ENGINEER IN SPECIFIC CASES.)~~

~~A. Butterfly valves, if approved, are used when applications are 14" inch diameter or greater.~~

B. Material, in accordance with AWWA C504.

C. Body Type:

1. Valves shall be high strength cast iron ASTM A-126, Class B with 18-8 Type 304 stainless steel body seat.

2. Valve vane shall be mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel nylon locked screws.

3. If mechanical joints are used, the installation shall be per AWWA Specification C111 and accessories (bolts, glands, and gaskets) shall be included.

4. All butterfly valves shall be of the rubber-seated tight-closing type. The rubber seat shall be a full circle 360° seat not penetrated by the valve shaft.

D. Valve Shafts:

1. The valve shaft shall be one piece extending full size through the entire valve and operator with no neckdown, keyways, or holes to weaken it.

2. The valve shaft shall have 304 stainless steel journals rotating in reinforced Teflon bearings.

3. Valves shall have permanently set two-way thrust bearing.

4. Packing shall be "triple-seal" rubber designed for permanent duty in underground service.

E. All valves shall have stainless bolts and zinc coated stainless steel nuts.

F. Flange connections shall be used connecting valves to tees or crosses for buried service.

2.06 VALVE BOXES

A. All buried valves shall be installed with cast iron, 2 piece, sleeve type, with an expanded bell base, 5 1/4 inch shaft valve boxes.

~~A.~~B. All valve nut extensions shall be pinned or otherwise locked to the valve nut.

2.07 TAPPING SADDLES / SLEEVES

A. For tapping saddles used for service connections to plastic pipe, provide full circle saddles. For all other pipe provide double strap bronze alloy, ductile iron, or stainless steel saddles.

B. Provide tapping saddles that have a minimum rated working pressure of 300 psi, neoprene Buna N gaskets, and bronze tapered threads.

C. When approved by Heber City, tapping sleeves may be used for fire lines or other branch branch connections. Tapping sleeves shall be ROMAC Industries SST (or approved equivalent). Tapping sleeves shall not be used for size-on-size applications. The branch line must be at least one nominal pipe size less than the line being connected to. Bricks shall be used for support, not wood shims or any other material.

2.08 SERVICE CONNECTIONS

A. Provide and install according to standard drawings.

B. Service Pipe:

1. Provide single length Polyethylene pipe (copper tube size) with compression fittings. Copper services are not allowed.

2. Locate service taps in the upper quadrant of the main line, approximately at 45 degrees. The minimum distance between taps is 24", with a 5 degree stager. Do not make service taps within 24" of the end of the main line.

3. Service saddles are required on all taps unless indicated otherwise. All water main saddles must be installed with a torque wrench to the torque setting found on the informational tags attached to the saddle body.

4. In subdivision developments, the contractor shall be responsible to furnish and install the corporation type stop and laterals to a point on private property 10 feet past the street right-of-way line.

5. No splices in water services for new service and relocation unless approved by City Engineer.

C. New Meter Boxes: ~~Mueller / Hunt~~ Thermal-Coil Meter Assembly. See the Appendix for alternatives.

~~C.~~

Existing Meter Box Repairs: Double walled plastic can with ring and cover of sufficient strength to withstand H-20 loadings without damage.
Meter Boxes are allowed within the driveway "zone" with prior approval from the Public Works Department. The driveway "zone" shall include the flared driveway approach including five feet either side from the top of the flare. All retrofit of meter boxes within the driveway "zone" shall include shear support at the bottom of the meter box and shall be flush with the concrete surface.

D. Meter Setters: Series 70 manufactured by Ford or Mueller.

E. Service connections greater in size than 2" shall follow the Compound Meter with 2" Bypass details in the latest version of the APWA Standard Plans & Specifications published under the direction of the Utah Chapter of the American Public Works Association. For details on specific meter requirements, contact the Heber City Public Works Department.

F. All materials to be supplied by the Contractor, except for the meter.

2.09 HYDRANT

A. In accordance with AWWA C502 and pattern approved by Owner.

B. 6-inch cast iron hydrant as manufactured by Mueller Centurion 250, ~~or~~ Waterous – Model # WB-67-250, or Clow Medallion.

C. Cast-Iron Body Fire Hydrant: Compression type, opening against pressure and closing with pressure, base valve design, 150 psi working pressure, with 1/4" diameter minimum tapping and bronze plug in standpipe.

1. Size: Minimum 5 1/4" valve opening.

2. Direction to Open Hydrant: Left.

3. Size and Shape of Operating and Cap Nuts: Pentagon 1-1/2" point to flat.

4. Hose Nozzles: Two 2-1/2" National Standard Thread, cap, gasket and chain.

5. ~~Pumper Nozzles: One 4-1/2" National Standard Thread, cap, gasket and chain.~~

6. Depth of Cover: 5'-0" to top of pipe unless indicated otherwise.

7. Connection to Main: O-ring seals and a 6" ASA 125 pound flanged inlet.

8. Pressure: Designed for a working pressure of 175 psi and a hydrostatic pressure of 350 psi.

9. Bottom connection: 6" flanged. Designed to allow the flanges at the sidewalk level to separate when hydrant is sheared off.

10. Automatic drain: Opens as the hydrant is closed.

11. Hydrants shall be provided by the manufacturer with a factory applied red coating. Field painting of hydrants shall not be allowed.

D. Mechanical joint or flanged in accordance with AWWA C110 and AWWA C111.

~~E. Hydrant spacing shall not exceed 500 feet.~~

2.10 FIRE SERVICE

A. All fire service shall be a minimum 3" ductile iron pipe.

B. All fire services are required to install a gate valve at the main line connection and a RP double check backflow valve immediately inside the building. Tracer wire shall be installed along entire length of fire service.

2.11 AIR RELEASE STATIONS

~~A. Air Releases shall be installed at all peaks and sharp changes in gradient with a difference of elevation greater than 15 feet. If the waterline has service connections within the location of the peak or change in the gradient, the air release station may be eliminated at the City Engineers discretion.~~

2.12 BACK FLOW PREVENTORS

A. All irrigation lines connected to culinary system shall have RP backflow devices with 3 chambers, and above ground air release with an air gap.

B. All backflow preventers shall be tested by a certified backflow technician, and a passing test report will need to be provided to the City.

2.13 HARDWARE, ACCESSORIES & BOLT PACKS

A. All hardware, bolt packs, etc. to be buried shall be greased with food grade FM grease and wrapped in 8 mil (min) plastic secured in place using heavy duty adhesive tape.

B. All hardware, piloting, bolt packs, etc. to be exposed (including in manholes and vaults) shall be Stainless Steel unless otherwise approved by the City Engineer.

PART 3 EXECUTION

3.01 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.02 BEDDING

Refer to Section 02225

3.03 INSTALLATION – PIPE & FITTINGS

A. The bottom of the trench shall be cut flat, true and even to provide uniform bearing for the full length of the pipe barrel.

B. Under no circumstances shall pipe or accessories be dropped into the trench.

C. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with adjoining pipe to prevent sudden offsets.

D. Pipe bedding and trench backfill shall be as defined in the previous sections.

E. Install fittings, valves, etc., without the use of repair sleeves unless otherwise approved by the Public Works Director. Cut-in fittings, valves, etc., shall be installed with the use of Mechanical Joint by Flange adapters (or other means as necessary) to eliminate the need for repair sleeves.

F. As work progresses, interior of pipe shall be cleared of dirt and other superfluous materials.

G. Trenches shall be kept free from water until pipe jointing has been completed. Pipe shall not be laid when condition or trench or weather is unsuitable for such work.

H. At all times when work is not in progress, all open ends of pipe and fittings shall be securely closed so that no water, earth, or other substance will enter pipe or fittings.

I. Maintain separation of water main and services from sewer piping in accordance with Utah State Code.

J. Install pipe to indicated elevation to within tolerance of 5/8 inches.

K. Install ductile iron piping and fittings to AWWA C600.

L. Route pipe in straight line.

M. Install pipe to allow for expansion and contraction without stressing pipe or joints.

N. Install access fittings to permit disinfection of water system performed under Section 02675.

O. Slope secondary irrigation water pipe and position drains at low points. Drains shall discharge into storm drain system or other stream course that will not adversely impact adjacent properties.

P. Form and place concrete for thrust restraints at each elbow, change of direction, or dead end of pipe main.

Q. Install mechanical joint restraints approved by Heber City at all bends, branches, or dead ends.

R. Establish elevations of buried culinary piping to ensure not less than 5 feet of cover.

S. Establish elevations of buried irrigation piping to ensure not less than 2 feet of cover. Elevation of buried irrigation piping shall be set to match the design elevations and slopes identified in the plans. Survey cut stakes shall be utilized and followed when installing irrigation piping.

T. Install metallic tape continuous over top of pipe buried 12 inches above pipe line.

U. Backfill trench in accordance with Section 02250.

V. Handling Ductile Iron Pipe:

1. Pipe and fittings shall be handled in such a manner as to insure installations in sound, undamaged condition.

2. Particular care shall be taken not to injure the pipe coating and lining. Cement lining in pipe or fittings which is broken or loosened shall be cause for rejection of pipe or fittings.

3. All damaged pipe coating shall be repaired, prior to laying pipe or placing backfill.

4. Repair shall be accomplished by removing all damaged coating, wire-brushing to exposed metal, and applying two coats of coal tar coating of a type and quality to that originally in coating the pipe.

W. Cutting, Cleaning and Inspection:

1. Cutting of pipe for closure pieces or for other reasons shall be done in a neat and workmanlike manner by a method which will not damage the pipe.

2. Before installation, each pipe shall be inspected for defects.

3. All defective, damaged or unsound pipe shall be rejected.

X. Location of Stub Pipes:

1. The location of each stub shall be marked by placing a 2 x 4 marker at the end of the pipe and extending vertically from the end of the pipe to approximately 15 inches above the ground surface.

2. The portion of the 2 x 4 extending above ground, shall be painted as follows:
   a. Green - indicating sewer stub.
   b. Blue - indicating water.

3.04 INSTALLATION - VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Locate valves on property lines, at each intersection, and not more than 500 feet between.

C. Center and plumb valve box over valve. Set box cover flush with finished grade with concrete collar as per standard drawings.

D. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

E. Valves located next to fittings shall be connected via flange x flange joints.

F. Anchorages: Provide anchorages for tees, wyes, crosses, plugs, caps, bends, valves, and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages.

G. On private building fire services, a gate valve must be installed at the property line to isolate the fire service and a detector check valve must be installed where the fire line first enters the building.

3.05 INSTALLATION - SERVICE CONNECTIONS

A. The contractor or home owner must provide and install all parts according to the standard drawings.

B. The Engineer or Public Works Department must inspect the installation before burying or backfilling. The Contractor shall conform to the following requirements before a water meter shall be installed by Heber City:

1. Notify the Water Department at least five working days prior to the time the meter is to be installed and before backfilling.

2. The water lateral should be exposed in the street right-of-way one foot outside the property line, even if the lateral extends onto the property.

3. The end of the house lateral should be within 2 feet of the service lateral.

4. Both laterals should be exposed freely in the center of the excavation.

5. To prevent damage from possible freezing, the water lateral may be covered with materials such as sand, light gravel, straw, insulation, or similar light materials.
6. To establish the correct street right-of-way line, the property line pins or the sidewalk must be in place.

C. All of the above requirements must be complied with to the satisfaction of the City before the water meter will be installed.

D. A service charge will be assessed for crew time when prerequisites are not met before setting a meter. This fee must be paid before the meter installation will be rescheduled.

E. Any required re-setting of the water meter following initial installation shall be done by the City at the expense of the Developer or Contractor.

F. Place meter can in park strip or 1 foot behind sidewalk or on city side of property line, as directed by City Engineer.

G. Install setter no closer than 24" of ground surface.

H. Lids shall be flush with top of sidewalk elevation.

3.06 DISINFECTION OF CULINARY WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 02675.

3.07 TESTING OF WATER PIPING SYSTEMS

A. Test pipeline system in accordance with Section 02660.

3.08 TRACER WIRE INSTALLATION

A. Copper tracer wire to be installed the total length of pipeline with a branch to each tee, cross, and fire hydrant. (See Standard Drawing):

1. Copper wire should be #12 gauge single strand jacketed wire, manufactured for underground service.

2. Wire shall be continuous without breaks. Splices shall be made with petroleum filled wire nut caps.

3. Tracer Wire to be secured to top of pipe at a minimum of every Ten feet, by means other than metallic.
4. Tracer Wire should be brought up in all fire hydrants in culinary water lines, and in the first lateral of each street for pressurized irrigation (not to exceed 500 feet).

B. Perform a continuity test in the presence of the City Inspector prior to paving.

3.09 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with section 02250.

B. If tests indicate Work does not meet specified requirements, remove work, replace, and retest.

END OF SECTION

SECTION 02675

DISINFECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Disinfection of potable water system.

B. Test and report results.

1.02 REFERENCES

A. AWWA A100: AWWA Standard for Water Wells.

B. AWWA B300: AWWA Standard for Hypochlorites.

C. AWWA B301: AWWA Standard for Liquid Chlorine.

D. AWWA C651: AWWA Standard for Disinfecting Water Mains.

E. AWWA C652: AWWA Standard for Disinfection of Water-Storage Facilities.

F. State of Utah: Public Drinking Water Regulations, Part 2, Section 12.

1.03 DEFINITIONS

A. Disinfectant Residual: The quantity of disinfectant in treated water.

B. ppm: Parts per million.

1.04 SUBMITTALS

A. Contractor's evidence of experience in disinfection.

B. Bacteriological laboratory's evidence of certification.

C. Disinfection Report: 3 copies including:

1. Date issued.

2. Project name and location.

3. Treatment contractor's name, address and phone number.

4. Type and form of disinfectant used.

5. Time and date of disinfectant injection started.

6. Time and date of disinfectant injection completed.

7. Test locations.

8. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.

9. Time and date of flushing start.

10. Time and date of flushing completion.

11. Disinfectant residual after flushing in ppm for each outlet tested.

D. Bacteriological Report: 3 copies including:

1. Date issued.

2. Project name and location.

3. Laboratory's name, certification number, address, and phone number.

4. Time and date of water sample collection.

5. Name of person collecting samples.

6. Test locations.

7. Time and date of laboratory test start.

8. Coliform bacteria test results for each outlet tested.

9. Certification that water conforms or fails to conform to bacterial standards of State of Utah public drinking water regulations.

10. Bacteriologist's signature.

1.05 QUALITY ASSURANCE

A. Affidavit by manufacturer that disinfectant conforms to AWWA and NSF standards.

B. Bacteriological Laboratory: Certified by State of Utah.

1.06 PRODUCT HANDLING

A. Store and protect disinfectant in accordance with manufacturer's recommendations to protect against damage or contamination. Do not use unsuitable disinfectant.

B. Follow all instruction labeling for safe handling and storage of disinfectant materials.

1.07 REGULATORY REQUIREMENTS

A. Conform to State of Utah public drinking water regulations.

PART 2 PRODUCTS

2.01 DISINFECTANT

A. Liquid Chlorine: AWWA B301 with chlorine 99.5 percent pure by volume.

B. Sodium Hypochlorite: AWWA B300 with not less than 100 grams per liter available chlorine.

C. Calcium Hypochlorite: AWWA B300 with 65 to 70 percent available chlorine by weight in granular form.

D. Powder, tablet, or gas according to manufacturer's specification.

PART 3 EXECUTION

3.01 PREPARATION

A. Disinfect the potable water pipelines prior to pressure testing if connected to an existing system.

B. Unless waived by the City Engineer for retrofit/reconstruction projects, all water system components (including service connections) within the section of pipeline being tested must be complete before the testing is performed.

C. Ensure that the pipeline to be disinfected is isolated from the existing system.

D. Follow all guidelines set forth in AWWA C651.

3.02 DISINFECTION OF WATER LINES

A. Use one of the approved chlorination methods in AWWA C651.

B. Chlorination shall provide a minimum of 25 ppm residual after 24-hours contact in the pipeline. In general, this residual may be expected with an application of 50 ppm although some conditions may require more.

C. If calcium hypochlorite granules are used, granules shall be placed at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500 foot intervals. The quantity of granules shall be shown in table below, where D is the inside diameter in feet.

PIPE SIZE (inches)	CALCIUM HYPOCHLORITE GRANULES (oz)	CALCIUM HYPOCHLORITE GRANULES (g)
4	1.7	48
6	3.8	108
8	6.7	190
10	10.5	298
12	15.1	428
14 and larger	D^2 x 15.1	D^2 x 428

D. During the process of chlorinating the pipeline all valves and other pipeline appurtenances shall be operated several times to provide sufficient contact with the chlorinating agent.

E. See Section 02660 3.02 H for requirements of potable service lines.

3.03 DISINFECTION OF CULINARY WELLS

A. Use one method defined under AWWA A100 as approved by City Engineer.

B. Do not start disinfection until well is thoroughly cleaned.

C. Use a disinfecting solution containing a minimum of 50 ppm residual chlorine.

3.04 DISINFECTION OF WATER STORAGE RESERVOIRS

A. Use one method defined under AWWA C652, as approved by City Engineer.

B. Do not start disinfection until water storage tank is thoroughly cleaned.

C. Provide and use necessary safety equipment for workers in contact with disinfectant or gasses they may produce.

3.05 QUALITY CONTROL - BACTERIOLOGICAL TEST

A. No samples for testing shall be taken sooner than 24 hours after system flushing.

B. At least one set of samples shall be collected from every 1,200 feet of new water main, plus one set from the end of the line and at least one set from each branch. Sample water at each of the following locations, as applicable:

1. Where water enters system, including each source.

2. Ends of piping runs.

3. Remote outlets.

C. Analyze water samples in accordance with State of Utah requirements. Two (2) samples, 24 hours apart, will be taken at each location.

D. If bacteriological test proves water quality to be unacceptable, repeat system treatment.

E. Water systems shall not be accepted or placed into service until a negative bacteriological test is made on water taken. Repeat dosing as necessary until a negative test is obtained. Provide a copy of the negative bacteriological test to City Engineer.

F. The Public Works Department will perform bacteriological sampling on all new water distribution system infrastructure intended to become part of the community's water system. All locations for sampling will be determined by water department personnel. The cost for each sample will be billed to Developer / Contractor. Payment for testing shall be made before results will be released by the City.

3.06 FLUSHING AND DISPOSAL OF DISINFECTANT

A. After the 24 hour retention period, flush the chlorinated water from the main until chlorine measurements show the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.

B. Legally dispose of disinfecting water and ensure no chlorine buildup or damage to the environment. Unless otherwise approved by the Public Works Director, disinfecting water shall not be discharged onto the ground. Disinfecting water shall normally be discharged into a holding container or water truck where the chlorine concentration level shall be brought down to an acceptable level prior to discharge per the direction of the Public Works Director through the use of de-chlorination tablets or other acceptable reducing agents.

C. Failing to flush the line may require Contractor to replace all gaskets and valves within the system at Contractor's expense.

D. Flushing shall be accomplished through hydrants or, if a hydrant does not exist at the end of the line, the Contractor shall install a tap of sufficient size to provide for a 2.5 foot per second flushing velocity in the line. When flushing water service lines, all water meter vault inlets and/or ball valves shall be flushed of all disinfectant.

E. The following flow quantity required to provide a 2.5 foot per second flushing velocity:

PIPE SIZE (In.)	FLOW (gpm)
4	100
6	220
8	390
10	610
12	880
16	1567

END OF SECTION

SECTION 02720

SANITARY SEWER AND STORM DRAIN SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements for pipe material and installation in sewer and drainage collection systems. All materials and workmanship shall strictly comply with the Utah State Plumbing Code.

1.02 REFERENCES

A. Section 02660: Pipeline Testing.

B. AASHTO-291: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

C. ASTM D 1248: Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.

D. ASTM D 2239: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter.

E. ASTM D 2321: Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.

F. ASTM D 2657: Standard Recommended Practice for Heat Joining of Thermoplastic Pipe and Fittings.

G. ASTM D 2774: Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.

H. ASTM D 3261: Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

I. ASTM D 3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

J. ASTM F 405: Standard Specification for Corrugated High Density Polyethylene (PE) Tubing and Fittings.

K. ASTM F 667: Standard Specification for Large Diameter Corrugated High Density Polyethylene Tubing and Fittings.

L. ASTM F 1055: Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.

M. ASTM C 1479: Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations.

1.03 DEFINITIONS

A. Standard Dimension Ratio (SDR): Average diameter of pipe divided by the minimum wall thickness. The diameter may be either inside or outside measurement depending upon which standard is referenced.

B. Code Designation: A rating of polyethylene pipe materials by the Plastic Pipe Institute. The designation PE 3408 designates the type of plastic pipe (PE), the grade (34), and the hydrostatic design stress measured in units of 100 psi (08).

1.04 SUBMITTALS

A. Manufacturer's affidavit certifying product was manufactured, tested and supplied in accordance with applicable references in this section together with a report of the test results and the date each test was completed.

PART 2 MATERIALS

2.01 REINFORCED CONCRETE SEWER AND STORM DRAIN PIPE

A. Reinforced concrete pipe shall be used for all sanitary sewers and storm drains where installation does not provide a cover of at least 2 feet over the top of the pipe.

B. Reinforced concrete pipe shall comply with the requirements of ASTM C76-109 with bell and spigot rubber gasket type joints for sanitary sewers and the alternate option of tongue and groove mortar joints for storm drain lines.

~~C. Minimum storm drain size is 18 inches, minimum sewer main size is 8 inches.~~

2.02 ~~CORRUGATED METAL STORM DRAINCULVERT PIPE~~

~~A. Galvanized or aluminized steel~~

~~1. Material according to ASTM A-929.~~

~~2. Pipe according to AASHTO M-36.~~

~~3. Design according to ASTM A-796.~~

~~4. Installation according to ASTM A-798.~~

~~B. Asphalt dipped according to ASTM A-849.~~

~~C. Pipe shall be Galvanized, Aluminized, or Asphalt dipped as required by City Engineer.~~

~~D. Minimum No. 14 gage plate thickness.~~

~~E. Pipe must be a minimum of 18 inches.~~

2.03 SUBSURFACE DRAIN PIPE

A. Pipe

1. Perforated PVC (ASTM D-1784).

2. Perforated Concrete Sewer Pipe (AASHTO M-86 & M-170).
3. Corrugated polyethylene piping (ASTM F-405-77a).

B. Bedding shall be drain rock.

2.04 PLASTIC SEWER PIPE

A. This specification covers rigid polyvinyl chloride pipe and fittings, hereinafter called PVC pipe and PVC fittings. The pipe and fittings shall meet or exceed all of the requirements of ASTM Specification D3034 and ASTM F679.

B. Samples of pipe, physical and chemical data sheets shall be submitted to the City Engineer for approval and his approval shall be obtained before pipe is purchased.

C. This pipe shall be homogeneous throughout and free form cracks, holes, foreign inclusions or other defects. The pipe shall be as uniform as commercially practical in color.

D. Physical Requirements

1. All PVC sewer pipe and fittings shall be made from clean, virgin, Type 1, Grade 1, PVC and minimum SDR-35 (PS46), conforming to ASTM resin specification D-1784. SDR-26 (PS115) or thicker (including fittings) shall be used for depths exceeding 12 ft measured from the top of the pipe, unless otherwise approved by the City Engineer.

~~2. All sewer pipe installed between manholes shall be of the same SDR and/or classification and shall be the highest classification required along the section.~~

~~3.~~2. All pipe joints shall be bell and spigot type with rubber ring gasket to permit expansion and contraction.

~~4.~~3. Pipe and fittings must be assembled with a nontoxic lubricant.

~~5.~~4. All pipe shall be less than 20 feet in length.

~~6.~~5. Spigot ends will have 15° tapered end with a memory mark around the diameter of the pipe to indicate proper insertion depth.

~~7.~~6. Wyes shall be of the same material as the pipe and in no case shall have thinner walls than that of the pipe furnished.

~~8.~~7. Sample wyes must be submitted for the City Engineer's approval and his approval must be obtained before purchase of the wyes.

~~9. Minimum sewer main line size is 8 inches.~~

2.05 HIGH DENSITY POLYETHYLENE STORM DRAIN PIPE (HDPE)

A. Smooth pipe systems

1. Material: Polyethylene code designation PE 3408 as rated in ASTM D 2239 with a minimum ASTM D 3350 cell classification of 345434C, and an SDR or pressure class rating as indicated.

2. Fittings: Manufactured of same resin as the pipe.

3. Joints:
   a. Thermally welded butt fusion in accordance with ASTM D 3261.
   b. Flanged in accordance with ASTM D 2657.

c. Ultra high molecular weight electrofusion tape with a polyethylene coupler meeting ASTM F1055 requirements.

4. Nuts and Bolts: Carbon steel machined heavy hex heads, Class 2 fit in accordance with ASTM A 307; Grade B, threads in accordance with ASME B1.1 Tape wrap steel materials for protection against corrosion after piping installation.

B. Corrugated Pipe Systems

1. Material: "High density polyethylene pipe shall be smooth lined and meet the requirements of AASHTO M294 Type S."

2. Material: Polyethylene, in accordance with ASTM F 405 or ASTM F 667, Type III, Category 4 or 5, Grade P33, Class C, or Grade P34, Class C as defined by ASTM D 1248.

3. Material: Polypropylene compound for pipe and fitting production shall be impact modified copolymer meeting the material requirements of ASTM F2881, Section 5 and AASHTO M330, Section 6.1

4. Fittings: Manufactured of same resin as the pipe.

a. Polypropylene fittings shall conform to ASTM F2881 or AASHTO M330. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

5. Joints: Bell and Spigot Type.

a. Polypropylene joints shall be joined using bell & spigot joints meeting the requirements of ASTM F2881 or AASHTO M330. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477.

C. Pipe Markings

1. Mark pipes continuously to identify:
   a. Manufacturer's name (or trade mark) and code.
   b. Nominal size.
   c. Polyethylene code designation.
   d. SDR rating. (Not applicable to corrugated polyethylene.)
   e. Date of manufacture.
   f. Pressure class. (Not applicable to corrugated polyethylene.)
   g. ASTM or AWWA designation number.

~~D. All storm drain sewer pipe must be a minimum of 18-inch in diameter for main lines.~~

2.06 SEWER LATERAL CONNECTIONS

A. All sewer lateral connections to new sewers shall be through preformed wyes.

B. Connections to existing sewers will be done with a sewer tapping machine as shown in Standard Drawings and use a Romac CB sewer saddle. "Inserta Tee" may be used only with prior approval from the Public Works Director and only on sewer laterals 10" and larger. All installations of "Inserta Tee" must be witnessed, inspected, and certified by authorized City agents.

C. Sewer laterals and fittings shall be constructed of a minimum of SDR 35 PVC. When SDR 35 PVC is used, a poured-concrete support, at least 4-inches thick and at least 4-inches beyond the

sides of the fitting, shall be placed under the wyes. SDR-26 PVC shall be used for depths exceeding 12 ft, measured from the top of pipe, unless otherwise approved by the City Engineer. All laterals shall have a minimum size of 4-inches.

~~D. 6-inch laterals shall connect into the main line through sewer manholes.~~

PART 3 EXECUTION

3.01 PIPE LAYING

A. All sewer pipe installation shall proceed up grade on a stable foundation with joints closely and accurately fitted.

~~1. Grade shall not be less than slope required for a full pipe to maintain 2 foot per second velocities.~~

B. Gaskets shall be fitted properly in place and care shall be taken in joining the pipe units to avoid twisting of gaskets.

C. Joints shall be clean and dry and a joint lubricant, as recommended by the pipe supplier, shall be applied uniformly to the mating joint surfaces to facilitate easy positive joint closure.

D. If adjustment of position of a pipe length is required after being laid, it shall be removed and rejointed as for a new pipe.

E. When laying is not in progress, the ends of the pipe shall be closed with tight fitting stopper to prevent the entrance of foreign material.

F. In addition to the above requirements all pipe installation shall comply to the specific requirements of the pipe manufacturer.

G. HDPE shall be installed as per manufacturer's instructions, ASTM D 2321 or ASTM D 2774 as applicable.

1. A minimum of 2 ft bury depth under paved areas for HDPE and PP pipe is required. Installation under non-paved areas, shall be installed per manufactures recommendations

H. Pipe shall be air tested per state regulations.

I. Concrete collars are required at all storm drain pipe connections to manholes or inlets. The concrete collar shall seal the storm drain pipe to the manhole or inlet.

J. All sewer repairs or joints that abut without a bell and spigot or mechanical joint shall use an approved gasketed solid sleeve, a"Fernco Stainless Steel Shear Ring", or a "Shear Guard" with concrete support saddle.

3.02 GRAVEL FOUNDATION FOR PIPE

A. Refer to Section 02225.

3.03 BEDDING

A. Refer to section 02225.

3.04 COMPACTION

A. Refer to Section 02250.

END OF SECTION

SECTION 02772

PONDS & SUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clear pond site and dispose of debris and unsuitable material.

B. Materials for dike.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures of Highway Construction Purposes.

1.03 SUBMITTALS

B. Laboratory analysis report of fill to be used in dikes in accordance with the sections referenced in this section and AASHTO M 145.

1.04 PERFORMANCE REQUIREMENTS

A. Protection: Do not contaminate embankment materials with debris or unsuitable material. Protect existing improvements, trees, structures or other items from damage during construction.

B. Dust Control: Thoroughly moisten all surfaces to prevent dust being a nuisance to the public, neighborhood, and concurrent performance of separate work on site.

C. Testing: 1 density test for each 100 square yard lift of backfill compacted in the Work.

1.05 JOB CONDITIONS

A. Do not interrupt surface drainage systems at site without City Engineer's approval.

B. Correct any damage caused by runoff or erosion during construction.

PART 2 PRODUCTS

2.01 BACKFILL SOILS

A. Native Fill: In accordance with Section 02205.

B. Common Fill: In accordance with Section 02205.

C. Select Fill: In accordance with Section 02206.

D. Impermeable Embankment: A-6 (CL) or A-4 (CL) material as defined in AASHTO M 145 with a plasticity index of at least 10, and a coefficient of permeability of less than 7 x 10-6 cm/sec.

E. Obtain City Engineer's approval of the material to be supplied prior to beginning construction.

2.02 GEOTEXTILE MATERIALS

A. Nonbiodegradable sheet material that is inert to soil chemicals, resistant to molds, mildew, acids and alkalies, and within a pH range of 3 to 12.

B. Sumps and Drain Fields: Geotextiles used as a separation layer between angular stone and fill or between stone and sump manhole/perforated pipe to prevent fines intrusion shall be AASHTO M288 Class 2 Non-Woven material (i.e. Mirafi 180 N, Contech C-70NW, etc.)

PART 3 EXECUTION

3.01 DETENTION AND RETENTION PONDS & SUMPS

~~A. Ponds shall be designed as attractive and usable spaces; i.e. depths 5 feet or less where feasible, appropriate landscaping, and elements that eliminate standing water and low flow impacts as required by the City Engineer.~~

~~B. Freeboard: 2 foot on dikes, 1 foot on excavations.~~

~~C. Slopes: 5:1 maximum side slopes on two or more sides, 4:1 maximum slopes on remaining sides, minimum 1% bottom slope.~~

~~D. Landscaping: Grass or other suitable landscaping materials should be used and irrigation systems installed. Developers will be required to escrow funds to landscape ponds when located on private lots for future reimbursement to the owner who completes the landscaping.~~

~~E. Easements: Provide minimum 20-foot easements for pipelines and access to maintain ponds. When located on private property, provide an easement over the pond area and 10 feet beyond the pond top of slope perimeter. Pond easements shown on subdivision plats shall be labeled with dimensions to facilitate relocation.~~

~~F. Detention ponds shall be designed for a minimum of a 25 year, maximum storm during a 24 hour period, a release rate of 0.1 cfs per acre, and provisions for an emergency overflow that will avoid flood damage to surrounding properties.~~

~~G. Retention ponds will be allowed if no suitable discharge point exists for conveying storm water away from the site. These ponds shall be designed for a minimum of a 100 year, maximum storm during a 24 hour period with appropriate features for maintaining water quality and percolating water into the ground. Percolation test results shall be provided and ponds shall be designed with sumps to completely drain within a 72 hour period unless otherwise approved by the City Engineer.~~

~~H. Pond inlets and outlets shall have trash racks or grates installed. A storm water pretreatment device, approved by the City, shall be installed upstream of the pond or sump inlets. When required, developments shall install a "Stormceptor" or approved equal pollutant removal device per City policy. When "Stormceptor" units are not required, a "Snout" or approved equal oil separator device shall be installed.~~

I. ~~Soil infiltration rates shall be verified by a certified percolation test at or near the location(s) which require storm water infiltration into the ground. A safety factor of two (2) shall be added to the final stabilized percolation rate used in the calculations to size storm water facilities.~~

3.02 EXCAVATION AND PREPARATION

A. In accordance with Section 02225.

B. Remove and stockpile all topsoil material for later placement on the outer dike surfaces.

C. Level areas where dikes are to be constructed. Unless indicated otherwise scarify the top 12" of the base material and compact to a minimum Standard Proctor of 92 percent in accordance with Section 02250.

3.03 EMBANKMENT CONSTRUCTION

A. Compact backfills to an average Standard Proctor density of 96 percent in accordance with Section 02250 with no single density reading less than 92 percent.

B. Place embankment materials in lifts consistent with the compaction equipment used.

C. Do not construct embankment with frozen or unapproved material.

D. Top of bank shall not be less than 10' wide with a 2% slope toward pond.

E. Overflow shall be provided by safety weir or a 5 fps max overflow outlet.

3.04 TOLERANCES

A. Dike Surface: Plus or minus 1" from true line and grade.

B. Dike Width: Plus or minus 6" from true line and grade.

3.05 FINISHING

A. After pond and slopes have been constructed to the lines and grades indicated, spread topsoil 6" deep on pond surfaces and grade to uniform slope.

B. Pond shall be landscaped and irrigated as approved by the City Engineer.

C. Dispose of excess or unsuitable materials and level all affected areas.

D. Leave site free of excess fill material and debris.

END OF SECTION

SECTION 02832

FENCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Chain Link Fence.

B. Wood Fence.

C. Construction Fence.

1.02 RELATED SECTIONS

A. Section 03304: Concrete anchorage for posts.

1.03 REFERENCES

A. ASTM A116: Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric.

B. ASTM A123: Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A392: Zinc-Coated Steel Chain-Link Fence Fabric.

D. ASTM F567: Installation of Chain-Link Fence.

E. ASTM F573: Residential Zinc-Coated Steel Chain Link Fence Fabric.

F. ASTM F1083: Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence structures.

G. ASTM F1234: Protective Coating on Steel Framework for Fences.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM F567.

PART 2 PRODUCTS

2.01 CHAIN LINK FENCE MATERIAL AND COMPONENTS

A. Framing (Steel): ASTM F1083 Schedule 40 galvanized steel pipe, welded construction, coating conforming to ASTM F1234 Type A on pipe exterior and interior.

B. Fabric Wire (Steel): ASTM A392 zinc coated wire fabric.

C. Concrete: Type specified in Section 03304.

D. Line Posts: 1.9 inch O. D. galvanized pipe at 2.72 lbs per foot.

E. Corner, Gate, Pull, and Terminal Posts: 2.4 inch O.D. galvanized pipe at 2.65 lbs. per foot.

F. Top Rail: 1.4 inch diameter, plain end, sleeve coupled.

G. Brace Rail: Minimum 1.6 inch O.D. galvanized pipe and adjustable 3/8 inch truss

H. Tension Wire: 7 gage, Bottom only.

2.02 WOOD FENCE MATERIAL AND COMPONENTS

A. Slats: Redwood, cedar, combed spruce or other wood covering acceptable to the City Engineer or his representative.

B. Bottom and top rail: Minimum 2x4x8 cedar stud.

C. Corner, Gate, End, or Line Posts: Minimum size 4x4 cedar wood post.

D. Concrete: Type specified in Section 03304.

2.03 CONSTRUCTION FENCE MATERIAL AND COMPONENTS

A. Material:

1. Fabric to be wire mesh which shall conform to AASHTO Designation M-279, nominal 0.9999-inch Farm Grade with standard six (6) inch graduated spacing. The wire mesh shall have a Class 1 zinc coating.

2. Corner, gate, end or line posts shall be painted metal tee, U or Y channel, angular, or other approved shapes 6'6" in length.

PART 3 EXECUTION

3.01 CHAIN LINK FENCE INSTALLATION

A. Line Pole Spacing, Straight run, tangents or curves:

1. Uniform spacing. Maximum 10 feet.
2. 100-foot radius or less, maximum 5 feet.
3. 100 to 200 foot radius, maximum 6 feet.
4. 200 to 500 foot radius, maximum 8 feet.

B. Set posts plumb, in concrete footings with top of footing 2 inches above finished grade. Slope top of concrete for water runoff.

C. Line Post Footing: Minimum 6 inches of concrete below bottom of post, 8 inches in diameter.

D. Corner, Gate, Pull, and Terminal Post Footing: Minimum 6 inches of concrete below bottom of post, 10 inches in diameter. Changes in line of more than 30 degrees shall be considered as corners.

E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.

F. Provide top rail through line post tops and splice with 6 inch long rail sleeves.

G. Do not stretch fabric until concrete foundation has cured 7 days.

H. Stretch fabric between terminal posts or at intervals of 500 feet maximum, whichever is less.

I. Position bottom of fabric 2 inches above finished grade and on a straight grade between posts. Excavate if necessary, fill only with approval of City Engineer.

J. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.

K. Fence fabric shall be placed on road side of posts unless otherwise indicated.

3.02 WOOD FENCE INSTALLATION

A. Construction Methods: The cedar posts shall be set true to line and grade in concrete bases at least two (2) feet in depth. All posts shall be sound and free from all decay, splits, multiple cracks, or any other defect which would weaken the posts or otherwise cause them to be structurally unsuitable for the purpose intended.

B. The maximum distance between posts in any section shall not exceed eight (8) feet. The top and bottom railing shall be securely fastened to the posts with galvanized nails or other acceptable means. Changes in line of 30 degrees or more shall be considered as corners. A minimum of six (6) inches of concrete shall be provided below the bottom of each post. End posts, corner posts, and gate posts shall have a concrete base at least twelve (12) inches in diameter. Bases for line posts shall also be twelve (12) inches in diameter.

C. Fence slats shall be placed on the roadway side of posts unless otherwise specified. The slats shall be placed approximately one (1) inch above the ground, and on a straight grade between posts by excavating high points of the ground. Filling depressions will be permitted only upon approval of the City Engineer. The slats shall be sound and free from all major decay or defects which would weaken or otherwise cause them to be unsuitable for fence slats. Fastening to top and bottom railing shall be done with two (2) galvanized nails and screw at both the top and bottom rail.

3.03 CONSTRUCTION FENCE INSTALLATION

A. Construction Methods:

1. Metal fence posts shall be a spaced a maximum interval of sixteen (16) feet. Posts spacing measurements shall be made parallel to the ground slope. All posts shall be placed in a vertical position. Metal posts may be installed by driving, if this can be done without damage to the post. Otherwise, they shall be installed to the specified depth (2'6") in larger drilled or dug holes and backfilled and compacted.

2. Corner posts shall be braced in two directions. End and gate posts shall be braced in one direction.

3. Wire mesh fabric shall be drawn tight enough to eliminate all sag without causing the "tension crimps" to fail to function.

4. Any high points along the ground surface which interfere with the placing of wire mesh shall be excavated to provide at least two (2) inches of ground clearance.

5. Every alternate lateral wire in the mesh fabric shall be fastened to each post by means of a clamp.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel bars, wire fabric or rod mats for cast-in -place concrete.

B. Support chairs, bolsters, bar supports, and spacers for supporting reinforcement.

1.02 REFERENCES

A. AASHTO M 254: Standard Specification for Corrosion Resistant Coated Dowel Bars.

B. ACI 301: Specifications for Structural Concrete for Buildings.

C. ACI 315: Details and Detailing of Concrete Reinforcement.

D. AASHTO M-32: Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

E. AASHTO M-55: Standard Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.

F. AASHTO M-55: Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

G. ASTM A 706: Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.

H. AWS D1.1: Structural Welding Code Steel.

I. AWS D1.4: Structural Welding Code Reinforcing Steel.

J. CRSI Document: Manual of Standard Practice.

1.03 SUBMITTALS

A. Shop drawings.

1. Indicate sizes, spacing, locations, and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting, and spacing devices.

2. When required by Engineer, prepare shop drawings by an engineer who complies with Utah licensing law and is acceptable to Engineer.

1.04 QUALITY ASSURANCE

A. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice.

B. Comply with ACI 301.

C. Welders: AWS D1.1 or AWS D1.4 as applicable.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcing Steel: In accordance with AASHTO M-31 or ASTM A 706 deformed bars, grade and type as indicated, including supplementary requirements S1, either uncoated or as indicated. When no grade is indicated use 60 grade steel. Use ASTM A 706 steel if welding is indicated or allowed.

B. Welded Steel Wire Fabric: In accordance with AASHTO M-55 plain type; in flat sheets or coiled rolls either uncoated or as indicated.

C. Stirrup Steel: In accordance with AASHTO M-32.

D. Plain Dowel Bars for Expansion Joints: In accordance with AASHTO M-31, Grade 60.

1. Provide metal dowel cap at one end of dowel to permit longitudinal movement of dowel within concrete section. Design caps with 1 end closed.

2. Provide for movement equal to joint width plus ½".

3. For load transfer bars, paint with 1 coat of lead or tar paint conforming to AASHTO M 254 and coat ½ with grease.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type or a patented system accepted by Engineer.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

2.03 FABRICATION

A. Fabricate reinforcement in accordance with ACI, providing for the concrete cover specified in Section 03304.

B. Locate reinforcing splices not indicated on drawings at points of minimum stress. Indicate location of splices on shop drawings.

C. Weld reinforcing bars in accordance with AWS D1.4.

PART 3 EXECUTION

3.01 PLACING

A. All reinforcement to be free of loose mill scale, loose or thick rust, dirt, paint, oil or grease.

B. Place all reinforcement in the exact position indicated. With tie wire tie bars together at alternate intersections.

C. Maintain the distance from vertical forms and between layers of reinforcement by means of prefabricated chairs, ties, hangers, or other approved devices. Placing and fastening of reinforcement in each section of the Work must be approved by Engineer before concrete is

placed.

D. Overlap sheets of metal mesh one square plus 6" to maintain a uniform strength. Securely fasten at the ends, edges, and support to maintain clearances.

E. Support reinforcing steel of formed flat slabs with metal chairs, precast concrete blocks or other slab bolsters. Size chairs or bolsters to position the steel in the exact location indicated. Space chairs for supporting the top steel and bolsters for supporting the bottom steel not more than 5 feet on centers in each direction. Plastic or epoxy coat that portion of the metal support in contact with the forms to prevent rust. Tie down deck steel to beams or forms at regular intervals of not more than 5 feet on centers along the beams or forms to prevent movement of the steel during placement of the concrete.

3.02 SPLICING

A. Furnish all reinforcement in the full lengths indicated unless otherwise permitted. Splicing of bars, except where indicated is not permitted without written approval from Engineer. Stagger splices where possible.

B. Unless indicated otherwise, overlap reinforcing bars a minimum of 30 diameters to make the splice. In lapped splices, place the bars and wire in such a manner as to maintain the minimum distance for clear spacing to the surface of the concrete.

C. Do not use lap splices on bars greater in diameter than No. 11 unless approved by Engineer.

D. Weld reinforcing steel only if indicated or if authorization is made by Engineer in writing. Weld in conformance to AWS D1.4.

E. Do not bend reinforcement after embedding in hardened concrete, unless permitted by Engineer.

F. Do not permit reinforcement or other embedded metal items bonded to the concrete, to extend continuously through any expansion joint, except dowels in floors bonded on only one side of joints.

3.03 PLACING EMBEDDED ITEMS

A. Place all sleeves, inserts, anchors and embedded items prior to concrete placement. Fill voids in embedded items temporarily with readily removable material to prevent entry of concrete.

B. Give all trades whose work is related to the concrete section ample notice and opportunity to introduce and/or furnish embedded items before concrete placement.

END OF SECTION

SECTION 03216

CONCRETE STRUCTURES, DRIVEWAY, SIDEWALK, CURB AND GUTTER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Materials, installation and tolerances for Portland cement concrete ramps, sidewalk, curbs, gutters, and driveway approaches.

1.02 SUBMITTALS

A. Concrete mix design must be submitted 48 hours before placement and physical-chemical analysis of aggregates, in accordance with Section 03304.

B. Test reports: Submit test reports as requested by Engineer verifying compliance with standards.

PART 2 PRODUCTS

2.01 BACKFILL MATERIALS

A. Common fill, in accordance with Section 02205.

B. Select fill, in accordance with Section 02206.

2.02 MATERIALS: Materials used in Portland cement concrete and reinforcing of Portland cement concrete shall meet the following requirements:

A. In accordance with Section 03304.

B. Reinforcing Steel: All bar material used for reinforcement of concrete shall be intermediate grade steel conforming to the requirements of ASTM Designation A-15 and shall be deformed in accordance with ASTM Designation A-305.

C. Welded Wire Fabric: Welded wire fabric for concrete reinforcement shall conform to the requirements of AASHTO M-55.

2.03 FORMS

A. Forms shall be substantially built and adequately braced so as to withstand the liquid weight of concrete. All linings, studding, walling and bracing shall be such as to prevent bulging, spreading, or loss of true alignment while pouring and displacement of concrete while setting.

B. Metal forms shall be used for curb and gutter work except at curves and on winding roads, unless continuous lay down machine is used, or as directed by city engineer.

C. Continuous curb lay down machine shall be used on all winding roads over 100 feet long, unless otherwise approved by City Engineer.

D. All edge forms for sidewalk pavements, curbs and gutters shall be of sufficient rigidity and adequately braced to accurately maintain line and grade.

E. Forms for curved sections shall be so constructed and placed that the finish surface of walls,edge of sidewalks, or curbs and gutters will not deviate appreciably from the arc of the curve.

F. Exposed vertical and horizontal edges of the concrete in structures shall be chamfered by the placing of moldings in the forms.

2.04 PORTLAND CEMENT CONCRETE

A. In accordance with Section 03304.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces scheduled to receive concrete form work for defects that will adversely affect the quality of the work and be out of compliance with tolerances for installation of concrete material.

B. Do not start work until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. A minimum slope of 0.5 % shall be maintained on all concrete used for drainage purposes unless discussed with and approved by the City Engineer.

B. Joining to Existing Concrete: Cut existing concrete to provide a straight line. Make all cuts at score lines or expansion joints. If existing adjacent concrete slabs not scheduled for replacement are damaged by Contractor's operation, replace concrete at no additional cost to City. When connecting to existing curb and gutter or waterways, the existing concrete shall be drilled and dowels inserted to make the connection.

C. Subgrade: A soils classification, as determined by AASHTO T-27 shall be made on the proposed subgrade and the following preparation schedule shall be followed based on that classification:

Sidewalk, Curb and Gutter, and Driveway Subgrade Preparation Schedule

SOIL CLASSIFICATION	REQUIREMENT
A-1 or A-2	The subgrade shall be moistened and compacted in accordance with Section 02250.
A-3 or A-4	The subgrade shall be over excavated a minimum of 12inches and replaced with select granular material and be moistened and compacted in accordance with Section 02250.
A-5, A-6, or A-7	The subgrade shall be over excavated a minimum of 18 inches, replaced with select granular material, and be moistened and compacted in accordance with Section 02250.

1. No organic material, soft clay, spongy material, or other deleterious material will be permitted in the scarified or imported subgrade layer.

2. Rough subgrade shall be shaped and graded at least 6 inches beyond the back of the sidewalk to within a tolerance of 0.10 feet of design grade and drainage shall be maintained at all times.

D. Compaction: As indicated, in accordance with Section 02250.

E. Select Backfill: Unless indicated otherwise, provide 6" minimum of select fill below curbs, gutter, driveway approaches, alley intersections, and sidewalks.

F. Reinforcement and Embedded Items

1. Reinforcing steel shall be clean and free from rust, scale, paint, grease, or other foreign matter which might impair the bond. It shall be accurately bent and shall be tied to prevent displacement when concrete is poured. Reinforcing steel shall be held in place by only metal or concrete ties, braces and supports. No steel shall extend from or be visible on any finished surface.

2. The Contractor shall use concrete chairs for holding the steel away from the subgrade and spreader or other type bars for securing the steel in place. The spreader bars shall be not less than 3/8 inch in diameter.

G. Site Preparation

1. Before batching and placing concrete, all equipment for mixing and transporting the concrete shall be cleaned.

2. All debris and ice shall be removed from the places occupied by the concrete.

3. Forms shall be thoroughly wetted (except in freezing weather), or oiled.

4. Masonry filler units that will be in contact with concrete shall be well drenched (except in freezing weather).

5. Reinforcement shall be thoroughly cleaned of ice or other coatings.

6. Water shall be removed from spaces to receive concrete.

3.03 CONCRETE PLACEMENT

A. Place in accordance with Section 03310.

B. No concrete shall be placed until the surfaces have been approved by the City Inspector.

C. When placing concrete on earth surfaces, the surfaces shall be free from frost, ice, mud, and water.

D. When the subgrade surface is dry soil or pervious material, it shall be sprayed with water immediately before placing of concrete or shall be covered with a plastic membrane.

E. Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to re-handling or flowing.

F. The concrete placing shall be carried on at such a rate that the concrete is at all times plastic and flows readily into the corners of forms and reinforcing bars.

G. No concrete that is partially hardened or been contaminated by foreign material shall be deposited in the work, nor shall retempered concrete be used.

H. All concrete in structures shall be vibrator compacted during the operation of placing and shall be thoroughly worked around reinforcement and embedded fixtures and into the corners of forms.

I. Placing concrete in cold weather:

1. No concrete shall be placed where the air temperature is lower than 40 degrees Fahrenheit, at a location where the concrete cannot be covered or protected from the surrounding air.

2. When concrete is placed below a temperature of 35 degrees Fahrenheit the ingredients of the concrete shall be heated so that the temperature of the mixture shall not be less than 50 degrees or more than 100 degrees Fahrenheit.

3. Before mixing, the heated aggregates shall not exceed 175 degrees Fahrenheit.

4. Cement shall not be added while the temperature of the mixed aggregates and water is greater than 100 degrees Fahrenheit.

5. When there is likelihood of freezing during the curing period, the concrete shall be protected by means of an insulated covering to prevent freezing of the concrete for a period of not less than 7 days after placing.

6. Equipment for protecting concrete from freezing shall be available at the job site prior to placing concrete. Particular care shall be exercised to protect edges and exposed corners from freezing.

7. In the event heating is employed, care shall be taken to insure that no part of the concrete becomes dried out or is heated to temperatures above 100 degrees Fahrenheit.

8. The housing, covering, or other protection used shall remain in place and intact at least 24 hours after the artificial heating is discontinued.

9. For a period of five days concrete shall be kept between 40 degrees and 100 degrees F.

3.04 CONCRETE MIXING

A. Concrete mix design must be submitted 48 hours before placement.

B. The concrete shall be mixed until there is a uniform distribution of the materials.

C. Sufficient water shall be used in mixing concrete to produce a mixture which will flatten and quake when deposited in place, but not enough to cause it to flow or exceed the water - cement ratio.

D. In no case shall the quantity of water used cause the collection of a surplus in the forms.

E. Ready-mixed concrete shall be mixed and delivered in accordance with the requirements set forth in AASHTO M-157.

F. Concrete shall be delivered and deposited in its final position within 90 minutes after adding the cement and water to the mixture.

G. Washing out of mixer trucks shall not be permitted within City rights-of-way.

3.05 CONTRACTION JOINTS

A. Sidewalks shall have contraction joints with the following requirements:

1. Spacing shall match sidewalk width.

2. Approximately 3/16 inch wide.

3. Approximately one-fourth of slab thickness.

B. Curb and Gutter shall have contraction joints with the following requirements:

1. Ten (10) foot intervals.

2. Approximately 3/16 inch wide.

3. Approximately one-half of slab thickness.

3.06 EXPANSION JOINTS

A. One-half (½) inch expansion joints, extending the full thickness of the slab shall be provided at minimum 60 foot intervals in all sidewalks in addition to locations where sidewalks adjoin existing sidewalks, or driveways. One-half (½) inch expansion joints shall be provided at minimum 100 ft intervals in curb and gutter.

B. Material for one-half (½) inch expansion joints shall be as defined in AASHTO M-33. Rubber Expansion Joint Filler is also acceptable as long as it meets or exceeds ASTM D1751-04 and AASHTO M-213-95

C. Expansion joints shall be installed with the top approximately one-quarter (1/4) inch below the concrete surface and extend to the bottom of the concrete.

3.07 SEALING OF EXPANSION AND CONTRACTION JOINTS

A. The sealant shall be one of the following or approved equal:

1. Polysulfide polymer by Thiokol Chemical Corporation.

2. Sonolastic one-part sealant by Sonneborn-Contech Corporation.

B. As an alternative to the above sealant a continuous film of 4 mil thickness water-proof plastic may be placed under all concrete sidewalks, curbs and gutters on the low sides of streets.

C. Other erosion prevention measures may be used as an alternate if the developer first obtains written approval from the City Engineer concerning material types and installation procedure.

3.08 FINISHING

A. Refer to Section 03345 for finishing requirements.

B. Slabs:

1. The concrete shall be brought to established grade and screened, and then worked with a magnesium float.

2. The concrete shall be given a light broom finish.

3. Dry cement or a mixture of dry cement and sand should in no case be sprinkled on the surface to absorb moisture or hasten hardening.

4. Do not spray water on the surface of concrete to aid in finishing.

5. Surface edges of all slabs shall be rounded to a radius of one-half (½) inch.

C. Curb and Gutter:

1. Curb and gutter shall be slipped with a continuous curb machine where possible.

2. Where concrete must be poured in curb and gutter forms it shall be tamped and spaded to insure a thorough mixture, eliminate air pockets, and create uniform and smooth sides.

3. While the concrete is still green and not thoroughly set, the forms shall be removed and the front and top sides shall be finished with a float or steel trowel to make a uniform finished surface.

4. The top and face of the curb and also the top of the apron on combined curb and gutter must be finished true to line and grade and without any irregularities of surface noticeable to the eye.

5. The gutter shall not hold water to a depth of more than one-fourth (1/4) of an inch nor shall any portion of the surface or face of the curb or gutter depart more than one-fourth (1/4) of an inch from a straight edge ten (10) feet in length, placed on the curb parallel to the centerline of the street nor shall any part of the exposed surface present a wavy appearance.

D. Sidewalk:

1. The sidewalk shall not hold water to a depth of more than one-fourth (1/4) of an inch nor shall any portion of the surface or face depart more than one-fourth (1/4) of an inch from a straight edge ten (10) feet in length, placed on the side walk parallel to the centerline of the street nor shall any part of the exposed surface present a wavy appearance.

3.09 CURING

A. Apply curing compound in accordance with Section 03310 unless water cure is indicated. Water cure is required if concrete surface sealing compound is to be applied.

B. A chemical curing agent may be used, provided it is applied in accordance with the manufacturers specifications.

C. As soon as the concrete has hardened sufficiently to prevent damage, the finished surface shall be sprinkled with water and kept wet for at least three (3) days.

3.10 PROTECTION AND REPAIRS

A. See Section 03310 Concrete Work

END OF SECTION

SECTION 03304

PORTLAND CEMENT CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Portland cement concrete material requirements.

B. Mix design requirements.

1.02 REFERENCES

A. AASHTO T- 26: Standard Method of Test for Quality of Water to be Used in Concrete.

B. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.

C. ACI 211.3: Standard Practice for Selecting Proportions for No-Slump Concrete.

D. ACI 214: Recommended Practice for Evaluation of Strength Test Results of Concrete.

E. ACI 306: Cold Weather Concreting.

F. AASHTO M-157: Standard Specification for Ready-Mix Concrete.

G. AASHTO M-85: Standard Specification for Portland Cement.

H. AASHTO M-154: Standard Specification for Air-Entraining Admixtures for Concrete.

I. AASHTO M-194: Standard Specification for Chemical Admixtures for Concrete.

J. AASHTO M-295: Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

1.03 DEFINITIONS

A. Average Strength (f_{cr}): The required average strength for 3 consecutive strength tests which statistically assures no more than the permissible proportions of tests will fall below specified strength.

B. Specified Strength (f_c'): The indicated strength.

1.04 SUBMITTALS

A. Mix Design: Submit each proposed mix design 48 hours prior to use in the Work. Indicate whether mixes have been designed for pumping. Include the report the following information.

1. Water-cement ratio.

2. Proportion of materials in the mix.

3. Source and type of cement.

4. Analysis of water to be used.

5. Type and name of admixtures applied. Indicate when accelerating or retarding admixtures are to be used.

6. Slump, air content and temperature of samples.

7. Unit weight of fresh and dry light weight concrete.

1.05 QUALITY ASSURANCE

A. Use the same source and type of cement, air-entraining agent, water reducing agent, other admixtures, and aggregate.

B. In proportioning materials for mixing, use scales certified by the State of Utah. Do not use volume measurement except for water and liquid admixtures.

C. Do not change the quantity of cement per cubic yard.

D. Use of admixtures will not relax hot or cold weather placement requirements.

E. Ready-mixed concrete, in accordance with AASHTO M-157 and requirements in this Section.

F. Testing Concrete: In accordance with Section 01450.

PART 2 PRODUCTS

2.01 CEMENT

A. Type II (moderate sulfate resistance) or Type V (high sulfate resistance), in accordance with ASTM M-185.

2.02 WATER

A. Water used in mixing concrete shall be clean and free from oil, acid, salt, injurious amounts of alkali, organic matter or other deleterious substances. Clean, non-staining and not detrimental. Comply with AASHTO T 26.

2.03 AGGREGATES - GENERAL

A. Gravel, crushed slag, crushed stone, or other inert material, composed of hard, strong, durable particles free of injurious coatings.

B. The materials passing the No. 200 sieve shall not exceed 1.75 percent by weight in the combined coarse and fine aggregate.

2.04 ADMIXTURES

A. Air Entrainment: pH 2.0 maximum type in accordance with AASHTO M-152.

B. Water Reducing and Water Retarding Agents: In accordance with AASHTO M-194.

1. Type A: Water reducing.

2. Type B: Retarding.

3. Type C: Accelerating.

4. Type D: Water reducing and water retarding.

5. Type E: Water reducing and accelerating.

6. Type F: High range water reducing (super plasticizer). *

7. Type G: High range water reducing and retarding. *

*The relative durability factor of water reducing admixtures shall not be less than 90 and the chlorides content (as Cl-) shall not exceed 1 percent by weight of the admixtures.

C. Calcium Chloride: None allowed.

D. Pozzolan: Pozzolan conforming to the requirements of ASTM C 618, Class F, is allowed as Portland cement replacing agent under the following conditions:

1. If a blended aggregate passes an unmodified ASTM C 1293 test, use of a pozzolan is allowed. If aggregate does not pass ASTM C 1293, select a pozzolan (or blended cement, or both) and determine the effective dosage to meet one of the following tests:

   a. ASTM C 1567. The expansion of the cement-pozzolan-aggregate job-mix mortar bar is less than or equal to 0.10 percent at 16 days. Do not use the test if a lithium admixture is used in the job-mix.

   b. ASTM C 441. The expansion of a test mixture at 56 days is less than or equal to a control mixture prepared with cement with equivalent alkalis between 0.5 and 0.6 percent.

2. Do not replace more than 10 percent of the Portland Cement.

3. The ratio of replacement by weight of Pozzolan to cement shall be 1.25 to 1.0.

4. The minimum cement content shall be used in the design formulas before replacement is made.

5. Loss of ignition of pozzolan is less than 3 percent and the water requirement shall not exceed 100 percent.

6. All other requirements of this section still apply.

7. Mix designs including trial batches are required for each aggregate source and for each concrete class.

E. Fly Ash: Class F fly ash allowed as a cement replacement under the following conditions:

1. Before replacement is made, use the minimum cement content in the design formula to establish the water/cement ratio.

2. Replace up to 20 percent of the cement by weight on a one (1) part fly ash to one (1) part cement basis.

3. Submit to Engineer a quality history of the fly ash identifying a minimum of 20 of the most current ASTM C 618 analysis.

2.05 ENTRAINING AGENT

A. An air-entraining agent shall be used in all concrete exposed to the weather. The agent shall conform to AASHTO Designations M-152.

2.06 ACI MIX DESIGN

A. The amount by which the average strength of a concrete mix exceeds the specified strength shall be based upon no more than 1 in 100 random individual strength tests falling below the specific strength.

B. Proportion the materials in accordance with ACI 211.1, 211.2 or 211.3 as applicable to produce concrete having the following properties or limitations:

CONCRETE MIX PROPERTIES			
Properties	Concrete Class		
	4000	3000	2500
Specified Compressive Strength f_c' at 28 days, psi	4000	3000	2500
Compressive Strength at 7 days, psi[(a)]	2680	2010	1675
Water-cement ratio (by weight), max	0.44	(c)	
Cement content (94 lb. sacks of cement per cubic yard of concrete)	6.5	5.5	5
Entrained air content, (% by volume) based on aggregate size	Entrained air content, (% by volume) based on aggregate size	Entrained air content, (% by volume) based on aggregate size	Entrained air content, (% by volume) based on aggregate size
2"	4.0 to 7.0	4.5 to 7.5	3.0 to 6.0
1-1/2"	4.5 to 7.5	4.5 to 7.5	3.0 to 6.0
1"	5.0 to 7.5	4.5 to 7.5	3.0 to 6.0
¾"	5.0 to 7.5	4.5 to 7.5	3.0 to 6.0
Slump Range, in. [(b)]	2 to 4	2 to 4	2 to 4

(a) Used for monitoring purposes only.
(b) Not more than 8" after adding high range water reducer admixture (super-plasticizer) to verified 2" to 3" slump concrete.
(c) Specific to exposure conditions and finishing need

C. The use for each class of concrete is as follows:

1. 4000 psi: Reinforced structural concrete.

2. 4000 psi: Sidewalks, curb and gutter, cross gutters, concrete collars, pavements and unreinforced footings and foundations.

3. 3000 psi: Thrust blocks, anchors and mass concrete.

D. Water:

1. Sufficient water shall be added to produce concrete with the minimum practicable slump.

2. The slump of mechanically vibrated concrete shall not exceed 4 inches.

3. No concrete shall be placed with a slump in excess of 5 inches.

4. The maximum permissible water cement ratio (including free moisture of aggregates shall be 5 and 5 3/4 gallons per bag of cement respectively for 4000 and 3000 psi air entrained concrete.

2.07 HAND MIXING

A. Do not hand mix batches exceeding 0.5 cubic yards.

2.08 HEATING, WATER AND AGGREGATE

A. Do not allow products of fuel combustion to contact the aggregate.

B. Heat aggregate and mixing water to 150 degrees F. maximum. Heat aggregates uniformly.

C. Maintain mixed concrete temperature at time of placement between 60 and 90 degrees F.

D. Do not mix cement with water or with mixtures of water and aggregate greater than 90 degrees.

PART 3 EXECUTION

3.01 DELIVERY

A. Slump: Do not transport concrete to the work location if concrete is greater than permissible slump.

B. Discharge: After the introduction of mixing water to the cement and aggregates at the batch plant, discharge concrete from truck mixer within 90 minutes.

3.02 RE-TEMPERING

A. Adding Water: When concrete arrives at site with slump below specified, water may be added once if neither the maximum approved water/cement ratio nor the maximum slump is exceeded provided that the drum turns a minimum of 90 revolutions.

B. Super-plasticizer: Premeasure and add high range water reducers (super-plasticizer) in accordance with manufacturer's instructions. Add super-plasticizer at site using truck-mounted power injection equipment capable of rapidly and uniformly distributing the admixture to the concrete. Mix for a minimum of 3 minutes prior to discharge.

C. Re-tempering after delivery time with super-plasticizer is prohibited.

3.03 CONCRETE PLACEMENT

A. In accordance with Section 03310.

END OF SECTION

SECTION 03310

CONCRETE WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete placement operations for slabs on grade, slabs on fill, structural building frame, and other concrete components.

1.02 REFERENCES

A. AASHTO M-182: Standard Specification for Burlap Cloth Made from Jute or Kenaf.

B. ACI 301: Specifications for Structural Concrete for Buildings.

C. ACI 305: Hot Weather Concreting.

D. ACI 306: Cold Weather Concreting.

E. ACI 309: Standard Practice for Consolidation of Concrete.

F. ACI 315: Details and Detailing of Concrete Reinforcement.

G. AASHTO M-148: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

H. ASTM C-642: Standard Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete.

1.03 RELATED WORK

A. Manufacture of Portland cement concrete and delivery to site, in accordance with Section 03304.

1.04 SUBMITTALS

A. Record of Placed Concrete: Record date, location of pour, quantity, air temperature, and test samples taken.

B. Product name, type, and chemical analysis of the following as applicable:

1. Curing compound.

2. Sealing compound.

3. Chemical hardener.

1.05 QUALITY ASSURANCE

A. Rejection: Concrete work which fails to meet one or more of the following requirements, and which cannot be brought into compliance shall be rejected. Engineer shall determine appropriate modifications or payment adjustments to be made.

1. Appearance: Concrete exposed to view with defects which adversely affect appearance of specified finish.

2. Strength: Strength of concrete fails to comply with any of the following requirements:
   a. Low compressive or flexural strength.
   b. Reinforcing steel size, quantity, strength, position, damage, or arrangement at variance with requirements.
   c. Concrete which differs from required dimensions or location in such a manner as to reduce its strength or load carrying capacity.
   d. Inadequate protection of concrete from extremes of temperature during the early stages of hardening and strength development.
   e. Mechanical injury, construction fires, accidents, or premature removal of formwork likely to result in deficient strength development.
   f. Workmanship likely to result in deficient strength.

3. Slab Tolerance: Field quality control as specified herein.

4. Material Sources: In accordance with Section 03305.

1.06 WARRANTY

A. Repair or replace defective or damaged work at no additional cost to City.

PART 2 PRODUCTS

2.01 ACCESSORIES

A. Bonding Compound: Polyvinyl acetate or acrylic base, rewettable type.

B. Vapor Retarder: 10 mil thick clear polyethylene sheet. Type recommended for below grade application.

C. Forms: In accordance with Section 03216 and ACI 315.

D. Reinforcement: In accordance with section 03200.

E. Covering: Waterproof paper, polyethylene sheet or burlap cloth complying with AASHTO M 182, Class two.

2.02 CONCRETE SURFACE CURING COMPOUND

A. Liquid membrane, in accordance with AASHTO M-148

B. Type of Compound: Engineer to select.

1. Type 1, clear or translucent without dye.

2. Type 1-D, clear or translucent with red fugitive dye.

3. Type 2, white pigmented.

C. Class of Vehicle: Class A, no restrictions.

D. Performance Criteria of Compound: Compatible with sealing compound, if sealing compound is to be applied over concrete curing compound.

PART 3 EXECUTION

3.01 PREPARATION

A. All exposed corners shall be chamfered (3/4" x 3/4").

B. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, held securely, and will not impede placing concrete.

C. Do not allow construction loads to exceed member capacity.

D. Prepare previously placed concrete by cleaning with steel brush and applying bonding compound. Apply bonding compound in accordance with manufacturer's instructions.

E. At locations where new concrete is dowelled to existing work, drill holes in existing concrete work placed at ambient temperatures above 40 degrees F. Use of admixtures will not relax cold weather placement requirements.

F. Do not disturb reinforcement, inserts, embedded parts, and formed joints.

G. Do not break or interrupt successive pours such that cold joints occur.

H. Honeycomb or embedded debris in concrete is not acceptable.

3.02 JOINTS

A. Saw cut patterns where indicated. Saw cut control joints without raveling of the concrete. A maximum of 24 hours after pouring the concrete and prior to occurrence of any surface cracking.

3.03 CONSOLIDATION

A. In accordance with ACI 309.

B. Keep spare vibrator available during concrete placement operations.

3.04 FINISHING

A. Do not add water or retemper concrete unless Engineer's approval is secured.

B. Slab Finishing Tolerances: When tolerance is not indicated, use Straightedge Tolerance.

1. Very Flat Tolerance: True plane with maximum variation of 1/8-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

2. Flat Tolerance: True plane with maximum variation of 3/16-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

3. Straightedge Tolerance: True plane with maximum variation of 5/16-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

4. Bullfloated Tolerance: True plane with maximum variation of 1/2-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

C. Finishes: In accordance with Section 03345. When type of finish is not indicated, use following finishes as applicable:

1. Sidewalks, garage floors, and ramps: Broom or belt finish.

2. Exterior concrete pavement: Broom or belt finish.

3. Exterior platforms, steps, and landings, exterior and interior pedestrian ramps, not covered by other finish materials: Nonslip finish.

4. Surfaces intended to receive bonded applied cementitious applications: Scratched finish.

5. Surfaces intended to receive roofing, except future floors, waterproofing membranes, and roof surfaces which are future floors or sand bed terrazzo: Floated finish.

6. Floors and roof surfaces which are floors intended as walking surfaces or to receive floor coverings: Troweled finish.

7. Unpainted concrete surfaces not exposed to public view: Smooth as-cast form finish.

8. Unpainted concrete surfaces exposed to public view: Rubbed finish.

9. Concrete surfaces to receive paint or plaster: Grout cleaned finish.

D. Chemical Hardener: After completion of curing, apply chemical hardener in accordance with manufacturer's instructions to all interior floor slabs which are exposed in finished work and elsewhere as indicated. After final coat of chemical hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water. Do not place liquid floor hardener on floor areas scheduled to receive synthetic matrice terrazzo, or setting beds for tile, terrazzo, vinyl flooring, or like items.

3.05 CURING

A. General: Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete. Cure concrete by applying curing compound, by moisture curing, by moisture-retaining cover curing, or by combinations thereof.

B. Curing Compounds:

1. Apply curing compound to concrete slabs within 2 hours of completing final finishing operations. Apply uniformly in continuous operation. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period. Should side forms be removed before expiration of 7 days from start of curing, coat exposed surfaces with curing compound.

2. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Engineer.

C. Moisture Curing: Provide either of the following methods.

1. Keep concrete surface continuously wet by covering with water or continuous water-fog spray.

2. Cover concrete surface with absorptive cover, thoroughly saturated with water and kept continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

3.06 SEALING

A. Seal concrete by applying a sealing compound as required by Engineer.

B. Surface Preparation: If necessary to remove curing compound, sandblast concrete surface. Clean surface free of dirt, oil, grease and other contaminants. If necessary use proprietary cleaning compounds (not raw acids) followed by thorough water rinsing. Use high pressure water equipment providing 1,200-2,000 psi to remove detergent residues. Do not attempt application when condensation is present.

C. Application: Spray with low pressure (20 psi) airless spray equipment. Saturate the surface to the point of rejection. On vertical surfaces apply 2 coats.

D. Coverage Rates: In accordance with manufacturer's recommendation.

E. Paint Adhesion: Always test to verify compatibility between sealant and other proposed surface treatments.

F. Warning: Remove inadvertent splashes before the solution has dried on the surface. If sealant is a hazardous material, allow use only by professional applicator. Three (3)- 4-inch cylinders shall be taken and a slump and air test shall be done at the beginning of concrete placement and every 50 cubic yards thereafter.

3.07 TESTS

A. Arrange for and perform all testing required for qualification of proposed materials and the establishment of mix designs, in determining strengths for early form removal, for cylinder tests after the addition of water, and other needs of Contractor.

B. Two slump tests, one before and one after the addition of super-plasticizer.

C. Three (3) standard 4-inch cylinder samples of concrete from trucks receiving water after addition of water.

3.08 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required levels, lines, details, and elevations.

B. Structural analysis and additional testing may be required at no additional cost to Owner when the strength of a structure is considered potentially deficient.

C. Where allowed, patch imperfections. Refer to Section 03345 for finish requirements.

3.09 PROTECTION AND REPAIRS

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. All concrete curbs, gutter, sidewalks, and driveways requiring removal and replacement, shall be removed and replaced to the next joint or scoring lining beyond the actually damaged or broken sections.

D. In the event that joints or scoring lines do not exist or are five or more feet from the removed or damaged section, the damaged portions shall be saw cut, removed, and reconstructed to neat, plane faces.

E. When saw cut sections are allowed for removal and replacement, use epoxied dowels in all cut planes.

F. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements.

G. Where necessary, lampblack or other pigments shall be added to the new concrete to obtain the desired results.

H. The concrete surface must not be damaged or pitted by rain.

I. The Contractor shall provide and use, when necessary, sufficient tarpaulins to completely cover all sections that have been placed within the preceding twelve (12) hours.

J. The Contractor shall erect and maintain suitable barriers to protect the finished surface.

K. Any section damaged from traffic or other causes occurring prior to its official final acceptance shall be repaired or replaced by the Contractor at his own expense in a manner satisfactory to the City Engineer.

L. Spalling: Concrete shall not spall or show signs of spalling before the warranty expiration. All concrete with spalling shall be removed and replaced by the Contractor or Owner at his own expense. When approved by City Engineer, concrete with spalling may be repaired by an approved method. The approved method must be a five step process which includes a muriatic acid wash, pressure wash with orbital nozzle, application of approved grout & cement modifier, and application of an approved sealer. The following products are approved for use to repair spalling concrete:

1. Planicrete AC Acrylic Latex Admixture for Mortar and Concrete mixed with Planitop X One-Component Fast Setting Vertical and Overhead Repair Mortar with Planiseal WR 40 Water Based 40%-Silane Penetrating Water Repellant.
2. Duraset 1000 Modified Acrylic Resin mixed with G100 Pro-Series Grout Mix and Liquid Colorant.
3. SuperSeal 2000 Solvent Based Acrylic Sealer.

M. Damaged Sidewalk and/or Curb & Gutter shall be repaired or replaced according to the following criteria.

1. Cracks in Concrete Infrastructure
   a. Cracks in Concrete Sidewalk
      i. Single "hairline" cracks running perpendicular to the length of the sidewalk, and which do not show evidence of vertical offset or movement, do not require repair or replacement.
      ii. All other cracks in sidewalk require removal and replacement of the entire concrete section*.
   b. Cracks in Concrete Curb & Gutter

i. Single "hairline" cracks running perpendicular to the length of the curb & gutter, and which do not show evidence of vertical offset or movement, do not require repair or replacement.
ii. Single cracks running perpendicular to the length of the curb & gutter which are greater in width than a "hairline" crack, but which are less than 1/8 inch in width, shall be repaired by sealing the crack with an approved sealant following preparation including routing and cleaning.
iii. All other cracks in curb & gutter require removal and replacement of the entire concrete section*.

2. Gouges in Concrete Infrastructure (Damage to Planar Surfaces, excludes Edges/Corners)
   a. Gouges in Concrete Sidewalk or Concrete Curb & Gutter
      i. Single (or minimal) gouges up to 3 inches in length and less than ½ inch in depth, and which do not represent a safety hazard in the opinion of the inspector, do not require repair or replacement.
      ii. Single (or minimal) gouges up to 3 inches in length and less than 3 inches in depth, shall be repaired using an approved two-part epoxy patching compound.
      iii. All other gouges in sidewalk require removal and replacement of the entire concrete section*.

3. Chips to Concrete Infrastructure (Damage to Edges & Corners)
   a. Chips in Concrete Sidewalk
      i. Single (or minimal) chips up to 3 inches in length and less than 1 ½ inches in width, and which do not represent a safety hazard in the opinion of the inspector, do not require repair or replacement.
      ii. All other chips in sidewalk require removal and replacement of the entire concrete section*.
   b. Chips in Concrete Curb & Gutter
      i. Single (or minimal) chips up to 3 inches in length and less than 1 ½ inches in width, shall be repaired using an approved two-part epoxy patching compound.
      ii. All other chips in curb & gutter require removal and replacement of the entire concrete section*.

4. In addition to the information provided above, removal and replacement of the entire concrete section* is required for the following types of damage:
   a. Multiple cracks, where the cracks are less than a sidewalk width apart.
   b. Cracks that converge creating small isolated pieces of concrete.
   c. Cracks that generally run parallel to the length of the infrastructure.
   d. Cracks that circle back to the original side creating "half moon" pieces of concrete.
   e. Cracks that allow the concrete to move vertically from the adjoining piece.
   f. Excessive scaring, spalling, or scraping of the finished concrete surface.
   g. Cracks with chipping along the edge at the surface indicating settlement or movement along the crack.
   h. Any damage, which in the inspectors' opinion, was clearly the result of negligence on the part of the builder, or damage which appears will result in failure of the sidewalk or gutter and its intended function.

*Sections may be cut and the damaged portions removed, provided no remaining or new section(s) are less than 5 feet in length. (Cut lines are considered as section lines.)

N. Approved Products for Concrete Damage Repair:
   1. Concrete Sealant: Sikaflex® 1a or 1cSL (or approved equal)
   2. Epoxy Repair: Rezi-weld 2-Part Gel Paste (or approved equal)

3. Epoxy Repair: Quikcrete Concrete Repair No. 8620-49 (or approved equal)

Note: As an alternate to the two-part epoxy patching compound, and when approved by the City Engineer, the 5 step process and products listed for spalling repair may be used for chip and gouge repair.

O. Concrete sidewalk and curb & gutter which is defective due to settlement, uneven joints, or tripping hazards may be corrected by "Concrete Lifting" as approved by City Engineer. Concrete lifting shall conform to the following:

1. Concrete repair by lifting shall only be performed by a licensed contractor specializing in concrete lifting.

2. Concrete lifting shall be completed by drilling strategically placed holes in concrete. A grout, sand, Portland cement, and water mixture shall be used proportioned to harden without settlement and to sufficiently fill voids beneath the concrete. Foam products may also be used when approved by City Engineer. Holes shall be placed to allow for pumping the mixture under the concrete to lift the settled areas. Additional holes shall also be drilled to allow for filling voids created by the lifting procedure.

3. The proportion of Portland cement shall be a minimum of 5 percent by weight of dry mixture.

4. The use of the concrete lifting technique may be attempted to correct uneven adjoining sections of concrete or correct areas of defective drainage. If concrete lifting does not correct the defective concrete to the Engineers satisfaction, the concrete shall be removed and replaced.

3.10 PLACING CONCRETE IN COLD WEATHER

A. No concrete shall be placed where the air temperature is lower than 40 degrees Fahrenheit, at a location where the concrete cannot be covered or protected from the surrounding air.

B. When concrete is placed below a temperature of 35 degrees Fahrenheit the ingredients of the concrete shall be heated so that the temperature of the mixture shall not be less than 50 degrees or more than 100 degrees Fahrenheit.

C. Before mixing, the heated aggregates shall not exceed 175 degrees Fahrenheit.

D. Cement shall not be added while the temperature of the mixed aggregates and water is greater than 100 degrees Fahrenheit.

E. When there is likelihood of freezing during the curing period, the concrete shall be protected by means of an insulated covering to prevent freezing of the concrete for a period of not less than 7 days after placing.

F. Equipment for protecting concrete from freezing shall be available at the job site prior to placing concrete. Particular care shall be exercised to protect edges and exposed corners from freezing.

G. In the event heating is employed, care shall be taken to insure that no part of the concrete becomes dried out or is heated to temperatures above 100 degrees Fahrenheit.

H. The housing, covering, or other protection used shall remain in place and intact at least 24 hours after the artificial heating is discontinued.

I. For a period of five days the concrete shall be kept above 40 degrees F and below 100 degrees F.

END OF SECTION

SECTION 03345

CONCRETE FINISHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Application procedure for concrete surface finishes.

1.02 PROJECT CONDITIONS

A. Allow concrete to cure not more than 72 hours before commencing surface finish operations, unless otherwise acceptable to Engineer.

B. Protect adjacent materials and finishes from dust, dirt and other surface or physical damage during finishing operations. Provide protections as required and remove from site at completion of Work.

C. For surfaces to be blast finished, perform abrasive blasting within 24 to 72 hours after casting. Coordinate with form work construction, concrete placement schedule, and form work removal to ensure that surfaces are blasted at same age for uniform results.

PART 2 EXECUTION

2.01 PATCH FINISHING

A. Repair surface defects immediately after form removal.

B. Make any patches in concrete to closely match color and texture of surrounding surfaces. Determine mix formula for patching mortar by trial and obtain a good color match with concrete when both patch and concrete are cured and dry.

1. Mix white and gray Portland cement as required to match surrounding concrete to produce grout having consistency of thick paint.

2. Use a minimum amount of mixing water.

3. Mix patching mortar in advance and allow to stand without frequent manipulation, without addition of water, until it has reached stiffest place able consistency.

4. After initial set, dress surfaces of patches manually to obtain same texture as surrounding surfaces.

C. Repair defective areas.

1. Remove honeycomb and defective concrete down to sound concrete.

2. Make edges perpendicular to surface or slightly undercut.

3. Featheredges are not permitted.

4. Dampen area to be patched and at least 6" surrounding it to prevent absorption of patching mortar water.

5. Prepare bonding grout.

6. Mix to consistency of thick cream.

7. Brush into surface.

D. After surface water has evaporated from patch area, brush bond coat into surface.

1. When bond coat begins to lose water sheen, apply patching mortar.

2. Thoroughly consolidate mortar into place and strike-off to leave patch slightly higher than surrounding surface.

3. Leave undisturbed for at least 1 hour before final finish.

4. Keep patched area damp for 72 hours or apply curing compound.

5. Do not use metal tools in finishing an exposed patch.

E. Tie Holes: Unless indicated otherwise, after being cleaned and thoroughly dampened, fill the hole solid with patching mortar.

F. Where as-cast finishes are indicated, total patched area my not exceed 1 in 500 of as-cast surface. This is in addition to form tie patches, if ties are permitted to fall within as-cast areas.

G. In any finishing process which is intended to expose aggregate on surface, patched areas must show aggregate.

1. Outer 1" of patch shall contain same aggregates as surrounding concrete.

2. For aggregate transfer finish, patching mixture shall contain same selected colored aggregates.

3. After curing, expose aggregates together with aggregates of adjoining surfaces by same process.

2.02 SLAB FINISHING

A. Broom or Belt Finish: After concrete has been placed, consolidated, struck-off, and leveled to the required tolerance, roughen surface transversely with stiff brushes, rakes, or burlap belt before final set.

B. Float Finish: After concrete has been placed, consolidated, struck-off, and leveled, do not work further until ready for floating.

1. Begin floating when water sheen has disappeared and surface has stiffness sufficient to permit operation.

2. During or after first floating, check planeness of entire surface with a 10 feet long straightedge applied at 2 or more different angles.

3. Cut down high spots and fill low spots to the required tolerance.

4. Refloat slab immediately to a uniform sandy texture.

C. Trowel Finish:

1. Float finish surface.

2. Power trowel.

3. Hand trowel as required to provide surface. Do not apply water to retemper concrete in finishing operations.

4. First troweling after power floating shall produce smooth surface relatively free of defects but which may still show some trowel marks.

5. Second trowel by hand after surface has hardened.

6. Leave finished surface essentially free of trowel marks, uniform in texture and appearance.

7. On surfaces intended to support floor coverings, grind off defects which would show through floor covering.

2.03 AS-CAST FORMED FINISHING

A. Rough: Patch defects, chip or rub off fins exceeding 1/4" height.

B. Smooth: Patch tie holes and defects and remove fins completely:

1. When surface texture is impaired and form joints misaligned, grind, bushhammer, or correct affected concrete as directed by Engineer.

2. Slurry grout areas evidencing minor mortar leakage to match adjacent concrete.

3. Repair major mortar leakage as a defective area.

4. When in opinion of Engineer, workmanship is less than acceptable standard, provide one of rubbed finishes at no additional cost to Owner.

2.04 RUBBED FINISHING

A. Produce following finishes on concrete with a smooth form finish.

1. Smooth Rubbed: Remove forms and perform necessary patching as soon after placement as possible.

2. Finish newly hardened concrete no later than 24 hours following form removal.

3. Wet surfaces and rub with carborundum brick or other abrasive until uniform color and texture are produced.

B. Grout Cleaned: Undertake no cleaning operations until all contiguous surfaces are completed and accessible.

1. Wet surface of concrete sufficiently to prevent absorption of water from grout.

2. Apply grout uniformly.

3. Immediately after grouting, scrub surface with cork float or stone to coat surface and fill

voids.

4. While grout is still plastic, remove excess grout by working surface with rubber float or sack.

5. After-surface whitens from drying, rub vigorously with clean burlap.

6. Keep damp for at least 36 hours after final rubbing.

7. Cork Floated: Remove forms within 2 to 3 days of placement where possible.

8. Remove ties.

9. Remove all burrs and fins.

10. Dampen wall surface.

11. Apply mortar with firm rubber float or with trowel, filling all surface voids.

12. Compress mortar into voids.

13. If mortar surface dries too rapidly to permit proper compaction and finishing, apply a small amount of water with fog sprayer.

14. Produce final texture with cork float using a swirling motion.

2.05 UNFORMED FINISHING

A. After concrete is placed, strike smooth, tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces.

B. Float to texture which is reasonably consistent with formed surfaces.

C. Continue final treatment on formed surfaces uniformly across uniformed surfaces.

END OF SECTION

SECTION 16530

STREET LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior lighting and accessories.

B. Poles.

1.02 RELATED SECTIONS

A. Section 03310 – Concrete work.

1.03 REFERENCES

A. ANSI C78.379 – Electric Lamps – High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.

B. IES RP-8 – Recommended Practices for Roadway Lighting.

C. NFPA 70-National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Shop drawings: Indicate dimensions and components for each luminaire.

B. Product Data: Provide dimensions, ratings, manufacturer, type, model and performance data.

C. Test Reports: Indicate measured illumination levels.

D. Submit manufacturer's installation instructions.

1.05 COORDINATION

A. Coordinate with electrical contractor.

B. Coordination with City and Heber Light & Power to verify location and connection of fixtures.

C. Receive approval by Civil Engineer for pole foundation.

D. Furnish bolt templates and pole mounting accessories to installer / contractor of pole foundations.

PART 2 APPROVED PRODUCTS

2.01 MANUFACTURERS

A. Holophane
B. Philips Lumec

2.02 FIXTURE REQUIREMENTS

A. Model: Holophane – Post Top Full Cutoff LED Series
Verify exact model number with City before ordering
Philips Lumec – Metroscape Full Cutoff LED Post Top
Verify exact model number with City before ordering

B. LED Performance Package: 80W to 100W Dimmable

C. Color Temperature: 3000 K CCT

D. Voltage: Auto-Sensing Voltage (120-227)

E. Housing/Trim/Covers: Modern Style – Swing Open Design, No Trim, Full Cover

F. Finish, Trim and/or Final Finish: Black

G. Optics: Asymmetric Lunar Optic - IES Type III

H. Finial: Standard

I. Prewired Leads: 25 feet prewired leads

J. Photocontrol: Long Life DTL Twistlock Photocontrol For Solid-State

K. Receptacle: Dimming Receptacle – 7 PIN

L. Mounting Condition: Concrete base with J bolts.

M. Pole: As required in this schedule.

2.03 POLES

A. Pole: Salem Aluminum Pole (SMA 14 F4J 13 P07 ABG BK)

B. Height: 14 feet

C. Shaft Style: F4J 4 inch diameter Fluted, 0.25 wall

D. Material: Aluminum or Concrete, non-direct burial type

E. Color/Finish: Powder Coat Paint Finish, Black

F. Shape: Fluted or smooth with 3'-8.5" high decorative bottom piece

G. Base: 13 inch Square Base, Base Weight 60, Base EPA 3.7880625

H. Anchor Bolt: AB-26-4

I. Loading Capacity Ratings:
1. 100 Pounds.
2. Steady Wind: 90 MPH minimum.

2.04 CONDUIT

A. One inch PVC scheduled 90 electrical (gray) conduit.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide concrete bases for lighting poles at intersections and cul-de-sac's or as shown on the plans. All concrete shall be a minimum of 4 foot below finished grade.

B. Install poles plumb. Provide shims and double nuts to adjust to plumb.

C. Install all components according to manufacturer recommendations.

D. Install conduit and secondary boxes according to Heber Light and Power specifications.

3.02 FIELD QUALITY CONTROL

A. Operate each light after installation and connection. Inspect for proper connections and operation.

B. Test photo-electric for cell operation.

3.03 ADJUSTING

A. Adjust light to provide illumination levels and distribution as directed.

B. Adjust photo-electric cell to operate correctly.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photo-cell surface as recommended by the manufacturer.

D. Clean finish and touch up damage.

3.05 PROTECTION OF FINISHED WORK

A. Re-lamp lights which have failed Final Completion.

3.06 ~~LIGHTING LOCATION~~

~~A. Local Roads~~

~~1. Location: In planter strip or if combination sidewalk, 1 one foot behind sidewalk.~~

~~2. Spacing: At each intersection with Collector Roads, and other critical points as determined by the City Engineer.~~

~~B. Collector Roads~~

~~1. Location: In planter strip or one foot behind sidewalk as indicated by drawings, and other critical points as determined by the City Engineer..~~

~~2. Spacing: At each intersection, and other critical points as~~

~~determined by the City Engineer.~~

END OF SECTION

SECTION 16532

COMMERCIAL BUSINESS STREET LIGHTING (HISTORIC)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior luminaries and accessories.

B. Poles.

1.02 RELATED SECTIONS

A. Section 003310 – Concrete Work.

1.03 REFERENCES

A. ANSI C78.379 – Electric Lamps – High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.

B. IES RP-8 – Recommended Practices for Roadway Lighting.

C. IES RP 20-Lighting for Parking Facilities.

D. NFPA 70-National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Shop drawings: Indicate dimensions and components for each luminaire.

B. Product Data: Provide dimensions, ratings, manufacturer, type, model and performance data.

C. Test Reports: Indicate measured illumination levels.

D. Submit manufacturer's installation instructions.

1.05 COORDINATION

A. Coordinate with electrical contractor.

B. Coordination with City and Heber Light & Power to verify location and connection of fixtures.

C. Receive approval by Civil Engineer for pole foundation.

D. Furnish bolt templates and pole mounting accessories to installer / contractor of pole foundations.

PART 2 APPROVED PRODUCTS

2.01 MANUFACTURERS

A. ~~Phillips-Hadco~~Holophane
B. Mountain States Lighting

2.02 FIXTURE REQUIREMENTS

A. Model: Holophane – Utility Washington Series Luminaire Full Cutoff LED2 (WFCL2). Verify exact model number with the City before ordering.

B. L.E.D. Performance Package: 11,500 Nominal Lumens

C. Color Temperature: 3000 K CCT

D. Voltage: Auto-Sensing Voltage (120-227)

E. Optics: Type 3 Distribution – Full Cutoff

F. Housing Color: Black

G. Finial: None

H. Pre-Wired Leads: 25 feet pre-wired leads.

I. Photo Control: NEMA Twistlock Photocontrol Receptacle – 7 PIN. Externally mounted.

J. Other Required Options: Field Adjustable Output, Shorting Cap

K. Mounting Condition: Concrete base with J-bolts.

L. Pole: As required in this schedule.

2.03 POLE REQUIREMENTS

A. Pole: Mountain States Lighting (#14.5TFS-6.5/4.5-11GA-16S-TT3.5X4
Steven Sales Company (FL210-D672A146-TENON-FP-AB) with Twin Arm Assembly

B. Height: 14.6 feet to Banner Arm (See Standard Drawing STREETS-13)

C. Shaft Style: Round Fluted, Tapered Diameter 6.5-inch to 4.5-inch.

D. Material: Aluminum or Steel, non-direct burial type.

E. Color/Finish: Powder Coat Paint Finish, Black.

F. Shape: Fluted with decorative base and double-banner arm.

G. Decorative Base: 20-inch Washington-Style High-Density Elastomer, or Aluminum Clam Shell Base (black).

H. Loading Capacity Ratings:
1. 100 pounds.
2. Steady Wind: 90 mph min.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pole to be direct burial at locations indicated. Auger hole without disrupting the soil below butt of the pole. Do not dig pole hole with a backhoe, to minimize disruption of firm soil. Fill with sand around pole, tamped regularly while backfilling.

B. Install poles plumb. Provide shims and double nuts to adjust to plumb.

C. Install all components according to manufacturer recommendations.

D. Install conduit and secondary boxes according to Heber Light and Power specifications.

3.02 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connections and operation.

B. Test for photo-electric cell operation.

3.03 ADJUSTING

A. Adjust luminaries to provide illumination levels and distribution as directed.

B. Adjust photo-electric cell to operate correctly.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photo-cell surface as recommended by the manufacturer.

D. Clean finish and touch up damage.

3.05 PROTECTION OF FINISH WORK

A. Relamp luminaries which have failed work at substantial completion.

3.06 LIGHTING LOCATION

A. Install at locations as indicated on the plans or as otherwise approved by the City Engineer.

~~3.07 SPACING~~

~~A. 150' to 250' on one side. Spacing can double to 300' to 500' on one side if alternating on both sides.~~

END OF SECTION

SECTION 16533

NORTH VILLAGE ZONE LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior lighting and accessories.

B. Poles.

1.02 RELATED SECTIONS

A. Section 03310 – Concrete work.

1.03 REFERENCES

A. ANSI C78.379 – Electric Lamps – High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.

B. IES RP-8 – Recommended Practices for Roadway Lighting.

C. NFPA 70-National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Shop drawings: Indicate dimensions and components for each luminaire.

B. Product Data: Provide dimensions, ratings, manufacturer, type, model and performance data.

C. Test Reports: Indicate measured illumination levels.

D. Submit manufacturer's installation instructions.

1.05 COORDINATION

A. Coordinate with electrical contractor.

B. Coordination with City and Heber Light & Power to verify location and connection of fixtures.

C. Receive approval by Civil Engineer for pole foundation.

D. Furnish bolt templates and pole mounting accessories to installer / contractor of pole foundations.

PART 2 APPROVED PRODUCTS

2.01 MANUFACTURES

A. Holophane
B. Luminis

2.02 FIXTURE REQUIREMENTS

A. Model: Holophane – GlasWerks Luminescent LED Hallbrook (GSLF3)
Verify exact model number with City before ordering

B. LED Lumen Package: P40 Performance Package

C. Color Temperature: 3000 K, 70 CRI

D. Voltage: MVOLT 120-227V

E. Optics: Asymmetric

F. Mounting Style: Quick Stem Mount

G. Finish Color: Black

H. Prewired Leads: 25 feet prewired leads

I. Photocontrol: 7 PIN NEMA Photocontrol Receptacle

J. Arm: Holophane HCA 36IN 1A BO SSA QSM BK RFD331152

K. Pole: As required in this schedule.

2.03 POLES

A.	Pole:	Luminis – BVP616XM6554
B.	Height:	16 feet (Cap to Base)
C.	Shaft Style:	Square 6" x 6"
D.	Material:	Aluminum, non-direct burial type
E.	Color/Finish:	Polyester Powder-Baked Coating 5-Stage Bath Preparation Process Luminis Heber City Faux Wood Finish UV-Stabilized Durable Scratch & Fade Resistant Finish
F.	Base:	Aluminum Decorative Cover Plates & Base (Match Holophane Support Arm)
G.	Cap:	Decorative Top Cover Plates & Base (Match Holophane Support Arm)
H.	Receptacle:	NEMA C136.41 &-PIN Receptacle with Shorting Cap Pre-Installed in pole cap

2.04 CONDUIT

A. One inch PVC scheduled 90 electrical (gray) conduit.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide concrete bases for lighting poles at intersections and cul-de-sac's or as shown on the plans. All concrete shall be a minimum of 4 foot below finished grade.

B. Install poles plumb. Provide shims and double nuts to adjust to plumb.

C. Install all components according to manufacturer recommendations.

D. Install conduit and secondary boxes according to Heber Light and Power specifications.

3.02 FIELD QUALITY CONTROL

A. Operate each light after installation and connection. Inspect for proper connections and operation.

B. Test photo-electric for cell operation.

3.03 ADJUSTING

A. Adjust light to provide illumination levels and distribution as directed.

B. Adjust photo-electric cell to operate correctly.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photo-cell surface as recommended by the manufacturer.

D. Clean finish and touch up damage.

3.05 PROTECTION OF FINISHED WORK

A. Re-lamp lights which have failed Final Completion.

END OF SECTION

APPENDIX A

HEBER CITY APPROVED EQUIVALENTS

The following is a list of pre-approved equivalents to be used in conjunction with the Heber City Standard Specifications and Drawings. These items may be used without prior approval from the City Engineer or Public Works Director. Any other requests for consideration as equivalents which differ from the Heber City Standard Specifications and Drawing will need to be submitted to and approved by the City Engineer and/or Public Works Director.

IRRIGATION

Irrigation Service – One Lot 1" Service:

McDonald:

- 1" McDonald 18" Pit Part # E-5-12940
- Insulation Pad Part # 90-C1 18x4

Mueller:

- 1" Single-Service Irrigation Box Part # 330IS1818FABS000296N

Ford:

- 1" Ford 18" Pit Part # PK488-18-C16819-002-NL
- Insulation Pad Part # CCID-18-4 Closed-Cell Foam Disc

Lids:

- DFW Part #DFW18MUE-IMBF2_Small_IRR
- Nicor Part # 18.75LLBLKIRRZthOLTE

Irrigation Service – Two Lots

Ford:

- 1 ½ x (2) 1" Ford Dual Meter Pit Part # PKD411-24C-C16050-004-NL
- Insulation Pad Part # CCID-24 Closed Cell Foam Disc
- ~~Lid Adapter Ring Ford Part # EXT-1 (Adapts 18" lid to 24")~~

Mueller:

- 1" Single-Service Irrigation Box Part # 330ID2718FAB000650/700098-1

Lids:

- DFW Part #DFW18MUE-IMBF2_Small_IRR
- Nicor Part # 18.75LLBLKIRRZthOLTE

CULINARY WATER

1" Culinary Water Service

Ford:

- Meter Pit Part # PFCBHH60-C16819-001-NL 1" x 60" Ford 18" coil meter pit with reduced port valves
- ~~Composite Lid Ford Part # PPSC-18-L-P-REC-T~~
- Insulation Disc Ford Part # CCID-18-4 Closed Cell Foam Disc
- Adjustable Curb Box Ford Part # EM2-50-46-42R with inner rod

Mueller:

- 1" Single-Service Box Part # 330CS1860RSBS000390N

Lids:

- DFW Part # 18MUE-IMBF_Small_Water Lid

Nicor Part # 18.75 LLBLKWAThDLTE

Fire Hydrants:

- 6" Waterous WB-67-250
- Clow Medallion
- Mueller Super Centurion 250 cast-iron

BRASS PARTS AND SADDLES

Corporation Stops

Both Iron Pipe thread and CC thread will be accepted.

Ford:

- Corp Stop Valve Part # FB1100-4-Q-NL

Mueller:

- Corp Stop Valve Part # B-25028-N

Curb Box and Stops

Ford:

- Curb Stop Valve Part # B84-444M-Q-NL
- Curb Box Part # EM2-50-46-42R

Saddles

These alternatives are for 10" or larger pipe size and/or if higher pressure ratings are needed than the standard Romac 305 and 306 stainless saddles can accommodate.

Ford:

- Saddle Part # 202BS

Mueller:

- Saddle Part # B2RS

END OF SECTION

HEBER CITY
HEART OF THE WASATCH BACK

REVIEW 1 DATE:_____
REVIEW 2 DATE:_____
REVIEW 3 DATE:_____

Engineering Review - Final Plan Checklist

DEVELOPMENT NAME:_____

The attached document is a list of typical Engineering Department review criteria for subdivisions. Each submittal shall include a pdf copy of complete plans. The Engineer is responsible for initialing each item on the Checklist. Please check with the Engineering Department before assuming that an item is not applicable, unless it is obviously not applicable. Documents submitted to the Engineering Department shall be organized according to the following general format:

1. Cover Sheet
2. Boundary and Topo Survey
3. Plat
4. Demolition Plan (as necessary)
5. Impact to Irrigation Plan (as necessary)
6. Site Plan
7. Grading and Drainage Plan
8. Utility Plan
9. Signing and Striping Plan, including SRTS (Coordinate with WCSD)
10. Plan/Profile Sheets
11. Custom Detail Sheets (Please exclude City Std Dwgs)

Upon first submittal for plan review, the applicant must sign the verification on the Engineering Plan Review Checklist indicating he/she has personally inspected the Checklist and that all items on the Checklist have been initialed by the responsible Engineer. A copy of the Checklist must accompany the plans with all subsequent reviews. The City will not accept plans for review without this signed Checklist.

In accepting plans for construction, Heber City assumes that applicants have not made any errors and have complied with all applicable codes and ordinances. If, after acceptance of plans for construction, an error is discovered or it is discovered that some aspect of the accepted drawings does not comply with applicable codes and ordinances, the applicant shall, at his own expense, revise the drawings and modify any infrastructure as necessary to correct the problem. Applicants and their design professionals shall remain responsible for their projects at all times.

Notice about Reimbursements: Reimbursement agreements must be approved by the City and executed by both parties before construction can begin on the project. If the applicant wishes to begin construction before there is an agreement in place with the City, he must sign and record a waiver stating he accepts the risk that he may not be reimbursed for any improvements installed, even if they are system improvements.

I understand the conditions stated above and have personally reviewed this submittal and verify that it is complete and that all of the items listed below have been initialed by the responsible Engineer.

Engineer's Signature_____

Printed Name _____

Applicant's Signature_____

Printed Name _____

Note: The following is not intended to be a comprehensive list of items. The City may require more information

Applicant Submitted (Initials)	Required Submittals	City Use Only Accepted Date
	Final Drainage Report -- This report shall include pipe systems, surface routes, and detention ponds. It shall also include a discussion about low impact development best management practices that were considered and implemented for the purpose of infiltrating or evapotranspiring, and using storm water from the site to protect water quality. If no best management practices were implemented, explain the reasons preventing their use. This report shall be stamped and certified by a Utah-licensed professional Engineer, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	Geotechnical report, including minimum pavement section.	
	Trip Generation Memo (Less than 100 ADT). Traffic Impact Study (for projects generating more than 100 ADT. Include PM Peak Trips)	
	Army Corps Requirements, if impacting wetlands.	
	Record of Survey per UCLS Standards, AND topographical map including all other relevant information or the existing recorded plat from the County Recorders Office	
	UDOT permit for access or storm drain connection to US 189, SR 113, or SR 40.	
	CLOMR/LOMR filed application for property in FEMA 100-yr flood plain.	
	Stream Alteration Permit from Utah Division of Water Rights if impacting a natural drainage channel.	
	Permit from the BOR and/or canal company if impacting a canal.	
	Construction plans signed and stamped by the responsible Engineer.	
	Dry Utilities Concept Plan	
	Pothole data for utility crossings in existing roadways.	
	Easement agreements.	
	Water Rights Action Report (Get form from Engineering)	
	Exhibits for inclusion into a Reimbursement Agreement for system improvements, if applicable: (1) Schedule of values listing the reiumbursable improvments, inlcuding the City's IFFP project number, quantities, unit prices, and total prices. (2) Site Plan showing the locations of reimbursable improvements with coded references to a schedule of values.	
	Obtain PLSS (Public Land Survey System) clearance letter from the Wasatch County Surveyor's Office if monuments will be disturbed. Per Utah Code 17-23-14 and 17-23-15. Contact info. Email surveyor@wasatch.utah.gov Address: 25 North Main Street, Heber, UT 84032 (435) 657-3222 .	

Applicant Submitted (Initials)	All Sheets Must Contain	City Use Only Accepted Date
	Project name	
	Drawing number and title.	
	"Call Before You Dig" logo.	
	North arrow and drawing scale.	
	Abbreviations and Legend	
	All text, features, and linework must be of a size which is legible when printed on standard 11x17 sized paper.	
	References to specific Standard Plans, as applicable	

Applicant Submitted (Initials)	Final Subdivision Plat (See City Standard Plat Template on City's website)	City Use Only Accepted Date
	Subdivision name, location and phase.	
	Names of adjacent property owners.	
	Locations of survey by Quarter Section, Township and Range	
	Signed, stamped, and dated Surveyor's Certificate (on first submittal)	
	North arrow and scale	
	Total acreage, # of Lots, and # of Parcels at the end of the Boundary Description	
	Lot area for each lot in square feet and acres.	
	Proposed streets (names and coordinates) and adjacent streets.	
	Point of beginning and basis of bearing	
	The distance and course to two (2) or more section or Quarter Corners, including Township and Range, or to identified monuments within a recorded subdivision.	
	All bearings, angles and distances along the boundary and lot lines.	
	Radius, length, chord distance, chord bearing and other curve data deemed necessary.	
	Location of street monuments with bearing and distance labeled monument-to-monument, and location with respect to corners	
	Existing and proposed easements, ROWs, buffer zones and public spaces shown	
	~~Written boundary description~~	
	FIRM Insurance Zone and Map number	
	Letter from Wasatch Co GIS approving the addressing. Numbering to be consistent with the phase of the plat, e.g. Phase 2 plat numbering 201, 202, 203, etc.	
	Intersection addresses	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots,	
	Public Utility Easements	

Applicant Submitted (Initials)	Cover Sheet	City Use Only Accepted Date
	Sealed by a Utah-licensed Professional Engineer (on first submittal)	
	Project name	
	Sheet Index for all sheets	
	Vicinity Map with North arrow	
	Legend	
	Contact information for the project team and other key contacts	
	City Standard Notes (See City Std. Spec. 00700.108)	

Applicant Submitted (Initials)	Site Plan	City Use Only Accepted Date
	Street names and widths	
	Subdivision lots with lot numbers	
	Proposed roadways connect to adjacent development existing/approved roadways.	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project.	
	Fire hydrant locations	
	Street lights at cul-de-sac ends, intersections with collectors and larger, and other critical points as determined by the City Engineer.	
	Roadway improvements (curb, gutter, sidewalk, ADA ramps)	
	Phasing of project. Location of temporary turn-arounds at phase boundaries.	
	Overall Site Plan uses callouts and is on 1 sheet (no matchlines)	
	Requirement to install reference pins in curb identifying locations of property lines.	

Applicant Submitted (Initials)	Existing Topography / Demolition Plan	City Use Only Accepted Date
	Existing Topography	
	All existing features in and adjacent to project	
	Plans for removal or relocation of existing infrastructure as needed	
	Areas classified as sensitive lands including 100-yr flood plains, natural drainages, water bodies, wetlands, and slopes greater than 30%	
	Existing easements or other encumbered areas	
	Street Names	

Applicant Submitted (Initials)	Grading and Drainage Plan	City Use Only Accepted Date
	Stamped and certified by a Utah-licensed Professional Engineer, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Existing contour lines (in gray scale) at one-foot intervals	
	Proposed contour lines at one-foot intervals	
	Benchmark elevation relative to an identified section corner.	
	Storm drain system showing pipe sizes, manholes, combination boxes and catch basins, with all elevations (rim & invert).	
	Detail sheet showing detention pond(s) (including cross-sections), sized orifice design, spillway, and overland flood route called out	
	FEMA Flood Zone delineation and 100-year flood elevation limits	
	Lot grading arrows	
	Spot elevations where necessary including curb returns	
	Locations of any utility conflicts	
	Minimum 18" pipe in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections. Locate catch basins on the uphill side of curb returns and lot lines where possible	
	Cul-de-sacs graded to drain away from the bulb, or with surface flood route	
	Location and type (details) of storm water treatment systems	
	Callout points of connection to existing system, if applicable	
	Slope arrows and labels along gutters, swales, cut/fill slopes, parking areas, and lots	
	Access road to all structures outside of the ROW (12' min width, 15% max slope)	
	Storm drain line extended to property lines terminated with a manhole	
	Flood overland route terminating at the storm water facility (usually a pond or street)	
	Overland runoff route for stormwater at all sag points	
	Minimum slopes on storm drains to achieve 3 feet per second flowing full.	
	Street Names	
	Overall Grading and Drainage Plan uses callouts and is on 1 sheet (no matchlines)	

Applicant Submitted (Initials)	Utility Plan	City Use Only Accepted Date
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots min., e.g., 2 for 10, 3 for 11-40, 4 for 41-80, 5 for 81-120	
	Sanitary sewer / storm drain systems showing pipe alignment, sizes, manholes, and laterals	
	Sewer and storm drain systems to the next manhole beyond subdivision boundary	
	Drinking and pressurized irrigation systems showing type and size of pipes and valves, and fittings (bends, crosses, tees, reducers)	
	Locations of services for all open space areas	
	Locations of all fire hydrants	
	Existing utilities (in grayscale) and plans for relocations as necessary	
	Points of connection to existing structures and pipe lines labeled	
	Existing and proposed easements as required by City Standards	
	Locations of existing and proposed power poles	
	Locations of existing and proposed streetlights	
	Utility line locations follow Street Standard Drawings	
	Streetlights at cul-de-sac ends, major street intersections, and critical points as determined by the City Engineer	
	Street Names	
	Overall Utility Plan uses callouts and is on 1 sheet (no matchlines)	
	Requirement to stamp curb indicating locations of utility laterals	

Applicant Submitted (Initials)	Plan and Profile Sheets	City Use Only Accepted Date
	Vicinity map within subdivision for each sheet	
	Phase boundaries and identification of what will be completed with each phase	
	Typical road sections per Heber City Standards	
	Label street names	
	Vertical curves for grade changes of 1% or greater	
	Vertical alignment of street tying into existing improvements	
	Matching centerline crowns for lower intersecting streets	
	Maximum 5 percent slope through intersections and 60 feet beyond	
	Pavement section per geotech report, or not less than City Standard	
	Locations of any utility conflicts	
	Storm drain pipe size, type, length and slope between manholes	
	Storm drain structures with rim, invert in, and invert out elevations	
	Minimum 18" storm drain in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections	
	Sewer pipe size, type, length and slope between manholes	
	Minimum sewer slopes per Utah Admin. Code Table R317-3-2.3(D)(4)	
	Sewer manhole sizes with rim, invert in, and invert out elevations	
	Drinking and irrigation systems with callouts for pipe size, and type	
	Locations of fire hydrants	
	Callout locations, sizes, types of all fittings (tee, cross, 45 bend, reducers, etc)	
	Air vacuum relief valves and blowoff valves in both plan and profile views	
	Drains at all low points in the Pressurized Irrigation System	
	Locations of waterline looping due to utility conflicts	

Applicant Submitted ovide Initia	Striping and Signage Plan	City Use Only Accepted Date
	Street names	
	Type, size, and station/offset of each sign with reference to MUTCD sign code	
	Pavement markings types and sizes with station/offset	
	Pavement marking taper rates, per 2009 MUTCD Section 3B.09 Lines 04-06	
	Phase boundaries and identification of what will be completed with each phase	

Applicant Submitted (Initials)	Detail Sheets	City Use Only Accepted Date
	Custom Detail Sheets (Please exclude City Standard Plans.)	

HEBER CITY
HEART OF THE WASATCH BACK

REVIEW 1 DATE:_____
REVIEW 2 DATE:_____
REVIEW 3 DATE:_____

Engineering Review - Preliminary Plan Checklist

NOTE: Shading or strikethrough signifies that it is not required for Preliminary Plans.

DEVELOPMENT NAME:_____

The attached document is a list of typical Engineering Department review criteria for subdivisions. Each submittal shall include a pdf copy of complete plans. The Engineer is responsible for initialing each item on the Checklist. Please check with the Engineering Department before assuming that an item is not applicable, unless it is obviously not applicable. Documents submitted to the Engineering Department shall be organized according to the following general format:

1. Cover Sheet
2. Boundary and Topo Survey
3. Plat
4. Demolition Plan (as necessary)
5. Impact to Irrigation Plan (as necessary)
6. Site Plan
7. Grading and Drainage Plan
8. Utility Plan
9. Signing and Striping Plan, including SRTS (Coordinate with WCSD)
10. Plan/Profile Sheets
11. Custom Detail Sheets (Please exclude City Std Dwgs)

Upon first submittal for plan review, the applicant must sign the verification on the Engineering Plan Review Checklist indicating he/she has personally inspected the Checklist and that all items on the Checklist have been initialed by the responsible Engineer. A copy of the Checklist must accompany the plans with all subsequent reviews. The City will not accept plans for review without this signed Checklist.

In accepting plans for construction, Heber City assumes that applicants have not made any errors and have complied with all applicable codes and ordinances. If, after acceptance of plans for construction, an error is discovered or it is discovered that some aspect of the accepted drawings does not comply with applicable codes and ordinances, the applicant shall, at his own expense, revise the drawings and modify any infrastructure as necessary to correct the problem. Applicants and their design professionals shall remain responsible for their projects at all times.

Notice about Reimbursements: Reimbursement agreements must be approved by the City and executed by both parties before construction can begin on the project. If the applicant wishes to begin construction before there is an agreement in place with the City, he must sign and record a waiver stating he accepts the risk that he may not be reimbursed for any improvements installed, even if they are system improvements.

I understand the conditions stated above and have personally reviewed this submittal and verify that it is complete and that all of the items listed below have been initialed by the responsible Engineer.

Engineer's Signature_____

Printed Name _____

Applicant's Signature_____

Printed Name _____

Note: The following is not intended to be a comprehensive list of items. The City may require more information

Applicant Submitted (Initials)	Required Submittals	City Use Only Accepted Date
	Final Drainage Report -- This report shall include pipe systems, surface routes, and detention ponds. It shall also include a discussion about low impact development best management practices that were considered and implemented for the purpose of infiltrating or evapotranspiring, and using storm water from the site to protect water quality. If no best management practices were implemented, explain the reasons preventing their use. ~~This report shall be stamped and certified by a Utah licensed professional Engineer~~, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	Geotechnical report, including minimum pavement section.	
	Trip Generation Memo (Less than 100 ADT). Traffic Impact Study (for projects generating more than 100 ADT. Include PM Peak Trips)	
	Army Corps Requirements, if impacting wetlands.	
	Record of Survey per UCLS Standards, AND topographical map including all other relevant information or the existing recorded plat from the County Recorders Office	
	UDOT permit for access or storm drain connection to US 189, SR 113, or SR 40.	
	CLOMR/LOMR filed application for property in FEMA 100-yr flood plain.	
	Stream Alteration Permit from Utah Division of Water Rights if impacting a natural drainage channel.	
	Permit from the BOR and/or canal company if impacting a canal.	
	Construction plans ~~signed and stamped by the responsible Engineer~~.	
	Dry Utilities Concept Plan	
	Pothole data for utility crossings in existing roadways.	
	Easement agreements.	
	Water Rights Action Report (Get form from Engineering)	
	Exhibits for inclusion into a Reimbursement Agreement for system improvements, if applicable: (1) Schedule of values listing the reiumbursable improvments, inlcuding the City's IFFP project number, quantities, unit prices, and total prices. (2) Site Plan showing the locations of reimbursable improvements with coded references to a schedule of values.	
	Obtain PLSS (Public Land Survey System) clearance letter from the Wasatch County Surveyor's Office if monuments will be disturbed. Per Utah Code 17-23-14 and 17-23-15. Contact info. Email surveyor@wasatch.utah.gov Address: 25 North Main Street, Heber, UT 84032 (435) 657-3222 .	

Applicant Submitted (Initials)	All Sheets Must Contain	City Use Only Accepted Date
	Project name	
	Drawing number and title.	
	"Call Before You Dig" logo.	
	North arrow and drawing scale.	
	Abbreviations and Legend	
	All text, features, and linework must be of a size which is legible when printed on standard 11x17 sized paper.	
	References to specific Standard Plans, as applicable	

Applicant Submitted (Initials)	Preliminary Subdivision Plat (See City Standard Plat Template on City's website)	City Use Only Accepted Date
	Subdivision name, location and phase.	
	Names of adjacent property owners.	
	Locations of survey by Quarter Section, Township and Range	
	Signed, stamped, and dated Surveyor's Certificate (on first submittal)	
	North arrow and scale	
	Total acreage, # of Lots, and # of Parcels at the end of the Boundary Description	
	Lot area for each lot in square feet and acres.	
	Proposed streets (names and coordinates) and adjacent streets.	
	Point of beginning and basis of bearing	
	The distance and course to two (2) or more section or Quarter Corners, including Township and Range, or to identified monuments within a recorded subdivision.	
	All bearings, angles and distances along the boundary and lot lines.	
	Radius, length, chord distance, chord bearing and other curve data deemed necessary.	
	Location of street monuments with bearing and distance labeled monument-to-monument, and location with respect to corners	
	Existing and proposed easements, ROWs, buffer zones and public spaces shown	
	Written boundary description	
	FIRM Insurance Zone and Map number	
	Letter from Wasatch Co GIS approving the addressing. Numbering to be consistent with the phase of the plat, e.g. Phase 2 plat numbering 201, 202, 203, etc.	
	Intersection addresses	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots,	
	Public Utility Easements	

Applicant Submitted (Initials)	Cover Sheet	City Use Only Accepted Date
	Sealed by a Utah-licensed Professional Engineer (on first submittal)	
	Project name	
	Sheet Index for all sheets	
	Vicinity Map with North arrow	
	Legend	
	Contact information for the project team and other key contacts	
	City Standard Notes (See City Std. Spec. 00700.108)	

Applicant Submitted (Initials)	Site Plan	City Use Only Accepted Date
	Street names and widths	
	Subdivision lots with lot numbers	
	Proposed roadways connect to adjacent development existing/approved roadways.	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project.	
	Fire hydrant locations	
	Street lights at cul-de-sac ends, intersections with collectors and larger, and other critical points as determined by the City Engineer.	
	Roadway improvements (curb, gutter, sidewalk, ADA ramps)	
	Phasing of project. ~~Location of temporary turn-arounds at phase boundaries.~~	
	Overall Site Plan uses callouts and is on 1 sheet (no matchlines)	
	Requirement to install reference pins in curb identifying locations of property lines.	

Applicant Submitted (Initials)	Existing Topography ~~/ Demolition Plan~~	City Use Only Accepted Date
	Existing Topography	
	All existing features in and adjacent to project	
	Plans for removal or relocation of existing infrastructure as needed	
	Areas classified as sensitive lands including 100-yr flood plains, natural drainages, water bodies, wetlands, and slopes greater than 30%	
	Existing easements or other encumbered areas	
	Street Names	

Applicant Submitted (Initials)	Grading and Drainage Plan	City Use Only Accepted Date
	~~Stamped and certified by a Utah-licensed Professional Engineer~~, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Existing contour lines (in gray scale) at one-foot intervals	
	Proposed contour lines at one-foot intervals	
	Benchmark elevation relative to an identified section corner.	
	Storm drain system showing pipe sizes, manholes, combination boxes and catch basins, with all elevations (rim & invert).	
	Detail sheet showing detention pond(s) (including cross-sections), sized orifice design, spillway, and overland flood route called out	
	FEMA Flood Zone delineation and 100-year flood elevation limits	
	Lot grading arrows	
	Spot elevations where necessary including curb returns	
	Locations of any utility conflicts	
	Minimum 18" pipe in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections. Locate catch basins on the uphill side of curb returns and lot lines where possible	
	Cul-de-sacs graded to drain away from the bulb, or with surface flood route	
	Location and type (details) of storm water treatment systems	
	Callout points of connection to existing system, if applicable	
	Slope arrows and labels along gutters, swales, cut/fill slopes, parking areas, and lots	
	Access road to all structures outside of the ROW (12' min width, 15% max slope)	
	Storm drain line extended to property lines terminated with a manhole	
	Flood overland route terminating at the storm water facility (usually a pond or street)	
	Overland runoff route for stormwater at all sag points	
	Minimum slopes on storm drains to achieve 3 feet per second flowing full.	
	Street Names	
	Overall Grading and Drainage Plan uses callouts and is on 1 sheet (no matchlines)	

Applicant Submitted (Initials)	Utility Plan	City Use Only Accepted Date
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots min., e.g., 2 for 10, 3 for 11-40, 4 for 41-80, 5 for 81-120	
	Sanitary sewer / storm drain systems showing pipe alignment, sizes, manholes, and laterals	
	Sewer and storm drain systems to the next manhole beyond subdivision boundary	
	Drinking and pressurized irrigation systems ~~showing type and size of pipes and valves, and fittings (bends, crosses, tees, reducers)~~	
	Locations of services for all open space areas	
	Locations of all fire hydrants	
	Existing utilities (in grayscale) and plans for relocations as necessary	
	Points of connection to existing structures and pipe lines labeled	
	Existing and proposed easements as required by City Standards	
	Locations of existing and proposed power poles	
	Locations of existing and proposed streetlights	
	Utility line locations follow Street Standard Drawings	
	Streetlights at cul-de-sac ends, major street intersections, and critical points as determined by the City Engineer	
	Street Names	
	Overall Utility Plan ~~uses callouts~~ and is on 1 sheet (no matchlines)	
	Requirement to stamp curb indicating locations of utility laterals	

Applicant Submitted (Initials)	Plan and Profile Sheets	City Use Only Accepted Date
	Vicinity map within subdivision for each sheet	
	Phase boundaries and identification of what will be completed with each phase	
	Typical road sections per Heber City Standards	
	Label street names	
	Vertical curves for grade changes of 1% or greater	
	Vertical alignment of street tying into existing improvements	
	Matching centerline crowns for lower intersecting streets	
	Maximum 5 percent slope through intersections and 60 feet beyond	
	Pavement section per geotech report, or not less than City Standard	
	Locations of any utility conflicts	
	Storm drain pipe size, type, length and slope between manholes	
	Storm drain structures with rim, invert in, and invert out elevations	
	Minimum 18" storm drain in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections	
	Sewer pipe size, type, length and slope between manholes	
	Minimum sewer slopes per Utah Admin. Code Table R317-3-2.3(D)(4)	
	Sewer manhole sizes with rim, invert in, and invert out elevations	
	Drinking and irrigation systems with callouts for pipe size, and type	
	Locations of fire hydrants	
	Callout locations, sizes, types of all fittings (tee, cross, 45 bend, reducers, etc)	
	Air vacuum relief valves and blowoff valves in both plan and profile views	
	Drains at all low points in the Pressurized Irrigation System	
	Locations of waterline looping due to utility conflicts	

Applicant Submitted rovide Initia	Striping and Signage Plan	City Use Only Accepted Date
	Street names	
	Type, size, and station/offset of each sign with reference to MUTCD sign code	
	Pavement markings types and sizes with station/offset	
	Pavement marking taper rates, per 2009 MUTCD Section 3B.09 Lines 04-06	
	Phase boundaries and identification of what will be completed with each phase	

Applicant Submitted (Initials)	Detail Sheets	City Use Only Accepted Date
	Custom Detail Sheets (Please exclude City Standard Plans.)	

STANDARD PLAT FORMAT

PLAT REQUIREMENTS

- FINAL PLAT SHALL BE PREPARED ON A SHEET OF APPROVED REPRODUCIBLE D-SIZE MYLAR AND MADE WITH TEXT NOT LESS THAN ONE-TENTH INCH IN SIZE, SHALL BE SO DRAWN THAT THE TOP OF THE SHEET FACES EITHER NORTH OR EAST, WHICHEVER ACCOMMODATES THE DRAWING BEST.
- ACCURATE LINES MUST BE DRAWN FOR ALL LINES, ANGLES AND CURVES USED TO DESCRIBE BOUNDARIES, BLOCKS, LOTS, STREETS, ALLEYS, EASEMENTS, AREAS TO BE RESERVED FOR PUBLIC USE AND OTHER IMPORTANT FEATURES.
- BOUNDARY LINES SHALL BE DRAWN HEAVIER THAN STREET AND LOT LINES.
- MONUMENTS SHALL BE INSTALLED BY THE SUBDIVIDER'S ENGINEER OR LAND SURVEYOR AT SUCH POINTS DESIGNATED ON THE FINAL PLAT AS ARE APPROVED BY THE PLANNING DEPARTMENT.
- MONUMENTS MUST BE PLACED PRIOR TO FINAL BOND RELEASE.
- THE WASATCH COUNTY RECORDER'S OFFICE MAY HAVE ADDITIONAL REQUIREMENTS FOR THIS PLAT

ITEMS REQUIRED FOR PRELIMINARY PLAT:

- SECTION INFORMATION – TWO OR MORE CORNERS IF POSSIBLE
- BASIS OF BEARING CLEARLY LABELED
- BOUNDARY CLEARLY SHOWN AND DIMENSIONED WITH LEGAL DESCRIPTION
- POINT OF BEGINNING CLEARLY LABELED
- BENCHMARK FOR PROJECT HORIZONTAL AND VERTICAL CONTROLS
- BOUNDARY LINES OF ADJACENT TRACTS OF UN-SUBSIDIZED LAND
- THE 100-YR FLOOD LEVEL OF ALL WATERCOURSES INDICATED WITH VERTICAL DATUM
- SURROUNDING PROPERTY OWNERSHIP
- LOCATION OF AND DIMENSIONS TO THE NEAREST BENCH MARK OR MONUMENT ON TWO OPPOSITE SIDES OF THE PLAT
- PROPERTIES LOCATED IN THE SENSITIVE LANDS OVERLAY ZONE
- LOT SIZE CLEARLY LABELED IN SQ. FT. & ACRES WITH LENGTH & WIDTH
- NORTH ARROW
- DRAWING SCALE CLEARLY MARKED AND NOT LESS THAN 1" = 100'
- AREAS WITH SLOPES LESS THAN 30%, 30-40%, 40-50% AND > 50%
- IDENTIFIED NATURAL HAZARDS AND MITIGATION MEASURES FOR AREAS, SUBJECT TO AVALANCHE, LANDSLIDE, ROCK FALL, LIQUEFACTION, DEBRIS FLOWS, SURFACE FAULT RUPTURE, COLLAPSIBLE SOILS, SHRINK-SWELL SOILS, SHALLOW GROUNDWATER (WITHIN 3 FEET OF THE SURFACE), SURFACE WATER, STREAM BEDS (INCLUDING INTERMITTENT), SPRINGS, 100-YEAR FLOOD ZONES, AND DRINKING WATER SOURCE PROTECTION ZONES.

ITEMS REQUIRED FOR FINAL PLAT:

- INCLUDE ALL ITEMS REQUIRED ON PRELIMINARY PLAT (EXCEPT CONTOURS)
- STREET MONUMENTS
- BUILDING SETBACKS
- PUBLIC UTILITY EASEMENTS, ACCESS EASEMENTS, EXISTING EASEMENTS
- PROPOSED STREET NAMES
- INTERSECTION ADDRESSES
- LOT ADDRESSES
- TYPICAL LOT DETAILS SHOWING BOTH CORNER AND INTERIOR LOTS
- VICINITY MAP
- PLAT NOTES
- PHYSICAL MARKERS SHALL BE PLACED AT EACH LOT CORNER
- IF PROPERTY CONTROLLED BY PUBLIC AGENT OR UTILITY COMPANY, APPROVAL FOR LOCATION, IMPROVEMENT, AND MAINTENANCE MUST BE SHOWN
- ELECTRONIC COPY THAT IS COMPATIBLE WITH CITY'S AUTOCAD MAPPING SYSTEM SHALL BE SUBMITTED

N

100 0 100 200

SCALE IN FEET

TYPICAL:1" = 30' MAX:1" = 100'

LEGEND

DATE OF PREPARATION

- 3 2 / 10 11 EXISTING SECTION CORNER (FOUND) (AS DESCRIBED)
- PHASE 1 BOUNDARY LINE
- STREET CENTERLINE
- PROPOSED STREET MONUMENT
- MONUMENT TO MONUMENT TIE
- PROPOSED FIRE HYDRANT
- PROPOSED STREET LIGHT
- PARCEL DEDICATION TO SARATOGA SPRINGS
- EXISTING RIGHT-OF-WAY OVER THE WEST 33.00 FEET OF THE PROPERTY IN SECTION 2
- BUILDING SETBACK LINE
- PUBLIC UTILITY EASEMENTS

CENTERLINE CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHORD BEARING
CL1	200.00	202.46	57°59'57"	110.86	193.92	N29°16'01"E
CL2	200.00	111.64	31°58'58"	57.32	110.20	S15°43'26"E
CL3	345.00	191.93	31°52'30"	98.52	189.47	S15°47'45"E

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHORD BEARING
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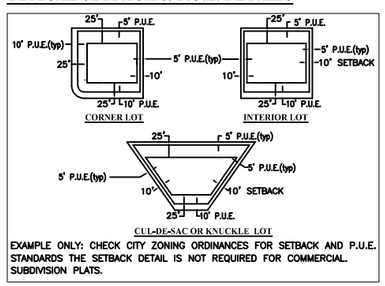
C8	50.00	5.12	05°51'42"	2.56	5.11	N09°10'38"E

DATA TABLE

INFORMATION	AC	SQ FT.	%TOTAL	#	NOTES
TOTAL PROJECT AREA	13.9	607182	100%		
SENSITIVE LANDS	0.2	7503	1%		7% OF OPEN SPACE
OPEN SPACE	2.3	101750	17%		
BUILDABLE LAND	8.1	354478	58%		
ROW AREA	3.5	150954	25%		
LANDSCAPING AREA	4.5	197518	33%		
LOTS				61	
NET DENSITY DWELLINGS BY ACRE				4.4	

TYPICAL SETBACK & P.U.E. DETAILS



EXAMPLE ONLY: CHECK CITY ZONING ORDINANCES FOR SETBACK AND P.U.E. STANDARDS THE SETBACK DETAIL IS NOT REQUIRED FOR COMMERCIAL. SUBDIVISION PLATS.

PLAT NAME AND PHASE

LOCATED IN A PORTION OF THE _____ QUARTER OF SECTION __,
TOWNSHIP __ SOUTH, RANGE __ EAST,
SALT LAKE BASE AND MERIDIAN
HEBER CITY, WASATCH COUNTY, UTAH

STANDARD PLAT NOTES

1- FINAL PLATS NOT RECORDED WITHIN ONE (1) YEAR FROM THE DATE RECEIVING FINAL APPROVAL SHALL BE NULL AND VOID UNLESS PHYSICAL CONSTRUCTION HAS STARTED OR AN EXTENSION HAS BEEN REQUESTED AND GRANTED PRIOR TO THE ORIGINAL PLAT EXPIRATION DATE. IN CASES WHERE CONSTRUCTION HAS STARTED, PLAT APPROVAL SHALL AUTOMATICALLY BE EXTENDED FOR A SECOND YEAR FROM THE DATE OF THE FINAL APPROVAL. IF PHYSICAL CONSTRUCTION HAS NOT STARTED, APPLICANTS MAY REQUEST AND BE GRANTED A ONE (1) YEAR EXTENSION. HOWEVER, IF AN EXTENSION IS GRANTED, THE REQUIREMENT TO INCORPORATE UPDATED CITY STANDARDS, OR REEVALUATE BONDS OR OTHER ASSURANCES MAY BE ENFORCED AS A CONDITION OF APPROVAL FOR THE EXTENSION.
2- PRIOR TO BUILDING PERMITS BEING ISSUED, SOIL AND/OR GEOTECHNICAL TESTING STUDIES MAY BE REQUIRED ON EACH LOT AS DETERMINED BY THE CITY BUILDING OFFICIAL.
3- THIS PLAT MAY BE SUBJECT TO A DEVELOPMENT AGREEMENT THAT SPECIFIES THE CONDITIONS OF DEVELOPING, BUILDING, AND USING PROPERTY WITHIN THIS PLAT. SEE CITY RECORDER FOR DETAILS.
4- PLAT IS SUBJECT TO "INSTALLATION OF IMPROVEMENTS AND BOND AGREEMENT NO. _____." WHICH REQUIRES THE CONSTRUCTION AND WARRANTY OF IMPROVEMENTS IN THIS SUBDIVISION. THESE OBLIGATIONS RUN WITH THE LAND AND ARE BINDING ON SUCCESSORS, AGENTS, AND ASSIGNS OF DEVELOPER. THERE ARE NO THIRD-PARTY RIGHTS OR BENEFICIARIES UNDER THIS AGREEMENT.
5- BUILDING PERMITS WILL NOT BE ISSUED UNTIL ALL REQUIRED IMPROVEMENTS HAVE BEEN INSTALLED PER CITY STANDARDS AND ALL FEES INCLUDING IMPACT AND CONNECTION FEES ARE PAID.
6- REFERENCES HEREIN TO DEVELOPER OR OWNER SHALL APPLY TO BOTH, AND ANY SUCH REFERENCE SHALL ALSO APPLY TO SUCCESSORS, AGENTS, AND ASSIGNS.
7- NO CITY MAINTENANCE SHALL BE PROVIDED FOR STREETS AND IMPROVEMENTS DESIGNATED AS "PRIVATE" ON THIS PLAT.
8- ALL PRIVATE STREETS, PARKING AREAS, AND COMMON AREA ARE DEDICATED AS CITY UTILITY EASEMENTS. HEBER CITY HAS THE RIGHT OF ACCESS THROUGH THESE EASEMENTS TO ACCESS, MAINTAIN, AND REPAIR CITY UTILITIES. NO CHANGES TO TOPOGRAPHY, STRUCTURES, ABOVE OR BELOW GROUND ARE ALLOWED IN EASEMENTS WITHIN 10 FEET OF CITY UTILITIES WITHOUT WRITTEN PERMISSION FROM THE HEBER CITY ENGINEER. ANY OBSTACLES ERECTED WITHIN THESE EASEMENTS WITHOUT WRITTEN PERMISSION WILL BE REMOVED AT THE CURRENT PROPERTY OWNER'S EXPENSE. ALL STORM DRAIN UTILITIES AND THEIR MAINTENANCE WITHIN PRIVATE PROPERTY SHALL BE THE RESPONSIBILITY OF PROPERTY OWNER. ALL SEWER LATERALS AND THEIR MAINTENANCE TO THE PUBLIC SEWER MAIN SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. ALL DRINKING WATER AND PRESSURIZED IRRIGATION SERVICES AND THEIR MAINTENANCE FROM THE WATER METER OR SERVICE VAULT SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER.
9- A GEOTECHNICAL REPORT HAS BEEN COMPLETED BY [GEOTECHNICAL ENGINEER], WHICH ADDRESSES SOIL AND GROUNDWATER CONDITIONS, PROVIDES ENGINEERING DESIGN CRITERIA, AND RECOMMENDS MITIGATION MEASURES IF PROBLEMATIC CONDITIONS WERE ENCOUNTERED. THE CITY ASSUMES NO LIABILITY OR RESPONSIBILITY FOR ANY RELIANCE ON THE INFORMATION OR LACK THEREOF IN THE REPORT.
10- AGRICULTURAL USES, OPERATIONS, AND RIGHTS ARE ADJACENT TO OR NEAR THE PLAT AND LOTS. THE LOTS IN THIS PLAT ARE SUBJECT TO THE SIGHTS, SOUNDS, ODORS, NUISANCES, AND ASPECTS ASSOCIATED WITH AGRICULTURAL OPERATIONS, USES, AND RIGHTS. THESE USES AND OPERATIONS MAY OCCUR AT ALL TIMES OF THE DAY AND NIGHT INCLUDING WEEKENDS AND HOLIDAYS. THE CITY IS NOT RESPONSIBLE OR LIABLE FOR THESE USES AND IMPACTS AND WILL NOT RESTRICT ANY GRANDFATHERED AGRICULTURAL USE FROM CONTINUING TO OCCUR LAWFULLY.
11- DRAINAGE ACROSS PROPERTY LINES SHALL NOT EXCEED THAT WHICH EXISTED PRIOR TO GRADING. EXCESS OR CONCENTRATED DRAINAGE SHALL BE CONTAINED ON SITE OR DIRECTED TO AN APPROVED DRAINAGE FACILITY. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE SHALL FALL A MINIMUM OF 6 INCHES WITHIN THE FIRST 10 FEET.

NOTES FOR PLATS WITH COMMON AREA

11- ALL OPEN SPACE, COMMON SPACE, AND TRAIL IMPROVEMENTS LOCATED HEREIN ARE TO BE INSTALLED BY OWNER AND MAINTAINED BY A HOMEOWNERS ASSOCIATION UNLESS SPECIFIED OTHERWISE ON EACH IMPROVEMENT.
12- LOTS/UNITS MAY BE SUBJECT TO ASSOCIATION BYLAWS, ARTICLES OF INCORPORATION AND CC&R'S."
13- COMMON AREAS ARE CONVEYED TO (INSERT NAME OF HOA).

VICINITY MAP

VICINITY MAP

SURVEYOR'S CERTIFICATE

I, the undersigned surveyor, do hereby certify that I am a professional Land Surveyor and that I hold a license (number shown below) in accordance with Utah Code Title 58, Chapter 22 of the Professional Engineers and Land Surveyors Licensing Act. I further certify that, by authority of the owners, I have completed a survey of the property described on this subdivision plat in accordance with Section 17-23-17, have verified all measurements, have subdivided said tract of land into lots, streets, together with easements, and have placed monuments on the ground as represented on the plat. I further certify that every existing right-of-way and easement grant of record for underground facilities, as defined in Utah Code Section 54-8a-2, and for other utility facilities, is accurately described on this plat, and that this plat is true and correct to the best of my knowledge. I also certify that I have filed, within 90 days of the establishment or reestablishment of this subdivision boundary, a map of the survey I have completed with the Wasatch County Surveyor.

BOUNDARY DESCRIPTION

A parcel of land situated in the ____ Quarter of Section __, Township __ South, Range East, Salt Lake Base and Meridian, said parcel being more particularly described as follows:

Beginning at a point....

Acres: _____ , # of lots ____ , # of parcels ____ .

SURVEYOR'S SEAL

OWNER'S DEDICATION

Know all men by these presents that the undersigned owner(s) of the above-described tract of land has/have caused the same to be subdivided into lots, parcels, and streets, together with easements and rights-of-way, to be hereafter known as:

XXXXX

and do hereby dedicate for the perpetual use of the public and City all parcels, lots, streets, easements, rights-of-way, and public amenities shown on this plat as intended for public or City use. The undersigned owner(s), agents, successors, and assigns shall voluntarily defend, indemnify, and save harmless the City against any easements or other encumbrance on a dedicated street, easement, or right-of-way that will interfere with the City's use, maintenance, and operation of the street or utilities. The undersigned owner(s), agents, successors, and assigns also hereby convey any other easements, as shown and/or noted on this plat, to the parties indicated and for the purposes shown and/or noted hereon. The undersigned owner(s), agents, successors, and assigns assume all liability with respect to the creation of this subdivision, the alteration of the ground surface, vegetation, drainage, or surface or sub-surface water flows within this subdivision, and the development activity within this subdivision by the undersigned owner(s), agents, successors, and assigns. The owner(s) hereby convey(s) the Common Area, as indicated hereon, to the (insert name of HOA), a Utah Nonprofit Corporation, with a registered address of (insert address).

In witness whereof I have set forth my hand this___ day of ____ , A.D. 20__.

Signature _____ Print Name _____ Title & Entity _____

Signature _____ Print Name _____ Title & Entity _____

For Plats with an HOA

OWNER'S ACKNOWLEDGMENT

STATE OF UTAH } S.S.
County of Utah

On this___day of ____, 20__, personally appeared before me _____ who being by me duly sworn, did prove to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed this plat with full authority of the owner(s).

I certify under PENALTY OF PERJURY under the laws of the State of Utah that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public Full Name: _____

Commission Number _____ My commission expires: _____

A Notary Public Commissioned in Utah

Each owner's signature must be notarized separately if multiple owners sign in front of different notaries. Please add an owner's acknowledgment signature block for each owner who signs the plat.

APPROVAL BY LEGISLATIVE BODY

The City Council of Heber City, County of Wasatch, approves this subdivision subject to the conditions and restrictions stated hereon, and hereby accepts the dedication of all streets, easements, and other parcels of land intended for the public purpose of the perpetual use of the public.

Mayor _____ Date _____

RECORDER'S SEAL

ENGINEER'S NAME: _____
ENGINEER'S ADDRESS: _____
DEVELOPER'S NAME: _____
DEVELOPER'S ADDRESS: _____

PLANNING DIRECTOR	CITY ENGINEER	WASATCH CO. FIRE DISTRICT	CITY ATTORNEY	COUNTY SURVEYOR
Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____
_____ PLANNING DIRECTOR	_____ CITY ENGINEER	_____ FIRE CHIEF	_____ CITY ATTORNEY	_____ COUNTY SURVEYOR

PLAT NAME AND PHASE

LOCATED IN A PORTION OF THE ____ QUARTER OF SECTION ___,TOWNSHIP ___ SOUTH, RANGE ___ EAST,
SALT LAKE BASE AND MERIDIAN
HEBER CITY, WASATCH COUNTY, UTAH

(INSERT PLAT NAME) AMENDED

AMENDING LOTS (INSERT LOT NUMBERS) OF (INSERT EXACT NAME OF PLAT BEING AMENDED)
LOCATED IN A PORTION OF THE _____ QUARTER OF SECTION__,
TOWNSHIP __ SOUTH, RANGE __ WEST,
SALT LAKE BASE AND MERIDIAN
CITY OF SARATOGA SPRINGS, UTAH COUNTY, UTAH

STANDARD FORMAT FOR AMENDED PLATS

N

100 0 100 200

SCALE IN FEET
TYPICAL:1" = 30' MAX:1" = 100'

LEGEND

DATE OF PREPARATION

- EXISTING SECTION CORNER (FOUND) (AS DESCRIBED)
- PHASE 1 BOUNDARY LINE
- STREET CENTERLINE
- PROPOSED STREET MONUMENT
- MONUMENT TO MONUMENT TIE
- PROPOSED FIRE HYDRANT
- PROPOSED STREET LIGHT
- PARCEL DEDICATION TO SARATOGA SPRINGS
- EXISTING RIGHT-OF-WAY OVER THE WEST 33.00 FEET OF THE PROPERTY IN SECTION 2
- BUILDING SETBACK LINE
- PUBLIC UTILITY EASEMENTS

VICINITY MAP

VICINITY MAP

DATA TABLE

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LANDSCAPING AREA	4.5	197518	33%		
LOTS				61	
NET DENSITY DWELLINGS BY ACRE				4.4	

CENTERLINE CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHORD BEARING
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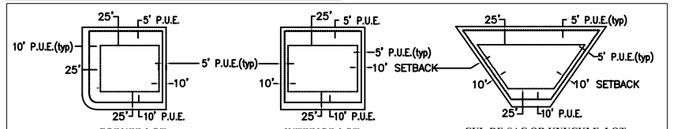
TYPICAL SETBACK & P.U.E. DETAILS



CORNER LOT | INTERIOR LOT | CUL-DE-SAC OR KNUCKLE LOT

EXAMPLE ONLY: CHECK CITY ZONING ORDINANCES FOR SETBACK AND P.U.E STANDARDS.
THE SETBACK DETAIL IS NOT REQUIRED FOR COMMERCIAL SUBDIVISION PLATS.

BY SIGNING THIS PLAT, THE FOLLOWING UTILITY COMPANIES ARE APPROVING THE: (A) BOUNDARY, COURSE, DIMENSIONS, AND INTENDED USE OF THE RIGHT-OF-WAY AND EASEMENT GRANTS OF RECORD; (B) LOCATION OF EXISTING UNDERGROUND AND UTILITY FACILITIES; (C) CONDITIONS OR RESTRICTIONS GOVERNING THE LOCATION OF THE FACILITIES WITHIN THE RIGHT-OF-WAY, AND EASEMENT GRANTS OF RECORD, AND UTILITY FACILITES WITHIN THE SUBDIVISION. "APPROVING" SHALL HAVE THE MEANING IN UTAH CODE SECTION 10-9A-603(4)(c)(ii). THE FOLLOWING NOTES ARE NOT ENDORSED OR ADOPTED BY SARATOGA SPRINGS AND DO NOT SUPERSEDE CONFLICTING PLAT NOTES OR SARATOGA SPRINGS POLICIES.

ROCKY MOUNTAIN POWER

1. PURSUANT TO UTAH CODE ANN. 54-3-27 THIS PLAT CONVEYS TO THE OWNER(S) OR OPERATORS OF UTILITY FACILITIES A PUBLIC UTILITY EASEMENT ALONG WITH ALL THE RIGHTS AND DUTIES DESCRIBED THEREIN.
2. PURSUANT TO UTAH CODE ANN. 17-27a-603(4)(c)(ii) ROCKY MOUNTAIN POWER ACCEPTS DELIVERY OF THE PUE AS DESCRIBED IN THIS PLAT AND APPROVES THIS PLAT SOLELY FOR THE PURPOSE OF CONFIRMING THAT THE PLAT CONTAINS PUBLIC UTILITY EASEMENTS AND APPROXIMATES THE LOCATION OF THE PUBLIC UTILITY EASEMENTS, BUT DOES NOT WARRANT THEIR PRECISE LOCATION. ROCKY MOUNTAIN POWER MAY REQUIRE OTHER EASEMENTS IN ORDER TO SERVE THIS DEVELOPMENT. THIS APPROVAL DOES NOT AFFECT ANY RIGHT THAT ROCKY MOUNTAIN POWER HAS UNDER:
   a. A RECORDED EASEMENT OR RIGHT-OF-WAY
   b. THE LAW APPLICABLE TO PRESCRIPTIVE RIGHTS
   c. TITLE 54, CHAPTER 8a, DAMAGE TO UNDERGROUND UTILITY FACILITIES OR
   d. ANY OTHER PROVISION OF LAW

APPROVED THIS _____ DAY OF _____ 20__

ROCKY MOUNTAIN POWER

DOMINION ENERGY QUESTAR CORPORATION

DOMINION ENERGY QUESTAR CORPORATION APPROVES THIS PLAT SOLELY FOR THE PURPOSE OF CONFIRMING THAT THE PLAT CONTAINS PUBLIC UTILITY EASEMENTS. DOMINION ENERGY QUESTAR CORPORATION MAY REQUIRE OTHER EASEMENTS IN ORDER TO SERVE THIS DEVELOPMENT. THIS APPROVAL DOES NOT CONSTITUTE ABROGATION OR WAIVER OF ANY OTHER EXISTING RIGHTS, OBLIGATIONS OR LIABILITIES PROVIDED BY LAW OR EQUITY. THIS APPROVAL DOES NOT CONSTITUTE ACCEPTANCE, APPROVAL OR ACKNOWLEDGEMENT OF ANY TERMS CONTAINED IN THE PLAT, INCLUDING THOSE SET FORTH IN THE OWNERS DEDICATION AND THE NOTES AND DOES NOT CONSTITUTE A GUARANTEE OF PARTICULAR TERMS OF NATURAL GAS SERVICE. FOR FURTHER INFORMATION PLEASE CONTACT DOMINION ENERGY QUESTAR CORPORATION'S RIGHT-OF-WAY DEPARTMENT AT 800-366-8532.

APPROVED THIS _____ DAY OF _____ 20__

BY _____

TITLE _____

DOMINION ENERGY QUESTAR CORP.

ITEMS REQUIRED FOR FINAL PLAT:

- INCLUDE ALL ITEMS REQUIRED ON PRELIMINARY PLAT (EXCEPT CONTOURS)
- STREET MONUMENTS
- BUILDING SETBACKS
- PUBLIC UTILITY EASEMENTS, ACCESS EASEMENTS, EXISTING EASEMENTS
- PROPOSED STREET NAMES
- INTERSECTION ADDRESSES
- LOT ADDRESSES
- TYPICAL LOT DETAILS SHOWING BOTH CORNER AND INTERIOR LOTS
- VICINITY MAP
- PLAT NOTES
- PHYSICAL MARKERS SHALL BE PLACED AT EACH LOT CORNER
- IF PROPERTY CONTROLLED BY PUBLIC AGENT OR UTILITY COMPANY, APPROVAL FOR LOCATION, IMPROVEMENT, AND MAINTENANCE MUST BE SHOWN
- ELECTRONIC COPY THAT IS COMPATIBLE WITH CITY'S AUTOCAD MAPPING SYSTEM SHALL BE SUBMITTED

PLAT REQUIREMENTS

- FINAL PLAT SHALL BE PREPARED ON A SHEET OF APPROVED REPRODUCIBLE D-SIZE MYLAR AND MADE WITH TEXT NOT LESS THAN ONE-TENTH INCH IN SIZE, SHALL BE SO DRAWN THAT THE TOP OF THE SHEET FACES EITHER NORTH OR EAST, WHICHEVER ACCOMMODATES THE DRAWING BEST.
- ACCURATE LINES MUST BE DRAWN FOR ALL LINES, ANGLES AND CURVES USED TO DESCRIBE BOUNDARIES, BLOCKS, LOTS, STREETS, ALLEYS, EASEMENTS, AREAS TO BE RESERVED FOR PUBLIC USE AND OTHER IMPORTANT FEATURES.
- BOUNDARY LINES SHALL BE DRAWN HEAVIER THAN STREET AND LOT LINES.
- MONUMENTS SHALL BE INSTALLED BY THE SUBDIVIDER'S ENGINEER OR LAND SURVEYOR AT SUCH POINTS DESIGNATED ON THE FINAL PLAT AS ARE APPROVED BY THE COMMUNITY DEVELOPMENT DEPARTMENT.
- MONUMENTS MUST BE PLACED PRIOR TO FINAL BOND RELEASE.
- THE UTAH COUNTY RECORDER'S OFFICE MAY HAVE ADDITIONAL REQUIREMENTS FOR THIS PLAT

STANDARD PLAT NOTES

1-PLAT MUST BE RECORDED WITHIN 24 MONTHS OF FINAL PLAT APPROVAL, OR FOR PHASED DEVELOPMENTS, WITHIN 24 MONTHS OF RECORDATION OF MOST RECENT PHASE. THE FIRST FINAL PLAT APPROVAL WAS GRANTED ON THE _____ DAY OF _____, 20__.
2-PRIOR TO BUILDING PERMITS BEING ISSUED, SOIL AND/OR GEOTECHNICAL TESTING STUDIES MAY BE REQUIRED ON EACH LOT AS DETERMINED BY THE CITY BUILDING OFFICIAL.
3-THIS PLAT MAY BE SUBJECT TO A DEVELOPMENT AGREEMENT THAT SPECIFIES THE CONDITIONS OF DEVELOPING, BUILDING, AND USING PROPERTY WITHIN THIS PLAT. SEE CITY RECORDER FOR DETAILS.
4-BUILDING PERMITS WILL NOT BE ISSUED UNTIL ALL REQUIRED IMPROVEMENTS HAVE BEEN INSTALLED PER CITY STANDARDS AND ALL FEES INCLUDING IMPACT AND CONNECTION FEES ARE PAID.
5-REFERENCES HEREIN TO DEVELOPER OR OWNER SHALL APPLY TO BOTH, AND ANY SUCH REFERENCE SHALL ALSO APPLY TO SUCCESSORS, AGENTS, AND ASSIGNS.
6-NO CITY MAINTENANCE SHALL BE PROVIDED FOR STREETS AND IMPROVEMENTS DESIGNATED AS "PRIVATE" ON THIS PLAT.
7- AGRICULTURAL USES, OPERATIONS, AND RIGHTS ARE ADJACENT TO OR NEAR THE PLAT AND LOTS. THE LOTS IN THIS PLAT ARE SUBJECT TO THE SIGHTS, SOUNDS, ODORS, NUISANCES, AND ASPECTS ASSOCIATED WITH AGRICULTURAL OPERATIONS, USES, AND RIGHTS. THESE USES AND OPERATIONS MAY OCCUR AT ALL TIMES OF THE DAY AND NIGHT INCLUDING WEEKENDS AND HOLIDAYS. THE CITY IS NOT RESPONSIBLE OR LIABLE FOR THESE USES AND IMPACTS AND WILL NOT RESTRICT ANY GRANDFATHERED AGRICULTURAL USE FROM CONTINUING TO OCCUR LAWFULLY.
8- DRAINAGE ACROSS PROPERTY LINES SHALL NOT EXCEED THAT WHICH EXISTED PRIOR TO GRADING. EXCESS OR CONCENTRATED DRAINAGE SHALL BE CONTAINED ON SITE OR DIRECTED TO AN APPROVED DRAINAGE FACILITY. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE SHALL FALL A MINIMUM OF 6 INCHES WITHIN THE FIRST 10 FEET.

NOTES FOR PLATS WITH COMMON AREA

9-ALL OPEN SPACE, COMMON SPACE, AND TRAIL IMPROVEMENTS LOCATED HEREIN ARE TO BE INSTALLED BY OWNER AND MAINTAINED BY A HOMEOWNERS ASSOCIATION UNLESS SPECIFIED OTHERWISE ON EACH IMPROVEMENT.
10-LOTS/UNITS MAY BE SUBJECT TO ASSOCIATION BYLAWS, ARTICLES OF INCORPORATION AND CC&R'S."
11-COMMON AREAS ARE CONVEYED TO (INSERT NAME OF HOA).

For Plats with an HOA

ITEMS REQUIRED FOR PRELIMINARY PLAT:

- SECTION INFORMATION - TWO OR MORE CORNERS IF POSSIBLE
- BASIS OF BEARING CLEARLY LABELED
- BOUNDARY CLEARLY SHOWN AND DIMENSIONED WITH LEGAL DESCRIPTION
- POINT OF BEGINNING CLEARLY LABELED
- BENCHMARK FOR PROJECT HORIZONTAL AND VERTICAL CONTROLS
- BOUNDARY LINES OF ADJACENT TRACTS OF UN-SUBSIDIZED LAND
- THE 100-YR FLOOD LEVEL OF ALL WATERCOURSES INDICATED WITH VERTICAL DATUM
- SURROUNDING PROPERTY OWNERSHIP
- LOCATION OF AND DIMENSIONS TO THE NEAREST BENCH MARK OR MONUMENT ON TWO OPPOSITE SIDES OF THE PLAT
- PROPERTIES LOCATED IN THE SENSITIVE LANDS OVERLAY ZONE
- LOT SIZE CLEARLY LABELED IN SQ. FT. & ACRES WITH LENGTH & WIDTH
- NORTH ARROW
- DRAWING SCALE CLEARLY MARKED AND NOT LESS THAN 1" = 100'
- AREAS WITH SLOPES LESS THAN 30%, 30-40%, 40-50% AND > 50%
- IDENTIFIED NATURAL HAZARDS, INCLUDING AREAS SUBJECT TO AVALANCHE, LIQUEFACTION, DEBRIS FLOWS, AND SURFACE FAULT RUPTURE

Each owner's signature must be notarized separately if multiple owners sign in front of different notaries. Please add an owner's acknowledgment signature block for each owner who signs the plat.

PUBLIC WORKS DIRECTOR

Approved by the Public Works Director on this ___ day of _____, A.D. 20____

PUBLIC WORKS DIRECTOR

CENTURY LINK

Approved this ___ day of _____, A.D. 20____

CENTURY LINK

PLANNING DIRECTOR

Approved by the Planning Director on this ___ day of _____, A.D. 20____

PLANNING DIRECTOR

LAND USE AUTHORITY

Approved by the Land Use Authority on this ___ day of _____, A.D. 20____

LAND USE AUTHORITY

SARATOGA SPRINGS ATTORNEY

Approved by Saratoga Springs Attorney on this ___ day of _____, A.D. 20____

SARATOGA SPRINGS ATTORNEY

COMCAST CABLE TELEVISION

Approved this ___ day of _____, A.D. 20____

COMCAST CABLE TELEVISION

CITY ENGINEER

Approved by the City Engineer on this ___ day of _____, A.D. 20____

CITY ENGINEER

FIRE CHIEF

Approved by the Fire Chief on this ___ day of _____, A.D. 20____

CITY FIRE CHIEF

LEHI CITY POST OFFICE

Approved by Post Office Representative on this ___ day of _____, A.D. 20____

LEHI CITY POST OFFICE REPRESENTATIVE

SURVEYOR'S CERTIFICATE

I, the undersigned surveyor, do hereby certify that I am a professional Land Surveyor and that I hold a license (number shown below) in accordance with Utah Code Title 58, Chapter 22 of the Professional Engineers and Land Surveyors Licensing Act. I further certify that, by authority of the owners, I have completed a survey of the property described on this subdivision plat in accordance with Section 17-23-17, have verified all measurements, have subdivided said tract of land into lots, streets, together with easements, and have placed monuments on the ground as represented on the plat. I further certify that every existing right-of-way and easement grant of record for underground facilities, as defined in Utah Code Section 54-8a-2, and for other utility facilities, is accurately described on this plat, and that this plat is true and correct to the best of my knowledge. I also certify that I have filed, within 90 days of the establishment or reestablishment of this subdivision boundary, a map of the survey I have completed with the Wasatch County Surveyor.

BOUNDARY DESCRIPTION

A parcel of land situated in the ____ Quarter of Section ___, Township __ South, Range East, Salt Lake Base and Meridian, said parcel being more particularly described as follows:

Beginning at a point....

Acres: ____ # of lots _____

Date _____ Surveyor's Name _____
License no._____

OWNER'S DEDICATION

Know all men by these presents that the undersigned owner(s) of the above-described tract of land has/have caused the same to be subdivided into lots, parcels, and streets, together with easements and rights-of-way, to be hereafter known as:

XXXXX

and do hereby dedicate for the perpetual use of the public and City all parcels, lots, streets, easements, rights-of-way, and public amenities shown on this plat as intended for public or City use. The undersigned owner(s), agents, successors, and assigns shall voluntarily defend, indemnify, and save harmless the City against any easements or other encumbrance on a dedicated street, easement, or right-of-way that will interfere with the City's use, maintenance, and operation of the street or utilities. The undersigned owner(s), agents, successors, and assigns also hereby convey any other easements, as shown and/or noted on this plat, to the parties indicated and for the purposes shown and/or noted hereon. The undersigned owner(s), agents, successors, and assigns assume all liability with respect to the creation of this subdivision, the alteration of the ground surface, vegetation, drainage, or surface or sub-surface water flows within this subdivision, and the development activity within this subdivision by the undersigned owner(s), agents, successors, and assigns. The owner(s) hereby convey(s) the Common Area, as indicated hereon, to the (insert name of HOA), a Utah Nonprofit Corporation, with a registered address of (insert address).

In witness whereof I have set forth my hand this___ day of ____, A.D. 20__.

Signature _____ Print Name _____ Title & Entity _____

Signature _____ Print Name _____ Title & Entity _____

OWNER'S ACKNOWLEDGMENT

STATE OF UTAH } S.S.
County of Utah

On this___day of ____, 20__, personally appeared before me _____, who being by me duly sworn, did prove to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed this plat with full authority of the owner(s).

I certify under PENALTY OF PERJURY under the laws of the State of Utah that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public Full Name:_____

Commission Number: _____ My commission expires: _____

A Notary Public Commissioned In Utah

APPROVAL BY LEGISLATIVE BODY

The City Council of Heber City, County of Wasatch, approves this subdivision subject to the conditions and restrictions stated hereon, and hereby accepts the dedication of all streets, easements, and other parcels of land intended for the public purpose of the perpetual use of the public.
This _____, day of _____, A.D. 20____.

Attest _____ Authorized for Acceptance
City Mayor

(INSERT PLAT NAME) AMENDED

AMENDING LOTS (INSERT LOT NUMBERS) OF (INSERT EXACT NAME OF PLAT BEING AMENDED)
LOCATED IN A PORTION OF THE _____ QUARTER OF SECTION
___,TOWNSHIP __ SOUTH, RANGE __ WEST,
SALT LAKE BASE AND MERIDIAN
CITY OF SARATOGA SPRINGS, UTAH COUNTY, UTAH

SURVEYORS SEAL	CITY ENGINEER SEAL	CLERK-RECORDER SEAL
		SP-1

HEBER CITY CORPORATION
75 North Main Street
Heber City, UT 84032
Heber City Council Meeting
July 18, 2023

DRAFT Minutes

4:30 p.m. Work Meeting
6:00 p.m. Regular Meeting

I. WORK MEETING - 4:30 P.M.

Mayor Franco called the meeting to order at 4:31 p.m.

City Council Present: Mayor Heidi Franco
Council Member Yvonne Barney
Council Member Mike Johnston
Council Member Rachel Kahler (absent 4:20 - 6:00 p.m.)
Council Member Scott Phillips - remotely (left at 7:27 p.m.)
Council Member Ryan Stack

Staff Present: City Manager Matt Brower
Assistant City Manager Mark Smedley
Community Development Director Tony Kohler
Planning Manager Jamie Baron
City Engineer Russ Funk
Airport Manager Travis Biggs
City Attorney Jeremy Cook
Officer Bryan Berg
City Recorder Trina Cooke

Staff Participating Remotely: IT Specialist Anthon Beales, Human Resource Manager Cherie Ashe, Engineering Technician Desiree Muheim, City Planner Jacob Roberts, Planning Manager Jamie Baron, Public Works Director Matthew Kennard, Finance Manager Sara Nagel, and Accounts Payable Technician Wendy Anderson.

Also Present: Pam Patrick, Heber Lefgren, Ann Moulton, Jerry Duke, Missy Luke, Dave Turner, Di Ann Duke Turner, Nay Goale, Mark Neilson, Sarah Duke Duncan, Jon R. Duke, Mike Bradshaw, Jared Wright, Kyler M. Harris, Austin Codwell, Sid Ostergaard, Jen Ostergaard, Glenn Parman, Phil Jordan, Tori Broughton, Morgan Lawrence, Caden Lawrence, Don K. Taylor, Terry Deihl, Armand Johanson, Paul Linford, Seville Neal, Moiria Rust, and others whose signatures were illegible or did not sign in.

Also Attending Remotely: (names listed as signed-in virtually) Cheryl Fox, Jesse Porquis, Kelli G, Christi Judd, Curtis Leavitt, John Janson, KPCW, Kate Sattelmeier, Kristen Small, Parker Sever, Paul Linford, Ron Winterton, Phil, Shorty, TMT, and T.

1. Council Meeting new software training Civic Clerk (Trina Cooke, City Recorder) - *30 min*

Civic Clerk representative Jesse Porquis provided an overview of the board portal for City Council Members to use with the City's new meeting software.

2. Discuss proposed Code Amendment to Chapter 18.68 Supplemental Zoning Regulations (Kohler, Janson) – *30 min*

Work Meeting Item Two was postponed until August 1 in order to hold the Closed Executive Session originally scheduled for the end of the Regular meeting.

3. Review of Moderate Income Housing Action Items (Baron) – *20 min*

Planning Manager Jamie Baron Presented the Moderate Income Housing report.

Council Member Phillips informed the Council he would need to depart the meeting at 7:00 p.m.

II. BREAK - 10 MIN

III. REGULAR MEETING - 6:00 P.M.

1. Call to Order

Mayor Franco called the meeting to order at 6:05 p.m.

2. Pledge of Allegiance (Heidi Franco, Mayor)

Mayor Franco led the recitation of the Pledge of Allegiance.

3. Prayer/Thought by Invitation (Mike Johnston, Council Member)

Pam Patrick shared a poem entitled "I know something good about you."

IV. CONFLICT OF INTEREST DISCLOSURE:

No conflicts were disclosed.

V. CONSENT AGENDA:

Mayor Franco proposed Action Agenda Items 7 and 8 be included with the Consent Agenda.

Motion: Council Member Phillips moved to keep the Duke property discussion on the Action Item agenda. **Second:** Council Member Johnston made the second. **Voting Yes:** Council Members Barney, Johnston, Kahler, Phillips, and Stack. **Voting No:** None. The **Motion Passed Unanimously, 5-0.**

Motion: Council Member Johnston moved to return item eight to the Regular Meeting Action Items agenda for discussion. **Second:** Council Member Phillips made the second.**Voting Yes:** Council Members Kahler, Johnston, Barney, Stack, and Phillips. **Voting No:** None. The **Motion Passed Unanimously, 5-0.**

Council Member Phillips inquired whether the Mayor wished to assign someone other than herself to the Fire District Advisory Board in order to alleviate some of the workload she held. Mayor Franco explained that the Fire Chief had requested the Mayors represent the Cities on the board.

Motion: Council Member Phillips moved that the Duke Farm discussion be moved forward on the agenda in order for him to be present for the discussion. **Second:** Council Member Kahler made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, Stack, and Phillips. **Voting No:** None. The **Motion Passed Unanimously, 5-0.**

Motion: Council Member Phillips moved to approve the Consent Agenda. **Second:** Council Member Stack made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, Stack, and Phillips. **Voting No:** None. The **Motion Passed Unanimously, 5-0.**

1. Approval of June 6, 2023 and June 20, 2023, City Council Meeting Minutes (Trina Cooke, City Recorder)

2. Approval of Ordinance 2023-27 updating Title 7 of the Heber City Municipal Code, Elections, in order to align with State Code as amended in the 2023 Legislative Session (Trina Cooke)

3. Approval of Ordinance 2023-28 Amending the Heber City Council 2023 Annual Meeting Schedule (Trina Cooke)

4. Approval to Hang Flags on Main Street in Remembrance of 9/11 from September 5-15 (Rachel Kahler, Council Member)

5. Approve Appointment of Mayor Heidi Franco as the Heber City Representative on the Wasatch County Fire District Advisory Commission (Heidi Franco, Mayor)

6. Approval of POSTT (Parks, Open Space, Trails, and Trees) Committee Nomination Tori Broughton (Heidi Franco, Mayor)

VI. PUBLIC COMMENTS:

Airport Manager Travis Biggs shared two videos of the latest event held at the Heber Valley Airport produced by local high school students. Kyler Harris and Austin Calwell shared their background and interest in photography and videography.

Morgan Lawrence felt the elimination of one of the two traffic lights on Main Street would help alleviate some of the traffic pressure. He proposed a realignment of Midway Lane to 100 South with funding from UDOT (Utah Department of Transportation as Main Street and Midway Lane were both State Roads. Mayor Franco felt the suggestion aligned with the Envision Heber agenda item and invited Mr. Lawrence to stay to listen to the Council discussion later in the meeting.

Di Ann Duke Turner noted that the farm lease for the Duke property was the only written record of the dollar amount that the City had paid for the land purchased from the Duke Family. She recalled conversations with City representatives who had verbally committed to keeping the land as open space for either cemetery use or a park.

Mayor Franco moved the meeting forward to item four on the Action Items agenda for discussion.

VII. GENERAL BUSINESS ITEMS:

1. Presentation of Mayor's Award to Glen Parman (Heidi Franco, Mayor) - *5 min*

Mayor Franco highlighted the services of Fleet Manager Glenn Parman as itemized in the letter attached to the agenda that was submitted by Public Works Director Matthew Kennard.

2. Presentation of Heber Valley's efforts to recognize 9/11 National Day of Service (Ann Moulton) - *5 min*

Ann Moulton, Just Serve Specialist, read the statement attached to the agenda.

3. Presentation by Heber Light and Power on Time of Use Rates (Jared Wright) – *10 min*

Jared Wright, representing Heber Light and Power, was present to explain the time-of-use rates as offered by the Power company. He described the cost of service study to determine peak demand hours of the day to accurately capture costs. The purpose was to encourage power conservation during peak demand in order to alleviate pressure on the system. The time-of-use program was a voluntary opt-in program with a commitment of one year. He noted simple changes to habits could produce energy savings.

4. Presentation by Animal Control Board (Justin Hatch, Animal Control Supervisor, Heidi Franco, Mayor, Heber Lefgren, Assistant County Manager) - *10 min*

Assistant County Manager Heber Lefgren presented the proposal to move the Animal Services to the County as proposed by the Animal Control Board. He noted his background as the director of the animal control department in San Antonio, Texas. Mr. Lefgren shared the accommodations offered by the shelter and provided a general assessment of the facility. Neither Mr. Lefgren nor Animal Control Supervisor Justin Hatch felt the department was failing. The intent was to look to the future to address the need for a new facility to offer better services, including adoption-friendly enclosures, and to determine which local entity was best suited to oversee the department. Council discussion followed.

5. Presentation of Findings from Colorado Cities Tour (Matt Brower, City Manager, Jamie Baron, Planning Manager) - *10 min*

City Manager Matt Brower explained the purpose for the tour of four different Colorado cities' downtown main streets had been to learn what had led to their success. Council Members, Planning Commissioners, and executive Staff had been invited to participate. Planning Manager Jamie Baron shared the PowerPoint as attached to the agenda highlighting architecture, art installations, parking solutions, restaurants and retail shops, as well as other amenities contributing to their success.

Planning Commissioner Sid Ostergard felt the tour had been very beneficial and thanked the City for the opportunity. Planning Commissioner Phil Jordan had participated in the tour as well. He felt contemporary and historic architecture could exist complementarily together. He thought parking solutions could be integrated into Heber's downtown area.

Mr. Brower invited the Council to a lunch meeting with Roger Brooks who would be sharing renderings for Heber City's downtown and Main Street revitalization.

Jerry Duke hoped the Council would proceed cautiously. He did not want to see Heber City follow the path of Park City and repeat their mistakes

6. Central Heber Replacements Project Update (Russ Funk, Engineering Director) - *10 min*

The replacements project update was not provided or discussed.

VIII. ACTION ITEMS:

1. Approval of Ordinance 2023-22 adopting General Plan Amendment for Envision Central Heber Vision Statement (Tony Kohler, Community Development Director) - *45 min*

Council Member Johnston felt the Council would not be able to get through the Envision Central Heber discussion due to the lateness of the hour and proposed dedicating a full two hours to the discussion at a future Work Meeting. Council Member Stack agreed.

Motion: Council Member Johnston moved that the General Plan Amendment for Envision Central Heber be moved to a future Work Meeting in two weeks or a month, when Council would be able to give it due diligence of at least 90 minutes. **Second:** Council Member Stack made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The **Motion Passed 4-0.**

2. Presentation of Rail-Trail Project and Request Support for Grant Application and Commitment to fund Heber City Portion of Trail (Nancy O'Toole) - *15 min*

Nancy O'Toole provided a project update and reviewed the proposed phases. The trail would travel between the Heber Valley Railroad and Soldier Creek in the Wasatch Mountain State Park. Phase three of the trail would be entirely in Heber City. Ms. O'Toole had applied for a 60-40 UDOT grant in which Heber City would be responsible for only 40% of the cost of the phase 3 portion of the trail. The County Council had approved their portion of the trail grant match unanimously. MAG (Mountainlands Association of Governments) Trail Consultant for Wasatch County, Don Taylor, further provided history of the efforts to get the trail built and noted there had been an environmental impact study completed in 2016. Ms. O'toole felt the project would be at the top of the State's grant recipient list due to the readiness of the project to begin. Mr. Brower ensured the funding could be found in the City's budget.

Motion: Council Member Stack moved to approve and fund phase three of the trail within the City; to require a 40% match of the total cost for phase three at $815,698.37 with the 40% match to be $326,279.35. **Second:** Council Member Kahler made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The **Motion Passed 4-0.**

3. Review Proposed Amendment to the North Village Views and Highlands Master Plans stemming from proposed change to North Village transportation corridor (Tony Kohler, Community Development Director) - *30 min*

Mike Bradshaw, representing the North Village Views, identified the proposed changes to the transportation plan. Consultant for the development, Phil Jordan, further described the proposed modifications to the plan and the effects upon the initially proposed plan as well as the dedicated art center with an amphitheater. Mr.Bradshaw explained their goal had been to reestablish the surrounding development's master plans without increasing the overall density.

Council Member Stack noted an additional 139 units in the proposal and felt the proposal should go through the proper process beginning with the return to the Planning Commission. Council Member Barney agreed with Council Member Stack.

Project development representative Terry Deihl explained the unit count had gone down by seven units but the ERU (equivalent residential units) count had slightly increased. The reason was an effort to offer a more affordable product for the university area.

Mayor Franco opened the discussion for public comment. 7:15 p.m.

Dave Turner felt the item needed to be returned to the Planning Commission for additional review.

With no further comments from the public, the comment period was closed.

Motion: Council Member Johnston moved to proceed with the request as outlined by Staff as an administrative amendment and let Staff continue to deal with it and the Planning Commission to review it. **Second:** Council Member Kahler made the second.

Council Member Stack felt the request was somewhat a sleight of hand because Council had been advised the developments needed to go through the negotiation and approval process individually yet now they were requesting changes as a whole. Council Member Barney agreed. Council Member Kahler noted her diligence regarding density. She had changed her mind somewhat due to the lack of affordability in Heber City. Mayor Franco wished to have park and ride lots included in the plan.

Vote: Voting Yes: Council Members Kahler, Johnston, and Phillips. **Voting No:** Council Members Barney and Stack. The **Motion Passed, 3-2.**

4. Authorize City Manager to Sign DRAFT Section 4(f) De Minimis Impact Concurrence Request from Utah Department of Transportation (UDOT) (Matt Brower, City Manager) - *10 - min*

City Manager Matt Brower explained UDOT's (Utah Department of Transportation) request for a letter of concurrence from Heber City with regard to the use of approximately 2.14 acres of City land located at Muirfield Park. The land would be used as a culvert to support the proposed future bypass. UDOT had learned there was a conservation easement located on the land that prohibited culverts. UDOT had expressed confidence in their ability to work through the conflict. Cheryl Fox with Summit Land Conservancy had drafted a letter to UDOT to propose solutions and maintain protection of the conservation easement.

Motion: Council Member Stack moved to bring agenda item six forward based upon the time-sensitive contract approval needed. **Second:** Council Member Kahler made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The **Motion Passed 4-0.**

5. Adoption of the Advisory Arts Committee (Matt Brower, City Manager) - *15 min*

A motion was made at the end of the Council Meeting to continue agenda item five to a future meeting.

6. Consider contract award to MC Contractors in the amount of $841,523.48 for the construction of the Mill Road Roundabout (Russ Funk, Engineering Director) - *10 min*

Mr. Brower explained the City had received only one bid for construction of a proposed roundabout to be located on Mill Road. The bid was approximately $300,000.00 over what had been estimated by the City Engineers. New calculations estimated the cost would be increased to nearer $1,200,000.00. Mr. Brower noted the City had yet to acquire the additional private property needed to construct the roundabout. He suggested there may be more competitive bids if the City put the project out for bid again in January.

Motion: Council Member Johnston moved to deny the roundabout bid and continue with the plan for property acquisition and to revisit the project bid process once the property acquisition had occurred. **Second:** Council member Kahler made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The **Motion Passed 4-0.**

Motion: Council Member Stack moved to consider agenda item eight next. **Second:** Council Member Kahler made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The **Motion Passed 4-0.**

7. Authorize Staff to Negotiate an Addendum to the Duke Land Lease Agreement Encompassing 15.79 +/- Acres (Heidi Franco, Mayor) - *10 min*

City Manager Matt Brower explained that the Council was being asked to provide direction to and approve Staff moving forward with the farm lease agreement negotiations for the Duke Family Farm.

Di Ann Duke Turner said that her family would like to await the Council's discussion and decision prior to commenting. She noted the size of Burgi Park in Midway. She did not feel there was such a thing as too big of a cemetery or too big a park.

Motion: Council Member Johnston moved to renew the land lease with the Duke Family for an additional five years with the current terms in the current land lease. **Second:** Council Member Kahler made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, Stack, and Phillips. **Voting No:** None. The **Motion Passed Unanimously, 5-0.**

Motion: Council Member Kahler moved to bring Action agenda item three forward in order to include Council Member Phillips in the discussion. **Second:** Council Member Stack made the second. Voting Yes: Council Members Kahler, Johnston, Barney, Stack, and Phillips. **Voting No:** None. The **Motion Passed Unanimously, 5-0.**

8. Consider Approval of the Children's Playground and Theme Associated with Wasatch Vista Park as Recommended by the Parks, Open Space, Trails, and Tree Advisory Committee. (Matt Brower, City Manager) - 10 Mins

Mr. Brower presented the attached PowerPoint for proposed amenities to be installed at the Wasatch Vista Park. A fitness court had been installed at the park and it was now proposed to install a chidrens playground nearby. The Parks, Open Space, Trails, and Trees (POSTT) committee had forwarded a recommendation to install a farm-themed playground, including an all-abilities musical equipment area, and a windmill with historical markers on it in recognition of the local farm families in the area. Mr. Brower proposed this be the second City project to be funded by TAP (Trails, Arts, and Parks) tax revenue. Council discussion followed.

Mayor Franco opened the discussion for public comment.

Kelly Gomez lived in the area and noted the many children located near the park. She wanted to know if there was a cost difference for a traditional play-set. She asked why traditional play equipment was being overlooked for the proposed farm scene play equipment. Council Member Barney shared the recent visit to Colorado cities had seen two such climbing playgrounds that were highly visited and appreciated by the children. She felt the musical equipment was very appreciated by the children as well.

Motion: Council Member Johnston moved to approve the recommended children's playground and farm theme at the Wasatch Vista Park as recommended by the POSTT committee. **Second:** Council Member Stack made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The **Motion Passed 4-0.**

Motion: Council Member Stack moved to continue agenda item five to the next available agenda in the interest of the time. **Second:** Council Member Kahler made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The **Motion Passed 4-0.**

IX. COMMUNICATION:

Mr. Brower shared the date and time of the annual Wasatch County Parade and asked which Council Members would be able to attend. He reminded Council of the lunch with Roger Brooks on August 16 at the Avon theater.

Mayor Franco shared an invitation with elected officials county-wide to meet with Congressional representative John Curtis in the Heber City Council Chambers from 1:00-2:00 p.m. on Monday, August 21, 2023.

X. CLOSED EXECUTIVE SESSION

1. Strategy session to discuss the purchase, exchange, or lease of real property ()

Motion: Council Member Barney made the motion to enter Closed Executive Session for the purpose of strategic discussion for the purchase, exchange, or lease of real property. **Second:** Council Member Stack made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. Council Member Kahler was absent. **Voting No:** None. The **Motion Passed 4-0.** The meeting entered Closed Executive Session at 4:27 p.m.

City Council Present:	Mayor Heidi Franco Council Member Yvonne Barney Council Member Mike Johnston Council Member Scott Phillips - remotely Council Member Ryan Stack
Absent:	Council Member Rachel Kahler
Staff Present:	City Manager Matt Brower City Attorney Jeremy Cook City Recorder Trina Cooke

Motion: Council Member Johnston moved to exit the Closed Executive Session and return to the Rgular Meeting. **Second:** Council Member Stack made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. Council Member Kahler was absent. **Voting No:** None. The **Motion Passed 4-0.** The meeting returned to Regular Session at 4:52 p.m.

XI. ADJOURNMENT:

Motion: Council Member Stack moved to adjourn. **Second:** Council Member Barney made the second. **Voting Yes:** Council Members Kahler, Johnston, Barney, and Stack. **Voting No:** None. Council Member Phillips was absent. The meeting adjourned at 10:07 p.m.

_____

Trina Cooke, City Recorder

HEBER CITY CORPORATION
75 North Main Street
Heber City, UT 84032
Heber City Council Meeting
August 1, 2023

DRAFT Minutes

4:00 p.m. Work Meeting
6:00 p.m. Regular Meeting

I. WORK MEETING - 4:00 P.M.

Mayor Franco called the Meeting to order at 4:12 p.m.

City Council Present:	Mayor Heidi Franco Council Member Yvonne Barney Council Member Mike Johnston Council Member Scott Phillips Council Member Ryan Stack
City Council Absent:	Council Member Rachel Kahler
Staff Present:	City Manager Matt Brower Community Development Director Tony Kohler Planning Manager Jamie Baron Finance Manager Sara Nagel City Engineer Russ Funk City Attorney Jeremy Cook IT Specialist Anthon Beales Officer Branden Russell City Recorder Trina Cooke

Staff Participating Remotely: IT Specialist Anthon Beales, Human Resource Manager Cherie Ashe, Engineering Technician Desiree Muheim, Planning Manager Jamie Baron, Accounts Payable Technician Wendy Anderson, and City Engineering Director Russ Funk.

Also Present: Sid Ostergaard, Ryan Bunnell, John Hejnay, Wyatt Karnes, Jessica Potter, Ethan Justinger, Di Ann Duke Turner, Bill Wark, Joshua Jewkes, Tori Broughton, Renee Waaj, Rob Winder, Tristan Preece, and others who did not sign in or whose signatures were illegible.

Also Attending Remotely: (names listed are shown as signed in) Dan Gasser, John Janson, Allison Salisbury, Brock Marchant, Kristen Bunnell, KPCW, Lisa, Matt, Megan Ryan, Richard Getz, Rob Winder, Shawn, Shorty, and T.

1. Financial Audit Service Interviews (Prospective Accounting Firms) - *90 min*

The City had issued a request for proposals (RFP) for financial auditing services and received four responses. The City's Audit Committee reviewed the proposals received and had forwarded the top three candidates for Council review. Finance Manager Sara Nagel explained Council's responsibility to select an auditing firm to perform the City's annual financial audit. The three firms met with the Council individually to provide their background and experience and answer Council's questions. Ron Stewart and Ben Probst represented Gilbert and Stewart CPA's; Jon Haderlie represented Larson and Company; and Jeff Miles and Shawn Martin represented HBME.

Audit Committee Chair Scott Holbrook hoped the Council would select a forward-looking firm that would best serve the rapidly growing City of Heber. The Audit Committee felt all three firms would do a good job.

Council proceeded to deliberate on the qualifications of the candidates and discussed their preferred choices.

2. Main Street Park Bandshell Concept (Jamie Baron, Planning Manager) - *15 min*

City Planning Manager Jamie Baron provided a presentation and reviewed the bigger picture within the Envision Central Heber portion of the City's master plan. He outlined the criteria used to implement the design for the bandshell with consideration of function, form, and design. Mr. Baron provided images of proposed designs. Sid Ostegaard had prepared design renderings and provided additional details. Council provided feedback, offered suggestions, and shared their preferences. Staff agreed to return with additional design proposals implementing Council's feedback.

II. BREAK - 10 MIN

III. REGULAR MEETING - 6:00 P.M.

1. Call to Order

Mayor Franco called the meeting to order at 6:14 p.m. and welcomed everyone present.

2. Pledge of Allegiance (Yvonne Barney, Council Member)

Council Member Yvonne Barney led the recitation of the Pledge of Allegiance.

3. Prayer/Thought by Invitation (Rachel Kahler, Council Member)

Heber City resident Josh Jewkes shared his appreciation for the recitation of the Pledge of Allegiance at the beginning of each City Council Meeting and expressed gratitude for the service of the Council and Mayor. Mr. Jewkes then shared a prayer.

IV. CONFLICT OF INTEREST DISCLOSURE:

There were no conflicts disclosed by Council.

V. CONSENT AGENDA:

City Manager Matt Brower requested that Council remove item two from the Consent Agenda in order to allow Staff to make additional changes.

Motion: Council Member Stack moved to remove agenda item two from the Consent Agenda. **Second:** Council Member Phillips made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. The **Motion Passed 4-0.**

Motion: Council Member Stack moved to approve the remaining items on the Consent Agenda as presented. **Second:** Council Member Phillips made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. The **Motion Passed 4-0.**

1. Ordinance 2023-19 Trails Code Amendment (Tony Kohler, Community Development Director)

2. Ordinance 2023-23 amending the LRemington MDA located at 160 W 500 N (Jamie Baron, Planning Manager)

Heber City Attorney Jeremy Cook wished to have a discussion with Council regarding the affordable housing and deed restriction language in the proposed amendment to the agreement. He asked for Council direction on whether they wished the affordable housing units dedication be set at 60% or 80% area median income (AMI). Josh Jewkes, representing the developer for the project, Bill Wark, proposed one of the units set at 60% AMI and two at 80% AMI. Planning Manager Jamie Baron provided numbers for the local AMI.

Motion: Council Member Phillips moved to approve the MDA with the changes recommended by Jeremy Cook setting one unit at 60% AMI and two units at 80% AMI. **Second:** Council Member Stack made the second.

Council Member Phillips clarified that he felt the AMI dedication was appropriate for the size of the development.

Council Member Barney explained that she no longer supported the proposed project based on the number of units and the narrowness of the lot. She felt it would be appropriate to establish two units at 60% AMI and two at 80% AMI. She questioned the accessibility for fire and sanitation trucks in the project.

Motion: Council Member Phillips called the question. Vote to call the question: **Voting Yes:** Council Member Phillips. **Voting No:** Council Members Johnston, Barney, and Stack. Council Member Kahler was absent. The **Motion Failed 1-3.**

Council Member Barney wished to negotiate for an additional affordable housing unit. Council Member Johnston corrected that the "A" in "AMI" stood for"area".

Amended Motion: Council Member Phillips wished to amend his motion to include strict deed restrictions in perpetuity for the affordable housing units. The Second stood. **Voting Yes:** Council Members Johnston, Stack, and Phillips. **Voting No:** Council Member Barney. Council Member Kahler was absent. The **Motion Passed 3-1.**

3. Consent to Pursue Development Agreement for Wasatch County Events Center (Tony Kohler, Community Development Director)

4. Appointment of D. Scott Crook as Employee Appeals Board / Employee Hearing Officer (Heidi Franco, Mayor)

VI. PUBLIC COMMENTS:

Wyatt Karnes stated that he and his wife were both teachers locally and had been approved to purchase a home in an affordable housing development with Mountainlands Community Housing Trust that was scheduled for completion in 2020. He listed the developer's failure to communicate, refusals to correct mistakes, and hostility shown when asked for more information. He further detailed the construction process that was three years behind schedule as well as the mistreatment that he felt he and other homeowners continued to receive. He was asking that Council not approve further building permits for Mountainlands or Parkview Place until the obligations to existing homeowners were fulfilled. He further asked, if the previous request was not possible, that the Council reconsider its decision to not allow Parkview Place to sell remaining homes at market value until the conditions were met with the existing homeowners. Full comments can be found in an email attached at the end of these meeting minutes.City Manager Matt Brower proposed to arrange a meeting between himself, Mr. Karnes, and the Director of Mountainlands Community Housing Trust in order to resolve the issues and concerns presented by Mr. Karnes.

Ethan Justinger, resident in the Parkview Place development, read his statement regarding his dissatisfaction and concerns with the same developer.

Jessica Potter also lived in the Parkview Place subdivision and read a list of incomplete and poorly executed construction examples of her home. She shared her difficult experience and described the project as a disaster.

Di Ann Duke Turner passed out pictures (attached) to show the weeds and neglect in the community that she felt the City needed to tend to. She had collected a mat that had been blocking a storm grate and delivered it to Council. She had intercepted the street sweeper to ask if they were sweeping the streets on a regular schedule. Mrs. Turner proceeded to offer suggestions to clean up the City. As her compliment to Council, she commended the quilt that hung in the Council Chambers.

VII. GENERAL BUSINESS ITEMS:

1. Heber City Historic Preservation Committee (Michael Moulton, Historical Chair) - *10 min*

General Business agenda item one was bypassed as Mr. Moulton was not present.

2. City Branding Initiative Update (Ryan Bunnell) - *20 min*

Ryan Bunnell, representing Ignition Creative Group, presented updated images for the City branding project based upon previous feedback from Council. Council Member Phillips felt the proposed logo was taking the City backward rather than forward. Council Member Stack did not support the proposed re-brand and logo and expressed his preference for the existing logo. Council Member Barney indicated she did like the proposed logo and recalled the representative from Main Street USA recommending the community adopt an identity. Council discussion continued, resulting in a proposal to issue a public survey for community feedback.

3. Muirfield and Coyote Springs Park Plans (Jamie Baron, Planning Manager)

Planning Manager Jamie Baron presented park design renderings as included in the attached meeting materials and asked for Council feedback. He shared the recommendations forwarded from the Parks, Open Space, Trails, and Trees (POSTT) committee. Mr. Brower shared that there were potential grants available that the City planned to apply for and Staff needed Council feedback to move forward. Council provided suggestions and feedback in order for staff to move forward and Mr. Brower agreed to integrate the feedback into the park plans and return to Council for approval.

4. Monthly Current Development Report (Planning Department, Jamie Baron, Planning Manager) - *10 min*

City Planning Manager Jamie Baron provided a report of new applications received by the City for June and July as shown in the attached presentation. Council Member Johnston asked that the promised parks within the Fitzgerald neighborhood developments not be forgotten.

Mr. Baron recalled the agreement specifically included neighborhood parks. He stated Staff would ensure the parks were included in final plans.

VIII. ACTION ITEMS:

Mayor Franco returned the meeting discussion to Consent Agenda item two regarding the LRemington master development plan (MDA) amendment.

1. Ordinance 2023-29; Creation of an Advisory Arts Committee (Matt Brower, City Manager) - *15 min*

City Manager Matt Brower explained the purpose of establishing an Arts Advisory Committee to assist the City and Staff with the distribution of the City's annual portion of TAP (Trails, Arts, and Parks) tax revenue and potential grant monies. He reviewed the desired qualifications for committee members and expected terms. Mr. Brower identified several potential projects. Council Member Johnston clarified that the Council was to vote to approve the ordinance only.

Mayor Franco opened the discussion for public comment.

Mr. Karnes, local high school teacher, proposed requiring the committee to work with students to include and support student projects.

Motion: Council Member Phillips moved to approve the most recently distributed and updated Ordinance 2023-29 with the findings and conditions as presented in the conclusion. **Second:** Council Member Johnston made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. The **Motion Passed 4-0.**

2. Ordinance 2023-30 Sensitive Lands Amendment (Tony Kohler, Community Development Director) - *30 min*

City Planning Consultant John Janson reviewed the clarification changes made to the proposed Sensitive Lands Ordinance as highlighted in the attached meeting materials.

Council Member Stack asked to strike the word "unbuildable" from section I. Mayor Franco asked to retain the last sentence in section K that read "Identified animal migration corridors may be replaced with a landscaped trail corridor(s). Council Member Stack felt the unbuildable slopes should not be allowed to be counted towards developers open space requirement. Council Member Johnston clarified that roads could be built across a slope of 30% at a 10% grade. Council discussion continued for clarification of the Ordinance language and defining open space.

Council Member Johnston referred to section F.4. and felt parking lots should not be included on the list of pollutants and the word "average" should be removed from the setback distance.

Motion: Council Member Phillips moved to adopt Ordinance 2023-30 with the following changes: removing the words "parking lots" from F.4. and making the setback 20 feet, to remove the word "unbuildable" from section I., and otherwise approving as presented.

Community Development Director Tony Kohler asked for clarification regarding the highlighted sections of the proposed ordinance. Council Member Phillips did not want any of the additionally proposed changes.

Second: Council Member Johnston made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. The **Motion Passed 4-0.**

Council asked to proceed to agenda items four, five, and six before addressing agenda item three. Mayor Franco moved the meeting forward to agenda item four.

3. Ordinance 2023-20 Affordable Housing Amendment (Tony Kohler, Community Development Director) - *20 min*

4. Authorize staff to negotiate and enter into an agreement with Centricity for Cityworks AMS and PLL Implementation Services in an amount not to exceed $218,000. (Russ Funk, Engineering Director) - *10 min*

City Engineer Russ Funk explained the purpose of the agenda item was to negotiate and enter into an agreement with Centricity to provide Cityworks Implementation Services for both the PLL (Permitting, Licensing, Land) and AMS (Asset Management) solutions. He described the functions and benefits of the software and noted the workflow streamlining increase that would be accomplished with the new implementation. There would need to be a budget amendment if approved.

Motion: Council Member Phillips moved to approve the item as presented with the findings and conditions as listed in the conclusion in the Staff Report. **Second:** Council Member Stack made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. The **Motion Passed 4-0.**

5. MOU between Wasatch County, Heber City, and the Church of Jesus Christ of Latter Day Saints regarding land use authority, required improvements, and maintenance responsibility relating to the Heber Valley Temple Project (Russ Funk, Engineering Director) - *10 Min*

City Engineer Russ Funk explained the LDS (Latter-Day Saints) Temple site was located in the County along Center Street, which beloned to Heber City. The MOU (Memorandum of Understanding) was necessary to clarify the responsibilities of each entity involved; the City, County, and Church. Mr. Funk provided examples of said responsibilities. One concern was the large number of construction trips on a Heber City-owned road for which the City would not be able to collect impact fees during the construction of the Temple. The LDS Church had agreed to install a roundabout at the west entrance to the Temple on Center Street in order to help address traffic concerns. He clarified the traffic should not be as large a concern for the residents as the trips would be spaced throughout the day rather than all at once, such as school drop-off and pick-up. Mr. Funk felt the cost of a roundabout should offset somewhat the lack of impact fees collected by the City. He added that the street lights installed by the church along the temple site would meet the Heber City dark-sky standards and the temple property lights would comply with the County dark-sky standards.

Council Member Stack could support approval of the MOU if the church agreed to comply with the City's dark-sky requirements. Council proceeded to discuss the MOU, share concerns with the added traffic in a residential area and dark sky compliance, as well as the possibility of collecting impact fees from the church.

Motion: Council Member Stack moved to extend the meeting for an additional 20 minutes. **Second:** Council Member Phillips made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. The **Motion Passed 4-0.**

Mr. Funk clarified that the MOU had yet to be approved by the County.

Church representative Tristan Preece felt the Council would be less concerned if they were to read the dark-sky restrictions established by the County. He felt the Wasatch County temple would be the most dimly lit temple in the world due to the County restrictions.

Mayor Franco opened the discussion for public comment.

Heber City resident John Hejnay shared that he lived directly by the proposed temple. He felt there was not enough information for decisions to be made by the Council. He did not believe there had been a traffic study done. City Engineer Russ Funk provided a copy of the traffic study. He had reviewed the due diligence report the church had provided and noted the service level of the road would be failing. He noted that over 5,000 people had attended the Bountiful Temple open-house.

Motion: Council Member Barney moved to continue the item, in order to have further discussion with the County, to no later than the last meeting in September. **Second:** Council Member Stack made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. The **Motion Passed 4-0.**

6. Contract for City's Professional Accounting Services (Sara Nagel, Finance Manager) - *10 min*

Finance Director Sara Nagel shared that Mr. Larson had agreed to Council's request to keep all work for Heber City done locally in Utah.

Motion: Council Member Stack moved to award the contract for the City's professional accounting services to Larson and Company subject to their additional agreement that their in-house Utah staff only would work on the City's contract for auditing services. **Second:** Council Member Barney made the second. **Voting Yes:** Council Members Johnston, Barney, Stack, and Phillips. **Voting No:** None. Council Member Kahler was excused. **The Motion Passed 4-0.**

IX. COMMUNICATION:

City Manager Matt Brower communicated the following:

1. The Wasatch County Fair Days Demolition Derby, which had taken place the previous weekend with contestants from the City and County competing against one another, had been a great success. The County had won but the City had gotten some great hits.

2. The August 15, 2023, City Council Meeting must end before 7:00 p.m. in order to hold the Truth in Taxation Public Hearing and Meeting scheduled to begin at 7:00 p.m.

3. The City had received one bid for the City Hall bell tower renovation and he asked for Council direction whether to move forward or put it out for a rebid. Council consensus was to proceed with the necessary repairs.

4. Mr. Brower pointed out the new chairs in the Council Chambers for the public.

5. Roger Brooks would be in town as the keynote speaker for a CAMS (Community Alliance for Main Street) lunch on August 16, 2023, that the Council was invited to attend.

6. Mr. Brower would be out of the office the following week in order to spend time with visiting family.

Mayor Franco shared that on August 22, 2023, at the Heber Valley Elementary, there would be a Meet and Greet for the final two candidates for the Heber City Chief of Police position.

X. ADJOURNMENT:

Motion: Council Member Stack moved to adjourn. **Second:** Council Member Phillips made the second. The meeting adjourned at 10:24 p.m.

_____

Trina Cooke, City Recorder

Heber City Council Staff Report

MEETING DATE: 8/15/2023

SUBJECT: Resolution 2023-12 amending the Airport Advisory Board (AAB) Bylaws

RESPONSIBLE: Jeremy Cook

DEPARTMENT: Airport

STRATEGIC RELEVANCE:

SUMMARY

As a condition of the agreements to settle the federal lawsuit involving OK3 AIR, the City agreed to amend the Airport Advisory Board Bylaws to provide OK3 AIR with a position on the Airport Advisory Board.

RECOMMENDATION

Approve the amendment to the Airport Advisory Board Bylaws

BACKGROUND

DISCUSSION

FISCAL IMPACT

None

CONCLUSION

ALTERNATIVES

1. Approve as proposed
2. Approve as amended
3. Continue
4. Deny

POTENTIAL MOTIONS

Alternative 1 - Approval - Staff Recommended Option

I move to **approve** the item as presented, with the findings and conditions as presented in the conclusion above.

Alternative 2 - Approve as Amended

I move to **approve** the item as amended, as follows.

Alternative 3 - Continue
I move to **continue** the item to another meeting on , with direction to the applicant and/or Staff on information and / or changes needed to render a decision, as follows:
Alternative 4 - Denial
I move to **deny** the item with the following findings.

ACCOUNTABILITY

Department: Airport
Staff member: Jeremy Cook, City Attorney

EXHIBITS

1. AAB Bylaws
2. Airport Advisory Board Bylaws - 4876-6376-5876 - 1
3. Resolution Amending AAB Bylaws - 4853-5107-8006 - 1

HEBER VALLEY AIRPORT ADVISORY BOARD BYLAWS
Adopted June 16, 2006, Amended August 9, 2023

PURPOSE: This section is enacted and intended for the purpose of establishing the Heber Valley Airport Advisory Board, whose objectives and purposes shall be to advise the City Council and the Mayor in matters pertaining to the policies of the Heber Valley Airport.

ARTICLE I: AUTHORITY

These rules and procedures are amended by Resolution 2018-12 of the Heber City Council.

ARTICLE II: JURISDICTION

The physical jurisdiction of the Airport Advisory Board (Board) is the Heber Valley/Russ McDonald Airport field boundaries and any infrastructure, safety zones, and the like appertaining thereto.

ARTICLE III: APPOINTMENT AND TERMS OF MEMBERS

A. The Airport Advisory Board shall consist of seven (7) members and two (2) alternates.

B. Membership shall be as follows:

1. One (1) City Council Member. Said Council Member shall be alternate Board Member, and once approved by the consent and advice of the City Council may serve at the pleasure of the Mayor for the duration of their term as Council Member. However, with the advice and consent of the City Council the Mayor may rotate this Council Member with other Council Members every two years, but this is not required, and left to the discretion of the Mayor. The alternate shall participate in the meeting and have all the other rights of regular board members, except voting; but if any voting members are absent or recused on a particular agenda item, such that the voting requirement for a quorum is not met, then the alternate may vote to fill the quorum.

2. Three (3) permanent Heber City Residents and shall be voting Board Members.

3. One (1) at-large permanent Wasatch County Resident. Said Wasatch County Resident Member may, but are not required to be a Heber City Resident, and shall be voting Board Members.

4. One (1) member that is a permanent resident of Daniel, Wasatch County; appointed by the town of Daniel and shall be a voting member.

5. One (1) Wasatch County Officer or Staff appointed by the Wasatch County Commissioners. Said Member shall be an alternate Board Member. The alternate shall participate in the meeting and have all the other rights of regular board members, except

voting; but if any voting members are absent or recused on a particular agenda item, such that the voting requirement for a quorum is not met, then the alternate may vote to fill the quorum.

6. One (1) Airport full-service fixed-base ~~commercial~~ operator ~~and~~ shall be a voting Board Member.

7. One (1) Airport tenant and shall be a voting Board Member.

8. A Quorum shall consist of a minimum of four (4) voting Board Members.

9. A Technical Assistance Committee will be formed as needed to help understand technical and other issues associated with the Airport or other entities that might be affected by it. During the time they serve on said Technical Assistance Committee, any such Committee Member shall not be paid or receive any compensation from the City.

10. For the purposes of this Article and provisions, Permanent Residency shall be defined as a person who meets the following criteria:

    a. is a citizen of the United States at least 30 days immediately prior to their appointment;
    b. has been a resident of Utah for at least the 30 days immediately before the appointment;
    c. will be at least 18 years old on the day of the appointment to the Board; and
    d. currently resides within the voting district or precinct in which the person would apply to register to vote. It is not a requirement of Board Membership that said Member votes, is registered or registers to vote.
    e. whose home and primary residence is located in Wasatch County and is recognized as a primary residence by the County Assessor.

11. Members shall be required to attend at least 75% of the publicized meetings of the Board, attendance to be determined on an annualized basis.

12. In the event a membership term is ended, and there is no immediate replacement and the Council does not approve or consent to a replacement, the person last serving in that position for said term shall continue to serve until the Mayor and Council come to an agreement or replace. However, any term of any Council Member shall terminate when they no longer serve as City Council Members.

C. Subject to Provision B(1) above regarding Heber City Council Members, and Provision 8 above, the terms of office for the seven appointed Airport Advisory Board Members shall be four years. The initial appointments shall be for, three (3) positions two (2) years, two (2) positions three (3) years, and two (2) positions (4) four years from January 1, 2005. The term of the alternate shall be two (2) years. Any vacancies in these positions shall be filled by a recommendation from the Mayor and confirmation by the City Council. The appointment will be for the remaining time of the member whose vacancy is being filled.

D. Improper conduct and non-performance of duties shall result in a recommendation to the Heber City Council for removal of said member. Members may be removed after a public hearing, by a majority vote of the City Council.

E. A stipend of $50.00 per meeting attended, shall be paid to Airport Advisory Board Members.

ARTICLE IV: AIRPORT ADVISORY BOARD OFFICERS AND THEIR DUTIES

A. Chairperson:

1. The Airport Advisory Board shall elect a Chairperson and a Vice-Chairperson from among its members at the first regular meeting in January.
2. The Chairperson and Vice-Chairperson shall serve for a term of two years, beginning the first regular meeting in January.
3. The Chairperson shall preserve order, and decide all points of order, subject to appeal of the membership. Such appeal shall be decided by a majority vote of the members present. The Chairperson may vote on all matters before the Airport Advisory Board.
4. The Chairperson with the concurrence of a majority vote of the Airport Advisory Board and the City Council may create such special subcommittees as he/she may, from time-to-time, deem necessary or desirable.
5. In the event of absence or disability the Chairperson, the Vice-Chairperson shall preside. In the absence of both, the members shall appoint a Chairperson for that meeting.

B. Vice-Chairperson:

1. Perform all of the above duties in the absence of the Chairperson;
2. Conduct the annual review of the Airport Advisory Board actions;
3. Coordinate and conduct the annual meeting of the Board; and
4. Provide orientation to new Airport Advisory Board Members.

C. Secretary

1. The duties of Secretary shall be performed under the direction of the Heber City Recorder's Office.

2. Assure true recording and maintenance of the public record, record the proceedings of all hearings and meetings; and prepare the minutes of the Board. Minutes shall include:

   a. The date, time, and place of the meeting;
   b. The names of members present and absent;
   c. Maintain an attendance record;
   d. The substance of all matters proposed, discussed, or decided, and a record, by individual members of votes taken;
   e. Findings and conclusions;
   f. Maintain a chronicle of Board motions and recommendations;

g. The names of all citizens who appeared and who gave comments and the substance in brief of their testimony;
h. Any other information that any member requests be entered in the minutes.
i. Assist the Chairman in ushering the orderly conduct of meetings in accordance with the by-laws and Roberts Rules of Order. At the Secretary's discretion, shall have the power to intervene with advise at any time on the proceedings of a meeting.
j. Notify the City Accounts Payable Clerk on the payment of stipends.

3. All recommendations to the City Council, involving changes in the City ordinances shall be submitted by the Secretary to the City Attorney for review. After the review, the proposed ordinance shall be returned to the Airport Advisory Board to evaluate any comments or suggestions before being submitted to the City Council.

ARTICLE V: STAFF OF THE BOARD AND THEIR DUTIES

A. Airport Manager and Secretary with assistance as requested from the Airport Advisory Board.

1. Shall advise the Airport Advisory Board regarding regulation of and requests for development and re-development, financial concerns, and other matters;
2. Coordination and supervision of work preparation by staff;
3. Prepare all documents for presentation to the Airport Advisory Board; and
4. Assist the Chairperson and Vice-Chairperson of the Board in the exercise of their duties.
5. Assistance shall be minor and administrative in nature. Requests that may require significant research time and work product should be assigned to a Technical Advisory Committee. The Airport Manager may approve significant requests for assistance upon request.

B. Legal Counsel

The City Attorney or his designee shall be the legal counsel for the Airport Advisory Board and its subcommittees.

ARTICLE VI: MEETINGS

A. The Airport Advisory Board shall meet as set forth in the annual notice of meeting schedule to conduct its duly appointed business.

B. A special meeting for any purpose may be held on the call of the Chairperson or four members of the Airport Advisory Board. Board members and public shall be notified of such meetings by the Secretary, in accordance with the provision of City and State law.

C. A Quorum of the Airport Advisory Board shall consist of four voting members, including one or two alternate members filling in as set forth in Article 3(B)(1), above. A quorum shall be necessary to conduct business.

1. Any agenda item must receive at least four (4) affirmative votes for approval or recommendation to City Council for approval.

2. A failure to vote by a member shall be counted as an abstention.

D. Order of Business for Regular Meetings

Unless approved by majority of the quorum, the Airport Advisory Board will follow the published Agenda.

1. Deadline for Filing and Removal of Agenda Items:

   a. Deadline for the General Public: All items submitted by the general public to be presented at the Airport Advisory Board Meeting must be in writing. The deadline for submitting an item to the Airport Board secretary is 5:00 p.m. one week + one day prior to the regular Airport Advisory Board meeting at which the item(s) are to be presented. Deadline for Airport Advisory Board Members, City Council Members, and City Staff.

   b. Items submitted by Airport Advisory Board Members, City Council Members, and City Staff to present at the Airport Advisory Board meeting must be in writing. The deadline for submitting an item to the Airport Board secretary is 5:00 p.m. one week + one day prior to the Airport Advisory Board meeting.

2. Removal of Agenda Items: Individuals may remove any item they submitted from the agenda at any time.

3. Each agenda item shall be accompanied with any support material needed for Board members to take action.

4. While matters not on the agenda may be discussed, no final action can be taken on any matter not on the written agenda.

ARTICLE VII: PARTICIPATION BY STAFF AND PUBLIC

A. No person shall be permitted to speak unless recognized by the Chairperson, who shall designate time limits to persons permitted to speak on any matter properly before the Board. Each person speaking before the Airport Advisory Board shall first state name, city or county and then the substance of his remarks.

B. Matters before the Airport Advisory Board shall be presented in the following manner:
   1. Presentation by staff;
   2. Presentation by applicant;
   3. Comments from the public, where appropriate, (decided by the chair);
   4. Comment and questions from the Airport Advisory Board;

5. Further comments by applicant and public; and
6. Concluding comments and recommendations from the staff.

C. Roberts Rules of Order will be applied as necessary.

ARTICLE VIII: FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

A. Form and Character of Motions

1. Upon review of the public record on a request and due deliberation among the members of the Airport Advisory Board, any member of the Board, except; the Chairperson, may make a motion. The motion shall include not only the direction of the motion (approval, approval with conditions, or denial), but also a recitation of the specific findings and conclusions supporting such motion

4. A second shall be required for each motion.

5. A motion shall die in absence of a second

6. Discussion and amendments on the motion

7. Where a motion to deny a request shall be defeated, a member of the Board initially in opposition shall have first right to make a motion to:

   a. Approve the request;
   b. To Table, or
   c. To continue the matter for further study or investigation

B. Forwarding the Airport Advisory Board recommendations to the City Council:

1. Recommendations made by the Airport Advisory Board will be prepared by staff and scheduled for presentation to the City Council.

2. Recommendations will be forwarded as approved by the Airport Advisory Board (without alteration).

3. The Airport Manager supported by the Chairman and other members of the Airport Advisory Board will present it to the City Council.

4. Airport Advisory Board Secretary will notify Board Members when Board matters are being presented to the City Council.

ARTICLE IX: REQUIREMENTS FOR THE SUBMISSION OF REQUESTS

A. The Airport Advisory Board may adopt standard forms for the submission of requests. All requests shall have reasonable advance time requirements;

DRAFT

B. The Airport Manager or his designee shall certify completeness of requests;

C. Any request denied shall not be resubmitted for a maximum period of six months or as requested by the Chairman; and

D. The Airport Advisory Board may recommend to the City Council a fee schedule for the submission of requests to cover processing, duplication, notices and, distribution of requests and related documents.

ARTICLE X: DOCUMENTS OF THE BOARD

A. Any and all materials submitted to the Airport Advisory Board regarding a request shall be entered into the public record by a motion to "accept for the record".

B. All notices, agendas, requests, agency or consultant letters or reports, staff reports, minutes of meetings, and resolutions or record shall constitute the documents of the Airport Advisory Board and shall be indexed as public record.

ARTICLE XI: ADMINISTRATIVE CALENDAR

A. Notice for all public hearings, work sessions and regular meetings shall conform to requirements of law.

B. Regular meeting schedule for the calendar year following shall be determined at the annual meeting of the Airport Advisory Board.

C. The Airport Advisory Board shall have an annual public meeting, to review the work of the previous year and plan the work program for the coming year.

ARTICLE XII: CONDUCT OF MEMBERS OF THE AIRPORT ADVISORY BOARD

A. Members of the Airport Advisory Board shall prepare themselves for hearings and meetings.

B. Appointed members of the Airport Advisory Board shall attend at least 75 percent of all meetings within a calendar year. Failure to do so may be deemed by the Airport Advisory Board or the Heber City Council as cause for removal.

C. An Airport Advisory Board member with a conflict of interest in a matter before the Board must state that such a conflict of interest exists and withdraw from participation in the public hearing, work session, or regular meeting on such matters. Participation of a member of the Airport Advisory Board with a conflict of interest may be cause for removal. The interests of that Airport Advisory Board member may be represented before the Board by agenda or legal representative at the public hearing, regular meeting, or work session and entered into the public record. The prohibition from "participation" does not exclude an Article 7.B.2 presentation or a response solicited from one of the other Board members.

ARTICLE XIII: CHANGES AFFECTING THE AIRPORT MASTER PLAN

Anytime the Airport Advisory Board would make a decision affecting the Airport Master Plan, the Board shall hold a public hearing to make an amendment to the Plan.

ARTICLE XIV: ADOPTION AND AMENDMENT OF BYLAWS; AIRPORT MINIMUM STANDARDS AMENDMENTS; AIRPORT RULES & REGULATIONS AMENDMENTS; AIRPORT LEASE RATES & CHARGES POLICY AMENDMENTS; & AIRPORT FEES

A. Bylaw adoption, or amendment, Airport Minimum Standards Amendments, Airport Rules & Regulations Amendments, Airport Lease Rates & Charges Policy Amendments, and Airport Fees shall be recommended to the Heber City Council by the Airport Advisory Board or City Council members following review by the Airport Manager and the City's legal counsel.

B. The City Council shall review the proposed bylaws amendment(s), Airport Minimum Standards Amendments, Airport Rules & Regulations Amendments, Airport Lease Rates & Charges Policy Amendments, and Airport Fees and make one of the following actions:

    1. Adopt as submitted;
    2. Reject as submitted; or
    3. Amend/revise and adopt

C. The bylaw or amendment proposal(s), Airport Minimum Standards Amendments, Airport Rules & Regulations Amendments, Airport Lease Rates & Charges Policy Amendments, and Airport Fees shall take effect immediately upon adoption by resolution of the City Council.

DRAFT

HEBER VALLEY AIRPORT ADVISORY BOARD BYLAWS
Adopted June 16, 2006, Amended August 9, 2023

PURPOSE: This section is enacted and intended for the purpose of establishing the Heber Valley Airport Advisory Board, whose objectives and purposes shall be to advise the City Council and the Mayor in matters pertaining to the policies of the Heber Valley Airport.

ARTICLE I: AUTHORITY

These rules and procedures are amended by Resolution 2018-12 of the Heber City Council.

ARTICLE II: JURISDICTION

The physical jurisdiction of the Airport Advisory Board (Board) is the Heber Valley/Russ McDonald Airport field boundaries and any infrastructure, safety zones, and the like appertaining thereto.

ARTICLE III: APPOINTMENT AND TERMS OF MEMBERS

A. The Airport Advisory Board shall consist of seven (7) members and two (2) alternates.

B. Membership shall be as follows:

1. One (1) City Council Member. Said Council Member shall be alternate Board Member, and once approved by the consent and advice of the City Council may serve at the pleasure of the Mayor for the duration of their term as Council Member. However, with the advice and consent of the City Council the Mayor may rotate this Council Member with other Council Members every two years, but this is not required, and left to the discretion of the Mayor. The alternate shall participate in the meeting and have all the other rights of regular board members, except voting; but if any voting members are absent or recused on a particular agenda item, such that the voting requirement for a quorum is not met, then the alternate may vote to fill the quorum.

2. Three (3) permanent Heber City Residents and shall be voting Board Members.

3. One (1) at-large permanent Wasatch County Resident. Said Wasatch County Resident Member may, but are not required to be a Heber City Resident, and shall be voting Board Members.

4. One (1) member that is a permanent resident of Daniel, Wasatch County; appointed by the town of Daniel and shall be a voting member.

5. One (1) Wasatch County Officer or Staff appointed by the Wasatch County Commissioners. Said Member shall be an alternate Board Member. The alternate shall participate in the meeting and have all the other rights of regular board members, except

voting; but if any voting members are absent or recused on a particular agenda item, such that the voting requirement for a quorum is not met, then the alternate may vote to fill the quorum.

6. One (1) Airport full-service fixed-base ~~commercial~~ operator ~~and~~ shall be a voting Board Member.

7. One (1) Airport tenant and shall be a voting Board Member.

8. A Quorum shall consist of a minimum of four (4) voting Board Members.

9. A Technical Assistance Committee will be formed as needed to help understand technical and other issues associated with the Airport or other entities that might be affected by it. During the time they serve on said Technical Assistance Committee, any such Committee Member shall not be paid or receive any compensation from the City.

10. For the purposes of this Article and provisions, Permanent Residency shall be defined as a person who meets the following criteria:

    a. is a citizen of the United States at least 30 days immediately prior to their appointment;
    b. has been a resident of Utah for at least the 30 days immediately before the appointment;
    c. will be at least 18 years old on the day of the appointment to the Board; and
    d. currently resides within the voting district or precinct in which the person would apply to register to vote. It is not a requirement of Board Membership that said Member votes, is registered or registers to vote.
    e. whose home and primary residence is located in Wasatch County and is recognized as a primary residence by the County Assessor.

11. Members shall be required to attend at least 75% of the publicized meetings of the Board, attendance to be determined on an annualized basis.

12. In the event a membership term is ended, and there is no immediate replacement and the Council does not approve or consent to a replacement, the person last serving in that position for said term shall continue to serve until the Mayor and Council come to an agreement or replace. However, any term of any Council Member shall terminate when they no longer serve as City Council Members.

C. Subject to Provision B(1) above regarding Heber City Council Members, and Provision 8 above, the terms of office for the seven appointed Airport Advisory Board Members shall be four years. The initial appointments shall be for, three (3) positions two (2) years, two (2) positions three (3) years, and two (2) positions (4) four years from January 1, 2005. The term of the alternate shall be two (2) years. Any vacancies in these positions shall be filled by a recommendation from the Mayor and confirmation by the City Council. The appointment will be for the remaining time of the member whose vacancy is being filled.

D. Improper conduct and non-performance of duties shall result in a recommendation to the Heber City Council for removal of said member. Members may be removed after a public hearing, by a majority vote of the City Council.

E. A stipend of $50.00 per meeting attended, shall be paid to Airport Advisory Board Members.

ARTICLE IV: AIRPORT ADVISORY BOARD OFFICERS AND THEIR DUTIES

A. Chairperson:

1. The Airport Advisory Board shall elect a Chairperson and a Vice-Chairperson from among its members at the first regular meeting in January.
2. The Chairperson and Vice-Chairperson shall serve for a term of two years, beginning the first regular meeting in January.
3. The Chairperson shall preserve order, and decide all points of order, subject to appeal of the membership. Such appeal shall be decided by a majority vote of the members present. The Chairperson may vote on all matters before the Airport Advisory Board.
4. The Chairperson with the concurrence of a majority vote of the Airport Advisory Board and the City Council may create such special subcommittees as he/she may, from time-to-time, deem necessary or desirable.
5. In the event of absence or disability the Chairperson, the Vice-Chairperson shall preside. In the absence of both, the members shall appoint a Chairperson for that meeting.

B. Vice-Chairperson:

1. Perform all of the above duties in the absence of the Chairperson;
2. Conduct the annual review of the Airport Advisory Board actions;
3. Coordinate and conduct the annual meeting of the Board; and
4. Provide orientation to new Airport Advisory Board Members.

C. Secretary

1. The duties of Secretary shall be performed under the direction of the Heber City Recorder's Office.

2. Assure true recording and maintenance of the public record, record the proceedings of all hearings and meetings; and prepare the minutes of the Board. Minutes shall include:

   a. The date, time, and place of the meeting;
   b. The names of members present and absent;
   c. Maintain an attendance record;
   d. The substance of all matters proposed, discussed, or decided, and a record, by individual members of votes taken;
   e. Findings and conclusions;
   f. Maintain a chronicle of Board motions and recommendations;

g. The names of all citizens who appeared and who gave comments and the substance in brief of their testimony;
h. Any other information that any member requests be entered in the minutes.
i. Assist the Chairman in ushering the orderly conduct of meetings in accordance with the by-laws and Roberts Rules of Order. At the Secretary's discretion, shall have the power to intervene with advise at any time on the proceedings of a meeting.
j. Notify the City Accounts Payable Clerk on the payment of stipends.

3. All recommendations to the City Council, involving changes in the City ordinances shall be submitted by the Secretary to the City Attorney for review. After the review, the proposed ordinance shall be returned to the Airport Advisory Board to evaluate any comments or suggestions before being submitted to the City Council.

ARTICLE V: STAFF OF THE BOARD AND THEIR DUTIES

A. Airport Manager and Secretary with assistance as requested from the Airport Advisory Board.

1. Shall advise the Airport Advisory Board regarding regulation of and requests for development and re-development, financial concerns, and other matters;
2. Coordination and supervision of work preparation by staff;
3. Prepare all documents for presentation to the Airport Advisory Board; and
4. Assist the Chairperson and Vice-Chairperson of the Board in the exercise of their duties.
5. Assistance shall be minor and administrative in nature. Requests that may require significant research time and work product should be assigned to a Technical Advisory Committee. The Airport Manager may approve significant requests for assistance upon request.

B. Legal Counsel

The City Attorney or his designee shall be the legal counsel for the Airport Advisory Board and its subcommittees.

ARTICLE VI: MEETINGS

A. The Airport Advisory Board shall meet as set forth in the annual notice of meeting schedule to conduct its duly appointed business.

B. A special meeting for any purpose may be held on the call of the Chairperson or four members of the Airport Advisory Board. Board members and public shall be notified of such meetings by the Secretary, in accordance with the provision of City and State law.

C. A Quorum of the Airport Advisory Board shall consist of four voting members, including one or two alternate members filling in as set forth in Article 3(B)(1), above. A quorum shall be necessary to conduct business.

1. Any agenda item must receive at least four (4) affirmative votes for approval or recommendation to City Council for approval.

2. A failure to vote by a member shall be counted as an abstention.

D. Order of Business for Regular Meetings

Unless approved by majority of the quorum, the Airport Advisory Board will follow the published Agenda.

1. Deadline for Filing and Removal of Agenda Items:

   a. Deadline for the General Public: All items submitted by the general public to be presented at the Airport Advisory Board Meeting must be in writing. The deadline for submitting an item to the Airport Board secretary is 5:00 p.m. one week + one day prior to the regular Airport Advisory Board meeting at which the item(s) are to be presented. Deadline for Airport Advisory Board Members, City Council Members, and City Staff.

   b. Items submitted by Airport Advisory Board Members, City Council Members, and City Staff to present at the Airport Advisory Board meeting must be in writing. The deadline for submitting an item to the Airport Board secretary is 5:00 p.m. one week + one day prior to the Airport Advisory Board meeting.

2. Removal of Agenda Items: Individuals may remove any item they submitted from the agenda at any time.

3. Each agenda item shall be accompanied with any support material needed for Board members to take action.

4. While matters not on the agenda may be discussed, no final action can be taken on any matter not on the written agenda.

ARTICLE VII: PARTICIPATION BY STAFF AND PUBLIC

A. No person shall be permitted to speak unless recognized by the Chairperson, who shall designate time limits to persons permitted to speak on any matter properly before the Board. Each person speaking before the Airport Advisory Board shall first state name, city or county and then the substance of his remarks.

B. Matters before the Airport Advisory Board shall be presented in the following manner:
   1. Presentation by staff;
   2. Presentation by applicant;
   3. Comments from the public, where appropriate, (decided by the chair);
   4. Comment and questions from the Airport Advisory Board;

5. Further comments by applicant and public; and
6. Concluding comments and recommendations from the staff.

C. Roberts Rules of Order will be applied as necessary.

ARTICLE VIII: FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

A. Form and Character of Motions

1. Upon review of the public record on a request and due deliberation among the members of the Airport Advisory Board, any member of the Board, except; the Chairperson, may make a motion. The motion shall include not only the direction of the motion (approval, approval with conditions, or denial), but also a recitation of the specific findings and conclusions supporting such motion

4. A second shall be required for each motion.

5. A motion shall die in absence of a second

6. Discussion and amendments on the motion

7. Where a motion to deny a request shall be defeated, a member of the Board initially in opposition shall have first right to make a motion to:

   a. Approve the request;
   b. To Table, or
   c. To continue the matter for further study or investigation

B. Forwarding the Airport Advisory Board recommendations to the City Council:

1. Recommendations made by the Airport Advisory Board will be prepared by staff and scheduled for presentation to the City Council.

2. Recommendations will be forwarded as approved by the Airport Advisory Board (without alteration).

3. The Airport Manager supported by the Chairman and other members of the Airport Advisory Board will present it to the City Council.

4. Airport Advisory Board Secretary will notify Board Members when Board matters are being presented to the City Council.

ARTICLE IX: REQUIREMENTS FOR THE SUBMISSION OF REQUESTS

A. The Airport Advisory Board may adopt standard forms for the submission of requests. All requests shall have reasonable advance time requirements;

DRAFT

B. The Airport Manager or his designee shall certify completeness of requests;

C. Any request denied shall not be resubmitted for a maximum period of six months or as requested by the Chairman; and

D. The Airport Advisory Board may recommend to the City Council a fee schedule for the submission of requests to cover processing, duplication, notices and, distribution of requests and related documents.

ARTICLE X: DOCUMENTS OF THE BOARD

A. Any and all materials submitted to the Airport Advisory Board regarding a request shall be entered into the public record by a motion to "accept for the record".

B. All notices, agendas, requests, agency or consultant letters or reports, staff reports, minutes of meetings, and resolutions or record shall constitute the documents of the Airport Advisory Board and shall be indexed as public record.

ARTICLE XI: ADMINISTRATIVE CALENDAR

A. Notice for all public hearings, work sessions and regular meetings shall conform to requirements of law.

B. Regular meeting schedule for the calendar year following shall be determined at the annual meeting of the Airport Advisory Board.

C. The Airport Advisory Board shall have an annual public meeting, to review the work of the previous year and plan the work program for the coming year.

ARTICLE XII: CONDUCT OF MEMBERS OF THE AIRPORT ADVISORY BOARD

A. Members of the Airport Advisory Board shall prepare themselves for hearings and meetings.

B. Appointed members of the Airport Advisory Board shall attend at least 75 percent of all meetings within a calendar year. Failure to do so may be deemed by the Airport Advisory Board or the Heber City Council as cause for removal.

C. An Airport Advisory Board member with a conflict of interest in a matter before the Board must state that such a conflict of interest exists and withdraw from participation in the public hearing, work session, or regular meeting on such matters. Participation of a member of the Airport Advisory Board with a conflict of interest may be cause for removal. The interests of that Airport Advisory Board member may be represented before the Board by agenda or legal representative at the public hearing, regular meeting, or work session and entered into the public record. The prohibition from "participation" does not exclude an Article 7.B.2 presentation or a response solicited from one of the other Board members.

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Anytime the Airport Advisory Board would make a decision affecting the Airport Master Plan, the Board shall hold a public hearing to make an amendment to the Plan.

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A. Bylaw adoption, or amendment, Airport Minimum Standards Amendments, Airport Rules & Regulations Amendments, Airport Lease Rates & Charges Policy Amendments, and Airport Fees shall be recommended to the Heber City Council by the Airport Advisory Board or City Council members following review by the Airport Manager and the City's legal counsel.

B. The City Council shall review the proposed bylaws amendment(s), Airport Minimum Standards Amendments, Airport Rules & Regulations Amendments, Airport Lease Rates & Charges Policy Amendments, and Airport Fees and make one of the following actions:

    1. Adopt as submitted;
    2. Reject as submitted; or
    3. Amend/revise and adopt

C. The bylaw or amendment proposal(s), Airport Minimum Standards Amendments, Airport Rules & Regulations Amendments, Airport Lease Rates & Charges Policy Amendments, and Airport Fees shall take effect immediately upon adoption by resolution of the City Council.

DRAFT

RESOLUTION NO. 2023-12

A RESOLUTION AMENDING THE HEBER VALLEY AIRPORT ADVISORY BOARD BYLAWS

WHEREAS, the Heber Valley Airport Advisory Board was formed to advise the City Council on issues related to the Heber Valley Airport;

WHEREAS, the City recently entered into agreements with OK3 Air to resolve federal litigation between the City and OK3 Air;

WHEREAS, to comply with the terms of the agreements, the City desires to amend the Heber Valley Airport Advisory Board Bylaws with respect to the board members on the advisory board.

NOW THEREFORE, BE IT RESOLVED by the City Council of Heber City, Utah, as follows:

The Heber Valley Airport Advisory Board Bylaws are amended as set forth in **Exhibit A.**

This Resolution shall take effect and be in force from and after its adoption and publication.

ADOPTED AND PASSED by the City Council of Heber City, Utah, this _____ day of _____, 2023. This Resolution shall become effective upon adoption and passage by the City Council.

HEBER CITY
A Utah Municipal Corporation

_____
Heidi Franco, Mayor

ATTEST:

_____
Trina Cooke, City Recorder

(city seal)

4853-5107-8006, v. 1

EXHIBIT "A"

Heber City Council Staff Report

MEETING DATE:	8/15/2023
SUBJECT:	Formal approval of and authorization for Staff to negotiate and enter into an agreement with Maddox Construction for an amount consistent with Maddox's bid response to the City, for the Bell Tower Renovation, and negotiate a contract amendment with FFKR to include its services as the Project Manager for said renovation.
RESPONSIBLE:	J. Mark Smedley
DEPARTMENT:	Administrative
STRATEGIC RELEVANCE:	Community &Economic Development Necessary Administrative Action

SUMMARY

The purpose of this item is to seek Council approval to negotiate and enter into an agreement with *Maddox Construction* to initiate and complete the Historic Bell Tower Renovation Construction Project, consistent with Maddox's bid response to the City Council, and seek Council approval to have Steve Cornell of *FFKR Architects, (FFKR) and his firm,* approved as the Project Manager and Management entity.

RECOMMENDATION

Approve and authorize Staff to negotiate and enter into an agreement with Maddox Construction for an amount consistent with Maddox's bid response to the City, for the Bell Tower Renovation, and to negotiate a contract provision with FFKR to act as Project Manager for the renovation.

BACKGROUND

In the Spring of 2022, the City contracted with FFKR Architects of Salt Lake City, Utah (FFKR) to inspect and review the Heber City Tabernacle Bell Tower, and give a recommendation for a remodel or renovation. On April 27, 2022, FFKR produced a Construction Document Set.

In April of this year, 2023, the City submitted a Request for Proposals (RFP) soliciting renovation and remodel construction proposals, consistent with said FFKR's recommendation and Construction Document Set.

The City received only one responsive bid from Maddox Construction of West Jordan, Utah, with a total estimated proposal of $307,380.00. City Staff reviewed the Maddox submittal and then asked FFKR to review the Maddox proposal to determine whether its response was consistent with FFKR's recommendation, and whether it was a reasonable bid. FFKR gave favorable approval for both inquiries.

At the August 1st, 2023 City Council Meeting, City Staff communicated the above information and

FFKR's recommendation and recommended that the City award the contract to Maddox as the winning proposal. The City Council informally indicated a desire to do so.

The City has an existing contract with FFKR. City Staff also recommends that the Council authorize negotiations with FFKR, particularly its supervisory architect, Steve Cornell, to have him function as the Project Manager for the renovation. It is anticipated the City may be able to add an addendum to said existing FFKR contract.

DISCUSSION

Over the past few years, the City Staff has discussed the renovation of the Bell Tower with the City Council and most recently the Historic Committee. The consistent feedback has been that the City should move forward with a renovation project. The Tabernacle Bell Tower, and the entire Tabernacle itself are symbols of Wasatch County and the entire Heber Valley. Moving forward with Maddox will address and act upon those discussions and satisfy the desire and need for the renovation and preservation of the Bell Tower.

FISCAL IMPACT

The cost is approximated at $307,380.00, which is the proposed bid from Maddox, and which was verified as reasonable by FFKR, plus the cost for FFKR to manage the project, the cost of which at this time is being negotiated and is not firmly known. Unfortunately, the project was not able to get started as early as hoped and implementation will now take place mostly in FY23/24. If this item is approved, a budget amendment will be needed for the $307, 380.00, plus the yet-to-be-determined Project Management costs.

CONCLUSION

Moving forward with the approval and contracts with both Maddox Construction and FFKR is expected to be well within reasonable fiscal and production expectations, and will bring to fruition the renovation of the Bell Tower in a satisfactory and enduring manner.

ALTERNATIVES

1. Approve as proposed
2. Approve as amended
3. Continue
4. Deny

POTENTIAL MOTIONS

Alternative 1 - Approval - Staff Recommended Option

I move to **approve** the item as presented, with the findings and conditions as presented in the conclusion above.

Alternative 2 - Approve as Amended

I move to **approve** the item as amended, as follows.

Alternative 3 - Continue
I move to **continue** the item to another meeting on , with direction to the applicant and/or Staff on information and / or changes needed to render a decision, as follows:

Alternative 4 - Denial
I move to **deny** the item with the following findings.

ACCOUNTABILITY

Department: Administrative
Staff member: J. Mark Smedley, Asst. City Manager

EXHIBITS

None

Heber City Council Staff Report

MEETING DATE:	8/15/2023
SUBJECT:	Formal approval of and authorization for Staff to negotiate and enter into an agreement with Maddox Construction for an amount consistent with Maddox's bid response to the City, for the Bell Tower Renovation, and negotiate a contract amendment with FFKR to include its services as the Project Manager for said renovation.
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DEPARTMENT:	Administrative
STRATEGIC RELEVANCE:	Community &Economic Development Necessary Administrative Action

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At the August 1st, 2023 City Council Meeting, City Staff communicated the above information and

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DISCUSSION

Over the past few years, the City Staff has discussed the renovation of the Bell Tower with the City Council and most recently the Historic Committee. The consistent feedback has been that the City should move forward with a renovation project. The Tabernacle Bell Tower, and the entire Tabernacle itself are symbols of Wasatch County and the entire Heber Valley. Moving forward with Maddox will address and act upon those discussions and satisfy the desire and need for the renovation and preservation of the Bell Tower.

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CONCLUSION

Moving forward with the approval and contracts with both Maddox Construction and FFKR is expected to be well within reasonable fiscal and production expectations, and will bring to fruition the renovation of the Bell Tower in a satisfactory and enduring manner.

ALTERNATIVES

1. Approve as proposed
2. Approve as amended
3. Continue
4. Deny

POTENTIAL MOTIONS

Alternative 1 - Approval - Staff Recommended Option

I move to **approve** the item as presented, with the findings and conditions as presented in the conclusion above.

Alternative 2 - Approve as Amended

I move to **approve** the item as amended, as follows.

Alternative 3 - Continue
I move to **continue** the item to another meeting on , with direction to the applicant and/or Staff on information and / or changes needed to render a decision, as follows:

Alternative 4 - Denial
I move to **deny** the item with the following findings.

ACCOUNTABILITY

Department: Administrative
Staff member: J. Mark Smedley, Asst. City Manager

EXHIBITS

None

Heber City Council Staff Report

MEETING DATE:	8/15/2023
SUBJECT:	Ordinance 2023-26, Update to the Engineering Standard Specifications and Drawings and the Storm Water Manual
RESPONSIBLE:	Gordon Miner
DEPARTMENT:	Engineering
STRATEGIC RELEVANCE:	Infrastructure Sustainability, Necessary Administrative Action

SUMMARY

The policy questions include the following:

Should the City Council adopt Staff's proposed updates to Engineering Standard Specifications and Drawings and Storm Water Design Manual?

RECOMMENDATION

On July 11, 2023, the Planning Commission conducted a public hearing and forwarded a positive recommendation for Staff's proposed updates to the Engineering Standard Specifications and Drawings and Storm Water Design Manual. With that recommendation, the Planning Commission added a recommendation that street light density be increased to all intersections and between intersections. Staff recommends that the City Council adopt Staff's proposed updates to the Engineering Standards Specifications and Drawings, and the Storm Water Design Manual, with direction to Staff about street light density.

Included in this packet are the Standard Plat template and Standard Amended Plat template, which are added by reference in the Standard Specifications.

Several checklists have been included with this item. They are not proposed to be codified. They are provided to invite comments from the Council about them, and to inform the Council that the checklists will be used to guide applicants, applicants' professionals, and Staff through the development entitlement process.

BACKGROUND

The subject documents have already been adopted by the City. From time to time, updates are necessary to stay abreast of current industry practices, make clarifications, and to make these documents more user-friendly. Previously, many standards were scattered in notes throughout the Drawings or throughout the Specifications.

The Engineering Department collaborated with the Public Works Department to ensure that they, as operators and maintainers of City systems, are fully-involved in the design and construction of said systems.

DISCUSSION

Several of the Specification sections and several of the Drawings remain unchanged. But, to orient you to the changes relative to the entire document, we have provided you with the entire document. Please notice the tables of contents of the Specifications and of the Drawings. The Specifications and Drawings that were changed are shown in red. The most-significant change is to put all design standards in one place (Section 00700), divide them by system, and add relevant standards, as needed. Other major changes include:

- Bolstering supporting industry standards and showing them hierarchically.
- Listing and describing engineering submittals necessary for development approval.
- Providing detailed geometric design standards for streets.
- Providing access management standards for street.
- Updating the Approved Equivalents for the Water System.
- Allowing the “Big Dipper” indoor grease trap when space does not allow outdoor equipment.
- Reworking of the Irrigation System service meter boxes.
- Emphasizing responsibility and accountability of design engineers.

FISCAL IMPACT

No direct fiscal impact. Indirectly, implementing sound standards and specifications improves the sustainability of City infrastructure and saves money over time.

CONCLUSION

We recommend these updates for the reasons described above.

ALTERNATIVES

1. Approve as proposed
2. Approve as amended
3. Continue
4. Deny

POTENTIAL MOTIONS

Alternative 1 - Approval - Staff Recommended Option

I move to **approve** the item as presented above.

Alternative 2 - Approve as Amended

I move to **approve** the item as amended, as follows.

Alternative 3 - Continue
I move to **continue** the item to another meeting on , with direction to the applicant and/or Staff on information and / or changes needed to render a decision, as follows:
Alternative 4 - Denial

I move to **deny** the item with the following findings.

ACCOUNTABILITY

Department: Engineering
Staff member: Gordon Miner, Engineer

EXHIBITS

1. Draft Storm Water Design Manual 230815
2. Draft Standard Drawings 230815
3. Draft Full Specifications 230815
4. Final Plan Engineering Review Checklist 230815
5. Preliminary Plan Engineering Review Checklist 230815
6. Standard Plat Template 230815
7. Standard Plat Amendment Template 230815

HEBER CITY

HEART OF THE WASATCH BACK

HEBER CITY STORM WATER DESIGN MANUAL

Heber City Engineering

JULY 2023

~~SEPTEMBER 20, 2022~~

HEBER CITY
75 N Main Street
Heber City, UT 84032

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Introduction

Purpose of document

The purpose of this document is to establish design standards and guidelines for storm drainage infrastructure within Heber City. This document also promotes uniformity among development design submittals and drainage reports.

The design criteria in this document are for use on public and private projects within the city. There are other adopted City documents that also reference requirements related to storm drain systems within the city. These documents include the Heber City Standard Specifications and Drawings, the Heber City Master Plans, and the Heber City Municipal Code. This document is designed to work in collaboration with these other stated references, however, in the case of discrepancies the more stringent standard will apply. All requirements and the intent of design requirements in this document shall be met unless otherwise approved by the City Engineer.

Definitions

cfs	*Cubic feet per second (449 gallons per minute)*
Ac-Ft	*Acre-foot (volume of water required to cover an acre of land to a depth of one foot)*
Detention	*Short term storage of runoff provided by a pond or similar facility. An outlet is provided that allows water to be released from the facility at a predetermined rate.*
LID	*Low Impact Development is an approach to improving water quality by reducing the amount of storm runoff generated by a project and relying on infiltration or evaporation to handle runoff where it is generated.*
Retention	*Long term storage of storm water provided by a pond or similar facility that does not allow water to be discharged. Water will stay in a retention pond after a storm event until it either evaporates or infiltrates into the bottom of the pond.*

Approval Procedure

Preliminary Drainage Plan and Report

i. A preliminary drainage plan and report are required for all site plan and subdivision developments within the city. The preliminary drainage plan must include the following as applicable:
    1. Existing topography (2-foot contours or finer) extending at least 100 feet beyond the site
    2. Existing drainage infrastructure and features
    3. Existing drainage and gravity irrigation channel/canal features
    4. Watershed delineations and existing drainage patterns/flow paths
    5. Proposed drainage infrastructure and features (onsite and offsite)
    6. Proposed drainage patterns/flow paths

ii. The preliminary drainage report must include the following as applicable:
    1. Introduction
    2. Project Scope
    3. Project Location
    4. Description of Existing Conditions
    5. Drainage Design Criteria
    6. Off-Site Watershed Drainage and Hydrology
        a. Preliminary Upstream/Downstream Flood Analysis
        b. Preliminary Hazards & Debris-Flow Analysis
    7. On-Site Area Drainage and Hydrology and Hydraulics
    8. LID features
    9. Detention and/or Retention Facilities
    10. Water Quality Features (e.g., LID, HDS, pretreatment etc.)
    11. Major Stream Crossings
    12. Non-pressurized Irrigation Systems

Final Drainage Plan and Report

iii. Final drainage plans and report are required for all site plan and subdivision developments within the City shall be submitted after acceptance/approval of the preliminary submittal. The final drainage report shall be submitted for review prior to final site plan or subdivision approval.

iv. Final Drainage Plans must include the following as applicable:
    1. Existing and proposed topography (2-foot contours or finer) extending at least 100 feet beyond the site
    2. Existing drainage infrastructure and features
        a. Onsite features (channels, flow control, etc.)
        b. Offsite features (debris basins, etc.)
    3. Existing drainage and gravity irrigation channel/canal features
    4. Watershed delineations and existing drainage patterns/flow paths
    5. Location of all proposed drainage features
        a. Onsite features (channels, flow control, etc.)
        b. Offsite features (debris basins, etc.)

6. Proposed drainage patterns/flow paths
7. Proposed drainage details
8. Improvements to city facilities
9. LID, water quality and retention features

v. Final Drainage Report must include as applicable:
1. Introduction
2. Project Scope
3. Project Location
4. Detailed Description of Existing Conditions
5. Drainage Design Criteria
6. Off-Site Drainage and Hydrology with Final Calculations
    a. Final Upstream/Downstream Flood Analysis
    b. Final Hazards & Debris-Flow Analysis
    c. Recommended Mitigation
7. On-Site Drainage Hydrology and Hydraulics with Final Calculations
8. Description of LID Measures
    a. Justification for products selected and why they are most appropriate
    b. Compliance with on-site retention rules
9. Detailed Description of Detention and/or Retention Facilities
10. Major Stream Crossing
11. Non-pressured Irrigation Systems
12. Permanent Erosion Control Features
13. Water Quality Features (e.g., LID, HDS, pretreatment etc.)
14. Storm Drain System Calculations

All plans and reports are subject to review and approved by Provo River Watershed Council. See Appendix A for list of resources for drainage design in Heber City.

Design Standards and Analysis Methods

These standards apply to all developments within Heber City including the North Village area or other areas that may annex into the City in the future. Heber City may establish additional storm drain design criteria for certain development areas through a new Storm Drain Master Plan and/or Master Plan update. All developments shall comply with the City Storm Drain Master Plan that is applicable for the respective development.

Design Storms for Conveyance

New developments within Heber City must have an initial and a major storm drain system for storm water conveyance. The initial system's purpose is to reduce the frequency of street flooding, reduce maintenance costs, and provide protection against regularly recurring damage from storm runoff. The initial conveyance system must handle the 10-year storm event at a duration equal to or less than the time of concentration (T_c), and typically consists of pipe, storm drain inlets, curb and gutter, or drainage swales that convey the storm water.

The purpose of the major conveyance system is to avoid major property damage or loss of life during flood level runoff conditions. The major system is comprised of the initial conveyance system elements but also includes the entire roadway cross section, including park strip and sidewalk, or other safe surface routes. The major system must protect against flooding during the 100-year storm event at a duration equal to or less than the T_c.

Every effort shall be made to keep the major system above ground. But, where that is impractical, the City Engineer may approve the major system to be underground if it is designed for it from the top of the catchment. "Funneling" at the bottom of a catchment is not allowed. The following figure details how the initial and major systems must function.

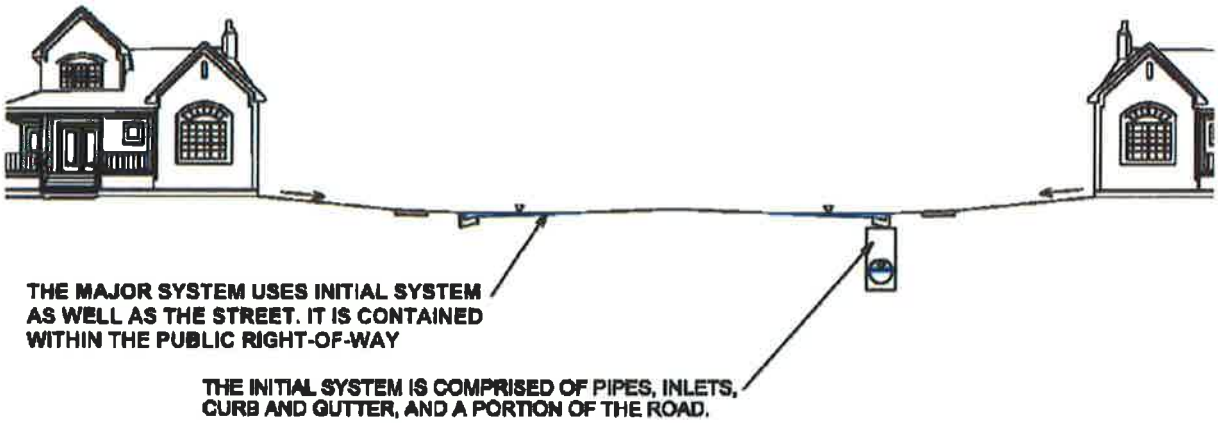

Figure 1. Initial and Major Drainage Systems

Directly connected impervious areas should be independent watershed basins and should not be combined and averaged with pervious areas.

Storage Facilities

100

Storm drain storage facilities are required for flood control and water quality purposes. Storage facilities may be above ground basins/ponds or below ground storage systems. Detention storage facilities require an approved suitable discharge location approved by the City Engineer. Retention facilities are required when no suitable discharge location is available. Detention facilities must be designed to store and detain the ~~25~~-year event with a maximum release rate of ~~the lesser~~ of 0.1 cfs/acre ~~or historic flows in the 2-year, 10-year and 25-year events~~. See the Post Construction Peak Discharge section for more detailed requirements. Retention storage facilities must provide retention volume for the 100-year, 24-hour event. Infiltration may be considered as outflow when sizing retention facilities. See the section on

If downstream conveyance capacities are limited, storm runoff peak flow rates shall be reduced to offset the impacts to the downstream system capacity.

former

Infiltration in this document for details regarding infiltration requirements. However, if infiltration is utilized for facility sizing design, shorter storm durations with higher intensities must be checked (i.e., rational spreadsheet), and the controlling or largest volume, minus the infiltration, shall be used to size the storage facility. Therefore, the 24-hour storm may not result in the largest storage volume. When utilizing the SCS Type II 24-hour storm for sizing storage facilities with infiltration, the storm distribution must provide a peak intensity where the majority of the rainfall occurs during a shorter period of time.

Storm Drain System Hydraulic Requirements

Pipe systems used for conveyance must be designed such that they flow unpressurized during the required design event. Minimum pipe diameter for public storm drain pipes within City right-of-way is 18 inches but may be reduced to 15 inches for pipes from a single inlet box. Private storm drain pipe may be reduced to 10 inches but must still adhere to conveyance design storm requirements. Pipe material must adhere to Heber City Standard Specifications and Drawings. Junction boxes or manholes should be placed such that the maximum pipe length between two structures does not exceed 400 feet.

Apply an inlet clogging factor of 30% for inlets on grade and 50% for inlets in sags.

The minimum pipe slopes shall be pursuant to HEC 22 Table 7-7. The n-values shall be 0.012 for plastic pipe and 0.013 for concrete pipe.

On steeper slopes, provide a sufficient number of inlets to reduce inlet bypass to less than 0.2 cfs and to reduce risk of water sweeping pedestrians off their feet.

Design storm drain system per HEC-22.

Channel Hydraulic Requirements

Open channels that are part of the initial conveyance system shall be designed to convey the 10-year flow while maintaining one-foot of freeboard. Channels that are located within a FEMA Special Flood Hazard Area, open channels that are the major conveyance system, and natural drainage channels shall be designed to convey the 100-year flow with one foot of freeboard. All channel sections must be adequately designed, detailed, and constructed, pursuant to the latest edition of HEC 15, to prevent erosion of the channel bed and banks.

for the 10-year event.

Above Ground Storage Basins (Ponds)

Above ground storage basins (ponds) shall be designed as attractive and usable spaces. Water depth should be five feet or less where feasible, appropriate landscaping shall be incorporated, and include elements that eliminate standing water and low flow impacts. Detention ponds shall include a low-flow surface channel, or underdrain that is sized for the 2-year storm event.

The required freeboard for detention basins is two feet in areas where any portion of the pond is constructed above existing ground and one foot when the pond is excavated in existing ground.

Basins that are not acting as a biofilter, or which have natural flow only, shall include at least one sump manhole to help facilitate infiltration of storm water, and the inlet into the basin shall be connected directly to the sump manhole.

Side slopes on City owned and maintained basins shall be 5H:1V or flatter on two or more sides, 4H:1V or flatter slopes on remaining sides, with a minimum 1% bottom slope. If the natural existing slope is

greater than 8% then basin side slopes may be increased to 3H:1V. A suitable location for ingress and egress shall be incorporated for ponds deeper than three feet, and this must include an access at least 15-feet wide at less than 15% grade. A minimum five-foot buffer between any pond grading and the property lines shall be provided.

Landscaping: Grass or other suitable landscaping materials should be used, and turf irrigation systems shall be installed for ponds that will be maintained by City personnel, unless a low-maintenance landscaping alternative is approved. Irrigating methods and practices must be accounted for in the hydrologic and infiltration calculations when designing and sizing ponds. Developers will be required to escrow funds to landscape ponds when located on private lots for future reimbursement to the owner who completes the landscaping at a future time. Developers will not use landscaping that may hinder infiltration if it is used in the sizing of the pond or required for Municipal Separate Storm Sewer (MS4) compliance. See infiltration section for more information on infiltration and landscaping requirements.

Easements: If basins are placed on private property, a minimum 20-foot easement for all underground lineal pipeline facilities and access to maintain ponds must be provided. Additionally, an easement must be provided over the pond area and a minimum of five feet beyond the pond top of slope perimeter. The easement shall be ten feet beyond the pond perimeter when an access along the pond edge is required. Pond easements shown on subdivision plats shall have restrictive language labeled with dimensions to facilitate locating in the field.

Basins shall be designed with provisions for an emergency overflow that will avoid flood damage to surrounding properties in the event of a storm exceeding the design capacity of the basin.

Retention basins shall be designed with mechanisms to ensure that the basin will completely drain within 48 hours after the 24-hour event with additional precipitation. (Verify a 72-hour storm will not overtop the basin). See the section on Infiltration in this document for details regarding infiltration requirements.

Basin inlets and outlets shall have trash racks or grates installed. A storm water pretreatment device, approved by the City, shall be installed upstream of the pond or sump inlets. See the Water Quality section of this report for requirements.

Culverts

Culverts that convey off-site flows through a project or beneath a road shall be designed for the 100-year event. Culverts shall be designed so the headwater elevation does not exceed 1.5 times the culvert diameter, or one foot below the elevation where water spills over the road or out of the channel. Concrete box culverts shall have a minimum 5-feet height from floor to ceiling, and multi-barrel culverts may not be used where high amounts of debris is expected. If multi-barrel culverts are used in other locations, designers must consider elevations of roads, buildings, driveways, and other features to prevent adverse impacts. Normal depth equations (Manning's Equations) cannot be used for culvert analysis. Inlet and outlet control shall be checked, and culvert hydraulic calculations provided.

Roadway Drainage

Inlets within roadways should be placed to control spread, or the amount of water flowing along the side of the road and in the gutter. Allowable spread is determined by the roadway classification as follows:

Table 1. Design Spread for Roadways

Design Frequency and Spread		
Roadway Classification	**Design Frequency**	**Design Spread**
Highway or Major Collector > 35 MPH	10-Year @ T_c	Shoulder (Outside of travel lane)
Highway or Major Collector ≤ 35 MPH	10-Year @ T_c	Shoulder + three feet
Local Street	10-Year @ T_c	½ Driving Lane

Inlets should also be placed upstream of intersections and pedestrian ramps to reduce bypass flows. Spread calculations shall be checked using HEC 22, Appendix A, Chart 1B.

Rainfall Runoff Computation Methods

Precipitation data obtained from the NOAA ATLAS 14 Point Precipitation Frequency website including intensity and depth data for Heber City is contained in Appendix B. This information shall be used for all development within Heber City.

Several hydrologic methods may be applicable depending on what type of analysis is required. The Rational Method is the most common method and may be used for sizing pipes, checking inlet spread and estimating peak flow rates for areas up to 100 acres.

Rational Method runoff coefficients are shown in Table 2. The runoff coefficients listed in Table 2 are the minimum values to be used in Heber City. Any runoff coefficients for other characteristics should be adjusted to account for the 100-year rainfall.

Table 2. Rational Runoff Coefficients

Surface or Cover Type *	**Runoff Coefficient (C)**
Asphalt or Concrete Pavement	0.90 (asphalt) 0.95 (concrete)
Roofs of Buildings (type dependent)	0.90 (asphalt shingles) 0.95 (steel)
Grass-covered Sandy Soils, Slopes 2% or less	0.13
Grass-covered Sandy Soils, Slopes > 2%	0.20
Grass-covered Clay Soils, Slopes 2% or less	0.22
Grass-covered Clay Soils, Slopes > 2%	0.49

* Surfaces not addressed in this table shall be approved by the City Engineer.

For storm analyses that require developing a volume or routing a volume of runoff, a dynamic hydrograph simulation model is required using AutoDesk SSA, HEC-HMS, or SWMM. Within dynamic hydrograph simulation models, the transform method shall be the NRCS Unit Hydrograph Method, and the routing method for runoff hydrographs shall be the Muskinghum-Cunge Method. Multiple hydrographs were developed by the Soil Conservation Service (SCS), now known as Natural Resources Conservation Service (NRCS). The SCS Type II 24-hour storm distribution should be used for estimating the precipitation for developments within Heber City.

The SCS method uses the Curve Number Method for determining rainfall runoff. Curve Numbers are determined by using a land cover type in conjunction with a hydrologic soil group. Land cover information can be obtained by means of aerial topography or GIS data. Hydrologic soil group information may be obtained from NRCS's Web Soil Survey website. The land cover and hydrologic soil group information are used to select an appropriate curve number using the manual titled *TR-55 Urban Hydrology for Small Watersheds*. TR-55 worksheets and calculation methods are provided in Appendix G and shall be utilized for developments that use the SCS method to estimate run-off. Typical CN values are included in Appendix C. Engineering judgement should be used when selecting curve numbers. Part 630 of the National Engineering Handbook says, "As a result of construction and other disturbances, the soil profile can be altered from its natural state and the listed group assignments generally no longer apply, nor can any supposition based on the natural soil be made that will accurately describe the hydrologic properties of the disturbed soil. In these circumstances, an onsite investigation should be made to determine the hydrologic soil group." Site specific factors such as terrain, potential precipitation on frozen ground, future conditions and other factors should be considered when selecting curve numbers. The SCS method shall only be used for estimating the run-off for development which are greater than 10 acres.

But, it still may be used if the Guo Averaging Parameter is included. The FAA Method

The Federal Aviation Administration (FAA) Method for estimating detention or retention volumes ~~may also be used for approximating storage facility volume requirements for developments. It~~ is outdated because it does not model the release rate correctly. ~~However, with the Guo Averaging Parameter, it is valid and can be used. However, it~~ is not applicable to in-series (cascading) ponds. This method is applicable for developments less than 100 acres, and the SCS method is required for developments larger than 100 acres. The FAA Method uses a spreadsheet to evaluate several storm durations for a given return period for ~~either~~ the 100-year storm ~~(retention) or 25-year storm (detention).~~ The total inflow volume for a storm duration is developed by multiplying the peak flow rate by the storm duration. The volume out is developed by utilizing a controlled discharge amount (discharge with detention only), and/or exfiltration from the detention pond when conditions permit. The required volume is equal to the inflow volume minus the outflow volume. This is evaluated for all storm durations to determine which storm duration provides the maximum required volume. Developments that use the FAA Method for estimating storage facility volumes shall use the spreadsheets provided by the City including the Guo Averaging Parameter when off-site discharge is utilized. An example is shown in Appendix I, or other approved spreadsheet formats.

Several methods for estimating time of concentration exist. They were each developed for specific parameters such as watershed size, slope, etc. Time of concentration methods used should be applicable to the areas in which they are being analyzed. The minimum time of concentration value should be 5 minutes.

For all software models, input and output data shall be provided so that it can be reviewed by the City. A copy of the model file shall also be provided to the City for review. Models must be provided to the City in Civil 3D Storm and Sanitary Analysis. City may consider other software models based on prior approval from the City Engineer.

Post Construction Peak Discharge

Heber City has adopted a 0.10 cfs/acre maximum release standard for undeveloped areas, i.e., areas outside Central Heber. This rate is assumed to be the historical undeveloped flow. For example, a 10-acre housing development would be able to have a post-development discharge rate of 1.0 cfs (10 acres

x 0.10 cfs/acre) provided there is a suitable point to discharge to. If the historic flow is found to be less than the 0.1 cfs/acre, this shall be used as the maximum allowed post-development discharge. Moreover, if the downstream system does not have capacity for the 0.1 cfs/acre discharge rate, the available capacity will become the controlling factor. To ensure that flow from new developments do not exceed 0.10 cfs/acre, detention facilities with controlled discharge are required. In cases where there is no suitable point to discharge to, retention facilities are required. See storage facilities section for more information.

Infiltration

Infiltration of treated storm water into the ground is encouraged. Detention and retention basin volumes may be sized by considering infiltration as an outflow component. Prior to assuming infiltration is a viable option, infiltration tests shall be conducted by a professional geotechnical engineer, geologist, or soil scientist licensed in Utah that determines the infiltration rate and demonstrates that the proposed soil profile is suitable for infiltration and will readily accept the water. Infiltration tests shall be performed using the double ring infiltrometer test in accordance with ASTM D 3385, and shall be performed at the location of where the result will be applied and at the elevation of the bottom of the facility where infiltration will occur. A minimum of two tests shall be performed with a minimum of one test per 10,000 square feet of the infiltration area. The slower or the average of the infiltration rates shall be used for design purposes.

Groundwater elevations shall be determined. Potential ground water level fluctuations shall be considered, and the lowest elevation of any detention basin should be at least two feet higher than the highest seasonal groundwater elevation. All design infiltration rates shall have a safety factor of two (2) or higher applied to the actual rate measured by the official infiltration test.

Only the wetted area when the storage volume (excluding freeboard) is at half depth

~~Only the plan view area at the bottom of the storage facility~~ may be used as an infiltration surface in infiltration calculations unless stage-volume-discharge curves are created and used. Infiltration must not be considered as an outflow prior to the storm water entering the pond, as this could create negative storage volume. Where infiltration galleries are located beneath surface ponds, the infiltration surface shall be the surface pond only.

Infiltration rates shall only be applied to the same soil that has been tested. If topsoil or other less permeable soil is added to a storage facility where percolation is being applied, the infiltration rate used in the design shall match rate of the less permeable soil. Alternatively, a permeable layer of gravel shall be used in the entire infiltration area.

An infiltration rate map is included in Appendix D. It is included to provide general infiltration information but shall not replace actual field tests.

Comply with all State groundwater protection regulations, guidelines and permits such as those associated with infiltration, infiltration wells, Class V injection wells and any others applicable to the site.

Long-Term Storm Drain Facility Maintenance

All public storm drain facilities will be maintained by Heber City unless otherwise specified in the development agreements. Developers, property owners, or their representatives such as a Homeowners Association, shall enter into a post-construction storm water management agreement with the City for all privately owned storm drain facilities, and/or publicly owned storm drain facilities that convey storm water from private roads and facilities. See Appendix J for template agreements.

Low Impact Development

Low Impact Development (LID) is a method of reducing storm runoff by capturing, treating, and retaining it on a very local level within each individual development. Although Heber City is not currently on the Utah MS4 list, it is anticipated to become an MS4 community in the future. LID is required by the Utah Department of Environmental Quality as part of an MS4 Program. To prepare for future compliance with the MS4 storm water discharge program and to reduce post-development storm water run-off in general, developments within Heber City must retain and treat the 80th percentile rainfall event as part of LID requirements. LID measures can also help achieve the onsite retention and treatment requirements. The 80th percentile depth for Heber City has been determined to be 0.47 inches. See Appendix E for this calculation. The Reese method, as shown in Appendix E, shall be used to calculate the volumetric runoff coefficient used for determining the 80th percentile volume. For developments larger than 10 acres use SCS Method to determine 80th percentile volume.

Localized LID methods are encouraged, however, the 80th percentile volume may be incorporated into larger detention or retention storage facilities if those facilities are located on site within the development area, or adjacent to, and if approved by the City Engineer.

Several typical LID measures are described in the following paragraphs. Portions of the LID descriptions have been taken from the Utah City Engineers Association (UCEA) and Utah DEQ LID Manual. See Appendix F for LID general details. The following LID descriptions are the approved LID measures to be used in Heber City. Any other proposed LID measures shall be approved by the City Engineer on a case-by-case basis. Please see the DEQ "Guide to Low Impact Development with Utah" for additional LID design guidelines and design flow-chart requirements.

Vegetated Swales

Vegetated swales may be considered dry or wet swales, and serve as a vegetative buffer between paved areas and storm drain facilities. The main advantages of vegetated swales are the degree of velocity reduction, detention, infiltration, and reduction of hard surface runoff. Storm runoff flows through the swale, where sediment and pollutants may settle out prior to entering downstream drainage facilities. A curb cut is one means of directing flow into swales where changes in elevation are limited.

Swales are often an attractive BMP solution because they can take advantage of already planned park strips. It should be noted that studies have shown that vegetated swales have a moderate ability to remove pollutants from storm water.

Dry Swales

A dry swale is a shallow, gently sloping drainage channel with broad, vegetated, side slopes. Dry swales provide temporary storage, filtration, and infiltration of storm runoff. A dry swale is versatile because it requires a relatively small area. Reduced channel velocities increase infiltration and water quality treatment and may reduce peak runoff. Channel vegetation can include turf, meadow grass, shrubs, and in limited quantities, small trees. Dry swales must be located above the water table to provide drainage. Dry swales are only allowed when groundwater is equal to or greater than 2-feet below the swale bottom elevation. When infiltrations rates are greater than 6.0 in/hour, dry swales shall either be designed as a biofilter for treatment of storm water or be preceded by an approved pre-treatment system. See the Water Quality section in this report for requirements. Retention LIDs shall provide treatment through settling, decreased flow rate, and bioretention with a designed release time.

Wet Swales

Wet swales are a type of filtration BMP and occur when the water table is located close to the surface. Wet swales act as a long and linear shallow treatment system. Like dry swales, check dams can be used as needed to create cells and contain the entire water quality treatment volume. Cells may be planted with emergent wetland plant species to improve pollutant removal. Wet swales, at a minimum, shall be preceded by a pre-treatment device to capture and remove pollutants and coarse sediment particles, see the Water Quality section below.

Infiltration Basin/Galleries

An infiltration basin is essentially a detention basin that is constructed such that storm water can exit the basin by means of infiltration into the surrounding ground. These include underground pipe and chamber systems. These systems can reduce pollutants by settling out or filtering materials and any pollutants that may be bound to those materials. They are also effective at reducing nutrients, metals and other pollutants.

Basins with no outlet or highly restricted outlets can be effective at eliminating pollutants, but there is some risk of concentrating pollutants or introduction of pollutants to groundwater that must be considered. One way to address this is by the utilization of a biofilter, hydrodynamic separator (HDS), or other pollutant removal measures within or upstream of a basin that is sized to handle the water quality design storm. All infiltration basins shall be preceded by a pre-treatment or treatment system to capture and remove pollutants and coarse sediment particles, see requirements in the Water Quality section below.

Basins and galleries must be sized to drain within 48 hours after the end of the design storm and to not overtop in the 72-hour storm.

Underground injection wells are included in this category, but water quality and applicable regulations must be considered and utilized.

Rain Gardens

A rain garden is a planted depression or similar feature that allows storm runoff from impervious urban areas like roofs, driveways, walkways, parking lots, and compacted lawn areas the opportunity to infiltrate into the soil.

Rain gardens are an LID tool that can be used in new or established developments. Rain gardens can be constructed in commercial and residential sites. The garden may be located near a street or parking lot in a shallow depression where runoff can be diverted into it. Native perennial plants are recommended in rain gardens with a barrier to reduce weeds. Nutrients in the storm runoff are reduced as plants or other growing media make use of them to grow.

Rain gardens can be constructed to allow infiltration. Where complete infiltration is not desired or is not feasible due to existing soil conditions, an underdrain may be installed to convey excess water to a storm drain retention system.

Studies underway at Utah State University have identified common reed and sedges are the optimal plant for use in northern Utah to remove nutrients, metals, and other pollutants (Dupont and McLean), but it must be harvested and disposed of elsewhere at regular intervals to prevent concentration of

pollutants in the soil or in the biofilters. Mulching and leaving in place does not address this. Whether such concentrations are critical depends on the contact with groundwater, and is still under study.

Root zone soil media must be shallow and water must pool or move slowly through the system or the pollutant removal is ineffective.

Rain garden filtration media shall meet the specification for biofilters (see Water Quality section below), are only allowed in private areas, and shall be maintained by the property owner.

Water Quality

Water quality is of utmost importance to Heber City. There are a variety of mechanisms to protect water quality from storm drain discharge systems. All storm water must pass through a pre-treatment or treatment system prior to discharging to a storage facility (above or below ground) that captures the 25-year to 100-year storm events. LID measures are intended to reduce storm runoff and to improve overall water quality. However, as most LID measures rely on infiltration, water quality must also be considered during design and implementation. Unless the native soil infiltration rate is less than 6.0 in/hr and/or the LID facility is designed and determined to treat the storm water (biofilter treatment), an approved hydrodynamic separator (HDS) pre-treatment device shall be used prior discharging to LID systems. All storm water that flows over an impervious surface must be treated.

Pre-treatment and Treatment Systems

Pre-treatment and treatment systems shall be sized, at a minimum, to treat the 2-year storm event at the duration that produces the highest flow rate while also being able to by-pass the peak conveyance storm at the time of concentration (T_c) without disrupting the treatment system. The peak conveyance storm represents the actual capacity of the initial conveyance system and may be larger than the 10-year event. Note, treatment systems that also serve as LID retention areas may be sized for the 80th percentile storm event but shall adhere to the by-pass requirements stated above. Requirements for pre-treatment and treatment are listed below.

Oil-Water and Hydrodynamic Separators (HDS) Pre-Treatment Devices:

All developments are required to install an appropriately sized hydrodynamic separator (HDS) prior to discharging to the retention/detention storage facility that captures the 25-year to 100-year storm events unless the LID methods utilized in the development incorporate a sized biofilter per the specification listed below and the storm water is not re-introduced to a source of pollution after it flows through the localized LID methods. Pre-treatment devices shall be maintained at least twice per year and per the guidelines provided by the manufacturer. All HDS devices must achieve, at a minimum, the following treatment levels:

- The HDS system shall be required to have a General Use Level Designation (GULD) performance verification through the TAPE program (Emerging stormwater treatment technologies (TAPE) - Washington State Department of Ecology). The device shall be sized to treat the peak runoff flow rate generated by the 2-year storm event at the Tc, when using Rational Method. Use the storm duration and distribution that creates the highest flow rate during a 2-year storm event when using other run-off computation methods.The proposed hydraulic loading rate (HLR) must not exceed the design HLR of the proposed device to be used. TAPE approval letters can be fou

Add bullet item: "The HDS system shall be designed to remove 80% of the total suspended solids (TSS) 110 microns or larger from the storm water.

found on the website and provide the design HLR and/or the maximum treatment flow rate for each model.

- The HDS system shall be concrete unless otherwise approved by the City Engineer
- The HDS system shall provide 90% removal of trash and ~~neutrally buoyant material~~ other particles larger than 5mm at the design treatment flow rate. Adding a screen to the tested system is not allowed to meet this spec, as modifying a TAPE verified system with a screen can significantly affect hydraulics, and thus water quality performance.
- The HDS system shall be designed to by-pass the peak conveyance storm event and prevent these larger storm events from washing out the oil, debris, and sediment that has been previously captured (off-line storage).
- The HDS system shall provide a minimum sump and oil storage capacity as follows:

Treatment Capacity Range (cfs)	Minimum Sump Storage Capacity (yd^3)	Minimum Oil Capacity (gal)
0-4	> 0.4	> 60
4-9	> 2	> 200
9-20	> 4	> 500
> 20	> 8	> 1000

Biofilter Treatment Systems: Biofilter is a generic description for bioswales, vegetated filter strips, rain gardens, or other structures that use a filtration media to capture storm water pollutants. The pollutants are decomposed by a biomass such as plants, a tree, or a specially designed biofilter media. These systems are typically connected to a storm drain system and if used shall be combined with detention/retention facilities.

All biofilters shall be sized to treat the 2-year T_c storm event flow rate while also be sized to by-pass larger flows without disrupting the treatment system. Biofilters shall treat the storm water prior to infiltrating into the native soils with infiltration rates greater than 6.0 in/hr and/or prior to discharging to a detention/retention facility unless a sized HDS system is properly incorporated as pre-treatment.

The growing media of the biofilter and shall be designed and certified to meet the following specifications.

RAIN GARDEN AND BIOFILTER GROWING MEDIA (Soil + Organics)

Assume a saturated hydraulic conductivity rate of 2.0 in/hr. Then, divide it by a safety factor of 2.0. So, the net rate is 1.0 in/hr.

RAIN GARDEN AND BIOFILTER SOIL

Particle Size Distribution

sand: 70-80%

silt: 0-30%

clay: 0-15%

Chemical Attribute and Nutrient Analysis

pH: 6.8-7.5

organic matter: < 1.5%

nitrogen: < 15 ppm

phosphorous: < 15 ppm

salinity: < 6 mmhos/cm

RAIN GARDEN AND BIOFILTER ORGANICS

shredded mulch: 3-5% (by weight of growing media)

VEGETATION

The filter area shall be vegetated with drought tolerant species that thrive in sandy soils. Table 3 provides a suggested seed mix for sites that will not need to be irrigated after the grass has been established.

Table 3. Suggested Seed Mix

Common Name	Scientific Name	Variety	PLS[2] lbs per Acre	Ounces per Acre
Sand bluestem	Andropogon hallii	Garden	3.5	
Sideoats grama	Bouteloua curtipendula	Butte	3	
Prairie sandreed	Calamovilfa longifolia	Goshen	3	
Indian ricegrass	Oryzopsis hymenoides	Paloma	3	
Switchgrass	Panicum virgatum	Blackwell	4	
Western wheatgrass	Pascopyrum smithii	Ariba	3	
Little bluestem	Schizachyrium scoparium	Patura	3	
Alkali sacaton	Sporobolus airoides		3	
Sand dropseed	Sporobolus cryptandrus		3	
Pasture sage[1]	Artemisia frigida			2
Blue aster[1]	Aster laevis			4
Blanket flower[1]	Gaillardia aristata			8
Prairie coneflower[1]	Ratibida columnifera			4
Purple prairieclover[1]	Dalea (Petalostemum) purpurea			4
Sub-Totals:			27.5	22
Total lbs per acre:			28.9	

[1] Wildflower seed (optional) for a more diverse and natural look.
[2] PLS = Pure Live Seed.

EXECUTION

thickness: >/= 18 inches

compaction: 80-85% of maximum dry density as measured by AASHTO T-99 (ASTM D698)

vegetation: Mix seed well and broadcast, followed by hand raking to cover seed and then mulched. Hydromulching can be effective for large areas. Do not place seed when standing water or snow is present or if the ground is frozen. Weed control is critical in the first two to three years, especially when starting with seed. When using sod, specify sand–grown sod. Do not use conventional sod. Conventional sod is grown in clay soil that will seal the filter area, greatly reducing overall function of the BMP.

Irrigation: Provide spray irrigation at or above the WQCV elevation or place temporary irrigation on top of the rain garden surface. Do not place sprinkler heads on the flat surface. Remove temporary irrigation when vegetation is established. If left in place this will become buried over time and will be damaged during maintenance operations. Adjust irrigation schedules during the growing season to provide the minimum water necessary to maintain plant health and to maintain the available pore space for infiltration.

Water Quality Control Measures

Other water quality control requirements are listed below.

Detention/Retention Facilities (Pollutant Control, LID): Detention basins are used to attenuate peak flow rates of a runoff hydrograph. They also can be designed to allow sediment, debris, and other contaminants to settle out by reducing water velocity or holding the water until it infiltrates or evaporates.

Retention facilities have no outlet and water is removed by infiltration or evaporation. Retention basins still function as a BMP the same way a detention basin does. Detention and retention facilities shall be used in combination with hydrodynamic separators or biofiltration systems.

These facilities require regular maintenance to remove debris, contaminants, and sediment build-up.

Outlet Protection/Energy Dissipation Devices: Outlet protection reduces or eliminates soil erosion thereby preventing the migration of soil to downstream channels. Outlet protection, pursuant to HEC 14, is required at all open discharge points.

Slope Protection: Slope protection ensures slopes will be stable during and after construction. The primary means of stabilization of a slope is establishing permanent vegetation, but may also consist of temporary or permanent rock, mulch, erosion control blankets, check dams, diversion dikes, or other means of protection. All slopes shall be stabilized after disturbance. Slopes of 3H:1V and steeper require permanent slope stabilization.

Source Protection

The Utah Division of Drinking Water requires that each well and spring serving a public drinking water system must have a source protection plan. Part of that plan includes the protection of groundwater from point and non-point sources. Developers within Heber must certify that all private and public

source protection zones are protected from storm water pollutants. Source protection zones for Heber City culinary water sources are shown on the source protection maps in Appendix H.

Storm water infiltration, drainage wells, or storm water injection wells are prohibited within 100 feet of Zone 1 of any source protection area. All storm drain storage facilities within 100 feet of a Zone 1 area shall be lined with an approved waterproof liner to prevent all storm water infiltration.

Natural Channels

All major natural channels in newly developed areas must maintain a buffer of open space and offset from development. This buffer is intended to help maintain water quality, prevent damage from flooding events, and maintain habitat and aesthetics. A minimum buffer width of 100-ft generally centered on the major natural drainage channel should be maintained. When natural topography or existing conditions favor a shift of the overall buffer area in one direction or another from the channel centerline, the City may approve a buffer zone shift with adequate justification. Development (including individual lots and buildings) is not allowed in the buffer zone. The drainage channel shall be protected and remain undisturbed where possible and with the exception of road or other crossings. Crossings of the natural channels shall be a minimum distance of 200-feet measured along the channel. Exceptions may be granted where proposed road crossings are adjacent to canal crossings or collector roads. Additional landscaping, green space, trails, or other amenities may be allowed if it is shown they will not negatively affect water quality or compromise the other goals of the buffer area. All improvements proposed in the natural drainages shall be approved by the City.

When existing developed areas are redeveloped and prior encroachment along or piping of historic channels has already taken place, a minimum buffer width of 50-ft generally centered on the major natural drainage channel shall be provided. No structures are allowed in the buffer area. Other improvements such as fencing, landscaping, hardscape, etc. may be allowed with written City approval and if adequate access along the channel is not compromised.

All development along natural channels, including proposals to relocate, alter, or pipe existing natural channels shall follow the National Flood Insurance Policy (NFIP) requirements and related City policies.

Where major historic channels are being re-established below the existing irrigation canals due to changes in the upstream drainage patterns (specifically as required in the North Village area), the buffer required along the re-established portion of the historic channel may be reduced by up to 40 ft, conditioned upon the following criteria:

- The re-established channel must be designed to convey the historic 100-year storm event considering no upstream retention/detention with a free board of 2 ft independent of the buffer area.
- Buffer area outside of the defined channel (on both sides) shall be a minimum of 20 feet wide, be designed to slope toward the channel, and allow for maintenance access along each side.
- Unless otherwise approved by the City, the re-established channels shall be constructed in a manner to appear as natural as possible with side slopes no steeper than 3H:1V.
- All provisions of this manual regarding natural channels and buffer areas with the exception of buffer area width shall still apply.

All buffer areas for natural channels shall have an easement dedicated to Heber City for emergency use.

Flood and Debris Flow Hazards

FEMA Flood Analysis

Ensure all pertinent FEMA flood mapping data is incorporated into plans and plats maps. Ensure all FEMA guidelines from https://www.fema.gov are followed including the sections on Floods & Maps, Floodplain Management, and Flood Insurance. FEMA uses the most accurate flood hazard information available and applies rigorous standards in developing Flood Insurance Rate Maps (FIRMs). All areas within Flood Hazard Areas shall be shown on plans and plats, and all Base Flood Elevation (BFE) data pertinent to the development must be provided.

To change the FIRM designation of a property, a Letter of Map Amendment (LOMA) and/or the Letter of Map Revision-Based on Fill (LOMR-F) processes must be strictly followed.

Debris-Flow Flood Hazard Analysis

The Western Unities states is beginning to see increased precipitation intensity and increasing fire size and frequency (Kean and Staley et al, 2021). Generally, there is not adequate time to prevent or mitigate a debris flow hazard *after* a wildfire has taken place. The USGS has found that 1-year storm events will typically trigger a post-wildfire debris flow event. Therefore, if a wildfire takes place, some type of debris flow is likely to happen within 1-year of the fire. These types of hazards should be prevented or controlled as deemed feasible. New development with undeveloped land upstream or downstream of the property containing natural slopes 30% and greater and/or where the City Engineer determines there could be a potential debris-flow risk, requires a specialized post wild-fire debris-flow analysis of the site including an estimated post-fire hazard assessment with mitigation measures.

Flood and Debris-flow hazard analysis reports shall include but shall not be limited to the following information for the areas to be developed:

- FEMA Flood Mapping Data including 100-year flood hazard zones
- Include and label the drainageways susceptible to periodic flooding associated with storm events or rapid snowmelt that are outside the FEMA designated flood zones
- U.S. Geological Survey Map
- Aerial Map
- Contour map with slopes labeled
- Geotechnical Test pit data
- Geologic Mapping Data to include historic upstream and downstream alluvial fan deposits and historic upstream or pass-through debris/mud flows as data is available.
- Vegetative cover type and percentage analysis
- Utah Division of Water Rights – Dam Safety requirements
- Post-fire debris-flow volume calculations with flood and post-fire debris-flow hazard assessment and mitigation

Flood and post-fire debris-flow hazard assessment and mitigation recommendations shall adhere to the following guidelines:

The storage volume fordebris and sediment shall be calculated using model equation (2) from the 2010 Cannon study (Cannon et al,, 2010) using a minimum 80% burn of slopes 30% and greater. The entire

drainage basin shall be modeled. Methods from the Gartner 2014 study and equation (3) may also be used until another model paper is published and adopted by USGS. (Gartner et al., 2014).

The minimum storm event interval shall be a 10-year occurrence with a T_c peak rainfall depth, unless otherwise approved by the City Engineer. Intensity is used for the Gartner method.

When the Gartner method is used, the watershed area burned at moderate to high severity shall be calculated based on a vegetation type assessment of the entire drainage basin. Vegetation type and coverage area data shall be obtained and summarized under the direction of a licensed Professional Engineer or other approved licensed professional. Forested areas and other areas with small or large tree species (deciduous or evergreen) and/or thick brush, such as Gambel Oak shall be assumed to burn at moderate to high severity. Staley et al. (2018) spells out further guidance on vegetation types and burn severity per vegetation type.

Debris flow is difficult to accurately model due to the nature of the material being carried by the storm water, especially if the natural channel that the debris flow will enter and travel through is altered by road crossings, culverts, or other diversions/obstructions over and through the natural channel. Unless the natural channel is undisturbed and can be accurately modeled to safely convey the debris flow without having to travel through any obstructions, culverts, roads, etc. that would otherwise plug or divert the flow off-course, the estimated debris volume needs to be contained in a debris-basin upstream from development. Road or other crossings shall be designed to allow and divert debris flow and/or flood water over the crossing using depression or other mechanism to allow the flow to pass the crossing continue down the natural channel. Other measures to contain and/or divert the debris volume may be considered, as approved by the City Engineer.

References

Cannon, S.H., Gartner, J.E., Rupert, M.G., Michael, J.A., Rea, A.H., & Parrett, C. (2010). Predicting the probability and volume of postwildfire debris flows in the intermountain western United States. *GSA Bulletin, v. 122*(1-2), 127-144. https://doi.org/10.1130/B26459.1

Gartner, J.E., Cannon, S.H., & Santi, P.M. (2014). Empirical models for predicting volumes of sediment deposited by debris flows and sediment-laden floods in the transverse ranges of southern California. *Engineering Geology, 176*, 45-56. https://doi.org/10.1016/j.enggeo.2014.04.008

Kean, J.W., & Staley, D.M. (2021). Forecasting the frequency and magnitude of postfire debris flows across southern California. *Earth's Future, 9*(3), e2020EF001735. https://doi.org/10.1029/2020EF001735

Staley, D.M., Tillery, A.C., Kean, J.W., McGuire, L.A., Pauling, H.E., Rengers, F.K., & Smith, J.B. (2018). Estimating post-fire debris-flow hazards prior to wildfire using a statistical analysis of historical distributions of fire severity from remote sensing data. *International Journal of Wildland Fire, 27*(9), 595-608. https://doi.org/10.1071/WF17122

TABLE 1				
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	LID / FRAME MODEL	COMMENTS
1 INCH	27" x 18"	330ID2718FAB000650N	~~DFW PLASTICS DFW18MVE-1MBF2 SML IRR~~ / 700098-1	NEW SERVICES

NOTE 1: FOR LARGER SIZES, USE SINGLE SERVICE DETAIL AND CONFIGURATION.

~~NOTE 2: SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.~~

TOP OF BOX SHALL BE 0-1" HIGHER THAN CURB. IF BOX IS LOW, USE MANUFACTURER PROVIDED GRADE RINGS TO ADJUST TO REQUIRED GRADE. BOXES SHALL NOT BE CUT DOWN TO ADJUST TO FINAL GRADE WITHOUT PERMISSION FROM THE PUBLIC WORKS DIRECTOR

MUELLER 700098-1 CAST IRON FRAME WITH ~~DFW PLASTICS DFW18MVE-1MBF2 SML IRR~~ COMPOSITE LID WITH SIDE LOCKING MECHANISM

INSULATION INSERT WITH NYLON STRAP HANDLE

~~MUELLER/HUNT~~ INLINE DOUBLE METER BOX WITH 1-1//2" INLET AND 1" DUAL SERVICE FITTINGS

1" INLINE BALL VALVE W/ SADDLE NUT

1-1/2" 45° MIP x FIP FITTING (BRSL45-015), 1-1/2" MUELLER H-15428N MIP x COMP FITTING & H-14211N COUPLING WITH FORD GT 206 FIBER WASHER (ANGLE CAN BE ELIMINATED DEPENDING ON BURY DEPTH AND WHEN APPROVED BY HEBER CITY PUBLIC WORKS)

FORD GT 206 FIBER WASHER PLACED INSIDE H-14223N COUPLING

1" MUELLER H-14223N COUPLING WITH THREADED PVC CAP

INSTALL ~~42" x 12" x 6"~~ CONCRETE BLOCKS ON THREE POINTS

ROUTE TRACER WIRE UNDERNEATH METER BOX

1" ULTRASONIC METER PER HEBER CITY REQUIREMENTS

SECTION VIEW

4 INCH SLEEVE 10 INCHES BELOW SIDEWALK SURFACE, EXTENDED A MINIMUM OF 6 INCHES PAST THE SIDEWALK ON BOTH SIDES & CAPPED LOCATE 5 FT ON EACH SIDE OF PROPERTY LINE

SIDEWALK

SECTION

STAINLESS STEEL LOCK PLATE & HARDWARE

SEE SECTION VIEW FOR ADDITIONAL SERVICE DETAILS

1-1/2" FIP X 1" MIP U-BRANCH

1.5" CTS 200 PSI PE SERVICE PIPE

A SMALL "PI" SHALL BE SCRIBED IN THE TOP BACK OF THE CURB AND GUTTER SHOWING THE LOCATION OF WATER SERVICE

TRACER WIRE AS INDICATED IN DRAWING WATER-5

TOP BACK OF CURB

ALL SS SERVICE SADDLE WITH "CC" THREADS FOR 4"-12" DIAM PIPE USE ROMAC 306 SERIES FOR > 12" PIPE ~~USE ROMAC 305 SERIES~~ See Appendix

CORPORATION STOP 1.5" CTS SERVICE MINIMUM FB 1000 FORD OR B 25008 MUELLER

PVC C900 PURPLE IRRIGATION PIPE

NOTES:

1. ALL COMPONENTS SHOWN TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WHEN METER BOXES ARE INSTALLED WITHIN DRIVEWAY ZONES OR WITHIN OTHER PAVED SURFACES, DIFFERENT TRAFFIC RATED LIDS & FRAMES MAY BE REQUIRED PER THE DIRECTION OF THE PUBLIC WORKS DIRECTOR.
5. IRRIGATION METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER. 4" SLEEVE REQUIRED ON ALL INSTALLATIONS INCLUDING EXISTING SIDEWALK.
6. IRRIGATION SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF OF SERVICE LINES.
7. METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
8. BEDDING OF ALL PIPE SHALL CONFORM TO HEBER CITY BEDDING STANDARDS FOR CULINARY WATER.
9. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.

IRRIGATION SERVICE - TWO LOTS

HORROCKS ENGINEERS
726 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2226

DATE: APRIL 2015
SCALE: N.T.S.

HEBER CITY CORPORATION
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY STANDARD DRAWING

IRRIGATION-1A

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TABLE 1				
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	LID / FRAME MODEL	COMMENTS
1" MINIMUM	18" x 18"	330IS1818FABS000646N	~~DFW18MR-1BF1 SML IRR (NO FRAME)~~	NEW SERVICES
1.5"	27" x 24"	500IS2724FAB000666N	~~DPW18MR-1BF1 SML IRR~~ / 700098-1	NEW SERVICES
2"	36" x 36"	550IS3636FAB000666N	SAME AS ABOVE w/ 790138 EXP RING	NEW SERVICES

NOTE 1: FOR LARGER SIZES CONTACT PUBLIC WORKS FOR REQUIREMENTS.

~~NOTE 2: SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.~~

TOP OF BOX SHALL BE 0-1" HIGHER THAN CURB. IF BOX IS LOW, USE MANUFACTURER PROVIDED GRADE RINGS TO ADJUST TO REQUIRED GRADE. BOXES SHALL NOT BE CUT DOWN TO ADJUST TO FINAL GRADE WITHOUT PERMISSION FROM THE PUBLIC WORKS DIRECTOR

MUELLER/HUNT INLINE EZ-SETTER METER BOX WITH 1" FITTINGS

1" INLINE BALL VALVE W/ SADDLE NUT

1" MUELLER H-15529N 45° MIP x COMP FITTING & H-14211N COUPLING WITH FORD GT 206 FIBER WASHER (ANGLE CAN BE ELIMINATED DEPENDING ON BURY DEPTH AND WHEN APPROVED BY HEBER CITY PUBLIC WORKS)

ROUTE TRACER WIRE UNDERNEATH METER BOX

MUELLER 700098 CAST IRON FRAME WITH 311955 COMPOSITE LID OR DFW PLASTICS ~~DFW18MR-1BF1 SML IRR COMPOSITE LID~~ WITH SIDE LOCKING MECHANISM

INSULATION INSERT WITH NYLON STRAP HANDLE

FORD GT 206 FIBER WASHER PLACED INSIDE H-14223N COUPLING

1" MUELLER H-14223N COUPLING WITH THREADED PVC CAP

INSTALL ~~12" x 12" x 6"~~ CONCRETE BLOCKS ON THREE POINTS

1" ULTRASONIC METER PER HEBER CITY SPECIFICATIONS

SECTION VIEW

4 INCH SLEEVE 10 INCHES BELOW SIDEWALK SURFACE, EXTENDED A MINIMUM OF 6 INCHES PAST THE SIDEWALK ON BOTH SIDES & CAPPED

SIDEWALK

SECTION

SEE SECTION VIEW FOR SERVICE DETAILS

1" CTS 200 PSI PE SERVICE PIPE

A SMALL "PI" SHALL BE SCRIBED IN THE TOP BACK OF THE CURB AND GUTTER SHOWING THE LOCATION OF WATER SERVICE

TRACER WIRE AS INDICATED IN DRAWING WATER-5

TOP BACK OF CURB

ALL SS SERVICE SADDLE WITH "CC" THREADS FOR 4"-12" DIAM PIPE USE ROMAC 308 SERIES FOR > 12" PIPE ~~USE ROMAC 305 SERIES~~ See Appendix "A"

CORPORATION STOP 1" CTS SERVICE MINIMUM FB 1000 FORD OR B 25008 MUELLER

PVC C900 PURPLE IRRIGATION PIPE

NOTES:

1. ALL COMPONENTS SHOWN TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WHEN METER BOXES ARE INSTALLED WITHIN DRIVEWAY ZONES OR WITHIN OTHER PAVED SURFACES, DIFFERENT TRAFFIC RATED LIDS & FRAMES MAY BE REQUIRED PER THE DIRECTION OF THE PUBLIC WORKS DIRECTOR.
5. IRRIGATION METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER. 4" SLEEVE REQUIRED ON ALL INSTALLATIONS INCLUDING EXISTING SIDEWALK.
6. IRRIGATION SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF OF SERVICE LINES.
7. METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
8. BEDDING OF ALL PIPE SHALL CONFORM TO HEBER CITY BEDDING STANDARDS FOR CULINARY WATER.
9. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.

IRRIGATION SERVICE - ONE LOT

HORROCKS ENGINEERS	DATE: APRIL 2015 SCALE: N.T.S.	HEBER CITY CORPORATION	75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY STANDARD DRAWING IRRIGATION-1B
	726 WEST 100 SOUTH #2 HEBER CITY, UTAH 84032 (435) 654-2226			

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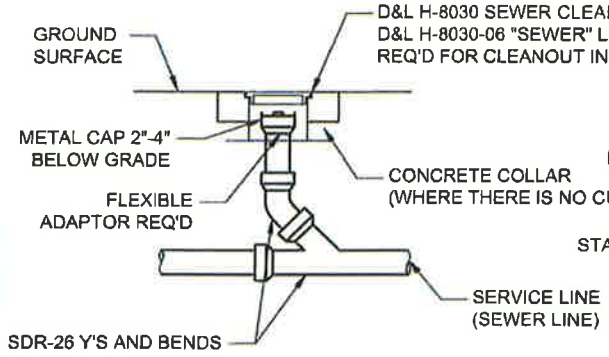
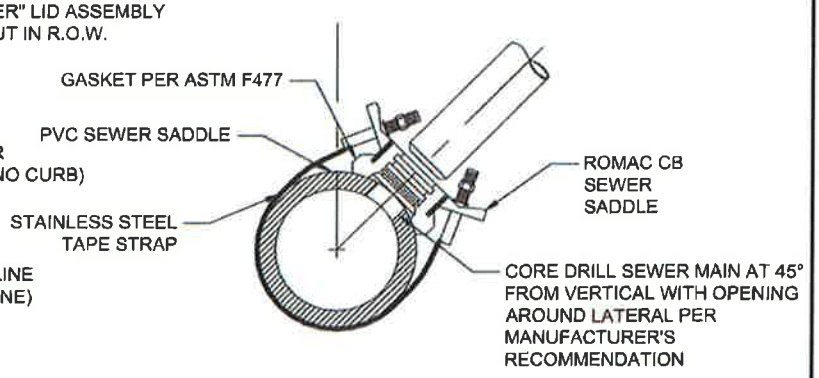
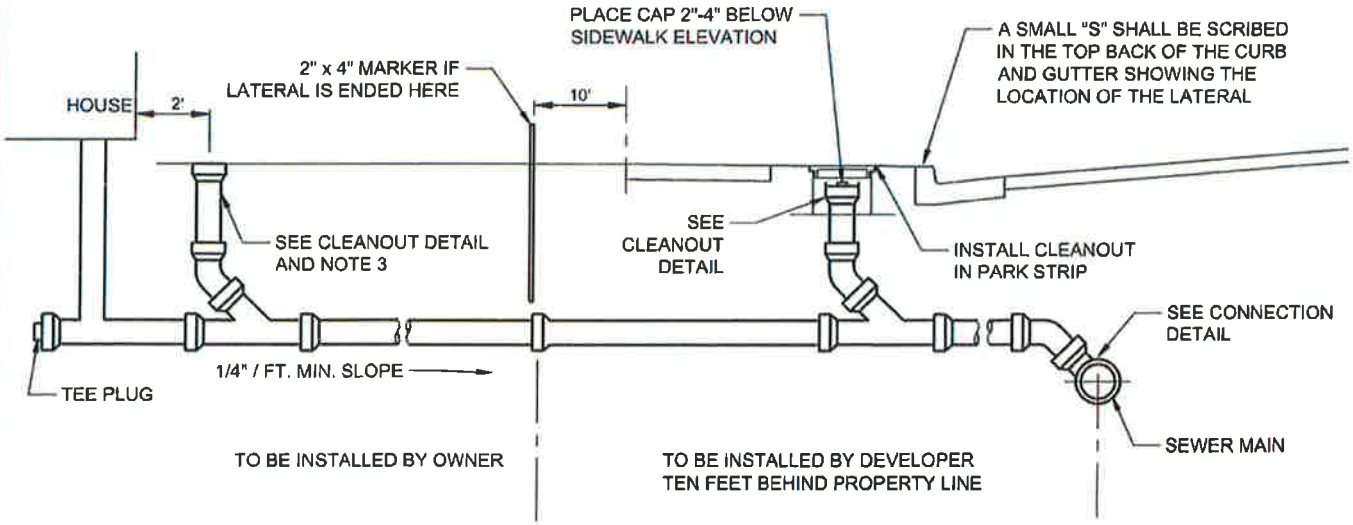


CLEANOUT DETAIL



CONNECTION DETAIL
ON EXISTING MAIN LINES
(SEE NOTE 6)



NOTES:

1. PIPE GRAPHICS DO NOT NECESSARILY INDICATE TYPE OF PIPE TO BE USED.
2. ALL PVC SEWER LATERAL PIPE AND FITTINGS WITHIN THE R.O.W. SHALL BE A MINIMUM OF SDR-26.
3. MAXIMUM SPACING BETWEEN CLEANOUTS IS 100' AND AT ALL BENDS.
4. MAXIMUM ALLOWED BEND IN LATERAL IS 22 1/2 DEGREES.
5. SEWER & WATER LATERALS ARE PROHIBITED IN COMMON TRENCH PER STATE CODE R 309-550-7.
6. "INSERTA TEE" MAY BE USED FOR CERTAIN CONDITIONS WITH PRIOR CITY ENGINEER APPROVAL.
7. WHEN APPROVED, "INSERTA TEE" INSTALLATION MUST BE WITNESSED, INSPECTED AND CERTIFIED BY AUTHORIZED CITY AGENTS
8. IN CERTAIN AREAS WHERE CONCERN FOR SEWER BACKUP EXISTS, A SEWER BACKFLOW PREVENTER (RECTORSEAL 97034) SHALL BE REQUIRED.
9. PIPE SLOPE SHALL BE 1/4" / FT MIN. ~~UNLESS OTHERWISE APPROVED BY HEBER CITY~~

	DATE: JUNE 2023 SCALE: N.T.S. 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY HEART OF THE WASATCH BACK	SEWER LATERAL & DETAILS SEWER-1

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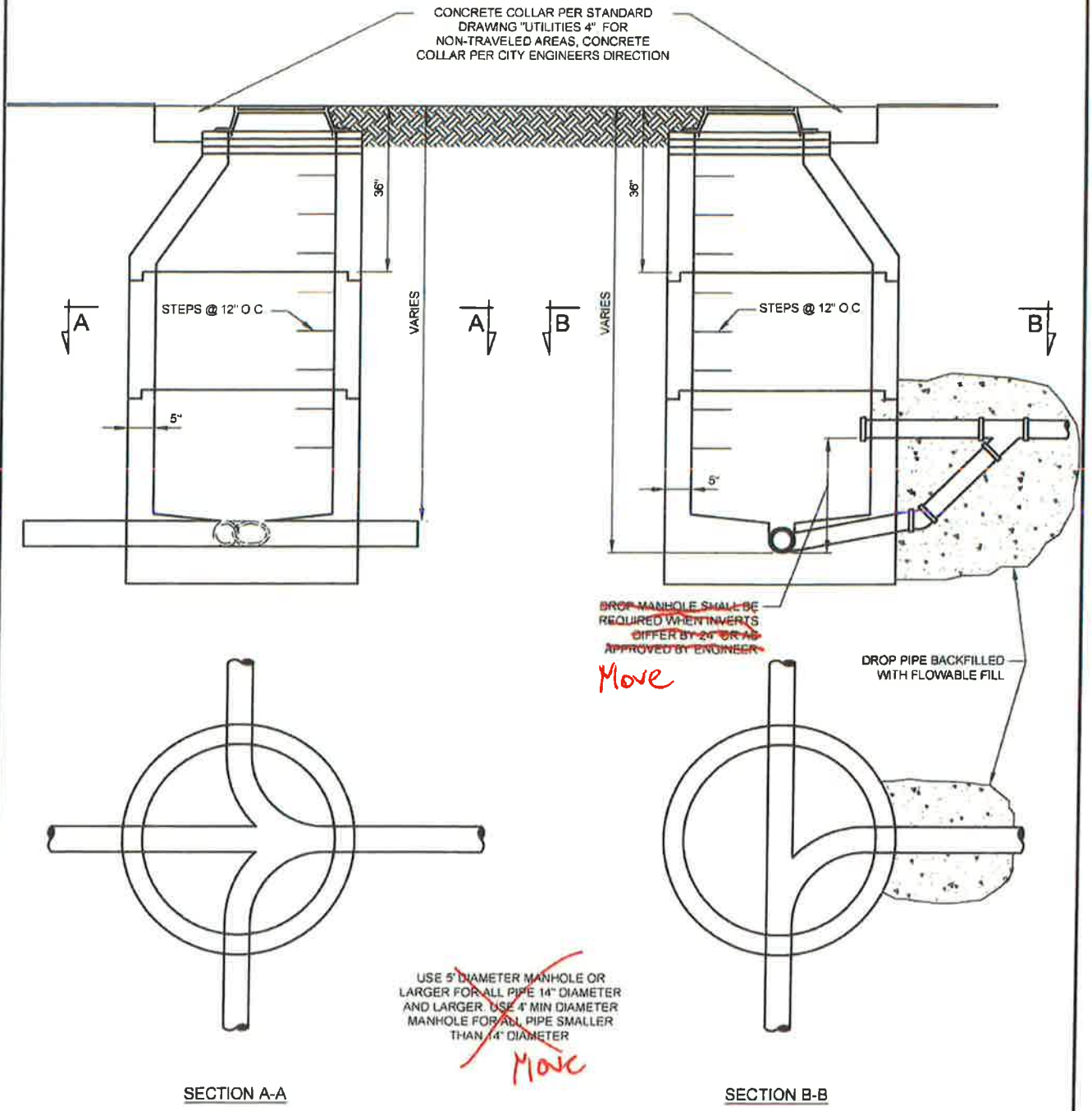

JUNCTION & DROP MANHOLES

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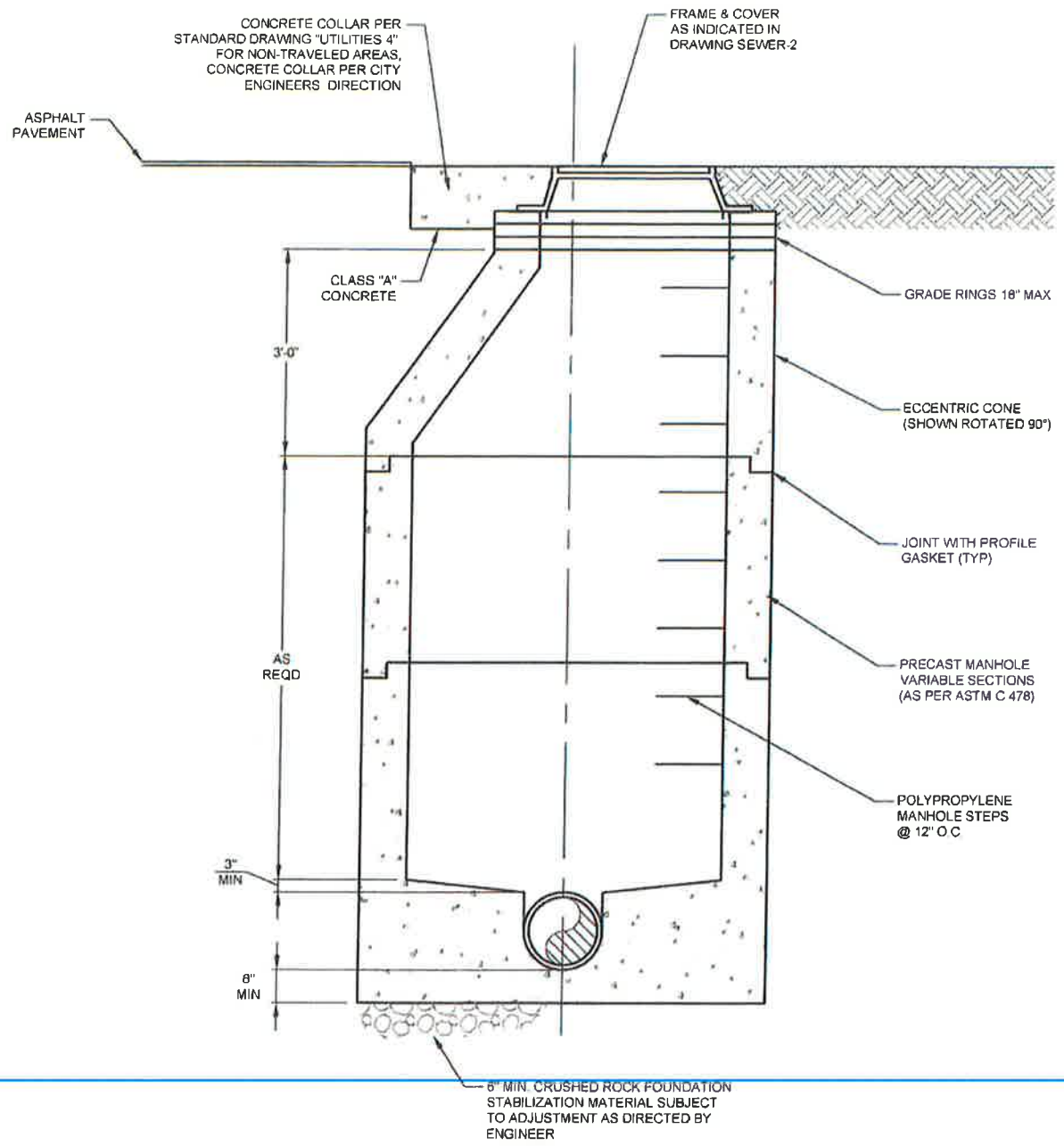
HORROCKS ENGINEERS 728 WEST 100 SOUTH #2 HEBER CITY, UTAH 84032 (435) 654-2226	DATE: APRIL 2015 SCALE: N.T.S.	HEBER CITY CORPORATION 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY STANDARD DRAWING SEWER-3



NOTES:

1. LOCATE MANHOLE COVER ON SIDE OF MANHOLE AS SHOWN ABOVE SET MANHOLE FRAME IN GROUT
2. ALL MANHOLES TO BE WATER TIGHT AND TESTED AS PER STD SPEC 02660
3. MANHOLE BASE AND 1ST SECTION OF MANHOLE TO BE FABRICATED AS AN INTEGRAL UNIT
4. ~~USE 5' DIAMETER OR LARGER MANHOLE FOR PIPES 14" DIAMETER AND LARGER~~
5. ~~USE 4' DIAMETER MANHOLE FOR ALL PIPES SMALLER THAN 14" DIAMETER~~

Move

PRECAST CONCRETE SEWER MANHOLE

HORROCKS ENGINEERS
726 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2226

DATE: FEBRUARY 2019
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY

HEBER CITY STANDARD DRAWING

SEWER-5

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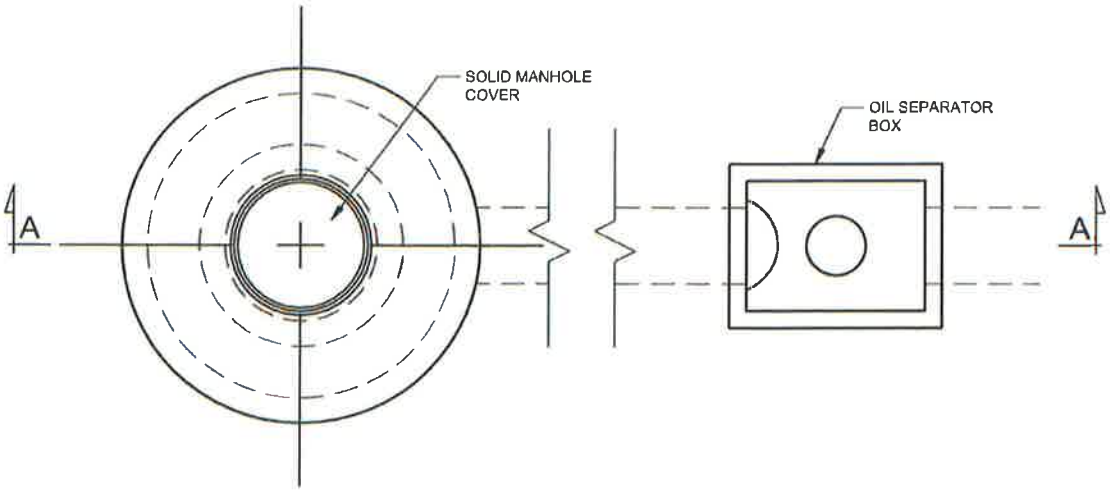

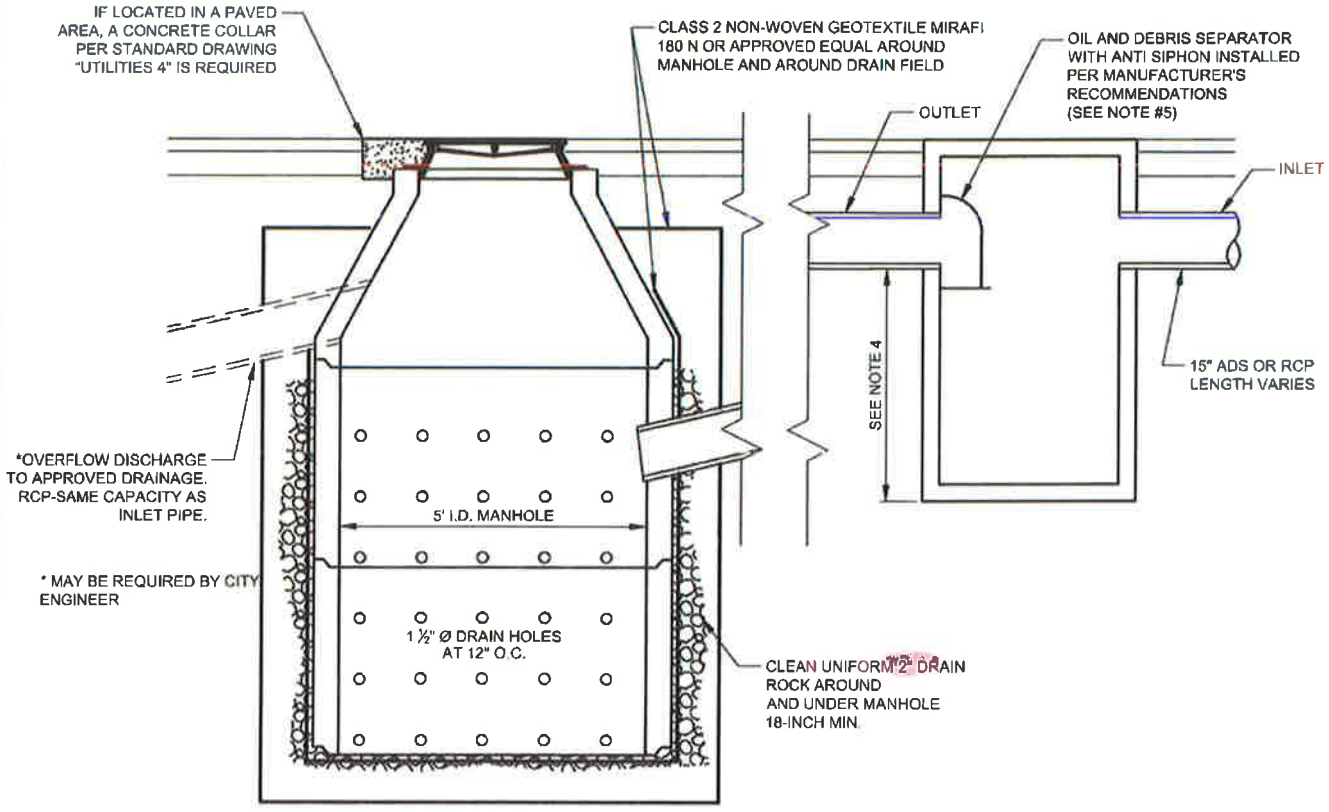

SECTION A-A

NOTES:

1. CONSTRUCT DROP INLET BOX TO MATCH WIDTH OF CURB & GUTTER. MATCH INSIDE LENGTH OF BOX TO INSIDE LENGTH OF FRAME.
2. D & L I-3516 WITH ADJUSTABLE CURB BOX.
3. STANDARD CAST IRON MANHOLE RING & LID.
4. SUMP DEPTH = 36" MIN. FOR 12" DIAMETER OUTLET AND SMALLER, FOR OUTLET DIAMETER 15" AND LARGER, DEPTH = 2.5 TO 3 TIMES THE DIAMETER.
5. SEE STANDARD SPECIFICATION 02772 PONDS.

	DATE: JUNE 2023 SCALE: N.T.S. 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY HEART OF THE WASATCH BACK	SUMP DISPOSAL & OIL SEPARATOR DRAIN-3

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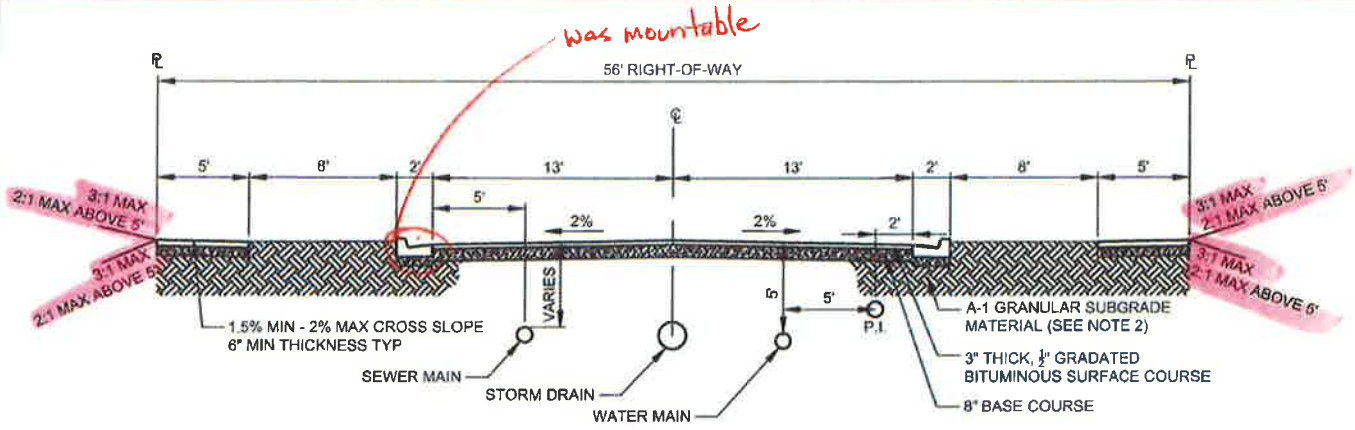
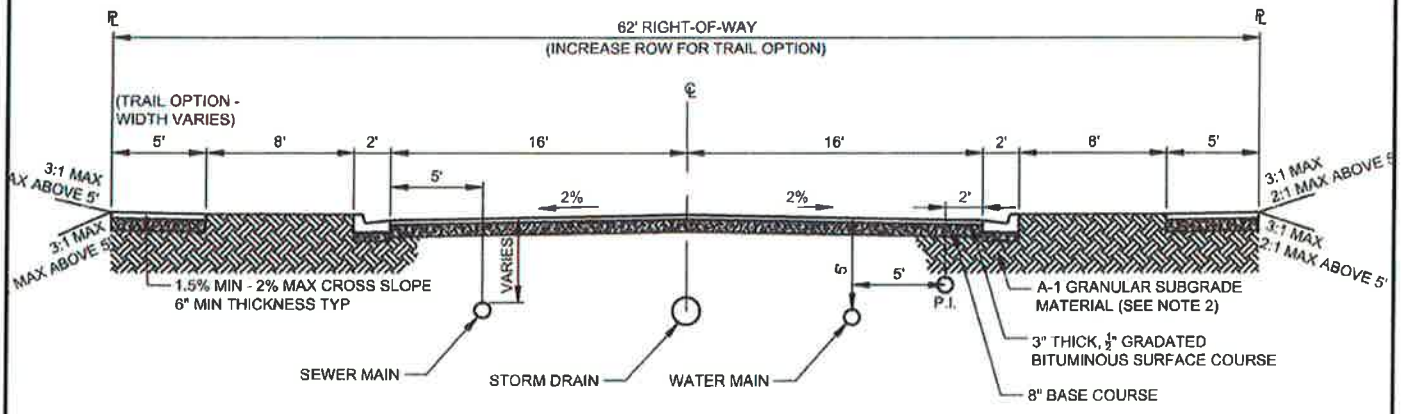


TYPICAL CRITERIA FOR USE OF MINOR RESIDENTIAL LOCAL STREET:

1. THE MAXIMUM AVERAGE DAILY TRIPS SHALL NOT EXCEED 500.
2. THE TOTAL NUMBER OF UNITS MUST BE LESS THAN 100.
3. PARKING TO BE RESTRICTED AS DIRECTED BY THE CITY ENGINEER.

MINOR RESIDENTIAL LOCAL



TYPICAL CRITERIA FOR USE OF MAJOR RESIDENTIAL LOCAL STREET:

1. THE MAXIMUM AVERAGE DAILY TRIPS SHALL NOT EXCEED 2000.
2. THE TOTAL NUMBER OF UNITS MUST BE LESS THAN 200.

MAJOR RESIDENTIAL LOCAL

NOTES FOR RESIDENTIAL STREETS:

1. SUBGRADE SHALL BE A-1 GRANULAR MATERIAL PER SECTION 02225.
2. MAXIMUM ROAD GRADE IS 8% WITHOUT CITY ENGINEER'S APPROVAL.
3. PARK STRIPS TO BE FILLED TO WITHIN ONE INCH OF T.B.C. AND TOP OF SIDEWALK.
4. WHERE HEBER CITY APPROVES INSTALLING A TRAIL OR SIDEWALK ON ONLY ONE SIDE, THE FULL RIGHT-OF-WAY DEDICATION IS STILL REQUIRED TO ALLOW FOR FUTURE INSTALLATION OF SIDEWALK.
5. TRAIL OPTION AND WIDTH IS DETERMINED BY HEBER CITY ACCORDING TO THE CURRENT TRAILS MASTER PLAN.

DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

MAJOR & MINOR RESIDENTIAL LOCAL

STREETS-1

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75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

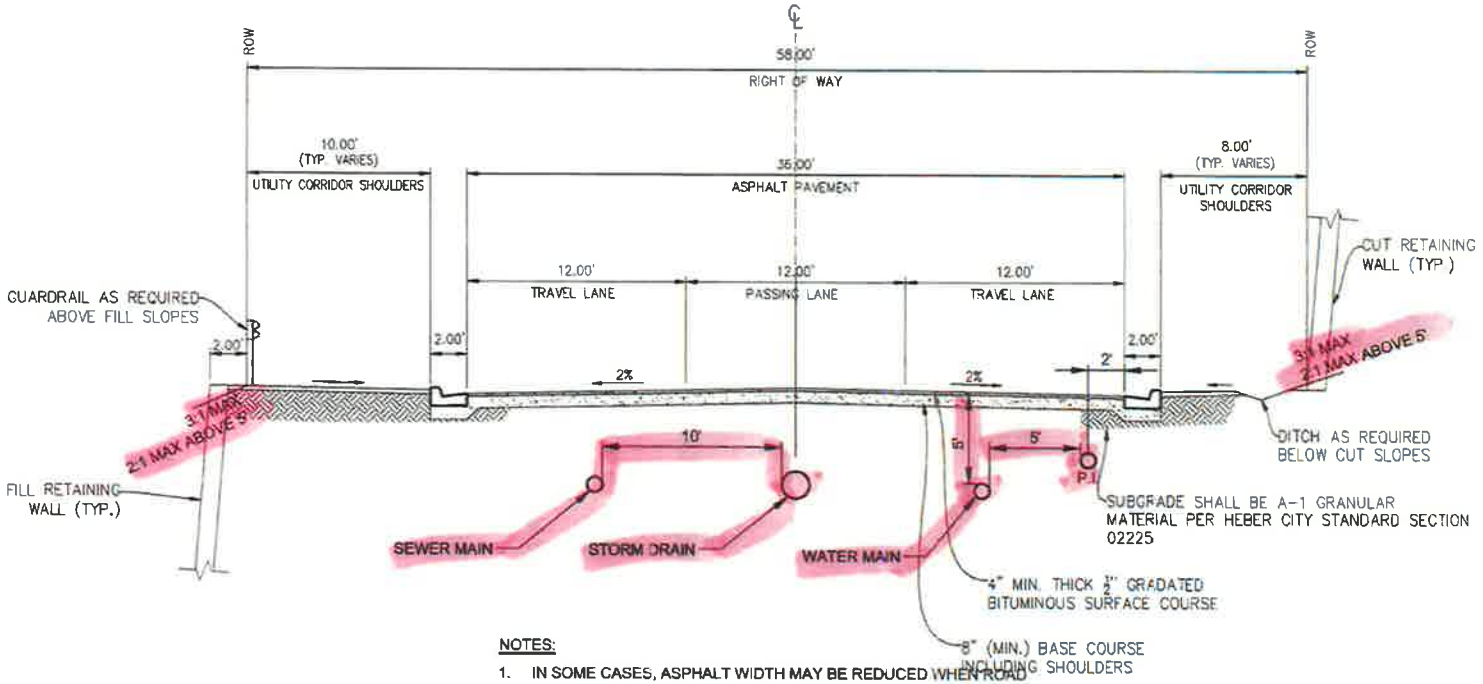
SCALE: N.T.S

DATE: JUNE 2023

HEBER CITY

NO-ACCESS MOUNTAIN COLLECTOR

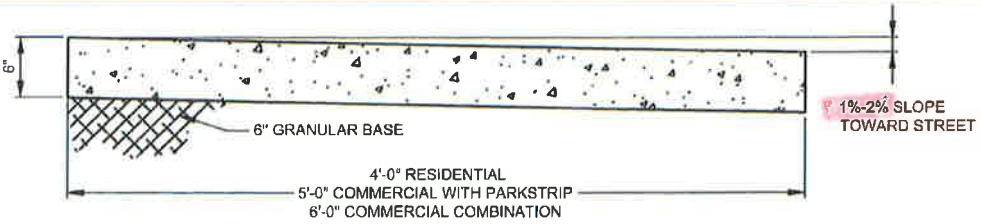
STREETS-2B



NOTES:

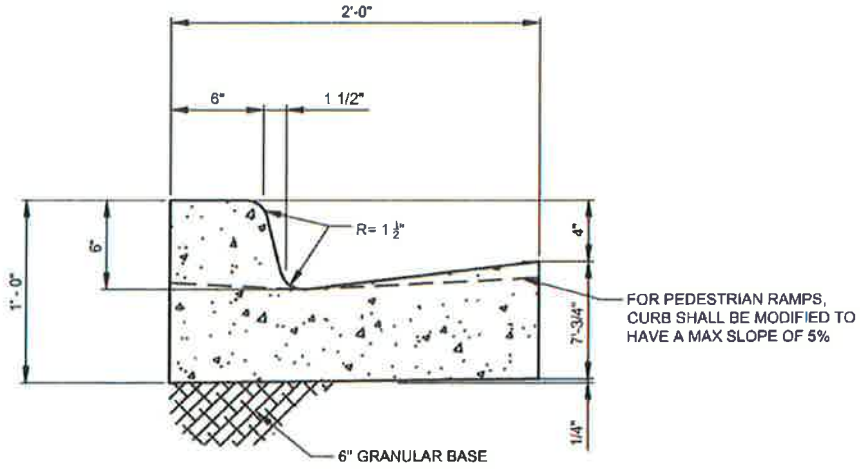
1. IN SOME CASES, ASPHALT WIDTH MAY BE REDUCED WHEN ROAD GRADE IS LESS THAN 4% WITH PRIOR CITY ENGINEER APPROVAL.
2. SUBGRADE SHALL BE A-1 GRANULAR MATERIAL PER SECTION 02225.
3. SHOULDERS TO BE FILLED TO WITHIN ONE INCH OF T.B.C.
4. NO PARKING.
5. NO RESIDENTIAL DRIVEWAYS.
6. TRAVERSES NON-DEVELOPABLE TERRAIN.
7. ENCROACHMENT EASEMENTS REQUIRED FOR WALLS/SLOPES OUTSIDE OF ROW.
8. TRAILS SHALL BE LOCATED OUTSIDE OF THE ROW.

NO ACCESS MOUNTAIN COLLECTOR



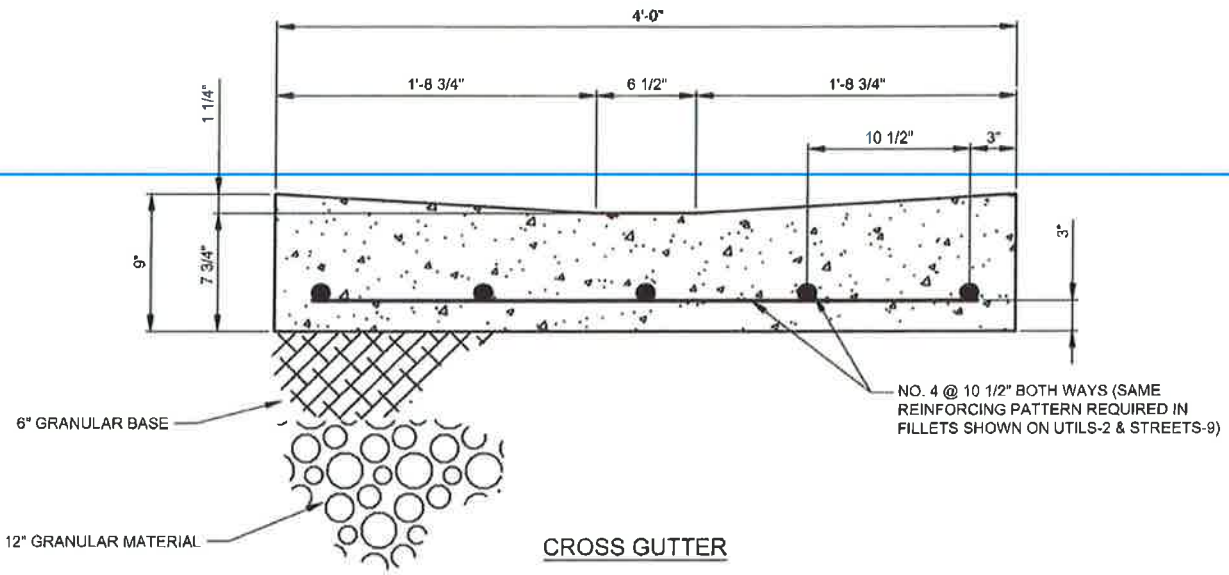
NOTE: WHEN REPLACING SIDEWALK, THICKNESS MAY BE REDUCED TO 4" WITH CITY ENGINEER APPROVAL.

SIDEWALK



NOTES:THE TOP BACK OF CURB SHALL BE STAMPED ACCORDING TO SECTION 700 - 1.02 - L.

HIGH BACK CURB & GUTTER



CROSS GUTTER

DATE: JUNE 2023 SCALE: N.T.S.	HEBER CITY HEART OF THE WASATCH BACK	SIDEWALK, HIGH-BACK CURB & CROSS-GUTTER
75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		STREETS-4

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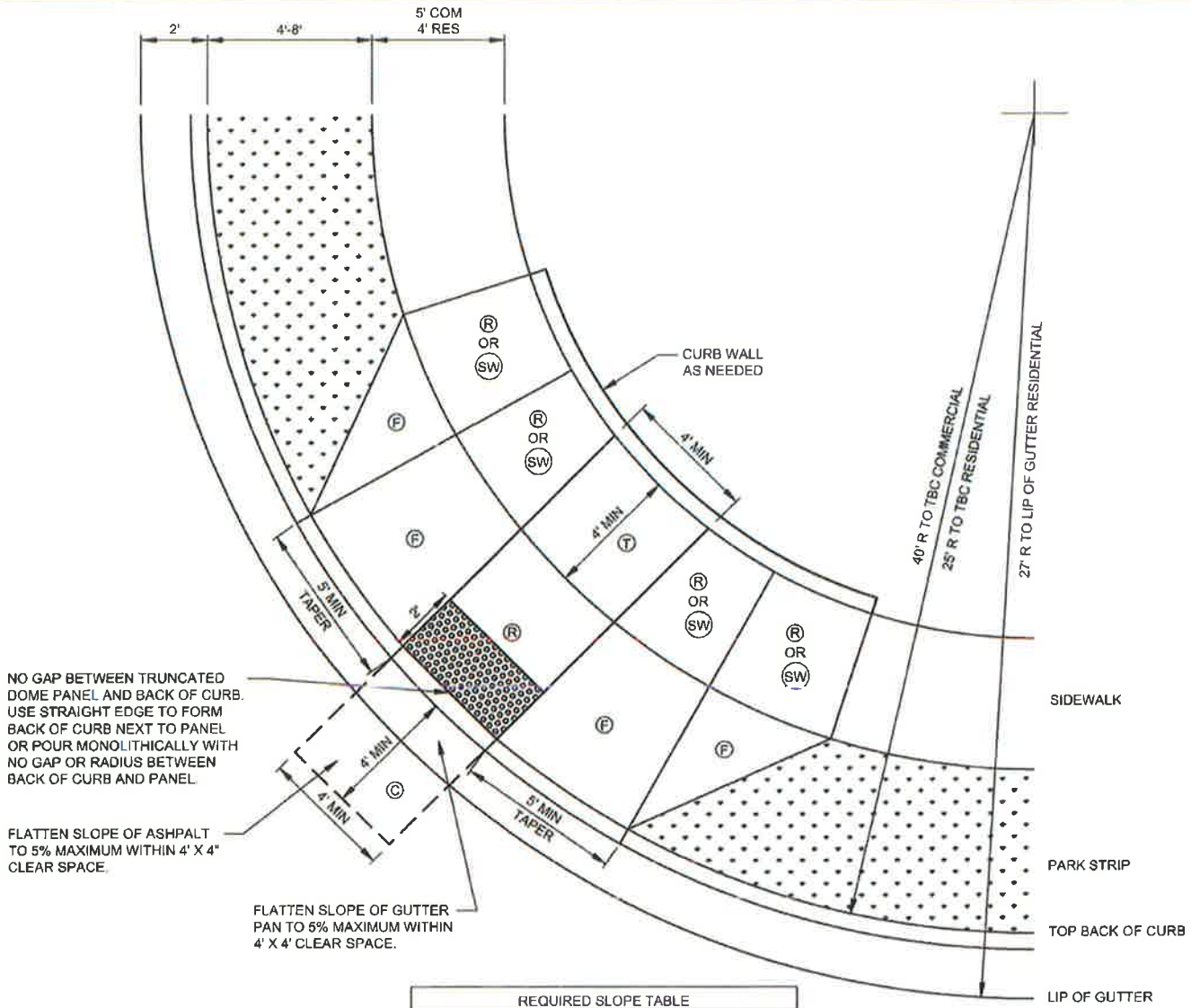

REQUIRED SLOPE TABLE		
LOCATION	RUNNING SLOPE	CROSS SLOPE
C	5% MAX	2% MAX *
F	10% MAX	-
R	5.1% MIN TO 8.3% MAX	2% MAX *
T	2% MAX	2% MAX *
SW	-	2% MAX

* DO NOT EXCEED THE ROADWAY PROFILE GRADE FOR THE CROSS SLOPE AT LOCATIONS WITHOUT A STOP OR YIELD SIGN OR AT MID-BLOCK RAMPS.

NOTES:

1. RAMP TO INCLUDE ADA DETECTABLE WARNING STRIP; IE. ADA SOLUTIONS, ARMOR-TILE CAST-IN-PLACE, MASCO CASTINTACT, WAUSAU, OR TEKWAY.
2. COLOR OF ADA DETECTABLE WARNING STRIP SHALL BE DARK RED OR GRAY.
3. TRUNCATED DOME PANEL WIDTH SHALL MATCH THE WIDTH OF THE CONNECTING SIDEWALK OR TRAIL.
4. CURB TAPER SLOPE SHALL BE 10% MAXIMUM.
5. NO LIPS ALLOWED. AT THE CURB CUT, A LIP IS A VERTICAL DISCONTINUITY GREATER THAN 1/4". AT THE GUTTER/ROAD TRANSITION, A LIP IS A VERTICAL DISCONTINUITY GREATER THAN 1/2". VERTICAL DISCONTINUITIES GREATER THAN 1/4" SHALL BE BEVELED WITH A SLOPE NOT GREATER THAN 50%.
6. ALL PEDESTRIAN RAMPS ON ADA-ACCESSIBLE ROUTES ARE SUBJECT TO THE REQUIREMENTS SHOWN ON THE UDOT PEDESTRIAN ACCESS STANDARD DRAWINGS. WHERE CONFLICTS EXIST, THE MORE STRINGENT SHALL GOVERN.

DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

CORNER PEDESTRIAN RAMPS

STREETS-5

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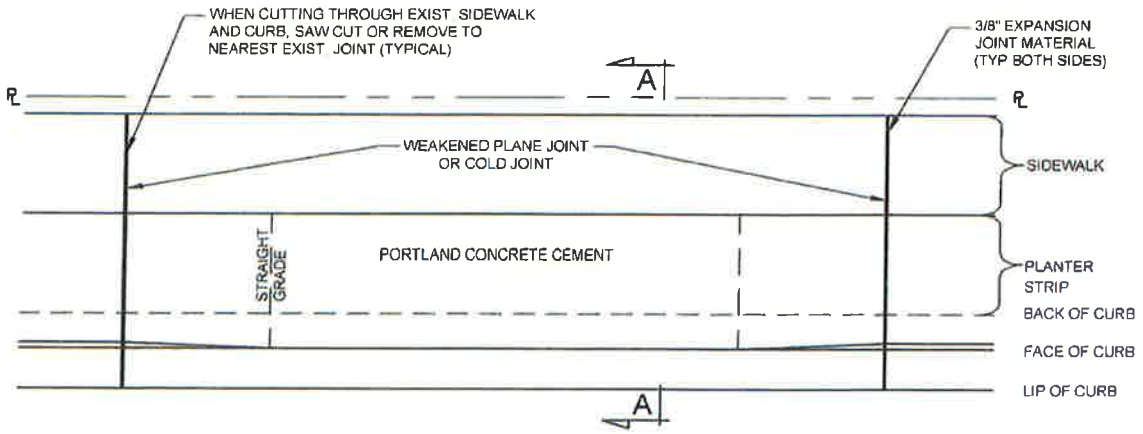
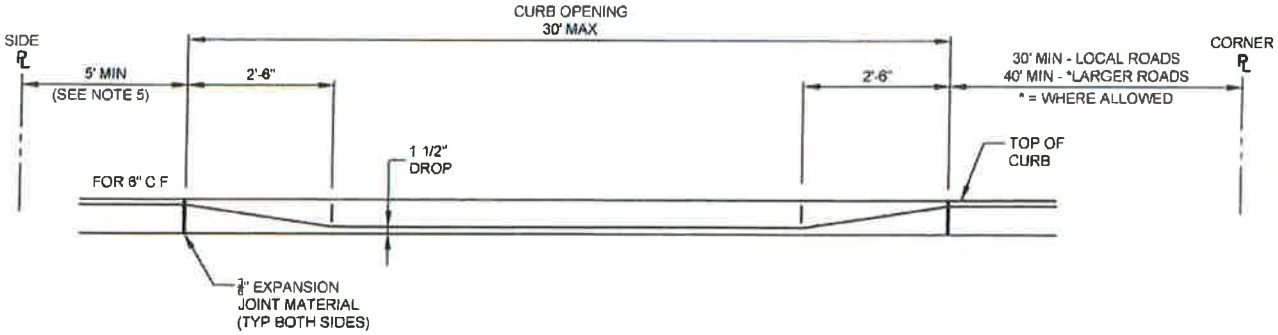
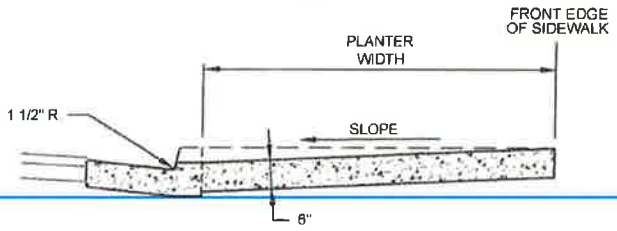


PLAN



ELEVATION



SECTION A-A

NOTES:

1. CURB OPENING SHALL HAVE A COURSE BROOM FINISH
2. C F = CURB FACE
3. INSTALL 4" PVC SLEEVE UNDER DRIVEWAY AND 10" BELOW SIDEWALK FOR PI SERVICE
4. DRIVEWAY APPROACHES SHALL NOT BE CLOSER THAN 10' TO ANOTHER DRIVEWAY APPROACH ON LOCAL ROADS
5. CURB OPENING SHALL NOT BEGIN WITHIN 5 FT OF THE PROPERTY LINE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER
6. ~~WHEN PERMITTED ON ROADS WITH HIGHER CLASSIFICATIONS, APPROACHES SHALL NOT BE CLOSER THAN 50' TO ANOTHER DRIVEWAY APPROACH.~~

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OK

kept, but moved.

RESIDENTIAL DRIVEWAY APPROACH

	DATE: JUNE 2021 SCALE: N.T.S	HEBER CITY	HEBER CITY STREETS-7
	75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		

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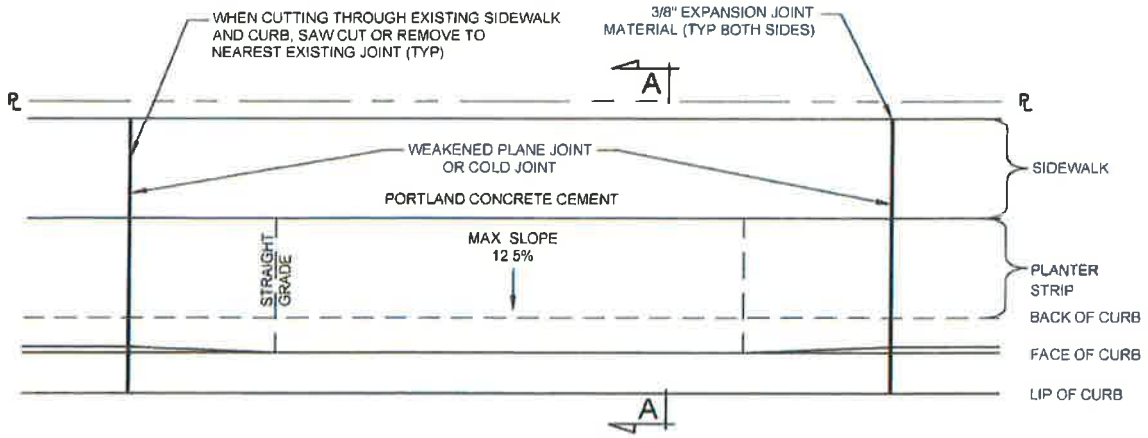
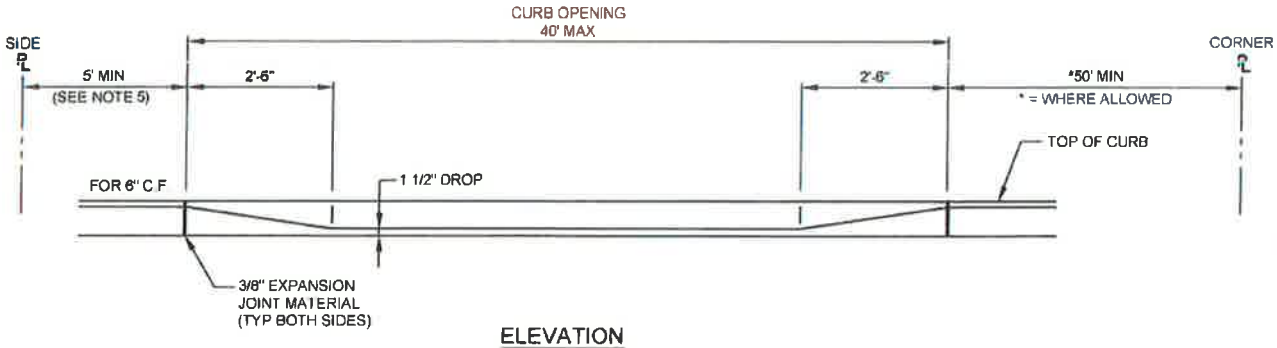


PLAN



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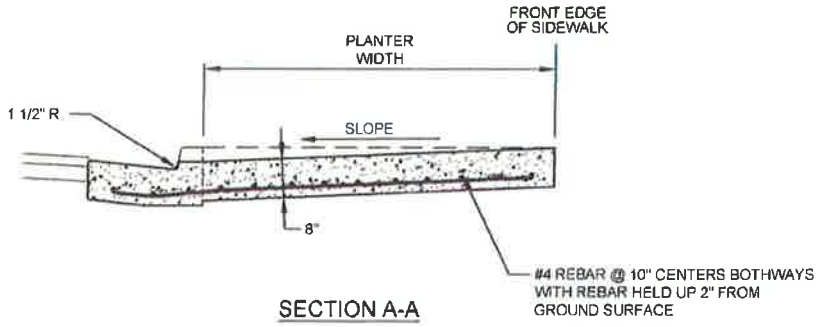

SECTION A-A

NOTES:

1. CURB OPENING SHALL HAVE A COURSE BROOM FINISH
2. C F = CURB FACE
3. DRIVEWAY APPROACHES SHALL NOT BE CLOSER THAN 10' TO ANOTHER DRIVEWAY APPROACH ON LOCAL ROADS
4. WHEN PERMITTED ON ROADS WITH HIGHER CLASSIFICATIONS, APPROACHES SHALL NOT BE CLOSER THAN 50' TO ANOTHER DRIVEWAY APPROACH
5. CURB OPENING SHALL NOT BEGIN WITHIN 5 FT OF THE PROPERTY LINE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER

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COMMERCIAL DRIVEWAY APPROACH

	DATE: JUNE 2021 SCALE: N.T.S. 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY	HEBER CITY STREETS-8

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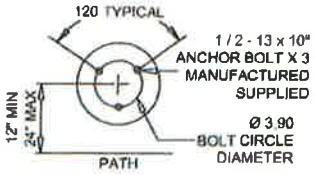
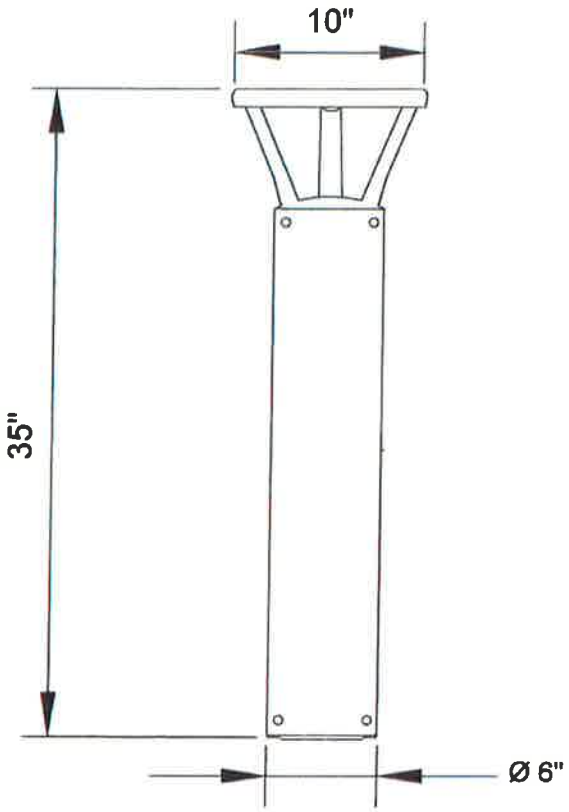
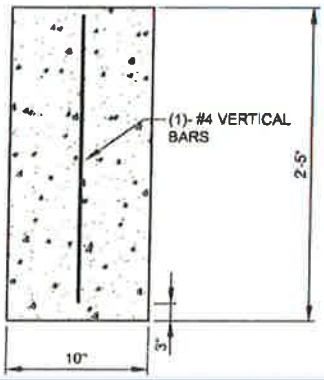


ANCHOR BOLT DETAIL



PLB - 102

NOTES:
1 TRAIL BOLLAR SHALL BE PLB SERIES SOLAR POWERED LED BOLLARD MODEL PLB 102 BK ASM WW 00 SEC BY FIRSTLIGHT TECHNOLOGIES



CONCRETE BASE

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NOTES
1 TRAIL LIGHTS SHALL BE INSTALLED ALONG ALL MASTER PLANNED TRAIL SYSTEMS AT 200 FT MAXIMUM INTERVALS AND AT ENTRANCES TO PARKS, TRAIL INTERSECTIONS, BRIDGES AND ROAD CROSSINGS.
2 CONCRETE SAHLL BE CLASS 3000 MIN PER SECTION 033014
3 CONCRETE BASES SHALL BE BACKFILLED WITH SUITABLE MATERIAL COMPACTED TO 95 PERCENT
4 THE TOP OF THE CONCRETE BASE SHALL BE 1 TO 2 INCHES ABOVE THE ADJACENT GRADE

TRAIL LIGHTING

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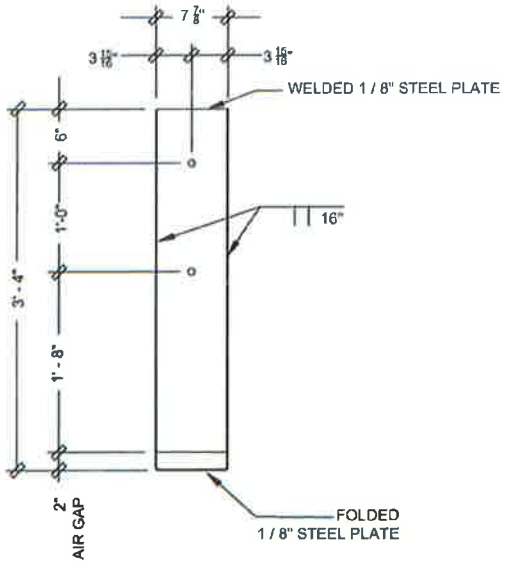
DATE: JUNE 2021
SCALE: N.T.S.

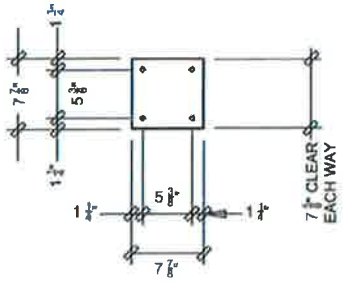
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

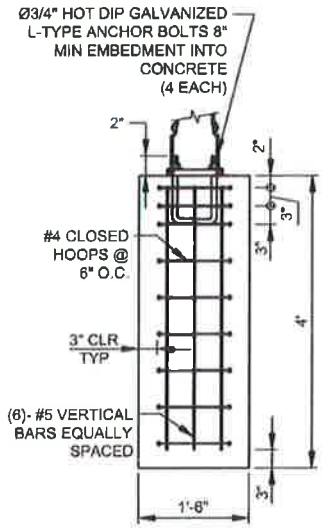
HEBER CITY

HEBER CITY

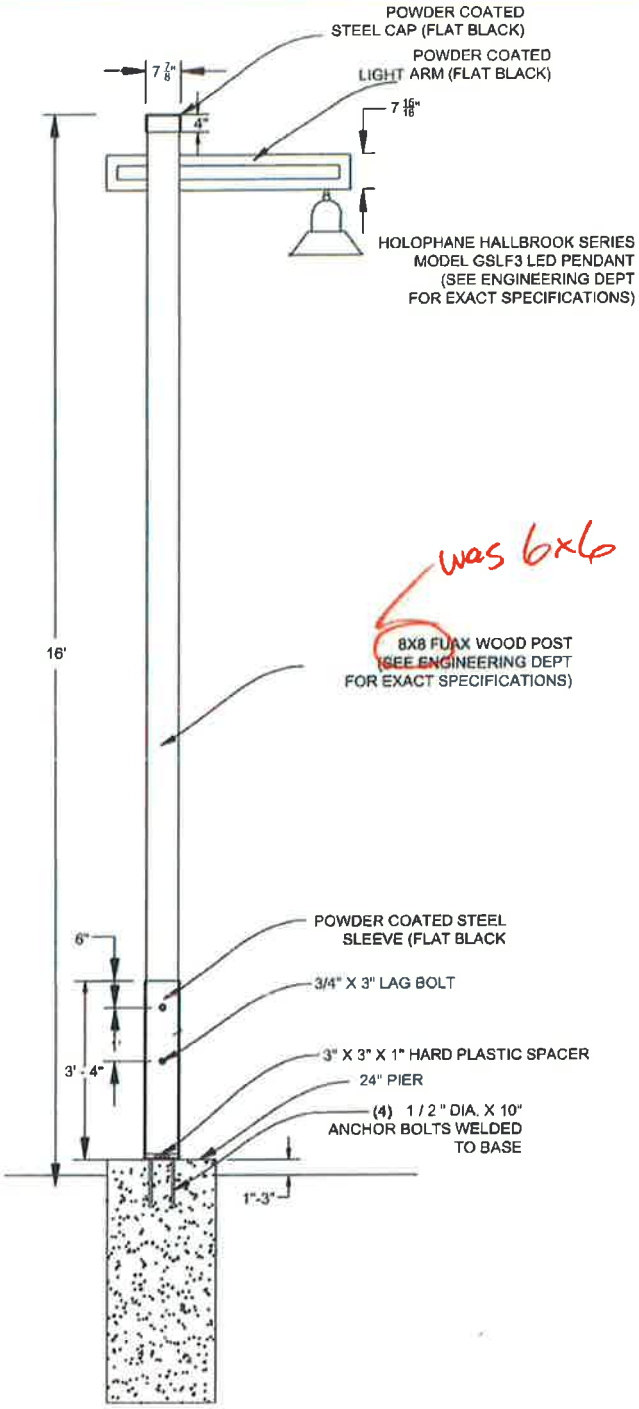
STREETS-14







CONCRETE BASE



NOTES:

1. LOADING CAPACITY OF POLE SHALL BE 100 POUND RATED FOR A STEADY WIND OF 90 MPH MINIMUM.
2. CONCRETE BASES SHALL BE BACKFILLED WITH SUITABLE MATERIAL COMPACTED TO 95 PERCENT.
3. CONCRETE BASES SHALL INCLUDE CONDUIT AND GROUNDING WIRE PER HEBER LIGHT & POWER REQUIREMENTS.
4. CONCRETE COMPRESSIVE STRENGTH (f'c) SHALL BE 4000 PSI.
5. THE TOP OF CONCRETE BASES SHALL BE BETWEEN 1 AND 3 INCHES ABOVE GRADE.

DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 854-0757

HEBER CITY
HEART OF THE WASATCH BACK

NORTH VILLAGE LIGHTING

STREETS-15

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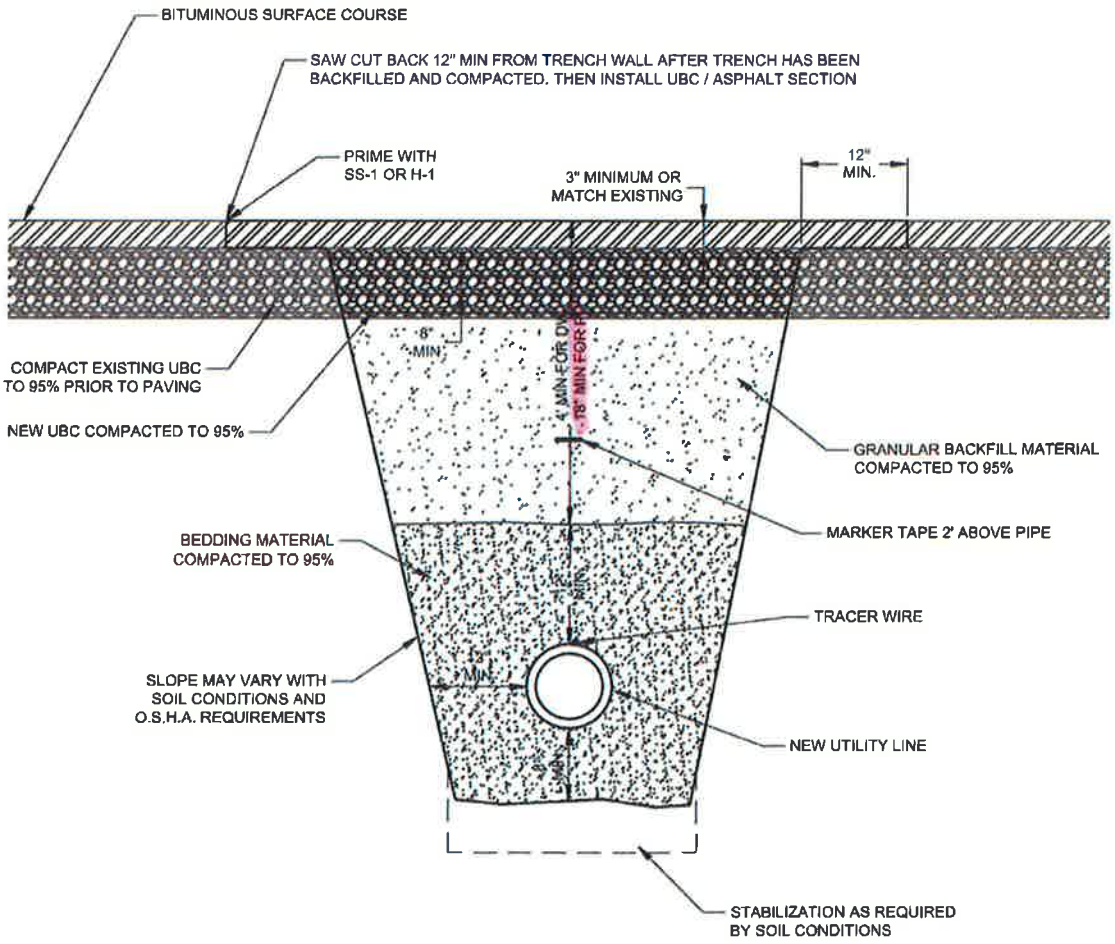

NOTES:

1. COMPACTED BEDDING MATERIAL SHALL NORMALLY CONSIST OF BEDDING SAND.
2. IF APPROVED BY CITY ENGINEER, 3/4" DRAIN ROCK MAY BE USED FOR BEDDING MATERIAL AND SHALL BE WRAPPED IN APPROVED FILTER FABRIC (SEE HEBER CITY SPECIFICATION 02772.2.02), UNLESS OTHERWISE APPROVED.
3. MATERIALS, METHOD & COMPACTION SHALL BE APPROVED BY ENGINEER.
4. USE OF PEA GRAVEL OR COURSE SAND FOR BEDDING MATERIAL IS PROHIBITED UNLESS OTHERWISE APPROVED BY THE CITY ENGINGEER.
5. USE OF NATIVE MATERIAL FOR BACKFILL IS PROHIBITED (EXCEPT AS APPROVED BY THE CITY ENGINEER WITH FULL TIME TESTING AND INSPECTION).
6. USE PROPER MARKER TAPE AS APPROVED BY CITY ENGINEER.
7. INSTALL TRACER WIRE AS PER WATER-5.
8. FLOWABLE FILL IS PROHIBITED AS BACKFILL MATERIAL UNLESS OTHERWISE APPROVED BY CITY ENGINEER. WHEN APPROVED, SURFACE FINISHES MUST STILL BE MATCHED.

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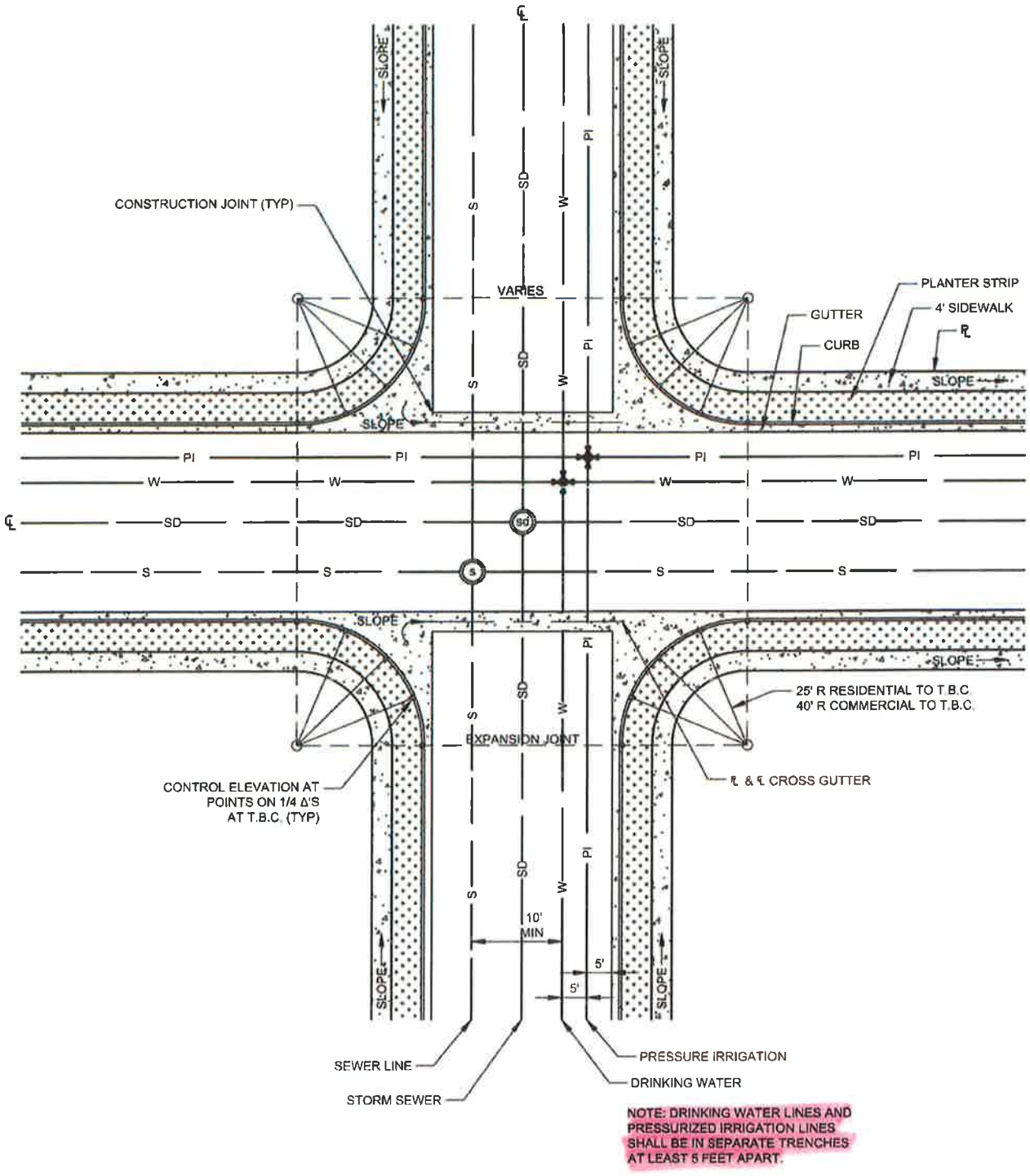
DATE: JUNE 2023 SCALE: N.T.S.	HEBER CITY HEART OF THE WASATCH BACK	UTILITY INSTALLATION TRENCH DETAIL	
75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757		UTIL-1	



DATE: JUNE 2023

SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

STANDARD STREET INTERSECTION & UTILITY LOCATION

UTIL-2

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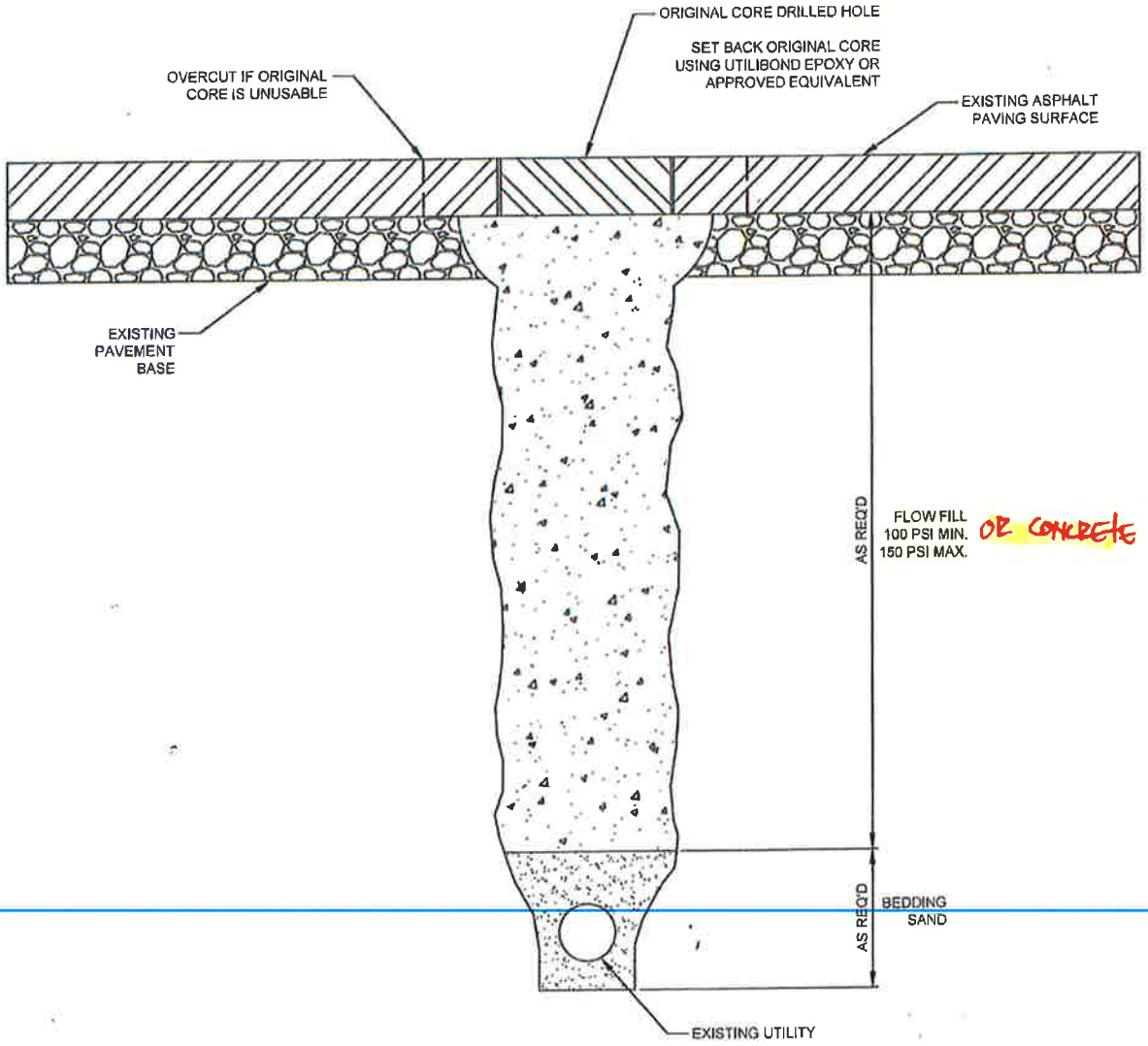

NOTES:

1. IF ORIGINAL CORE CANNOT BE USED, THEN CORE MUST BE OVERCUT 12" MIN. AND THEN FILLED WITH HOT MIX ASPHALT.

UTILITY POTHOLE REPAIR

	DATE: JUNE 2021 SCALE: N.T.S. 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY	HEBER CITY UTILITIES-5

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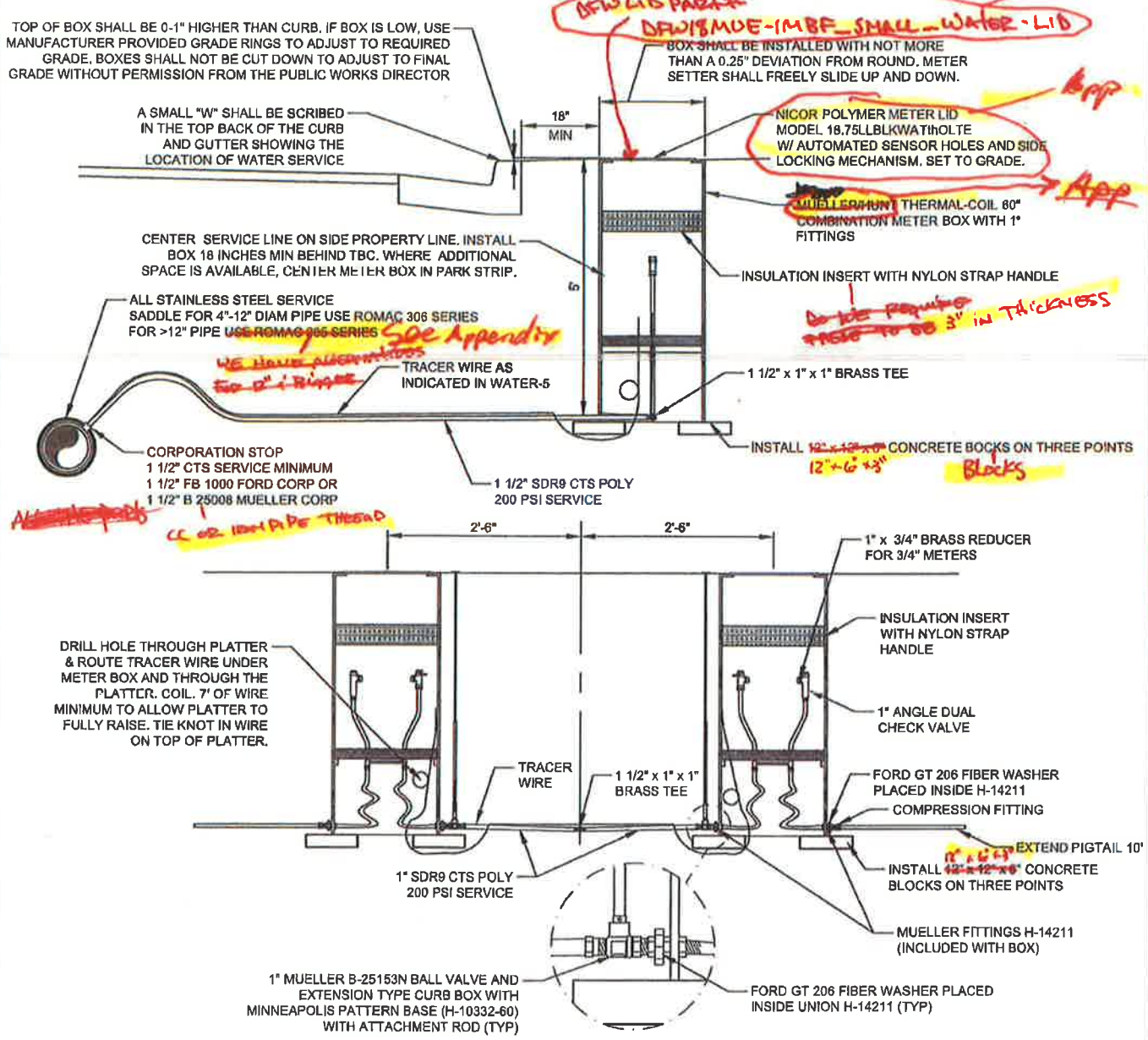
TABLE 1					
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	FRAME MODEL	COMMENTS	INSULATION INSERT
1 INCH	18" x 60"	330CS1860RSBS000390N	N/A	NEW SERVICES	790153

NOTE 1: FOR LARGER SIZES , USE SINGLE SERVICE DETAIL AND CONFIGURATION

NOTE 2: THIS ALTERNATE DUAL METER BOX CONFIGURATION SHALL ONLY BE USED WHEN THE DUAL METER SINGLE BOX CONFIGURATION (SEE DWG WATER-6A) IS NOT COMMERCIALLY AVAILABLE AND WHEN APPROVED BY THE CITY ENGINEER.



NOTES:

1. METER BOX, COVER, COPPER SETTER, CORPORATION STOP, & SERVICE LINES TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WATER METER WILL BE INSTALLED BY HEBER CITY.
5. SEE UTILS-3 FOR PLAN VIEW.
6. WATER METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER.
7. WATER SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF FIRE HYDRANT LINE OR SERVICE LINES.
8. WATER METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
9. ANY NIPPLES USED IN SERVICE SHALL BE STAINLESS STEEL.
10. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.
11. SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.

WATER SERVICE - TWO LOTS

HORROCKS ENGINEERS
728 WEST 100 SOUTH #2
HEBER CITY, UTAH 84032
(435) 654-2228

DATE: APRIL 2015
SCALE: N.T.S.

HEBER CITY CORPORATION
75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

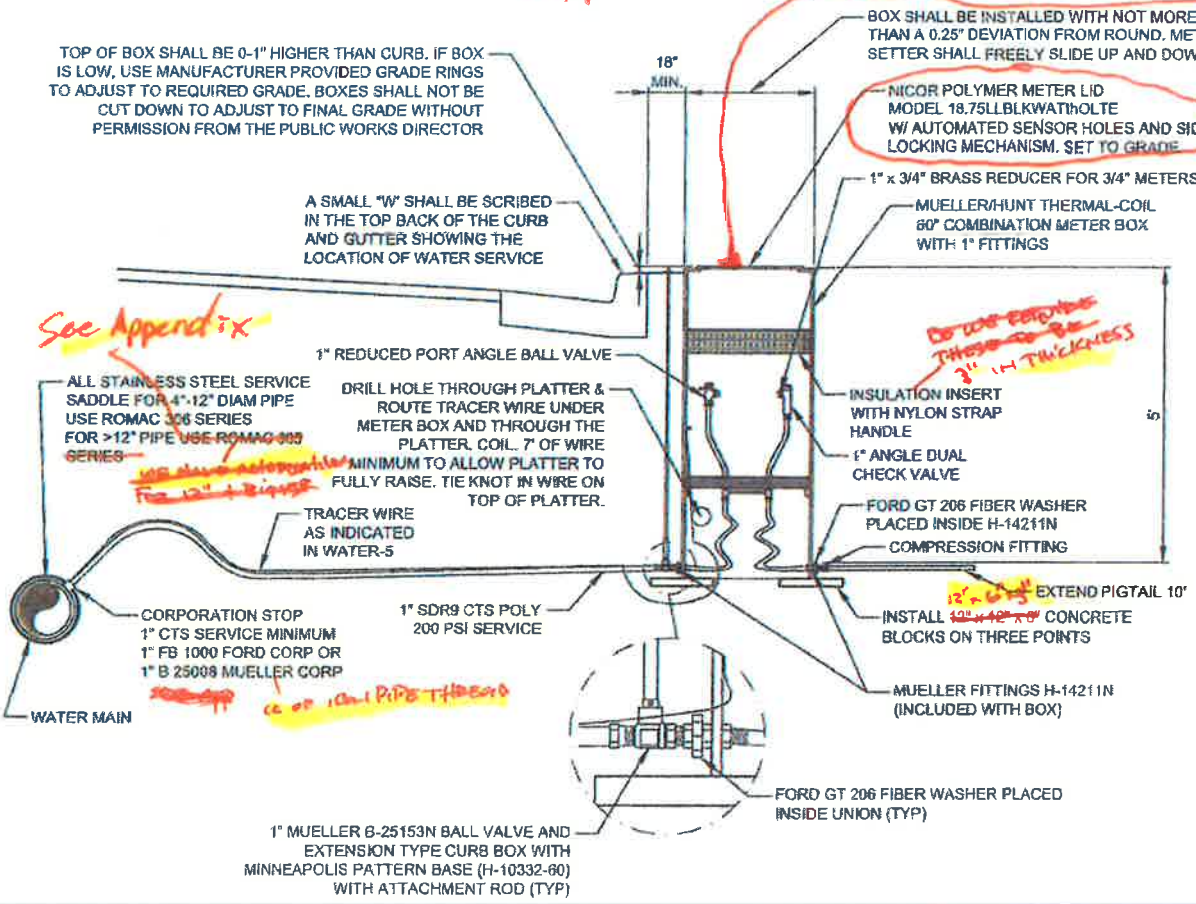
HEBER CITY STANDARD DRAWING

WATER-6A

H:\Heber City\Std Dwgs\2022 March\Updated drawings\WATER-6A_Updated.dwg - Service 2 Lots - 4/05/2022 08:23am, alexandria.lewallen

TABLE 1					
SERVICE LINE SIZE	MINIMUM METER BOX SIZE	BOX MODEL	FRAME MODEL	COMMENTS	INSULATION INSERTS
1" MINIMUM	18" x 60"	330CS1860RSBS000390N	NA	NEW SERVICES	790153
1 1/2"	24" x 60"	500VS2460RVB000520N	700098-1	" "	790325
2"	27" x 60"	550VS2760RVB000520N	700098-1	" "	790327

NOTE 1: FOR LARGER SIZES CONTACT PUBLIC WORKS FOR REQUIREMENTS

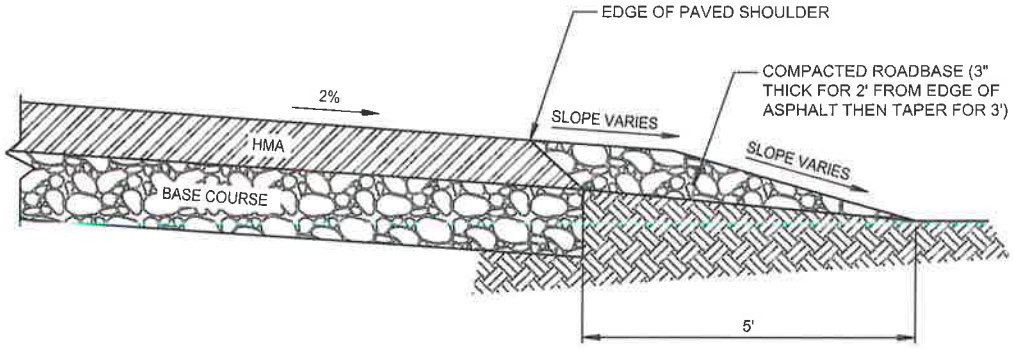


NOTES:
1. METER BOX, COVER, COPPER SETTER, CORPORATION STOP, & SERVICE LINES TO BE FURNISHED AND INSTALLED BY DEVELOPER AND CONFORM TO AWWA C800.
2. STAINLESS STEEL STIFFENERS ON ALL POLY CONNECTIONS.
3. METER BOXES ARE ALLOWED WITHIN DRIVEWAY ZONE ONLY WITH PRIOR APPROVAL FROM PUBLIC WORKS DIRECTOR.
4. WATER METER WILL BE INSTALLED BY HEBER CITY.
5. SEE UTILS-3 FOR PLAN VIEW.
6. WATER METER CAN TO BE LOCATED IN THE MIDDLE OF THE PLANTER STRIP OR BETWEEN SIDEWALK AND PROPERTY LINE (FOR COMBINATION SIDEWALK) OR AS DIRECTED BY ENGINEER.
7. WATER SERVICE SHOULD CONNECT DIRECTLY TO THE MAIN LINE AND NOT "TEE" OFF FIRE HYDRANT LINE OR SERVICE LINES.
8. WATER METER CAN SHALL BE COMPLETELY BACKFILLED WITH COMPACTED 3" MINUS GRANULAR MATERIAL FROM TOP TO BOTTOM.
9. ANY NIPPLES USED FOR SERVICE SHALL BE STAINLESS STEEL.
10. METER FEE WILL BE ASSESSED WITH BUILDING PERMIT OR AT TIME OF METER INSTALLATION.
11. SEE APPENDIX A FOR ADDITIONAL APPROVED ALTERNATES.

WATER SERVICE - SINGLE LOTS

HORROCKS ENGINEERS 728 WEST 100 SOUTH #2 HEBER CITY, UTAH 84032 (435) 654-2226	DATE: APRIL 2015 SCALE: N.T.S.	HEBER CITY CORPORATION 75 NORTH MAIN STREET HEBER CITY, UTAH 84032 (435) 654-0757	HEBER CITY STANDARD DRAWING WATER-6B

H:\Heber City\Std Dwgs\2022 March\Updated drawings\WATER-6B_Updates.dwg - Service 1 Lot - 4/05/2022 08:25am, alexandria.wallen



NOTES:

1. MAINTAIN POSITIVE DRAINAGE AWAY FROM ROAD AT THE SHOULDER.
2. ROADBASE MATERIAL REQUIREMENTS - FOLLOW HEBER CITY STANDARD SPECIFICATIONS SECTION 02206 (SELECT FILL) FOR UNTREATED BASE COARSE.
3. COMPACTION REQUIREMENTS:
   A. MAINTAIN OPTIMUM MOISTURE CONTENT +/- 2%.
   B. USE A MINIMUM OF TWO PASSES WITH A ROLLER OR AS DIRECTED BY THE ENGINEER.

DATE: JUNE 2023
SCALE: N.T.S.

75 NORTH MAIN STREET
HEBER CITY, UTAH 84032
(435) 654-0757

HEBER CITY
HEART OF THE WASATCH BACK

RESIDENTIAL ROAD SHOULDER WITHOUT CURB & GUTTER

STREETS-16

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HEBER CITY STANDARD SPECIFICATIONS AND DRAWINGS

HEBER CITY

HEART OF THE WASATCH BACK

July 2023

Prepared by:

HEBER CITY CORPORTATION
75 North Main Street
Heber City, UT 84032

STANDARD SPECIFICATIONS
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Spec. No.	Last Rev.	Specification Name
00200	06/21	Permit Requirements
00700	08/23	General Improvement Requirements
00900	06/21	Procedural Policy for the Water and Sewer
01450	06/21	Testing and Process Control
02150	03/17	Shoring and Underpinning
02205	03/17	Common Fill
02206	03/17	Select Fill
02225	03/17	Excavation and Backfill Operations
02245	03/17	Low Density Concrete Backfill (Flowable Fill)
02250	03/17	Soil Compaction
02504	06/20	Asphalt Concrete
02505	03/17	Emulsified Asphalt Slurry Seal
02510	06/21	Asphalt Paving
02512	03/17	Restoration of Surface Improvements
02513	06/21	Utility Pothole Repair – Keyhole Method
02607	08/23	Manholes and Covers
02609	08/23	Grease and Sand Interceptor
02660	03/17	Pipeline Testing
02668	08/23	Water Transmission and Distribution Systems
02675	06/21	Disinfection
02720	08/23	Sanitary Sewer and Storm Drain Systems
02772	08/23	Ponds & Sumps
02832	03/17	Fences
03200	03/17	Concrete Reinforcement
03216	06/21	Concrete Structures, Driveway, Sidewalk, Curb and Gutter
03304	03/17	Portland Cement Concrete
03310	06/21	Concrete Work
03345	03/17	Concrete Finishing
16530	08/23	Street Lighting
16532	08/23	Commercial Business Street Lighting (Historic)
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STANDARD DRAWINGS FOLLOW SPECIFICATIONS

STANDARD DRAWINGS
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Note: In some instances, alternative products are accepted. See the Appendix for alternative products.

Drawing No.	Last Rev.	Drawing Name
IRR-1A	08/23	Irrigation Service – Two Lots
IRR-1B	08/23	Irrigation Service – Single Lot
SEWER-1	08/23	Sewer Lateral
SEWER-2	03/17	Manhole Ring and Cover
SEWER-3	08/23	Junction Manhole, Drop Manhole
SEWER-4	03/17	Pre-Fabricated Sewer Lateral
SEWER-5	08/23	Precast Concrete Sewer Manhole
SEWER-6	02/19	Grease Interceptor
DRAIN-1	08/23	Curb Drop Inlet Box
DRAIN-2	03/17	Grate and Frame
DRAIN-3	08/23	Sump Disposal and Oil Separator
DRAIN-4	03/17	Curb Face Drop Inlet Box
STREETS-1	08/23	Street Cross-Sections & Utility Locations - Locals
STREETS-2A	06/20	Street Cross-Sections & Utility Locations - Collectors
STREETS-2B	08/23	Street Cross-Section - No Access Mountain Collector
STREETS-3A	06/20	Street Cross-Sections - Historic Business Core
STREETS-3B	06/20	Street Cross-Sections - Historic Business Core - Major Intersection
STREETS-4	08/23	Sidewalk, High Back Curb & Gutter, Cross Gutters
STREETS-5	08/23	Corner Pedestrian Ramps
STREETS-6	06/21	Mid-Block Pedestrian Ramps
STREETS-7	08/23	Residential Driveway Approach
STREETS-8	08/23	Commercial Driveway Approach
STREETS-9	03/18	Cul-De-Sacs
STREETS-10	02/19	Street Address Signs
STREETS-11	03/17	Survey Monuments
STREETS-12	06/21	Street Lighting
STREETS-13	06/21	Commercial Historic Street Lighting
STREETS-14	08/23	Trail Lighting
STREETS-15	08/23	North Village Street Lighting
STREETS-16	08/23	Residential Road Shoulder without Curb and Gutter
UTIL-1	08/23	Utility Installation Trench Detail
UTIL-2	08/23	Standard Street Intersection and Utility Location
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UTIL-4	03/17	Utility Concrete Collars
UTIL-5	08/23	Utility Pothole Repair
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WATER-3	04/22	Valve Boxes & Collars
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WATER-5	03/17	Tracer Wire Installation

WATER-6A	08/23	Water Service – Two Lots
WATER-6B	08/23	Water Service – Single Lot
WATER-7	03/17	Air Release Station
WATER-8	04/22	Blowoff / Flush Valve

SECTION 00200

PERMIT REQUIREMENTS

PART 1 GENERAL

1.01 PURPOSE OF INTENT

A. The purpose of this section is to describe Heber City's Department of Public Work's policies for issuing permits and to control any excavation and construction operations in the public way in Heber City. All contractors and utility companies proposing to construct, repair or replace any facility within the public way, shall contact the Heber City Department of Public Works and complete all permit requirements prior to commencing proposed work as outlined in this section.

B. Utility companies and contractors constructing approved facilities in new subdivision streets shall not be required to obtain a "Street cut and/or Excavation Permit", but will still be subject to City inspection and compliance with subdivision requirements.

1.02 POLICIES

A. Permittee must be licensed with the State of Utah. It is the Policy of Heber City that contractors desiring to perform work in the City's public way shall be properly licensed in the State of Utah. The acceptable licenses include:

TYPE OF WORK	LICENSE
Any type of concrete work	E100 or S260
Paving	E100 or S260
Landscaping	E100 or S330
Buried gas, telephone, water, irrigation and power lines	E100 or S410
Sanitary sewer and storm drains	E100 or S410
Asphalt patching	E100, or S260
Trenching	E100
Highway sign installation	E100 or S440
Manhole covers	E100
Paint striping highways	E100, S260, or S270

Exceptions: A license shall not be required when the Permittee is a public utility company.

B. Policy for determining when "permit waivers" can be granted. Working within the public way without a permit violates Heber City ordinances unless the permit is waived by the Public Works Department. Waivers can be granted by the Public Works Department when any of the following conditions occur:

1. When routine maintenance work which is being done by the City, State and utility personnel does not involve excavations in the City's public way, i.e., crack sealing, street

resurfacing and repair, snow plowing, sanding, sweeping, garbage collection, storm drain cleaning, leaves pickup, above grade work, etc.

2. When a Permittee allows other contractors or utility companies to perform work in the permitted trench limits.

3. When utilities must be relocated or adjusted in conjunction with a City Public Works Department sponsored project provided the utility work is being accomplished within one week of the time the City or its Contractor is scheduled to begin construction at that location and provided the work is coordinated and approved by the City's Public Works Department.

C. Policy for issuing no fee permits. The Public Works Department reserves the right to issue "no fee permits" for work in the public way when the following conditions are met:

1. When utility companies are doing excavation work and such work is required in conjunction with a City Public Works Department project, and the work is required to be accomplished prior to the execution of the Public Works Department contract.

2. When the City Public Works Department is repairing or maintaining public way facilities such as curbs, gutters, cross drains, storm drains, traffic facilities, driveway, sidewalk, etc, and such work requires excavation.

3. When frames and lids in paved surfaces are raised or lowered providing the work does not disturb the underlying roadbase material.

4. When the work is otherwise covered under a separate bond in favor of Heber City and approval for a "No Fee Permit" is authorized by the Heber City Engineer.

D. Policy for revoking "Permit Waivers" and "No Fee Permits". "Permits Waivers" and "No Fee Permits" will be revoked by the Public Works Department if the work is defective or requires action or supplemental inspection by the Public Works Department. In the revocation proceedings, the Public Works Department shall serve written notice which defines the problems encountered and the time (at least one day) the Permittee has to correct the problem. If the work is not satisfactorily completed within the time specified, the "Permit Waiver" or the "No Fee Permit" shall be revoked. The Permittee will be required to secure a Fee Permit before proceeding to complete the work.

E. Policy for extending permit construction time limits. Subject to the Public Works Department's approval, permits which expire may be extended but may also be subject to payment of a permit extension fee as shown in the current Heber City Consolidated Fee Schedule. The length of the extension determined by the Permittee shall be subject to the approval of the Public Works Department.

1.03 GENERAL CONDITIONS

A. Permit: When the work is in progress, the Permittee shall have at the work site a copy of the permit and the Contractor's License Number under which the work is being performed.

B. Emergency work: Maintenance of pipelines or facilities in the public way may proceed without a permit when emergency circumstances demand the work be done immediately, provided a permit could not reasonably and practicably have been obtained beforehand.

In the event that emergency work is commenced on or within any public way of the City, the Public Works Department shall be notified within one-half hour when the work commences or as soon as possible from the time the work is commenced. If emergency work is commenced during

off business hours, the Public Works Department will be notified within one (1) hour of the start of work on the first regular business day on which City offices are open after such work commences, and, at the discretion of the Public Works Department, a permit may be issued which shall be retroactive to the date when the work was begun. Before commencing and while conducting emergency work, all necessary safety precautions for the protection of the public and the direction and control of traffic shall be taken. None of the provisions of these regulations are waived for emergency situations except the prior permit requirements.

C. Private access: Temporary, all weather roadways, driveway, walks, and right-of-ways for vehicles and pedestrians shall be constructed and continuously maintained where required.

D. Existing utilities: The Contractor shall use extreme caution to avoid a conflict, contact or damage to existing utilities, such as power lines, sewer lines, storm drains, street lights, telephone lines, television lines water lines, gas lines, poles or other appurtenances during the course of construction of this project. Any such conflict, contact or damage shall be immediately communicated to the Public Works Department.

E. Preconstruction pictures of existing public way improvements: The Permittee may secure pictures of the conditions of the existing public way improvements such as curbing, sidewalk, landscaping, asphalt surfaces, etc. In the event that public way improvements are damaged and no pictures are taken, the Public Works Department will assume the correction of the damage is the responsibility of the Permittee.

PART 2 REQUIREMENTS

2.01 STREET CUT AND/OR EXCAVATION PERMIT REQUIREMENTS

A. No excavations or street cuts shall be performed within the public right of way without first obtaining a permit from the City. Cut permits shall be valid for a period of 30 calendar days from the date of issuance. Such permits shall be issued by the Public Works Department upon the applicant meeting the conditions and making the commitments outlined below:

1. Show proof that a competent, responsible, and licensed contractor will do the work.

2. Present evidence of public liability insurance in an amount of not less than $200,000.

3. Post a $3,000 cash bond, an adequate performance bond, or a $10,000 blanket license and permit bond. The cash bond or performance bond will be held by the City to guarantee that the required improvements, restoration work, surface and every part thereof, will remain in good condition for a period of 2 years after final acceptance.

4. Agree, at no cost to the City, to make all repairs and to maintain the improvements, the trench, the surface, and every part thereof in good condition during the two (2) year warranty period.

5. Provide proper traffic signage in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and provide for and maintain through traffic in a form approved by the City Engineer at all times throughout the duration of the work.

6. Obtain approval from the City Engineer for any required road closures and provide 48 hours notice to those responsible for emergency services: e.g. school authority, law enforcement and fire protection officials.

7. Properly backfill or plate all cuts and excavations at the end of each working day.

8. Obtain City inspection of the work. Calls for inspection need to be made 24 hours in advance.

9. Repair roadway surfaces with temporary "cold mix" asphalt surfacing, two (2) inches thick, if permanent "hot mix" asphalt paving cannot be completed within 2 days of backfilling the trench. Temporary surfaces must remain smooth and flush with the road surface, and repaired as necessary by the contractor to maintain this condition, until permanent paving is complete.

10. Backfill with untreated base course material compacted to 95 percent of the maximum dry density, starting from the pipe bedding and continuing up to the bottom of the pavement. Excavated material is not to be used for backfill unless contractor can provide density testing, and material is in compliance with Section 02225.3.09 of the City Standard Specifications.

11. Permanent resurfacing shall be per Heber City Standard Specifications and a minimum of 4 inches thick. Paving width shall extend 12 inches beyond each side of the re-compacted width of the trench. Existing pavement edges shall be saw cut to form a clean line. Asphalt edges shall be tacked and rolled with a steel drum roller to achieve a smooth level surface.

12. Fees: The application for a permit authorizing excavation and street cuts shall be accompanied by the fee established by the most current Heber City fee schedule that has been approved and adopted by the Heber City Council.

13. Temperatures must be warm enough to avoid the risk of frost damage to existing utilities and assure proper compaction. Road cut permits will be allowed between April 1st and October 15th. Road Cuts outside of these dates will be prohibited by the City once the temperature drops below 32° night or day, ground is frozen, or compaction cannot be obtained. This does not apply to borings, emergencies and excavations beyond 5 feet from edge of asphalt.

2.02 EXCAVATION OPERATIONS

A. Blue stakes: Before commencing excavation operations, the Permittee shall call "Blue Stakes" and Heber City Public Works Department.

B. Traffic control devices: Traffic control devices such as barricades, signs and cones must be in place before excavation begins.

C. Protection of paved surfaces outside of excavation area: In order to avoid unnecessary damage to paved surfaces, backhoes, outriggers, track equipment or any other construction equipment that may prove damaging to asphalt shall use rubber cleats or paving pads when operating on or crossing said surfaces.

2.03 ENVIRONMENTAL CONTROL

A. Dust and debris: The Permittee or Contractor shall keep dust and debris controlled at the work site at all times. If necessary, wet down dusty areas with water and provide containers for debris. The City Engineer reserves the right to shut down the work or issue a citation if dust is not controlled.

B. Noise: The Permittee or Contractor shall keep neighborhood free of noise nuisance in accordance with the Noise Ordinance.

C. Cleanup: The Permittee or Contractor shall remove all equipment, material, barricades and similar items from the right-of-way. Areas used for storage of excavated material will be smoothed and returned to their original contour.

D. Vacuum sweeping or hand sweeping shall be required when the Public Works Department determines cleaning equipment is ineffective.

2.04 ENFORCEMENT

A. Violators of these regulations of working within the Public Way shall be subject to the provisions of Heber City Ordinances.

END OF SECTION

SECTION 00700

~~GENERAL~~ IMPROVEMENT REQUIREMENTS

PART 1 GENERAL

This section defines the general requirements for improvements to be built by the Developer. The Developer is responsible to comply with these Standard Specifications. Alterations, substitutions, or changes from these Standard Specifications shall not be allowed unless prior authorization is obtained from the City Engineer. The developer is responsible for providing all documentation and research supporting requests for changes to these Standards, and the associated costs.

1.01 Street and utility improvements are required along the entire frontage of property being developed, extending to property lines to accommodate future development.

1.02 Public pipelines through private property shall be in dedicated home-owner-association or business-owner-association open space centered in a 20-feet-wide easement in favor of the City. Easements must extend 10 feet beyond the end of the utility. Show easements on the development plat and on the City's Standard Easement forms, which grant the easements to the City. Easements must be executed and returned to the City Office prior to acceptance being granted. Easements in the name of the City shall not be recorded by anyone except the City.

1.03 All parcels receiving water, sewer, or irrigation service shall have their own independent services and laterals. These laterals or services shall be contained within the parcel or along the frontage of the property for which the service is intended to eliminate special utility easements crossing adjacent properties.

1.04 ~~Public utility easements shall be 10 feet wide around perimeter of standard lots. Cottage lots shall have the side lot PUE's reduced to 5 feet.~~ For residential subdivisions, public utility easements, of not less than ten feet in width, are required on front lot lines. Public utility and/or drainage easements, of not less than 10 feet, are required on side lot lines and on rear lot lines where needed, when requested by public utility companies, or as otherwise required or approved by the City Engineer. City utilities shall normally be placed in City rights-of-way. When approved by the City Engineer, City utilities may be placed beneath private streets, private parking areas, or in other common open space in an exclusive City utility easement of not less than 20 feet in width. Easements shall be provided to the City using the City's standard utility easement language in use at the time such easements are provided. Easements for commercial or industrial development shall generally follow the same requirements.

1.05 DEFINITIONS

ACCESS: Any driveway or other point of entry or exit, such as a street, road, or highway that connects to the general street system. Where two public streets intersect, the secondary street is considered the access.

ACKNOWLEDGEMENT (Acceptance of Plans): Recognition by the City that the Engineer of Record, has certified his or her construction plans and supporting information to be in compliance with the Heber City Code and Standard Specifications and Drawings.

APPLICANT: Any person, corporation, entity, designee, or agency applying for a permit.

APPROVED EQUAL: Equipment or material which, in the opinion of the City's Representative, is equal in quality, durability, appearance, strength, design, performance, physical dimensions, and arrangement to the equipment or material specified, and will function adequately in accordance with the general design.

AS-BUILT DRAWINGS: Drawings which show the Project as actually-constructed, and which include any and all changes made to the construction plans before and during construction.

BEST MANAGEMENT PRACTICE (BMP): Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the State.

CITY INSPECTOR: The authorized representative of the City or Engineer assigned to observe the Work performed, or materials furnished by the Contractor in an effort to ensure compliance with City requirements.

CITY/OWNER: Wherever the word "City" or "Owner" appears, it shall be interpreted to mean "Heber City", unless otherwise denoted.

CONSTRUCTION ACTIVITIES: Clearing, dredging, excavating, and grading of land and other activities associated with buildings, structures or other types of real property such as utilities, bridges, dams, and roads. Includes mobilization/demobilization and any other activity that occurs on site.

DRIVEWAY: A grade-separated access constructed within the right-of-way connecting the public street with adjacent property.

EASEMENT: An interest in real property that conveys use, but not ownership, of a portion of an owner's property.

ENGINEER: The City Engineer, or his or her representative.

ENGINEER-OF-RECORD: The professional engineer, licensed in the State of Utah, who prepared, or directly supervised the preparation of the engineering drawings and documents presented to the City for acknowledgement, and who shall accept sole responsibility for the completeness and accuracy of the drawings and documents presented to the City.

ESSENTIAL INFRASTRUCTURE: Essential infrastructure includes: water, sewer, irrigation, storm drain, curb, pavement, and street signs for emergency wayfinding. The access requirements of IFC Chapter 5 and Appendix D must be installed and approved prior to final inspection and the issuance of a Certificate of Occupancy. Temporary roads, where approved, are required to be capable of supporting vehicle loading under all weather conditions, and must meet the following criteria:

A. The surface of the road should be capable of carrying the load of the anticipated emergency response vehicles and be drivable in all kinds of weather.
B. Asphalt pavement.
C. Access roads shall be maintained for emergency and fire access throughout the duration of the project.
D. Fire hydrants must be installed and functional prior to combustible materials arrival on the site.

FINAL ACCEPTANCE OF PUBLIC INFRASTRUCTURE: The date specified in writing by the Engineer when all work, including all punch list work designated by the Engineer, is complete and accepted by the City after the completion of the warranty period.

INSPECTED AND ACCEPTED or ACCEPTANCE: City recognition of infrastructure conformance to all applicable City Standards.

INSPECTION: A review of the project, including but not limited to a visual review of the work completed to date. It does not include or imply an exhaustive or detailed review of the Work nor does it create a duty on the part of the Engineer or Owner to detect latent defects.

INTERSECTION: The general area where two or more streets join or cross at grade.

LAW: Any applicable City, County, State, or federal statutes or regulations governing anything relating to

the Work embodied in the Agreement.

LOW-IMPACT DEVELOPMENT (LID): An approach to land development, or redevelopment, that works with nature to more closely mimic pre-development hydrologic functions.

PARTIAL STREET: A street that has full frontage improvements on the near side, the full width of pavement, and curb on the opposite side.

PAVEMENT: The uppermost layer of bituminous or Portland-cement concrete material placed on the traveled way or shoulders for a riding surface, whether rigid or flexible in composition. This term is used interchangeably with "surfacing."

PROFESSIONAL ENGINEER: An engineer who is licensed to practice in the State of Utah.

PROFESSIONAL LAND SURVEYOR: A land surveyor who is licensed to practice in the State of Utah.

PUBLIC UTILITY EASEMENT (PUE): A property right provided for "dry" utilities (gas, power, telecom) that are regulated by the Public Service Commission. City utilities are not public utilities.

RECOGNIZED-AND-GENERALLY-ACCEPTED GOOD ENGINEERING PRACTICES (RAGAGEPs): Practices that are based on established codes, standards, published technical reports or recommended practices or similar documents. RAGAGEPs are not practices from other cities or practices promoted by individuals based on their individual professional judgement.

RIGHT-OF-WAY (ROW): All public rights-of-way and easements, public footpaths, walkways and sidewalks, streets, roads, highways, alleys, and water or drainage ways. It does not, however, include Public Utility easements not within Public Ways of the City.

STANDARD SPECIFICATIONS: The Standard Specifications and Drawings for Heber City.

STREET: A general term for denoting a public way or private way for the purpose of transporting people, materials, and goods.

SUBGRADE: That portion of the roadbed surface which has been prepared, as specified, and upon which a layer of specified roadbed material or base, or sub-surfacing, or pavement is to be placed.

SUBSTANTIVE REVIEW: A general evaluation of the overall design and general compliance with the City Code and engineering standards. It is not an exhaustive review for compliance with each specific provision of the City Code, other applicable standards or regulations, or RAGAGEPs. Substantive review shall not shift the responsibility and liability for the completeness and accuracy of the plans and related designs from the Engineer-of-Record to the City.

SURFACE OR SURFACING: The uppermost layer of material placed on the traveled way or shoulders, and is usually of asphalt or concrete. This term is used interchangeably with "pavement."

WORK: The construction services performed including materials on City infrastructure and includes all labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations to construct a project. The term also includes the supervision, inspection, and other on-site functions incidental to the actual construction.

1.06 ADOPTION OF HEBER CITY STANDARD SPECIFICATIONS AND PLANS MANUAL

Heber City has adopted the following as the basis for the Heber City Standard Specifications and Drawings:

A. Heber City Standard Specifications and Drawings Manual, as included herein.

B. Heber City Storm Water Design Manual. All storm-drainage-related work not specifically described in said Manual shall conform to Mile High Flood District Urban Storm Drainage Manual, current edition (MHFD Manual).
C. International Fire Code (IFC), current edition, Appendix D.
D. All transportation-related work not specifically described in these Standards shall conform to the latest editions of: policies and practices published by the American Association of State Highway Transportation Officials (AASHTO), or the Institute of Transportation Engineers (ITE), or the Utah Department of Transportation (UDOT) Roadway Design Manual, the selection of which shall be at the sole discretion of the City Engineer.
E. FHWA and Utah Manual on Uniform Traffic Control Devices for Highways and Streets (MUTCD).
F. All work not specifically described in these Standards, MHFD Manual, AASHTO, ITE, IFC Appendix D, and MUTCD shall conform to RAGAGEPs. When none of the above-referenced standards apply or are otherwise determined as acceptable by the City. **The City Engineer will be allowed two weeks to provide an adequate specification to control and provide guidelines for construction.**

The Heber City Standard Specifications and Drawings Manual is available for download at www.heberut.gov.

1.07 CITY ENGINEER'S AUTHORITY

A. The City Engineer has the authority to provide Substantive Review of submitted Construction Drawings, studies, and supporting documentation.
B. The City Engineer shall provide feedback pursuant to his/her Substantive Review of the Construction Drawings, studies, and supporting documentation.
C. Changes to address the City Engineer's feedback shall be made to the Construction Drawings and returned to the City Engineer for City acknowledgement of the Construction Drawings.
D. The City Engineer has authority to issue Stop Work Orders when construction is progressing contrary to the City Code, the City's Standard Specifications and Drawings, or an acknowledged set of construction drawings.
E. **The City Engineer will make the decision relating to all questions which may arise as to the quality and acceptability of alterations, substitutions, or changes proposed. In case any question should arise, relative to these Standards, the final determination or decision of the City Engineer shall be complied with as a condition of the Developer receiving final** acceptance ~~approval~~ **of the work in question.**
F. The City Engineer has additional authority such as is stated in these Standards and the City Code.

1.08 CONSTRUCTION NOTES

The following are the Standard City Construction Notes. Additional notes may be required for specific projects at the discretion of the City Engineer.

A. TYPICAL

1. Contractor assumes all responsibility for job site conditions during construction of this project, including the safety and well-being of all persons and property. This responsibility shall apply continuously and not be limited to normal working hours.
2. Contractor shall obtain all applicable permits and/or written agreements necessary to complete the work.
3. Contractor shall schedule a pre-construction meeting with the City's Engineering Department at least 5 business days prior to the start of construction. Contractor must attend and bring one set of the Acknowledged construction drawings and a copy of the current Heber City Standard Specifications and Drawings Manual (available at heberut.gov).
4. Contractor shall have in possession and on-site at all times one copy of the current

acknowledged construction plans stamped, signed, and dated by the Engineer of Record, the Applicant, and the City.

5. Developer's Engineers (Civil and Geotechnical) shall perform sufficient inspections and surveys during grading and construction to render an opinion in writing as to adherence tothe accepted plans and compliance with Heber City Standard Specifications and Drawings Manual.
6. ~~On construction requiring approval prior to proceeding with the work, a~~Any work done in the absence of an inspector's approval shall be subject to rejection. All underground GPS data must be collected by a City representative prior to backfill. Inspectors may request the contractor to expose work that has been backfilled without prior inspection or collection of GPS data. All such rework shall be completed at the Developer's or Owner's expense.
7. Survey monuments must be installed in accordance with the current Heber City and Wasatch County Surveyor's Office requirements.
8. All disturbed property survey markers shall be reset in their original locationsupon completion of all construction activities.
9. Contractor shall provide all traffic control which must conform to the current MUTCD. Provide site-specific Traffic Control Plans [prepared by an American Traffic Safety Services Association (ATSSA) or AGC-Certified Individual] prior to installation of any traffic control device. Traffic Control Plans must be Accepted by the City prior to implementation and before any shoulder, lane, or street closure.

B. TRENCHES AND UTILITIES

1. Trenches shall be completed and restored per City Standard Drawing UTIL-1.
2. Pothole existing utilities in accordance with City Standard Drawing UTIL-5.
3. Contractor is responsible to locate, avoid, protect, and repair all utilities encountered during construction, whether or not they are shown on the plans. Locations of underground utilities shown on plans are approximate and require field verification by Contractor.
4. All trenches within public right-of-way must be backfilled or securely plated during non-working hours. Trenches outside these areas shall be back-filled or protected by approved temporary fencing and/or barricades during non-working hours. Trenches in the roadway must be backfilled, compacted, and paved within 48 hours of road-cut. Paint striping shall be replaced in accordance to City Standards within 48-hours of restoration of pavement.

C. ROADWAY CONSTRUCTION AND RESTORATION

1. Subgrade must be approved prior to construction of untreated base course and pavement sections. Subgrade approval requires that a proof-roll be completed and verified by a City inspector, and that all utilities be installed, inspected with connections to main lines completed, and accepted by the City.
2. Asphalt patching to roads between October 15 and April 15 will be considered temporary only, and must be replaced according to City Standards and Specifications between the following April 15 and July 1.
3. Material Submittals are required for all items placed within the City right-of-way. All submittals must be dated within 90 days of the Construction Start Date (unless specified otherwise) and be submitted prior to the start of construction activities.
4. Moratorium Standard (New, Reconstructed, and Overlaid Streets): No cuts permitted for two (2) years from the time of construction/ reconstruction/overlay)
5. Special Restoration Standard: This standard applies to new, reconstructed, overlaid, and chip/slurry-sealed streets:

a. New, Reconstructed, and Overlaid Streets (for 5 years after end of moratorium): The asphalt surface shall be milled a minimum depth of two (2) inches, and fifteen (15) feet each way from the edge of the cut. Milling shall be done in widths equivalent to existing striped traffic lanes. The City Engineer reserves the right to require additional area and/or depth if deemed appropriate to restore roadway to original condition. Approved fabric is required when existing pavement included a fabric prior to the permitted cut.
b. Chip/Slurry-Sealed Streets (for one year after cip/slurry application): The asphalt surface shall be re-chipped/slurried a minimum of fifteen (15) feet each way from the edge of the cut, in widths equivalent to existing striped traffic lanes.

6. Roads shall be opened for traffic during peak hours. Lane closures may only be in effect from 9am-2pm, and 7pm-7am when night work is approved. Contractors shall accommodate all special school or local government schedules and events. Paint striping shall be replaced in accordance with City Standards within 48-hours of restoration of pavement.
7. All road closures must be approved by the City Engineer. All requests for road closures shall be made in writing and include a site-specific Traffic Control Plan for the proposed closure. When approved, closures of Collector Streets will require a 2-week advance notice to the public informing them of the upcoming closure. The notice shall be provided using on-site Variable Message Sign (VMS) boards indicating the anticipated start date and duration of the closure. VMS boards shall remain on site for the full two-week advance-notice period. If the duration of the closure is extended beyond the approved period, the extension shall be coordinated with the City Engineer and shall require additional VMS board notification to the public.

1.09 SUBMITTALS REQUIRED FOR DEVELOPMENT ACKNOWLEDGEMENT

A. ENGINEERING PLAN REVIEW CHECKLIST – The City provides Engineering Plan Review Checklists to assist developers and their professionals in the preparation of the engineering submittals for the acceptance of a development project. The Engineering Checklist does not replace the City Code or Engineering Standards and Specifications. The Engineering Checklist must be completed and signed by the Applicant and the Engineer-of-Record at the time of application submittal.

B. SUPPLEMENTAL ENGINEERING REPORTS – All engineering reports submitted for final acknowledgment shall be stamped, signed, and dated by a professional engineer ON THE FIRST SUBMITTAL.

1. Drainage Report – Drainage reports must be prepared in accordance with the design criteria and methodologies specified in the Heber City Storm Water Design Manual. Drainage reports shall include an LID Evaluation to identify feasible BMPs, and an Infiltration Feasibility Determination. In addition to the required engineer's stamp, signature, and date, drainage reports must include a certification from the engineer stating:

> I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept the sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. . I understand that the City assumes no responsibility or liability for this report.

2. Geotechnical Report – Geotechnical reports shall include:

~~2.~~

a. Summary of Proposed Construction
b. Pavement designs that comply with City Standards.
c. Double-Ring Infiltrometer Tests that are performed pursuant to ASTM D 3385 and the City

Storm Drain Manual.

d. Evaluation of Geologic Hazards and Proposed Mitigation Measures
e. Subsurface Soil Profiles
f. Groundwater Considerations and Proposed Mitigation Measures
g. Soil Classifications
h. Soil Properties, including Corrosivity and Proposed Mitigation Measures
i. Design Recommendations
~~j.~~ Construction Recommendations

3. Traffic Impact Study (TIS) – A traffic study is necessary to identify, review, and make recommendations for mitigation of the potential impacts a development may have on the roadway system. Identification of impacts and appropriate mitigation measures allows the City to assess the existing and future system safety, performance, maintenance, and capacity needs. TISs shall follow the Utah Department of Transportation's TIS Requirements, including the Levels of Study and associated thresholds. Additional requirements and investigation may be imposed upon the applicant as necessary. Likely information presented in a TIS may include, but is not limited to, site location and proposed access point(s), phased and/or full development trip generation, connection point design elements, adjacent and relevant development, existing and future traffic volumes, assessment of the system impacts, AND mitigation measures as appropriate.

4. Engineer's Estimate of Probable Costs – An Engineer's Estimate of Probable Costs shall be submitted to the City AFTER, not before, the engineering drawings have been accepted by the City. It shall include quantities, unit prices, and total prices of each landscaping and infrastructure improvement required as a condition precedent to recording a subdivision plat or the development of a commercial, industrial, mixed use, or multi-family project. When determining the assurance and warranty bond amounts, the City Engineer may change the unit prices in the estimate according to the City's research of market pricing.

5. Reimbursement Agreement Exhibits – Reimbursement requests for all infrastructure upsizing (system improvements) beyond the project improvement needs must be presented to the City at the Preliminary Plat or Commercial Initial Site Plan step to allow City staff advance time to work on a reimbursement agreement with the applicant. Reimbursement agreements must be accepted by the City and be executed by both parties before construction can begin on the project. All reimbursements that have not already been approved by the City Council in the City's approved and adopted budget require specific approval by the City Council.

   If the applicant wishes to begin construction before there is an agreement in place with the City, they must sign a waiver stating they accept the risk that they may not be reimbursed for any improvements installed, even if they are system improvements.

   The following exhibits are required to initiate a reimbursement agreement:

   a. Exhibit A -- Itemized Schedule of Values – Include quantities and unit prices of reimbursable items. Correlate it with an accompanying map. It shall be stamped, signed, and dated by the Engineer-of-Record.
   b. Exhibit B – Contractor bids or engineer estimates that support the prices shown in the Itemized Schedule of Values.
   c. Exhibit C -- Map of Reimbursable Items – Show the locations of all of the reimbursable items. Correlate it with the accompanying Itemized Schedule of Values.

C. BOUNDARY SURVEY – Boundary surveys, also known as record of survey, shall be stamped, signed, and dated by a professional land surveyor ON THE FIRST SUBMITTAL. If performed within the last 90 days, the survey shall have been filed in the Office of the County Surveyor and include evidence of filing.

D. EASEMENT AGREEMENT – All easement agreements shall be submitted to the City Engineer on the City's Standard Easement templates (available upon request from the City Engineer) for City acceptance. Easements in the name of the City shall not be recorded by anyone except the City. After

City acceptance and the recordation at the County Recorder's Office, the recordation shall be referenced on the subject plat. Right-of-Discharge easements (available upon request from the City Engineer) shall be granted to and indemnify the City whenever storm water drainage from City ROW discharges onto private property.

E. WATER RIGHT ACTION REPORT – Water rights to be used in development shall be summarized on a Water Right Action Report that is prepared by the Developer and approved by the City Engineer. A standard template for this the Report is available from the City Engineer upon request.

F. SUBDIVISION PLAT – Subdivision plats submitted for final acceptance shall be stamped, signed, and dated by a professional land surveyor ON THE FIRST SUBMITTAL.

G. DRY UTILITIES CONCEPTUAL PLAN

H. LEGAL DESCRIPTION – Legal descriptions submitted for final acceptance shall be accompanied by an illustration of the legal description, both of which shall be stamped, signed, and dated by a professional land surveyor ON THE FIRST SUBMITTAL.

I. NOTICE OF INTENT (NOI) – An NOI to the Utah Division of Water Quality for Storm Water Discharges Associated with Construction Activity shall be required prior to starting any construction activity.

J. FLOODPLAIN DEVELOPMENT PERMIT – The Floodplain Development Permit is the mechanism by which the City evaluates any and all impacts of activities proposed within regulated floodplains in the City. Contact the City Engineer for the Permit application when proposing activities within a regulated floodplain.

K. ENGINEERING DESIGN DRAWINGS –Accepted Engineering Design Drawings shall be valid for one~~2~~ years from the date of legislative approval~~Acceptance~~. If construction has not begun within one~~2~~ years from the date of legislative approval~~Acceptance~~, the Engineering Design Drawings shall become null and void unless an extension is granted by the City. Expired drawings must be re-checked by the City as part of a new application under the current ordinances in order to be Accepted again. Engineering Design Drawings must include, but are not limited to:

1. Reference to the City's Construction Notes (Section 1.04)
2. Boundary Survey
3. Topographical (existing conditions) Survey
4. Subdivision Plat
5. Demolition Plan (as necessary)
6. Impact-to-Private-Irrigation Plan (as necessary)
7. Site Plan
8. Grading and Drainage Plan
9. Utility Plan
10. Signing and Striping Plan, including a Safe Routes to School Plan (Coordinate with WCSD.)
11. Plan/Profile Sheets
12. Detail Sheets (not including copies of City Standard Drawings). City Standard Drawings shall be referenced in ONE place for all applicable infrastructure.

The Impact-to-Private-Irrigation Plan shall include a certification, signed by the Applicant stating:

As the developer of this property, I hereby certify that I understand: (1) how the existing gravity irrigation system works in the vicinity of this property, (2) how my development of this property will affect this system and associated stakeholders, (3) that I have coordinated with and have approval from the subject irrigation company(ies), (4) that I take full responsibility for the changes I am making to this system, (5) Heber City does not assume responsibility or liability for changes I make to this system.

The Grading and Drainage Plan shall include a certification from the Engineer-of-Record stating:

I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept the sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report.

Engineering Design Drawings submitted for Final Acceptance shall be certified on the cover sheet by the Engineer-of-Record, ON THE FIRST SUBMITTAL with the following language:

Engineer's Certification

As the Engineer-of-Record, I hereby certify that these construction drawings and supporting information ("Plans") comply with the Heber City Code and Standard Specifications and Drawings ("Standards"). I understand and agree that:

1. The City's Acknowledgment of these plans shall not be construed to be a permit for, or an approval of, any variance from any of the provisions of the Standards, unless a separate written approval authorizing a specific deviation has been provided by the City Engineer.
2. The City's Acknowledgement of these Plans, or feedback from the City on whether the Plans meet the Standards, shall not prevent the City from requiring the correction of errors in the Plans at any time, including after construction of improvements.
3. The City's Acknowledgement of these Plans does not constitute a permit from the Federal or State Government or permission to deviate from Federal or State Laws or Regulations.
4. The City's Acknowledgement of these Plans does not grant permission to work on the properties of others.

1.10 STORM DRAIN SYSTEM

A. SEE THE HEBER CITY STORM WATER DESIGN MANUAL.

B. IRRIGATION DITCHES

1. Private irrigation ditches within developments shall remain open, or be piped, pursuant to the affected stakeholders' specifications. Such changes to existing irrigation systems shall be included in the engineering plans.
2. Provide irrigation easements on the subject plat "for the benefit of the upstream and downstream users" to formalize prescriptive easements.
3. City-operated-and-maintained irrigation ditches shall remain open, unless otherwise approved by the City Engineer. Any City irrigation ditches that are piped shall follow the applicable City standards.

1.11 SANITARY SEWER SYSTEM

A. The impact of any proposed sewer system, on the existing sewer system, will be reviewed by the City Engineer. The developer may be required to add additional off-site sewer improvements in order to provide adequate sewer service for the proposed development.

1. Areas that will be serviced through the proposed development will be considered and the method of service to those areas will be determined by the City Engineer. Increased system size may be required by the City Engineer for future development.
2. City-owned sewer lift stations are prohibited.

B. Sewer mains shall be as shown in the City's current Capital Facilities Plan or Master Plan.

C. The minimum size of any sewer main line shall be 8-inch diameter.

D. All sewer pipe between manholes shall be of the same SDR and classification, and shall be the highest SDR and classification required along the section.

E. The minimum size of sewer laterals shall be 4 inches.

F. All sewer pipes shall be sized to a maximum of 75 percent of their capacity.

G. Sewer lines shall be designed according to the minimum slopes below. The design flow shall be calculated based on equivalent residential connections in addition to a peaking factor depending on the size of sewer pipe. For 8-inch pipe, the peaking factor shall be 4.0. For pipe larger than 8-inches the peaking factor shall be 2.5. The minimum sewer slopes shall be as follows (foot/foot):

1. 8-inch – 0.004
2. 10-inch – 0.0028
3. 12-inch – 0.0022
4. 15-inch – 0.0015
5. 18-inch – 0.0012
6. >/= 21-inch – 0.001

H. The minimum sewer depth shall be 13.0 feet under normal conditions. In areas of shallower sewer, the following note shall be added to the development plat: "Shallow Sewer Depths! Contractor shall verify sewer depths before excavating for basement. Home(s) with basement may not have sewer service available for basement."

I. A minimum of 5 feet of cover shall be required over all sewer lines.

J. Sewer shall be located at 10-foot minimum horizontal distance from drinking water lines.

K. Manholes must be constructed at the end of all sewer lines. Cleanouts shall not be substituted for manholes nor installed at the ends of lines. Stubs for future sewer extension may be installed without a manhole or cleanout. But, no sewer services shall be connected to the sewer stub until the line is extended and a manhole has been installed at the end of the line.

L. The minimum size manhole shall be 4-foot diameter. 5-foot diameter manholes shall be used in the following situations:

1. At all intersections of four or more 8-inch or larger pipelines.
2. Where any connecting pipe size is 14 inches in diameter or larger.
3. Where the deflection angle of the pipeline exceeds 90 degrees.
4. When both items "1" and "2" occur in the same manhole, a 6-feet manhole is required.

M. A 12-feet access road shall be constructed to all manholes and shall be capable of supporting H-20 loading.

N. Where new sewer lines are connected to existing sewer lines, a 5-feet-diameter manhole shall be constructed over the existing sewer line.

O. Manhole Spacing: The maximum span between manholes shall be 400 feet.

P. Six-inch and larger laterals shall connect to the main line through sewer manholes.

Q. The minimum drops through manholes shall be as follows:

1. Deflection Greater than 90° - 0.3 foot drop
2. Deflection of 75° - 90° – 0.2 foot drop
3. Deflection of 0° - 74° – 0.1 foot drop, not exceeding 0.20 feet across the manhole.

R. Drop manholes are required when the inverts differ by 24 inches or more.

S. Deflections in manholes on steep grades:

1. Where incoming slopes at manholes are greater than or equal to 5 percent and the deflection angle within the manhole is greater than or equal to 45 degrees but less than 90 degrees, a five-feet manhole with an extra deep trough is required.
2. Where incoming slopes at manholes are greater than or equal to 5 percent and the deflection angle within the manhole is greater than 90 degrees, a six-feet manhole with an extra deep trough is required.
3. The benching of the extra-deep trough shall be located 25 percent higher than the diameter of the incoming pipe.

T. Each non-single-family building or unit of separate ownership shall require a separate sanitary sewer lateral.

U. Grease interceptors, pursuant to the City Code and City Standard Specifications, shall be required on all commercial development where food service uses are anticipated.

1. Sampling manholes shall be installed downstream of all grease traps.
2. Sampling manholes and grease interceptors shall be inspected and maintained per the Utah Health Code, the City's Kitchen Best Management Practices Ordinance, and Wasatch County Health Department Regulations.

1.12 DRINKING WATER SYSTEM

Private systems shall be designed and inspected the same as public systems.

A. PIPELINES

1. Pipelines shall be as shown in the City's current Capital Facilities Plan or Master Plan, and be at least 8 inches in diameter, unless approved otherwise by the City Engineer for water quality purposes in dead-end lines. Pipelines that supply fire hyrdrants shall be at least 8 inches in diameter.
2. Fire hydrants shall be located on the same side of the street as the drinking water main line. The horizontal distance between the drinking water lines and pressurized irrigation lines shall be at least 5 feet.
3. Pipelines in private streets shall be on the same sides as in public streets unless approved otherwise by the City Engineer.
4. The horizontal distance between drinking water lines and sanitary sewer lines shall be at least 10 feet. Where a water main and sewer line must cross, the water main shall be at least 18 inches above the sewer line. Separation distances shall be measured from pipe edge to pipe edge. Adherence to all separation requirements included in Sections R309-550-7 and R309-550-12 shall be required unless a written variance is requested and granted from the Utah Division of Drinking Water and Heber City.
5. Special design and construction considerations in accordance with Section R309-550-5(6) of the Utah Administrative Code shall be required for water mains located in areas of geologic hazard (e.g., slide zones, fault zones, river crossings, etc.)
6. Surface water crossings are generally prohibited and will only be allowed when no other practical alternatives exist and when specifically approved in writing by the City Engineer. If allowed,

surface water crossings shall be designed and constructed in accordance with Section R309-550-8(8) of the Utah Administrative Code.

7. The minimum fire flow and pressure requirements shall be pursuant to State Standards, or more if determined by the Fire Marshall.
8. The minimum operating pressure in all parts of the system shall be 30 pounds per square inch during peak instantaneous demand.
9. The maximum static pressure in all parts of the system shall be 130 pounds per square inch.
10. Systems shall be designed so that pressures conform to the pressure zones shown in the City's Capital Facilities Plan.
11. The maximum flow velocity shall be 5 feet per second.
12. The impact of any proposed system on the existing system will be reviewed by the City Engineer. The developer may be required to add offsite infrastructure to mitigate impacts to the existing system and provide adequate water supply to their development.
13. If required by the City Engineer, the Engineer-of-Record shall provide a computer network model, for the City Engineer's review, of the proposed system showing compliance with this Standard. The City will provide boundary conditions, based on the system, for the model.
14. Individual booster pumps are not allowed, except in buildings with more than two stories above ground.
15. To provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins and "looping" of the drinking water system ~~whenever practical~~. Where dead-end mains do occur (permanent or temporary), a fire hydrant or approved blow-off assembly shall be installed for flushing purposes as directed by the City Engineer. Flushing devices must have the minimum sizes shown on Heber City Standard Drawing "Water-8", but must also be sized to provide a minimum velocity of 2.5 fps in the water main.
16. Permanent dead-ends shall not be longer than 600 feet.
17. The maximum allowable deflection of pipe joints shall be less than or equal to half of the manufacturer recommended maximum deflection.

B. VALVES

1. Valves smaller than 14 inches shall be gate valves. Valves 14 inches and larger shall be butterfly valves.
2. Valves shall be placed at intervals not exceeding 800 feet.
3. At junctions, valves shall be placed on all legs.
4. Valves shall be placed within 5 feet to 10 feet of the ends of casings.
5. Valves shall be placed at connections to the existing system.
6. When approved by the City, tapping sleeves may be used for fire lines or other branch connections. Tapping sleeves shall not be used for size-on-size applications. Branch lines must be at least one nominal pipe size smaller than the line being connected to.
7. Blow-offs shall be placed at the ends of and low points in pipelines. Fire hydrants may be used as blow-offs.
8. Air releases shall be installed at all peaks and sharp changes in gradient with a difference in elevation greater than 15 feet. If the water line has service connections within the location of the peak or change in gradient, the air release may be eliminated at the City Engineer's discretion.

C. FIRE HYDRANTS

1. Fire hydrants shall be placed at the ends of cul-de-sacs, the ends of dead-end streets, and at least every 1000 feet of off-site pipelines.
2. Fire hydrants shall be placed not more than 500 feet apart, or as directed by the Fire Marshall.
3. The minimum fire flow shall be pursuant to State Standards, or more if required by the Fire Marshall.
4. Fire hydrants shall be placed on the same side of the street at the water main pipeline.

1.13 PRESSURIZED IRRIGATION SYSTEM

A. PIPELINES

1. Pipelines shall be as shown in the Capital Facilities Plan or Master Plan, and be at least 6 inches in diameter.
2. Pipelines in private streets shall be on the same sides as in public streets.
3. The minimum operating pressure in all parts of the system shall be 30 pounds per square inch during peak instantaneous demand.
4. The maximum static pressure in all parts of the system shall be 120 pounds per square inch.
5. Systems shall be designed so that pressures conform to the pressure zones shown in the City's Capital Facilities Plan.
6. The maximum peak day flow velocity shall be 5 feet per second.
7. The impact of any proposed system on the existing system will be reviewed by the City Engineer. The developer may be required to add offsite infrastructure to mitigate impacts to the existing system and provide adequate water supply to their development.
8. If required by the City Engineer, the Engineer-of-Record shall provide a computer network model, for the City Engineer's review, of the proposed system showing compliance with this Standard. The City will provide boundary conditions, based on the system, for the model.
9. The maximum allowable deflection of pipe joints shall be less than or equal to half of the manufacturer recommended maximum deflection.
10. Public pipelines through private property, if approved, shall be in dedicated home-owner-association or business-owner-association open space centered in a 20-feet-wide easement in favor of the City.
11. All pipelines shall be designed such that the system can be easily drained to surface ditches or storm drain systems.

B. VALVES

1. Valves smaller than 14 inches shall be gate valves. Valves 14 inches and larger shall be butterfly valves.
2. Valves shall be placed at intervals not exceeding 800 feet.
3. At junctions, valves shall be placed on all legs.
4. Valves shall be placed within 5 feet to 10 feet of the ends of casings.
5. Valves shall be placed at connections to the existing system.
6. When approved by the City, tapping sleeves may be used for branch connections. Tapping sleeves shall not be used for size-on-size applications. Branch lines must be at least one nominal pipe size smaller than the line being connected to.
7. Blow-offs shall be placed at the ends of and low points in pipelines.
8. Air releases shall be installed at all peaks and sharp changes in gradient with a difference in elevation greater than 15 feet. If the water line has service connections within the location of the peak or change in gradient, the air release may be eliminated at the City Engineer's discretion.
9. Drains shall be installed at low points in the system.

1.14 STREET SYSTEM

Private streets shall be privately-owned-and-maintained.

A. DESIGN REQUIREMENTS

1. The pavement design (subbase, roadbase, and asphalt) for private streets shall be at least the same as public streets.
2. The pavement width of private streets shall be at least as wide as required by the latest edition of Appendix D of the International Fire Code.
3. Normally, sidewalk, park strip, curb, and strip paving are required along redeveloping properties. In the event that the requirement for such is delayed by deed restriction, the shoulder of the road shall be improved with 3 inches of roadbase for a distance of 4 feet from the edge of asphalt. The surface of the roadbase shall tie in with the surface of the asphalt. Beyond the roadbase, the

surface of the soil shall be graded to a swale and then slope up to the edge of the right-of-way.

4. Roundabouts, following Federal Highway Administration Design Guidelines, are required where feasible and practical, pursuant to the following criteria:
   a. Minimum inscribed diameter of 110 feet, using a WB-62 design vehicle for City roads of lower classification than major collector.
   b. Minimum inscribed diameter of 120 feet, using a WB-67 design vehicle for single-lane major collectors.
   c. Islands shall include mountable curb and decorative (stamped, colored, etc.) concrete aprons approved by Heber City.
   d. Minimum inscribed diameter of 150 feet for double-lane applications.
   e. Refuge areas shall be incorporated into intersection leg islands with crosswalks and ADA panels.
   f. Raised landscaped center islands with an additional feature/sculpture approved by Heber City.
5. Because preference is given to pedestrians, a driveway approach is required for all private accesses unless recommended otherwise by the City Engineer, based on site-specific considerations, such as:
   a. speed, slope, and functional classification of the adjacent street
   b. width of the proposed access
   c. volume of the proposed access
   d. drainage
6. Curb returns adjacent to ADA ramps shall have a maximum slope of 2 percent where possible. Where the base of the curb ramp, or the edge of the flush landing must join an intersection of two streets with running grades greater than 2 percent, the base of the curb ramp or the edge of the flush landing may be warped to meet the street running grade. Every effort shall be made to minimize this grade by warping the street cross slope plus or minus 4 percent on both legs of the intersection.
7. The following Table 1 serves as a guide to design professionals by providing a summary of the City's Street Design Standards.
8. A physical traffic calming measure is required on local street segments longer than 1000 feet without at least a 45-degree turn.
9. School crosswalks and associated STOP bars and signage shall be placed along Safe-Routes-to-School routes. Other crosswalks shall be placed as directed by the City Engineer.
10. Access management of public streets shall follow Table 2.
11. The developer is required to complete a type II slurry seal on all street improvements one year after final inspection and prior to the expiration of the warranty period.
12. Temporary paved ~~hard-surfaced~~ turnarounds ~~cul-de-sacs~~ are required on all dead end public streets that will be extended and are greater than one-and-a-half lots in length. The cost of installing the future curb, gutter, sidewalk, driveway extension etc., when the temporary cul-de-sac is removed, shall be escrowed with the City.
13. The top back of curb shall be stamped, showing locations of water, sewer, and secondary irrigation lateral service pipes:
   a. "W" for drinking water.
   b. "S" for sewer.
   c. "I" for pressurized irrigation.
14. A brass pin shall be imbedded in the curb marking the location of each property line.

TABLE 1 – GEOMETRIC DESIGN OF STREETS

DESIGN ELEMENT	MINOR LOCAL	LOCAL	MINOR COLLECTOR	MAJOR COLLECTOR	MOUNTAIN COLLECTOR	HISTORIC BUSINESS CORE
Posted/Design Speed	25		30	35	35	25
Typical Section Elements						
ROW Width	56'	62'	68'	80' or 85'[a]	58'	92'[b]
Pavement Width	26'	32'	38'	38'-50'[c]	36'	48'/58'
Number of Lanes	2[g]			3	3	2
Side Cut/Fill Slopes	3:1 up to 5 feet high and 2:1 above 5 feet high					
20 Year ESAL Requirement	60,000	60,000	250,000			
VERTICAL DESIGN ELEMENTS						
Vehicle Design	Passenger, School Buses, Delivery trucks, dump Trucks	Passenger, School Buses, Delivery trucks, dump Trucks	Passenger, School Buses, Delivery trucks, Dump/Concrete Trucks	Passenger, School Buses, Delivery trucks, Dump/Concrete Trucks	Passenger, School Buses, Delivery Trucks, Dump / Concrete Trucks	Passenger, School Buses, Delivery Trucks, Dump/Concrete Trucks, Semi Loads
Minimum Centerline Grade	0.5%					
Maximum Centerline Grade	10%	8%[d]				5%
Maximum Centerline Grade Across Designated Crosswalks	2% with stop or yield control 5% without stop or yield control[h]		2% with stop or yield control 5% without stop or yield control[h]			
Max. Grade in Cul-de-Sacs	5%	Not Allowed				
Maximum Centerline Grade Break w/o Vertical Curve	1%		0.5%			0.5%
Maximum TBC Grade Break w/o a Vertical Curve[e]	2%					
Minimum Crest Vertical Curve "K" Value	12		19	29		
Minimum Sag Vertical Curve "K" Value	26		37	49		
Minimum Length of a Vertical Curve	60'		90'			
HORIZONTAL DESIGN ELEMENTS						
Minimum Mid-Block Centerline Curve Radius	198'		333'	510'		198'
Superelevation	Not Allowed					
INTERSECTIONS						
Intersection Sight Distance	Refer to AASHTO: A Policy on Geometric Design of Highways and Streets, Latest Edition					
Corner Curb Radius	25'		40'			40'
Minimum Angle of Intersection	60° for at least 100'		80° for at least 100'			
Maximum Centerline Offset	5'		2'			
Maximum Centerline Grade[f]	5%		4%			
Vertical Tie-In	Lower streets shall match the centerline crowns in an intersection. Higher streets shall tie in 12' off the centerline of local streets or at the edge of the outside travel lane of other streets.					

a. If a 10-feet trail is used, 5 feet more is required.
b. An 82.5-feet right-of-way may be used with City approval.
c. Depending on whether a landscaped median is used, and whether on-street parking is allowed.
d. Under special circumstances, grades up to 10 percent may be approved, if grades would exceed 8 percent in order to maintain 4 percent through the intersections, and conditioned upon providing individual designs to construct ADA-compliant ramps.
e. Maximum grade break of 2% along TBC with Minimum length of 25 feet between breaks.
f. Grade must extend at least 50 feet beyond the side of the lane of the intersecting street.
g. Turn lanes with appropriate stacking lengths may be required (per the TIS).
h. In some instances, the cross slope of pedestrian crossings may be increased to match the slope of the road in accordance with PROWAG R304.5.3.

Heber City Access Management Standards

Functional Classification	Minimum Driveway Spacing (feet)[1,2,3,4]			Cross Street Unsignalized Intersection Spacing (feet)	Geometric Design of Driveway Access[6]					Minimum Signal Spacing (feet)
					Single-Family Residential Driveways			Other Driveways		
	Upstream and Downstream (feet)	Opposing Upstream (feet)	Opposing Downstream (feet)		Approach Width (feet)[6]	Edge Clearance (feet)[7]	Curb Return Radius (feet)	Approach Width (feet)[6]	Edge Clearance (feet)[7]	
Major Arterial w/o Median Barrier	350	175	160	660	12 min 30 max	5 min	10 min 15 max	Two Way 25 min 40 max One Way 16 min 30 max	20 min	2640
Major Arterial w/ Median Barrier	200	130	160	400						2640
Minor Arterial w/o Median Barrier	200	115	105	660						1320
Minor Arterial w/ Median Barrier	150	65	105	400						1320
Collector w/o Median Barrier	150	105	90	250						1320
Collector w/ Median Barrier	85	50	70	150						1320
Minor Collector w/o Median Barrier	85	105	90	250						1320
Minor Collector w/ Median Barrier	50	50	70	150						1320
Local w/ or w/o Median Barrier	10	-	-	150						N/A

1. Driveway spacing is measured as shown in Figure 1. For Local streets, the spacing is measured from edge-to-edge.
2. Corner clearance requirements for access points should meet or exceed the minimum driveway spacing requirements. Curb cuts on major arterials should be spaced at distances greater than 230 feet apart, measured from face-of-curb to face-of-curb, with the preferred distance being 300 feet.
3. For corner properties, access to public streets should be provided from the lesser (lowest functional classification) street.
4. Driveways in right-turn lane transition areas are discouraged.
5. For the benefit of traffic safety and flow, access points may be required to be designed to prohibit certain types of turning movements.
6. Wider driveway widths may be permitted to accommodate additional turning and/or acceptance lanes.
7. Distance between side property line and edge nearest drive as measured along traveled way.

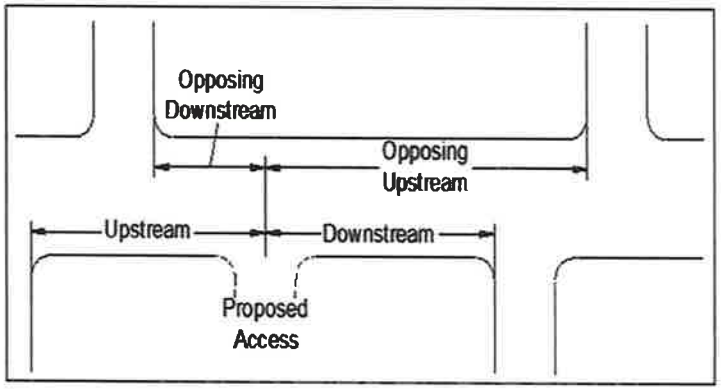


Figure 1: Measurements for Minimum Access Spacing Standards

B. MORATORIUM STANDARD (New, Reconstructed, and Overlaid Streets) -- No cuts permitted for two years from the time of the construction/restoration/overlay.

C. SPECIAL RESTORATION STANDARD (New, Reconstructed, Overlaid, and Chip/Slurry-Sealed Streets)

1. New, Reconstructed, and Overlaid Streets (for 5 years after end of moratorium): The asphalt surface shall be milled a minimum depth of two (2) inches, and fifteen (15) feet each way from the edge of the cut. Milling shall be done in widths equivalent to existing striped traffic lanes. The City Engineer reserves the right to require additional area and/or depth if deemed appropriate to restore roadway to original condition. Approved fabric is required when existing pavement included a fabric prior to the permitted cut.
2. Chip/Slurry-Sealed Streets (for one year after chip/slurry application): The asphalt surface shall be re-chipped/slurried a minimum of 15 feet each way from the edge of the cut, in widths equivalent to existing striped traffic lanes.

1.15 TRAILS SYSTEM

A. DESIGN REQUIREMENTS

1. Trails shall be as shown in the City's current Parks and Trails Capital Facilties Plan or Master Plan.
2. Additional trails are encouraged and shall be provided in accordance and shall be provided in accordance with the City's adopted trail plans and standards.
3. Trails shall comply with the requirements of the Americans with Disabilities Act (ADA) where reasonably appropriate and feasible. A trail is considered ADA-accessible if it meets the following criteria:
   a. 5-feet minimum width
   b. Hard surface – Asphalt and concrete are the most accessible. Compacted crushed stone with a diameter less than 3/8-inch is also acceptable.
   c. Longitudinal grade less than 5 percent.
   d. Ramps, not stairs, should be provided for grades exceeding the 5-percent maximum.
   e. Ramp grades should not exceed 8 percent, and have a level landing for every 30 inches of vertical rise, and have a slip-resistant surface.
   f. 32-inch-high handrails should be installed on all ramps and bridges.
   g. Trails should have a rest area every 300 feet, preferably cleared with a bench.
4. Grades – Trail grades shall not exceed one-half of the grade of the hillside being traversed. The following table identifies maximum lengths for trail sections with longitudinal grades greater than 5 percent.

Grade (percent)	Max. Length (ft)
<5	None
5-6	800
6-7	400
7-8	200
8-9	100
9-10	50
>10	0

5. Maintain a minimum clear view for cyclists of 150 feet. If this distance cannot be met, signing pursuant to MUTCD shall be used. Signs shall be installed 50-60 feet ahead of sight-obstructing changes in alignment.
6. Maintain a vertical clearance of at least 10 feet. The vertical clearance on trails used during winter

months shall be at least 16 feet due to snow.

7. Lengths of Vertical Curves

Grade Break (percent)	Min. Length (ft)
<3	0
3	10
4	75
5	120
6	150
7	171
8	188
9	200
10	210
11	218
12	225
12-20	264

8. The minimum horizontal curve radius shall be 74 feet.
9. The maximum grade through trail intersections is 3 percent.
10. Construction Standards

The trail cross slope shall be 1.5 percent to 2 percent. Where trails cross streets, the cross lsope may be increased to match the cross slope of the road in accordance with PROWAG R304.5.3.

Trail Type	Width (ft)	Materials
Improved Multi-Use	10-14 with a 20 easement, depending on regional connections per Staff and the Trails Map, plus 2-wide shoulders	Asphalt – Properly-Prepared Subgrade, Weed barrier, 6 inches of Roadbase, 3 inches of Asphalt. Concrete and pavers can be used to appropriate areas.
Improved Pedestrian	8 with a 20 easement, plus 2-wide shoulders	Concrete – Properly-Prepared Subgrade, Weed barrier, 6 inches of ¾-inch Gravel, 4 inches of Concrete.
Back Country	4 with a 20 easement, plus 2-wide shoulders	Natural Surface

11. Easements – All public trails will require a recorded easement using the City's standard easement language in use at the time the easement is recorded. Trail easements shall normally be included on associated plats. When separate trail easements have been recorded, they shall be referenced on applicable plats.
12. Bridges
    a. A building permit is required for bridges.
    b. Widths of bridges shall be the same as the associated trails.
13. Trailheads – Trailheads shall be provided in accordance with the Parks and Trails Master Plan and associated trail design guidelines.
14. Fences – Fencing should be installed only where physical separation is necessary for safety or to preserve adjacent landowner privacy. Fences should normally be 5 feet from the trail edge and must also be located within the trail easement.

1.15 STREET AND TRAILS LIGHTING SYSTEMS

A. Street lights shall be located at cul-de-sac ends, street intersections with collector streets or larger, and critical points as determined by the City Engineer. On street intersections, there shall be two lights located kitty-corner on the through street around the corners from the STOP signs.

B. Commercial Historic street lights shall be installed on Main Street between 400 South and 300 North, spaced four per block on both sides.

C. Trail lights shall be installed along all master-planned trail systems at 200-feet maximum intervals and at entrances to parks, trail intersections, bridges, and road crossings.

1.02 GENERAL REQUIREMENTS

A. ~~The Developer is responsible to comply with these standard specifications. Alterations, substitutions, or changes from these standard specifications shall not be allowed unless prior authorization is obtained from the City Engineer. The developer is responsible for providing all documentation and research supporting requests for changes to these standards, and the associated costs. The City Engineer will make the decision relating to all questions which may arise as to the quality and acceptability of alterations, substitutions, or changes proposed. In case any question should arise, relative to these standards, the final determination or decision of the City Engineer shall be complied with as a condition of the Developer receiving final approval of the work being questioned.~~

B. ~~The improvements shall include all street improvements in front of all lots and along all dedicated streets to a connection with existing improvements of the same kind or to the boundary of the subdivision nearest existing improvements.~~

C. ~~Public roads shall not exceed a grade of 8% without approval from the City Engineer. Under special circumstances grades up to 10% may be approved, conditioned upon 1) providing individual designs to construct ADA compliant handicap ramps, and 2) incorporating a 60' minimum transition to a 4% grade at intersections.~~

D. ~~The developer is required to complete a type II slurry seal on all street improvements one year after final inspection and prior to the expiration of the guarantee period.~~

E. ~~Layout must provide for future extension to adjacent development and be compatible with the contour of the ground for proper drainage.~~

F. ~~All water, sewer, irrigation and any other buried utility or conduit shall be installed to the boundary lines of the subdivision. For existing lots of record, the utility for which service is needed shall be extended through the entire frontage of the property unless otherwise directed by the City Engineer.~~

G. ~~All parcels receiving water, sewer, or irrigation service shall have their own independent services and laterals. These laterals or services shall be contained within the parcel or property for which the service is intended to eliminate special utility easements crossing adjacent properties. Deviation from this requirement, regardless of how or when it is determined to be in violation, shall be at the complete discretion of the City Engineer and Public Works Director.~~

H. ~~If construction requires a specification not found herewith and is deemed necessary by City Engineer, the City Engineer will be allowed two weeks to provide an adequate specification to control and provide guidelines for construction.~~

I. Inspection: The term "inspection" (or its derivatives) means a review of the project, including but not limited to a visual review of the work completed to date. It does not include or imply an exhaustive or detailed review of the Work nor does it create a duty on the part of the Engineer or Owner to detect latent defects.

J. Temporary hard surfaced cul-de-sacs are required on all dead end public streets that will be extended and are greater than one and a half lots in length. The cost of installing the future curb, gutter, sidewalk, driveway extension etc., when the temporary cul-de-sac is removed, shall be escrowed with the City.

K. Adequate facilities for drainage shall be provided and may not adversely impact adjacent properties.

L. Easements for water, sewer, or storm drains not in the public right of way shall be a minimum of 20 feet wide for a single utility and dedicated solely to Heber City for the given use. Public Utility Easement's shall not be used in lieu of dedicated easements for new utilities and access.

M. Public utility easements (PUE's) shall be 10ft wide around perimeter of standard lots. Cottage lots shall have the side lot PUE's reduced to 5 feet.

N. The top back of curb shall be stamped in the following manner, showing locations of water, sewer, and secondary irrigation stub pipes:

a. A "W" stamp for culinary water.
b. An "S" stamp for sewer.
c. An "I" stamp for secondary irrigation.
d. A brass pin will be imbedded in the curb marking the location of each property line.

O. A landscaping plan including details of proposed irrigation systems shall be submitted for all parks or other landscaped areas which are to become the responsibility of the City to operate and maintain. These plans shall meet the requirements of and be approved by the Director of the Parks Department.

P. Heber City requires roundabouts for new development where feasible and practical. Roundabouts shall be designed with the following criteria:

a. Min inscribed diameter of 120 ft using a WB-67 design vehicle for single lane major collectors.
b. Min inscribed diameter of 110 ft using a WB-62 design vehicle for City roads of lower classification than major collector.
c. Min inscribed diameter of 150 ft for double lane applications.
d. Roundabouts shall follow FHWA Design Guidelines.
e. Mini and urban compact roundabouts may be approved for private roads at the discretion of the City Engineer.
f. Islands shall include mountable curb and decorative (stamped, colored, etc.) concrete aprons approved by Heber City.
g. Refuge areas shall be incorporated into intersection leg islands with crosswalks and ADA panels.
h. Roundabouts shall include raised landscaped center islands with an additional feature/sculpture approved by Heber City.

PART 2 SUBMITTALS

2.01 DRAWINGS

A. Complete and detailed construction plans and drawings of improvements shall be submitted as an electronic PDF to the City Engineer for signature prior to final approval of the project by City Council. The construction drawings will not be signed by the City Engineer until the following items have also been completed:

1. The plan check procedure has been completed.

2. All required easements have been designated on the subdivision plat or dedicated by separate document to the City.

3. An Engineers Estimate of the improvement costs has been submitted to the City.

B. The Mylar plat map will not be signed by the City Engineer for recordation until the following items have also been completed:

1. The performance agreement has been completed and executed.

2. All required water rights or shares have been transferred to the city.

3. The City escrow deposits have been paid in full.

4. If requested, three (3) sets of hard copy final approved construction plans have been provided to the City.

C. The signed construction drawings will be valid for two (2) years from the date of City approval. If construction has not begun within two (2) years from the approval date, the drawings shall become null and void. Expired drawings will require rechecking by the City.

PART 3 REQUIREMENTS

3.01 STANDARDS FOR CONSTRUCTION DRAWINGS: The following instructions are for the purpose of standardizing the preparation of drawings to obtain uniformity in appearance, clarity, size and styl.

A. One hard copy approved set shall be kept available at the construction site.

B. The plans and designs shall meet the standards defined in the Specifications and Drawings. The minimum information required on drawings for improvements are as follows:

1. All drawings and/or prints shall be clear and legible and conform to good engineering and drafting room practice.

2. Size of drawings shall be 24" x 36" and 11" x 17" (trim line) with minimum borders of ½" on top, bottom, and right sides, left side 1 ½".

3. North arrow (plan).

4. Scale and elevations referenced to U.S.G.S. datum.

5. Stationing and elevations for profiles.

6. Title block, located in lower right corner of sheet to include:
   a. Name of City.
   b. Project title (subdivision, etc.).
   c. Specific type and location of work.
   d. Space for approval signature of City Engineer and date.
   e. Name of engineer or firm preparing drawings with license number.

3.02 CURB AND GUTTER, DRAINS AND DRAINAGE STRUCTURES, SIDEWALKS, SITE GRADING IMPROVEMENTS, AND STREET SURFACING DRAWING REQUIREMENTS

A. Scale: 1"=50' horizontal; 1"=5' or 10' vertical.

B. Plans and profiles for each side of the street whether existing or proposed with elevations clearly indicated. Centerline profile may be eliminated.

C. Stationing and top of curb elevations with curve data for all curb returns.

D. Flow direction and type of cross drainage structures at intersections with adequate flow line elevations.

E. B.M. location and elevation (use U.S.G.S. datum).

F. Type of curb and gutter and distance from front to back of curb.

G. Cross slopes to gutter as shown on the standard cross section drawings.

H. Vertical curves for grade breaks equal to or greater than 1%.

I. Typical street cross section for all street sizes and variations.

J. Street survey monument locations.

K. Plan and profile of existing ground and purposed profiles extending 200' beyond the proposed project.

L. Profile drawings for all storm drainage infrastructure.

M. Requirement to install reference pins in curb identifying location of property lines.

N. Street address and regulatory signs at each intersection.

O. Sleeves for all utility crossings i.e. phone, power, gas, and cable.

P. Street Lights

Q. Storm Water Pollution Prevention Plan according to State requirements and best management practices for the site.

3.03 SEWER DRAWING REQUIREMENTS

A. Scale: 1"=50' horizontal; 1"=5' or 1"=10' vertical.

B. Location, size and grade of mains and laterals.

C. Manhole size, location and flowline elevation.

D. Type of pipe.

E. B.M. location and elevation (use U.S.G.S. datum).

F. Profile Drawing

3.04 CULINARY WATER DRAWING REQUIREMENTS

A. Scale: 1"=50' horizontal; 1"=5' or 1"=10' vertical.

B. Size and location of water mains, valves, hydrants, and related appurtenances.

C. Type of pipe.

D. Minimum cover.

E. Details of all utility conflicts.

F. Profile Drawings, unless waived by the City Engineer.

3.05 IRRIGATION PIPE

A. Scale: 1"=50' horizontal; 1"=10' vertical.

B. Location, size and grade of mains. The mains shall be sloped to drain.

C. Elevations of main shall provide minimum 3 feet of cover on transmission lines and 2 feet of cover on distribution lines.

D. Type of pipe

E. B.M. location and elevation (use U.S.G.S. datum)

F. Profile Drawings, unless waived by the City Engineer.

3.06 STRUCTURES

A. Each set of plans shall be accompanied by a separate sheet of details for structures which are to be constructed.

B. All structures shall be designed in accordance with minimum requirements established by the Heber City Standard Specifications.

C. All structural drawings shall contain the following:

1. Scale of each detail.

2. Title block, lower right hand corner on all sheets, include name of subdivision.

3. Completely dimensioned and described.

PART 4 EXECUTION

4.01 GENERAL

A. All construction work involving the installation of improvements in subdivisions shall be subject to inspection by the City.

B. Certain types of construction require approval prior to proceeding with the work while other types only require periodic inspection while the work is occurring.

1. Approval is required prior to proceeding with the following types of work:
   a. Placing concrete for curb, gutter, sidewalks, thrust blocks, collars and other structures.
   b. Connections or tie-in's to existing water, sewer, storm drain, and irrigation systems
   c. Pipe line flushing, pressure testing, and videoing of water, sewer, storm drain, and irrigation lines.
   d. Street subgrade proof roll, placing subbase, and laying street asphalt.

2. Periodic inspections shall be required on the following:
   a. Street grading and gravel base.
   b. Excavations for curb and gutter and sidewalks.
   c. Excavations for structures.
   d. Trenches for laying pipe.
   e. Forms for curb and gutter, sidewalks and structures.
   f. Laying of street surfacing.

C. On construction requiring approval prior to proceeding with the work, any work done in the absence of an inspector's approval shall be subject to rejection. All underground GPS data must be collected prior to backfill. Inspector may request contractor to expose work that has been backfilled without prior inspection or to collect GPS data.

4.02 PRECONSTRUCTION CONFERENCE

A. A preconstruction conference shall be held before any excavation or other work is begun in the subdivision or project. The meeting will be held at a location specified by the City Engineer and will include: (a) City Engineer; (b) Developer or Project Manager; (c) Subdivision or Project Engineer; (d) all Contractors and Subcontractors involved with installing the subdivision or project improvements; (e) a representative of Heber City Inspection Department; (f) representatives of local utility companies as may be required by Heber City. Items pertaining to the construction and inspection of the subdivision or Project Improvements will be discussed. Upon request, one (1) copy of the Heber City Standard Specification and Drawings will be issued to the contractor during this meeting. Additional copies may be obtained for $20.00 each.

4.03 REQUESTS FOR INSPECTION

A. Requests for inspections shall be made to the City, in writing or by personal contact with the inspector assigned to the project, by the person responsible for construction.

B. Requests for inspection on work requiring continuous inspection shall be made at least three (3) days prior to the commencing of the work.

C. Notice for all other inspections shall be given one (1) working day in advance of the required inspection (subsequent inspections and re-inspection shall require the same notification period.

D. After hour and/or weekend inspections are available under extreme conditions, but are subject to payment of after hour inspection fees as shown in the Heber City Consolidated Fee Schedule. .

E. The Contractor/Developer shall GPS surface features (i.e. valves, meter cans, hydrants, cleanouts, manholes, irrigation boxes, etc.) for the Record Drawings. The Contractor/Developer shall coordinate with the Heber City Public Works Department to expose and GPS all underground features and connections to mains (i.e. corp. stops, sewer lateral connections to main, cleanouts, transitions and/or fittings, etc.) for City Mapping of the utilities.

4.04 REQUESTS FOR WATER SHUT DOWN

A. Request for water shut down shall be made a minimum of ~~24~~48 hours prior to the desired shut down.

B. Requests shall be made to the Public Works Superintendent and include, date, time and location.

C. Valves are to be opened and closed by City personnel only.

D. Contractor is to provide a minimum of 24 hour notification to all customers affected by the shutdown including but not limited to door to door contact and a flyer or handout describing the estimated date, time, location of the shut down, and emergency phone number. Contractor shall also notify the City 48 hours in advance so that a Parlant notification can be sent to affected customers.

4.05 CONSTRUCTION COMPLETION INSPECTION

A. An inspection shall be made by the City Engineer after all construction work is completed.

B. Any faulty or defective work shall be corrected by the persons responsible for the work within a period of thirty (30) days of the date of City Engineers Inspection Report defining the faulty or defective work.

C. The Developer shall furnish "Record" drawings of all improvements prior to subdivision final approval. Record drawings shall be submitted via~~include~~ electronic PDF. ~~and~~ AutoCAD files. ~~A~~and/or a printed mylar shall also be submitted when requested. Record drawings shall be the original drawings, signed by the City and engineer of record, with corrections of minor changes that occurred during construction noted. Major changes that significantly change a drawing sheet will have a new design sheet created during construction and resigned by the City Engineer. All changes made to the design during construction shall be recorded and include, but not be limited to changes to alignments, elevations, utility main line locations, service lateral locations, and any other changes made during construction.

4.06 GUARANTEE OF WORK

A. The Developer shall warrant and guarantee the improvements by executing Heber City's Standard Performance Agreement and posting a bond, acceptable to the City, for ~~up to 20%~~100 percent of the ~~value~~estimated cost of the improvements to be constructed. The City will add 10 percent to the estimated cost to cover administrative costs incurred by the City to complete the improvements, if necessary. The improvements provided for hereunder, and every part thereof, will be guaranteed to remain in good condition for a period of ~~two (2)~~one ~~years~~, after the date of Final Acceptance by the City Engineer. Developer agrees to make all repairs to the improvements during the guarantee period at no cost to the City. ~~The guarantee period may be reduced to one (1) year if final acceptance occurs between April 30th and November 1st and, if in the opinion of the City, the developer or the contractor's past performance has been excellent.~~ The improvement warranty period may be extended by the City if the City determines for good cause that the one-year period

would be inadequate to protect the public health, safety, and welfare; and if the City has substantial evidence on record of prior poor performance by the applicant, or that the area upon which the infrastructure will be constructed contains suspect soil that the City has not required the applicant to mitigate.

B. Final Acceptance shall not be granted and the guarantee period shall not commence until all of the items noted on the project punch list have been completed.

C. The determination for necessity of repairs and maintenance of the work rests with the City Engineer. His decision upon the matter shall be final and binding upon the Developer, and the guarantee hereby stipulated shall extend to and include, but shall not be limited to the entire street base, and all pipe, joints, valves, backfill, and compaction as well as the working surface, curbs, gutter, sidewalks, and other accessories that are, or may be affected by the construction operations, and whenever, in the judgment of the City Engineer, said work shall be in need of repair or rebuilding.

D. If the Developer fails to begin making repairs within ten (10) days from the date of the service of such notice, the City Engineer shall have such repairs made and the cost of such repairs shall be paid by the Developer together with an additional 25 percent for stipulated damages for failure on the part of the Developer to make the repairs.

4.07 SUBDIVISION ORDINANCES

A. The Developer and his Engineer must familiarize themselves with the existing subdivision ordinances, requirements of which maya~~re~~ not be included in these Sstandards.

4.08 ROADWAY PERMITS

A. For construction material and procedures not addressed by the specifications, the most recent revision of the standard specification of the following agencies shall apply:

1. American Association of State Highway & Transportation Officials. (AASHTO).
2. American Society for Testing & Material (ASTM).
3. American Waterworks Association (AWWA).
4. Uniform Building Code of the International Conference of Building Officials (UBC).
5. Utah Department of Transportation (UDOT) Standard Specifications and Standard Plans.
6. Manual on Uniform Traffic Control Devices (MUTCD).

4.09 BUILDING PERMIT AND OCCUPANCY

A. Subdivisions and other large scale development shall be nearly complete with essential facilities (as defined in Heber City ordinances) being constructed pursuant to the accepted drawings~~in place~~ and operational before a building permit will be issued. Such completion shall be ~~certified in writing~~ verified by the City Engineer or their designee. ~~The certification shall verify that the project has been built as per approved plans.~~

B. Occupancy will be allowed within any subdivision or development only upon compliance with Heber City Ordinances.

4.10 UNUSUAL LOADINGS

A. In unusual circumstances of structural loading, the City Engineer shall have the authority to require measures to strengthen structure and/or foundations as needed to protect the City's interests.

4.11 SNOW REMOVAL FOR ROADS AND FIRE HYDRANTS

A. The owner of the subdivision or other large scale development shall be responsible to keep the roads and the fire hydrants cleared of snow until the roads are accepted by the City Engineer.

B. The fire hydrants shall be cleared for at least three (3) feet in all directions.

END OF SECTION

SECTION 00900

PROCEDURAL POLICY FOR WATER & SEWER

PART 1 HOOKUP FEES

1.01 SECTION INCLUDES

A. This section defines water and sewer hookup fees, billing procedures and policies.

1.02 WATER HOOKUP FEES

A.

LINE SIZE	HOOKUP FEE	IMPACT FEE**	MAX RATE *
3/4" Water Hookup	See Heber City Consolidated Fee Schedule	See Heber City Consolidated Fee Schedule	30 GPM
1" Water Hookup			50 GPM
1 1/2" Water Hookup			100 GPM
2" Water Hookup			160 GPM
3" Water Hookup			350 GPM
4" Water Hookup			1000 GPM

* Estimated at 80% of manufacturer's maximum rating. Meters 3-inches and above are compound meters which are determined separately.

** Impact Fees are adjusted annually based on the ENR index.

B. Apartment Complexes and other Multiple Dwelling units are responsible to pay a hookup fee for each separate meter servicing said units.

1.03 SEWER HOOKUP FEES

A.

TYPE	IMPACT FEE*
Residential	See Heber City Consolidated Fee Schedule
Non-Residential	Commercial development charges are based on Equivalent Residential Units (ERU's) calculated from average water usage and the number of fixture units.

* These are adjusted annually based on the ENR index.

PART 2 BILLING PROCEDURES

After completion of hookup, billing for Water and Sewer service will begin. Sewer will be billed at the base rate until the home is occupied. When the home becomes occupied, the Sewer will be billed using the State averages of usage based on the number of persons occupying the home until a history is obtained.

2.01 WATER BILLING PROCEDURES

A. Water fees will be set by resolution and may change as the City Council deems necessary. Water billings are billed in arrears. Current base fees based on line size are per Heber City Consolidated Fee Schedule.

B. County Residents who are permitted to hook onto Heber City's Water System will be billed 1 ½ times the normal rates.

C. The base fee will entitle each user to the number of gallons of water included in the base fee as shown in the current Heber City Consolidated Fee Schedule. Additional usage over the base amount will be billed at a higher rate per thousand gallons as indicated in the Heber City Consolidated Fee Schedule.

2.02 TEMPORARY/CONSTRUCTION WATER

A. Temporary water for construction or other similar purposes will be served from the local irrigation company when available. Culinary water may be obtained if the City determines that irrigation water is unavailable. Temporary water may be discontinued at any time if deemed necessary by the City. Persons wishing to obtain temporary water may apply for a construction meter at the City Public Works Office and submit a deposit identified in the Heber City Consolidated Fee Schedule. The City Public Works Department will install a meter at the fire hydrant location requested (unless installation by the Contractor is approved by Public Works) and periodically bill the applicant for water used at a rate identified in the Heber City Consolidated Fee Schedule per thousand gallons. Upon notification to discontinue service the City Public Works Department will remove the construction meter (unless removal by the Contractor is approved by Public Works) and, if in good condition refund the applicants deposit. Applicant is responsible for all water usage registered on the meter.

B. The City may issue one time water permits to users requiring minimal quantities of water. Water for these permits will only be provided from the hydrant located at the City's Public Works Yard. Users must have a permit in their possession and available for inspection at all times when transporting water.

C. If access to construction water through the meter service box is wanted during construction of new buildings, the contractor or owner will need to sign up for water service through the City and have the meter set by Public Works. Occupancy will not be granted until a water meter has been properly set by the City.

Upon receiving a request for final inspection, the Building Department personnel will check the water meter vault and determine if a meter has been set. If the meter is in place then the inspector will proceed with the inspection, if not then the inspection will cease until the meter has been installed. It is the responsibility of the individual(s) requesting occupancy to set up the water service account and request the meter be set.

2.03 POLICY REGARDING LEAKS

A. When a leak is discovered by the owner or the City, adjustments to billings will be given when proof of repair is provided. Repairs must take place within 10 days of the leak discovery or no adjustment will be made. Adjustments will be given to approximate the previous history of a similar period.

2.04 WINTER FREEZE UP POLICY

A. In certain circumstances the Public Works Director may authorize individuals to leave water running in their homes during the winter months to prevent water lines from freezing. If an individual is thus authorized, their water billing will be adjusted to the base rate. If individuals

leave water running without permission from the Public Works Director, no adjustment will be made to the billing.

2.05 SEWER BILLING PROCEDURES

A. Sewer fees will be set by resolution and may be changed as the City Council deems necessary. Sewer billings are billed one month in advance. Current base monthly fees are identified in the Heber City Consolidated Fee Schedule:

B. Sewer flow charges are based on the winter water usage from approximately October 10th to April 10th, of each year. Flow charges over the base rate are calculated as follows:

Water Usage / 6 months = Average Monthly Use

Average Monthly Use x $ Rate per Thousand Gallons = Flow Charge

C. Flow charges are then added to the base fee to equal your monthly bill.

D. If no sewer history exists, the City will use the formula below for the first year.

Base Rate + (Per Person Charge x #of People)

2.06 POLICY REGARDING WINTER WATER LEAKS

A. When a water leak is discovered during the winter months by the owner or a City employee, Heber City will use the State average usage for the number of persons living in the home for determining the flow charges for the April billing.

2.07 LIVESTOCK METERS

A. Persons who water livestock will be required to install a separate meter in order for Heber City to deduct water used for watering livestock before calculating flow charges for the Sewer billing.

2.08 SPRINKLER SYSTEMS

A. Persons wishing to install sprinkler systems attached to the culinary water system will be required to connect onto their water line between the home and the water meter, unless a hardship exists. The Public Works Director will determine if a hardship exists. The City Manager will give final approval. If a hardship exists, a separate meter can be installed and will be billed as a normal connection. Those who receive permission to have a separate connection will be required to pay the appropriate hook up fee as determined in section 1.02 A. These connections are not transferable to another property if they are abandoned.

All necessary backflow prevention devices are to be installed per the International Uniform Plumbing Code and City Ordinance. Backflow devices for sprinkler systems shall be Reduced Pressure Zone Backflow Prevention Assemblies (RP Devices). RP Devices will need to be accompanied by a certification from a licensed tester that the device is functioning properly prior to city acceptance.

2.09 ABANDONMENT OF SERVICES AND LATERALS

A. Existing water services shall be abandoned to the city's main line. The "corp" valve shall be removed and the tap plugged. All abandonments shall be coordinated with the Public Works Director.

B. Existing sewer laterals shall be abandoned by capping the lateral with a water tight plug at the main line. If the lateral ties into a manhole, the water tight plug may be placed inside the manhole.

2.10 WATER METER LOCATIONS

A. Water meters shall be installed in the public right-of-way perpendicular to the water main. The meters will normally be located in the park strip, or in cases where no park strip exists, may be installed on the city side of the property line. In the case of services tapped off water mains in easements, the meter shall be within the easement and adjacent to the main.

B. Water meters located within the driveway or driveway approach shall be flush with the concrete surface and shall be inspected and approved by the Public Works Department.

PART 3 CUTOFF POLICY

3.01 Heber City's policy regarding disconnection of services for delinquent payment is as follows:

A. When an account become 30 days past due, billings will be marked as past due with payment required in 10 days or service will be disconnected.

B. If no response is received within the first ten day period, a Notice of Disconnection will be mailed. This notice will allow ten additional days before disconnection will take place.

C. If no response is received within the 10 day period the water will be disconnected.

D. Before water services are restored, the bill must be paid in full and payment for a reconnect fee must be paid as identified in the Heber City Consolidated Fee Schedule.

END OF SECTION

SECTION 01450

TESTING AND PROCESS CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section defines the responsibility of the Developer or Contractor to adequately test native materials and construction materials, and to furnish the City with manufacturer's certifications of material quality.

1.02 QUALITY ASSURANCE

A. The developer or Contractor shall be responsible for all sampling, delivery of samples to a qualified testing agency, testing, and delivery of test results or materials certifications to City at no charge to the City. Testing and certifications reports shall be approved by the City as to conformance to City construction specifications prior to final inspection and/or acceptance by the City of any materials or workmanship.

1.03 SUBMITTALS

A. Field Test Report: When possible submit original reports immediately to Engineer or inspector, but in no case later than end of following day.

B. Laboratory Test Report: Submit original report to Engineer within 48 hours after test results are determined.

PART 2 EXECUTION

2.01 SAMPLING

A. Sampling of materials shall be as specified in each test.

B. The City Engineer or City Inspector may require that sampling be performed in their presence, in which case the Developer or Contractor shall be notified of this requirement in writing at the time the building permit is issued, or at the preconstruction meeting, or when construction drawings are released by the City for construction, as applicable.

C. The presence of a City Inspector shall not relieve the Developer/Contractor of any requirement in this Section.

D. Each sample or test shall be accompanied by the following written data, which shall be reported to the City with test results:

1. Name of Project.
2. Name of Developer/Contractor.
3. Project Street Address.
4. Appropriate Test Name.

5. Date of Sampling.

6. Sample Number (if more than one sample per day).

7. Name of technician who performed the testing.

8. Location of sample.

2.02 TESTING AGENCY

A. All materials testing, whether in a laboratory or in the field, shall be conducted by a certified independent testing agency approved by the City.

2.03 SOIL CLASSIFICATION TEST

A. The soil classification test shall be conducted to determine the suitability of native soils for road subbase and building foundations.

B. The soil classification test shall conform to AASHTO M-146 of latest revision.

C. The soil shall be classified according to AASHTO soil classifications.

D. One soil classification test shall be required for each test area. A test area shall be limited to one parcel of one soil type, a maximum 1,000 feet long and maximum 5 acres.

E. In test areas of less than 2 acres, the City Engineer may waive this requirement.

F. The soil sample shall be taken from a test area at a minimum depth of 24 inches below the future design grades, of native soil, and shall be free from foreign material, asphalt, concrete, ice or manmade materials.

G. Where deep footings or pile foundations are proposed, soil classification tests at several depths may be required in each test area.

H. The results of all determinations shall be reported in writing to City Engineer.

2.04 COMPACTION TEST OF SOIL AND UNTREATED BASE COURSE

A. Laboratory tests to establish maximum laboratory density shall be determined in accordance with AASHTO T-180, Method D for A-1 classification soils and AASHTO T-99, Method D for all other soils.

B. Samples to determine laboratory density shall be taken from the stockpiled backfill or from the uncompacted base course in place.

The acceptance of soil and base course with respect to compaction shall be based upon all density tests made in a lot meeting the density required.

ROADS

1. Field density tests shall be as specified by AASHTO T-191 or by use of a portable nuclear density testing device. Field density tests shall be taken at a depth equal to ½ the maximum depth of the lift tested.

2. A lot shall equal the amount of soil or untreated base course compacted in each production day.

3. A test lot shall be divided into sublots and one density test shall be taken within each sublot.

4. The location of sampling sites within the sublot shall be chosen on a random basis by use of a suitable random number table.

5. Each test lot shall have a minimum of two (2) sublots. A sublot shall be no larger than 1,000 cubic yards for embankment, no larger than 200 cubic yards for backfill over pipe or against structures and no larger 1,000 tons for untreated road base.

UTLITY PIPE

1. Main line utility trenches shall have a passing compaction test every 200 feet at each lift.

2. Lateral line utility trenches shall have a minimum of one passing compaction test.

3. Each manhole, inlet, water valve cluster, or any other utility which is raised to grade shall have a minimum of one passing compaction test.

4. All tests, whether they are pass or fail, shall be recorded and submitted by testing company each day.

5. If two sequential tests fail, the frequency of the tests may be increased at the City Engineer's discretion.

C. The test results of all samples tested shall be reported to the City Engineer. A test lot shall be accepted when the average of the density determinations is not less than the density required for that improvement in these specifications and when no one density determination is less than 95% of the density required by these specifications.

D. Compaction tests not conforming to required specifications may be rejected and re-compaction or related construction efforts to obtain compaction shall be at the Developer's expense.

2.05 TEST ROLL OF ROADWAY SUBGRADE

A. Roll Test shall be performed when required by City Engineer to determine the structural integrity of the subgrade and street section.

B. The Roll Test shall be performed as follows:

1. The contractor shall provide a loaded 10 wheel dump truck or water truck to drive over the subgrade material within the roadway.

2. The loaded truck shall be driven slowly over the subgrade to locate soft spots in the subgrade surface.

3. Soft spots in the subgrade shall be identified and marked by the City Engineer or Inspector.

4. It shall be the developer's responsibility to remove the rejected subgrade material to depth determined by City Engineer. The rejected material shall be replaced with A-1 granular backfill approved by City Engineer.

2.06 GRADATION TEST OF UNTREATED BASE COURSE

A. The gradation of untreated base course shall be determined in accordance with AASHTO T-27.

B. The total amount of material passing the No. 200 sieve shall be determined by washing in water in accordance with AASHTO T-11.

C. The acceptance of road base with respect to gradation shall be based upon the average of all determinations in a lot. A lot shall be limited to one source of borrow and limited to one subdivision plat or one development. One sample shall be required for each 1,000 tons of untreated base course in a test lot. When the test lot is less than 100 tons, the requirement for the gradation test may be waived by the City Engineer.

D. The location of sampling sites within a test lot shall be chosen on a random basis by a suitable random number table.

E. All material not conforming to the specified gradations may be rejected at the Developer's expense.

2.07 EXTRACTION - GRADATION TESTING OF BITUMINOUS SURFACE COURSE

A. Samples of the bituminous surface course or asphalt concrete shall be tested with respect to asphalt binder, sieve analysis, theoretical maximum specific gravity, and VMA in accordance with Utah Department of Highways Test Procedures.

B. Mix design shall be submitted to the City Engineer for approval a minimum of 5 working days before work is to begin.

C. Acceptance of bituminous surface course with respect to gradation and bitumen content shall be based upon the average of the determinations made in a lot.

1. A lot shall equal the amount of bituminous surface course placed in each production day.

2. When a lot exceeds 1,000 tons, a minimum of three (3) samples shall be taken in each lot.

3. When a lot is 1,000 tons or less, a minimum of two (2) samples shall be taken.

4. Samples shall be taken at the time of lay-down of bituminous surface course and before compaction. Samples shall be taken from the mat behind the lay-down machine.

5. Sampling shall be timed to represent the entire production day. The time of day, date of sample, station and offset location shall be clearly marked with the sample.

6. If the average asphalt is less than 2.5% of optimal content, the Contractor may be required to lay an additional lift or slurry seal, based on the City Engineer's recommendation.

2.08 COMPACTION TESTING OF BITUMINOUS SURFACE COURSE

A. Laboratory tests to establish the Theoretical Maximum Specific Gravity of the bituminous surface course shall be determined in accordance with ASTM D2041 and ASTM D1559.

B. Samples to determine maximum laboratory density shall be taken at the time of lay-down of bituminous surface course and before compaction.

C. Acceptance of bituminous surface course with respect to compaction shall be based upon the average determination of field density tests made in a lot.

1. Field density tests shall be by a portable nuclear density testing device and by laboratory density analysis of core samples. At a minimum, one core sample shall be taken every 2,000 tons or at each change in mix design to calibrate the portable nuclear density testing device(s). The location of the core shall be at a location also tested with the portable nuclear testing device. Each portable nuclear testing device shall be calibrated to the density of a core test at the same location as the core was taken. Additional core tests shall be completed per the direction of the City Engineer.

2. A test lot shall be the quantity of surface course placed and compacted in each construction day.

3. The test lot shall be subdivided into sublot(s) of approximately equal size and no larger than 1,600 square yards in area.

4. One field density test shall be taken in each sublot, randomly located in the test lot by use of a suitable random number table.

D. Test lots shall be accepted with respect to density when the average in place density meets the requirements of Section 02510. Entire test lots or individual areas not meeting these requirements are subject to removal and replacement at the discretion of the City Engineer.

E. Core Tests

1. Acceptance of the completed bituminous surface course with respect to thickness shall be based on the average thickness of a test lot.
   a. A test lot shall equal approximately 4,000 square yards of completed roadway.
   b. A lot shall be divided into sublots of approximately 2,000 square yards.

2. One thickness test, randomly selected by use of a random number table, shall be taken within each sublot. A minimum of three core tests will be taken.

3. A lot shall be accepted when the average thickness of all sublots is not less than 3/8 inch the total designated bituminous surface course thickness and when no individual sublot shows a deficient thickness of more than ½ inch.

4. Lots or sublots that are not acceptable because of deficient thickness shall be brought into compliance by placing additional surface course as directed by the Engineer.

5. The removed core will be replaced with low strength concrete.

2.09 COMPRESSIVE STRENGTH TESTING OF CONCRETE CYLINDERS

A. Samples of concrete shall be taken at the construction site, molded in standard cylinder shapes, allowed to cure, and tested with respect to comprehensive strength when required by the City Engineer.

B. All samples of concrete shall be taken in conformance to AASHTO T-141 of the latest revision.

C. Acceptance of concrete with respect to compressive strength shall be based upon the average determination of all "strength tests" made in a lot.

1. A test lot shall be the quantity of concrete placed at one job in a construction day.

2. For each 50 cubic yards of concrete in a test lot, a minimum of three (3) compressive "strength tests" shall be run, except that for lots of less than 5 cubic yards, the number of "strength tests" per lot shall be the average strength of three standard cylinders.

3. The making, curing and compressive strength testing of concrete cylinders shall conform to AASHTO T-22 and AASHTO T-23.

D. Concrete may be rejected if desired strengths are not obtained at the Developer's expense.

2.10 ADDITIONAL CONCRETE TESTING

A. Slump Test: Determine slump in accordance with AASHTO T-152. One slump test is required for every 50 yards with a minimum of one test per day.

B. Air Test: Determine normal weight concrete air content; AASHTO T-152 and light weight concrete air content; AASHTO T-196.

C. When requested by Engineer, test concrete in place by impact hammer, sonoscope, or other nondestructive device:

1. To determine relative strengths in various locations in Work.

2. To aid in evaluating concrete strength.

3. To select areas to be cored.

2.11 CERTIFICATIONS FOR WATER SYSTEM VALVES

A. In certain water system equipment, steel items and pipe listed below, a manufacturer's certificate shall be furnished with each unit of equipment, certifying conformance to the applicable requirements of City Standard Specifications:

1. Gate Valves.

2. Butterfly Valves.

3. Steel Reinforcing Bars.

4. Structural Steel.

5. Corrugated Metal Pipe.

6. Polyvinyl Chloride Pipe.

7. ABS Composite (Truss) and Solid Wall Pipe.

2.12 SUMMARY TABLE OF TESTS AND CERTIFICATIONS

A. The following is a summary of the tests, number of samples per test and certificates that are required for construction work and developments in Heber City. This summary is provided as a reference guide. For details governing each item, refer to the appropriate test specification herein.

TEST SUBJECT	SPECIFIC TEST	NUMBER OF TESTS
Soil Classification	AASHTO M-145	1 test per test area of uniform soil type and 5 acres maximum.
Compaction of Soil & Base Course	Lab Density- AASHTO T-99 Method D or AASHTO T-180 Method D Embankment & Base Course Field Density- Portable Nuclear	As needed to establish laboratory density 1 test plus minimum one test per 1,000 cu.yds.

TEST SUBJECT	SPECIFIC TEST	NUMBER OF TESTS
	Equipment or AASHTO T-191 Backfill Field Density- Portable Nuclear Equipment or AASHTO T-191	1 test plus minimum one test per 200 cu.yds.
Base Course Gradation	Sieve Analysis- AASHTO T-27 Passing No. 200 Sieve- AASHTO T-11 Utility Pipe	1 test per 1,000 tons Every 200 linear feet of main line trench at each lift. One test per lateral trench and at each utility (MH, Valve, box, etc.)
Extraction-Gradation Test of Bituminous Surface Course	UDOT Test Procedure 8-946 & 8-947	3 tests per pavement construction day
Compaction of Bituminous Surface Course	Lab Density- Marshall Test, ASTM D-1559 Field Density- Portable Nuclear Equipment	1 test per pavement construction day 1 test per 1600 square yards sublot
Core Tests	4" Core Sample	1 thickness test per 2,000 square yards or 3 test minimum
Concrete Test Cylinders Air & Slump Test	AASHTO T-23	3 cylinders per 50 cubic yards or minimum of 3 cylinders on placements less than 50 cubic yards
Pressure Reducing & Regulating Valves	Manufacturer's Certificate	1 for each valve
Gate Valves	Manufacturer's Certificate	1 for each valve over 12" diameter
Back Flow Reduced Pressure Zone Assembly (RP)	Field Test Certificate by licensed technician	
Butterfly Valves	Manufacturer's Certificate	1 for each valve
Steel Re-Bar	Manufacturer's Certificate	1 for each 1,000 pounds of one grade
Structural Steel	Manufacturer's Certificate	1 for each lot of one shape, one grade
Corrugated Metal Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class
Polyvinyl Chloride Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class
A.B.S. Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class

END OF SECTION

SECTION 02150

SHORING AND UNDERPINNING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shoring for open excavations requiring a protective system.

1.02 REFERENCES

A. OSHA Construction Standards Chapter P: Excavations, Trenching, and Shoring.

1.03 RESPONSIBILITY

A. Contractor/Developer is solely responsible for safety. It is the Contractor/Developer's responsibility to adhere to all of OSHA's current regulations.

1.04 DEFINITIONS

A. Accepted Engineering Practices: Those requirements or practices which are compatible with standards required by a duly licensed or recognized authority.

B. Benching: A method of protecting persons and property against cave-ins by excavation the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

C. Excavation: Any man-made cut, cavity, or depression in an earth surface, including trenches, formed by earth removal and producing unsupported earth conditions (sides). If installed forms or similar structures reduce the depth-to-width relationship, and excavation may become a trench.

D. Failure: The permanent deformation or breakage of a structural member or connection; or the collapse of all or part of an excavation.

E. Protective System: Any recognized method of protecting persons and property against cave-ins, the collapse of adjacent structures, or material that may fall or roll from an excavation side or into and excavation. Protective systems include support systems, sloping and benching systems and shield systems.

F. Shield/Trenchbox : A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect persons and property within the structure without preventing a cave-in. Shields may be permanent structures or may be designed to be portable and moved along as work progresses. Portable shields used in trenches are usually referred to as "trench boxes" or "trench shields".

G. Shoring: A structure that supports the sides of an excavation and thereby protects persons and property by preventing cave-ins.

H. Sides: A vertical or inclined earth surfaces formed at the outer edges of an excavation.

I. Sloping: A method of protecting persons and property against cave-ins by excavation to form sides that are inclined away from the excavation, the angle on incline being of such a degree for the conditions of exposure that a cave-in will not occur.

J. Support System: A structure which protects persons and property by providing support to an adjacent structure, underground installation, or the sides of an excavation.

K. Trench: A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.

1.05 DESIGN OF PROTECTIVE SYSTEMS

A. Use professional engineer to design support systems, shield systems, and the structural components of these systems, and sloping and benching systems to resist without failure all loads that are intended to be imposed or transmitted to them.

B. Fully compensate in design procedures for hydrostatic pressure in the excavation sides.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials shall be as per 1.05 of this section.

PART 3 EXECUTION

3.01 STABILITY OF ADJACENT STRUCTURES

A. Use support systems such as shoring, bracing, or underpinning where stability of adjoining buildings, walls, sidewalks, pavements, or other structures is endangered by excavation operations.

3.02 INSPECTIONS

A. Contractor/Developer shall employ and have on site at all times a competent person, as defined be OSHA, who is responsible for excavation inspection.

B. Inspect excavations daily for evidence of possible cave-ins, indications of failure of protective systems, or other hazardous conditions.

C. Upon discovery of hazardous conditions, cease all work in the excavations until additional precautions have been taken to ensure persons and property safety.

3.03 ADDITIONAL REQUIREMENT FOR TRENCH EXCAVATION

A. Do not excavate material to a level greater than 2 feet below the bottom of the members of a support system if the system is designed to resist the forces calculated for the full depth of the trench, and indications of a possible cave-in below the bottom of the support system are not evident while the trench is open.

END OF SECTION

SECTION 02205

COMMON FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Common fill material requirements.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

B. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.03 DEFINITIONS

A. Common Fill: Backfill material which is not mechanically graded.

1.04 ACCEPTANCE

A. Acceptance of common fill shall be determined by Engineer and will be based upon sublots of 500 tons.

B. Engineer reserves the right to select and test backfill on a random basis from any location in the Work, on the site or from the backfill source.

PART 2 PRODUCTS

2.01 GRANULAR FILL

A. Classification A-1-a. Refer to AASHTO M145

B. Non-Plastic and well graded.

C. Bank run material: free of shale, clay, slag, friable material and debris.

D. The material must be within the following limits:

SIEVE SIZE	PERCENT BY WEIGHT PASSING SIEVE
4 inches	99
No. 4 (4.75 mm)	30 to 70
No. 200 (75 micro m)	3 to 15

2.02 BORROW

A. Sound, earthen material with 95% passing the 4 inch sieve.

B. Classifications A-1-a through A-4. Refer to AASHTO M145.

2.03 SAND

A. Clean, coarse, natural sand.

B. Nonplastic when tested in accordance with ASTM D 4318.

C. 100 percent shall pass a ½ inch screen.

D. No more than 20 percent shall pass a number 200 screen.

2.04 SOURCE QUALITY CONTROL

A. Verify gradation compliance in accordance with AASHTO T-27. Select samples uniformly in time on a random basis.

PART 3 EXECUTION

3.01 INSTALLATION

B. Excavation and Backfill Operations: In accordance with Section 02225.

END OF SECTION

SECTION 02206

SELECT FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Select fill material requirements.

1.02 REFERENCES

A. AASHTO T-96: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

B. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.03 DEFINITIONS

A. Select Fill: Backfill material which is mechanically graded.

1.04 SUBMITTALS

A. Material analyses of each select fill material to be used.

1.05 ACCEPTANCE

A. Engineer reserves the right to select, reject, and test backfill on a random basis from any location in the Work or from the backfill source.

PART 2 PRODUCTS

2.01 AGGREGATES – UNTREATED BASE COURSE

A. Clean, hard, tough, durable and sound mineral aggregates that consists of 95% crushed stone, crushed gravel or crushed slag; free of deleterious and organic matter; and complies with the following:

1. Aggregate Wear Under AASHTO T-96: Less than 50 percent.

2. Material shall be classified as A-1 material.

3. Two fractured faces Under AASHTO T-335: A minimum of 50 percent.

4. Dry Rodded Weight Under AASHTO T-19: Not be less than 75 lb/ft^3.

5. Gradation Limits: Establish the job mix target gradation for each sieve. Target grading curve must lie within the gradation limits of the Master Grading Band Limits. The Job Mix Gradation Tolerance is the allowable deviation from the job mix target gradation on the applicable sieves. The following limits are based on fine and course aggregate having approximately the same bulk specific gravities. Sieve gradations are based upon percent of aggregate passing by weight in accordance with AASHTO T-27 and T-11.

MASTER GRADING BAND LIMITS – UNTREATED BASE COURSE

SIEVE SIZE	Type 1-1/2		Type 1		Type 3/4		JOB MIX GRADATION TOLERANCE
	Min	Max	Min	Max	Min	Max	
1-1/2"	100	--	--	--	--	--	
1"	90	100	100	--	--	--	±9.0 (1-1/2")
3/4"	70	85	--	--	100	--	±9.0 (1-1/2 &1")
½"	65	80	79	91	--	--	±9.0
3/8"	55	75	--	--	78	92	±9.0
No. 4	40	65	49	61	55	67	±7.0
No. 16	25	40	27	35	28	38	±5.0
No. 200	7	11	7	11	7	11	±3.0

6. Source quality control shall be in accordance with AASHTO T-27. Verify job-mix grading band material compliance by selecting samples uniformly in time on a random basis.

2.02 DRAIN ROCK

A. Consist of hard, durable particles of stone or gravel, screened or crushed to specified size and gradation.

B. Free from vegetable matter, lumps or balls of clay, or other deleterious matter.

C. Crush or waste coarse material and waste fine material as required to meet gradation requirements.

D. Aggregate Wear: Percentage of wear not greater than 50 percent when tested in accordance with AASHTO T-96.

E. Conform to size and grade within the limits as follows when tested in accordance with AASHTO T-27.

	¾ " Drain Rock	1-1/2" Drain Rock	3" Drain Rock
SIEVE SIZE (Square Openings)	PERCENT BY WEIGHT PASSING SIEVE	PERCENT BY WEIGHT PASSING SIEVE	PERCENT BY WEIGHT PASSING SIEVE
4 inch	100	100	100
3 inch	100	100	95-100
2 inch	100	100	50-100
1-1/2 inch	100	95-100	15-55
3/4 inch	95-100	50-100	0-20
3/8 inch	15-55	15-55	0-15
Number 4	0-10	0-25	0-10
Number 8	0-5	0-5	0-5
Number 200	0-2	0-2	0-2

2.03 GRAVEL

A. Consist of hard, durable particles or fragments of stone or gravel, screened or crushed to specified sizes and gradations.

B. Free from vegetable matter, lumps or balls of clay, alkali, adobe, or other deleterious matter.

C. When sampled and tested in accordance with specified test methods, material shall comply with the following requirements:

1. Durability index: Percentage of wear not greater than 40 percent after 500 revolutions when tested in accordance with ASTM C 131.

2. Plasticity Index: Not greater than 5 when tested in accordance with ASTM D 4318.

3. Liquid limit: Not greater than 25 percent when tested in accordance with ASTM D 4318.

D. Conform to sizes and grade within the limits as follows when tested in accordance with ASTM C 136 and ASTM C 117:

SIEVE SIZE (Square Openings)	PERCENT BY WEIGHT PASSING SIEVE
3 inch	--
1-1/2 inch	100
Number 4	30-70
Number 8	20-60
Number 30	10-40
Number 200	0-12

2.04 PEA GRAVEL

A. Consists of hard, durable particles or fragments of stone or gravel, screen or crushed to specified sizes and gradations. Pea gravel shall only be used with Engineer's approval.

SIEVE	PERCENT PASSING BY WEIGHT
1/2 inch	100
3/8 inch	95-100
Number 4	0-3
Number 16	0-2
Number 200	0-1

2.05 COARSE SAND

A. Consists of hard, durable particles or fragments of stone or gravel, screen or crushed to specified sizes and gradations. Coarse sand shall only be used with Engineer's approval.

SIEVE	PERCENT PASSING BY WEIGHT
3/8 inch	100
Number 4	95-50
Number 16	0-5
Number 200	0-3

2.06 BEDDING SAND

A. Friable river or bank aggregate, free of loam and organic matter. Graded as follows.

SIEVE	PERCENT PASSING BY WEIGHT
3/8 inch	100
Number 4	95-100
Number 50	0-70
Number 100	0-30
Number 200	0-20

PART 3 EXECUTION

3.01 INSTALLATION

A. Excavation and Backfill Operations: In accordance with Section 02225.

END OF SECTION

SECTION 02225

EXCAVATION AND BACKFILL OPERATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for trenching and backfilling for underground pipelines.

B. Excavating and backfilling operations adjacent to and under structures including boxes, headwalls, or other structures as required by City Engineer.

C. Backfilling and compacting operation for construction and reconstruction of roadways, embankments, streets, parking lots, and other paved surface areas.

D. Excavation permit requirements.

1.02 DEFINITIONS

A. Pipe Zone: That zone in an excavation which supports, surrounds, and extends to 1 foot above the top of the pipe barrel.

B. Bedding: Process of preparing the trench bottom to receive the pipe and the backfilling on each side of the pipe to 12 inches over the top of the pipe.

C. Roadway: Area within the street right-of-way, including the area under the street, curb, gutter, and one (1) foot behind curb.

1.03 SUBMITTALS

A. Cut Sheets: In accordance with Section 00700.

B. Material Analysis Reports: In accordance with Sections 02205 or 02206 as applicable.

C. Density Test Reports: In accordance with Section 02250.

D. Depth of backfill lift. This information shall be contingent upon type of equipment used in compaction operation. Engineer may order lesser thickness if compaction is not achieved.

1.04 STORAGE AND HANDLING

A. Stockpile excavated material in a manner as to cause a minimum of inconvenience to public travel and provide for emergency traffic as necessary.

B. Maintain free access to all existing fire hydrants, water valves, irrigation valves, gas valves, manholes, cleanouts, and meters.

C. Maintain clearance for free flow of storm water in all gutters, conduits, and natural water courses.

D. Utilize appropriate traffic signs, markers, and procedures in all product storage and handling activities.

E. Promptly remove all other material from site.

1.05 SITE CONDITIONS

A. Unsuitable Weather Limitations: Do not place, spread, or roll any fill material during unsuitable weather conditions. Do not resume operations until moisture content of material is satisfactory.

B. Protection of Graded Areas: Protect graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or unsuitable weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Prior to excavation operations, photograph existing surfaces along which Work may take place in order to determine, after construction is completed, whether any damage of existing improvements occurred prior to construction operations.

E. Grading: In compaction operations, do not vary the surface of finished aggregate base course more than 1/4" above or below grade.

PART 2 PRODUCTS

2.01 WATER

A. Make arrangements for source of water during construction and make arrangements for delivery of water to site. Comply with all local laws and regulations when securing water from water utility company at no additional cost to City.

2.02 SOIL MATERIALS

A. Over-excavation Fill: Select Fill: in accordance with Section 02206.

B. Common Fill: in accordance with Section 02205.

C. Select Fill: in accordance with Section 02206.

D. Native Backfill:

1. When approved by City Engineer, native backfill material obtained from project excavations may be used as backfill, provided organic material, rubbish, debris, rocks larger than 8 inches, and other objectionable materials are removed.

2. Bituminous pavement obtained from project excavations will not be permitted as backfill except for the following:
   a. May be mixed with road sub-base if material meets section 02205.2.01 gradation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify areas to be backfilled are free of debris, snow, ice, or water and ground surfaces are not frozen.

B. Verify foundation of basement walls are braced to support surcharge forces imposed by backfilling operations and that required concrete compressive strengths have been achieved.

C. Immediately prior to suspension of construction operations for any reason, provide proper and necessary drainage of work area.

3.02 PREPARATION

A. For pipelines, use means necessary to avoid displacement, and injury to, pipe and structures while compacting soil or operating equipment next to pipeline.

B. Movement of construction machinery over a pipeline at any stage is solely at Contractor's risk.

C. When excavation is required in jurisdictions other than City, satisfy all conditions of the appropriate agencies.

D. Identify required lines, grades, contours, and benchmarks.

E. Notify all affected utility companies and Blue Stakes prior to commencing excavation operation.

F. Support and protect from damage, until completion of the Work, any existing facilities and structures which exist in, pass through, or pass under the site.

3.03 CONTROL OF GROUNDWATER

A. All trenches shall be kept free from water during excavation, fine grading, pipe laying, jointing, and embedment operations.

B. Where the trench bottom is mucky or otherwise unstable because of the presence of groundwater, and in cases where the static groundwater elevation is above the bottom of any trench or bell holed excavation, such groundwater shall be lowered to the extent necessary to keep the trench free from water and the trench bottom stable when the work within the trench is in progress.

3.04 SHORING

A. Comply with Section 02150 when required by field condition.

3.05 GENERAL EXCAVATION OPERATIONS

A. If topsoil is on site, remove and store it for later use on site.

B. Excavate site to required grade for Work. Use all means necessary to control dust on or near Work and on or near all off-site borrow and disposal areas.

C. Notify Engineer of unexpected subsurface conditions.

D. Underpin adjacent structure which may be damaged by excavation work, including service utilities and pipe chases.

E. If unstable material is encountered at the bottom or face of excavation, suspend excavation and consult with Engineer. Obtain written approval from Engineer before proceeding. Correct unauthorized excavation at no cost to City.

F. Provide necessary protection to excavation walls as required. If conditions permit, slope excavation side to maintain a safe and clean working area. Remove loose materials.

G. Correct excavation beyond the specified lines and grades by filling the resulting voids with approved compacted fill. If the fill is to become the subgrade for other fill, use material approved by Engineer. Do not proceed until Engineer has approved the material and the proposed method of backfilling for over excavation errors.

3.06 EXCAVATION FOR PIPELINES

A. Trenches shall be excavated to the depths and widths required to accommodate the construction of the pipelines, as follows:

1. Except in ledge rock, cobble rock, stones or water saturated earth, mechanical excavation of trenches shall not extend below an elevation of 4 inches below the bottom of the pipe after placement in its final position.

2. All additional excavation necessary for preparation of the trench bottom shall be made manually.

3. Excavation for trenches in ledge rock, cobble rock, stones, mud or other material unsatisfactory for pipe foundation, shall extend to a depth of at least 4 inches below the bottom of the pipe.

4. A bedding of special material shall be placed and thoroughly compacted with pneumatic tampers in 4-inch lifts to provide a smooth, stable foundation.

5. Special foundation material shall consist of suitable earth material free from roots, sod, vegetation, or other organic matter.

6. Trench bottoms shall be hand shaped as specified in paragraph (2) above.

7. The maximum width of trench, measured at the top of the pipe, shall be as narrow as possible but a minimum of 6 inches on each side of the pipe.

8. Where ground water is encountered, clay dikes and/or filter fabric may be required at minimum100 foot intervals or as directed by the City Engineer.

B. Grade bottom of trenches to provide uniform bearing surface.

C. If necessary, make bell holes and depressions required to complete joining of pipe or box.

D. In public thoroughfares and regardless of trench depth, safely barricade and limit open trenches to a maximum of 200 lineal feet in the daytime, except in traveled roadways where a maximum of 80 lineal feet of open trench will be allowed.

E. Close trenches during nighttime conditions.

3.07 GRAVEL FOUNDATION FOR PIPE

A. Wherever the subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load; where water must be drained to maintain a dry bottom for pipe installation and at other locations as previously defined, the subgrade shall be excavated to a minimum of 12 inches and replaced with crushed rock or gravel.

B. Gravel for pipe foundations shall conform to the requirements of Drain Rock in Section 02206.

C. Drain Rock material shall be deposited over the entire trench width in 18-inch maximum layers, each layer shall be compacted by tamping, rolling, or vibrating.

D. The material shall be graded to produce a uniform and continuous support for the installed pipe.

3.08 BEDDING & PIPE ZONE

A. Excavate pipe trench in accordance with this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Form and place concrete for pipe thrust restraints at any change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide thrust restraint bearing on native subsoil according to standard drawings.

C. Place bedding material at trench bottom in one continuous layer not exceeding 8 inches compacted depth; compact to 95 percent.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact to 95 percent.

E. Backfill shall be carefully placed around and over pipes and shall not be permitted to fall directly on a pipe from such a height or in such a manner as to cause damage.

F. Maintain optimum moisture content of bedding material to attain required compaction density.

3. 09 BACKFILLING FOR PIPELINES

A. Lift thickness for trench backfill shall not exceed 8 inches compacted depth.

B. Trench backfilling above the level of the pipe bedding shall normally be accomplished with A-1 material. Native excavated materials may be used when approved by Heber City and shall be free from rocks larger than 8-inches in diameter.

C. Compaction Requirements

1. Under pavements, shoulders, or other surface improvements the in-place density shall be a minimum of 95% of laboratory maximum dry density as determined by AASHTO T-180 (ASTM D1557) for A-1 soils and AASHTO T-99 (ASTM D698) for all other soils.

2. In other areas the in-place density shall be a minimum of 92% of the maximum dry density as determined by the same laboratory method.

3. See Section 01450.2.04.C.6.

D. Clay cut off dikes shall be constructed as required by City Engineer.

3.10 STRUCTURAL EXCAVATION

A. Provide all required shoring, cribs, cofferdams, and caissons including all pumping, bailing, draining, sheathing, bracing, and related items.

B. Slope excavation sides as excavation progress to maintain a safe and clean working area as required by OSHA.

C. Support excavation. Do not interfere with the bearing of adjacent foundations, pipelines, etc.

D. All unauthorized excavation below the specified structure subgrade shall be replaced with concrete, monolithic with that of the slab above or with coarse gravel thoroughly compacted into place.

E. Subgrade soil for all concrete structures shall be firm, dense, thoroughly compacted, and consolidated.

F. Subgrade soil shall be free from mud and muck; and shall be sufficiently stable to remain firm and intact under the feet of the workmen engaged in subgrade surfacing, laying reinforcing steel, and depositing concrete.

G. Coarse gravel or crushed stone may be used for subsoil reinforcement if results satisfactory to the City Engineer can be obtained thereby.

1. Material shall be applied in lifts of 6" or less.

2. Each lift shall be embedded in the subsoil by thorough tamping.

3. All excess soil shall be removed to compensate for the displacement of the gravel or crushed stone and the finished elevation of any subsoil reinforced in this manner shall not be above the specified subgrade.

3. 11 BACKFILLING FOR STRUCTURES

A. Do not fill adjacent to structures until approval is obtained from Engineer.

B. All forms shall be removed and the excavation shall be cleaned of all trash and debris.

C. Backfill areas to contours and elevations indicated. Do not use frozen materials.

D. Do not use compaction equipment adjacent to walls or retaining walls that may cause wall to become overstressed or moved from final alignment.

E. Place select fill a minimum of 3 feet around the outside of structures.

F. Place and compact select fill materials in continuous lifts not exceeding 12" loose depth.

G. Place and compact common fill material in continuous lifts not exceeding 8" loose depth.

H. Do not disturb or damage foundation perimeter drainage, foundation, damp proofing, foundation waterproofing and protective cover, or utilities in trenches.

I. Backfill against foundation walls simultaneously on each side. Do not backfill against walls until concrete has obtained required 7 day strength.

J. Make smooth changes in grade. Blend slopes into level areas.

K. Remove surplus backfill materials from site.

L. Leave stockpile areas completely free of excess fill materials.

M. Slope grade away from structure at a minimum of 3" in 10 feet unless otherwise indicated.

N. Compaction: Each layer of material shall be compacted by hand or machines tampers or by other suitable equipment to a density equal to 95% of maximum dry density as measured by AASHTO T-180 (ASTM D1557) for A-1 soils and AASHTO T-99 (ASTM D698) for all other soils.

O. Restore any damaged structure to its original strength and condition and re-backfill to specifications.

3. 12 ROADWAY EXCAVATIONS

A. In advance of setting line and grade stakes, clean subgrade area of brush, weeds, vegetation, grass, and debris. Drain all depressions or ruts which contain water.

B. A soils classification, as determined by AASHTO T-27, shall be made on the proposed subgrade, and the following shall be required based on that classification:

SOIL CLASSIFICATIONS	REQUIREMENT
A-1	The subgrade shall be scarified to a depth of 12" and the loosened material shall be moistened and compacted to the equivalent of 95% of maximum dry density as measured by AASHTO T-180.
A-2, A-3, A-4 or A-5	The subgrade shall be over-excavated a minimum of 12" subgrade scarified and compacted, replaced with A-1 granular material, and be moistened and compacted as above.
A-6 or A-7	The subgrade shall be over-excavated a minimum of 18" subgrade scarified and compacted, replaced with A-1 granular material, and be moistened and compacted as above.

C. No organic material, soft clay, spongy material, or other deleterious material will be permitted in the scarified or imported subgrade layer.

D. Rough sub-grades shall be shaped and graded to within a tolerance of 0.15 feet of design grade and drainage shall be maintained at all times.

E. Moisture content of the subgrade layer shall be maintained at not less than 95% or more than 105% of optimum moisture content, during the compaction process. The entire roadbed, to one foot behind the back of curb, must be compacted to the specified density to a minimum depth of 8 inches.

F. If removal of boulders, rubble, or existing improvements, found within the excavated area results in a lower excavation elevation than indicated, backfill over excavation in a manner approved by Engineer.

G. Remove all deposits susceptible to frost heave.

H. Excavations through or under City streets, sidewalks, street shoulders, driveways, etc. shall comply with the following requirements:

1. Material removed by excavation is not to be used as backfill or placed back into the trench under any paved portion of the street. However, sand may be used for backfill up to one foot above top of pipe.

2. The remaining trench shall be filled with select fill as per section 02206.

3. The trench shall be filled to the existing asphalt level and guarded from traffic until set.

4. Within 10 days of the fill, sufficient fill material shall be removed and replaced with material comparable to the adjacent surface material shall meet the requirements of Section 02504 of these specifications.

5. The City Engineer shall inspect all work.

3. 13 SUBGRADE PREPARATION

A. Compact subgrade surfaces to density specified for overlying backfills. Refer to Section 02250.

B. If areas of subgrade are not readily capable of in-situ compaction, secure City Engineer's authorization for extra excavation and backfill.

C. Maintain minimum overburden cover of 2 feet over pipelines or conduits during subgrade preparation.

3. 14 BACKFILLING FOR PAVEMENT

A. Before beginning backfilling operations obtain Engineer's approval of excavation operation.

B. Do not damage subsurface structures, utility mains, or service lines.

C. Process backfill and avoid segregation. Keep base course free from pockets of coarse or fine material.

D. Deposit base course on the roadbed in a uniform manner which will provide the required compacted thickness. Maintain moisture content.

E. Shoulders are an integral part of the embankment. Do not build shoulders to a grade higher than that of the adjacent granular base course. Maintain efficient surface runoff at all times.

F. Compaction: in accordance with Section 02250.

G. Prior to placing pavements, proof roll in accordance with Section 01450.

3. 15 BLASTING

A. Blasting will not be allowed except by permission from the City Engineer.

B. The Contractor shall comply with all laws, ordinances, and applicable safety code requirements and regulations relative to the handling, storage, and use of explosives and protection of life and property.

C. If allowed, Contractor shall be fully responsible for all damage attributable to his blasting operations.

D. Excessive blasting or overshooting will not be permitted and any material outside the authorized cross-section which may be shattered or loosened by blasting shall be removed by the Contractor.

3. 16 COMPACTION OF BACKFILL

A. In accordance with Section 02250.

3. 17 IMPORTED BACKFILL MATERIAL

A. In the event the native excavated material is not satisfactory for backfilling as determined by the City Engineer, the Contractor shall provide imported granular fill in accordance with Section 02205.

3. 18 DISPOSAL OF EXCESS MATERIALS

A. All excess material shall be hauled away from the construction site and disposed of by the Contractor.

END OF SECTION

SECTION 02245

LOW DENSITY CONCRETE BACKFILL (FLOWABLE FILL)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Low density concrete backfill.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 150 - Specification for Portland Cement.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements

1. Low Density Concrete Backfill:
   a. 28 day compressive strength shall be between 100 psi and 150 psi. (1 bag mix)

1.04 SUBMITTALS

A. Proposed mix design.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Pregenerated foam: One of the following or equal:

1. Mearl Corporation, Roselle Park, N.J., Mearl Geofoam Liquid.

2.02 MATERIALS

A. Low Density Concrete Backfill Components:

1. Type II low alkali Portland cement.

2. Water.

3. Aggregate: Pregenerated foam, vermiculite, or other low weight aggregate material which will conform to the strength and density requirements specified herein.

PART 3 EXECUTION

3.01 INSTALLATION

A. General

1. Low density concrete (flowable fill) may only be used for backfill when approved by the City Engineer.

2. Install low density concrete backfill as a nonstructural backfill material as indicated on the submitted Drawings.

3. Place low density concrete backfill in a manner so that minimal consolidation of the material occurs during and after placement.

B. Metal plates shall be placed over trench for 48 hours to protect concrete.

END OF SECTION

SECTION 02250

SOIL COMPACTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Compaction control of native and imported backfill material.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

B. AASHTO T-99: Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Hammer and 12-In. (305-mm) Drop.

C. AASHTO T-180: Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using a 10-lb (4.54-kg) Hammer and an 18-In. (457-mm) Drop.

D. AASHTO T-238: Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.03 DEFINITIONS

A. A-1 Soils: AASHTO M 145 describes the nature of these soils.

B. Modified Proctor: The test method used for moisture-density relationship of soils as determined by the ASTM D 1557 test method.

C. Percent Compaction or Percent Density: The ratio of the field dry density to the laboratory maximum dry density expressed as a percentage.

D. Standard Proctor: The test method used for moisture-density relationship of soils as determined by the ASTM D 698 test method.

1.04 WARRANTY

A. Correct deficient conditions. Replace or repair surfacing materials and damaged facilities.

B. The method of construction repair shall be proposed in writing by Contractor for approval by Engineer prior to correcting the failed condition.

C. Failure to detect any defective work or material does not prevent later rejection of the work nor obligate Engineer for final acceptance when such defective work or material is discovered.

PART 2 EXECUTION

2.01 COMPACTION REQUIREMENTS

A. The Developer\Contractor shall be responsible to perform and pay for all testing of earth materials.

B. Moisten or de-water backfill material to obtain optimum moisture for compaction compliance.

C. The material shall be deposited in horizontal layers having a compacted thickness of no more than 12 inches for roadway and 6 inches for trenches.

D. The distribution of materials shall be such that the compacted material will be homogeneous and free from lenses, pockets, or other imperfections.

E. The material shall have the optimum moisture content required for the purpose of compaction and the moisture content shall be uniform throughout the layer, insofar as practicable.

F. Backfill shall be compacted by means of sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers of a size and type approved by the City Engineer.

G. If the required relative density is not attained, test sections will be required to determine any adjustments in compacting equipment, thickness of layers, moisture content and compactive effort necessary to attain the specified minimum relative density.

H. Approval of equipment, thickness of layers, moisture content and compactive effort shall not be deemed to relieve the Contractor of the responsibility for attaining the specified minimum relative densities.

I. The Contractor in planning his work shall allow sufficient time to perform the work connected with test sections and to permit the City Engineer to make tests for relative densities.

J. The Contractor shall take care not to overwork soils and exceed maximum compaction percentages when such percentages are defined. Contractor shall be responsible to adjust work methods and equipment necessary to meet compaction requirements without additional costs to the City.

2.02 FIELD QUALITY CONTROL

A. Optimum Soil Density: Unless indicated otherwise.

1. In accordance with AASHTO T-180 Method D test (Modified Proctor).

2.03 COMPACTION UNDER ROADWAYS

A. Fill or embankment material shall normally consist of A-1 materials and be compacted to not less than 95% of maximum dry density as measured by AASHTO T-180 (ASTM D1557).

B. Compaction shall extend one foot beyond proposed back of curb line.

2.04 COMPACTION UNDER SIDEWALKS, CURB AND GUTTER, AND DRIVEWAYS

A. Fill or embankment material shall normally consist of A-1 materials and be compacted to not less than 95% of maximum dry density as measured by AASHTO T-180 (ASTM D1557).

B. Compaction of material shall extend to at least one foot each side of the edge of the slab.

2.05 COMPACTION OF OTHER FILLS AND EMBANKMENTS

A. Fill or embankment materials other than those mentioned above shall be compacted to not less than 92% of maximum dry density as measured by AASHTO T-180 (ASTM D1557) for A-1 soils and by AASHTO T-99 (ASTM D698) for all other soils.

END OF SECTION

SECTION 02504

ASPHALT CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This is a material specification for hot mix and cold mix bituminous paving mixtures.

1.02 REFERENCES

A. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregate.

B. AASHTO M-17: Standard Specification for Mineral Filler for Bituminous Paving Mixtures.

C. AASHTO T-165: Standard Test Method for Effect of Water on Cohesion of Compacted Bituminous Mixtures.

D. AASHTO T-245: Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

E. AASHTO T-246: Standard Test Methods for Resistance to Deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus.

F. AASHTO T-182: Standard Test Method for Coating and Stripping of Bitumen-Aggregate Mixtures.

G. AASHTO M-156: Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.

H. ASTM D 4215: Standard Specification for Cold-Mixed, Cold-Laid Bituminous Paving Mixture.

1.03 DEFINITIONS

A. Traffic Classifications:

1. Class I: Parking lots, driveways, light traffic residential streets, light traffic farm roads.

2. Class II: Residential streets, rural farm and residential roads.

3. Class III: Urban minor collector streets, rural minor collector roads.

4. Class IV: Urban minor arterial and light industrial and light industrial streets, rural major collector and minor arterial highways.

5. Class V: Urban freeways, expressways and principal arterial highways, rural interstate and other principal arterial highways.

1.04 SUBMITTALS

A. Mix Design: Submit each proposed mix design 14 days prior to use in the Work. Include in the report the following information.

1. Mix design method: A Marshal Mix Design or Superpave Mix Design shall be used for Class I and Class II roads. Superpave Mix Design shall be used for Class III, Class IV, and Class V roads.
   a. For Marshall: use a five (5) point design using a four (4) point binder series with a one (1) point verification at the optimum binder content.
   b. For Superpave Mix Design: follow the 2017 Utah Department of Transportation (UDOT) Standard Specification section 02741 Hot Mix Asphalt (HMA) requirements for aggregates and volumetric mix design. All designs gyrations and compaction parameters shall meet the 20 year design ESALS 0.3 to < 3 Million. (N_{design}/% of G_{mm} = 75/97), 3% Air Voids. Super Pave Mix shall be ½" Fine Mix with 15% maximum Reclaimed Asphalt Pavement (RAP) content.

2. Job control target data for aggregate ideal grading.

3. Permissible range limits of bitumen content in mixture.

4. Mixture's index of retained strength, AASHTO T-165

5. Additives. If none, state none are required.

6. Percent voids.

B. Source Aggregate Sample Report. Indicate rodded weight of aggregate, percentage of wear, weight loss, sand equivalent value, percent of fractured faces, amount of organic matter, plasticity of fines, and percentage of fines retained on the aggregate.

C. Pre-Approved Mix Design Data: If supplier has on record, a City approved mix design, submit name and address of supplier for each mix design 3 days prior to using asphalt concrete mix.

1.05 QUALITY ASSURANCE

A. Bitumen weights shall be determined by the mix design.

B. Use asphalt cement when recycled asphalt mixtures are indicated.

C. Do not change source of supply of paving asphalt or aggregate without Engineer's written approval.

D. Each shipment of bituminous material shall be uniform in appearance and consistency with no foaming when heated to the specified mixing temperature.

E. Do not use storage containers contaminated with other asphalt types or grades.

F. Gradation, density, and maximum density shall be determined by extraction tests, ASTM D 5444. Asphalt binder content shall be determined by using a burn-off oven, ASTM D 6307.

G. Validate binder grade received from the supplier.

PART 2 PRODUCTS

2.01 ASPHALT BINDER

A. Class I and II Streets, Trails and patches: Performance Grade (PG) of virgin asphalt binder shall be PG 58-28.

B. Class III, IV, & V Streets: Performance Grade (PG) of virgin asphalt binder shall be PG 64-34.

2.02 AGGREGATES - MATERIALS

A. Clean, hard, tough, durable and sound mineral aggregates that consist of crushed stone, crushed gravel, crushed RAP or RAP blend, or crushed slag conforming to the following requirements:

1. Rodded Weight density; not less than 75 pounds per cubic foot.

2. Percentage of wear of coarse aggregate retained on the No. 8 sieve; not exceeding 40 unless specific aggregates having higher values are known to be satisfactory.

3. Weight loss; not exceeding 16 percent by weight when subject to 5 cycles of sodium sulfate.

4. The combined aggregate after going through the dryer shall have a sand equivalent value of not less than 60 percent.

B. Coarse Aggregate: Use an aggregate that the portion retained on the No. 4 sieve has not less than 50 percent of particles by weight with at least two mechanically fractured faces or clean angular faces.

C. Fine Aggregate: Fine Aggregate Angularity per AASHTO T304 shall be 40% minimum.

D. Fine aggregate passing the No. 4 sieve may be either a natural or manufactured product containing not more than 2 percent by weight of organic matter or other deleterious substances.

1. Aggregate passing the No. 40 sieve is nonplastic.

2. Natural sand shall be a maximum of 15%.

3. Mineral Filler: When mix design indicates need, add as separate ingredient; AASHTO M-17.

2.03 AGGREGATES - MASTER GRADING BAND LIMITS FOR MARSHAL MIX DESIGN

A. Maximum particle size of ½ compacted lift thickness. DM-1/2" mix shall be used unless otherwise specified on the plans and/or standard drawings.

B. The following gradations describe the total percent passing by weight, AASHTO T-27, and is based on fine and coarse aggregate having approximately the same bulk specific gravities.

C. Target Grading Curve must lie within one of the Master Grading Bands in the following table.

MASTER GRADING BAND LIMITS FOR MARSHALL MIX DESIGN				
Sieve Size	DENSE MIXTURES			
	Type DM-3/4		Type DM-1/2	
	Min	Max	Min	Max
1"				
3/4"	100	-----		
½"	-----	-----	100	-----
3/8"	75	91	-----	-----
# 4	46	62	60	80
# 8	-----	-----	-----	-----
# 16	22	34	28	42
# 50	11	23	11	23
# 200	5	7	5	7

2.04 AGGREGATES - JOB-CONTROL GRADING BAND LIMITS

A. The job control formula shall produce a smooth curve approximately paralleling the master grading band limits for the designated mix. If application of the tolerances results in a job control grading band outside the master grading band, the full job control tolerances shall apply. The following describes the job control grading bands.

JOB-CONTROL GRADING BAND LIMITS					
Sieve Size	Amount Passing Sieve, weight %				
	1 Test	2 Tests	3 Tests	4 Tests	5 Tests
≥ ½	± 10	± 7.3	± 6.3	± 5.6	± 5.2
3/8	± 9	± 6.9	± 5.9	± 5.3	± 4.9
No. 4	± 9	± 6.7	± 5.7	± 5.2	± 4.8
No. 8	± 7	± 5.6	± 4.8	± 4.3	± 4.0
No. 16	± 7	± 5.2	± 4.6	± 4.2	± 3.9
No. 50	± 6	± 4.3	± 3.8	± 3.4	± 3.2
No. 200	± 3	± 2.4	± 2.0	± 1.8	± 1.7

2.05 MARSHALL MIX DESIGN

A. The Marshall mix design shall be based upon AASHTO T-245, traffic classifications, and the following:

MARSHALL MIX DESIGN REQUIREMENTS						
	CLASS I		CLASS II		CLASS III to V	
	Min	Max	Min	Max	Min	Max
Number of Compaction Blows (each end of specimen)	35	34	50	50	NA	NA
Stability, lb (ASTM D 6927)	1500	-----	1500	-----	NA	-----
Flow, in 0.01 in. units	8	20	8	18	NA	NA
% Voids in Mineral Aggregate (VMA), (ASTM D 3203)						
½" nominal maximum particle size	15		15		NA	
¾" nominal maximum particle size	14		14		NA	
% Air Voids,	3	3.5	3	3.5	NA	NA
Unconfined Compression Strength Retention, % (AASHTO T-165)	80	-----	80	-----	NA	-----

B. Compensate for specific gravity and absorption of aggregate to determine bitumen content by laboratory testing.

C. Recycled Asphalt Pavement (RAP) for Marshall Mix and Superpave Mixes: A maximum 15% Reclaimed Asphalt Pavement (RAP) by total weight of the mix is allowed in asphalt concrete mix, and a maximum 15% of the total binder content of the mix may be RAP asphalt binder.

D. Dust to Binder ratio should not be more than 1.4.

E. The mix design air voids shall be between 3% and 3.5%, where mix shall not exceed 3.5% air voids per ASTM D 3203. However, the percent asphalt or fines may need to be adjusted to achieve optimal strength.

F. If mix design is older than 365 days from date of submission, mix shall be recertified.

G. Voids in the Mineral Aggregate (VMA) shall be calculated using Gsb dry for both virgin and rap aggregates.

2.06 MIXING PLANT

A. Hot-mixed, hot-laid paving mixtures; AASHTO M-156.

2.07 SOURCE QUALITY CONTROL

A. Unconfined Compression Strength Retention: When crushed mineral aggregate which is thoroughly coated with bitumen has an index of retained strength less than 80 percent bring the strength into compliance by adding any of the following additives to the mix.

1. Anti-stripping agent.

2. Hydrated lime.

3. Portland cement.

B. Coating and Stripping of Bitumen-Aggregate Mixture: Immediately after mixing, the mixing shall meet the requirements of AASHTO T-182, whereby not more than 5 percent of the aggregate particles shall remain uncoated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Plant Mix Bituminous Paving: In accordance with Section 02510.

END OF SECTION

SECTION 02505

EMULSIFIED ASPHALT SLURRY SEAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This is a material specification and application specification for emulsified asphalt slurry seal.

1.02 REFERENCES

A.	ASHTO T-27:	Standard Method for Sieve Analysis of Fine and Coarse Aggregate.
B.	AASHTO T-2:	Sampling Mineral Aggregates.
C.	AASHTO T-11:	Materials Finer than No. 200 in Mineral Aggregate.
D.	AASHTO 176:	Sand Equivalent Value of Soils and Fine Aggregate.
E.	AASHTO T-84:	Specific Gravity and Absorption of Fine.
F.	AASHTO T-19:	Unit Weight Aggregate.
G.	AASHTO T-96:	Resistance to Abrasion of Small Size Coarse Aggregate by use of the Los Angeles Machine.
H.	AASHTO T-37:	Sieve Analysis of Mineral Filler.
I.	AASHTO T-40:	Sampling Bituminous Materials.
J.	AASHTO T-59:	Testing Emulsified Asphalt.
K.	AASHTO M-140:	Specification for Emulsified Asphalt.
L.	AASHTO T-49:	Penetration 100 gm at 5 sec. 77°F(25°C).
M.	ASTM D242:	Mineral Filler for Bituminous Paving Mixtures.

1.03 DEFINITIONS

A. The slurry seal shall consist of a mixture of an approved emulsified asphalt, mineral aggregate, water and specified additives, proportioned, mixed and uniformly spread over a properly prepared surface. The completed slurry seal shall leave a homogeneous mat, adhere firmly to the prepared surface, and have a friction resistant surface texture throughout its service life.

1.04 SUBMITTALS

A. Mix Design: Submit each proposed mix design 14 days prior to use in the Work.

PART 2 PRODUCTS

2.01 EMULSIFIED ASPHALT

A. POLYMER MODIFIED EMULSION The emulsified asphalt shall be CQS-1HL, CQS-1HP, QS-1HL, or QS-1HP as specified in AASHTO M-140. The polymer modifier shall be either a solid synthetic rubber or latex material. The polymer modifier shall be combined with the base asphalt or asphalt emulsion at a minimum rate of 3% solids by weight of asphalt prior to loading at the manufacturing plant. The polymer modified emulsion shall be compatible with the mix design developed for the conventional slurry seal. Each shipment of emulsified asphalt shall be accompanied by a certificate of analysis / compliance from the manufacturer.

2.02 AGGREGATES - MATERIALS

A. The mineral aggregate shall be manufactured (100% crushed) stone such as granite, slag, limestone, chat, or other high quality aggregate that is free from dirt, organic matter, clay balls, adherent films of clay, dust, or other objectionable matter.

B. The Contractor shall insure that all oversize aggregate and other objectionable matter are removed from the mineral aggregate utilized in the slurry seal mixture. Screening shall be required at the stockpile if there are problems created by oversize materials in the mixture.

2.03 AGGREGATES - GRADING BAND LIMITS

A. Gradation Type II will be used unless otherwise specified.

B. The following gradations describe the total percent passing by weight, AASHTO T-27, and is based on fine and coarse aggregate having approximately the same bulk specific gravities.

GRADING BAND LIMITS						
Sieve Size	DENSE MIXTURES					Stockpile Tolerance
	Type I		Type II		Type III	
	Min	Max	Min	Max	Min	Max
3/8"	100	-----	100	-----	100	-----
# 4	100	-----	90	100	70	90
# 8	90	100	65	90	45	70
# 16	65	90	45	70	28	50
# 30	40	65	30	50	19	34
# 50	25	42	18	30	12	28
# 100	15	30	10	21	7	18
# 200	10	20	6	15	5	15
						+ or - 5%
						+ or - 5%
						+ or - 5%
						+ or - 5%
						+ or - 4%
						+ or - 3%
						+ or - 2%

2.04 AGGREGATES - JOB-CONTROL GRADING BAND LIMITS

A. The job mix gradation shall be within the gradation band for the desired type. After the target gradation has been submitted, then the percent passing each sieve shall not vary by more than the stockpile tolerance and still remain within the gradation band.

2.05 MINERAL FILLER

A. Portland Cement, hydrated lime, limestone dust, flyash, Aluminum sulfate, or other approved filler meeting the requirements of ASTM D242 shall be used if required by the mix design. They shall be considered as part of the dry aggregate. The quantity and type of filler, if required, shall be determined by the job mix design. It shall be used for one or more of the following reasons only: to improve the gradation of the aggregate to provide improved stability and workability of the slurry, or the increase the durability of the cured slurry.

2.06 WATER

A. Water for the slurry mixture shall be clear, potable, free from harmful soluble salts, and compatible with the slurry mixture. If the water is obtained from a source other than sanitary systems, such as a river, stream, or pond, a sample of the water must be tested and approved by the laboratory performing the mix design.

2.07 MIX DESIGN

A. The mix design shall be made with the same aggregate gradation that the Contractor will provide on the project. Sources of all materials shall be selected prior to the time when the mix design is prepared and the materials are required to be used in the work. Slurry seal mixture shall not be placed until a mix design, submitted by the Contractor, has been approved by the Project Manager. The exact proportions of asphalt emulsion, aggregate, mineral filler, additives, and water to be used in the preparation of the slurry seal shall be determined by an approved testing laboratory experienced in slurry seal mix design procedures.

The approved slurry mix shall be a homogeneous mixture, sufficiently stable during the entire mixing/spreading period so that the emulsion does not break, there are no segregation of the fines from the coarse aggregate, and the liquid portion of the mix does not float to the surface. The amount and type of asphalt emulsion to be blended with aggregate shall be determined by the laboratory mix design. The set control additive shall be introduced into the slurry seal mixture by an approved method that will assure uniform distribution and proper control. The exact amount shall be determined by conditions in the field and indicated in the mix design. A minimum amount of water shall be used as necessary to obtain a workable and homogeneous mixture. The slurry seal mixture shall show no signs of uncoated aggregate or premature breaking of emulsion when applied to the pavement surface.

B. The mix design and all slurry seal materials shall be approved by the City Engineer prior to use. The component materials shall be within the following limits:

1.	Residual Asphalt	Type I: 10% - 16% Type II: 7.5% - 13.5% Type III: 6.5% - 12% Based on dry weight of aggregate
2.	Mineral Filler	0.5% - 2.0% Based on dry weight of aggregate
3.	Additives	As needed
4.	Water	As needed to achieve proper mix consistency

2.06 ADDITIVES

A. Additives may be used to accelerate or retard the break-set of the slurry seal, or improve the resulting finished surface. The quantity and type of set control additive, if required, shall be determined by the job mix design and conform to the applicable sections of ASTM D3910 and ISSA T102. The use of additives in the slurry mix shall be made initially in quantities predetermined by the mix design with field adjustments if required, after approval by the City Engineer.

PART 3 EXECUTION

3.01 EQUIPMENT - GENERAL

A. All equipment, tools, and machines used in performance of this work shall be maintained in satisfactory working condition.

3.02 MIXING EQUIPMENT

A. Mixing Unit. The slurry seal shall be mixed and applied with a machine designed and manufactured to lay slurry seal with a minimum aggregate capacity of eight (8) cubic yards to reduce the number of transverse joints. The slurry seal mixing machine shall be a continuous flow mixing unit, capable of delivering accurately predetermined proportions of aggregate, asphalt emulsion, and mineral filler (if required) to a revolving spiraled multi-blade mixer and of discharging the thoroughly mixed product on a continuous basis. The mixing unit shall be capable of thoroughly blending all ingredients together without violent action. The mixing machine shall be equipped with an approved fines feeder that provides an accurate metering device or method of introducing a predetermined proportion of mineral filler to the aggregate. The fines feeder shall be used only when mineral filler is part of the mix design. The mixing machine shall be equipped with a water pressure system and fog type spray bar. The machine shall be capable of mixing materials at preset proportions regardless of the speed of the machine and without changing machine settings.

Each mixing unit to be used in performance of the work shall be calibrated prior to construction. Previous calibration documentation covering the exact materials to be used may be accepted, provided it was made during the current calendar year. The documentation shall include an individual calibration of each material at various settings which can be related to the machine metering device(s).

Attached to the mixing machine shall be a mechanical squeegee distributor (spreader box) having a rubber-like material in contact with the surface to prevent unwanted egress of slurry. It shall prevent loss of slurry on varying grades and crown by adjustments to assure uniform spread. An appropriate mechanical device for lateral distribution of the slurry shall be operated within the spreader box. There shall be a steering device, a flexible strike-off, and a burlap or other approved drag. The spreader box shall be adjustable to widths from eight (8) to fifteen (15) feet to minimize the number of longitudinal joints. Broken slurry seal mixture shall not be allowed to collect in the spreader box or on the flexible strike-off.

3.03 SPREADING EQUIPMENT

A. The mixture shall be spread uniformly by means of a conventional surfacing spreader box attached to the mixer and equipped to agitate and spread the material evenly throughout the box. A front seal shall be provided to insure no loss of the mixture at the road contact point.

3.04 WEATHER LIMITATIONS

A. The slurry seal shall not be applied if either the pavement or air temperature is below 50°F(10°C) and falling, but may be applied when both pavement and air temperature are above 45°F(7°C) and rising. No slurry seal shall be applied when there is danger that the finished product will freeze before 24 hours. The mixture shall not be applied when weather conditions prolong opening to traffic beyond a reasonable time.

3.05 NOTIFICATION AND TRAFFIC CONTROL

A. All homeowners and business affected by the paving shall be notified one day in advance of the surfacing. Should work not occur on the specified day, a new notification will be distributed.

B. Suitable methods shall be used by the contractor to protect the slurry seal from all types of

vehicular traffic without damage. Opening to traffic does not constitute acceptance of the work. Traffic control shall in accordance with the MUTCD manual.

3.06 SURFACE PREPARATION

A. Immediately prior to applying the slurry seal the surface shall be cleared of all loose material, oil spots, vegetation, and other objectionable material. Any standard cleaning method will be acceptable. If water is used, cracks shall be allowed to dry thoroughly before slurry surfacing. Manholes, valve boxes, drop inlets and other service entrances shall be protected from the slurry seal by a suitable method. The City Engineer shall approve the surface preparation prior to surfacing.

B. It is advisable to pre-treat cracks in the pavement surface with an acceptable crack sealer prior to application of the slurry seal. Crack sealing shall be completed a minimum of 3 months prior to slurry seal.

3.07 APPLICATION

A. When required by local conditions, the surface shall be pre-wetted by fogging ahead of the spreader box.

B. The slurry seal shall be of the desired consistency upon leaving the mixer. A sufficient amount of material shall be carried in all parts of the spreader at all times so that a complete coverage is obtained.

C. No streaks, such as those caused by oversized aggregate shall be left in the finished surface.

D. No excess buildup, uncovered areas, or unsightly appearance shall be permitted on longitudinal or transverse joints. The Contractor shall provide suitable width spreading equipment to produce a minimum number of longitudinal joints throughout the project. When possible, longitudinal joints shall be placed on lane lines. Half passes and odd width passes will be used only in minimum amounts. If half passes are used, they shall not be the last pass of any paved area. A maximum of six inches (6") shall be allowed for overlap of longitudinal lane line joints.

E. Areas which cannot be reached with slurry seal machines shall be surfaced using hand squeegees to provide complete and uniform coverage. The area to be handworked shall be lightly dampened prior to mix placement and the slurry worked immediately. Care shall be exercised to leave no unsightly appearance from handwork. The same type finish as applied by the spreader box shall be required. Handwork shall be completed during machine applying process.

F. Care shall be taken to insure straight lines along curbs and shoulders. No runoff on these areas will be permitted. Lines at intersections will be kept straight to provide good appearance.

G. All areas, such as manways, gutters and intersections, shall have the slurry seal removed as specified by the City Engineer. The Contractor shall remove any debris associated with the performance of the work on a daily basis.

H. Rate of Application measured in pounds of dry aggregate per square yard:

APPLICATION RATE

Type I	8-12#/SY
Type II	12-20#/SY
Type III	18-30#/SY

I. The longitudinal joint between adjacent lanes shall have no visible lap, pinholes, or uncovered areas. Thick application caused by overlapping shall be smoothed immediately with hand squeegees before the slurry seal mixture breaks. When possible, longitudinal joints shall be placed on lane lines. The Contractor shall provide suitable spreading equipment to minimize the number of longitudinal joints. Overlays that occur at transverse joints shall be smoothed before the slurry seal mixture breaks, so that a uniform surface is obtained.

J. Care shall be taken to insure straight lines along curbs and shoulders. No runoff on these areas will be permitted. Lines at intersections shall be kept straight to provide a good appearance.

3.08 SAMPLING AND TESTING

A. Suitable sized samples of aggregate, asphalt emulsion, and mineral filler (if required) shall be submitted, when requested by the Project Manager, for approval not less than ten (10) days before the work starts. All samples of materials shall be supplied by the Contractor at his expense, and all tests necessary to determine conformance with requirements specified shall be performed without cost to the Contractor. Additional samples of materials shall be furnished as directed by the Project Manager during progress of the work. The owner will notify the Contractor immediately if any test fails to meet the specifications.

If it is established that a satisfactory slurry seal mixture meeting the requirements specified herein cannot be produced from the materials furnished, the materials shall be rejected and the Contractor shall submit new samples.

END OF SECTION

SECTION 02510

ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section covers the requirements for bituminous surface paving on roads and trails.

PART 2 SUBMITTALS

A. Contractor shall establish a mix gradation and the amount of bituminous material shall be submitted fourteen (14) working days prior to surfacing for the approval by the City Engineer and shall meet the requirements of the gradation selected.

B. Test Reports: Submit test reports as requested by City Engineer verifying compliance with specified standards.

PART 3 EXECUTION

3.01 ALL STREETS AND TRAILS SHALL BE SURFACED IN ACCORDANCE WITH THE FOLLOWING:

A. Streets:
1. 8-inch minimum untreated base course over prepared and approved subgrade.
2. 3-inch minimum compacted thickness plant mix asphalt surfacing on all local streets.
3. 4-inch minimum compacted thickness plant mix asphalt surfacing on all collector and arterial streets.
4. 2-lift minimum for plant mix asphalt surfacing when final compacted pavement thickness is greater than 3 inches unless otherwise approved by the City Engineer.

B. Trails:
1. 6-inch minimum untreated base course over prepared and approved subgrade and weed barrier geotextile.
2. 3-inch minimum compacted thickness plant mix asphalt surfacing on all trails.
3. Weed barrier geotextile according to the following:

Table 7 – Weed Barrier Geotextile

Property	ASTM	MARV Standard
Grab tensile strength, lbs.	D 4632	315
Grab elongation, percent, minimum	D 4632	50
Puncture strength, lbs.	D 4833	900
Trapezoid tear, lbs.	D 4533	100
Apparent opening size (AOS), US sieve, minimum	D 4751	40
Ultraviolet degradation, percent	D 4355	70
NOTES (a) Percent of grab elongation retained determined after ultraviolet weathering, ASTM D 4355 for 500 hours.		

3.02 BASE COURSE

A. Base for all streets shall consist of select material, as specified in Section 02206.

B. Base shall be laid in accordance with Section 02225.

C. Surfaces shall be true to the established grade with thickness being not less than 1/4 inch from the required layer thickness and with the surface elevation varying not more than 3/8 inch in ten feet from the true profile and cross section.

3.03 BITUMINOUS SURFACE COURSE

A. Base course shall be free of any contamination prior to laying surface course.

B. The surface course shall consist of a mixture of mineral aggregate and binder conforming to Section 02504.

C. Gradation of aggregate shall conform to Section 02504.

D. The Contractor shall apply a tack coat to all new or existing asphalt or concrete edges and surfaces that will be in contact with the new bituminous surface course. This includes all longitudinal and transverse joints regardless of the joint temperature.

1. Tack coat shall be SS-1 or 1-H.

E. The bituminous surface course shall be mixed at a mixing plant and spread and compacted on the prepared base in conformance with the lines and dimensions shown on the plans and in accordance with these Specifications.

F. All existing asphalt shall be saw cut to remove fractures, cracked or damaged asphalt.

1. Asphalt shall be saw cut in straight lines.

3.04 CONSTRUCTION METHODS AND EQUIPMENT

A. All asphalt will be laid using a lay down machine unless written approval is granted by City Engineer.

B. The methods employed in performing the work, all equipment, tools and machinery and other appliances used in handling the materials and executing the work shall be the responsibility of the Contractor.

C. At no cost to the City, the Contractor shall make such changes in the methods employed and in the equipment used as are necessary whenever the bituminous being produced does not meet the specification herein established.

D. Provide necessary survey stakes for horizontal control and vertical control on roads and trails. Furnish, place, and maintain supports, wire devices, and materials as required to provide continuous line and grade reference control for placing pavement and matching existing pavement surfaces on roads and trails.

3.05 SPREADING

A. The bituminous mixtures shall be spread with self-propelled mechanical spreading and conditioning equipment capable of distributing at least a 12-foot width.

B. The City Engineer shall determine whether or not the bituminous surface course shall be spread in one or more courses.

C. No surface course shall be placed less than 1 inch in thickness.

D. The mixture shall be spread and struck off in such a manner that the finished surface shall result in a uniform smooth surface.

E. The longitudinal joints in any succeeding courses shall be offset at least 6 inches transversely to avoid a vertical joint through more than one course.

F. The temperature of the bituminous mix shall be between 250° F and 325° F when placing.

G. Asphalt joints and seams shall be placed at lane lines when possible, and shall not be placed in wheel lines without written approval from the City Engineer.

3.06 COMPACTION

A. After the mixture has been spread, the surface shall be rolled in longitudinal direction commencing at the outside edge or lower side and preceding to the higher side.

B. Each pass of the roller shall overlap the preceding pass at least one-half the width of the roller.

C. The average in place density shall be in the range of 94% to 96% of the Theoretical Maximum Specific Gravity determined by the testing methods outlined in Section 01450 with no individual areas falling below 92% or above 97.5% of the Theoretical Specific Gravity.

D. Rolling operations shall be conducted in such a manner that shoving or distortion will not develop beneath the roller.

E. Do not over compact the asphalt pavement nor under compact. Complete compaction before the following temperatures are reached: 180 degrees F for hot mixes, and 140 degrees F for warm mixes.

F. Quality Control

1. The surface of the pavement, after compaction, shall be uniform and true to the established crown and grade.

2. The Developer/Contractor shall be responsible to test bituminous mixtures for compaction in accordance with Section 01450, TESTING AND PROCESS CONTROL.

3. Traffic shall not be allowed to travel on new asphalt surface until pavement temperature has reached 120° F or lower.

3.07 WEATHER LIMITATIONS

A. No bituminous surface shall be placed when the temperature of the air or road bed is 50° F or below, during rainy weather, when the base is wet or during other unfavorable weather conditions as determined by the City Engineer.

B. The air temperature shall be measured in the shade.

3.08 FLAGGING

A. Flaggers shall be required as directed to facilitate the safe control of traffic over highways and streets under construction at such locations as required and directed by the City Engineer.

B. Flagging shall be performed by certified, trained, and properly equipped flaggers.

C. All flagging shall be done as described in the Safety Orders covering flaggers of the Industrial Commission of Utah and in accordance with the MUTCD manual.

3.09 ROUGHNESS TOLERANCE

A. When tested with a ten (10) foot straight edge placed parallel to the center line of the pavement, the surface of the pavement at any point shall not deviate from the lower edge of the straight edge by more than one-quarter of an inch. If any part of the pavement fails the 10 foot straight edge test, roughness shall be determined using a certified profilograph or profiler.

B. The following table shall be used to verify roughness tolerances.

ROUGHNESS TOLERANCE						
Speed MPH	Traffic Class	Profile Roughness Index (PRI), Inches / Mile				Profile Deviation Inches/25 feet Maximum
		IRI		PI		
		Min	Max	Min	Max	
25 to 30	II	--	--	--	110	0.4
	III or IV	129	177	46	66	0.4
31 to 45	I or II	90	155	35	50	0.4
	III or IV	70	90	21	35	0.4
45 +	All Classes	--	70	--	21	0.4

Notes:
a) IRI (International Roughness Index), ASTM E 950. Use a ¼ car.
b) PI (Profile Index), ASTM E 1274. Use a zero blanking band.
c) Profile deviation applies to bump and depression measurements.
d) As a minimum, trace right wheel path in direction of travel.

C. Profile Roughness Index (PRI): Verify bumps and depressions are removed so profile index in each lot meets tolerance: Lot is 0.1 lane mile (528 feet long one lane wide). Add segments shorter than 250 feet to preceding lot. Treat partial segments longer than 250 feet as a lot. Excluded from the lot are turn lanes, parking lanes, medians, street fixtures, crowns of intersecting streets, bridge decks, grades greater than eight (8) percent, and vertical curves less than 1,000 feet radius.

D. Profile Deviation: Verify "must grind" bumps and depressions are removed from the lot surface where lot is the total pavement area placed, no area excluded. Begin traces 50 feet before edge of new pavement and end traces 50 feet after edge of new pavement. Areas (including the 50 feet end of traces) exceeding the profile deviation tolerance are "must grind" areas.

E. Mark all "must grind" areas on pavement to identify locations to be corrected.

F. Repair: Grinding is an acceptable method for correcting "must grind" areas. Skin patching with feather edge for depressions is NOT acceptable. Raise depressions by milling and inlay or remove and replace repair. Re-profile corrected segments to verify index meets tolerance. Apply GSB-88 orother approved emulsion to grind areas at a rate of 0.11± 0.01 gal/yd^2, using approximately 40% residual asphalt.

G. Notify the Engineer in writing when corrective work will be performed and at least two working days before re-profile will be completed.

H. When thickness is deficient, place additional material over deficient areas. Do not skin patch. Mill for inlay as necessary.

END OF SECTION

SECTION 02512

RESTORATION OF SURFACE IMPROVEMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Restoration of surface improvement requirements.

1.02 GENERAL IMPROVEMENT REQUIREMENTS

A. The Contractor shall be responsible for the protection and the restoration or replacement of any improvements existing on public or private property at the start of work or placed there during the progress of work.

B. Existing improvements shall include but are not limited to landscaping, permanent surfacing, curbs, ditches, driveways, culverts, fences and walls. All improvements shall be reconstructed to equal or better, in all respects, to the existing improvements removed.

PART 2 PRODUCTS

A. Select Fill: In accordance with Section 02206.

B. Asphalt Concrete: In accordance with Section 02510.

C. Concrete: In accordance with Section 03304.

PART 3 EXECUTION

3.01 ROAD BASE REPAIR

A. Where trenches are excavated through gravel surfaced areas such as roads and driveways, etc., the gravel surface shall be restored and maintained as follows:

1. The gravel shall be placed deep enough to provide a minimum of 6-inches of material.

2. The gravel shall be placed in the trench at the time it is backfilled. The surface shall be maintained by blading, sprinkling, rolling, adding gravel, etc., to maintain a safe uniform surface satisfactory to the Engineer. Excess material shall be removed from the premises immediately.

3. Material for use on gravel surfaces shall be obtained from sound tough durable gravel or rock meeting the requirements of Section 02206.

3.02 BITUMINOUS SURFACE REPAIR

A. Where trenches are excavated through bituminous surfaced roads, driveways or parking areas, the surface shall be restored and maintained as follows:

1. Trenches shall be backfilled with untreated base course from the pipe bedding to 3 inches from the top of existing asphalt.

2. Asphalt shall be saw cut back 12 inches from existing trench wall's and the exposed road base surface shall be compacted as shown on standard drawing.

3. Pavement restoration shall include priming of pavement edges with bituminous material and placing and rolling plant mix bituminous material to the level of the adjacent pavement surfaces. Proper compaction of the bituminous material shall be verified per the requirements of Section 02510.

3.03 CONCRETE REPAIR

See Section 03310 Concrete Work

END OF SECTION

SECTION 02513

UTILITY POTHOLE REPAIR-KEYHOLE METHOD

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This specification covers the requirements for keyhole coring, vacuum excavation, backfilling, and reinstatement of the keyhole core in asphalt or concrete pavements to allow for underground utility repairs and underground exploratory potholing. Keyhole coring shall be defined as follows: The operation of coring a circular hole through the roadway pavement using diamond tipped core drilling equipment.

1.02 Pothole Excavation:

A. The vertical alignment of the keyhole coring shall be perpendicular to the horizon, and the cutting shall extend to the full depth of the existing pavement section.

B. Unless otherwise approved by the Engineer, keyhole cores shall be no less than 6 –inches and no greater than 18- inches in diameter. Adjacent cores shall not be closer than 3 feet from each other (edge to edge), shall not contain a joint or any pavement cracks greater than 1/8-inch wide, and shall not be performed in pavements where the section is less than 3-inches thick. Coring shall be performed with a keyhole coring saw with high strength steel diamond tipped core drill bits.

C. The Contractor shall place a temporary mark on the keyhole core prior to cutting to insure that the removed section is replaced in the same orientation as originally found in the pavement.

D. Soils within potholes shall be removed by air/vacuum extraction methods to expose utilities. The zone of soil removal shall remain essentially within a vertical plane extending below the edges of the removed pavement. The Contractor shall remove all excess materials excavated from the site.

PART 2 PRODUCTS

A. Bonding Agent: The bonding agent is material required to bond asphalt pavement cores to the asphalt concrete pavement from which it was originally removed. Bonding material shall be a single component cementitious, rapid hardening, high strength, waterproof bonding agent conforming to the physical properties shown in Table-1 below, and Section 3.01 B

TABLE 1 – BONDING MATERIAL PROPERTIES

Property	ASTM Test method	Requirements
Bond Strength (Slant Shear), psi (70° F., 30 minute cure)	C882	200 minimum
Strength, psi (70° F., 60 minute cure)	C109	1500 minimum

1) Bonding material shall be impervious to water penetration at the joint after curing.
2) Bonding material shall, within 30 minutes at minimum ambient temperature of 70 degrees F., allow an 18" diameter core to support a traffic load equivalent to at least three (3) times the AASHTO H-25 standard wheel load.
3) The bonding material is required to securely bond the asphalt concrete core to asphalt concrete pavement and to fill all voids between the core and pavement and within the core.
4) Specifications and test results for the bonding material shall be submitted to the City for review and approval before use.

PART 3 EXECUTION

3.01 Pavement Restoration:

A. Pothole Backfill: The Contractor shall place 1 ft of compacted bedding sand over utility. The remainder of the hole shall be filled with flowable fill in accordance with Section 02245 – Flowable Fill, to the bottom of the pavement surface

B. The surface cut by keyhole coring restored to its original condition with the reinstated core flush with and in the original orientation as the existing surface, matching existing pavement surface appearance.

C. A bonding agent shall be a single component cementitious, rapid hardening, high strength, water proofed application such as Utilibond, manufactured by Utilicor Technologies, Inc., or an Engineer approved equal shall be used for pavement core reinstatement. Excess bonding material shall be removed from the restored surface. A patched appearance shall be avoided in surface restoration wherever possible.

D. Unless otherwise approved by the Engineer, the Contractor shall reinstate the bonded keyhole core within 24 hours of cutting the pavement. Openings allowed to be left open greater than 24 hours shall be covered with an approved steel road plate capable of supporting traffic loads.

3.02 Surface Tolerances:

A. The reinstated core shall be flush and level with the adjacent pavement. Gaps attributable to the positioning of the core shall be less than 1/16-inch between the bottom of a minimum 3- foot long straightedge and the surface of the pavement in any direction on the surface of the keyhole core, except across the pavement crown or drainage gutters.

B. Deficiencies:
1. Where the pavement core is found to be fractured or defective upon removal, or becomes damaged after removal and prior to reinstating, the defective or damaged core shall not be used to reinstate the pavement. Pavement repair shall be performed in accordance with Section 02512.

2. A pavement core is considered unacceptable when one of the following conditions exist:

1) The core contains any vertical cracks wider than 1/8-inch extending full depth or partial depth through the core; or

2) Any deteriorated piece of the core is larger than 10 percent of the overall area of the core.

3) Two or more successive layers of asphalt concrete in the core become horizontally delaminated and cannot be rebounded to each other with the bonding compound.

3. All unacceptable pavement cores shall be removed from the job site.

4. If another equivalent core of sound condition and matching existing pavement of the same diameter, depth and composition as the defective core is available, it may be reinstated in substitution of the defective core.

END OF SECTION

SECTION 02607

MANHOLES AND COVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modular precast concrete manhole sections with tongue-and-groove joints, covers, anchorage, and accessories.

1.02 RELATED SECTIONS

1.03 REFERENCES

A. AASHTO M-105: Gray Iron Castings.

B. ASTM C478: Precast Reinforced Concrete Manhole Sections.

C. ASTM C923: Resilient Connectors between Reinforced Concrete Manhole Structures and Pipes.

1.04 SUBMITTALS FOR REVIEW

A. Shop Drawings: Indicate manhole locations, elevations, piping, and sizes and elevations of penetrations.

B. Product Data: Provide manhole covers, component construction, features, configuration, and dimensions.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 GENERAL REQUIREMENTS

A. The Contractor shall furnish and install watertight cast-in-place or precast concrete manholes at the locations shown on the Drawings approved by the City Engineer. All new manholes shall be precast unless the manhole is being installed on an existing line, unless otherwise approved in writing by the City Engineer. All precast manholes shall have flexible watertight pipe-to-manhole boot connectors. All cast-in-place manholes shall have a hydrophilic water stop at pipe-to-manhole connections.

B. Manholes shall be furnished complete with cast iron rings and covers.

~~C. Manhole spacing shall not exceed 400 lineal feet unless approved by City Engineer.~~

~~D. Manholes shall be installed at the end of each line exceeding 15 feet in length.~~

~~E.~~C. ~~Cleanouts shall not be substituted for manholes nor installed at the end of lines.~~

~~F.~~D. Cleanouts on sewer laterals shall be placed every 100 feet and at all bends.

~~G.~~E. Flow Channels:

1. The flow channel through manholes shall conform to the inlet and outlet pipe.

2. The depth of flow channels should be one-half to three-quarters of the diameter of the pipe.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:

1. Materials and Equipment: Product options and substitutions. Substitutions: Permitted.

2. Materials shall be manufactured by a Concrete Precast Association (CPA) approved facility.

B. Manhole Sections: Reinforced precast concrete in accordance with AASHTO M-199 and ASTM C923. Mortar and Grout: Type S.

2.02 COMPONENTS

A. Wall and Cone Sections:

1. Manhole walls shall be constructed of 48" I.D. precast sectional, reinforced concrete pipe.

2. For pipelines of 14" diameter or larger, the manholes shall be 60" minimum I.D.
   a. The throat section of the manhole shall be adjustable by use of pipe sections up to 18 inches in height.
   b. The taper section shall be a maximum of 3 feet in height, shall be of eccentric conical design, and shall taper uniformly from 48 inches to 30 inches inside diameter.
   c. The 48-inch inside diameter pipe used in the base section shall be furnished in section lengths of 1, 2, 3 and 4 feet as required.
   d. Reinforcing steel shall consist of a circular cage with a minimum cross sectional area of three-tenths (0.3) of a square inch of steel per foot in both directions.
   e. 18" space maximum between cone and lid.

3. All joint surfaces of precast sections and the face of the manhole base shall be thoroughly cleaned and wet prior to setting precast sections.

4. All manhole joints, including grade rings, shall be sealed with a butyl rubber sealant (mastic) that is permanently flexible and non-shrinking, similar to Brandt No. 95 Cold Weather Vault Sealant.

5. Mortar can be used for repairs and additional sealing of joints including grade rings and manhole rings. The mortar shall consist of 1 part cement and 1-1/2 parts sand with sufficient water added to bring mixture to workable consistency.

B. Manhole Steps:

1. 12" Copolymer Polypropylene Plastic Steps.

2. Reinforcement: ½" grade 60 steel reinforcement.

3. Steps must meet requirements outlined in ASTM C478 and ASTM C497.

C. Concrete Base Pad:

1. Except as noted below, manhole bases shall be pre-cast concrete conforming to the requirements of Section 03310 of these Specifications.

2. Where sewer lines pass through or enter manholes the invert channels shall be smooth and semi-circular in cross section.

3. Changes of direction of flow within the manholes shall be made with a smooth curve with as long a radius as possible and a minimum of 0.2 feet of fall.

4. The floor of the manhole outside the flow channels shall be smooth and slope toward the channel at not less than ½ inch per foot.

5. For high ground water areas, precast manholes and bases shall be required.

D. Lid and Frame:

1. All iron castings shall conform to the requirements of AASHTO M-105 for grey iron castings.

2. Rings and covers shall have machined bearing surfaces and a minimum cover weight of 150 pounds and minimum ring weight of 233 pounds.

3. The foundry name, year of manufacture, and "WATER", "SEWER", "STORM DRAIN", or "IRRIGATION" shall be marked on the cover.

4. All manhole rings shall be carefully set to the grade shown on the approved drawings or as directed by the City Engineer.

5. The manhole covers shall be so installed to be within 1/4" from the asphalt surface.

6. A concrete ring 12" wide, but no greater than 18" wide, and 8" thick will be poured around lid in accordance with Section 03304. Asphalt concrete collars are prohibited.

7. All manhole lids should be vented unless directed otherwise by the City Engineer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify that built-in items are in proper location and ready for roughing into Work.

C. Verify excavation for manholes is correct.

3.02 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.03 PLACING MANHOLE SECTIONS

A. Place base pad, with top surface level.

B. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

C. Cut and fit for pipe as required.

D. Grout vase of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.

E. Set cover frames and covers level without tipping, to correct elevations.

3.04 DROP TYPE MANHOLES

~~A. A drop pipe should be provided for a sewer entering a manhole at an elevation of 24 inches or more above the manhole invert.~~

~~B.~~A. Where the difference in elevation between the incoming sewer and manhole invert is less than 24 inches, the invert shall be filleted to prevent solids deposition.

~~C.~~B. Drop manholes should be constructed with an outside wye drop connection. If an inside drop connection is necessary, it shall be secured to the interior wall of the manhole and provide access for cleaning. Inside drop connections will not be allowed without written approval from the Heber City Engineer.

~~D.~~C. Due to the unequal earth pressures that would result from the backfilling operation in the vicinity of the manhole, the entire outside drop connection shall be encased in low density concrete.

3.05 SCHEDULES

A. Storm Sewer Manholes: Precast concrete sections, copolymer polypropylene plastic steps, 48 inch inside dimension, to depth indicated, with bolted lid.

END OF SECTION

SECTION 02609

GREASE AND SAND INTERCEPTOR

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modular precast concrete grease interceptor sections with joint covers, access holes, anchorage, cast iron ring, grate, and accessories.

B. Modular precast concrete sand interceptor sections with joint covers, access holes anchorage, cast iron ring, grate, and accessories.

C. Injection molded thermoplastic hydromechanical grease interceptors with covers, access holes, and accessories.

1.02 RELATED SECTIONS

1.03 REFERENCES

A. AASHTO M-105: Gray Iron Castings.

B. AASHTO M-199: Precast Reinforced Concrete.

C. ASTM C-923: Resilient Connectors between Reinforced Concrete Structures and Pipes.

1.04 SUBMITTALS FOR REVIEW

A. Product Data: Provide ring & covers, component construction, features, configuration, and dimensions.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 GENERAL REQUIREMENTS

A. Grease and sand interceptors are required as pre-treatment before discharging into the sanitary sewer system from car washes, automobile service stations, any non-residential facility with a floor drain, and all non-residential food preparation facilities. ~~When determined by the City Engineer that grease control is required, per~~ Follow Chapter 10 of the International Plumbing Code~~, the following control shall be used~~. Grease interceptors, indoor and outdoor, shall be sized by the applicant, and a sizing certification from a professional engineer shall be provided to the City upon request.

1. Standard Grease Interceptors (outdoor, gravity):

   a. Grease interceptors are required on all new non-residential building construction or retrofits which include food preparation and serving areas
   b. A sampling manhole shall be located below the downstream outlet.

2. Hydromechanical Grease Interceptors (HGIs) (outdoor)

a. When approved by the City Engineer, approved HGIs may be used in low-grease/fat food service applications with less than 8 total fixture unit equivalents.

b. HGIs shall be properly sized EnduraXL models by Canplas Industries or approved equivalent.

c. Must include a separate sampling manhole or built in port that can be used for sampling.

~~c.~~

3. Indoor Grease Interceptors

a. For retrofit or remodel commercial construction, when approved by the City, an indoor Big Dipper Grease Interceptor system (or approved equivalent) may be installed inside the building.

b. Indoor grease interceptors will only be approved when, in the opinion of the City, space constraints make outdoor interceptors impractical or infeasible.

c. Access shall be provided upon request to City personnel for system inspection.

~~3.~~

B. The Contractor shall furnish and install watertight cast-in-place or precast concrete grease interceptors and sand interceptors as required by the City Engineer or City Officials.

C. Grease interceptors and sand interceptors shall be furnished complete with cast iron rings and covers.

D. Design of grease/sand interceptors and grease traps need to be approved by City Engineer.

E. Flow Channels

1. The flow channel through Grease interceptors shall conform with the slope of the sewer.

2. Adjacent floor area should drain to the channel with the minimum slope of 1 inch per foot.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:

1. Amcor.

2. Geneva Pipe.

3. Dura-crete.

B. Grease interceptor Sections and sand interceptor: Reinforced precast concrete in accordance with AASHTO M-199 with gaskets in accordance with ASTM C923.

C. Mortar and Grout: Type S.

2.02 COMPONENTS

A. Standard Grease Interceptors

1. Outdoor gravity grease interceptors shall have a minimum of two compartments.

2. The minimum size for grease interceptors shall be 750 gallons, unless otherwise approved

3. Wall Sections to be designed to meet ASTM C913 with AASHTO HS-20 loading:

   a. Interceptors shall be constructed of 6" thick precast reinforced concrete. Box size to be 3-foot by 3-foot and the height as shown on plans. Provide grade rings as needed.

   b. Grease interceptor shall be designed to meet ASTM C-857 "minimum structural design loading for underground precast concrete utility structures. Provide grade rings as needed.

   c. All joint surfaces of precast sections and the face of the walls, base, and grade rings shall be thoroughly cleaned and wet prior to setting precast sections.

   d. All joints including grade rings shall be set in mortar consisting of 1 part cement and 1 ½ parts sand with sufficient water added to bring the mixture to workable consistency, or the joints shall be sealed with butyl rubber gasket that is permanently flexible and non-shrinking, similar to Brandt No. 95 Cold Weather Vault Sealant.

4. Lid and Frame:

   a. All iron castings shall conform to the requirements of H-20 loading for grey iron castings.

   b. Rings and grates shall have machined bearing surfaces and a minimum cover weight of 150 pounds and minimum ring weight of 233 pounds.

   c. The foundry name, year of manufacture, and "SEWER"shall be marked on the cover.

   d. All Grease interceptor and clean-out box rings shall be carefully set to the grade as shown on the approved drawings or as directed by the Engineer.

   e. Grate covers shall be so installed to be within 1/4" below the finished surface.

   f. A concrete ring 12" wide and 8" thick will be poured around lid in accordance with Section 03304.

2.03 CONFIGURATION

A. Shape: rectangular.

B. Design Size: design criteria to be submitted to the City Engineer for review.

C. Clear Grate and Lid Opening: 24 inches diameter.

D. Pipe Inlet and Outlet: Pipe inlet and outlet to be grouted to eliminate infiltration and leakage.

PART 3 EXECUTION

3.01 PLACING CONCRETE SECTIONS

A. Place base pad, trowel top surface level.

B. Place Grease interceptor or sand interceptor plumb and level, trim to correct elevations, anchor to base pad.

C. Cut and fit for pipe as required.

D. Grout base of shaft sections to achieve slope to exit piping.

E. Provide grade rings and Trowel smooth. Contour as required.

F. Set cover frames and covers level without tipping, and to correct elevations.

3.02 SCHEDULES

A. Grease interceptors and sand interceptors: Precast concrete sections, copolymer polypropylene plastic steps, to depth indicated, with tamper proof lid.

END OF SECTION

SECTION 02660

PIPELINE TESTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing requirements for potable and non-potable water piping systems and sanitary sewers.

1.02 DEFINITIONS

A. Leakage: The quantity of water required to maintain the specified hydrostatic test pressure after the pipeline has been filled with water and the air expelled.

B. Non-rigid Pipe: Any pipe which requires bedding and backfill material for structural support.

1.03 SUBMITTALS

A. Pipeline Test Report: Include the following items:

1. Type of test.
2. Identification of pipe system.
3. Size, type, location and length of pipe in test section.
4. Test pressure and time.
5. Amount of leakage versus allowable.
6. Date of test approval.
7. Signature of test supervisor.
8. Signature of the City Engineer, Inspector, or City Water Superintendent witnessing and approving the test.
9. One copy of video tape.

1.04 PROJECT CONDITIONS

A. After construction of sanitary or storm sewer lines, they shall be thoroughly cleaned, tested for leakage and alignment, and closed circuit television inspected in the presence of the City Engineer or the City Inspector before acceptance by the City. If directional drilling or underground boring takes place after sewer and/or storm drain lines have been installed, inspected, and tested, the sewer and/or storm drain lines near the drilling/boring shall be inspected a second time with a closed circuit television inspection per Section 2660 - 3.09.

B. Repair pipeline system at no additional cost to City until it passes subsequent retesting.

C. Recording Equipment:

1. Supply all necessary equipment to perform pressure testing.

2. Secure City's approval of pressure gages.

3. Locate all gages and recording equipment away from affects of sunshine or other weather conditions.

4. Place, vents, pressure taps and drains for the test. Repair pipeline at the completion of the test at no cost to City.

PART 2 PRODUCTS

2.01 TESTING MATERIALS

A. Medium: Water or air, as required by test.

B. Equipment: Temporary motors, pumps, pumping apparatus, pressure gages, connections, power, etc. for making the tests.

PART 3 EXECUTION

3.01 PREPARATION

A. Notify City Engineer or City Water Superintendent 48 hours in advance of test.

B. Carry out tests as pipeline construction progresses to ensure construction methods are producing satisfactory results.

C. Disinfect potable water pipelines per Section 2675 prior to pressure testing if connected to an existing system.

3.02 PRESSURE TESTING FOR PRESSURIZED WATER PIPELINES

A. Test shall be performed only after the pipeline has been properly filled, flushed, and purged of air. Provide air release taps at points of highest elevations as needed before testing. Insert permanent plugs after test has been completed. The test pressure shall be applied by means of an approved and disinfectedpumping assembly connected to the pipe in a manner satisfactory to the City.

B. The test pressure shall not exceed the thrust restraint design pressure or 50 psi in excess of the pressure class of the pipe, fittings, or valves, whichever is less (as specified by the manufacturer). During the tests, the system and any exposed pipe, fittings, valves, and hydrants shall be carefully examined for leakage.

C. Test pressure and duration: The duration of the hydrostatic test shall be 2 hr. The hydrostatic test pressure shall be set to 50 psi in excess of the lowest class rating of any pipe, saddle, fitting, or valve within the section being tested at the highest pressure along the test section. The test pressure shall not vary by more than 5 psi (plus or minus) for the duration of the test. If necessary, the test pressure shall be maintained by additional pumping during the 2 hr test duration. The pressure reading shall be noted every 10 minutes during the test.

D. The testing allowance: The testing allowance shall be defined as the quantity of water that must be supplied to the pipe section being tested to maintain a pressure within 5 psi of the specified hydrostatic test pressure. The quantity of water shall be accurately measured in gallons by suitable methods. No installation will be accepted if the quantity of makeup water is greater than that determined by the formula:

$$Q = \frac{LD\sqrt{P}}{148{,}000}$$

Where:
Q = quantity of makeup water in gallons per hour
L = length of pipe section being tested, in feet
D = nominal diameter of pipe, in inches
P = average test pressure during the hydrostatic test, in pounds per square inch (gauge)

E. Provide suitable means for determining water lost by leakage under the test pressure.

F. Locate and repair the defective elements and retest until the leakage is within the specified allowance.

G. Repair any noticeable leakage even if total leakage is less than allowable.

H. Service Lines:

1. Potable water service lines shall be connected to a potable water line before disinfection and bacteriological testing of the line is completed in accordance with Section 2675 Part 3.06, unless the service line needs to remain active during a replacement project, or as otherwise approved by the City Engineer. Service lines must be flushed in accordance with Section 2675 Part 3.06.

2. All service lines shall be pressure tested up to the curb stop in accordance with this section.

3. The connection between the water meter box and curb stop shall be either pressure tested in accordance with the guidelines in this section or visually inspected for leaks once the working water pressure is turned into the service line.

3.03 ALIGNMENT AND GRADE TEST

A. No variance will be allowed from line and grade in excess of 1/32" per inch of pipe diameter or ½" maximum provided that such variation shall not result in a level or reverse sloping invert.

B. Variations in invert elevations between adjoining ends of pipe due to eccentricity of joining surface and pipe interior surface shall not exceed 1/64" per inch of pipe diameter, or ½" maximum.

3.04 OBSTRUCTION TEST

A. Visually examine pipe internally for obstructions by use high power light or mirror.

B. When required by the City Engineer, a round incompressible mandrel 1" less in diameter than the internal pipeline diameter and 2 times the diameter in length will be passed through the pipeline.

3.05 NON-RIGID PIPE DEFLECTION TEST

A. When required by the City Engineer, test installed sections of non-rigid pipeline to ensure that circumferential deflection does not exceed 5 percent of the average inside diameter using a rigid mandrel with a circular cross section pulled through the pipe by hand.

3.06 INFILTRATION TEST

A. No pipe section will be accepted if the infiltration rate exceeds 100 gallons per inch diameter per mile per 24 hours.

3.07 FLUSHING OF SANITARY SEWERS

A. All sanitary sewer lines shall be flushed and cleared prior to acceptance by the City.

B. Flushing:

1. Laterals and trunk lines shall be flushed by water with a high pressure sewer jet to remove all foreign material. Flushing shall be completed prior to television inspection.

2. All debris located at the bottom of each manhole shall be removed. Dirt grease, sand, and gravel shall be removed so that the walls of the sewer pipe can be inspected.

3. Wastewater and debris shall not be permitted to enter sewer lines in service, but shall be removed at the lowest manhole of the extension.

4. Other methods of cleaning may be used upon approval of the City Engineer.

5. After the lines have been thoroughly cleaned, they shall be tested between all manholes for displacement.

3.08 LEAKAGE TESTS FOR SANITARY SEWERS

A. General Requirements:

1. The contractor shall test all sanitary sewers by means of an exfiltration test.

2. Length of line tested at one time shall be limited to the length between adjacent manholes.

B. Testing with Water:

1. Each section of the sewer shall be tested between successive manholes by closing the lower end of the sewer to be tested and the inlet of the upper manhole with stoppers.

2. The pipe and manhole shall be filled with water to a point approximately 4-feet above the invert of the sewer at the center of the upper manhole.

3. The allowable leakage will be computed by the formula:

$$E = 0.25\ D\ H$$

Where: E = Allowable leakage in gallons per minute per 1000 feet of sewer tested.
D = Internal diameter of the pipe in inches.
H = Difference in elevation in the water surface in the upper manhole and the invert of the pipe at the lower manhole (feet).

4. Leakage from the sewer, as shown by the test, which exceeds that allowed by the formula will be corrected by the Contractor to reduce the exfiltration to within permissible limits.

5. Where the difference in elevation between inverts of adjacent manholes exceeds 10-feet, the exfiltration leakage test will be modified as directed by the City Engineer.

6. House surface laterals shall be considered part of the main sewer to which they are connected and shall be tested with the main line sewer.

C. Testing with air:

1. Air pressure may be used in lieu of the water exfiltration test subject to the approval of the City Engineer.

2. The low pressure air test shall be conducted by the following method under the direction of the City Engineer or City Inspector with equipment equal to Cherne Industrial, Inc.

3. All wyes, tees, or ends of lateral stubs shall be suitably capped and braced to withstand the internal test pressures. Caps shall be easily removable for future lateral extensions.

4. After a manhole to manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs. One of the plugs shall have three hose connections. Air for inflation of the triple connection pneumatic plug shall be supplied through a factory-equipped control panel. There shall be three hose connections from the control panel to the pneumatic plug. One hose shall be used for inflation of the plug. The second hose shall be used for continuously reading the air pressure in the sealed line. The third hose shall be used for introducing low pressure air into the sealed line.

5. There shall be a 3-1/2" or larger diameter, 0.30 psig gauge mounted on the control panel for reading of the internal pressure in the line being tested. Calibrations from the 0-10 psig range shall be in tenths of pounds and the 0-10 psig portion shall cover 90% of the complete dial range.

6. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any ground water that may be over the pipe.

7. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period (3.5 psig minimum pressure in the pipe), the third hose shall be disconnected from the control panel.

8. The pipe and joints shall also be considered acceptable when the time required in minutes for pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time shown for the given diameters in the following tables:

PIPE DIAMETER (Inches)	MINUTES
4	2.0
6	3.0
8	4.0
10	5.0
12	5.5
15	7.5
18	8.5
21	10.0
24	11.5

9. If the installation fails to meet this requirement, the Contractor shall determine at his own expense the source of leakage.

10. The Contractor shall repair or replace all defective materials and/or workmanship.

11. Pressure test concrete sewer manholes by the negative air pressure (vacuum) test as per ASTM C1244.

3.09 CLOSED CIRCUIT TELEVISION INSPECTION

A. Contractor shall inspect the sewer and storm drain lines with a color television camera. The camera test shall be supervised and witnessed by the City Engineer or the City Inspector and shall be done as follows:

1. The lines and lateral connections will be televised at the cost of the Developer until the lines are accepted by the City.

2. The camera shall have "PAN and TILT" capability for detailed wall, joint, and service inspection. The camera shall be pulled through the sewer line or propelled with a tractor.

3. The light intensity and camera focus shall be adjusted to obtain a good clear picture at all times.

4. The operator shall control the travel speed of the camera so that the walls of the pipe can be clearly viewed. The speed shall not be greater than 20 feet per minute. The operator shall stop and inspect each service, obstruction, or pipe deformation. Locations of each shall be noted and included in the final Inspection Report.

5. Defects such as high and low spots, joint separations, offset joints, chipped ends, cracked or damaged pipe, infiltration points and debris in lines shall be corrected . The maximum acceptable limits for 8 to 10 inch pipes are: 0.25 inches for joint separations, 0.5 inches for low spots, and 0.25 inches for chipped ends.

6. A flat or reverse grade will not be acceptable.

7. If the pipeline is found unacceptable, the problem shall be corrected by the contractor and re-televised.

8. The television inspection process shall be done immediately after running water in the pipe and no visible discharge occurs at the downstream manhole.

9. Television inspection must be scheduled with the City at least one (1) week in advance of inspection.

10. A typed log of the closed circuit television inspection with a digital CD/DVD video shall be turned over and become the property of the City. The Inspection Report shall contain the following:

    a. Location of sewer line and direction of flows
    b. Connecting manhole numbers with starting and ending manhole
    c. Manhole condition, flowline condition, and cover conditions
    d. Pipeline size, material, and condition, with defect locations noted from center of manhole
    e. Location of services located as to distance from center of manhole
    f. Date of inspection, name of contractor, and signature of operator/logger

11. After cleaning and inspection have been completed and any defects are corrected and accepted, the lines shall be tested for leakage by methods discussed in Section 3.08.

3.10 PIPE TESTING SCHEDULE

A. Irrigation:

1. Alignment and grade test.

2. Pressure test.

3. Operational Testing:
   a. Perform operational testing after hydrostatic test is complete, backfill is in place and sprinkler heads adjusted to final position.
   b. Demonstrate system meets coverage requirements and automatic controls function properly.
   c. Coverage requirements are based on operation of 1 circuit at a time.

B. Sanitary Sewers:

1. Displacement test.

2. Pressure test for gravity pipeline systems.

3. Pressure test for pressure pipeline systems.

4. Video test for sanitary sewers.

5. Pressure test manholes.

C. Subdrains:

1. Alignment and grade test.

2. Obstruction test.

3. Non-rigid pipe deflection test (if applicable)

D. Storm Drains:

1. Alignment and grade test.

2. Obstruction test.

3. Non-rigid pipe deflection test (if applicable).

4. Pressure test for pressure pipeline systems.

5. Video test for storm drain per 1.04 Project Conditions paragraph A.

E. Potable Water System:

1. Obstruction test.

2. Bacteria test.

3. Pressure test.

4. If pressure test fails and line is repaired, the bacteria test shall be repeated.

END OF SECTION

SECTION 02668

WATER TRANSMISSION AND DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe and fittings for culinary water line.

B. Valves, fire hydrants and water meters.

1.02 RELATED SECTIONS

A. Section 02205: Common Fill.

B. Section 02206: Select Fill.

C. Section 02225: Excavating and Backfill Operations.

D. Section 02250: Soil Compaction.

E. Section 02660: Pipeline Testing.

F. Section 02675: Disinfection.

G. Section 03300: Cast-in-Place Concrete: Concrete for thrust restraints.

1.03 REFERENCES

A. ASME B16.18: Cast Copper Alloy Solder Joint Pressure Fittings.

B. ASME B16.22: Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

C. ASTM B88: Seamless Copper Water Tube.

D. ASTM D2241: Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).

E. ASTM D2855: Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and fittings.

F. AWWA C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

G. AWWA C105: Polyethylene Encasement for Ductile Iron Piping for Water and Other liquids.

H. AWWA C110: American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids.

I. AWWA C111: Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.

J. AWWA C151: Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

K. AWWA C500: Gate Valves, 3 through 48 in NPS, for Water and Sewage Systems.

L. AWWA C502: Dry Barrel Fire Hydrants.

M. AWWA C504: Rubber Seated Butterfly Valves.

N. AWWA C600: Installation of Ductile-Iron Water Mains and Appurtenances.

O. AWWA C900: Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.

P. AWWA C906: Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 63 In. for Water Distribution and Transmission

Q. UL 246: Hydrants for Fire - Protection Service.

1.04 SUBMITTALS

A. Prior to construction, submit 6 copies of the manufacturers specification for all products to the engineer for approval.

1.05 SUBMITTALS AT PROJECT CLOSEOUT

A. Record and submit actual locations of piping, valves, connections, thrust restraints, and invert elevations.

B. Identify and describe unexpected variations in subsoil conditions or utilities.

1.06 SPECIAL REQUIREMENTS & CONSIDERATIONS

A. All materials which may contact drinking water, including pipes, gaskets, lubricants, and O-Rings, shall be ANSI-certified as meeting the requirements of ANSI/NSF Standard 61, Drinking Water System Components – Health Effects. To permit field-verification of this certification, all components shall be appropriately stamped with the NSF logo.

B. Pipe, joints, fittings, valves, and fire hydrants shall conform to applicable sections of AWWA Standards C104-A21.4-08 through C550-05 and C900-07 through C950-07.

C. All pipe materials and fittings shall be "lead free" in accordance with Section 1417 of the Federal Safe Drinking Water Act. They shall be certified as meeting ANSI/NSF 372 or Annex G of ANSI/SNF 61.

~~D. The standard horizontal distance between water lines and sanitary sewer lines shall be at least 10 feet. Where a water main and sewer line must cross, the water main shall be at least 18 inches above the sewer line. Separation distances shall be measured from pipe edge to pipe edge. Adherence to all separation requirements included in Sections R309-550-7 and R309-550-12 shall be required unless a written variance is requested and granted from the Utah Division of Drinking Water and Heber City.~~

~~E. Special design and construction considerations in accordance with Section R309-550-5(6) of the Utah Administrative Code shall be required for water mains located in areas of geologic hazard (e.g., slide zones, fault zones, river crossings, etc.)~~

~~F. Surface water crossings are generally prohibited and will only be allowed when no other practical alternatives exist and when specifically approved in writing by the City Engineer. If allowed, surface water crossings shall be designed and constructed in accordance with Section R309-550-8(8) of the Utah Administrative Code.~~

~~G. To provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins and "looping" of the water system whenever practical. Where dead-~~

~~end mains do occur (permanent or temporary), a fire hydrant or approved blow-off assembly shall be installed for flushing purposes as directed by the City Engineer. Flushing devices must have the minimum sizes shown on Heber City Standard Drawing "Water-8", but must also be sized to provide a minimum velocity of 2.5 fps in the water main.~~

PART 2 PRODUCTS

2.01 DUCTILE IRON WATER PIPE

A. Ductile Iron Water pipe shall be Class 50 for slip-on joint piping (Class 51 for 4-inch size) and Class 53 for mechanical joint and flanged joint piping.

B. All piping shall conform to AWWA Specification C151 of the latest revision.

C. Pipe joints shall be the push-on rubber gasket type of mechanical joint type with rubber gaskets conforming to AWWA C111 of latest revision or flanged connections conforming to AWWA C115 of latest revision.

D. All Ductile Iron Pipe wall thickness shall conform to AWWA C150.

E. Fittings: Fittings shall conform to AWWA Specification C110, or C153 and shall have mechanical, flanged or push-on rubber gasket joints.

F. Coatings and Linings for Ductile Iron Pipe:

1. All exterior surfaces of pipe and fittings shall be coated with hot coal tar approximately 1 mil thick or polyethylene encasement (AWWA C105) when soils conditions require additional protection.

2. All interior surfaces of pipe and fittings shall be coated with the standard thickness cement mortar lining in conformity with the requirements of AWWA C104

G. Markings:

1. Pipe markings shall include the following, marked continuously down the length:
   a. Manufacturer's Name.
   b. Nominal Size.
   c. Class Pressure Rating.
   d. NSF Logo.
   e. Identification Code.

~~H. Minimum water main size is 8 inches for culinary and 6 inches for secondary irrigation.~~

2.02 POLYVINYL CHLORIDE PIPE (PVC)

A. All PVC pipe used for transmission lines shall be AWWA C900, DR-18 or as determined by the City Engineer. All PVC pipe used for secondary irrigation lines shall be AWWA C900, DR-18 Purple pipe or as determined by the City Engineer.

B. Conformance: All PVC pipe shall conform to the latest revisions of the following specifications.

1. AWWA Spec. C900 (PVC pressure pipe for water).

2. ASTM Spec. D-2241 (Dimensions, Class, SDR, and tolerances).

3. National Sanitation Foundation Testing Laboratories (NFS).

4. Rubber Gasketing shall conform to ASTM F477.

5. Joints in compliance with ASTM D3139.

C. Pipe Dimensions:

1. Standard lengths shall be 20 feet.

2. Wall thickness shall be in accordance with ASTM d-2241.

3. Pipe ends shall be beveled to accept the gasketed coupling (4" and larger).

~~4. Minimum water main size is 8 inches for culinary and 6 inches for secondary irrigation.~~

D. Couplings and Fittings:

1. For pipelines over 2 inches in diameter, ductile iron fittings in conformance with AWWA C110 or C153 shall be used on PVC pipelines and shall have mechanical, flanged or push-on rubber gasket joints.

2. Where PVC fittings or couplings are used, they shall be furnished by the pipe manufacturer and shall accommodate the pipe for which they are to be used.

3. They shall have a minimum pressure rating of 200 psi.

4. Insertion depth of the pipe in the coupling shall be controlled by a gauge mark or mechanical stop in the coupling which will allow for a thermal expansion and contraction.

E. Lubrication: Lubrication shall be water soluble, non-toxic, be non-objectionable in taste and odor imparted to the fluid, be non-supporting of bacteria growth, and have no deteriorating effect on the PVC or rubber gaskets.

F. Concrete Blocking:

1. All fittings at bends and branches in water pipe lines shall be provided with concrete thrust blocking as shown on the Standard Drawings in addition to mechanical restraints.

~~2. All bolts shall be greased and bends will be wrapped with 8 mil plastic.~~

3. Blocking shall be of concrete specified in Section 03300, poured in place and shall bear against solid undisturbed earth at the sides and bottom of the trench excavation and shall be shaped so as to not obstruct access to the joints of the pipe or fitting.

2.03___-HIGH-DENSITY POLYETHYLENE (HDPE)

A. HDPE pipe shall only be used under certain design conditions with prior approval from City Engineer. All HDPE pipe used for culinary water transmission lines shall be AWWA C906, DR-11 with blue stripe or as determined by the City Engineer. All HDPE pipe used for secondary irrigation lines shall be AWWA C906, DR-11 with purple pipe or as determined by the City Engineer.

B. Conformance: All HDPE pipe shall conform to the latest revisions of the following specifications.

1. AWWA Spec. C906 (Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 63 In., for Water Distribution and Transmission).

2. ASTM D-2239 (Standard Spec for Polyethylene (PE) Plastic Pipe), ASTM D2737, ASTM D3035, and F714 (PVC plastic pipe SDR-PR and Class T).

G. Pipe Dimensions:

1. D.I.P.S shall be used unless otherwise stated.

2. Standard lengths shall be 40 or 50 feet.

~~3. Minimum water main size is 8 inches I.D. for culinary and 6 inches I.D. for secondary irrigation.~~

2.04 GATE VALVES

A. Gate valves shall be used for all applications. In cases where there is limited vertical clearance or when the operating nut of the gate valve would be less than three (3) feet from the surface, horizontal gate valves shall be used.

B. Furnish gate valves that conform to the requirements of AWWA C509~~, for applications less than 14" diameter and AWWA C515 for applications 14" diameter and greater, with cast iron body, bronze mounted, resilient wedge, parallel seat, non-rising stem design with "O" ring seals.~~

C. Operating Direction: Open counterclockwise.

D. Buried Valves: Unless otherwise shown or specified, in line valves shall be of Mechanical Joint connection design for buried service. Flange connections shall be used connecting valves to tees or crosses for buried service.

E. Buried Valves shall have 2" operation nuts.

F. Horizontal gate valves shall have 2:1 beveled gear reduction, unless otherwise approved by the City Engineer.

2.05 BUTTERFLY VALVES ~~(PROHIBITED UNLESS APPROVED BY THE CITY ENGINEER IN SPECIFIC CASES.)~~

~~A. Butterfly valves, if approved, are used when applications are 14" inch diameter or greater.~~

B. Material, in accordance with AWWA C504.

C. Body Type:

1. Valves shall be high strength cast iron ASTM A-126, Class B with 18-8 Type 304 stainless steel body seat.

2. Valve vane shall be mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel nylon locked screws.

3. If mechanical joints are used, the installation shall be per AWWA Specification C111 and accessories (bolts, glands, and gaskets) shall be included.

4. All butterfly valves shall be of the rubber-seated tight-closing type. The rubber seat shall be a full circle 360° seat not penetrated by the valve shaft.

D. Valve Shafts:

1. The valve shaft shall be one piece extending full size through the entire valve and operator with no neckdown, keyways, or holes to weaken it.

2. The valve shaft shall have 304 stainless steel journals rotating in reinforced Teflon bearings.

3. Valves shall have permanently set two-way thrust bearing.

4. Packing shall be "triple-seal" rubber designed for permanent duty in underground service.

E. All valves shall have stainless bolts and zinc coated stainless steel nuts.

F. Flange connections shall be used connecting valves to tees or crosses for buried service.

2.06 VALVE BOXES

A. All buried valves shall be installed with cast iron, 2 piece, sleeve type, with an expanded bell base, 5 1/4 inch shaft valve boxes.

~~A.~~B. All valve nut extensions shall be pinned or otherwise locked to the valve nut.

2.07 TAPPING SADDLES / SLEEVES

A. For tapping saddles used for service connections to plastic pipe, provide full circle saddles. For all other pipe provide double strap bronze alloy, ductile iron, or stainless steel saddles.

B. Provide tapping saddles that have a minimum rated working pressure of 300 psi, neoprene Buna N gaskets, and bronze tapered threads.

C. When approved by Heber City, tapping sleeves may be used for fire lines or other branch branch connections. Tapping sleeves shall be ROMAC Industries SST (or approved equivalent). Tapping sleeves shall not be used for size-on-size applications. The branch line must be at least one nominal pipe size less than the line being connected to. Bricks shall be used for support, not wood shims or any other material.

2.08 SERVICE CONNECTIONS

A. Provide and install according to standard drawings.

B. Service Pipe:

1. Provide single length Polyethylene pipe (copper tube size) with compression fittings. Copper services are not allowed.

2. Locate service taps in the upper quadrant of the main line, approximately at 45 degrees. The minimum distance between taps is 24", with a 5 degree stager. Do not make service taps within 24" of the end of the main line.

3. Service saddles are required on all taps unless indicated otherwise. All water main saddles must be installed with a torque wrench to the torque setting found on the informational tags attached to the saddle body.

4. In subdivision developments, the contractor shall be responsible to furnish and install the corporation type stop and laterals to a point on private property 10 feet past the street right-of-way line.

5. No splices in water services for new service and relocation unless approved by City Engineer.

C. New Meter Boxes: ~~Mueller / Hunt~~ Thermal-Coil Meter Assembly. See the Appendix for alternatives.

~~C.~~

Existing Meter Box Repairs: Double walled plastic can with ring and cover of sufficient strength to withstand H-20 loadings without damage.
Meter Boxes are allowed within the driveway "zone" with prior approval from the Public Works Department. The driveway "zone" shall include the flared driveway approach including five feet either side from the top of the flare. All retrofit of meter boxes within the driveway "zone" shall include shear support at the bottom of the meter box and shall be flush with the concrete surface.

D. Meter Setters: Series 70 manufactured by Ford or Mueller.

E. Service connections greater in size than 2" shall follow the Compound Meter with 2" Bypass details in the latest version of the APWA Standard Plans & Specifications published under the direction of the Utah Chapter of the American Public Works Association. For details on specific meter requirements, contact the Heber City Public Works Department.

F. All materials to be supplied by the Contractor, except for the meter.

2.09 HYDRANT

A. In accordance with AWWA C502 and pattern approved by Owner.

B. 6-inch cast iron hydrant as manufactured by Mueller Centurion 250, ~~or~~ Waterous – Model # WB-67-250, or Clow Medallion.

C. Cast-Iron Body Fire Hydrant: Compression type, opening against pressure and closing with pressure, base valve design, 150 psi working pressure, with 1/4" diameter minimum tapping and bronze plug in standpipe.

1. Size: Minimum 5 1/4" valve opening.

2. Direction to Open Hydrant: Left.

3. Size and Shape of Operating and Cap Nuts: Pentagon 1-1/2" point to flat.

4. Hose Nozzles: Two 2-1/2" National Standard Thread, cap, gasket and chain.

5. ~~Pumper Nozzles: One 4-1/2" National Standard Thread, cap, gasket and chain.~~

6. Depth of Cover: 5'-0" to top of pipe unless indicated otherwise.

7. Connection to Main: O-ring seals and a 6" ASA 125 pound flanged inlet.

8. Pressure: Designed for a working pressure of 175 psi and a hydrostatic pressure of 350 psi.

9. Bottom connection: 6" flanged. Designed to allow the flanges at the sidewalk level to separate when hydrant is sheared off.

10. Automatic drain: Opens as the hydrant is closed.

11. Hydrants shall be provided by the manufacturer with a factory applied red coating. Field painting of hydrants shall not be allowed.

D. Mechanical joint or flanged in accordance with AWWA C110 and AWWA C111.

~~E. Hydrant spacing shall not exceed 500 feet.~~

2.10 FIRE SERVICE

A. All fire service shall be a minimum 3" ductile iron pipe.

B. All fire services are required to install a gate valve at the main line connection and a RP double check backflow valve immediately inside the building. Tracer wire shall be installed along entire length of fire service.

2.11 AIR RELEASE STATIONS

~~A. Air Releases shall be installed at all peaks and sharp changes in gradient with a difference of elevation greater than 15 feet. If the waterline has service connections within the location of the peak or change in the gradient, the air release station may be eliminated at the City Engineers discretion.~~

2.12 BACK FLOW PREVENTORS

A. All irrigation lines connected to culinary system shall have RP backflow devices with 3 chambers, and above ground air release with an air gap.

B. All backflow preventers shall be tested by a certified backflow technician, and a passing test report will need to be provided to the City.

2.13 HARDWARE, ACCESSORIES & BOLT PACKS

A. All hardware, bolt packs, etc. to be buried shall be greased with food grade FM grease and wrapped in 8 mil (min) plastic secured in place using heavy duty adhesive tape.

B. All hardware, piloting, bolt packs, etc. to be exposed (including in manholes and vaults) shall be Stainless Steel unless otherwise approved by the City Engineer.

PART 3 EXECUTION

3.01 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.02 BEDDING

Refer to Section 02225

3.03 INSTALLATION – PIPE & FITTINGS

A. The bottom of the trench shall be cut flat, true and even to provide uniform bearing for the full length of the pipe barrel.

B. Under no circumstances shall pipe or accessories be dropped into the trench.

C. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with adjoining pipe to prevent sudden offsets.

D. Pipe bedding and trench backfill shall be as defined in the previous sections.

E. Install fittings, valves, etc., without the use of repair sleeves unless otherwise approved by the Public Works Director. Cut-in fittings, valves, etc., shall be installed with the use of Mechanical Joint by Flange adapters (or other means as necessary) to eliminate the need for repair sleeves.

F. As work progresses, interior of pipe shall be cleared of dirt and other superfluous materials.

G. Trenches shall be kept free from water until pipe jointing has been completed. Pipe shall not be laid when condition or trench or weather is unsuitable for such work.

H. At all times when work is not in progress, all open ends of pipe and fittings shall be securely closed so that no water, earth, or other substance will enter pipe or fittings.

I. Maintain separation of water main and services from sewer piping in accordance with Utah State Code.

J. Install pipe to indicated elevation to within tolerance of 5/8 inches.

K. Install ductile iron piping and fittings to AWWA C600.

L. Route pipe in straight line.

M. Install pipe to allow for expansion and contraction without stressing pipe or joints.

N. Install access fittings to permit disinfection of water system performed under Section 02675.

O. Slope secondary irrigation water pipe and position drains at low points. Drains shall discharge into storm drain system or other stream course that will not adversely impact adjacent properties.

P. Form and place concrete for thrust restraints at each elbow, change of direction, or dead end of pipe main.

Q. Install mechanical joint restraints approved by Heber City at all bends, branches, or dead ends.

R. Establish elevations of buried culinary piping to ensure not less than 5 feet of cover.

S. Establish elevations of buried irrigation piping to ensure not less than 2 feet of cover. Elevation of buried irrigation piping shall be set to match the design elevations and slopes identified in the plans. Survey cut stakes shall be utilized and followed when installing irrigation piping.

T. Install metallic tape continuous over top of pipe buried 12 inches above pipe line.

U. Backfill trench in accordance with Section 02250.

V. Handling Ductile Iron Pipe:

1. Pipe and fittings shall be handled in such a manner as to insure installations in sound, undamaged condition.

2. Particular care shall be taken not to injure the pipe coating and lining. Cement lining in pipe or fittings which is broken or loosened shall be cause for rejection of pipe or fittings.

3. All damaged pipe coating shall be repaired, prior to laying pipe or placing backfill.

4. Repair shall be accomplished by removing all damaged coating, wire-brushing to exposed metal, and applying two coats of coal tar coating of a type and quality to that originally in coating the pipe.

W. Cutting, Cleaning and Inspection:

1. Cutting of pipe for closure pieces or for other reasons shall be done in a neat and workmanlike manner by a method which will not damage the pipe.

2. Before installation, each pipe shall be inspected for defects.

3. All defective, damaged or unsound pipe shall be rejected.

X. Location of Stub Pipes:

1. The location of each stub shall be marked by placing a 2 x 4 marker at the end of the pipe and extending vertically from the end of the pipe to approximately 15 inches above the ground surface.

2. The portion of the 2 x 4 extending above ground, shall be painted as follows:
   a. Green - indicating sewer stub.
   b. Blue - indicating water.

3.04 INSTALLATION - VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Locate valves on property lines, at each intersection, and not more than 500 feet between.

C. Center and plumb valve box over valve. Set box cover flush with finished grade with concrete collar as per standard drawings.

D. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

E. Valves located next to fittings shall be connected via flange x flange joints.

F. Anchorages: Provide anchorages for tees, wyes, crosses, plugs, caps, bends, valves, and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages.

G. On private building fire services, a gate valve must be installed at the property line to isolate the fire service and a detector check valve must be installed where the fire line first enters the building.

3.05 INSTALLATION - SERVICE CONNECTIONS

A. The contractor or home owner must provide and install all parts according to the standard drawings.

B. The Engineer or Public Works Department must inspect the installation before burying or backfilling. The Contractor shall conform to the following requirements before a water meter shall be installed by Heber City:

1. Notify the Water Department at least five working days prior to the time the meter is to be installed and before backfilling.

2. The water lateral should be exposed in the street right-of-way one foot outside the property line, even if the lateral extends onto the property.

3. The end of the house lateral should be within 2 feet of the service lateral.

4. Both laterals should be exposed freely in the center of the excavation.

5. To prevent damage from possible freezing, the water lateral may be covered with materials such as sand, light gravel, straw, insulation, or similar light materials.
6. To establish the correct street right-of-way line, the property line pins or the sidewalk must be in place.

C. All of the above requirements must be complied with to the satisfaction of the City before the water meter will be installed.

D. A service charge will be assessed for crew time when prerequisites are not met before setting a meter. This fee must be paid before the meter installation will be rescheduled.

E. Any required re-setting of the water meter following initial installation shall be done by the City at the expense of the Developer or Contractor.

F. Place meter can in park strip or 1 foot behind sidewalk or on city side of property line, as directed by City Engineer.

G. Install setter no closer than 24" of ground surface.

H. Lids shall be flush with top of sidewalk elevation.

3.06 DISINFECTION OF CULINARY WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 02675.

3.07 TESTING OF WATER PIPING SYSTEMS

A. Test pipeline system in accordance with Section 02660.

3.08 TRACER WIRE INSTALLATION

A. Copper tracer wire to be installed the total length of pipeline with a branch to each tee, cross, and fire hydrant. (See Standard Drawing):

1. Copper wire should be #12 gauge single strand jacketed wire, manufactured for underground service.

2. Wire shall be continuous without breaks. Splices shall be made with petroleum filled wire nut caps.

3. Tracer Wire to be secured to top of pipe at a minimum of every Ten feet, by means other than metallic.
4. Tracer Wire should be brought up in all fire hydrants in culinary water lines, and in the first lateral of each street for pressurized irrigation (not to exceed 500 feet).

B. Perform a continuity test in the presence of the City Inspector prior to paving.

3.09 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with section 02250.

B. If tests indicate Work does not meet specified requirements, remove work, replace, and retest.

END OF SECTION

SECTION 02675

DISINFECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Disinfection of potable water system.

B. Test and report results.

1.02 REFERENCES

A. AWWA A100: AWWA Standard for Water Wells.

B. AWWA B300: AWWA Standard for Hypochlorites.

C. AWWA B301: AWWA Standard for Liquid Chlorine.

D. AWWA C651: AWWA Standard for Disinfecting Water Mains.

E. AWWA C652: AWWA Standard for Disinfection of Water-Storage Facilities.

F. State of Utah: Public Drinking Water Regulations, Part 2, Section 12.

1.03 DEFINITIONS

A. Disinfectant Residual: The quantity of disinfectant in treated water.

B. ppm: Parts per million.

1.04 SUBMITTALS

A. Contractor's evidence of experience in disinfection.

B. Bacteriological laboratory's evidence of certification.

C. Disinfection Report: 3 copies including:

1. Date issued.
2. Project name and location.
3. Treatment contractor's name, address and phone number.
4. Type and form of disinfectant used.
5. Time and date of disinfectant injection started.
6. Time and date of disinfectant injection completed.
7. Test locations.

8. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.

9. Time and date of flushing start.

10. Time and date of flushing completion.

11. Disinfectant residual after flushing in ppm for each outlet tested.

D. Bacteriological Report: 3 copies including:

1. Date issued.

2. Project name and location.

3. Laboratory's name, certification number, address, and phone number.

4. Time and date of water sample collection.

5. Name of person collecting samples.

6. Test locations.

7. Time and date of laboratory test start.

8. Coliform bacteria test results for each outlet tested.

9. Certification that water conforms or fails to conform to bacterial standards of State of Utah public drinking water regulations.

10. Bacteriologist's signature.

1.05 QUALITY ASSURANCE

A. Affidavit by manufacturer that disinfectant conforms to AWWA and NSF standards.

B. Bacteriological Laboratory: Certified by State of Utah.

1.06 PRODUCT HANDLING

A. Store and protect disinfectant in accordance with manufacturer's recommendations to protect against damage or contamination. Do not use unsuitable disinfectant.

B. Follow all instruction labeling for safe handling and storage of disinfectant materials.

1.07 REGULATORY REQUIREMENTS

A. Conform to State of Utah public drinking water regulations.

PART 2 PRODUCTS

2.01 DISINFECTANT

A. Liquid Chlorine: AWWA B301 with chlorine 99.5 percent pure by volume.

B. Sodium Hypochlorite: AWWA B300 with not less than 100 grams per liter available chlorine.

C. Calcium Hypochlorite: AWWA B300 with 65 to 70 percent available chlorine by weight in granular form.

D. Powder, tablet, or gas according to manufacturer's specification.

PART 3 EXECUTION

3.01 PREPARATION

A. Disinfect the potable water pipelines prior to pressure testing if connected to an existing system.

B. Unless waived by the City Engineer for retrofit/reconstruction projects, all water system components (including service connections) within the section of pipeline being tested must be complete before the testing is performed.

C. Ensure that the pipeline to be disinfected is isolated from the existing system.

D. Follow all guidelines set forth in AWWA C651.

3.02 DISINFECTION OF WATER LINES

A. Use one of the approved chlorination methods in AWWA C651.

B. Chlorination shall provide a minimum of 25 ppm residual after 24-hours contact in the pipeline. In general, this residual may be expected with an application of 50 ppm although some conditions may require more.

C. If calcium hypochlorite granules are used, granules shall be placed at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500 foot intervals. The quantity of granules shall be shown in table below, where D is the inside diameter in feet.

PIPE SIZE (inches)	CALCIUM HYPOCHLORITE GRANULES (oz)	CALCIUM HYPOCHLORITE GRANULES (g)
4	1.7	48
6	3.8	108
8	6.7	190
10	10.5	298
12	15.1	428
14 and larger	D^2 x 15.1	D^2 x 428

D. During the process of chlorinating the pipeline all valves and other pipeline appurtenances shall be operated several times to provide sufficient contact with the chlorinating agent.

E. See Section 02660 3.02 H for requirements of potable service lines.

3.03 DISINFECTION OF CULINARY WELLS

A. Use one method defined under AWWA A100 as approved by City Engineer.

B. Do not start disinfection until well is thoroughly cleaned.

C. Use a disinfecting solution containing a minimum of 50 ppm residual chlorine.

3.04 DISINFECTION OF WATER STORAGE RESERVOIRS

A. Use one method defined under AWWA C652, as approved by City Engineer.

B. Do not start disinfection until water storage tank is thoroughly cleaned.

C. Provide and use necessary safety equipment for workers in contact with disinfectant or gasses they may produce.

3.05 QUALITY CONTROL - BACTERIOLOGICAL TEST

A. No samples for testing shall be taken sooner than 24 hours after system flushing.

B. At least one set of samples shall be collected from every 1,200 feet of new water main, plus one set from the end of the line and at least one set from each branch. Sample water at each of the following locations, as applicable:

1. Where water enters system, including each source.

2. Ends of piping runs.

3. Remote outlets.

C. Analyze water samples in accordance with State of Utah requirements. Two (2) samples, 24 hours apart, will be taken at each location.

D. If bacteriological test proves water quality to be unacceptable, repeat system treatment.

E. Water systems shall not be accepted or placed into service until a negative bacteriological test is made on water taken. Repeat dosing as necessary until a negative test is obtained. Provide a copy of the negative bacteriological test to City Engineer.

F. The Public Works Department will perform bacteriological sampling on all new water distribution system infrastructure intended to become part of the community's water system. All locations for sampling will be determined by water department personnel. The cost for each sample will be billed to Developer / Contractor. Payment for testing shall be made before results will be released by the City.

3.06 FLUSHING AND DISPOSAL OF DISINFECTANT

A. After the 24 hour retention period, flush the chlorinated water from the main until chlorine measurements show the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.

B. Legally dispose of disinfecting water and ensure no chlorine buildup or damage to the environment. Unless otherwise approved by the Public Works Director, disinfecting water shall not be discharged onto the ground. Disinfecting water shall normally be discharged into a holding container or water truck where the chlorine concentration level shall be brought down to an acceptable level prior to discharge per the direction of the Public Works Director through the use of de-chlorination tablets or other acceptable reducing agents.

C. Failing to flush the line may require Contractor to replace all gaskets and valves within the system at Contractor's expense.

D. Flushing shall be accomplished through hydrants or, if a hydrant does not exist at the end of the line, the Contractor shall install a tap of sufficient size to provide for a 2.5 foot per second flushing velocity in the line. When flushing water service lines, all water meter vault inlets and/or ball valves shall be flushed of all disinfectant.

E. The following flow quantity required to provide a 2.5 foot per second flushing velocity:

PIPE SIZE (In.)	FLOW (gpm)
4	100
6	220
8	390
10	610
12	880
16	1567

END OF SECTION

SECTION 02720

SANITARY SEWER AND STORM DRAIN SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The requirements for pipe material and installation in sewer and drainage collection systems. All materials and workmanship shall strictly comply with the Utah State Plumbing Code.

1.02 REFERENCES

A. Section 02660: Pipeline Testing.

B. AASHTO-291: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

C. ASTM D 1248: Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.

D. ASTM D 2239: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter.

E. ASTM D 2321: Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.

F. ASTM D 2657: Standard Recommended Practice for Heat Joining of Thermoplastic Pipe and Fittings.

G. ASTM D 2774: Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.

H. ASTM D 3261: Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

I. ASTM D 3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

J. ASTM F 405: Standard Specification for Corrugated High Density Polyethylene (PE) Tubing and Fittings.

K. ASTM F 667: Standard Specification for Large Diameter Corrugated High Density Polyethylene Tubing and Fittings.

L. ASTM F 1055: Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.

M. ASTM C 1479: Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations.

1.03 DEFINITIONS

A. Standard Dimension Ratio (SDR): Average diameter of pipe divided by the minimum wall thickness. The diameter may be either inside or outside measurement depending upon which standard is referenced.

B. Code Designation: A rating of polyethylene pipe materials by the Plastic Pipe Institute. The designation PE 3408 designates the type of plastic pipe (PE), the grade (34), and the hydrostatic design stress measured in units of 100 psi (08).

1.04 SUBMITTALS

A. Manufacturer's affidavit certifying product was manufactured, tested and supplied in accordance with applicable references in this section together with a report of the test results and the date each test was completed.

PART 2 MATERIALS

2.01 REINFORCED CONCRETE SEWER AND STORM DRAIN PIPE

A. Reinforced concrete pipe shall be used for all sanitary sewers and storm drains where installation does not provide a cover of at least 2 feet over the top of the pipe.

B. Reinforced concrete pipe shall comply with the requirements of ASTM C76-109 with bell and spigot rubber gasket type joints for sanitary sewers and the alternate option of tongue and groove mortar joints for storm drain lines.

~~C. Minimum storm drain size is 18 inches, minimum sewer main size is 8 inches.~~

2.02 ~~CORRUGATED METAL STORM DRAINCULVERT PIPE~~

~~A. Galvanized or aluminized steel~~

~~1. Material according to ASTM A-929.~~

~~2. Pipe according to AASHTO M-36.~~

~~3. Design according to ASTM A-796.~~

~~4. Installation according to ASTM A-798.~~

~~B. Asphalt dipped according to ASTM A-849.~~

~~C. Pipe shall be Galvanized, Aluminized, or Asphalt dipped as required by City Engineer.~~

~~D. Minimum No. 14 gage plate thickness.~~

~~E. Pipe must be a minimum of 18 inches.~~

2.03 SUBSURFACE DRAIN PIPE

A. Pipe

1. Perforated PVC (ASTM D-1784).

2. Perforated Concrete Sewer Pipe (AASHTO M-86 & M-170).
3. Corrugated polyethylene piping (ASTM F-405-77a).

B. Bedding shall be drain rock.

2.04 PLASTIC SEWER PIPE

A. This specification covers rigid polyvinyl chloride pipe and fittings, hereinafter called PVC pipe and PVC fittings. The pipe and fittings shall meet or exceed all of the requirements of ASTM Specification D3034 and ASTM F679.

B. Samples of pipe, physical and chemical data sheets shall be submitted to the City Engineer for approval and his approval shall be obtained before pipe is purchased.

C. This pipe shall be homogeneous throughout and free form cracks, holes, foreign inclusions or other defects. The pipe shall be as uniform as commercially practical in color.

D. Physical Requirements

1. All PVC sewer pipe and fittings shall be made from clean, virgin, Type 1, Grade 1, PVC and minimum SDR-35 (PS46), conforming to ASTM resin specification D-1784. SDR-26 (PS115) or thicker (including fittings) shall be used for depths exceeding 12 ft measured from the top of the pipe, unless otherwise approved by the City Engineer.

~~2. All sewer pipe installed between manholes shall be of the same SDR and/or classification and shall be the highest classification required along the section.~~

~~3.~~2. All pipe joints shall be bell and spigot type with rubber ring gasket to permit expansion and contraction.

~~4.~~3. Pipe and fittings must be assembled with a nontoxic lubricant.

~~5.~~4. All pipe shall be less than 20 feet in length.

~~6.~~5. Spigot ends will have 15° tapered end with a memory mark around the diameter of the pipe to indicate proper insertion depth.

~~7.~~6. Wyes shall be of the same material as the pipe and in no case shall have thinner walls than that of the pipe furnished.

~~8.~~7. Sample wyes must be submitted for the City Engineer's approval and his approval must be obtained before purchase of the wyes.

~~9. Minimum sewer main line size is 8 inches.~~

2.05 HIGH DENSITY POLYETHYLENE STORM DRAIN PIPE (HDPE)

A. Smooth pipe systems

1. Material: Polyethylene code designation PE 3408 as rated in ASTM D 2239 with a minimum ASTM D 3350 cell classification of 345434C, and an SDR or pressure class rating as indicated.

2. Fittings: Manufactured of same resin as the pipe.

3. Joints:
   a. Thermally welded butt fusion in accordance with ASTM D 3261.
   b. Flanged in accordance with ASTM D 2657.

c. Ultra high molecular weight electrofusion tape with a polyethylene coupler meeting ASTM F1055 requirements.

4. Nuts and Bolts: Carbon steel machined heavy hex heads, Class 2 fit in accordance with ASTM A 307; Grade B, threads in accordance with ASME B1.1 Tape wrap steel materials for protection against corrosion after piping installation.

B. Corrugated Pipe Systems

1. Material: "High density polyethylene pipe shall be smooth lined and meet the requirements of AASHTO M294 Type S."

2. Material: Polyethylene, in accordance with ASTM F 405 or ASTM F 667, Type III, Category 4 or 5, Grade P33, Class C, or Grade P34, Class C as defined by ASTM D 1248.

3. Material: Polypropylene compound for pipe and fitting production shall be impact modified copolymer meeting the material requirements of ASTM F2881, Section 5 and AASHTO M330, Section 6.1

4. Fittings: Manufactured of same resin as the pipe.

a. Polypropylene fittings shall conform to ASTM F2881 or AASHTO M330. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

5. Joints: Bell and Spigot Type.

a. Polypropylene joints shall be joined using bell & spigot joints meeting the requirements of ASTM F2881 or AASHTO M330. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477.

C. Pipe Markings

1. Mark pipes continuously to identify:
   a. Manufacturer's name (or trade mark) and code.
   b. Nominal size.
   c. Polyethylene code designation.
   d. SDR rating. (Not applicable to corrugated polyethylene.)
   e. Date of manufacture.
   f. Pressure class. (Not applicable to corrugated polyethylene.)
   g. ASTM or AWWA designation number.

~~D. All storm drain sewer pipe must be a minimum of 18-inch in diameter for main lines.~~

2.06 SEWER LATERAL CONNECTIONS

A. All sewer lateral connections to new sewers shall be through preformed wyes.

B. Connections to existing sewers will be done with a sewer tapping machine as shown in Standard Drawings and use a Romac CB sewer saddle. "Inserta Tee" may be used only with prior approval from the Public Works Director and only on sewer laterals 10" and larger. All installations of "Inserta Tee" must be witnessed, inspected, and certified by authorized City agents.

C. Sewer laterals and fittings shall be constructed of a minimum of SDR 35 PVC. When SDR 35 PVC is used, a poured-concrete support, at least 4-inches thick and at least 4-inches beyond the

sides of the fitting, shall be placed under the wyes. SDR-26 PVC shall be used for depths exceeding 12 ft, measured from the top of pipe, unless otherwise approved by the City Engineer. All laterals shall have a minimum size of 4-inches.

~~D. 6-inch laterals shall connect into the main line through sewer manholes.~~

PART 3 EXECUTION

3.01 PIPE LAYING

A. All sewer pipe installation shall proceed up grade on a stable foundation with joints closely and accurately fitted.

~~1. Grade shall not be less than slope required for a full pipe to maintain 2 foot per second velocities.~~

B. Gaskets shall be fitted properly in place and care shall be taken in joining the pipe units to avoid twisting of gaskets.

C. Joints shall be clean and dry and a joint lubricant, as recommended by the pipe supplier, shall be applied uniformly to the mating joint surfaces to facilitate easy positive joint closure.

D. If adjustment of position of a pipe length is required after being laid, it shall be removed and rejointed as for a new pipe.

E. When laying is not in progress, the ends of the pipe shall be closed with tight fitting stopper to prevent the entrance of foreign material.

F. In addition to the above requirements all pipe installation shall comply to the specific requirements of the pipe manufacturer.

G. HDPE shall be installed as per manufacturer's instructions, ASTM D 2321 or ASTM D 2774 as applicable.

1. A minimum of 2 ft bury depth under paved areas for HDPE and PP pipe is required. Installation under non-paved areas, shall be installed per manufactures recommendations

H. Pipe shall be air tested per state regulations.

I. Concrete collars are required at all storm drain pipe connections to manholes or inlets. The concrete collar shall seal the storm drain pipe to the manhole or inlet.

J. All sewer repairs or joints that abut without a bell and spigot or mechanical joint shall use an approved gasketed solid sleeve, a"Fernco Stainless Steel Shear Ring", or a "Shear Guard" with concrete support saddle.

3.02 GRAVEL FOUNDATION FOR PIPE

A. Refer to Section 02225.

3.03 BEDDING

A. Refer to section 02225.

3.04 COMPACTION

A. Refer to Section 02250.

END OF SECTION

SECTION 02772

PONDS & SUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clear pond site and dispose of debris and unsuitable material.

B. Materials for dike.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures of Highway Construction Purposes.

1.03 SUBMITTALS

B. Laboratory analysis report of fill to be used in dikes in accordance with the sections referenced in this section and AASHTO M 145.

1.04 PERFORMANCE REQUIREMENTS

A. Protection: Do not contaminate embankment materials with debris or unsuitable material. Protect existing improvements, trees, structures or other items from damage during construction.

B. Dust Control: Thoroughly moisten all surfaces to prevent dust being a nuisance to the public, neighborhood, and concurrent performance of separate work on site.

C. Testing: 1 density test for each 100 square yard lift of backfill compacted in the Work.

1.05 JOB CONDITIONS

A. Do not interrupt surface drainage systems at site without City Engineer's approval.

B. Correct any damage caused by runoff or erosion during construction.

PART 2 PRODUCTS

2.01 BACKFILL SOILS

A. Native Fill: In accordance with Section 02205.

B. Common Fill: In accordance with Section 02205.

C. Select Fill: In accordance with Section 02206.

D. Impermeable Embankment: A-6 (CL) or A-4 (CL) material as defined in AASHTO M 145 with a plasticity index of at least 10, and a coefficient of permeability of less than 7 x 10-6 cm/sec.

E. Obtain City Engineer's approval of the material to be supplied prior to beginning construction.

2.02 GEOTEXTILE MATERIALS

A. Nonbiodegradable sheet material that is inert to soil chemicals, resistant to molds, mildew, acids and alkalies, and within a pH range of 3 to 12.

B. Sumps and Drain Fields: Geotextiles used as a separation layer between angular stone and fill or between stone and sump manhole/perforated pipe to prevent fines intrusion shall be AASHTO M288 Class 2 Non-Woven material (i.e. Mirafi 180 N, Contech C-70NW, etc.)

PART 3 EXECUTION

3.01 DETENTION AND RETENTION PONDS & SUMPS

~~A. Ponds shall be designed as attractive and usable spaces; i.e. depths 5 feet or less where feasible, appropriate landscaping, and elements that eliminate standing water and low flow impacts as required by the City Engineer.~~

~~B. Freeboard: 2 foot on dikes, 1 foot on excavations.~~

~~C. Slopes: 5:1 maximum side slopes on two or more sides, 4:1 maximum slopes on remaining sides, minimum 1% bottom slope.~~

~~D. Landscaping: Grass or other suitable landscaping materials should be used and irrigation systems installed. Developers will be required to escrow funds to landscape ponds when located on private lots for future reimbursement to the owner who completes the landscaping.~~

~~E. Easements: Provide minimum 20-foot easements for pipelines and access to maintain ponds. When located on private property, provide an easement over the pond area and 10 feet beyond the pond top of slope perimeter. Pond easements shown on subdivision plats shall be labeled with dimensions to facilitate relocation.~~

~~F. Detention ponds shall be designed for a minimum of a 25 year, maximum storm during a 24 hour period, a release rate of 0.1 cfs per acre, and provisions for an emergency overflow that will avoid flood damage to surrounding properties.~~

~~G. Retention ponds will be allowed if no suitable discharge point exists for conveying storm water away from the site. These ponds shall be designed for a minimum of a 100 year, maximum storm during a 24 hour period with appropriate features for maintaining water quality and percolating water into the ground. Percolation test results shall be provided and ponds shall be designed with sumps to completely drain within a 72 hour period unless otherwise approved by the City Engineer.~~

~~H. Pond inlets and outlets shall have trash racks or grates installed. A storm water pretreatment device, approved by the City, shall be installed upstream of the pond or sump inlets. When required, developments shall install a "Stormceptor" or approved equal pollutant removal device per City policy. When "Stormceptor" units are not required, a "Snout" or approved equal oil separator device shall be installed.~~

I. ~~Soil infiltration rates shall be verified by a certified percolation test at or near the location(s) which require storm water infiltration into the ground. A safety factor of two (2) shall be added to the final stabilized percolation rate used in the calculations to size storm water facilities.~~

3.02 EXCAVATION AND PREPARATION

A. In accordance with Section 02225.

B. Remove and stockpile all topsoil material for later placement on the outer dike surfaces.

C. Level areas where dikes are to be constructed. Unless indicated otherwise scarify the top 12" of the base material and compact to a minimum Standard Proctor of 92 percent in accordance with Section 02250.

3.03 EMBANKMENT CONSTRUCTION

A. Compact backfills to an average Standard Proctor density of 96 percent in accordance with Section 02250 with no single density reading less than 92 percent.

B. Place embankment materials in lifts consistent with the compaction equipment used.

C. Do not construct embankment with frozen or unapproved material.

D. Top of bank shall not be less than 10' wide with a 2% slope toward pond.

E. Overflow shall be provided by safety weir or a 5 fps max overflow outlet.

3.04 TOLERANCES

A. Dike Surface: Plus or minus 1" from true line and grade.

B. Dike Width: Plus or minus 6" from true line and grade.

3.05 FINISHING

A. After pond and slopes have been constructed to the lines and grades indicated, spread topsoil 6" deep on pond surfaces and grade to uniform slope.

B. Pond shall be landscaped and irrigated as approved by the City Engineer.

C. Dispose of excess or unsuitable materials and level all affected areas.

D. Leave site free of excess fill material and debris.

END OF SECTION

SECTION 02832

FENCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Chain Link Fence.

B. Wood Fence.

C. Construction Fence.

1.02 RELATED SECTIONS

A. Section 03304: Concrete anchorage for posts.

1.03 REFERENCES

A. ASTM A116: Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric.

B. ASTM A123: Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A392: Zinc-Coated Steel Chain-Link Fence Fabric.

D. ASTM F567: Installation of Chain-Link Fence.

E. ASTM F573: Residential Zinc-Coated Steel Chain Link Fence Fabric.

F. ASTM F1083: Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence structures.

G. ASTM F1234: Protective Coating on Steel Framework for Fences.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM F567.

PART 2 PRODUCTS

2.01 CHAIN LINK FENCE MATERIAL AND COMPONENTS

A. Framing (Steel): ASTM F1083 Schedule 40 galvanized steel pipe, welded construction, coating conforming to ASTM F1234 Type A on pipe exterior and interior.

B. Fabric Wire (Steel): ASTM A392 zinc coated wire fabric.

C. Concrete: Type specified in Section 03304.

D. Line Posts: 1.9 inch O. D. galvanized pipe at 2.72 lbs per foot.

E. Corner, Gate, Pull, and Terminal Posts: 2.4 inch O.D. galvanized pipe at 2.65 lbs. per foot.

F. Top Rail: 1.4 inch diameter, plain end, sleeve coupled.

G. Brace Rail: Minimum 1.6 inch O.D. galvanized pipe and adjustable 3/8 inch truss

H. Tension Wire: 7 gage, Bottom only.

2.02 WOOD FENCE MATERIAL AND COMPONENTS

A. Slats: Redwood, cedar, combed spruce or other wood covering acceptable to the City Engineer or his representative.

B. Bottom and top rail: Minimum 2x4x8 cedar stud.

C. Corner, Gate, End, or Line Posts: Minimum size 4x4 cedar wood post.

D. Concrete: Type specified in Section 03304.

2.03 CONSTRUCTION FENCE MATERIAL AND COMPONENTS

A. Material:

1. Fabric to be wire mesh which shall conform to AASHTO Designation M-279, nominal 0.9999-inch Farm Grade with standard six (6) inch graduated spacing. The wire mesh shall have a Class 1 zinc coating.

2. Corner, gate, end or line posts shall be painted metal tee, U or Y channel, angular, or other approved shapes 6'6" in length.

PART 3 EXECUTION

3.01 CHAIN LINK FENCE INSTALLATION

A. Line Pole Spacing, Straight run, tangents or curves:

1. Uniform spacing. Maximum 10 feet.
2. 100-foot radius or less, maximum 5 feet.
3. 100 to 200 foot radius, maximum 6 feet.
4. 200 to 500 foot radius, maximum 8 feet.

B. Set posts plumb, in concrete footings with top of footing 2 inches above finished grade. Slope top of concrete for water runoff.

C. Line Post Footing: Minimum 6 inches of concrete below bottom of post, 8 inches in diameter.

D. Corner, Gate, Pull, and Terminal Post Footing: Minimum 6 inches of concrete below bottom of post, 10 inches in diameter. Changes in line of more than 30 degrees shall be considered as corners.

E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.

F. Provide top rail through line post tops and splice with 6 inch long rail sleeves.

G. Do not stretch fabric until concrete foundation has cured 7 days.

H. Stretch fabric between terminal posts or at intervals of 500 feet maximum, whichever is less.

I. Position bottom of fabric 2 inches above finished grade and on a straight grade between posts. Excavate if necessary, fill only with approval of City Engineer.

J. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.

K. Fence fabric shall be placed on road side of posts unless otherwise indicated.

3.02 WOOD FENCE INSTALLATION

A. Construction Methods: The cedar posts shall be set true to line and grade in concrete bases at least two (2) feet in depth. All posts shall be sound and free from all decay, splits, multiple cracks, or any other defect which would weaken the posts or otherwise cause them to be structurally unsuitable for the purpose intended.

B. The maximum distance between posts in any section shall not exceed eight (8) feet. The top and bottom railing shall be securely fastened to the posts with galvanized nails or other acceptable means. Changes in line of 30 degrees or more shall be considered as corners. A minimum of six (6) inches of concrete shall be provided below the bottom of each post. End posts, corner posts, and gate posts shall have a concrete base at least twelve (12) inches in diameter. Bases for line posts shall also be twelve (12) inches in diameter.

C. Fence slats shall be placed on the roadway side of posts unless otherwise specified. The slats shall be placed approximately one (1) inch above the ground, and on a straight grade between posts by excavating high points of the ground. Filling depressions will be permitted only upon approval of the City Engineer. The slats shall be sound and free from all major decay or defects which would weaken or otherwise cause them to be unsuitable for fence slats. Fastening to top and bottom railing shall be done with two (2) galvanized nails and screw at both the top and bottom rail.

3.03 CONSTRUCTION FENCE INSTALLATION

A. Construction Methods:

1. Metal fence posts shall be a spaced a maximum interval of sixteen (16) feet. Posts spacing measurements shall be made parallel to the ground slope. All posts shall be placed in a vertical position. Metal posts may be installed by driving, if this can be done without damage to the post. Otherwise, they shall be installed to the specified depth (2'6") in larger drilled or dug holes and backfilled and compacted.

2. Corner posts shall be braced in two directions. End and gate posts shall be braced in one direction.

3. Wire mesh fabric shall be drawn tight enough to eliminate all sag without causing the "tension crimps" to fail to function.

4. Any high points along the ground surface which interfere with the placing of wire mesh shall be excavated to provide at least two (2) inches of ground clearance.

5. Every alternate lateral wire in the mesh fabric shall be fastened to each post by means of a clamp.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel bars, wire fabric or rod mats for cast-in -place concrete.

B. Support chairs, bolsters, bar supports, and spacers for supporting reinforcement.

1.02 REFERENCES

A. AASHTO M 254: Standard Specification for Corrosion Resistant Coated Dowel Bars.

B. ACI 301: Specifications for Structural Concrete for Buildings.

C. ACI 315: Details and Detailing of Concrete Reinforcement.

D. AASHTO M-32: Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

E. AASHTO M-55: Standard Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.

F. AASHTO M-55: Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

G. ASTM A 706: Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.

H. AWS D1.1: Structural Welding Code Steel.

I. AWS D1.4: Structural Welding Code Reinforcing Steel.

J. CRSI Document: Manual of Standard Practice.

1.03 SUBMITTALS

A. Shop drawings.

1. Indicate sizes, spacing, locations, and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting, and spacing devices.

2. When required by Engineer, prepare shop drawings by an engineer who complies with Utah licensing law and is acceptable to Engineer.

1.04 QUALITY ASSURANCE

A. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice.

B. Comply with ACI 301.

C. Welders: AWS D1.1 or AWS D1.4 as applicable.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcing Steel: In accordance with AASHTO M-31 or ASTM A 706 deformed bars, grade and type as indicated, including supplementary requirements S1, either uncoated or as indicated. When no grade is indicated use 60 grade steel. Use ASTM A 706 steel if welding is indicated or allowed.

B. Welded Steel Wire Fabric: In accordance with AASHTO M-55 plain type; in flat sheets or coiled rolls either uncoated or as indicated.

C. Stirrup Steel: In accordance with AASHTO M-32.

D. Plain Dowel Bars for Expansion Joints: In accordance with AASHTO M-31, Grade 60.

1. Provide metal dowel cap at one end of dowel to permit longitudinal movement of dowel within concrete section. Design caps with 1 end closed.

2. Provide for movement equal to joint width plus ½".

3. For load transfer bars, paint with 1 coat of lead or tar paint conforming to AASHTO M 254 and coat ½ with grease.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type or a patented system accepted by Engineer.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

2.03 FABRICATION

A. Fabricate reinforcement in accordance with ACI, providing for the concrete cover specified in Section 03304.

B. Locate reinforcing splices not indicated on drawings at points of minimum stress. Indicate location of splices on shop drawings.

C. Weld reinforcing bars in accordance with AWS D1.4.

PART 3 EXECUTION

3.01 PLACING

A. All reinforcement to be free of loose mill scale, loose or thick rust, dirt, paint, oil or grease.

B. Place all reinforcement in the exact position indicated. With tie wire tie bars together at alternate intersections.

C. Maintain the distance from vertical forms and between layers of reinforcement by means of prefabricated chairs, ties, hangers, or other approved devices. Placing and fastening of reinforcement in each section of the Work must be approved by Engineer before concrete is

placed.

D. Overlap sheets of metal mesh one square plus 6" to maintain a uniform strength. Securely fasten at the ends, edges, and support to maintain clearances.

E. Support reinforcing steel of formed flat slabs with metal chairs, precast concrete blocks or other slab bolsters. Size chairs or bolsters to position the steel in the exact location indicated. Space chairs for supporting the top steel and bolsters for supporting the bottom steel not more than 5 feet on centers in each direction. Plastic or epoxy coat that portion of the metal support in contact with the forms to prevent rust. Tie down deck steel to beams or forms at regular intervals of not more than 5 feet on centers along the beams or forms to prevent movement of the steel during placement of the concrete.

3.02 SPLICING

A. Furnish all reinforcement in the full lengths indicated unless otherwise permitted. Splicing of bars, except where indicated is not permitted without written approval from Engineer. Stagger splices where possible.

B. Unless indicated otherwise, overlap reinforcing bars a minimum of 30 diameters to make the splice. In lapped splices, place the bars and wire in such a manner as to maintain the minimum distance for clear spacing to the surface of the concrete.

C. Do not use lap splices on bars greater in diameter than No. 11 unless approved by Engineer.

D. Weld reinforcing steel only if indicated or if authorization is made by Engineer in writing. Weld in conformance to AWS D1.4.

E. Do not bend reinforcement after embedding in hardened concrete, unless permitted by Engineer.

F. Do not permit reinforcement or other embedded metal items bonded to the concrete, to extend continuously through any expansion joint, except dowels in floors bonded on only one side of joints.

3.03 PLACING EMBEDDED ITEMS

A. Place all sleeves, inserts, anchors and embedded items prior to concrete placement. Fill voids in embedded items temporarily with readily removable material to prevent entry of concrete.

B. Give all trades whose work is related to the concrete section ample notice and opportunity to introduce and/or furnish embedded items before concrete placement.

END OF SECTION

SECTION 03216

CONCRETE STRUCTURES, DRIVEWAY, SIDEWALK, CURB AND GUTTER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Materials, installation and tolerances for Portland cement concrete ramps, sidewalk, curbs, gutters, and driveway approaches.

1.02 SUBMITTALS

A. Concrete mix design must be submitted 48 hours before placement and physical-chemical analysis of aggregates, in accordance with Section 03304.

B. Test reports: Submit test reports as requested by Engineer verifying compliance with standards.

PART 2 PRODUCTS

2.01 BACKFILL MATERIALS

A. Common fill, in accordance with Section 02205.

B. Select fill, in accordance with Section 02206.

2.02 MATERIALS: Materials used in Portland cement concrete and reinforcing of Portland cement concrete shall meet the following requirements:

A. In accordance with Section 03304.

B. Reinforcing Steel: All bar material used for reinforcement of concrete shall be intermediate grade steel conforming to the requirements of ASTM Designation A-15 and shall be deformed in accordance with ASTM Designation A-305.

C. Welded Wire Fabric: Welded wire fabric for concrete reinforcement shall conform to the requirements of AASHTO M-55.

2.03 FORMS

A. Forms shall be substantially built and adequately braced so as to withstand the liquid weight of concrete. All linings, studding, walling and bracing shall be such as to prevent bulging, spreading, or loss of true alignment while pouring and displacement of concrete while setting.

B. Metal forms shall be used for curb and gutter work except at curves and on winding roads, unless continuous lay down machine is used, or as directed by city engineer.

C. Continuous curb lay down machine shall be used on all winding roads over 100 feet long, unless otherwise approved by City Engineer.

D. All edge forms for sidewalk pavements, curbs and gutters shall be of sufficient rigidity and adequately braced to accurately maintain line and grade.

E. Forms for curved sections shall be so constructed and placed that the finish surface of walls,edge of sidewalks, or curbs and gutters will not deviate appreciably from the arc of the curve.

F. Exposed vertical and horizontal edges of the concrete in structures shall be chamfered by the placing of moldings in the forms.

2.04 PORTLAND CEMENT CONCRETE

A. In accordance with Section 03304.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces scheduled to receive concrete form work for defects that will adversely affect the quality of the work and be out of compliance with tolerances for installation of concrete material.

B. Do not start work until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. A minimum slope of 0.5 % shall be maintained on all concrete used for drainage purposes unless discussed with and approved by the City Engineer.

B. Joining to Existing Concrete: Cut existing concrete to provide a straight line. Make all cuts at score lines or expansion joints. If existing adjacent concrete slabs not scheduled for replacement are damaged by Contractor's operation, replace concrete at no additional cost to City. When connecting to existing curb and gutter or waterways, the existing concrete shall be drilled and dowels inserted to make the connection.

C. Subgrade: A soils classification, as determined by AASHTO T-27 shall be made on the proposed subgrade and the following preparation schedule shall be followed based on that classification:

Sidewalk, Curb and Gutter, and Driveway Subgrade Preparation Schedule

SOIL CLASSIFICATION	REQUIREMENT
A-1 or A-2	The subgrade shall be moistened and compacted in accordance with Section 02250.
A-3 or A-4	The subgrade shall be over excavated a minimum of 12inches and replaced with select granular material and be moistened and compacted in accordance with Section 02250.
A-5, A-6, or A-7	The subgrade shall be over excavated a minimum of 18 inches, replaced with select granular material, and be moistened and compacted in accordance with Section 02250.

1. No organic material, soft clay, spongy material, or other deleterious material will be permitted in the scarified or imported subgrade layer.

2. Rough subgrade shall be shaped and graded at least 6 inches beyond the back of the sidewalk to within a tolerance of 0.10 feet of design grade and drainage shall be maintained at all times.

D. Compaction: As indicated, in accordance with Section 02250.

E. Select Backfill: Unless indicated otherwise, provide 6" minimum of select fill below curbs, gutter, driveway approaches, alley intersections, and sidewalks.

F. Reinforcement and Embedded Items

1. Reinforcing steel shall be clean and free from rust, scale, paint, grease, or other foreign matter which might impair the bond. It shall be accurately bent and shall be tied to prevent displacement when concrete is poured. Reinforcing steel shall be held in place by only metal or concrete ties, braces and supports. No steel shall extend from or be visible on any finished surface.

2. The Contractor shall use concrete chairs for holding the steel away from the subgrade and spreader or other type bars for securing the steel in place. The spreader bars shall be not less than 3/8 inch in diameter.

G. Site Preparation

1. Before batching and placing concrete, all equipment for mixing and transporting the concrete shall be cleaned.

2. All debris and ice shall be removed from the places occupied by the concrete.

3. Forms shall be thoroughly wetted (except in freezing weather), or oiled.

4. Masonry filler units that will be in contact with concrete shall be well drenched (except in freezing weather).

5. Reinforcement shall be thoroughly cleaned of ice or other coatings.

6. Water shall be removed from spaces to receive concrete.

3.03 CONCRETE PLACEMENT

A. Place in accordance with Section 03310.

B. No concrete shall be placed until the surfaces have been approved by the City Inspector.

C. When placing concrete on earth surfaces, the surfaces shall be free from frost, ice, mud, and water.

D. When the subgrade surface is dry soil or pervious material, it shall be sprayed with water immediately before placing of concrete or shall be covered with a plastic membrane.

E. Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to re-handling or flowing.

F. The concrete placing shall be carried on at such a rate that the concrete is at all times plastic and flows readily into the corners of forms and reinforcing bars.

G. No concrete that is partially hardened or been contaminated by foreign material shall be deposited in the work, nor shall retempered concrete be used.

H. All concrete in structures shall be vibrator compacted during the operation of placing and shall be thoroughly worked around reinforcement and embedded fixtures and into the corners of forms.

I. Placing concrete in cold weather:

1. No concrete shall be placed where the air temperature is lower than 40 degrees Fahrenheit, at a location where the concrete cannot be covered or protected from the surrounding air.

2. When concrete is placed below a temperature of 35 degrees Fahrenheit the ingredients of the concrete shall be heated so that the temperature of the mixture shall not be less than 50 degrees or more than 100 degrees Fahrenheit.

3. Before mixing, the heated aggregates shall not exceed 175 degrees Fahrenheit.

4. Cement shall not be added while the temperature of the mixed aggregates and water is greater than 100 degrees Fahrenheit.

5. When there is likelihood of freezing during the curing period, the concrete shall be protected by means of an insulated covering to prevent freezing of the concrete for a period of not less than 7 days after placing.

6. Equipment for protecting concrete from freezing shall be available at the job site prior to placing concrete. Particular care shall be exercised to protect edges and exposed corners from freezing.

7. In the event heating is employed, care shall be taken to insure that no part of the concrete becomes dried out or is heated to temperatures above 100 degrees Fahrenheit.

8. The housing, covering, or other protection used shall remain in place and intact at least 24 hours after the artificial heating is discontinued.

9. For a period of five days concrete shall be kept between 40 degrees and 100 degrees F.

3.04 CONCRETE MIXING

A. Concrete mix design must be submitted 48 hours before placement.

B. The concrete shall be mixed until there is a uniform distribution of the materials.

C. Sufficient water shall be used in mixing concrete to produce a mixture which will flatten and quake when deposited in place, but not enough to cause it to flow or exceed the water - cement ratio.

D. In no case shall the quantity of water used cause the collection of a surplus in the forms.

E. Ready-mixed concrete shall be mixed and delivered in accordance with the requirements set forth in AASHTO M-157.

F. Concrete shall be delivered and deposited in its final position within 90 minutes after adding the cement and water to the mixture.

G. Washing out of mixer trucks shall not be permitted within City rights-of-way.

3.05 CONTRACTION JOINTS

A. Sidewalks shall have contraction joints with the following requirements:

1. Spacing shall match sidewalk width.

2. Approximately 3/16 inch wide.

3. Approximately one-fourth of slab thickness.

B. Curb and Gutter shall have contraction joints with the following requirements:

1. Ten (10) foot intervals.

2. Approximately 3/16 inch wide.

3. Approximately one-half of slab thickness.

3.06 EXPANSION JOINTS

A. One-half (½) inch expansion joints, extending the full thickness of the slab shall be provided at minimum 60 foot intervals in all sidewalks in addition to locations where sidewalks adjoin existing sidewalks, or driveways. One-half (½) inch expansion joints shall be provided at minimum 100 ft intervals in curb and gutter.

B. Material for one-half (½) inch expansion joints shall be as defined in AASHTO M-33. Rubber Expansion Joint Filler is also acceptable as long as it meets or exceeds ASTM D1751-04 and AASHTO M-213-95

C. Expansion joints shall be installed with the top approximately one-quarter (1/4) inch below the concrete surface and extend to the bottom of the concrete.

3.07 SEALING OF EXPANSION AND CONTRACTION JOINTS

A. The sealant shall be one of the following or approved equal:

1. Polysulfide polymer by Thiokol Chemical Corporation.

2. Sonolastic one-part sealant by Sonneborn-Contech Corporation.

B. As an alternative to the above sealant a continuous film of 4 mil thickness water-proof plastic may be placed under all concrete sidewalks, curbs and gutters on the low sides of streets.

C. Other erosion prevention measures may be used as an alternate if the developer first obtains written approval from the City Engineer concerning material types and installation procedure.

3.08 FINISHING

A. Refer to Section 03345 for finishing requirements.

B. Slabs:

1. The concrete shall be brought to established grade and screened, and then worked with a magnesium float.

2. The concrete shall be given a light broom finish.

3. Dry cement or a mixture of dry cement and sand should in no case be sprinkled on the surface to absorb moisture or hasten hardening.

4. Do not spray water on the surface of concrete to aid in finishing.

5. Surface edges of all slabs shall be rounded to a radius of one-half (½) inch.

C. Curb and Gutter:

1. Curb and gutter shall be slipped with a continuous curb machine where possible.

2. Where concrete must be poured in curb and gutter forms it shall be tamped and spaded to insure a thorough mixture, eliminate air pockets, and create uniform and smooth sides.

3. While the concrete is still green and not thoroughly set, the forms shall be removed and the front and top sides shall be finished with a float or steel trowel to make a uniform finished surface.

4. The top and face of the curb and also the top of the apron on combined curb and gutter must be finished true to line and grade and without any irregularities of surface noticeable to the eye.

5. The gutter shall not hold water to a depth of more than one-fourth (1/4) of an inch nor shall any portion of the surface or face of the curb or gutter depart more than one-fourth (1/4) of an inch from a straight edge ten (10) feet in length, placed on the curb parallel to the centerline of the street nor shall any part of the exposed surface present a wavy appearance.

D. Sidewalk:

1. The sidewalk shall not hold water to a depth of more than one-fourth (1/4) of an inch nor shall any portion of the surface or face depart more than one-fourth (1/4) of an inch from a straight edge ten (10) feet in length, placed on the side walk parallel to the centerline of the street nor shall any part of the exposed surface present a wavy appearance.

3.09 CURING

A. Apply curing compound in accordance with Section 03310 unless water cure is indicated. Water cure is required if concrete surface sealing compound is to be applied.

B. A chemical curing agent may be used, provided it is applied in accordance with the manufacturers specifications.

C. As soon as the concrete has hardened sufficiently to prevent damage, the finished surface shall be sprinkled with water and kept wet for at least three (3) days.

3.10 PROTECTION AND REPAIRS

A. See Section 03310 Concrete Work

END OF SECTION

SECTION 03304

PORTLAND CEMENT CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Portland cement concrete material requirements.

B. Mix design requirements.

1.02 REFERENCES

A. AASHTO T- 26: Standard Method of Test for Quality of Water to be Used in Concrete.

B. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.

C. ACI 211.3: Standard Practice for Selecting Proportions for No-Slump Concrete.

D. ACI 214: Recommended Practice for Evaluation of Strength Test Results of Concrete.

E. ACI 306: Cold Weather Concreting.

F. AASHTO M-157: Standard Specification for Ready-Mix Concrete.

G. AASHTO M-85: Standard Specification for Portland Cement.

H. AASHTO M-154: Standard Specification for Air-Entraining Admixtures for Concrete.

I. AASHTO M-194: Standard Specification for Chemical Admixtures for Concrete.

J. AASHTO M-295: Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

1.03 DEFINITIONS

A. Average Strength (f_{cr}): The required average strength for 3 consecutive strength tests which statistically assures no more than the permissible proportions of tests will fall below specified strength.

B. Specified Strength (f_c'): The indicated strength.

1.04 SUBMITTALS

A. Mix Design: Submit each proposed mix design 48 hours prior to use in the Work. Indicate whether mixes have been designed for pumping. Include the report the following information.

1. Water-cement ratio.

2. Proportion of materials in the mix.

3. Source and type of cement.

4. Analysis of water to be used.

5. Type and name of admixtures applied. Indicate when accelerating or retarding admixtures are to be used.

6. Slump, air content and temperature of samples.

7. Unit weight of fresh and dry light weight concrete.

1.05 QUALITY ASSURANCE

A. Use the same source and type of cement, air-entraining agent, water reducing agent, other admixtures, and aggregate.

B. In proportioning materials for mixing, use scales certified by the State of Utah. Do not use volume measurement except for water and liquid admixtures.

C. Do not change the quantity of cement per cubic yard.

D. Use of admixtures will not relax hot or cold weather placement requirements.

E. Ready-mixed concrete, in accordance with AASHTO M-157 and requirements in this Section.

F. Testing Concrete: In accordance with Section 01450.

PART 2 PRODUCTS

2.01 CEMENT

A. Type II (moderate sulfate resistance) or Type V (high sulfate resistance), in accordance with ASTM M-185.

2.02 WATER

A. Water used in mixing concrete shall be clean and free from oil, acid, salt, injurious amounts of alkali, organic matter or other deleterious substances. Clean, non-staining and not detrimental. Comply with AASHTO T 26.

2.03 AGGREGATES - GENERAL

A. Gravel, crushed slag, crushed stone, or other inert material, composed of hard, strong, durable particles free of injurious coatings.

B. The materials passing the No. 200 sieve shall not exceed 1.75 percent by weight in the combined coarse and fine aggregate.

2.04 ADMIXTURES

A. Air Entrainment: pH 2.0 maximum type in accordance with AASHTO M-152.

B. Water Reducing and Water Retarding Agents: In accordance with AASHTO M-194.

1. Type A: Water reducing.

2. Type B: Retarding.

3. Type C: Accelerating.

4. Type D: Water reducing and water retarding.

5. Type E: Water reducing and accelerating.

6. Type F: High range water reducing (super plasticizer). *

7. Type G: High range water reducing and retarding. *

*The relative durability factor of water reducing admixtures shall not be less than 90 and the chlorides content (as Cl-) shall not exceed 1 percent by weight of the admixtures.

C. Calcium Chloride: None allowed.

D. Pozzolan: Pozzolan conforming to the requirements of ASTM C 618, Class F, is allowed as Portland cement replacing agent under the following conditions:

1. If a blended aggregate passes an unmodified ASTM C 1293 test, use of a pozzolan is allowed. If aggregate does not pass ASTM C 1293, select a pozzolan (or blended cement, or both) and determine the effective dosage to meet one of the following tests:

   a. ASTM C 1567. The expansion of the cement-pozzolan-aggregate job-mix mortar bar is less than or equal to 0.10 percent at 16 days. Do not use the test if a lithium admixture is used in the job-mix.

   b. ASTM C 441. The expansion of a test mixture at 56 days is less than or equal to a control mixture prepared with cement with equivalent alkalis between 0.5 and 0.6 percent.

2. Do not replace more than 10 percent of the Portland Cement.

3. The ratio of replacement by weight of Pozzolan to cement shall be 1.25 to 1.0.

4. The minimum cement content shall be used in the design formulas before replacement is made.

5. Loss of ignition of pozzolan is less than 3 percent and the water requirement shall not exceed 100 percent.

6. All other requirements of this section still apply.

7. Mix designs including trial batches are required for each aggregate source and for each concrete class.

E. Fly Ash: Class F fly ash allowed as a cement replacement under the following conditions:

1. Before replacement is made, use the minimum cement content in the design formula to establish the water/cement ratio.

2. Replace up to 20 percent of the cement by weight on a one (1) part fly ash to one (1) part cement basis.

3. Submit to Engineer a quality history of the fly ash identifying a minimum of 20 of the most current ASTM C 618 analysis.

2.05 ENTRAINING AGENT

A. An air-entraining agent shall be used in all concrete exposed to the weather. The agent shall conform to AASHTO Designations M-152.

2.06 ACI MIX DESIGN

A. The amount by which the average strength of a concrete mix exceeds the specified strength shall be based upon no more than 1 in 100 random individual strength tests falling below the specific strength.

B. Proportion the materials in accordance with ACI 211.1, 211.2 or 211.3 as applicable to produce concrete having the following properties or limitations:

CONCRETE MIX PROPERTIES			
Properties	Concrete Class		
	4000	3000	2500
Specified Compressive Strength f_c' at 28 days, psi	4000	3000	2500
Compressive Strength at 7 days, psi[(a)]	2680	2010	1675
Water-cement ratio (by weight), max	0.44	(c)	
Cement content (94 lb. sacks of cement per cubic yard of concrete)	6.5	5.5	5
Entrained air content, (% by volume) based on aggregate size	Entrained air content, (% by volume) based on aggregate size	Entrained air content, (% by volume) based on aggregate size	Entrained air content, (% by volume) based on aggregate size
2"	4.0 to 7.0	4.5 to 7.5	3.0 to 6.0
1-1/2"	4.5 to 7.5	4.5 to 7.5	3.0 to 6.0
1"	5.0 to 7.5	4.5 to 7.5	3.0 to 6.0
¾"	5.0 to 7.5	4.5 to 7.5	3.0 to 6.0
Slump Range, in. [(b)]	2 to 4	2 to 4	2 to 4

(a) Used for monitoring purposes only.
(b) Not more than 8" after adding high range water reducer admixture (super-plasticizer) to verified 2" to 3" slump concrete.
(c) Specific to exposure conditions and finishing need

C. The use for each class of concrete is as follows:

1. 4000 psi: Reinforced structural concrete.

2. 4000 psi: Sidewalks, curb and gutter, cross gutters, concrete collars, pavements and unreinforced footings and foundations.

3. 3000 psi: Thrust blocks, anchors and mass concrete.

D. Water:

1. Sufficient water shall be added to produce concrete with the minimum practicable slump.

2. The slump of mechanically vibrated concrete shall not exceed 4 inches.

3. No concrete shall be placed with a slump in excess of 5 inches.

4. The maximum permissible water cement ratio (including free moisture of aggregates shall be 5 and 5 3/4 gallons per bag of cement respectively for 4000 and 3000 psi air entrained concrete.

2.07 HAND MIXING

A. Do not hand mix batches exceeding 0.5 cubic yards.

2.08 HEATING, WATER AND AGGREGATE

A. Do not allow products of fuel combustion to contact the aggregate.

B. Heat aggregate and mixing water to 150 degrees F. maximum. Heat aggregates uniformly.

C. Maintain mixed concrete temperature at time of placement between 60 and 90 degrees F.

D. Do not mix cement with water or with mixtures of water and aggregate greater than 90 degrees.

PART 3 EXECUTION

3.01 DELIVERY

A. Slump: Do not transport concrete to the work location if concrete is greater than permissible slump.

B. Discharge: After the introduction of mixing water to the cement and aggregates at the batch plant, discharge concrete from truck mixer within 90 minutes.

3.02 RE-TEMPERING

A. Adding Water: When concrete arrives at site with slump below specified, water may be added once if neither the maximum approved water/cement ratio nor the maximum slump is exceeded provided that the drum turns a minimum of 90 revolutions.

B. Super-plasticizer: Premeasure and add high range water reducers (super-plasticizer) in accordance with manufacturer's instructions. Add super-plasticizer at site using truck-mounted power injection equipment capable of rapidly and uniformly distributing the admixture to the concrete. Mix for a minimum of 3 minutes prior to discharge.

C. Re-tempering after delivery time with super-plasticizer is prohibited.

3.03 CONCRETE PLACEMENT

A. In accordance with Section 03310.

END OF SECTION

SECTION 03310

CONCRETE WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete placement operations for slabs on grade, slabs on fill, structural building frame, and other concrete components.

1.02 REFERENCES

A. AASHTO M-182: Standard Specification for Burlap Cloth Made from Jute or Kenaf.

B. ACI 301: Specifications for Structural Concrete for Buildings.

C. ACI 305: Hot Weather Concreting.

D. ACI 306: Cold Weather Concreting.

E. ACI 309: Standard Practice for Consolidation of Concrete.

F. ACI 315: Details and Detailing of Concrete Reinforcement.

G. AASHTO M-148: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

H. ASTM C-642: Standard Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete.

1.03 RELATED WORK

A. Manufacture of Portland cement concrete and delivery to site, in accordance with Section 03304.

1.04 SUBMITTALS

A. Record of Placed Concrete: Record date, location of pour, quantity, air temperature, and test samples taken.

B. Product name, type, and chemical analysis of the following as applicable:

1. Curing compound.

2. Sealing compound.

3. Chemical hardener.

1.05 QUALITY ASSURANCE

A. Rejection: Concrete work which fails to meet one or more of the following requirements, and which cannot be brought into compliance shall be rejected. Engineer shall determine appropriate modifications or payment adjustments to be made.

1. Appearance: Concrete exposed to view with defects which adversely affect appearance of specified finish.

2. Strength: Strength of concrete fails to comply with any of the following requirements:
   a. Low compressive or flexural strength.
   b. Reinforcing steel size, quantity, strength, position, damage, or arrangement at variance with requirements.
   c. Concrete which differs from required dimensions or location in such a manner as to reduce its strength or load carrying capacity.
   d. Inadequate protection of concrete from extremes of temperature during the early stages of hardening and strength development.
   e. Mechanical injury, construction fires, accidents, or premature removal of formwork likely to result in deficient strength development.
   f. Workmanship likely to result in deficient strength.

3. Slab Tolerance: Field quality control as specified herein.

4. Material Sources: In accordance with Section 03305.

1.06 WARRANTY

A. Repair or replace defective or damaged work at no additional cost to City.

PART 2 PRODUCTS

2.01 ACCESSORIES

A. Bonding Compound: Polyvinyl acetate or acrylic base, rewettable type.

B. Vapor Retarder: 10 mil thick clear polyethylene sheet. Type recommended for below grade application.

C. Forms: In accordance with Section 03216 and ACI 315.

D. Reinforcement: In accordance with section 03200.

E. Covering: Waterproof paper, polyethylene sheet or burlap cloth complying with AASHTO M 182, Class two.

2.02 CONCRETE SURFACE CURING COMPOUND

A. Liquid membrane, in accordance with AASHTO M-148

B. Type of Compound: Engineer to select.

1. Type 1, clear or translucent without dye.

2. Type 1-D, clear or translucent with red fugitive dye.

3. Type 2, white pigmented.

C. Class of Vehicle: Class A, no restrictions.

D. Performance Criteria of Compound: Compatible with sealing compound, if sealing compound is to be applied over concrete curing compound.

PART 3 EXECUTION

3.01 PREPARATION

A. All exposed corners shall be chamfered (3/4" x 3/4").

B. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, held securely, and will not impede placing concrete.

C. Do not allow construction loads to exceed member capacity.

D. Prepare previously placed concrete by cleaning with steel brush and applying bonding compound. Apply bonding compound in accordance with manufacturer's instructions.

E. At locations where new concrete is dowelled to existing work, drill holes in existing concrete work placed at ambient temperatures above 40 degrees F. Use of admixtures will not relax cold weather placement requirements.

F. Do not disturb reinforcement, inserts, embedded parts, and formed joints.

G. Do not break or interrupt successive pours such that cold joints occur.

H. Honeycomb or embedded debris in concrete is not acceptable.

3.02 JOINTS

A. Saw cut patterns where indicated. Saw cut control joints without raveling of the concrete. A maximum of 24 hours after pouring the concrete and prior to occurrence of any surface cracking.

3.03 CONSOLIDATION

A. In accordance with ACI 309.

B. Keep spare vibrator available during concrete placement operations.

3.04 FINISHING

A. Do not add water or retemper concrete unless Engineer's approval is secured.

B. Slab Finishing Tolerances: When tolerance is not indicated, use Straightedge Tolerance.

1. Very Flat Tolerance: True plane with maximum variation of 1/8-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

2. Flat Tolerance: True plane with maximum variation of 3/16-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

3. Straightedge Tolerance: True plane with maximum variation of 5/16-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

4. Bullfloated Tolerance: True plane with maximum variation of 1/2-inch in 10 feet when measured with a 10-foot straightedge placed anywhere on the slab in any direction.

C. Finishes: In accordance with Section 03345. When type of finish is not indicated, use following finishes as applicable:

1. Sidewalks, garage floors, and ramps: Broom or belt finish.

2. Exterior concrete pavement: Broom or belt finish.

3. Exterior platforms, steps, and landings, exterior and interior pedestrian ramps, not covered by other finish materials: Nonslip finish.

4. Surfaces intended to receive bonded applied cementitious applications: Scratched finish.

5. Surfaces intended to receive roofing, except future floors, waterproofing membranes, and roof surfaces which are future floors or sand bed terrazzo: Floated finish.

6. Floors and roof surfaces which are floors intended as walking surfaces or to receive floor coverings: Troweled finish.

7. Unpainted concrete surfaces not exposed to public view: Smooth as-cast form finish.

8. Unpainted concrete surfaces exposed to public view: Rubbed finish.

9. Concrete surfaces to receive paint or plaster: Grout cleaned finish.

D. Chemical Hardener: After completion of curing, apply chemical hardener in accordance with manufacturer's instructions to all interior floor slabs which are exposed in finished work and elsewhere as indicated. After final coat of chemical hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water. Do not place liquid floor hardener on floor areas scheduled to receive synthetic matrice terrazzo, or setting beds for tile, terrazzo, vinyl flooring, or like items.

3.05 CURING

A. General: Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete. Cure concrete by applying curing compound, by moisture curing, by moisture-retaining cover curing, or by combinations thereof.

B. Curing Compounds:

1. Apply curing compound to concrete slabs within 2 hours of completing final finishing operations. Apply uniformly in continuous operation. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period. Should side forms be removed before expiration of 7 days from start of curing, coat exposed surfaces with curing compound.

2. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Engineer.

C. Moisture Curing: Provide either of the following methods.

1. Keep concrete surface continuously wet by covering with water or continuous water-fog spray.

2. Cover concrete surface with absorptive cover, thoroughly saturated with water and kept continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

3.06 SEALING

A. Seal concrete by applying a sealing compound as required by Engineer.

B. Surface Preparation: If necessary to remove curing compound, sandblast concrete surface. Clean surface free of dirt, oil, grease and other contaminants. If necessary use proprietary cleaning compounds (not raw acids) followed by thorough water rinsing. Use high pressure water equipment providing 1,200-2,000 psi to remove detergent residues. Do not attempt application when condensation is present.

C. Application: Spray with low pressure (20 psi) airless spray equipment. Saturate the surface to the point of rejection. On vertical surfaces apply 2 coats.

D. Coverage Rates: In accordance with manufacturer's recommendation.

E. Paint Adhesion: Always test to verify compatibility between sealant and other proposed surface treatments.

F. Warning: Remove inadvertent splashes before the solution has dried on the surface. If sealant is a hazardous material, allow use only by professional applicator. Three (3)- 4-inch cylinders shall be taken and a slump and air test shall be done at the beginning of concrete placement and every 50 cubic yards thereafter.

3.07 TESTS

A. Arrange for and perform all testing required for qualification of proposed materials and the establishment of mix designs, in determining strengths for early form removal, for cylinder tests after the addition of water, and other needs of Contractor.

B. Two slump tests, one before and one after the addition of super-plasticizer.

C. Three (3) standard 4-inch cylinder samples of concrete from trucks receiving water after addition of water.

3.08 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required levels, lines, details, and elevations.

B. Structural analysis and additional testing may be required at no additional cost to Owner when the strength of a structure is considered potentially deficient.

C. Where allowed, patch imperfections. Refer to Section 03345 for finish requirements.

3.09 PROTECTION AND REPAIRS

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. All concrete curbs, gutter, sidewalks, and driveways requiring removal and replacement, shall be removed and replaced to the next joint or scoring lining beyond the actually damaged or broken sections.

D. In the event that joints or scoring lines do not exist or are five or more feet from the removed or damaged section, the damaged portions shall be saw cut, removed, and reconstructed to neat, plane faces.

E. When saw cut sections are allowed for removal and replacement, use epoxied dowels in all cut planes.

F. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements.

G. Where necessary, lampblack or other pigments shall be added to the new concrete to obtain the desired results.

H. The concrete surface must not be damaged or pitted by rain.

I. The Contractor shall provide and use, when necessary, sufficient tarpaulins to completely cover all sections that have been placed within the preceding twelve (12) hours.

J. The Contractor shall erect and maintain suitable barriers to protect the finished surface.

K. Any section damaged from traffic or other causes occurring prior to its official final acceptance shall be repaired or replaced by the Contractor at his own expense in a manner satisfactory to the City Engineer.

L. Spalling: Concrete shall not spall or show signs of spalling before the warranty expiration. All concrete with spalling shall be removed and replaced by the Contractor or Owner at his own expense. When approved by City Engineer, concrete with spalling may be repaired by an approved method. The approved method must be a five step process which includes a muriatic acid wash, pressure wash with orbital nozzle, application of approved grout & cement modifier, and application of an approved sealer. The following products are approved for use to repair spalling concrete:

1. Planicrete AC Acrylic Latex Admixture for Mortar and Concrete mixed with Planitop X One-Component Fast Setting Vertical and Overhead Repair Mortar with Planiseal WR 40 Water Based 40%-Silane Penetrating Water Repellant.
2. Duraset 1000 Modified Acrylic Resin mixed with G100 Pro-Series Grout Mix and Liquid Colorant.
3. SuperSeal 2000 Solvent Based Acrylic Sealer.

M. Damaged Sidewalk and/or Curb & Gutter shall be repaired or replaced according to the following criteria.

1. Cracks in Concrete Infrastructure
   a. Cracks in Concrete Sidewalk
      i. Single "hairline" cracks running perpendicular to the length of the sidewalk, and which do not show evidence of vertical offset or movement, do not require repair or replacement.
      ii. All other cracks in sidewalk require removal and replacement of the entire concrete section*.
   b. Cracks in Concrete Curb & Gutter

i. Single "hairline" cracks running perpendicular to the length of the curb & gutter, and which do not show evidence of vertical offset or movement, do not require repair or replacement.
ii. Single cracks running perpendicular to the length of the curb & gutter which are greater in width than a "hairline" crack, but which are less than 1/8 inch in width, shall be repaired by sealing the crack with an approved sealant following preparation including routing and cleaning.
iii. All other cracks in curb & gutter require removal and replacement of the entire concrete section*.

2. Gouges in Concrete Infrastructure (Damage to Planar Surfaces, excludes Edges/Corners)
   a. Gouges in Concrete Sidewalk or Concrete Curb & Gutter
      i. Single (or minimal) gouges up to 3 inches in length and less than ½ inch in depth, and which do not represent a safety hazard in the opinion of the inspector, do not require repair or replacement.
      ii. Single (or minimal) gouges up to 3 inches in length and less than 3 inches in depth, shall be repaired using an approved two-part epoxy patching compound.
      iii. All other gouges in sidewalk require removal and replacement of the entire concrete section*.

3. Chips to Concrete Infrastructure (Damage to Edges & Corners)
   a. Chips in Concrete Sidewalk
      i. Single (or minimal) chips up to 3 inches in length and less than 1 ½ inches in width, and which do not represent a safety hazard in the opinion of the inspector, do not require repair or replacement.
      ii. All other chips in sidewalk require removal and replacement of the entire concrete section*.
   b. Chips in Concrete Curb & Gutter
      i. Single (or minimal) chips up to 3 inches in length and less than 1 ½ inches in width, shall be repaired using an approved two-part epoxy patching compound.
      ii. All other chips in curb & gutter require removal and replacement of the entire concrete section*.

4. In addition to the information provided above, removal and replacement of the entire concrete section* is required for the following types of damage:
   a. Multiple cracks, where the cracks are less than a sidewalk width apart.
   b. Cracks that converge creating small isolated pieces of concrete.
   c. Cracks that generally run parallel to the length of the infrastructure.
   d. Cracks that circle back to the original side creating "half moon" pieces of concrete.
   e. Cracks that allow the concrete to move vertically from the adjoining piece.
   f. Excessive scaring, spalling, or scraping of the finished concrete surface.
   g. Cracks with chipping along the edge at the surface indicating settlement or movement along the crack.
   h. Any damage, which in the inspectors' opinion, was clearly the result of negligence on the part of the builder, or damage which appears will result in failure of the sidewalk or gutter and its intended function.

*Sections may be cut and the damaged portions removed, provided no remaining or new section(s) are less than 5 feet in length. (Cut lines are considered as section lines.)

N. Approved Products for Concrete Damage Repair:
   1. Concrete Sealant: Sikaflex® 1a or 1cSL (or approved equal)
   2. Epoxy Repair: Rezi-weld 2-Part Gel Paste (or approved equal)

3. Epoxy Repair: Quikcrete Concrete Repair No. 8620-49 (or approved equal)

Note: As an alternate to the two-part epoxy patching compound, and when approved by the City Engineer, the 5 step process and products listed for spalling repair may be used for chip and gouge repair.

O. Concrete sidewalk and curb & gutter which is defective due to settlement, uneven joints, or tripping hazards may be corrected by "Concrete Lifting" as approved by City Engineer. Concrete lifting shall conform to the following:

1. Concrete repair by lifting shall only be performed by a licensed contractor specializing in concrete lifting.

2. Concrete lifting shall be completed by drilling strategically placed holes in concrete. A grout, sand, Portland cement, and water mixture shall be used proportioned to harden without settlement and to sufficiently fill voids beneath the concrete. Foam products may also be used when approved by City Engineer. Holes shall be placed to allow for pumping the mixture under the concrete to lift the settled areas. Additional holes shall also be drilled to allow for filling voids created by the lifting procedure.

3. The proportion of Portland cement shall be a minimum of 5 percent by weight of dry mixture.

4. The use of the concrete lifting technique may be attempted to correct uneven adjoining sections of concrete or correct areas of defective drainage. If concrete lifting does not correct the defective concrete to the Engineers satisfaction, the concrete shall be removed and replaced.

3.10 PLACING CONCRETE IN COLD WEATHER

A. No concrete shall be placed where the air temperature is lower than 40 degrees Fahrenheit, at a location where the concrete cannot be covered or protected from the surrounding air.

B. When concrete is placed below a temperature of 35 degrees Fahrenheit the ingredients of the concrete shall be heated so that the temperature of the mixture shall not be less than 50 degrees or more than 100 degrees Fahrenheit.

C. Before mixing, the heated aggregates shall not exceed 175 degrees Fahrenheit.

D. Cement shall not be added while the temperature of the mixed aggregates and water is greater than 100 degrees Fahrenheit.

E. When there is likelihood of freezing during the curing period, the concrete shall be protected by means of an insulated covering to prevent freezing of the concrete for a period of not less than 7 days after placing.

F. Equipment for protecting concrete from freezing shall be available at the job site prior to placing concrete. Particular care shall be exercised to protect edges and exposed corners from freezing.

G. In the event heating is employed, care shall be taken to insure that no part of the concrete becomes dried out or is heated to temperatures above 100 degrees Fahrenheit.

H. The housing, covering, or other protection used shall remain in place and intact at least 24 hours after the artificial heating is discontinued.

I. For a period of five days the concrete shall be kept above 40 degrees F and below 100 degrees F.

END OF SECTION

SECTION 03345

CONCRETE FINISHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Application procedure for concrete surface finishes.

1.02 PROJECT CONDITIONS

A. Allow concrete to cure not more than 72 hours before commencing surface finish operations, unless otherwise acceptable to Engineer.

B. Protect adjacent materials and finishes from dust, dirt and other surface or physical damage during finishing operations. Provide protections as required and remove from site at completion of Work.

C. For surfaces to be blast finished, perform abrasive blasting within 24 to 72 hours after casting. Coordinate with form work construction, concrete placement schedule, and form work removal to ensure that surfaces are blasted at same age for uniform results.

PART 2 EXECUTION

2.01 PATCH FINISHING

A. Repair surface defects immediately after form removal.

B. Make any patches in concrete to closely match color and texture of surrounding surfaces. Determine mix formula for patching mortar by trial and obtain a good color match with concrete when both patch and concrete are cured and dry.

1. Mix white and gray Portland cement as required to match surrounding concrete to produce grout having consistency of thick paint.

2. Use a minimum amount of mixing water.

3. Mix patching mortar in advance and allow to stand without frequent manipulation, without addition of water, until it has reached stiffest place able consistency.

4. After initial set, dress surfaces of patches manually to obtain same texture as surrounding surfaces.

C. Repair defective areas.

1. Remove honeycomb and defective concrete down to sound concrete.

2. Make edges perpendicular to surface or slightly undercut.

3. Featheredges are not permitted.

4. Dampen area to be patched and at least 6" surrounding it to prevent absorption of patching mortar water.

5. Prepare bonding grout.

6. Mix to consistency of thick cream.

7. Brush into surface.

D. After surface water has evaporated from patch area, brush bond coat into surface.

1. When bond coat begins to lose water sheen, apply patching mortar.

2. Thoroughly consolidate mortar into place and strike-off to leave patch slightly higher than surrounding surface.

3. Leave undisturbed for at least 1 hour before final finish.

4. Keep patched area damp for 72 hours or apply curing compound.

5. Do not use metal tools in finishing an exposed patch.

E. Tie Holes: Unless indicated otherwise, after being cleaned and thoroughly dampened, fill the hole solid with patching mortar.

F. Where as-cast finishes are indicated, total patched area my not exceed 1 in 500 of as-cast surface. This is in addition to form tie patches, if ties are permitted to fall within as-cast areas.

G. In any finishing process which is intended to expose aggregate on surface, patched areas must show aggregate.

1. Outer 1" of patch shall contain same aggregates as surrounding concrete.

2. For aggregate transfer finish, patching mixture shall contain same selected colored aggregates.

3. After curing, expose aggregates together with aggregates of adjoining surfaces by same process.

2.02 SLAB FINISHING

A. Broom or Belt Finish: After concrete has been placed, consolidated, struck-off, and leveled to the required tolerance, roughen surface transversely with stiff brushes, rakes, or burlap belt before final set.

B. Float Finish: After concrete has been placed, consolidated, struck-off, and leveled, do not work further until ready for floating.

1. Begin floating when water sheen has disappeared and surface has stiffness sufficient to permit operation.

2. During or after first floating, check planeness of entire surface with a 10 feet long straightedge applied at 2 or more different angles.

3. Cut down high spots and fill low spots to the required tolerance.

4. Refloat slab immediately to a uniform sandy texture.

C. Trowel Finish:

1. Float finish surface.

2. Power trowel.

3. Hand trowel as required to provide surface. Do not apply water to retemper concrete in finishing operations.

4. First troweling after power floating shall produce smooth surface relatively free of defects but which may still show some trowel marks.

5. Second trowel by hand after surface has hardened.

6. Leave finished surface essentially free of trowel marks, uniform in texture and appearance.

7. On surfaces intended to support floor coverings, grind off defects which would show through floor covering.

2.03 AS-CAST FORMED FINISHING

A. Rough: Patch defects, chip or rub off fins exceeding 1/4" height.

B. Smooth: Patch tie holes and defects and remove fins completely:

1. When surface texture is impaired and form joints misaligned, grind, bushhammer, or correct affected concrete as directed by Engineer.

2. Slurry grout areas evidencing minor mortar leakage to match adjacent concrete.

3. Repair major mortar leakage as a defective area.

4. When in opinion of Engineer, workmanship is less than acceptable standard, provide one of rubbed finishes at no additional cost to Owner.

2.04 RUBBED FINISHING

A. Produce following finishes on concrete with a smooth form finish.

1. Smooth Rubbed: Remove forms and perform necessary patching as soon after placement as possible.

2. Finish newly hardened concrete no later than 24 hours following form removal.

3. Wet surfaces and rub with carborundum brick or other abrasive until uniform color and texture are produced.

B. Grout Cleaned: Undertake no cleaning operations until all contiguous surfaces are completed and accessible.

1. Wet surface of concrete sufficiently to prevent absorption of water from grout.

2. Apply grout uniformly.

3. Immediately after grouting, scrub surface with cork float or stone to coat surface and fill

voids.

4. While grout is still plastic, remove excess grout by working surface with rubber float or sack.

5. After-surface whitens from drying, rub vigorously with clean burlap.

6. Keep damp for at least 36 hours after final rubbing.

7. Cork Floated: Remove forms within 2 to 3 days of placement where possible.

8. Remove ties.

9. Remove all burrs and fins.

10. Dampen wall surface.

11. Apply mortar with firm rubber float or with trowel, filling all surface voids.

12. Compress mortar into voids.

13. If mortar surface dries too rapidly to permit proper compaction and finishing, apply a small amount of water with fog sprayer.

14. Produce final texture with cork float using a swirling motion.

2.05 UNFORMED FINISHING

A. After concrete is placed, strike smooth, tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces.

B. Float to texture which is reasonably consistent with formed surfaces.

C. Continue final treatment on formed surfaces uniformly across uniformed surfaces.

END OF SECTION

SECTION 16530

STREET LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior lighting and accessories.

B. Poles.

1.02 RELATED SECTIONS

A. Section 03310 – Concrete work.

1.03 REFERENCES

A. ANSI C78.379 – Electric Lamps – High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.

B. IES RP-8 – Recommended Practices for Roadway Lighting.

C. NFPA 70-National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Shop drawings: Indicate dimensions and components for each luminaire.

B. Product Data: Provide dimensions, ratings, manufacturer, type, model and performance data.

C. Test Reports: Indicate measured illumination levels.

D. Submit manufacturer's installation instructions.

1.05 COORDINATION

A. Coordinate with electrical contractor.

B. Coordination with City and Heber Light & Power to verify location and connection of fixtures.

C. Receive approval by Civil Engineer for pole foundation.

D. Furnish bolt templates and pole mounting accessories to installer / contractor of pole foundations.

PART 2 APPROVED PRODUCTS

2.01 MANUFACTURERS

A. Holophane
B. Philips Lumec

2.02 FIXTURE REQUIREMENTS

A. Model: Holophane – Post Top Full Cutoff LED Series
Verify exact model number with City before ordering
Philips Lumec – Metroscape Full Cutoff LED Post Top
Verify exact model number with City before ordering

B. LED Performance Package: 80W to 100W Dimmable

C. Color Temperature: 3000 K CCT

D. Voltage: Auto-Sensing Voltage (120-227)

E. Housing/Trim/Covers: Modern Style – Swing Open Design, No Trim, Full Cover

F. Finish, Trim and/or Final Finish: Black

G. Optics: Asymmetric Lunar Optic - IES Type III

H. Finial: Standard

I. Prewired Leads: 25 feet prewired leads

J. Photocontrol: Long Life DTL Twistlock Photocontrol For Solid-State

K. Receptacle: Dimming Receptacle – 7 PIN

L. Mounting Condition: Concrete base with J bolts.

M. Pole: As required in this schedule.

2.03 POLES

A. Pole: Salem Aluminum Pole (SMA 14 F4J 13 P07 ABG BK)

B. Height: 14 feet

C. Shaft Style: F4J 4 inch diameter Fluted, 0.25 wall

D. Material: Aluminum or Concrete, non-direct burial type

E. Color/Finish: Powder Coat Paint Finish, Black

F. Shape: Fluted or smooth with 3'-8.5" high decorative bottom piece

G. Base: 13 inch Square Base, Base Weight 60, Base EPA 3.7880625

H. Anchor Bolt: AB-26-4

I. Loading Capacity Ratings:
1. 100 Pounds.
2. Steady Wind: 90 MPH minimum.

2.04 CONDUIT

A. One inch PVC scheduled 90 electrical (gray) conduit.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide concrete bases for lighting poles at intersections and cul-de-sac's or as shown on the plans. All concrete shall be a minimum of 4 foot below finished grade.

B. Install poles plumb. Provide shims and double nuts to adjust to plumb.

C. Install all components according to manufacturer recommendations.

D. Install conduit and secondary boxes according to Heber Light and Power specifications.

3.02 FIELD QUALITY CONTROL

A. Operate each light after installation and connection. Inspect for proper connections and operation.

B. Test photo-electric for cell operation.

3.03 ADJUSTING

A. Adjust light to provide illumination levels and distribution as directed.

B. Adjust photo-electric cell to operate correctly.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photo-cell surface as recommended by the manufacturer.

D. Clean finish and touch up damage.

3.05 PROTECTION OF FINISHED WORK

A. Re-lamp lights which have failed Final Completion.

3.06 ~~LIGHTING LOCATION~~

~~A. Local Roads~~

~~1. Location: In planter strip or if combination sidewalk, 1 one foot behind sidewalk.~~

~~2. Spacing: At each intersection with Collector Roads, and other critical points as determined by the City Engineer.~~

~~B. Collector Roads~~

~~1. Location: In planter strip or one foot behind sidewalk as indicated by drawings, and other critical points as determined by the City Engineer..~~

~~2. Spacing: At each intersection, and other critical points as~~

~~determined by the City Engineer.~~

END OF SECTION

SECTION 16532

COMMERCIAL BUSINESS STREET LIGHTING (HISTORIC)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior luminaries and accessories.

B. Poles.

1.02 RELATED SECTIONS

A. Section 003310 – Concrete Work.

1.03 REFERENCES

A. ANSI C78.379 – Electric Lamps – High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.

B. IES RP-8 – Recommended Practices for Roadway Lighting.

C. IES RP 20-Lighting for Parking Facilities.

D. NFPA 70-National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Shop drawings: Indicate dimensions and components for each luminaire.

B. Product Data: Provide dimensions, ratings, manufacturer, type, model and performance data.

C. Test Reports: Indicate measured illumination levels.

D. Submit manufacturer's installation instructions.

1.05 COORDINATION

A. Coordinate with electrical contractor.

B. Coordination with City and Heber Light & Power to verify location and connection of fixtures.

C. Receive approval by Civil Engineer for pole foundation.

D. Furnish bolt templates and pole mounting accessories to installer / contractor of pole foundations.

PART 2 APPROVED PRODUCTS

2.01 MANUFACTURERS

A. ~~Phillips-Hadco~~Holophane
B. Mountain States Lighting

2.02 FIXTURE REQUIREMENTS

A. Model: Holophane – Utility Washington Series Luminaire Full Cutoff LED2 (WFCL2). Verify exact model number with the City before ordering.

B. L.E.D. Performance Package: 11,500 Nominal Lumens

C. Color Temperature: 3000 K CCT

D. Voltage: Auto-Sensing Voltage (120-227)

E. Optics: Type 3 Distribution – Full Cutoff

F. Housing Color: Black

G. Finial: None

H. Pre-Wired Leads: 25 feet pre-wired leads.

I. Photo Control: NEMA Twistlock Photocontrol Receptacle – 7 PIN. Externally mounted.

J. Other Required Options: Field Adjustable Output, Shorting Cap

K. Mounting Condition: Concrete base with J-bolts.

L. Pole: As required in this schedule.

2.03 POLE REQUIREMENTS

A. Pole: Mountain States Lighting (#14.5TFS-6.5/4.5-11GA-16S-TT3.5X4
Steven Sales Company (FL210-D672A146-TENON-FP-AB) with Twin Arm Assembly

B. Height: 14.6 feet to Banner Arm (See Standard Drawing STREETS-13)

C. Shaft Style: Round Fluted, Tapered Diameter 6.5-inch to 4.5-inch.

D. Material: Aluminum or Steel, non-direct burial type.

E. Color/Finish: Powder Coat Paint Finish, Black.

F. Shape: Fluted with decorative base and double-banner arm.

G. Decorative Base: 20-inch Washington-Style High-Density Elastomer, or Aluminum Clam Shell Base (black).

H. Loading Capacity Ratings:
1. 100 pounds.
2. Steady Wind: 90 mph min.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pole to be direct burial at locations indicated. Auger hole without disrupting the soil below butt of the pole. Do not dig pole hole with a backhoe, to minimize disruption of firm soil. Fill with sand around pole, tamped regularly while backfilling.

B. Install poles plumb. Provide shims and double nuts to adjust to plumb.

C. Install all components according to manufacturer recommendations.

D. Install conduit and secondary boxes according to Heber Light and Power specifications.

3.02 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connections and operation.

B. Test for photo-electric cell operation.

3.03 ADJUSTING

A. Adjust luminaries to provide illumination levels and distribution as directed.

B. Adjust photo-electric cell to operate correctly.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photo-cell surface as recommended by the manufacturer.

D. Clean finish and touch up damage.

3.05 PROTECTION OF FINISH WORK

A. Relamp luminaries which have failed work at substantial completion.

3.06 LIGHTING LOCATION

A. Install at locations as indicated on the plans or as otherwise approved by the City Engineer.

~~3.07 SPACING~~

~~A. 150' to 250' on one side. Spacing can double to 300' to 500' on one side if alternating on both sides.~~

END OF SECTION

SECTION 16533

NORTH VILLAGE ZONE LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior lighting and accessories.

B. Poles.

1.02 RELATED SECTIONS

A. Section 03310 – Concrete work.

1.03 REFERENCES

A. ANSI C78.379 – Electric Lamps – High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.

B. IES RP-8 – Recommended Practices for Roadway Lighting.

C. NFPA 70-National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Shop drawings: Indicate dimensions and components for each luminaire.

B. Product Data: Provide dimensions, ratings, manufacturer, type, model and performance data.

C. Test Reports: Indicate measured illumination levels.

D. Submit manufacturer's installation instructions.

1.05 COORDINATION

A. Coordinate with electrical contractor.

B. Coordination with City and Heber Light & Power to verify location and connection of fixtures.

C. Receive approval by Civil Engineer for pole foundation.

D. Furnish bolt templates and pole mounting accessories to installer / contractor of pole foundations.

PART 2 APPROVED PRODUCTS

2.01 MANUFACTURES

A. Holophane
B. Luminis

2.02 FIXTURE REQUIREMENTS

A. Model: Holophane – GlasWerks Luminescent LED Hallbrook (GSLF3)
Verify exact model number with City before ordering

B. LED Lumen Package: P40 Performance Package

C. Color Temperature: 3000 K, 70 CRI

D. Voltage: MVOLT 120-227V

E. Optics: Asymmetric

F. Mounting Style: Quick Stem Mount

G. Finish Color: Black

H. Prewired Leads: 25 feet prewired leads

I. Photocontrol: 7 PIN NEMA Photocontrol Receptacle

J. Arm: Holophane HCA 36IN 1A BO SSA QSM BK RFD331152

K. Pole: As required in this schedule.

2.03 POLES

A.	Pole:	Luminis – BVP616XM6554
B.	Height:	16 feet (Cap to Base)
C.	Shaft Style:	Square 6" x 6"
D.	Material:	Aluminum, non-direct burial type
E.	Color/Finish:	Polyester Powder-Baked Coating 5-Stage Bath Preparation Process Luminis Heber City Faux Wood Finish UV-Stabilized Durable Scratch & Fade Resistant Finish
F.	Base:	Aluminum Decorative Cover Plates & Base (Match Holophane Support Arm)
G.	Cap:	Decorative Top Cover Plates & Base (Match Holophane Support Arm)
H.	Receptacle:	NEMA C136.41 &-PIN Receptacle with Shorting Cap Pre-Installed in pole cap

2.04 CONDUIT

A. One inch PVC scheduled 90 electrical (gray) conduit.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide concrete bases for lighting poles at intersections and cul-de-sac's or as shown on the plans. All concrete shall be a minimum of 4 foot below finished grade.

B. Install poles plumb. Provide shims and double nuts to adjust to plumb.

C. Install all components according to manufacturer recommendations.

D. Install conduit and secondary boxes according to Heber Light and Power specifications.

3.02 FIELD QUALITY CONTROL

A. Operate each light after installation and connection. Inspect for proper connections and operation.

B. Test photo-electric for cell operation.

3.03 ADJUSTING

A. Adjust light to provide illumination levels and distribution as directed.

B. Adjust photo-electric cell to operate correctly.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photo-cell surface as recommended by the manufacturer.

D. Clean finish and touch up damage.

3.05 PROTECTION OF FINISHED WORK

A. Re-lamp lights which have failed Final Completion.

END OF SECTION

APPENDIX A

HEBER CITY APPROVED EQUIVALENTS

The following is a list of pre-approved equivalents to be used in conjunction with the Heber City Standard Specifications and Drawings. These items may be used without prior approval from the City Engineer or Public Works Director. Any other requests for consideration as equivalents which differ from the Heber City Standard Specifications and Drawing will need to be submitted to and approved by the City Engineer and/or Public Works Director.

IRRIGATION

Irrigation Service – One Lot 1" Service:

McDonald:

- 1" McDonald 18" Pit Part # E-5-12940
- Insulation Pad Part # 90-C1 18x4

Mueller:

- 1" Single-Service Irrigation Box Part # 330IS1818FABS000296N

Ford:

- 1" Ford 18" Pit Part # PK488-18-C16819-002-NL
- Insulation Pad Part # CCID-18-4 Closed-Cell Foam Disc

Lids:

- DFW Part #DFW18MUE-IMBF2_Small_IRR
- Nicor Part # 18.75LLBLKIRRZthOLTE

Irrigation Service – Two Lots

Ford:

- 1 ½ x (2) 1" Ford Dual Meter Pit Part # PKD411-24C-C16050-004-NL
- Insulation Pad Part # CCID-24 Closed Cell Foam Disc
- ~~Lid Adapter Ring Ford Part # EXT-1 (Adapts 18" lid to 24")~~

Mueller:

- 1" Single-Service Irrigation Box Part # 330ID2718FAB000650/700098-1

Lids:

- DFW Part #DFW18MUE-IMBF2_Small_IRR
- Nicor Part # 18.75LLBLKIRRZthOLTE

CULINARY WATER

1" Culinary Water Service

Ford:

- Meter Pit Part # PFCBHH60-C16819-001-NL 1" x 60" Ford 18" coil meter pit with reduced port valves
- ~~Composite Lid Ford Part # PPSC-18-L-P-REC-T~~
- Insulation Disc Ford Part # CCID-18-4 Closed Cell Foam Disc
- Adjustable Curb Box Ford Part # EM2-50-46-42R with inner rod

Mueller:

- 1" Single-Service Box Part # 330CS1860RSBS000390N

Lids:

- DFW Part # 18MUE-IMBF_Small_Water Lid

Nicor Part # 18.75 LLBLKWAThDLTE

Fire Hydrants:

- 6" Waterous WB-67-250
- Clow Medallion
- Mueller Super Centurion 250 cast-iron

BRASS PARTS AND SADDLES

Corporation Stops

Both Iron Pipe thread and CC thread will be accepted.

Ford:

- Corp Stop Valve Part # FB1100-4-Q-NL

Mueller:

- Corp Stop Valve Part # B-25028-N

Curb Box and Stops

Ford:

- Curb Stop Valve Part # B84-444M-Q-NL
- Curb Box Part # EM2-50-46-42R

Saddles

These alternatives are for 10" or larger pipe size and/or if higher pressure ratings are needed than the standard Romac 305 and 306 stainless saddles can accommodate.

Ford:

- Saddle Part # 202BS

Mueller:

- Saddle Part # B2RS

END OF SECTION

HEBER CITY
HEART OF THE WASATCH BACK

REVIEW 1 DATE:_____
REVIEW 2 DATE:_____
REVIEW 3 DATE:_____

Engineering Review - Final Plan Checklist

DEVELOPMENT NAME:_____

The attached document is a list of typical Engineering Department review criteria for subdivisions. Each submittal shall include a pdf copy of complete plans. The Engineer is responsible for initialing each item on the Checklist. Please check with the Engineering Department before assuming that an item is not applicable, unless it is obviously not applicable. Documents submitted to the Engineering Department shall be organized according to the following general format:

1. Cover Sheet
2. Boundary and Topo Survey
3. Plat
4. Demolition Plan (as necessary)
5. Impact to Irrigation Plan (as necessary)
6. Site Plan
7. Grading and Drainage Plan
8. Utility Plan
9. Signing and Striping Plan, including SRTS (Coordinate with WCSD)
10. Plan/Profile Sheets
11. Custom Detail Sheets (Please exclude City Std Dwgs)

Upon first submittal for plan review, the applicant must sign the verification on the Engineering Plan Review Checklist indicating he/she has personally inspected the Checklist and that all items on the Checklist have been initialed by the responsible Engineer. A copy of the Checklist must accompany the plans with all subsequent reviews. The City will not accept plans for review without this signed Checklist.

In accepting plans for construction, Heber City assumes that applicants have not made any errors and have complied with all applicable codes and ordinances. If, after acceptance of plans for construction, an error is discovered or it is discovered that some aspect of the accepted drawings does not comply with applicable codes and ordinances, the applicant shall, at his own expense, revise the drawings and modify any infrastructure as necessary to correct the problem. Applicants and their design professionals shall remain responsible for their projects at all times.

Notice about Reimbursements: Reimbursement agreements must be approved by the City and executed by both parties before construction can begin on the project. If the applicant wishes to begin construction before there is an agreement in place with the City, he must sign and record a waiver stating he accepts the risk that he may not be reimbursed for any improvements installed, even if they are system improvements.

I understand the conditions stated above and have personally reviewed this submittal and verify that it is complete and that all of the items listed below have been initialed by the responsible Engineer.

Engineer's Signature_____

Printed Name _____

Applicant's Signature_____

Printed Name _____

Note: The following is not intended to be a comprehensive list of items. The City may require more information

Applicant Submitted (Initials)	Required Submittals	City Use Only Accepted Date
	Final Drainage Report -- This report shall include pipe systems, surface routes, and detention ponds. It shall also include a discussion about low impact development best management practices that were considered and implemented for the purpose of infiltrating or evapotranspiring, and using storm water from the site to protect water quality. If no best management practices were implemented, explain the reasons preventing their use. This report shall be stamped and certified by a Utah-licensed professional Engineer, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	Geotechnical report, including minimum pavement section.	
	Trip Generation Memo (Less than 100 ADT). Traffic Impact Study (for projects generating more than 100 ADT. Include PM Peak Trips)	
	Army Corps Requirements, if impacting wetlands.	
	Record of Survey per UCLS Standards, AND topographical map including all other relevant information or the existing recorded plat from the County Recorders Office	
	UDOT permit for access or storm drain connection to US 189, SR 113, or SR 40.	
	CLOMR/LOMR filed application for property in FEMA 100-yr flood plain.	
	Stream Alteration Permit from Utah Division of Water Rights if impacting a natural drainage channel.	
	Permit from the BOR and/or canal company if impacting a canal.	
	Construction plans signed and stamped by the responsible Engineer.	
	Dry Utilities Concept Plan	
	Pothole data for utility crossings in existing roadways.	
	Easement agreements.	
	Water Rights Action Report (Get form from Engineering)	
	Exhibits for inclusion into a Reimbursement Agreement for system improvements, if applicable: (1) Schedule of values listing the reiumbursable improvments, inlcuding the City's IFFP project number, quantities, unit prices, and total prices. (2) Site Plan showing the locations of reimbursable improvements with coded references to a schedule of values.	
	Obtain PLSS (Public Land Survey System) clearance letter from the Wasatch County Surveyor's Office if monuments will be disturbed. Per Utah Code 17-23-14 and 17-23-15. Contact info. Email surveyor@wasatch.utah.gov Address: 25 North Main Street, Heber, UT 84032 (435) 657-3222 .	

Applicant Submitted (Initials)	All Sheets Must Contain	City Use Only Accepted Date
	Project name	
	Drawing number and title.	
	"Call Before You Dig" logo.	
	North arrow and drawing scale.	
	Abbreviations and Legend	
	All text, features, and linework must be of a size which is legible when printed on standard 11x17 sized paper.	
	References to specific Standard Plans, as applicable	

Applicant Submitted (Initials)	Final Subdivision Plat (See City Standard Plat Template on City's website)	City Use Only Accepted Date
	Subdivision name, location and phase.	
	Names of adjacent property owners.	
	Locations of survey by Quarter Section, Township and Range	
	Signed, stamped, and dated Surveyor's Certificate (on first submittal)	
	North arrow and scale	
	Total acreage, # of Lots, and # of Parcels at the end of the Boundary Description	
	Lot area for each lot in square feet and acres.	
	Proposed streets (names and coordinates) and adjacent streets.	
	Point of beginning and basis of bearing	
	The distance and course to two (2) or more section or Quarter Corners, including Township and Range, or to identified monuments within a recorded subdivision.	
	All bearings, angles and distances along the boundary and lot lines.	
	Radius, length, chord distance, chord bearing and other curve data deemed necessary.	
	Location of street monuments with bearing and distance labeled monument-to-monument, and location with respect to corners	
	Existing and proposed easements, ROWs, buffer zones and public spaces shown	
	~~Written boundary description~~	
	FIRM Insurance Zone and Map number	
	Letter from Wasatch Co GIS approving the addressing. Numbering to be consistent with the phase of the plat, e.g. Phase 2 plat numbering 201, 202, 203, etc.	
	Intersection addresses	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots,	
	Public Utility Easements	

Applicant Submitted (Initials)	Cover Sheet	City Use Only Accepted Date
	Sealed by a Utah-licensed Professional Engineer (on first submittal)	
	Project name	
	Sheet Index for all sheets	
	Vicinity Map with North arrow	
	Legend	
	Contact information for the project team and other key contacts	
	City Standard Notes (See City Std. Spec. 00700.108)	

Applicant Submitted (Initials)	Site Plan	City Use Only Accepted Date
	Street names and widths	
	Subdivision lots with lot numbers	
	Proposed roadways connect to adjacent development existing/approved roadways.	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project.	
	Fire hydrant locations	
	Street lights at cul-de-sac ends, intersections with collectors and larger, and other critical points as determined by the City Engineer.	
	Roadway improvements (curb, gutter, sidewalk, ADA ramps)	
	Phasing of project. Location of temporary turn-arounds at phase boundaries.	
	Overall Site Plan uses callouts and is on 1 sheet (no matchlines)	
	Requirement to install reference pins in curb identifying locations of property lines.	

Applicant Submitted (Initials)	Existing Topography / Demolition Plan	City Use Only Accepted Date
	Existing Topography	
	All existing features in and adjacent to project	
	Plans for removal or relocation of existing infrastructure as needed	
	Areas classified as sensitive lands including 100-yr flood plains, natural drainages, water bodies, wetlands, and slopes greater than 30%	
	Existing easements or other encumbered areas	
	Street Names	

Applicant Submitted (Initials)	Grading and Drainage Plan	City Use Only Accepted Date
	Stamped and certified by a Utah-licensed Professional Engineer, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Existing contour lines (in gray scale) at one-foot intervals	
	Proposed contour lines at one-foot intervals	
	Benchmark elevation relative to an identified section corner.	
	Storm drain system showing pipe sizes, manholes, combination boxes and catch basins, with all elevations (rim & invert).	
	Detail sheet showing detention pond(s) (including cross-sections), sized orifice design, spillway, and overland flood route called out	
	FEMA Flood Zone delineation and 100-year flood elevation limits	
	Lot grading arrows	
	Spot elevations where necessary including curb returns	
	Locations of any utility conflicts	
	Minimum 18" pipe in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections. Locate catch basins on the uphill side of curb returns and lot lines where possible	
	Cul-de-sacs graded to drain away from the bulb, or with surface flood route	
	Location and type (details) of storm water treatment systems	
	Callout points of connection to existing system, if applicable	
	Slope arrows and labels along gutters, swales, cut/fill slopes, parking areas, and lots	
	Access road to all structures outside of the ROW (12' min width, 15% max slope)	
	Storm drain line extended to property lines terminated with a manhole	
	Flood overland route terminating at the storm water facility (usually a pond or street)	
	Overland runoff route for stormwater at all sag points	
	Minimum slopes on storm drains to achieve 3 feet per second flowing full.	
	Street Names	
	Overall Grading and Drainage Plan uses callouts and is on 1 sheet (no matchlines)	

Applicant Submitted (Initials)	Utility Plan	City Use Only Accepted Date
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots min., e.g., 2 for 10, 3 for 11-40, 4 for 41-80, 5 for 81-120	
	Sanitary sewer / storm drain systems showing pipe alignment, sizes, manholes, and laterals	
	Sewer and storm drain systems to the next manhole beyond subdivision boundary	
	Drinking and pressurized irrigation systems showing type and size of pipes and valves, and fittings (bends, crosses, tees, reducers)	
	Locations of services for all open space areas	
	Locations of all fire hydrants	
	Existing utilities (in grayscale) and plans for relocations as necessary	
	Points of connection to existing structures and pipe lines labeled	
	Existing and proposed easements as required by City Standards	
	Locations of existing and proposed power poles	
	Locations of existing and proposed streetlights	
	Utility line locations follow Street Standard Drawings	
	Streetlights at cul-de-sac ends, major street intersections, and critical points as determined by the City Engineer	
	Street Names	
	Overall Utility Plan uses callouts and is on 1 sheet (no matchlines)	
	Requirement to stamp curb indicating locations of utility laterals	

Applicant Submitted (Initials)	Plan and Profile Sheets	City Use Only Accepted Date
	Vicinity map within subdivision for each sheet	
	Phase boundaries and identification of what will be completed with each phase	
	Typical road sections per Heber City Standards	
	Label street names	
	Vertical curves for grade changes of 1% or greater	
	Vertical alignment of street tying into existing improvements	
	Matching centerline crowns for lower intersecting streets	
	Maximum 5 percent slope through intersections and 60 feet beyond	
	Pavement section per geotech report, or not less than City Standard	
	Locations of any utility conflicts	
	Storm drain pipe size, type, length and slope between manholes	
	Storm drain structures with rim, invert in, and invert out elevations	
	Minimum 18" storm drain in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections	
	Sewer pipe size, type, length and slope between manholes	
	Minimum sewer slopes per Utah Admin. Code Table R317-3-2.3(D)(4)	
	Sewer manhole sizes with rim, invert in, and invert out elevations	
	Drinking and irrigation systems with callouts for pipe size, and type	
	Locations of fire hydrants	
	Callout locations, sizes, types of all fittings (tee, cross, 45 bend, reducers, etc)	
	Air vacuum relief valves and blowoff valves in both plan and profile views	
	Drains at all low points in the Pressurized Irrigation System	
	Locations of waterline looping due to utility conflicts	

Applicant Submitted ovide Initia	Striping and Signage Plan	City Use Only Accepted Date
	Street names	
	Type, size, and station/offset of each sign with reference to MUTCD sign code	
	Pavement markings types and sizes with station/offset	
	Pavement marking taper rates, per 2009 MUTCD Section 3B.09 Lines 04-06	
	Phase boundaries and identification of what will be completed with each phase	

Applicant Submitted (Initials)	Detail Sheets	City Use Only Accepted Date
	Custom Detail Sheets (Please exclude City Standard Plans.)	

HEBER CITY
HEART OF THE WASATCH BACK

REVIEW 1 DATE:_____
REVIEW 2 DATE:_____
REVIEW 3 DATE:_____

Engineering Review - Preliminary Plan Checklist

NOTE: Shading or strikethrough signifies that it is not required for Preliminary Plans.

DEVELOPMENT NAME:_____

The attached document is a list of typical Engineering Department review criteria for subdivisions. Each submittal shall include a pdf copy of complete plans. The Engineer is responsible for initialing each item on the Checklist. Please check with the Engineering Department before assuming that an item is not applicable, unless it is obviously not applicable. Documents submitted to the Engineering Department shall be organized according to the following general format:

1. Cover Sheet
2. Boundary and Topo Survey
3. Plat
4. Demolition Plan (as necessary)
5. Impact to Irrigation Plan (as necessary)
6. Site Plan
7. Grading and Drainage Plan
8. Utility Plan
9. Signing and Striping Plan, including SRTS (Coordinate with WCSD)
10. Plan/Profile Sheets
11. Custom Detail Sheets (Please exclude City Std Dwgs)

Upon first submittal for plan review, the applicant must sign the verification on the Engineering Plan Review Checklist indicating he/she has personally inspected the Checklist and that all items on the Checklist have been initialed by the responsible Engineer. A copy of the Checklist must accompany the plans with all subsequent reviews. The City will not accept plans for review without this signed Checklist.

In accepting plans for construction, Heber City assumes that applicants have not made any errors and have complied with all applicable codes and ordinances. If, after acceptance of plans for construction, an error is discovered or it is discovered that some aspect of the accepted drawings does not comply with applicable codes and ordinances, the applicant shall, at his own expense, revise the drawings and modify any infrastructure as necessary to correct the problem. Applicants and their design professionals shall remain responsible for their projects at all times.

Notice about Reimbursements: Reimbursement agreements must be approved by the City and executed by both parties before construction can begin on the project. If the applicant wishes to begin construction before there is an agreement in place with the City, he must sign and record a waiver stating he accepts the risk that he may not be reimbursed for any improvements installed, even if they are system improvements.

I understand the conditions stated above and have personally reviewed this submittal and verify that it is complete and that all of the items listed below have been initialed by the responsible Engineer.

Engineer's Signature_____

Printed Name _____

Applicant's Signature_____

Printed Name _____

Note: The following is not intended to be a comprehensive list of items. The City may require more information

Applicant Submitted (Initials)	Required Submittals	City Use Only Accepted Date
	Final Drainage Report -- This report shall include pipe systems, surface routes, and detention ponds. It shall also include a discussion about low impact development best management practices that were considered and implemented for the purpose of infiltrating or evapotranspiring, and using storm water from the site to protect water quality. If no best management practices were implemented, explain the reasons preventing their use. ~~This report shall be stamped and certified by a Utah licensed professional Engineer~~, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	Geotechnical report, including minimum pavement section.	
	Trip Generation Memo (Less than 100 ADT). Traffic Impact Study (for projects generating more than 100 ADT. Include PM Peak Trips)	
	Army Corps Requirements, if impacting wetlands.	
	Record of Survey per UCLS Standards, AND topographical map including all other relevant information or the existing recorded plat from the County Recorders Office	
	UDOT permit for access or storm drain connection to US 189, SR 113, or SR 40.	
	CLOMR/LOMR filed application for property in FEMA 100-yr flood plain.	
	Stream Alteration Permit from Utah Division of Water Rights if impacting a natural drainage channel.	
	Permit from the BOR and/or canal company if impacting a canal.	
	Construction plans ~~signed and stamped by the responsible Engineer~~.	
	Dry Utilities Concept Plan	
	Pothole data for utility crossings in existing roadways.	
	Easement agreements.	
	Water Rights Action Report (Get form from Engineering)	
	Exhibits for inclusion into a Reimbursement Agreement for system improvements, if applicable: (1) Schedule of values listing the reiumbursable improvments, inlcuding the City's IFFP project number, quantities, unit prices, and total prices. (2) Site Plan showing the locations of reimbursable improvements with coded references to a schedule of values.	
	Obtain PLSS (Public Land Survey System) clearance letter from the Wasatch County Surveyor's Office if monuments will be disturbed. Per Utah Code 17-23-14 and 17-23-15. Contact info. Email surveyor@wasatch.utah.gov Address: 25 North Main Street, Heber, UT 84032 (435) 657-3222 .	

Applicant Submitted (Initials)	All Sheets Must Contain	City Use Only Accepted Date
	Project name	
	Drawing number and title.	
	"Call Before You Dig" logo.	
	North arrow and drawing scale.	
	Abbreviations and Legend	
	All text, features, and linework must be of a size which is legible when printed on standard 11x17 sized paper.	
	References to specific Standard Plans, as applicable	

Applicant Submitted (Initials)	Preliminary Subdivision Plat (See City Standard Plat Template on City's website)	City Use Only Accepted Date
	Subdivision name, location and phase.	
	Names of adjacent property owners.	
	Locations of survey by Quarter Section, Township and Range	
	Signed, stamped, and dated Surveyor's Certificate (on first submittal)	
	North arrow and scale	
	Total acreage, # of Lots, and # of Parcels at the end of the Boundary Description	
	Lot area for each lot in square feet and acres.	
	Proposed streets (names and coordinates) and adjacent streets.	
	Point of beginning and basis of bearing	
	The distance and course to two (2) or more section or Quarter Corners, including Township and Range, or to identified monuments within a recorded subdivision.	
	All bearings, angles and distances along the boundary and lot lines.	
	Radius, length, chord distance, chord bearing and other curve data deemed necessary.	
	Location of street monuments with bearing and distance labeled monument-to-monument, and location with respect to corners	
	Existing and proposed easements, ROWs, buffer zones and public spaces shown	
	Written boundary description	
	FIRM Insurance Zone and Map number	
	Letter from Wasatch Co GIS approving the addressing. Numbering to be consistent with the phase of the plat, e.g. Phase 2 plat numbering 201, 202, 203, etc.	
	Intersection addresses	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots,	
	Public Utility Easements	

Applicant Submitted (Initials)	Cover Sheet	City Use Only Accepted Date
	Sealed by a Utah-licensed Professional Engineer (on first submittal)	
	Project name	
	Sheet Index for all sheets	
	Vicinity Map with North arrow	
	Legend	
	Contact information for the project team and other key contacts	
	City Standard Notes (See City Std. Spec. 00700.108)	

Applicant Submitted (Initials)	Site Plan	City Use Only Accepted Date
	Street names and widths	
	Subdivision lots with lot numbers	
	Proposed roadways connect to adjacent development existing/approved roadways.	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project.	
	Fire hydrant locations	
	Street lights at cul-de-sac ends, intersections with collectors and larger, and other critical points as determined by the City Engineer.	
	Roadway improvements (curb, gutter, sidewalk, ADA ramps)	
	Phasing of project. ~~Location of temporary turn-arounds at phase boundaries.~~	
	Overall Site Plan uses callouts and is on 1 sheet (no matchlines)	
	Requirement to install reference pins in curb identifying locations of property lines.	

Applicant Submitted (Initials)	Existing Topography ~~/ Demolition Plan~~	City Use Only Accepted Date
	Existing Topography	
	All existing features in and adjacent to project	
	Plans for removal or relocation of existing infrastructure as needed	
	Areas classified as sensitive lands including 100-yr flood plains, natural drainages, water bodies, wetlands, and slopes greater than 30%	
	Existing easements or other encumbered areas	
	Street Names	

Applicant Submitted (Initials)	Grading and Drainage Plan	City Use Only Accepted Date
	~~Stamped and certified by a Utah-licensed Professional Engineer~~, with the following language: "I hereby certify that this report/design for the management of storm water of this development was prepared by me, or under my direct supervision, according to applicable engineering standards. I understand and accept sole responsibility and liability associated with the feasibility and long-term viability of the facilities addressed herein. I understand that the City assumes no responsibility or liability for this report."	
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Existing contour lines (in gray scale) at one-foot intervals	
	Proposed contour lines at one-foot intervals	
	Benchmark elevation relative to an identified section corner.	
	Storm drain system showing pipe sizes, manholes, combination boxes and catch basins, with all elevations (rim & invert).	
	Detail sheet showing detention pond(s) (including cross-sections), sized orifice design, spillway, and overland flood route called out	
	FEMA Flood Zone delineation and 100-year flood elevation limits	
	Lot grading arrows	
	Spot elevations where necessary including curb returns	
	Locations of any utility conflicts	
	Minimum 18" pipe in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections. Locate catch basins on the uphill side of curb returns and lot lines where possible	
	Cul-de-sacs graded to drain away from the bulb, or with surface flood route	
	Location and type (details) of storm water treatment systems	
	Callout points of connection to existing system, if applicable	
	Slope arrows and labels along gutters, swales, cut/fill slopes, parking areas, and lots	
	Access road to all structures outside of the ROW (12' min width, 15% max slope)	
	Storm drain line extended to property lines terminated with a manhole	
	Flood overland route terminating at the storm water facility (usually a pond or street)	
	Overland runoff route for stormwater at all sag points	
	Minimum slopes on storm drains to achieve 3 feet per second flowing full.	
	Street Names	
	Overall Grading and Drainage Plan uses callouts and is on 1 sheet (no matchlines)	

Applicant Submitted (Initials)	Utility Plan	City Use Only Accepted Date
	A note stating, "A Notice to Proceed must be obtained from the City Engineer prior to doing any work on the project	
	Survey monuments provided at some street (major preferred) intersections -- 2 monuments for the first 10 lots and 1 additional monument for every additional 30 lots min., e.g., 2 for 10, 3 for 11-40, 4 for 41-80, 5 for 81-120	
	Sanitary sewer / storm drain systems showing pipe alignment, sizes, manholes, and laterals	
	Sewer and storm drain systems to the next manhole beyond subdivision boundary	
	Drinking and pressurized irrigation systems ~~showing type and size of pipes and valves, and fittings (bends, crosses, tees, reducers)~~	
	Locations of services for all open space areas	
	Locations of all fire hydrants	
	Existing utilities (in grayscale) and plans for relocations as necessary	
	Points of connection to existing structures and pipe lines labeled	
	Existing and proposed easements as required by City Standards	
	Locations of existing and proposed power poles	
	Locations of existing and proposed streetlights	
	Utility line locations follow Street Standard Drawings	
	Streetlights at cul-de-sac ends, major street intersections, and critical points as determined by the City Engineer	
	Street Names	
	Overall Utility Plan ~~uses callouts~~ and is on 1 sheet (no matchlines)	
	Requirement to stamp curb indicating locations of utility laterals	

Applicant Submitted (Initials)	Plan and Profile Sheets	City Use Only Accepted Date
	Vicinity map within subdivision for each sheet	
	Phase boundaries and identification of what will be completed with each phase	
	Typical road sections per Heber City Standards	
	Label street names	
	Vertical curves for grade changes of 1% or greater	
	Vertical alignment of street tying into existing improvements	
	Matching centerline crowns for lower intersecting streets	
	Maximum 5 percent slope through intersections and 60 feet beyond	
	Pavement section per geotech report, or not less than City Standard	
	Locations of any utility conflicts	
	Storm drain pipe size, type, length and slope between manholes	
	Storm drain structures with rim, invert in, and invert out elevations	
	Minimum 18" storm drain in the ROW, except 15" when for one inlet	
	Catch basins provided at all intersections	
	Sewer pipe size, type, length and slope between manholes	
	Minimum sewer slopes per Utah Admin. Code Table R317-3-2.3(D)(4)	
	Sewer manhole sizes with rim, invert in, and invert out elevations	
	Drinking and irrigation systems with callouts for pipe size, and type	
	Locations of fire hydrants	
	Callout locations, sizes, types of all fittings (tee, cross, 45 bend, reducers, etc)	
	Air vacuum relief valves and blowoff valves in both plan and profile views	
	Drains at all low points in the Pressurized Irrigation System	
	Locations of waterline looping due to utility conflicts	

Applicant Submitted rovide Initia	Striping and Signage Plan	City Use Only Accepted Date
	Street names	
	Type, size, and station/offset of each sign with reference to MUTCD sign code	
	Pavement markings types and sizes with station/offset	
	Pavement marking taper rates, per 2009 MUTCD Section 3B.09 Lines 04-06	
	Phase boundaries and identification of what will be completed with each phase	

Applicant Submitted (Initials)	Detail Sheets	City Use Only Accepted Date
	Custom Detail Sheets (Please exclude City Standard Plans.)	

STANDARD PLAT FORMAT

PLAT REQUIREMENTS

- FINAL PLAT SHALL BE PREPARED ON A SHEET OF APPROVED REPRODUCIBLE D-SIZE MYLAR AND MADE WITH TEXT NOT LESS THAN ONE-TENTH INCH IN SIZE, SHALL BE SO DRAWN THAT THE TOP OF THE SHEET FACES EITHER NORTH OR EAST, WHICHEVER ACCOMMODATES THE DRAWING BEST.
- ACCURATE LINES MUST BE DRAWN FOR ALL LINES, ANGLES AND CURVES USED TO DESCRIBE BOUNDARIES, BLOCKS, LOTS, STREETS, ALLEYS, EASEMENTS, AREAS TO BE RESERVED FOR PUBLIC USE AND OTHER IMPORTANT FEATURES.
- BOUNDARY LINES SHALL BE DRAWN HEAVIER THAN STREET AND LOT LINES.
- MONUMENTS SHALL BE INSTALLED BY THE SUBDIVIDER'S ENGINEER OR LAND SURVEYOR AT SUCH POINTS DESIGNATED ON THE FINAL PLAT AS ARE APPROVED BY THE PLANNING DEPARTMENT.
- MONUMENTS MUST BE PLACED PRIOR TO FINAL BOND RELEASE.
- THE WASATCH COUNTY RECORDER'S OFFICE MAY HAVE ADDITIONAL REQUIREMENTS FOR THIS PLAT

ITEMS REQUIRED FOR PRELIMINARY PLAT:

- SECTION INFORMATION – TWO OR MORE CORNERS IF POSSIBLE
- BASIS OF BEARING CLEARLY LABELED
- BOUNDARY CLEARLY SHOWN AND DIMENSIONED WITH LEGAL DESCRIPTION
- POINT OF BEGINNING CLEARLY LABELED
- BENCHMARK FOR PROJECT HORIZONTAL AND VERTICAL CONTROLS
- BOUNDARY LINES OF ADJACENT TRACTS OF UN-SUBSIDIZED LAND
- THE 100-YR FLOOD LEVEL OF ALL WATERCOURSES INDICATED WITH VERTICAL DATUM
- SURROUNDING PROPERTY OWNERSHIP
- LOCATION OF AND DIMENSIONS TO THE NEAREST BENCH MARK OR MONUMENT ON TWO OPPOSITE SIDES OF THE PLAT
- PROPERTIES LOCATED IN THE SENSITIVE LANDS OVERLAY ZONE
- LOT SIZE CLEARLY LABELED IN SQ. FT. & ACRES WITH LENGTH & WIDTH
- NORTH ARROW
- DRAWING SCALE CLEARLY MARKED AND NOT LESS THAN 1" = 100'
- AREAS WITH SLOPES LESS THAN 30%, 30-40%, 40-50% AND > 50%
- IDENTIFIED NATURAL HAZARDS AND MITIGATION MEASURES FOR AREAS, SUBJECT TO AVALANCHE, LANDSLIDE, ROCK FALL, LIQUEFACTION, DEBRIS FLOWS, SURFACE FAULT RUPTURE, COLLAPSIBLE SOILS, SHRINK-SWELL SOILS, SHALLOW GROUNDWATER (WITHIN 3 FEET OF THE SURFACE), SURFACE WATER, STREAM BEDS (INCLUDING INTERMITTENT), SPRINGS, 100-YEAR FLOOD ZONES, AND DRINKING WATER SOURCE PROTECTION ZONES.

ITEMS REQUIRED FOR FINAL PLAT:

- INCLUDE ALL ITEMS REQUIRED ON PRELIMINARY PLAT (EXCEPT CONTOURS)
- STREET MONUMENTS
- BUILDING SETBACKS
- PUBLIC UTILITY EASEMENTS, ACCESS EASEMENTS, EXISTING EASEMENTS
- PROPOSED STREET NAMES
- INTERSECTION ADDRESSES
- LOT ADDRESSES
- TYPICAL LOT DETAILS SHOWING BOTH CORNER AND INTERIOR LOTS
- VICINITY MAP
- PLAT NOTES
- PHYSICAL MARKERS SHALL BE PLACED AT EACH LOT CORNER
- IF PROPERTY CONTROLLED BY PUBLIC AGENT OR UTILITY COMPANY, APPROVAL FOR LOCATION, IMPROVEMENT, AND MAINTENANCE MUST BE SHOWN
- ELECTRONIC COPY THAT IS COMPATIBLE WITH CITY'S AUTOCAD MAPPING SYSTEM SHALL BE SUBMITTED

N

100 0 100 200

SCALE IN FEET

TYPICAL:1" = 30' MAX:1" = 100'

LEGEND

DATE OF PREPARATION

- 3 2 / 10 11 EXISTING SECTION CORNER (FOUND) (AS DESCRIBED)
- PHASE 1 BOUNDARY LINE
- STREET CENTERLINE
- PROPOSED STREET MONUMENT
- MONUMENT TO MONUMENT TIE
- PROPOSED FIRE HYDRANT
- PROPOSED STREET LIGHT
- PARCEL DEDICATION TO SARATOGA SPRINGS
- EXISTING RIGHT-OF-WAY OVER THE WEST 33.00 FEET OF THE PROPERTY IN SECTION 2
- BUILDING SETBACK LINE
- PUBLIC UTILITY EASEMENTS

CENTERLINE CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHORD BEARING
CL1	200.00	202.46	57°59'57"	110.86	193.92	N29°16'01"E
CL2	200.00	111.64	31°58'58"	57.32	110.20	S15°43'26"E
CL3	345.00	191.93	31°52'30"	98.52	189.47	S15°47'45"E

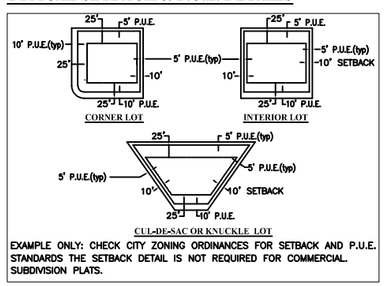
CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHORD BEARING
C6	225.00	59.81	15°13'53"	30.08	59.64	N50°39'03"E
C7	15.00	13.62	52°01'12"	7.32	13.16	S32°15'24"W
C8	50.00	5.12	05°51'42"	2.56	5.11	N09°10'38"E

DATA TABLE

INFORMATION	AC	SQ FT.	%TOTAL	#	NOTES
TOTAL PROJECT AREA	13.9	607182	100%		
SENSITIVE LANDS	0.2	7503	1%		7% OF OPEN SPACE
OPEN SPACE	2.3	101750	17%		
BUILDABLE LAND	8.1	354478	58%		
ROW AREA	3.5	150954	25%		
LANDSCAPING AREA	4.5	197518	33%		
LOTS				61	
NET DENSITY DWELLINGS BY ACRE				4.4	

TYPICAL SETBACK & P.U.E. DETAILS



EXAMPLE ONLY: CHECK CITY ZONING ORDINANCES FOR SETBACK AND P.U.E. STANDARDS THE SETBACK DETAIL IS NOT REQUIRED FOR COMMERCIAL. SUBDIVISION PLATS.

PLAT NAME AND PHASE

LOCATED IN A PORTION OF THE _____ QUARTER OF SECTION__,
TOWNSHIP__ SOUTH, RANGE __EAST,
SALT LAKE BASE AND MERIDIAN
HEBER CITY, WASATCH COUNTY, UTAH

STANDARD PLAT NOTES

1-FINAL PLATS NOT RECORDED WITHIN ONE (1) YEAR FROM THE DATE RECEIVING FINAL APPROVAL SHALL BE NULL AND VOID UNLESS PHYSICAL CONSTRUCTION HAS STARTED OR AN EXTENSION HAS BEEN REQUESTED AND GRANTED PRIOR TO THE ORIGINAL PLAT EXPIRATION DATE. IN CASES WHERE CONSTRUCTION HAS STARTED, PLAT APPROVAL SHALL AUTOMATICALLY BE EXTENDED FOR A SECOND YEAR FROM THE DATE OF THE FINAL APPROVAL. IF PHYSICAL CONSTRUCTION HAS NOT STARTED, APPLICANTS MAY REQUEST AND BE GRANTED A ONE (1) YEAR EXTENSION. HOWEVER, IF AN EXTENSION IS GRANTED, THE REQUIREMENT TO INCORPORATE UPDATED CITY STANDARDS, OR REEVALUATE BONDS OR OTHER ASSURANCES MAY BE ENFORCED AS A CONDITION OF APPROVAL FOR THE EXTENSION.
2-PRIOR TO BUILDING PERMITS BEING ISSUED, SOIL AND/OR GEOTECHNICAL TESTING STUDIES MAY BE REQUIRED ON EACH LOT AS DETERMINED BY THE CITY BUILDING OFFICIAL.
3-THIS PLAT MAY BE SUBJECT TO A DEVELOPMENT AGREEMENT THAT SPECIFIES THE CONDITIONS OF DEVELOPING, BUILDING, AND USING PROPERTY WITHIN THIS PLAT. SEE CITY RECORDER FOR DETAILS.
4-PLAT IS SUBJECT TO "INSTALLATION OF IMPROVEMENTS AND BOND AGREEMENT NO. _____." WHICH REQUIRES THE CONSTRUCTION AND WARRANTY OF IMPROVEMENTS IN THIS SUBDIVISION. THESE OBLIGATIONS RUN WITH THE LAND AND ARE BINDING ON SUCCESSORS, AGENTS, AND ASSIGNS OF DEVELOPER. THERE ARE NO THIRD-PARTY RIGHTS OR BENEFICIARIES UNDER THIS AGREEMENT.
5-BUILDING PERMITS WILL NOT BE ISSUED UNTIL ALL REQUIRED IMPROVEMENTS HAVE BEEN INSTALLED PER CITY STANDARDS AND ALL FEES INCLUDING IMPACT AND CONNECTION FEES ARE PAID.
6-REFERENCES HEREIN TO DEVELOPER OR OWNER SHALL APPLY TO BOTH, AND ANY SUCH REFERENCE SHALL ALSO APPLY TO SUCCESSORS, AGENTS, AND ASSIGNS.
7-NO CITY MAINTENANCE SHALL BE PROVIDED FOR STREETS AND IMPROVEMENTS DESIGNATED AS "PRIVATE" ON THIS PLAT.
8-ALL PRIVATE STREETS, PARKING AREAS, AND COMMON AREA ARE DEDICATED AS CITY UTILITY EASEMENTS. HEBER CITY HAS THE RIGHT OF ACCESS THROUGH THESE EASEMENTS TO ACCESS, MAINTAIN, AND REPAIR CITY UTILITIES. NO CHANGES TO TOPOGRAPHY, STRUCTURES, ABOVE OR BELOW GROUND ARE ALLOWED IN EASEMENTS WITHIN 10 FEET OF CITY UTILITIES WITHOUT WRITTEN PERMISSION FROM THE HEBER CITY ENGINEER. ANY OBSTACLES ERECTED WITHIN THESE EASEMENTS WITHOUT WRITTEN PERMISSION WILL BE REMOVED AT THE CURRENT PROPERTY OWNER'S EXPENSE. ALL STORM DRAIN UTILITIES AND THEIR MAINTENANCE WITHIN PRIVATE PROPERTY SHALL BE THE RESPONSIBILITY OF PROPERTY OWNER. ALL SEWER LATERALS AND THEIR MAINTENANCE TO THE PUBLIC SEWER MAIN SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. ALL DRINKING WATER AND PRESSURIZED IRRIGATION SERVICES AND THEIR MAINTENANCE FROM THE WATER METER OR SERVICE VAULT SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER.
9-A GEOTECHNICAL REPORT HAS BEEN COMPLETED BY [GEOTECHNICAL ENGINEER], WHICH ADDRESSES SOIL AND GROUNDWATER CONDITIONS, PROVIDES ENGINEERING DESIGN CRITERIA, AND RECOMMENDS MITIGATION MEASURES IF PROBLEMATIC CONDITIONS WERE ENCOUNTERED. THE CITY ASSUMES NO LIABILITY OR RESPONSIBILITY FOR ANY RELIANCE ON THE INFORMATION OR LACK THEREOF IN THE REPORT.
10- AGRICULTURAL USES, OPERATIONS, AND RIGHTS ARE ADJACENT TO OR NEAR THE PLAT AND LOTS. THE LOTS IN THIS PLAT ARE SUBJECT TO THE SIGHTS, SOUNDS, ODORS, NUISANCES, AND ASPECTS ASSOCIATED WITH AGRICULTURAL OPERATIONS, USES, AND RIGHTS. THESE USES AND OPERATIONS MAY OCCUR AT ALL TIMES OF THE DAY AND NIGHT INCLUDING WEEKENDS AND HOLIDAYS. THE CITY IS NOT RESPONSIBLE OR LIABLE FOR THESE USES AND IMPACTS AND WILL NOT RESTRICT ANY GRANDFATHERED AGRICULTURAL USE FROM CONTINUING TO OCCUR LAWFULLY.
11- DRAINAGE ACROSS PROPERTY LINES SHALL NOT EXCEED THAT WHICH EXISTED PRIOR TO GRADING. EXCESS OR CONCENTRATED DRAINAGE SHALL BE CONTAINED ON SITE OR DIRECTED TO AN APPROVED DRAINAGE FACILITY. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE SHALL FALL A MINIMUM OF 6 INCHES WITHIN THE FIRST 10 FEET.

NOTES FOR PLATS WITH COMMON AREA

11-ALL OPEN SPACE, COMMON SPACE, AND TRAIL IMPROVEMENTS LOCATED HEREIN ARE TO BE INSTALLED BY OWNER AND MAINTAINED BY A HOMEOWNERS ASSOCIATION UNLESS SPECIFIED OTHERWISE ON EACH IMPROVEMENT.
12-LOTS/UNITS MAY BE SUBJECT TO ASSOCIATION BYLAWS, ARTICLES OF INCORPORATION AND CC&R'S."
13-COMMON AREAS ARE CONVEYED TO (INSERT NAME OF HOA).

VICINITY MAP

VICINITY MAP

SURVEYOR'S CERTIFICATE

I, the undersigned surveyor, do hereby certify that I am a professional Land Surveyor and that I hold a license (number shown below) in accordance with Utah Code Title 58, Chapter 22 of the Professional Engineers and Land Surveyors Licensing Act. I further certify that, by authority of the owners, I have completed a survey of the property described on this subdivision plat in accordance with Section 17-23-17, have verified all measurements, have subdivided said tract of land into lots, streets, together with easements, and have placed monuments on the ground as represented on the plat. I further certify that every existing right-of-way and easement grant of record for underground facilities, as defined in Utah Code Section 54-8a-2, and for other utility facilities, is accurately described on this plat, and that this plat is true and correct to the best of my knowledge. I also certify that I have filed, within 90 days of the establishment or reestablishment of this subdivision boundary, a map of the survey I have completed with the Wasatch County Surveyor.

BOUNDARY DESCRIPTION

A parcel of land situated in the ____ Quarter of Section __, Township __ South, Range East, Salt Lake Base and Meridian, said parcel being more particularly described as follows:

Beginning at a point....

Acres: _____ , # of lots ____ , # of parcels ____ .

SURVEYOR'S SEAL

OWNER'S DEDICATION

Know all men by these presents that the undersigned owner(s) of the above-described tract of land has/have caused the same to be subdivided into lots, parcels, and streets, together with easements and rights-of-way, to be hereafter known as:

XXXXX

and do hereby dedicate for the perpetual use of the public and City all parcels, lots, streets, easements, rights-of-way, and public amenities shown on this plat as intended for public or City use. The undersigned owner(s), agents, successors, and assigns shall voluntarily defend, indemnify, and save harmless the City against any easements or other encumbrance on a dedicated street, easement, or right-of-way that will interfere with the City's use, maintenance, and operation of the street or utilities. The undersigned owner(s), agents, successors, and assigns also hereby convey any other easements, as shown and/or noted on this plat, to the parties indicated and for the purposes shown and/or noted hereon. The undersigned owner(s), agents, successors, and assigns assume all liability with respect to the creation of this subdivision, the alteration of the ground surface, vegetation, drainage, or surface or sub-surface water flows within this subdivision, and the development activity within this subdivision by the undersigned owner(s), agents, successors, and assigns. The owner(s) hereby convey(s) the Common Area, as indicated hereon, to the (insert name of HOA), a Utah Nonprofit Corporation, with a registered address of (insert address).

In witness whereof I have set forth my hand this___ day of ____ , A.D. 20__.

Signature Print Name Title & Entity

Signature Print Name Title & Entity

For Plats with an HOA

OWNER'S ACKNOWLEDGMENT

STATE OF UTAH } S.S.
County of Utah

On this___day of ____, 20__, personally appeared before me _____ who being by me duly sworn, did prove to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed this plat with full authority of the owner(s).

I certify under PENALTY OF PERJURY under the laws of the State of Utah that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public Full Name: _____

Commission Number: _____ My commission expires: _____

A Notary Public Commissioned in Utah

Each owner's signature must be notarized separately if multiple owners sign in front of different notaries. Please add an owner's acknowledgment signature block for each owner who signs the plat.

APPROVAL BY LEGISLATIVE BODY

The City Council of Heber City, County of Wasatch, approves this subdivision subject to the conditions and restrictions stated hereon, and hereby accepts the dedication of all streets, easements, and other parcels of land intended for the public purpose of the perpetual use of the public.

Mayor Date

RECORDER'S SEAL

ENGINEER'S NAME: _____
ENGINEER'S ADDRESS: _____
DEVELOPER'S NAME: _____
DEVELOPER'S ADDRESS: _____

PLANNING DIRECTOR	CITY ENGINEER	WASATCH CO. FIRE DISTRICT	CITY ATTORNEY	COUNTY SURVEYOR
Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____	Approved on this _____ day of _____, A.D. 20____
PLANNING DIRECTOR	CITY ENGINEER	FIRE CHIEF	CITY ATTORNEY	COUNTY SURVEYOR

PLAT NAME AND PHASE

LOCATED IN A PORTION OF THE ____ QUARTER OF SECTION ___,TOWNSHIP ___ SOUTH, RANGE ___ EAST,
SALT LAKE BASE AND MERIDIAN
HEBER CITY, WASATCH COUNTY, UTAH

(INSERT PLAT NAME) AMENDED

AMENDING LOTS (INSERT LOT NUMBERS) OF (INSERT EXACT NAME OF PLAT BEING AMENDED)
LOCATED IN A PORTION OF THE _____ QUARTER OF SECTION__,
TOWNSHIP __ SOUTH, RANGE __ WEST,
SALT LAKE BASE AND MERIDIAN
CITY OF SARATOGA SPRINGS, UTAH COUNTY, UTAH

STANDARD FORMAT FOR AMENDED PLATS

N

100 0 100 200

SCALE IN FEET
TYPICAL:1" = 30' MAX:1" = 100'

LEGEND

DATE OF PREPARATION

- EXISTING SECTION CORNER (FOUND) (AS DESCRIBED)
- PHASE 1 BOUNDARY LINE
- STREET CENTERLINE
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- MONUMENT TO MONUMENT TIE
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- PROPOSED STREET LIGHT
- PARCEL DEDICATION TO SARATOGA SPRINGS
- EXISTING RIGHT-OF-WAY OVER THE WEST 33.00 FEET OF THE PROPERTY IN SECTION 2
- BUILDING SETBACK LINE
- PUBLIC UTILITY EASEMENTS

VICINITY MAP

VICINITY MAP

DATA TABLE

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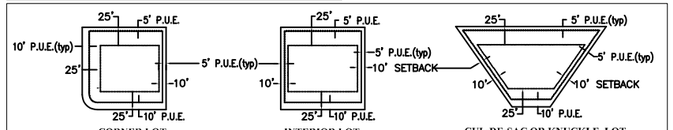
TYPICAL SETBACK & P.U.E. DETAILS



EXAMPLE ONLY: CHECK CITY ZONING ORDINANCES FOR SETBACK AND P.U.E STANDARDS.
THE SETBACK DETAIL IS NOT REQUIRED FOR COMMERCIAL SUBDIVISION PLATS.

BY SIGNING THIS PLAT, THE FOLLOWING UTILITY COMPANIES ARE APPROVING THE: (A) BOUNDARY, COURSE, DIMENSIONS, AND INTENDED USE OF THE RIGHT-OF-WAY AND EASEMENT GRANTS OF RECORD; (B) LOCATION OF EXISTING UNDERGROUND AND UTILITY FACILITIES; (C) CONDITIONS OR RESTRICTIONS GOVERNING THE LOCATION OF THE FACILITIES WITHIN THE RIGHT-OF-WAY, AND EASEMENT GRANTS OF RECORD, AND UTILITY FACILITES WITHIN THE SUBDIVISION. "APPROVING" SHALL HAVE THE MEANING IN UTAH CODE SECTION 10-9A-603(4)(c)(ii). THE FOLLOWING NOTES ARE NOT ENDORSED OR ADOPTED BY SARATOGA SPRINGS AND DO NOT SUPERSEDE CONFLICTING PLAT NOTES OR SARATOGA SPRINGS POLICIES.

ROCKY MOUNTAIN POWER

1. PURSUANT TO UTAH CODE ANN. 54-3-27 THIS PLAT CONVEYS TO THE OWNER(S) OR OPERATORS OF UTILITY FACILITIES A PUBLIC UTILITY EASEMENT ALONG WITH ALL THE RIGHTS AND DUTIES DESCRIBED THEREIN.
2. PURSUANT TO UTAH CODE ANN. 17-27a-603(4)(c)(ii) ROCKY MOUNTAIN POWER ACCEPTS DELIVERY OF THE PUE AS DESCRIBED IN THIS PLAT AND APPROVES THIS PLAT SOLELY FOR THE PURPOSE OF CONFIRMING THAT THE PLAT CONTAINS PUBLIC UTILITY EASEMENTS AND APPROXIMATES THE LOCATION OF THE PUBLIC UTILITY EASEMENTS, BUT DOES NOT WARRANT THEIR PRECISE LOCATION. ROCKY MOUNTAIN POWER MAY REQUIRE OTHER EASEMENTS IN ORDER TO SERVE THIS DEVELOPMENT. THIS APPROVAL DOES NOT AFFECT ANY RIGHT THAT ROCKY MOUNTAIN POWER HAS UNDER:
   a. A RECORDED EASEMENT OR RIGHT-OF-WAY
   b. THE LAW APPLICABLE TO PRESCRIPTIVE RIGHTS
   c. TITLE 54, CHAPTER 8a, DAMAGE TO UNDERGROUND UTILITY FACILITIES OR
   d. ANY OTHER PROVISION OF LAW

APPROVED THIS _____ DAY OF _____ 20__

ROCKY MOUNTAIN POWER

DOMINION ENERGY QUESTAR CORPORATION

DOMINION ENERGY QUESTAR CORPORATION APPROVES THIS PLAT SOLELY FOR THE PURPOSE OF CONFIRMING THAT THE PLAT CONTAINS PUBLIC UTILITY EASEMENTS. DOMINION ENERGY QUESTAR CORPORATION MAY REQUIRE OTHER EASEMENTS IN ORDER TO SERVE THIS DEVELOPMENT. THIS APPROVAL DOES NOT CONSTITUTE ABROGATION OR WAIVER OF ANY OTHER EXISTING RIGHTS, OBLIGATIONS OR LIABILITIES PROVIDED BY LAW OR EQUITY. THIS APPROVAL DOES NOT CONSTITUTE ACCEPTANCE, APPROVAL OR ACKNOWLEDGEMENT OF ANY TERMS CONTAINED IN THE PLAT, INCLUDING THOSE SET FORTH IN THE OWNERS DEDICATION AND THE NOTES AND DOES NOT CONSTITUTE A GUARANTEE OF PARTICULAR TERMS OF NATURAL GAS SERVICE. FOR FURTHER INFORMATION PLEASE CONTACT DOMINION ENERGY QUESTAR CORPORATION'S RIGHT-OF-WAY DEPARTMENT AT 800-366-8532.

APPROVED THIS _____ DAY OF _____ 20__

BY _____

TITLE _____

DOMINION ENERGY QUESTAR CORP.

ITEMS REQUIRED FOR FINAL PLAT:

- INCLUDE ALL ITEMS REQUIRED ON PRELIMINARY PLAT (EXCEPT CONTOURS)
- STREET MONUMENTS
- BUILDING SETBACKS
- PUBLIC UTILITY EASEMENTS, ACCESS EASEMENTS, EXISTING EASEMENTS
- PROPOSED STREET NAMES
- INTERSECTION ADDRESSES
- LOT ADDRESSES
- TYPICAL LOT DETAILS SHOWING BOTH CORNER AND INTERIOR LOTS
- VICINITY MAP
- PLAT NOTES
- PHYSICAL MARKERS SHALL BE PLACED AT EACH LOT CORNER
- IF PROPERTY CONTROLLED BY PUBLIC AGENT OR UTILITY COMPANY, APPROVAL FOR LOCATION, IMPROVEMENT, AND MAINTENANCE MUST BE SHOWN
- ELECTRONIC COPY THAT IS COMPATIBLE WITH CITY'S AUTOCAD MAPPING SYSTEM SHALL BE SUBMITTED

PLAT REQUIREMENTS

- FINAL PLAT SHALL BE PREPARED ON A SHEET OF APPROVED REPRODUCIBLE D-SIZE MYLAR AND MADE WITH TEXT NOT LESS THAN ONE-TENTH INCH IN SIZE, SHALL BE SO DRAWN THAT THE TOP OF THE SHEET FACES EITHER NORTH OR EAST, WHICHEVER ACCOMMODATES THE DRAWING BEST.
- ACCURATE LINES MUST BE DRAWN FOR ALL LINES, ANGLES AND CURVES USED TO DESCRIBE BOUNDARIES, BLOCKS, LOTS, STREETS, ALLEYS, EASEMENTS, AREAS TO BE RESERVED FOR PUBLIC USE AND OTHER IMPORTANT FEATURES.
- BOUNDARY LINES SHALL BE DRAWN HEAVIER THAN STREET AND LOT LINES.
- MONUMENTS SHALL BE INSTALLED BY THE SUBDIVIDER'S ENGINEER OR LAND SURVEYOR AT SUCH POINTS DESIGNATED ON THE FINAL PLAT AS ARE APPROVED BY THE COMMUNITY DEVELOPMENT DEPARTMENT.
- MONUMENTS MUST BE PLACED PRIOR TO FINAL BOND RELEASE.
- THE UTAH COUNTY RECORDER'S OFFICE MAY HAVE ADDITIONAL REQUIREMENTS FOR THIS PLAT

STANDARD PLAT NOTES

1-PLAT MUST BE RECORDED WITHIN 24 MONTHS OF FINAL PLAT APPROVAL, OR FOR PHASED DEVELOPMENTS, WITHIN 24 MONTHS OF RECORDATION OF MOST RECENT PHASE. THE FIRST FINAL PLAT APPROVAL WAS GRANTED ON THE _____ DAY OF _____, 20__.
2-PRIOR TO BUILDING PERMITS BEING ISSUED, SOIL AND/OR GEOTECHNICAL TESTING STUDIES MAY BE REQUIRED ON EACH LOT AS DETERMINED BY THE CITY BUILDING OFFICIAL.
3-THIS PLAT MAY BE SUBJECT TO A DEVELOPMENT AGREEMENT THAT SPECIFIES THE CONDITIONS OF DEVELOPING, BUILDING, AND USING PROPERTY WITHIN THIS PLAT. SEE CITY RECORDER FOR DETAILS.
4-BUILDING PERMITS WILL NOT BE ISSUED UNTIL ALL REQUIRED IMPROVEMENTS HAVE BEEN INSTALLED PER CITY STANDARDS AND ALL FEES INCLUDING IMPACT AND CONNECTION FEES ARE PAID.
5-REFERENCES HEREIN TO DEVELOPER OR OWNER SHALL APPLY TO BOTH, AND ANY SUCH REFERENCE SHALL ALSO APPLY TO SUCCESSORS, AGENTS, AND ASSIGNS.
6-NO CITY MAINTENANCE SHALL BE PROVIDED FOR STREETS AND IMPROVEMENTS DESIGNATED AS "PRIVATE" ON THIS PLAT.
7- AGRICULTURAL USES, OPERATIONS, AND RIGHTS ARE ADJACENT TO OR NEAR THE PLAT AND LOTS. THE LOTS IN THIS PLAT ARE SUBJECT TO THE SIGHTS, SOUNDS, ODORS, NUISANCES, AND ASPECTS ASSOCIATED WITH AGRICULTURAL OPERATIONS, USES, AND RIGHTS. THESE USES AND OPERATIONS MAY OCCUR AT ALL TIMES OF THE DAY AND NIGHT INCLUDING WEEKENDS AND HOLIDAYS. THE CITY IS NOT RESPONSIBLE OR LIABLE FOR THESE USES AND IMPACTS AND WILL NOT RESTRICT ANY GRANDFATHERED AGRICULTURAL USE FROM CONTINUING TO OCCUR LAWFULLY.
8- DRAINAGE ACROSS PROPERTY LINES SHALL NOT EXCEED THAT WHICH EXISTED PRIOR TO GRADING. EXCESS OR CONCENTRATED DRAINAGE SHALL BE CONTAINED ON SITE OR DIRECTED TO AN APPROVED DRAINAGE FACILITY. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE SHALL FALL A MINIMUM OF 6 INCHES WITHIN THE FIRST 10 FEET.

NOTES FOR PLATS WITH COMMON AREA

9-ALL OPEN SPACE, COMMON SPACE, AND TRAIL IMPROVEMENTS LOCATED HEREIN ARE TO BE INSTALLED BY OWNER AND MAINTAINED BY A HOMEOWNERS ASSOCIATION UNLESS SPECIFIED OTHERWISE ON EACH IMPROVEMENT.
10-LOTS/UNITS MAY BE SUBJECT TO ASSOCIATION BYLAWS, ARTICLES OF INCORPORATION AND CC&R'S."
11-COMMON AREAS ARE CONVEYED TO (INSERT NAME OF HOA).

For Plats with an HOA

ITEMS REQUIRED FOR PRELIMINARY PLAT:

- SECTION INFORMATION - TWO OR MORE CORNERS IF POSSIBLE
- BASIS OF BEARING CLEARLY LABELED
- BOUNDARY CLEARLY SHOWN AND DIMENSIONED WITH LEGAL DESCRIPTION
- POINT OF BEGINNING CLEARLY LABELED
- BENCHMARK FOR PROJECT HORIZONTAL AND VERTICAL CONTROLS
- BOUNDARY LINES OF ADJACENT TRACTS OF UN-SUBSIDIZED LAND
- THE 100-YR FLOOD LEVEL OF ALL WATERCOURSES INDICATED WITH VERTICAL DATUM
- SURROUNDING PROPERTY OWNERSHIP
- LOCATION OF AND DIMENSIONS TO THE NEAREST BENCH MARK OR MONUMENT ON TWO OPPOSITE SIDES OF THE PLAT
- PROPERTIES LOCATED IN THE SENSITIVE LANDS OVERLAY ZONE
- LOT SIZE CLEARLY LABELED IN SQ. FT. & ACRES WITH LENGTH & WIDTH
- NORTH ARROW
- DRAWING SCALE CLEARLY MARKED AND NOT LESS THAN 1" = 100'
- AREAS WITH SLOPES LESS THAN 30%, 30-40%, 40-50% AND > 50%
- IDENTIFIED NATURAL HAZARDS, INCLUDING AREAS SUBJECT TO AVALANCHE, LIQUEFACTION, DEBRIS FLOWS, AND SURFACE FAULT RUPTURE

Each owner's signature must be notarized separately if multiple owners sign in front of different notaries. Please add an owner's acknowledgment signature block for each owner who signs the plat.

PUBLIC WORKS DIRECTOR

Approved by the Public Works Director on this ___ day of _____, A.D. 20____

PUBLIC WORKS DIRECTOR

CENTURY LINK

Approved this ___ day of _____, A.D. 20____

CENTURY LINK

PLANNING DIRECTOR

Approved by the Planning Director on this ___ day of _____, A.D. 20____

PLANNING DIRECTOR

LAND USE AUTHORITY

Approved by the Land Use Authority on this ___ day of _____, A.D. 20____

LAND USE AUTHORITY

SARATOGA SPRINGS ATTORNEY

Approved by Saratoga Springs Attorney on this ___ day of _____, A.D. 20____

SARATOGA SPRINGS ATTORNEY

COMCAST CABLE TELEVISION

Approved this ___ day of _____, A.D. 20____

COMCAST CABLE TELEVISION

CITY ENGINEER

Approved by the City Engineer on this ___ day of _____, A.D. 20____

CITY ENGINEER

FIRE CHIEF

Approved by the Fire Chief on this ___ day of _____, A.D. 20____

CITY FIRE CHIEF

LEHI CITY POST OFFICE

Approved by Post Office Representative on this ___ day of _____, A.D. 20____

LEHI CITY POST OFFICE REPRESENTATIVE

SURVEYOR'S CERTIFICATE

I, the undersigned surveyor, do hereby certify that I am a professional Land Surveyor and that I hold a license (number shown below) in accordance with Utah Code Title 58, Chapter 22 of the Professional Engineers and Land Surveyors Licensing Act. I further certify that, by authority of the owners, I have completed a survey of the property described on this subdivision plat in accordance with Section 17-23-17, have verified all measurements, have subdivided said tract of land into lots, streets, together with easements, and have placed monuments on the ground as represented on the plat. I further certify that every existing right-of-way and easement grant of record for underground facilities, as defined in Utah Code Section 54-8a-2, and for other utility facilities, is accurately described on this plat, and that this plat is true and correct to the best of my knowledge. I also certify that I have filed, within 90 days of the establishment or reestablishment of this subdivision boundary, a map of the survey I have completed with the Wasatch County Surveyor.

BOUNDARY DESCRIPTION

A parcel of land situated in the ____ Quarter of Section ___, Township __ South, Range ___ East, Salt Lake Base and Meridian, said parcel being more particularly described as follows:

Beginning at a point....

Acres: ____ # of lots _____

Date _____ Surveyor's Name _____
License no._____

OWNER'S DEDICATION

Know all men by these presents that the undersigned owner(s) of the above-described tract of land has/have caused the same to be subdivided into lots, parcels, and streets, together with easements and rights-of-way, to be hereafter known as:

XXXXX

and do hereby dedicate for the perpetual use of the public and City all parcels, lots, streets, easements, rights-of-way, and public amenities shown on this plat as intended for public or City use. The undersigned owner(s), agents, successors, and assigns shall voluntarily defend, indemnify, and save harmless the City against any easements or other encumbrance on a dedicated street, easement, or right-of-way that will interfere with the City's use, maintenance, and operation of the street or utilities. The undersigned owner(s), agents, successors, and assigns also hereby convey any other easements, as shown and/or noted on this plat, to the parties indicated and for the purposes shown and/or noted hereon. The undersigned owner(s), agents, successors, and assigns assume all liability with respect to the creation of this subdivision, the alteration of the ground surface, vegetation, drainage, or surface or sub-surface water flows within this subdivision, and the development activity within this subdivision by the undersigned owner(s), agents, successors, and assigns. The owner(s) hereby convey(s) the Common Area, as indicated hereon, to the (insert name of HOA), a Utah Nonprofit Corporation, with a registered address of (insert address).

In witness whereof I have set forth my hand this___ day of ____, A.D. 20__.

Signature _____ Print Name _____ Title & Entity _____

Signature _____ Print Name _____ Title & Entity _____

OWNER'S ACKNOWLEDGMENT

STATE OF UTAH } S.S.
County of Utah

On this___day of ____, 20__, personally appeared before me _____, who being by me duly sworn, did prove to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed this plat with full authority of the owner(s).

I certify under PENALTY OF PERJURY under the laws of the State of Utah that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public Full Name:_____

Commission Number: _____ My commission expires: _____

A Notary Public Commissioned In Utah

APPROVAL BY LEGISLATIVE BODY

The City Council of Heber City, County of Wasatch, approves this subdivision subject to the conditions and restrictions stated hereon, and hereby accepts the dedication of all streets, easements, and other parcels of land intended for the public purpose of the perpetual use of the public.
This _____, day of _____, A.D. 20____.

Attest _____ Authorized for Acceptance
City Mayor

(INSERT PLAT NAME) AMENDED
AMENDING LOTS (INSERT LOT NUMBERS) OF (INSERT EXACT NAME OF PLAT BEING AMENDED)
LOCATED IN A PORTION OF THE _____ QUARTER OF SECTION ___,TOWNSHIP __ SOUTH, RANGE __ WEST,
SALT LAKE BASE AND MERIDIAN
CITY OF SARATOGA SPRINGS, UTAH COUNTY, UTAH

SURVEYORS SEAL	CITY ENGINEER SEAL	CLERK-RECORDER SEAL
		SP-1

Heber City Council Staff Report

MEETING DATE: 8/15/2023
SUBJECT: Ordinance 2023-22 adopting the Envision Central Heber Vision
RESPONSIBLE: Tony Kohler
DEPARTMENT: Planning
STRATEGIC RELEVANCE: Community Development

SUMMARY

As part of the public process to explore potential alternative scenarios for the downtown, central neighborhoods, and the tourist/recreation area, a more specific plan and vision are being proposed. People+Place has been contracted to manage this process, and throughout the winter several workshops have been held, culminating in a final workshop on May 3, 2023. Ideas generated by said workshops have been combined to create a series of more formal land use proposals. The intent is to modify and enhance the current sections in the Envision Heber 2050 general plan, and to assure consensus on this Vision. This specific plan is called Envision Central Heber.

RECOMMENDATION

Staff recommends the City Council approve Ordinance 2023-22, adopting the Envision Central Heber Vision.

BACKGROUND

The Envision Heber 2050 general plan was adopted a few years ago. It covers the downtown area but not in the detail needed for developing priorities/steps for the City to consider in implementation. This process will lead to changes in the general plan, another public hearing with those updates, and follow-up with ordinance changes to assure that future development meets the intent of the plan.

The Planning Commission held a public hearing on June 13th. Public input centered on reinforcing the history of the area more, that implementation will need development-friendly incentives, and the idea of realigning via a smooth connection between Midway Lane and Center Street. The Planning Commissioners raised concerns about parking, which is addressed in the vision as a phased approach – on-street parking striping first, surface parking lots, and then a parking structure. As part of the discussion, activating downtown to create more demand, would logically come first, although the street striping of parking spaces is generally fairly inexpensive.

The Planning Commission gave a unanimous recommendation to the City Council to adopt the 2050 Vision. Some discussion was held that even with the adoption, sections of the Envision Heber 2050 General Plan would be coming back to them as the Vision is incorporated into the chapters.

DISCUSSION

A pdf of the Vision posters that covers all the proposals is attached via a series of links. You will need to scroll around it to absorb all of the content – this is best done on a larger screen (laptop/desktop and not a phone). More visual renderings are available online.

Input at the workshop was positive and the prioritization exercise revealed the greatest area of emphasis should be the downtown area. Within the downtown, suggestions for a pedestrian-focused alley, reimagined Main Street (beautification), mixed-use, historic preservation, and more activity were the most mentioned projects. For parking, the phased approach was highly supported, moving from striped on-street parking, to public surface parking lots, and then, as demand necessitates, building multi-level parking garages.

For the Tourism/Recreation area, the projects that were supported include more trails/trail depot, retail and restaurants near the railroad, a pedestrian alley pilot project, more tourist-oriented amenities, and some emphasis on the 600 W/Midway Lane as the west gateway to Heber.

For the Central Neighborhoods, the public suggestions are to remain a quiet, mostly single-family neighborhood, with allowances for accessory dwelling units (detached and attached) and flag lots. The streets should transition to more pedestrian/bike-friendly streets. Pocket parks and the historical walk on Center Street were also popular and generally, there was also support for enlarging the transition area along Midway Lane to include Center Street.

The City has also engaged Roger Brooks, a world-renowned city downtown revitalization specialist. In a recent meeting with him, the Central Heber Vision was detailed, allowing him to comment on its content. Included here is s short summary:

Roger thinks we should emphasize City Park as first priority. This means activating it in a way that brings people back all the time, not just for events. The benefits of this would be increased interest in new developments located adjacent to the park. He also suggested closing 200 South between Main and 100 West which adds to the park and creates more development potential on the north side of the street (as a consultant, all of that suggests a "pause" on the park design). Finding a non-traditional park designer that embraces the activity principle could be key to achieving the park becoming the “living room” for Heber and the catalyst to downtown revitalization.

Food trucks and the connection to the alley were also liked by Roger.

Alley - great idea and endorsed by Roger

Create a transportation connection like a trolley to the Heber Valley Railroad (new idea), and emphasize downtown.

For the City Hall block, there is a need for a plan - maybe a different kind of plan with not as much emphasis on activity. All agreed the County building should be relocated.

In general, he very much endorsed the 2050 Vision and emphasized working on the downtown.

Additional recent discussions:

- The districts could consider new names.

- Consider moving the mixed-use commercial to 200 East and West to coincide with the CRA boundaries – no flexibility in that area suggests no new revenues for the CRA from that area. This idea could also just be for the 200 West area.
- Central neighborhoods might need more options for infill/redevelopment. Ideas like no frontage requirements and revising the flag lot policy have been discussed.
- Although this is likely a zoning option, creating more incentives for affordable housing options is important. In addition, consider a height limit in the zoning for the transition areas of 35'.
- The 100 South corridor should reflect small businesses, with no large-scale developments.

FISCAL IMPACT

Potential to incentivize growth in the Downtown and Tourist/Recreation districts.

CONCLUSION

The significant outreach public process has led to a citizen generated scenario for Central Heber, but may need some slight modifications.

ALTERNATIVES

1. Approve as proposed
2. Approve as amended
3. Continue
4. Deny

POTENTIAL MOTIONS

Staff Recommended Option – Approve

I move to approve Ordinance 2023-22 with the findings and conditions as presented in the conclusion above.

Alternative 2 – Approve as Amended

I move to approve Ordinance 2023-22, with the findings and conditions as presented in the conclusion above, with the following changes:

1. Move the Downtown transition area composed of mixed uses to 200 East and 200 West
2. Allow for more flexibility in the neighborhoods for infill opportunities
3. Assure the 100 South corridor is for smaller developments and businesses through zoning modifications.

Alternative 3 – Continue

I move to continue Ordinance 2023-22 to another meeting on , with direction to the applicant and/or Staff on information and / or changes needed to render a decision, as follows:

Alternative 4 – Deny

I move to deny Ordinance 2023-22.

ACCOUNTABILITY

Department: Planning
Staff member: Tony Kohler, Community Development Director

EXHIBITS

1. 1 2023-05-03 Central Heber Vision Scenario
2. 2 2023-05-03 Main Street Vision
3. 3 2023-05-03 Main Street 2050
4. 4 2023-05-03 Recreation and Tourism Vision
5. 5 2023-05-03 Central Neighborhoods Vision
6. CC-07-18-23 Envision CH
7. Ord 2023-22 Env Central Heber

CENTRAL HEBER VISION

The heart of our community and region, Central Heber is a destination area featuring unique shopping, dining, and gathering areas for residents and visitors who enjoy a welcoming and peaceful environment with a sense of history and place in a beautiful mountain valley. The Main Street District is our economic catalyst, featuring our historic center and working, living, and public gathering areas in a mixed use environment, which help support street level retail, restaurants, and entertainment. Outdoor-oriented local and regional recreation are features at our Recreation and Tourism District, which is the place to go to enjoy the train, rent a bike, enjoy a ballgame, or plan regional recreational adventures. Heber's quiet central neighborhoods provide places to live that are rooted in our history while also conveniently located nearby places to work, play, shop and dine.

GENERAL RECOMMENDATIONS

1. Highlight Heber's sense of history and place in a beautiful mountain valley, and its welcoming and peaceful environment.
2. Create a walkable, bikeable central city, with safe and pleasant streets.
3. Connect destination places and districts with interesting, pedestrian-friendly routes.
4. Create increased living and working opportunities in the Main Street area, for economic resilience and to better support uses like shopping, dining, gathering, and entertainment.
5. Activate and connect public spaces on Main Street, including Heber City Park, Civic Center Block, and the Public Safety Block, adding amenities, activities, and attractions that people return to again and again.
6. Enliven the streets in Heber's Main Street area with features that provide interest and comfort and encourage repeat visits.
7. Create a new recreation/lifestyle gateway on the west side of town that supports existing and new recreation, tourism, and outdoor-oriented pursuits, better positioning Heber as a destination for regional recreational opportunities.
8. Provide a small neighborhood dining/shopping area near the train station to provide amenities adjacent to tourism and sporting events.
9. Create a new missing middle neighborhood east of the planned high school to provide needed housing options.
10. Preserve Central Heber's neighborhoods, enhancing their quiet, friendly atmosphere while providing options for new housing that fits into the historic fabric.

RECREATION & TOURISM DISTRICT

The western gateway into Heber from Midway at 600 West and 100 South is anchored by a flex-space venue and plaza supporting recreational opportunities and lifestyle. It includes mixed uses focusing on meeting day-to-day needs of nearby residents and visitors, and supporting and expanding local and regional recreation and tourism opportunities. A small commercial area adjacent to the railroad depot provides convenient options for dining and services. Needed missing middle and more reasonably priced housing is provided east of the planned high school.

WEST GATEWAY | NEW SCHOOL NEIGHBORHOOD | RAILROAD AREA

Character
An outdoor-oriented district that lets Main Street shine while supporting local recreational activities and regional recreational destination pursuits.

Focus
Outdoor and recreational lifestyle

Features
Flex-space lifestyle center and gathering area; trails (including Spring Creek Canal Trail), trailheads, and a trail depot with bike rentals and repair; potential shuttle to Main Street, pedestrian and bike friendly boulevard along 600 West to connect the West Gateway and the Railroad Area

Placemaking
Wide sidewalks, benches, outdoor dining areas, street trees, plaza space, fire pits/heaters, bike racks, activity structures, art/sculptures, planters, attractive streetlights

Use Mix

West Gateway
Residential & Lodging: hotel, housing in mixed use buildings with ground floor commercial
Civic: cultural assembly, performance and/or museum
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (main floor retail/restaurant required)
Open Space: active plaza, pocket park, conservation garden
Parking: on-street public parking areawide, private parking lots

Railroad Area
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office
Parking: on street public parking areawide, private parking lots

New School Neighborhood
Residential: missing middle, multifamily
Open Space: neighborhood park

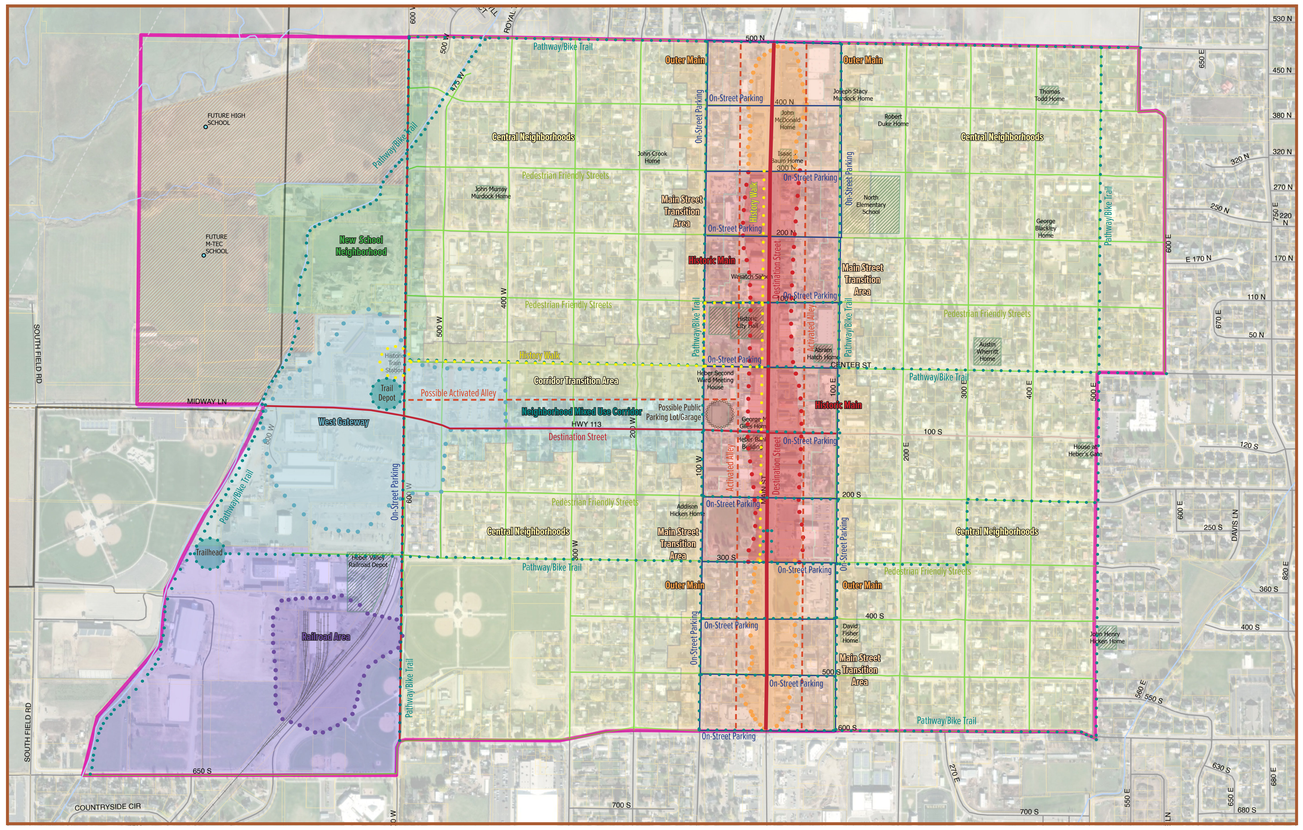
Building Height

West Gateway
Up to four stories
Step backs required for buildings over three stories
Encourage other height-softening strategies (e.g. roofline variation, building modulation, attached features, corner cuts)

Railroad Area:
Up to two stories

New School Neighborhood:
Up to three stories

Visual
Style: classic materials and features, modern/clean lines
Preferred building materials: brick, wood/composite siding, sandstone, timbers
Design standards requiring classic commercial features (e.g. storefront), but with flexibility for a variety of styles (e.g. mountain modern)



DEFINITIONS

Activated Alley: primarily a pedestrian space with extra-wide sidewalk or shared pathway, street trees, and seating/eating/gathering/event space.

Destination Street: a pedestrian-friendly street with extra-wide sidewalk, street trees, seating/eating space, and on-street parking.

Missing Middle Housing: a range of house-scale buildings with multiple units—compatible in scale and form with detached single-family homes that provide housing for middle income households. Examples include town homes and mansion homes.

Pedestrian Friendly Street: a street that feels comfortable for people,with wide sidewalk, street trees, and on-street parking.

Workforce Housing: a type of home that aims to provide affordable, safe, and comfortable living spaces for workers and their households. Examples include multiplex or stacked housing (apartments or condos).

Legend

- Historic Buildings
- Potential Bypass
- RAIL LINES
- STREAMS
- TRAILS & PATHWAYS
- BIKE_PED_STREET
- ALLEY_STREET
- NEIGHBORHOOD_TRANSITION
- MIXED_CORRIDOR
- CENTRAL_NEIGHBORHOODS
- STREET_DESTINATION
- PEDESTRIAN_FRIENDLY
- MINOR_DESTINATION
- BIKE_PED_STREET
- ALLEY_STREET_TYPE
- STREET_PARK_ONCE
- TRAIN_RETAIL_COMMERCIAL
- CulturalGateway
- ENVISION CENTRAL HEBER STUDY BOUNDARY
- HEBER CITY BOUNDARY
- PARCELS
- STREETS
- FUTURE_SCHOOLS
- FUTURE_HIGHSCHOOL_MTEC
- HISTORIC_MAIN_STREET
- MAIN_STREET_OUTER_NORTH
- MAINSTREET_OUTER_SOUTH

0 500 1,000 2,000 3,000 4,000 Feet

MAIN STREET DISTRICT

Main Street is characterized by a vibrant business environment and ample housing opportunities that support dining, shopping, playing, and gathering opportunities, providing a strong destination in the heart of Heber City. Historic Main (300 North to 300 South) features the richest suite of options for people to return to again and again, from restaurants and shops to inviting public spaces and streets, making the area a strong destination for residents and visitors. Alleys off Main Street as well as streets bisecting Main provide quieter spaces for shopping and dining. Outer Main (north of 300 North and south of 300 South) offers the greatest opportunities for working and living near Historic Main. The District as a whole features Main Street destination branding and beautification.

HISTORIC MAIN | OUTER MAIN | MAIN STREET TRANSITION AREA

Historic Main = 300 North to 300 South | Outer Main = north of 300 North and south of 300 South

Character
Highly active destination Main Street featuring live/work/play/shop/dine/gather opportunities; historic/classic architecture in Historic Main District and historic themed but more flexible architecture in outer Main.

Focus
Major focus on business and housing that supports shopping/dining/playing/gathering; Heber City Park, Civic Center Block, and Public Safety Block provide active park/plaza space for gathering

Features
Walkable streets, on-street parking district wide, alley pilot project(s) behind Main Street for a quiet dining/pedestrian experience, history walk on Main Street with a major feature at Civic Center Block, publicly owned historic buildings and places preserved, active destination public space at Heber City Park, Civic Center Block, and Public Safety Block

Placemaking
Benches, outdoor dining areas, street trees, plaza space, fire pits/heaters, bike racks, activity structures, art/sculptures, planters, attractive streetlights

Activity Spaces to Consider
Skating ribbon/rink, farmer's market, rock climbing wall/boulders, food truck court, food hall, concert/event amphitheater, fitness stations, water feature

Use Mix

Historic Main & Outer Main
Residential & Lodging: missing middle/multifamily, hotel
Civic
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office
Open Space: destination plaza/park
Commercial use required on Main Street-facing first floor facades in Historic Main, with limited percentage allowed for residential or office access doors
Residential allowed on Main Street-facing first floor facades in Outer Main

Main Street Transition Area
Residential: single family, missing middle
Accessory uses: home-based business, attached/detached accessory dwelling units,
Open space: pocket park/plaza

Parking
Striped on-street public parking district wide, private parking lots/garages but not fronting Main Street in Historic Main area, public parking lot/public parking garage possible in future phase

Building Height
Up to three stories allowed in Historic Main; with step backs up to four stories allowed
Up to four stories allowed in Outer Main with step backs for buildings over three stories; up to five stories allowed if incorporating additional design features and affordable housing (on site or off site)
Step backs required for buildings over three stories on Main Street
Step backs required for buildings over two stores adjacent to publicly-owned historic places
Building height transition required; buildings on 100 West/100 East frontages limited to three stories or less
Require other height-softening strategies (e.g. roofline variation, building modulation, attached features, corner cuts/plazas)

Visual Preferences
Style: mix of existing historic and new modern and traditional
Preferred building materials: brick, sandstone, glass, timbers, rock
Apply existing design standard for classic commercial requiring historic/classic commercial features (e.g. storefront), but with flexibility for a mix of styles, especially in Outer Main
Historic Main: increase existing design standards, and encourage a greater number of classical/historic building features

Step Back: a change in the vertical plane of multi-story buildings that preserves the pedestrian experience at sidewalk-level by setting the upper story building facade away from the street

Building Height Transition Area: a change in building heights, generally with taller buildings on more intense streets, with shorter buildings as the transition area nears single family homes

ENVISION CENTRAL HEBER

CENTRAL NEIGHBORHOODS DISTRICT

In central neighborhoods, changes to housing is typical of older neighborhoods: maintaining and enhancing existing homes, rebuilding those that owners deem are no longer satisfactory, and adding attached accessory dwelling units. Detached accessory dwellings and flag lots are allowed to provide more neighborhood housing options, but in keeping with the feel of a predominantly single family residential area. The 100 South corridor between 600 West and Main includes new missing middle housing and neighborhood retail, restaurants, and services.

CENTRAL NEIGHBORHOODS & MIXED USE CORRIDOR

Character
Quiet, pedestrian-friendly streets with a range of homes built across decades, supported by a neighborhood corridor that includes additional housing options and convenient neighborhood retail, restaurants, and services.

Focus
Residential, with some neighborhood retail and commercial along 100 South

Features
Pedestrian-friendly streets with bike network, neighborhood parks, a potential alley pilot project between 100 South and Center Street, history walk connecting the original train depot and the Civic Center Block, historic structures and homes enhanced

Use Mix

Neighborhoods
Residential: single family
Open Space: neighborhood park
Accessory Uses: home-based business, attached accessory dwelling units, detached accessory dwelling units with height equal to or lower than main home height, flag lots

Neighborhood Mixed Use Corridor
Residential & Lodging: missing middle multifamily, hotel
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (on commercial corners on 100 South)
Open Space: pocket park/plaza, neighborhood park
Parking: on-street public parking, private parking lots behind buildings

Corridor Transition Area (area between mixed use corridor and neighborhoods)
Residential: missing middle, single family
Open Space: pocket park/plaza, neighborhood park

Building Height
Up to three stories

OUR MAIN STREET DISTRICT IS FOR NURTURING COMMUNITY

As we grow, our Main Street District will feature new places to live and work, and especially places to gather together, to celebrate, to share a meal, to support a local artisan or shopkeeper. This is where we enjoy life together and practice our tradition of being friendly, warm, and welcoming.

MAIN STREET DISTRICT VISION

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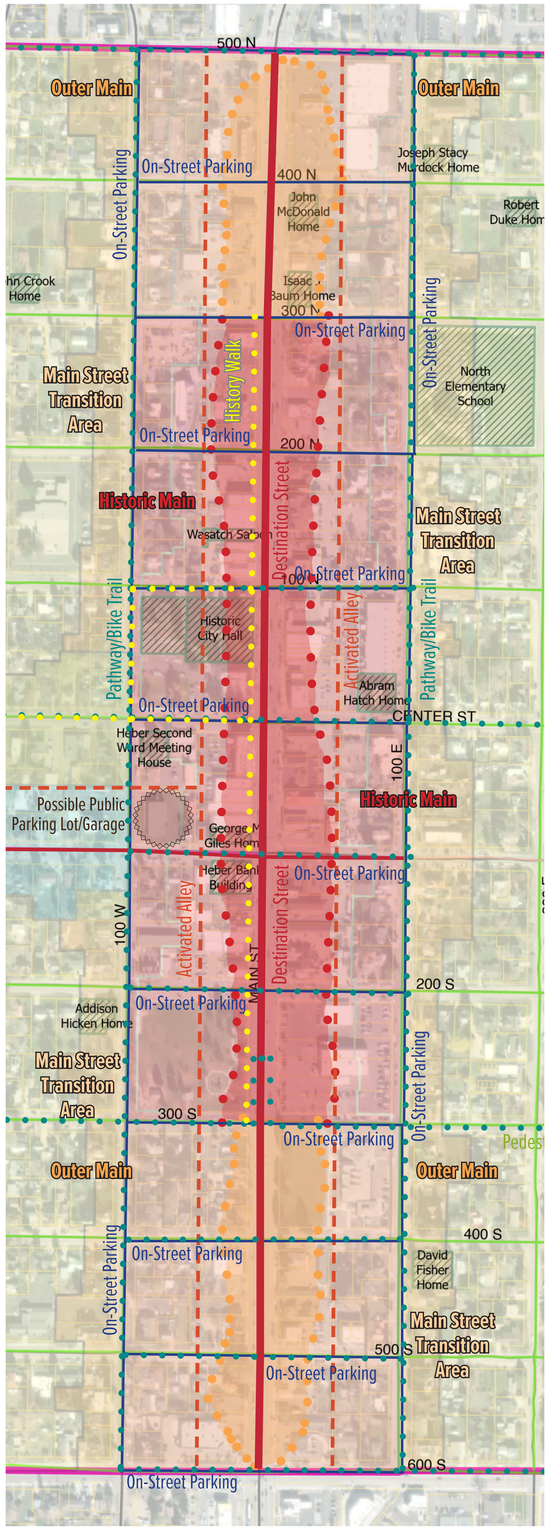

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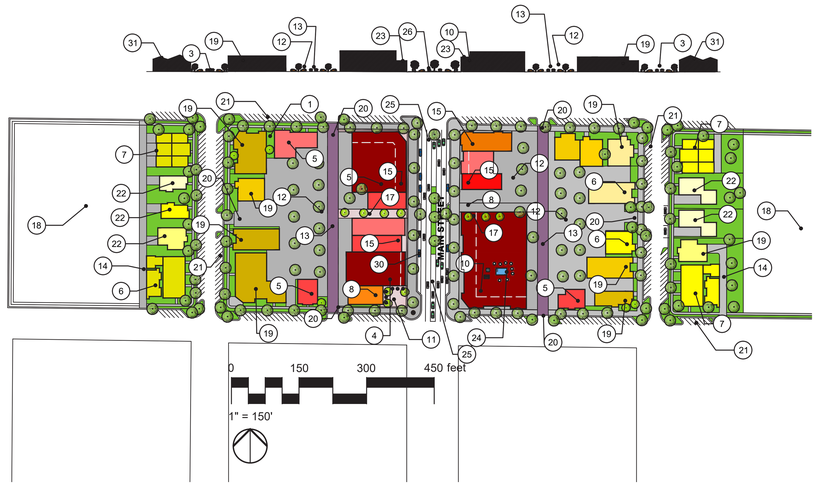
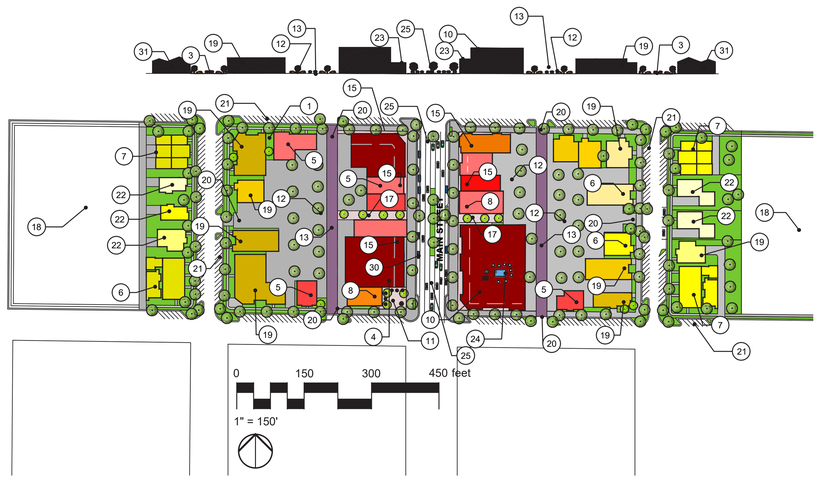
Multifamily/Workforce Housing: a type of home that aims to provide affordable, safe, and comfortable living spaces for workers and their households. Examples include multiplex or stacked housing (apartments or condos).

HISTORIC MAIN STREET DISTRICT | MODEL BLOCK TYPE

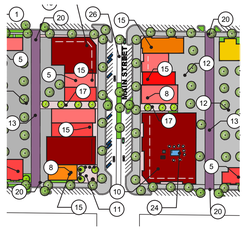


OUTER MAIN STREET DISTRICT | MODEL BLOCK TYPE

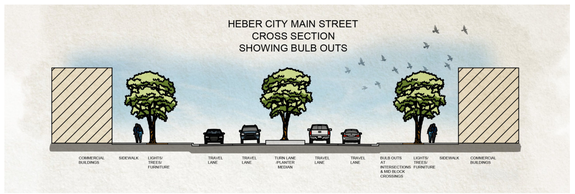


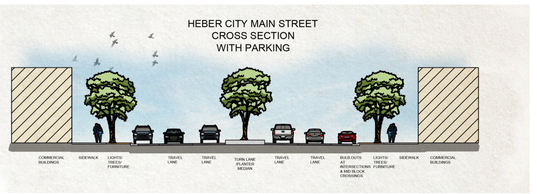
SYMBOL	DESCRIPTION
1	COMMON AREAS (LANDSCAPE, POCKET PARKS, COURTYARDS)
3	LOCAL STREET WITH ON STREET DIAGONAL PARKING
4	MIXED USE BUILDINGS (TYPICALLY RESIDENTIAL OR OFFICE OVER RETAIL)
5	COMMERCIAL BUILDING - FACING STREET WITH PARKING LOCATED TO THE SIDE OR REAR OF THE BUILDING
6	MISSING MIDDLE HOUSING (HOUSE SCALE, UNIT MIX IS TYPICALLY 3-5 PER BUILDING UP TO 12 UNITS A BUILDING)
7	MISSING MIDDLE HOUSING (TOWNHOMES, MANSION HOMES)
8	STAND ALONE COMMERCIAL (RESTAURANT, RETAIL, OFFICE)
10	POSSIBLE HOTEL/MIXED USE BUILDING. SETBACK FROM THREE STORIES TO FOUR STORIES. ROOF TOP AMENITIES.
11	PLAZA
12	SURFACE PARKING AREAS - INCLUDING LANDSCAPING, TREES, AND WALKS. WHENEVER POSSIBLE PARKING LOTS SHOULD BE SHARED AND CONNECT TO MUTIPLE LOTS AND BUILDINGS.
13	PARKING ALLEY USED FOR PEDESTRIANS AND VEHICLES. POTENTIAL USES MAY INCLUDE VEHICLES AND PEDESTRIANS DURING WEEK AND PEDESTRIAN ONLY ON WEEKEND OR EVENTS.
14	RESIDENTIAL ALLEY - PROVIDING ACCESS TO GARAGES, FLAG LOTS, AND ADUS.
15	MAIN STREET BUILDINGS - POSSIBLE MIXED-USE. THREE STORIES ALLOWED ON MAIN AND SETBACK TO GO TO FOUR STORIES.
17	PEDESTRIAN ALLEY CONNECTING BACK ALLEY AND PARKING TO MAIN STREET. ALLEY CAN BE USED FOR OUTDOOR DINING AND EVENTS.
18	EXISTING CENTRAL HEBER RESIDENTIAL NEIGHBORHOODS. MINIMAL CHANGE.
19	COMMERCIAL BUILDING COMPATIBLE IN SCALE AND DESIGN WITH MISSING MIDDLE HOUSING. BUILDINGS SHOULD BE CLOSE TO THE STREET WITH PARKING ON THE SIDE OR REAR.
20	PARKING ENTRANCES (NOT ON ARTERIAL STREETS)
21	DIAGONAL PARKING CENTRAL HEBER STREETS
22	SINGLE FAMILY HOMES
23	BUILDING STEPBACK. MAIN STREET AT 2-3 STORIES BEFORE GOING HIGHER.
24	POSSIBLE ROOF TOP AMENITIES.
25	MAIN STREET W/ FOUR TRAVEL LANES, PARALLEL PARKING AND ONE TURNING LANE/PLANTING MEDIAN. MORE TRAVEL LANES FOR VEHICLES, NARROWER SIDEWALKS AND LESS ON STREET PARKING.
26	MAIN STREET W/ TWO TRAVEL LANES, DIAGONAL PARKING, AND SIDEWALKS. THIS OPTION IS ONLY POSSIBLE AFTER THE UDOT BYPASS IS COMPLETED. THE RESULTS INCLUDE WIDER SIDEWALKS, MORE ON-STREET PARKING, SLOWER SPEEDS AND A STREETSCAPE MORE SUITED TO PEDESTRIANS.
30	ON-STREET PARALLEL PARKING
31	SINGLE FAMILY OR MISSING MIDDLE HOUSING (COMPATIBLE IN SCALE AND DESIGN WITH SINGLE FAMILY RESIDENTIAL)

MAIN STREET MORE WALKABLE ALTERNATE



MAIN STREET CROSS SECTIONS





DOWNTOWN ADJACENT STREET CROSS SECTION

WHAT COULD MAIN STREET BE LIKE IN 2050?

Implementing a community vision is a long-term endeavor. Imagine what Heber could be like in 2050 if we take a proactive approach to growth in coming decades. Our vision is a centers strategy. We want to focus growth in areas that are most appropriate, so we can take some pressure off surrounding open lands and beloved neighborhoods. The Main Street District is our primary center, the heart of our community and region.

ENVISION CENTRAL HEBER

WE CELEBRATE AND NURTURE OUR COMMUNITY IN OUR MAIN STREET DISTRICT

As we grow, our Main Street District will feature new places to live and work, and especially places to gather together, to celebrate, to share a meal, to support a local artisan or shopkeeper. This is where we enjoy life together and practice our tradition of being friendly, warm, and welcoming.

Current aerial photograph of the Main Street District between Main Street & 900 West, from City Park looking north; vision concept in illustration above and zoomed in below.

Current aerial photograph of the Main Street District, looking south, with the blocks between 100 East and Main Street in the foreground; vision concept in illustration above; vision concept zoomed in below, looking northwest toward the Main Street and 900 South intersection.

WE CELEBRATE THE HEART OF OUR REGION

As we grow, our Main Street District continues providing our economic energy, featuring new places to live and work, set among ample space to get outside and see outside. While we foster a vibrant economy and provide more options for living in the heart of our city, we maintain space to enjoy the views and outdoor lifestyle that people in Heber love.

WE CELEBRATE OUR HERITAGE

We reflect on, remember, and celebrate Heber's heritage at Civic Center Block, highlighting the historic tabernacle and theater, daylighting Lake Creek, and creating interpretive elements commemorating our history. This space is also the center of our history walk which runs along Main Street and then along Center Street, ending at the historic depot building.

Current aerial photograph of the Civic Center Block, location of the historic tabernacle; vision concept for Civic Center Block in illustration above; vision concept zoomed in below, looking at a new public arts/history building and interpretive features.

Current aerial photograph of the Public Safety Block; vision concept for the Public Safety Block in illustration above; vision concept zoomed in below.

WE CELEBRATE COMMON SPACES

Rather than developing all of the green space on the Public Safety Block, this concept preserves a large plaza for enjoying a meal in the shade or strolling through an exhibition or year round farmer's market out of the weather. The trees and buildings along the perimeter reduce traffic noise and provide space for a plaza, food hall, meeting rooms, or other amenities.

WE CELEBRATE LIFE TOGETHER

We cherish time with family and friends, and a community-friendly alley off Main Street provides space without the noise of traffic to enjoy time together, whether enjoying family fun at a market, an outdoor movie, or simply getting together for a meal with long-time friends.

A new building featuring public meeting and arts space complements the existing historic tabernacle and new outdoor elements highlighting our history. The creek reminds us of our ties to the nature around us.

A pedestrian-friendly Main Street concept.

A pedestrian-friendly concept for side streets.

WE CELEBRATE OUR PUBLIC SPACES

Our Civic Block, Public Safety Block, and our streets—including Main Street and adjacent side streets—all demonstrate care for our city and attention to maintaining high quality public spaces that people can use and enjoy.

RECREATION & TOURISM DISTRICT VISION

The western gateway into Heber from Midway at 600 West and 100 South is anchored by a flex-space venue and plaza supporting recreational opportunities and lifestyle. It includes mixed uses focusing on meeting day-to-day needs of nearby residents and visitors, and supporting and expanding local and regional recreation and tourism opportunities. A small commercial area adjacent to the railroad depot provides convenient options for dining and services. Needed missing middle and more reasonably priced housing is provided east of the planned high school.

ENVISION CENTRAL HEBER

WEST GATEWAY | NEW SCHOOL NEIGHBORHOOD | RAILROAD AREA

Character

An outdoor-oriented district that lets Main Street shine while supporting local recreational activities and regional recreational destination pursuits.

Focus

Outdoor and recreational lifestyle

Features

Flex-space lifestyle center and gathering area; trails (including Spring Creek Canal Trail), trailheads, and a trail depot with bike rentals and repair; potential shuttle to Main Street, pedestrian and bike friendly boulevard along 600 West to connect the West Gateway and the Railroad Area

Placemaking

Wide sidewalks, benches, outdoor dining areas, street trees, plaza space, fire pits/heaters, bike racks, activity structures, art/sculptures, planters, attractive streetlights

Use Mix

West Gateway
Residential & Lodging: hotel, housing in mixed use buildings with ground floor commercial

Civic: cultural assembly, performance and/or museum

Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (main floor retail/restaurant required)

Open Space: active plaza, pocket park, conservation garden

Parking: on-street public parking areawide, private parking lots

Railroad Area
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office

Parking: on street public parking areawide, private parking lots

New School Neighborhood
Residential: missing middle, multifamily

Open Space: neighborhood park

Building Height

West Gateway
Up to four stories

Step backs required for buildings over three stories

Encourage other height-softening strategies (e.g. roofline variation, building modulation, attached features, corner cuts)

Railroad Area:
Up to two stories

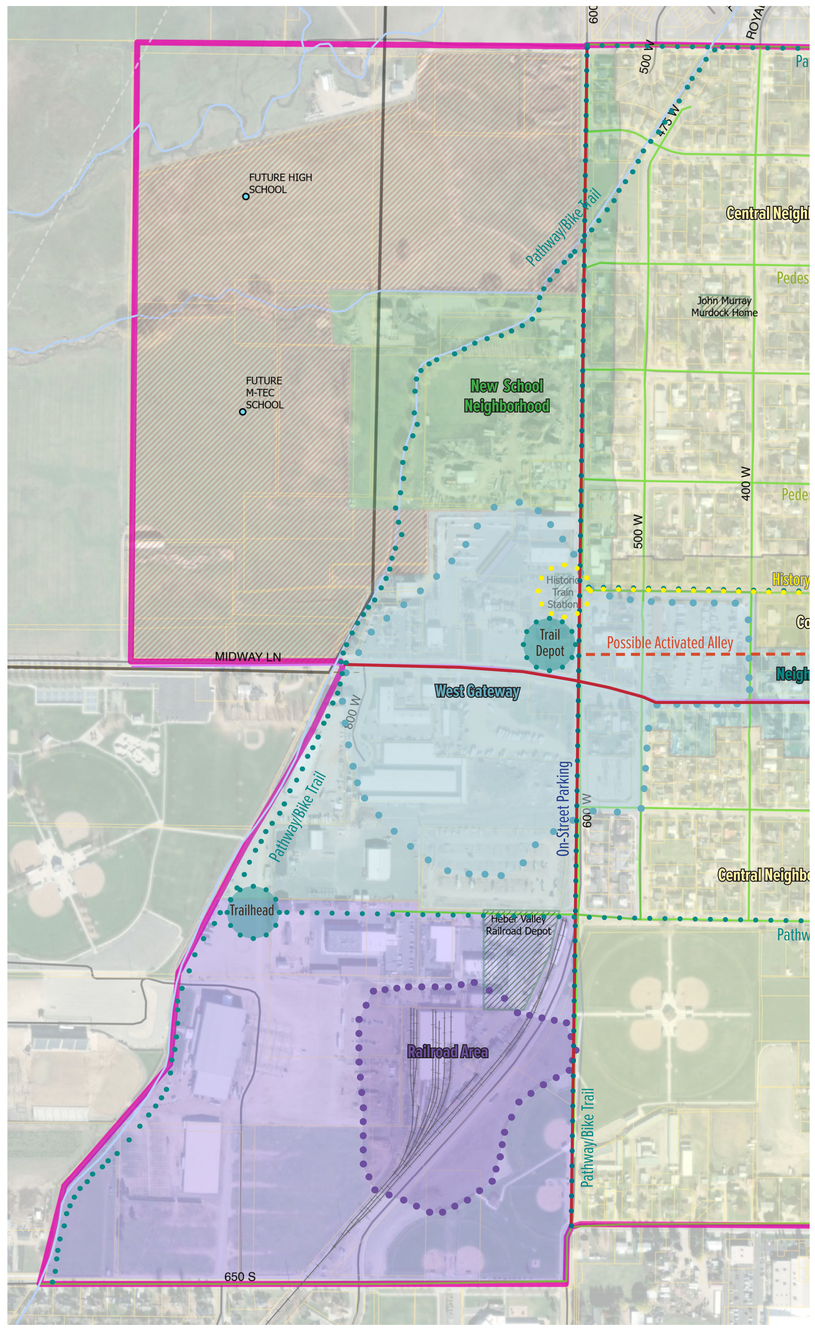
New School Neighborhood:
Up to three stories

Visual

Style: classic materials and features, modern/clean lines

Preferred building materials: brick, wood/composite siding, sandstone, timbers

Design standards requiring classic commercial features (e.g. storefront), but with flexibility for a variety of styles (e.g. mountain modern)

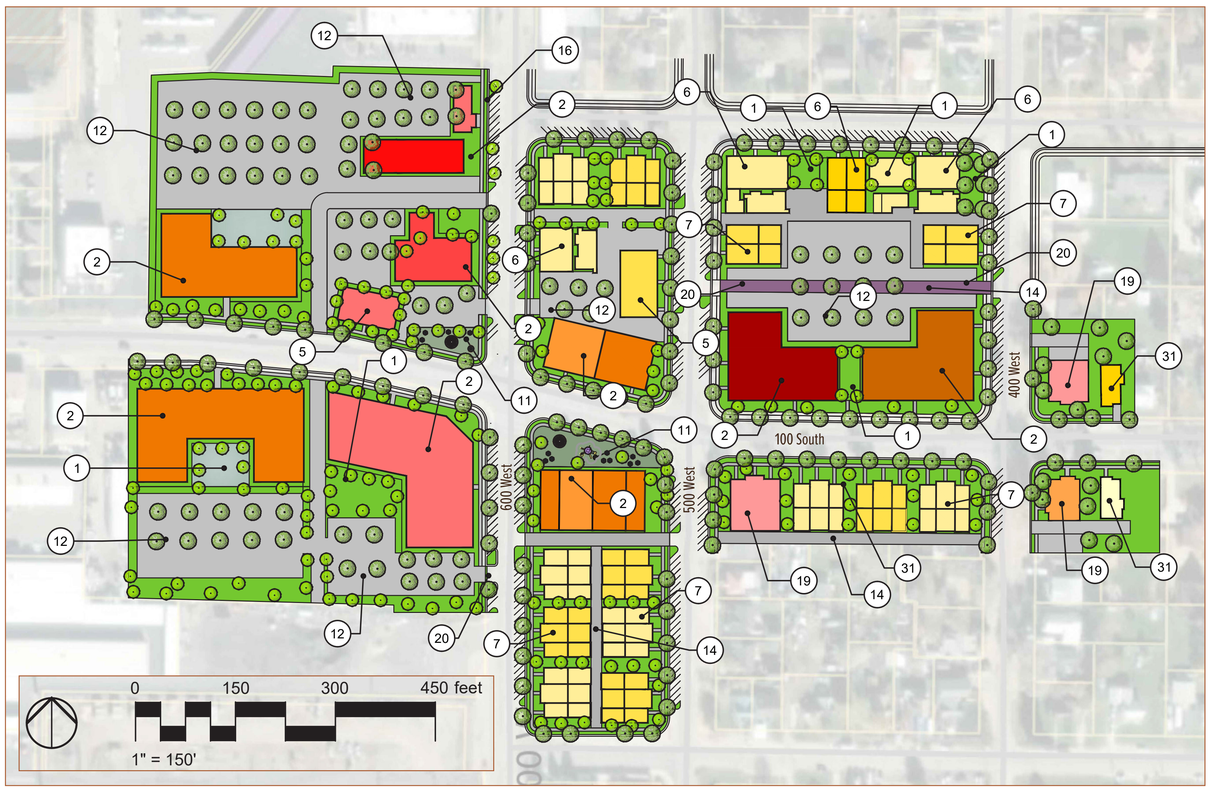


DEFINITIONS

Missing Middle Housing: a range of house-scale buildings with multiple units—compatible in scale and form with detached single-family homes. Examples include town homes and mansion homes.

Multifamily/Workforce Housing: a type of home that aims to provide affordable, safe, and comfortable living spaces for workers and their households. Examples include multiplex or stacked housing (apartments or condos).

WEST GATEWAY CONCEPT

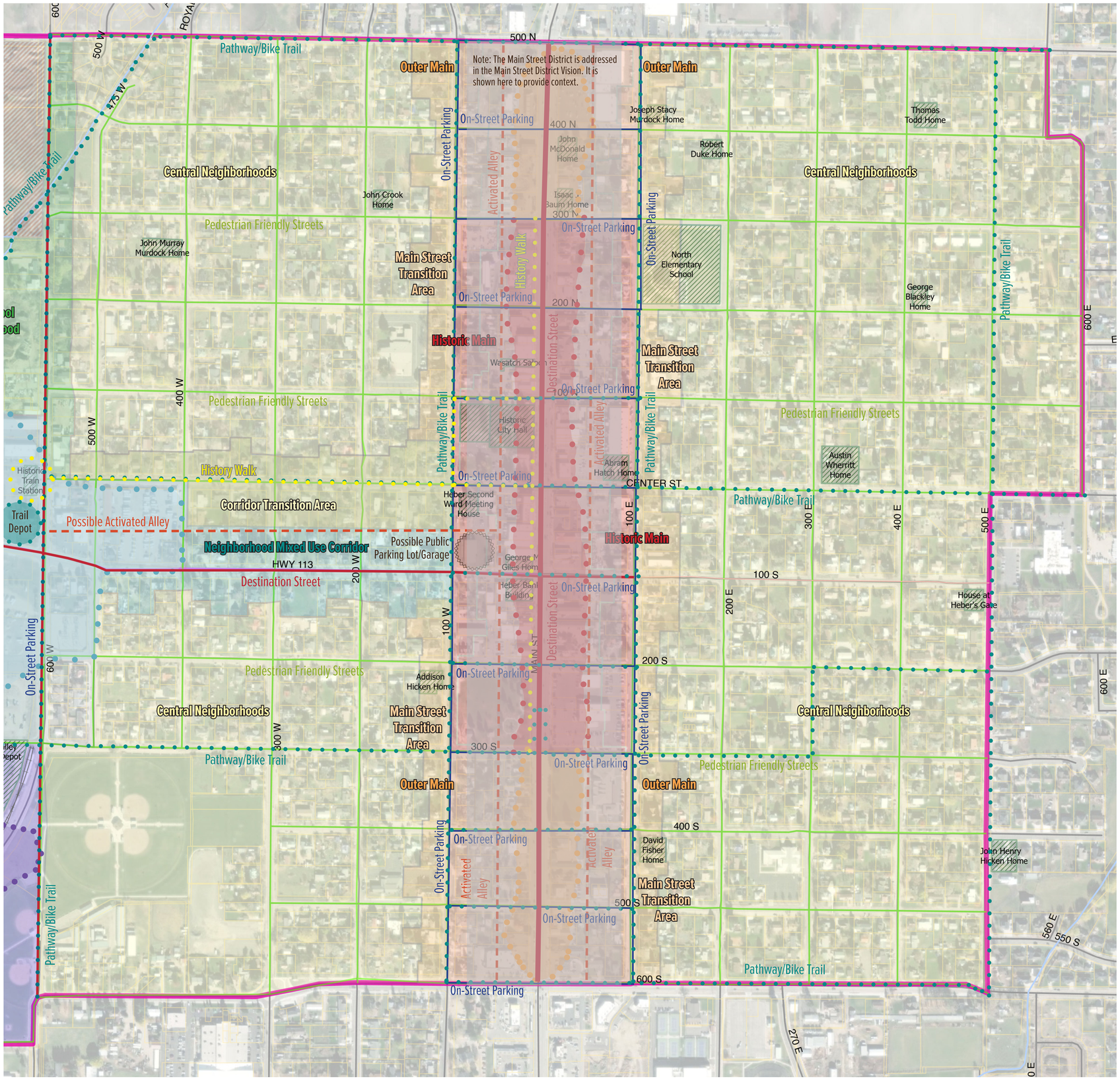


SYMBOL	DESCRIPTION
1	COMMON AREAS (LANDSCAPE, POCKET PARKS, COURTYARDS)
2	BUILDINGS (OPTIONS INCLUDE: MIXED USE, COMMERCIAL, HOTEL OR APARTMENTS)
5	COMMERCIAL BUILDING - FACING STREET WITH PARKING LOCATED TO THE SIDE OR REAR OF THE BUILDING
6	MISSING MIDDLE HOUSING (HOUSE SCALE, UNIT MIX IS TYPICALLY 3-5 PER BUILDING UP TO 12 UNITS A BUILDING)
7	MISSING MIDDLE HOUSING (TOWNHOMES, MANSION HOMES)
11	PLAZA
12	SURFACE PARKING AREAS - INCLUDING LANDSCAPING, TREES, AND WALKS. WHENEVER POSSIBLE PARKING LOTS SHOULD BE SHARED AND CONNECT TO MUTIPLE LOTS AND BUILDINGS.
14	RESIDENTIAL ALLEY - PROVIDING ACCESS TO GARAGES, FLAG LOTS, AND ADUS.
16	HISTORIC TRAIN BUILDING - TO BE PRESERVED IF POSSIBLE. POTENTIAL USES INCLUDE MUSEUM, RESTAURANT, OFFICE, OR RETAIL.
19	COMMERCIAL BUILDING COMPATIBLE IN SCALE AND DESIGN WITH MISSING MIDDLE HOUSING. BUILDINGS SHOULD BE CLOSE TO THE STREET WITH PARKING ON THE SIDE OR REAR.
20	PARKING ENTRANCES (NOT ON ARTERIAL STREETS)
31	SINGLE FAMILY OR MISSING MIDDLE HOUSING (COMPATIBLE IN SCALE AND DESIGN WITH SINGLE FAMILY RESIDENTIAL)

CENTRAL NEIGHBORHOODS VISION

In central neighborhoods, changes to housing is typical of older neighborhoods: maintaining and enhancing existing homes, rebuilding those that owners deem are no longer satisfactory, and adding attached accessory dwelling units. Detached accessory dwellings and flag lots are allowed to provide more neighborhood housing options, but in keeping with the feel of a predominantly single family residential area. The 100 South corridor between 600 West and Main includes new missing middle housing and neighborhood retail, restaurants, and services.

ENVISION CENTRAL HEBER



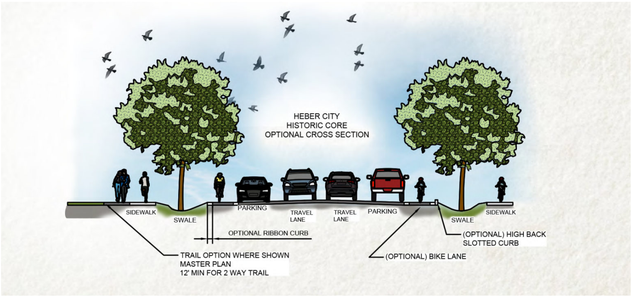
MODEL BLOCK TYPE | NEIGHBORHOOD MIXED USE CORRIDOR

0 150 300 450 feet

1" = 150'

SYMBOL	DESCRIPTION
3	LOCAL STREET WITH ON STREET DIAGONAL PARKING
6	MISSING MIDDLE HOUSING (HOUSE SCALE, UNIT MIX IS TYPICALLY 3-5 PER BUILDING UP TO 12 UNITS A BUILDING)
7	MISSING MIDDLE HOUSING (TOWNHOMES, MANSION HOMES)
8	STAND ALONE COMMERCIAL (RESTAURANT, RETAIL, OFFICE)
14	RESIDENTIAL ALLEY - PROVIDING ACCESS TO GARAGES, FLAG LOTS, AND ADUS.
19	COMMERCIAL BUILDING COMPATIBLE IN SCALE AND DESIGN WITH MISSING MIDDLE HOUSING. BUILDINGS SHOULD BE CLOSE TO THE STREET WITH PARKING ON THE SIDE OR REAR.
22	SINGLE FAMILY HOMES
27	DETACHED ACCESSORY DWELLING UNIT
28	ATTACHED ACCESSORY DWELLING UNIT
29	FLAG LOT
30	ON-STREET PARALLEL PARKING

CENTRAL NEIGHBORHOODS CONCEPTUAL STREETS CROSS SECTION



CENTRAL NEIGHBORHOODS & MIXED USE CORRIDOR

Character
Quiet, pedestrian-friendly streets with a range of homes built across decades, supported by a neighborhood corridor that includes additional housing options and convenient neighborhood retail, restaurants, and services.

Focus
Residential, with some neighborhood retail and commercial along 100 South

Features
Pedestrian-friendly streets with bike network, neighborhood parks, a potential alley pilot project between 100 South and Center Street, history walk connecting the original train depot and the Civic Center Block, historic structures and homes enhanced

Use Mix

Neighborhoods
Residential: single family

Open Space: neighborhood park

Accessory Uses: home-based business, attached accessory dwelling units, detached accessory dwelling units with height equal to or lower than main home height, flag lots

Neighborhood Mixed Use Corridor
Residential & Lodging: missing middle multifamily, hotel

Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (on commercial corners on 100 South)

Open Space: pocket park/plaza, neighborhood park

Parking: on-street public parking, private parking lots behind buildings

Corridor Transition Area (area between mixed use corridor and neighborhoods)
Residential: missing middle, single family

Open Space: pocket park/plaza, neighborhood park

Building Height
Up to three stories

DEFINITIONS

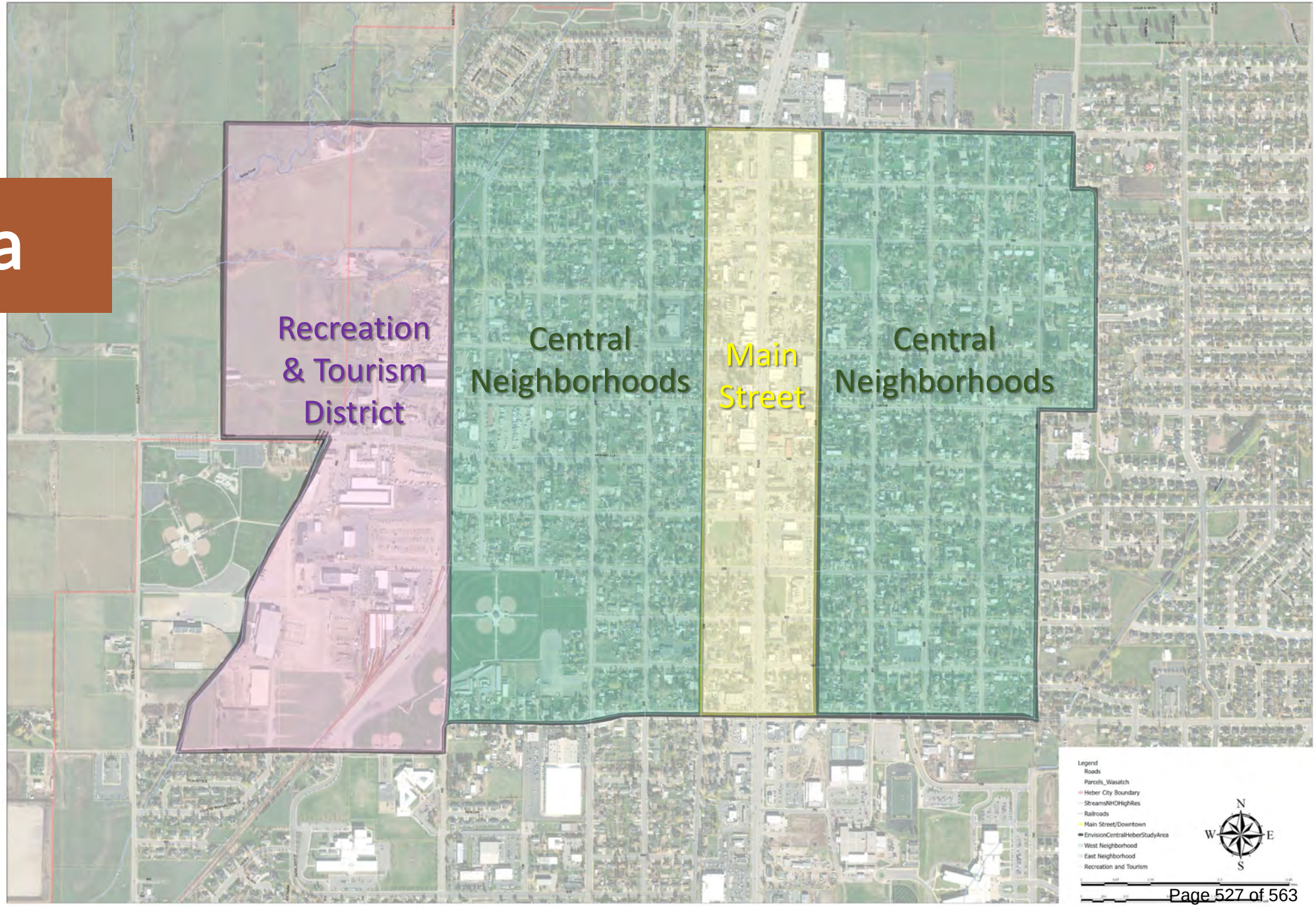
Activated Alley: extra-wide sidewalk or shared pathway, street trees, seating/eating space

Destination Street: street with extra-wide sidewalk, street trees, seating/eating space, on-street parking

Missing Middle Housing: a range of house-scale buildings with multiple units—compatible in scale and form with detached single-family homes. Examples include town homes and mansion homes.

Pedestrian Friendly Street: street with wide sidewalk, street trees, on-street parking

Study Area


Recreation & Tourism District
Central Neighborhoods
Main Street
Central Neighborhoods
Legend
Roads
Parcels_Wasatch
Heber City Boundary
StreamsNHDHighRes
Railroads
Main Street/Downtown
EnvisionCentralHeberStudyArea
West Neighborhood
East Neighborhood
Recreation and Tourism
N
W
E
S

Hundreds of Citizens Involved

Envision Heber

- 3 public meetings
- 2 mailers to every household
- Lots! = print/radio presence
- 23,324 = social media reach
- 2,500 = unique visitors to website
- 1200+ survey responses

Envision Central Heber Outreach and Involvement

- 6 stakeholder/public meetings; 6 steering committee meetings
- 2 mailers to every household and business in study area (2800 addresses)
- Emailed invitations to every household and business in study area (letter from Mayor Franco)
- Invitations hand delivered by city staff to Main Street businesses
- 276 survey responses
- 1100 = unique visitors to website, 3200 page views
- 300 social media post interactions
- 1,459 hours of focus

Envision Central Heber Process

1

Workshop (Brainstorm)

Analysis/Scenario Development

2

Open House (Alternative Scenarios)

Draft Vision Development

3

Vision Celebration (Consensus) May 3

Vision Statement
Guiding Principles
Vision Map
Specific Area Plans

4

Implementation (Ready, Set, Action!)

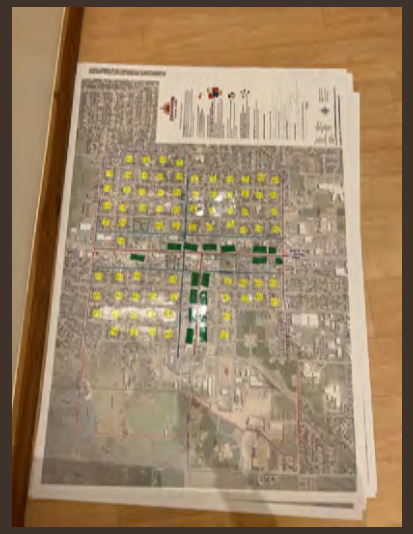
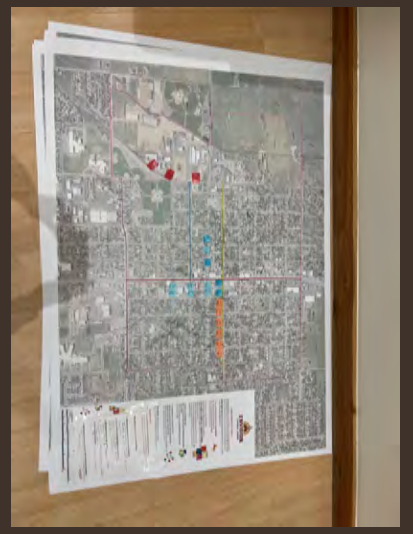
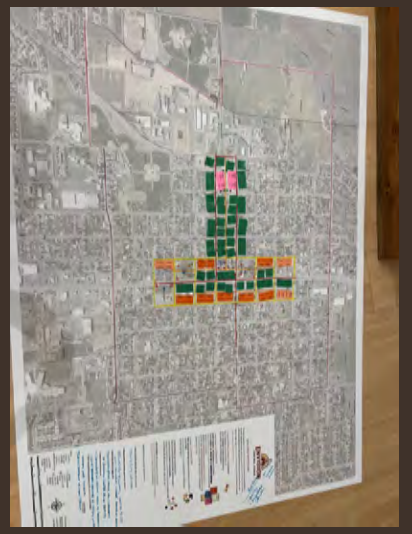
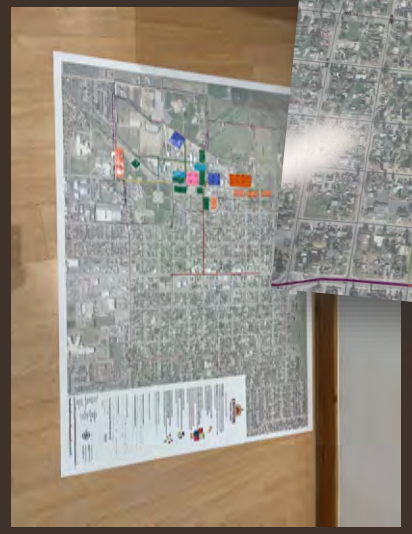
Addition to General Plan
Policy/Code Updates

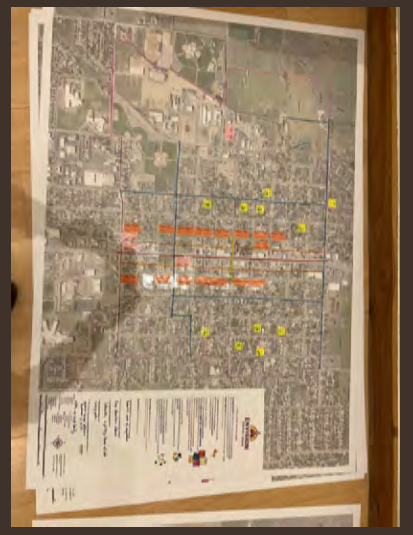
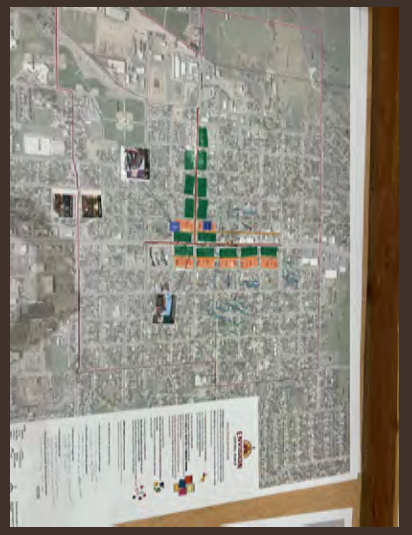
Envision Central Heber

Survey: What do you value? What do you imagine?

As we grow, what do we need to hold on to? How shall we accommodate anticipated growth?

13 Maps Created by Stakeholders

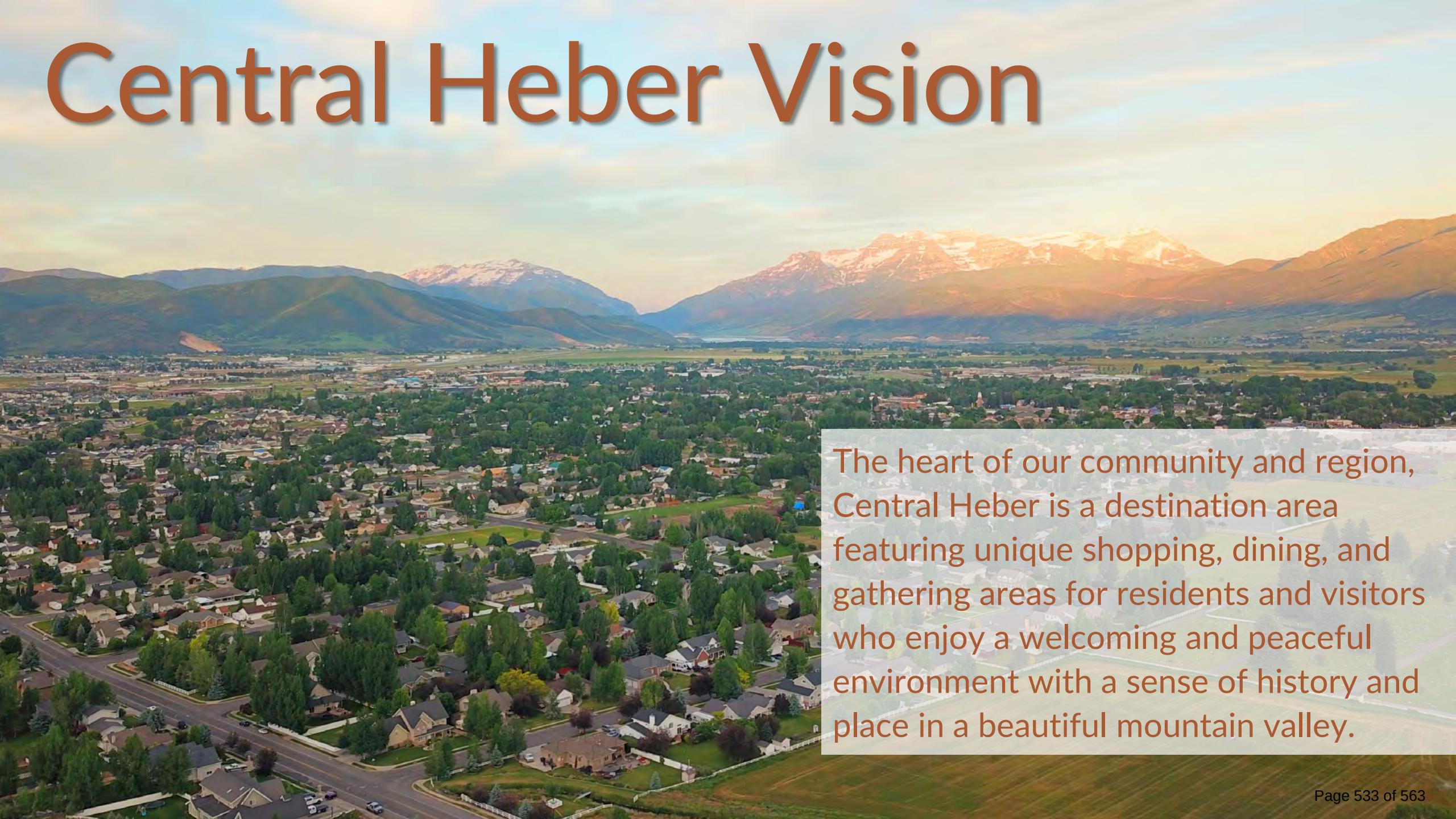
Map Trends & Ideas: Overall

- Main Street is a destination street
- Strong connection between Main Street and the recreation and tourism district
- Train is a major component
- Strong interest in character design standards for quality buildings
- Mostly 3 story buildings, with 4-5 in specific areas of Main and recreation and tourism areas

Main Street Concept

Center Street Concept

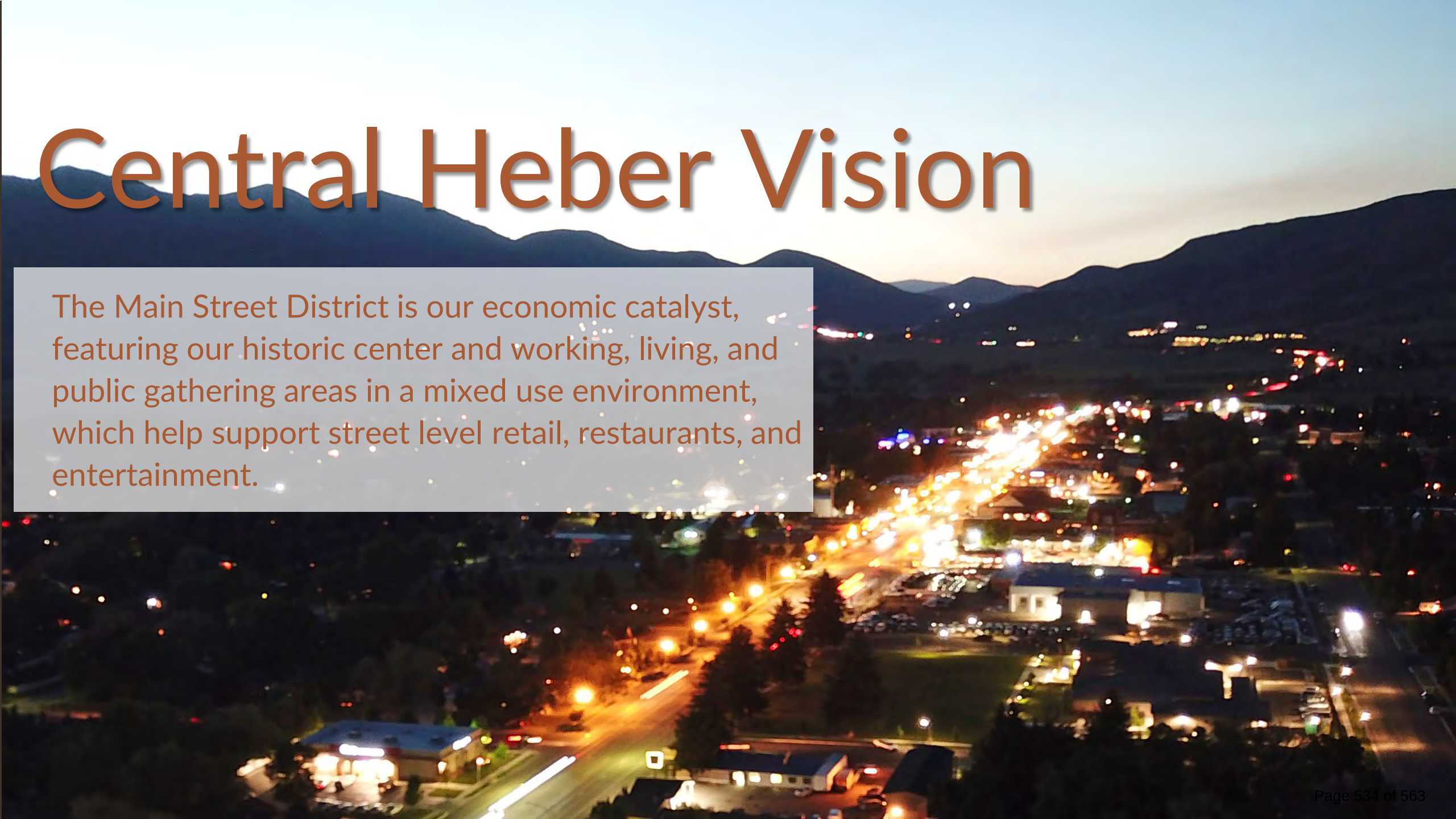
Central Heber Vision



The heart of our community and region, Central Heber is a destination area featuring unique shopping, dining, and gathering areas for residents and visitors who enjoy a welcoming and peaceful environment with a sense of history and place in a beautiful mountain valley.

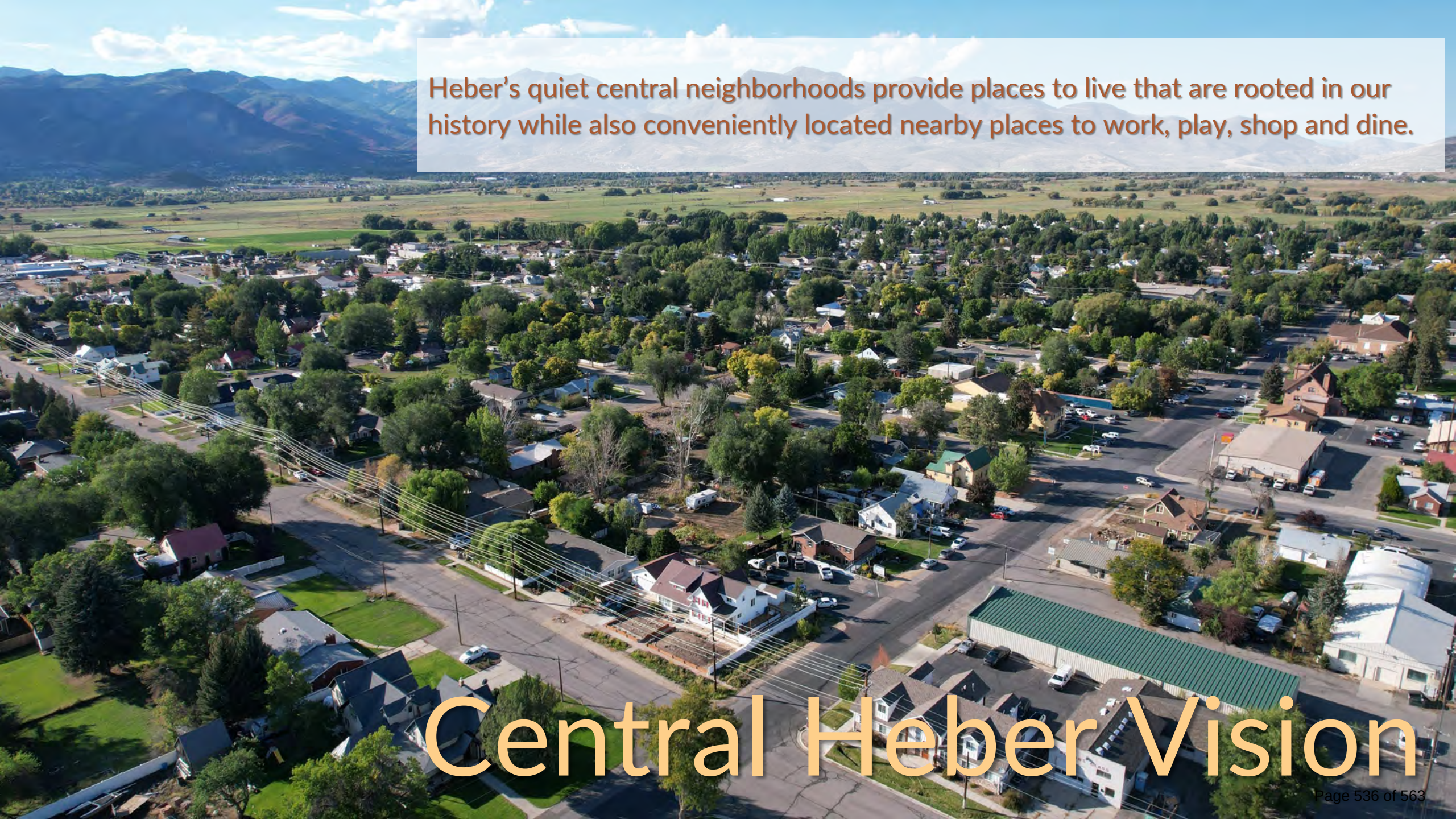
Central Heber Vision

The Main Street District is our economic catalyst, featuring our historic center and working, living, and public gathering areas in a mixed use environment, which help support street level retail, restaurants, and entertainment.



Outdoor-oriented local and regional recreation are features at our Recreation and Tourism District, which is the place to go to enjoy the train, rent a bike, enjoy a ballgame, or plan regional recreational adventures.

Central Heber Vision



Heber's quiet central neighborhoods provide places to live that are rooted in our history while also conveniently located nearby places to work, play, shop and dine.

Central Heber Vision

General Recommendations

1. Highlight Heber's sense of history and place in a beautiful mountain valley, and its welcoming and peaceful environment.
2. Create a walkable, bikeable central city, with safe and pleasant streets.
3. Connect destination places and districts with interesting, pedestrian-friendly routes.
4. Create increased living and working opportunities in the Main Street area, for economic resilience and to better support uses like shopping, dining, gathering, and entertainment.
5. Activate and connect public spaces on Main Street, including Heber City Park, Civic Center Block, and the Public Safety Block, adding amenities, activities, and attractions that people return to again and again.
6. Enliven the streets in Heber's Main Street area with features that provide interest and comfort and encourage repeat visits.
7. Create a new recreation/lifestyle gateway on the west side of town that supports existing and new recreation, tourism, and outdoor-oriented pursuits, better positioning Heber as a destination for regional recreational opportunities.
8. Provide a small neighborhood dining/shopping area near the train station to provide amenities adjacent to tourism and sporting events.
9. Create a new missing middle neighborhood east of the planned high school to provide needed housing options.
10. Preserve Central Heber's neighborhoods, enhancing their quiet, friendly atmosphere while providing options for new housing that fits into the historic fabric.

Vision Scenario Map

CENTRAL HEBER VISION

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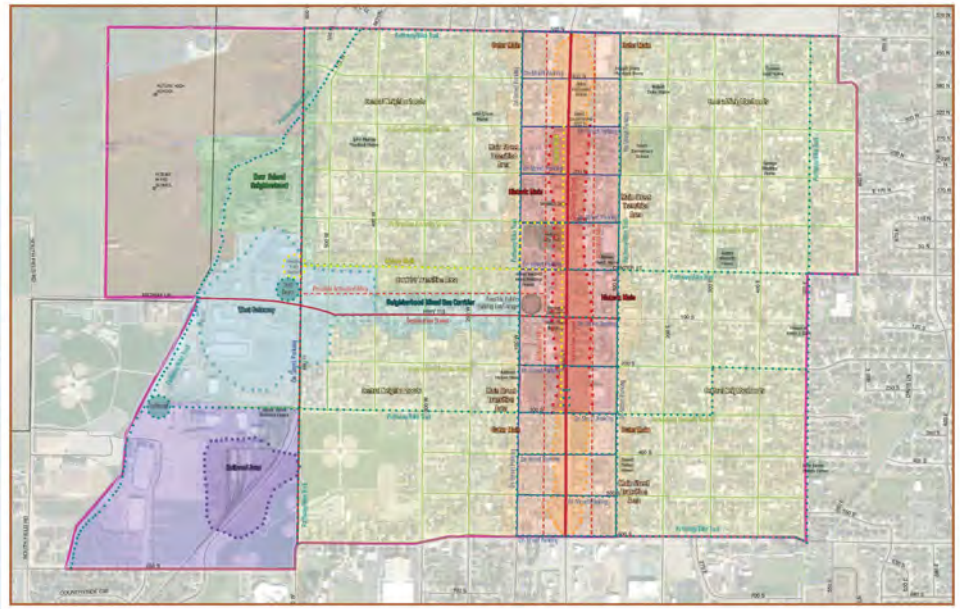
WEST GATEWAY | NEW SCHOOL NEIGHBORHOOD | RAILROAD AREA



MAIN STREET DISTRICT

Main Street is characterized by a vibrant business environment and ample housing opportunities that support dining, shopping, playing, and gathering opportunities, providing a strong destination in the heart of Heber City. Historic Main (300 North to 300 South) features the richest suite of options for people to return to again and again, from restaurants and shops to inviting public spaces and streets, making the area a strong destination for residents and visitors. Alleys off Main Street as well as streets bisecting Main provide quieter spaces for shopping and dining. Outer Main (north of 300 North and south of 300 South) offers the greatest opportunities for working and living near Historic Main. The District as a whole features Main Street destination branding and beautification.

HISTORIC MAIN | OUTER MAIN | MAIN STREET TRANSITION AREA

DEFINITIONS

Activated Alley: primarily a pedestrian space with extra-wide sidewalk or shared pathway, street trees, and seating/lounging/gathering/event space.

Destination Street: a pedestrian-friendly street with extra-wide sidewalk, street trees, seating/waiting space, and on-street parking.

Missing Middle Housing: a range of house-scale buildings with multiple units - compatible in scale and form with detached single-family homes that provide housing for middle income households. Examples include town homes and mansion homes.

Pedestrian Friendly Street: a street that feels comfortable for people with wide sidewalk, street trees, and on-street parking.

Workforce Housing: a type of home that aims to provide affordable, safe, and comfortable living spaces for workers and their households. Examples include multiplex or stacked housing (apartments or condos).

CENTRAL NEIGHBORHOODS DISTRICT

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CENTRAL NEIGHBORHOODS & MIXED USE CORRIDOR

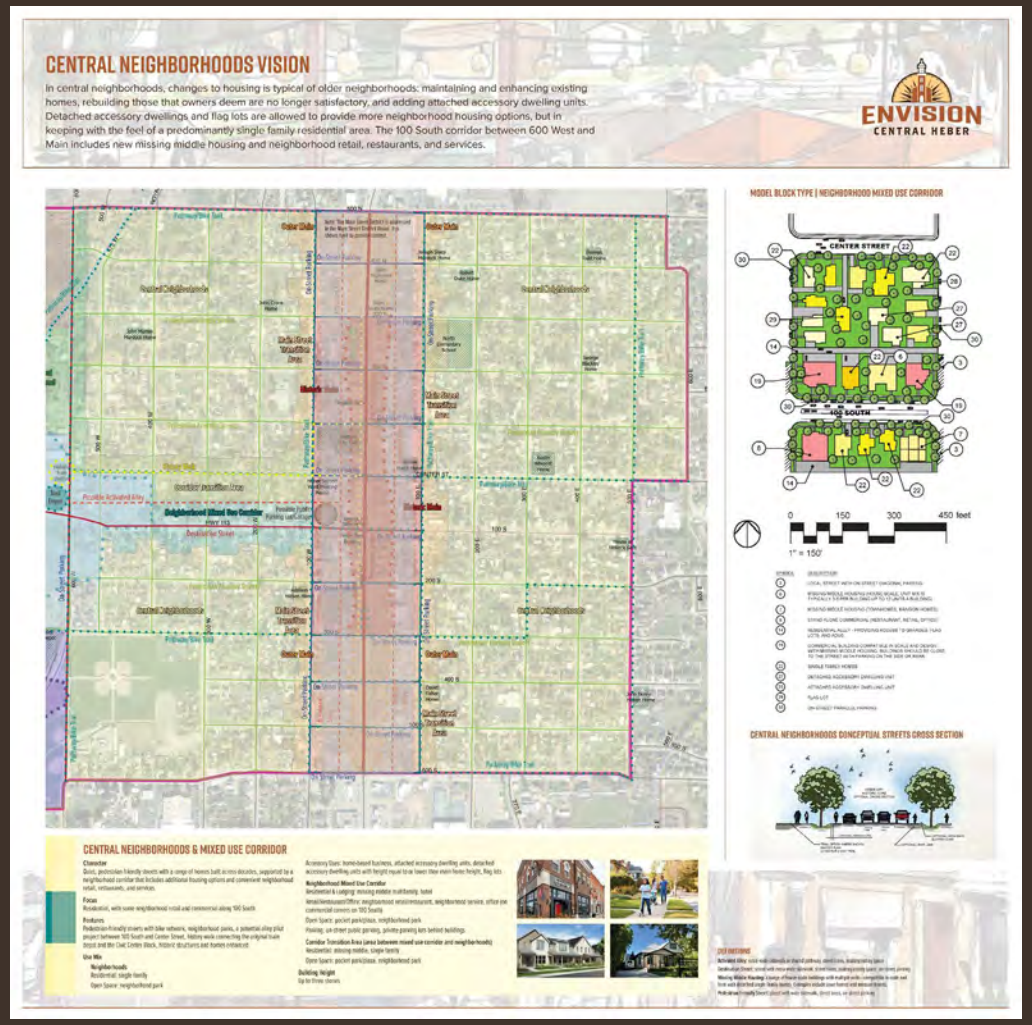
OUR MAIN STREET DISTRICT IS FOR NURTURING COMMUNITY

As we grow, our Main Street District will feature new places to live and work, and especially places to gather together, to celebrate, to share a meal, to support a local artisan or shopkeeper. This is where we enjoy life together and practice our tradition of being friendly, warm, and welcoming.

ENVISION CENTRAL HEBER

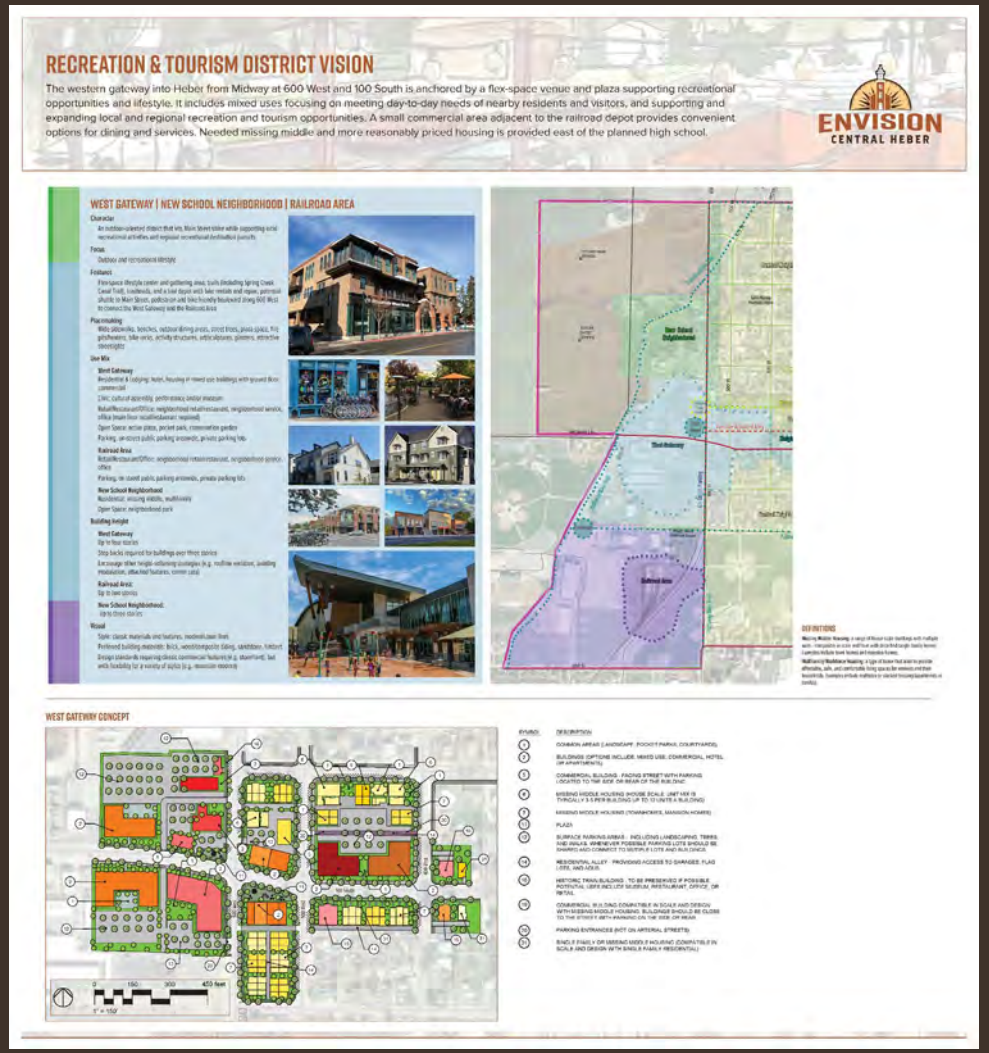
Quiet Central Neighborhoods

- Preserve single family neighborhoods
- Detached accessory dwellings and flag lots
- Pedestrian/bike friendly streets
- Build on neighborhood mixed use corridor



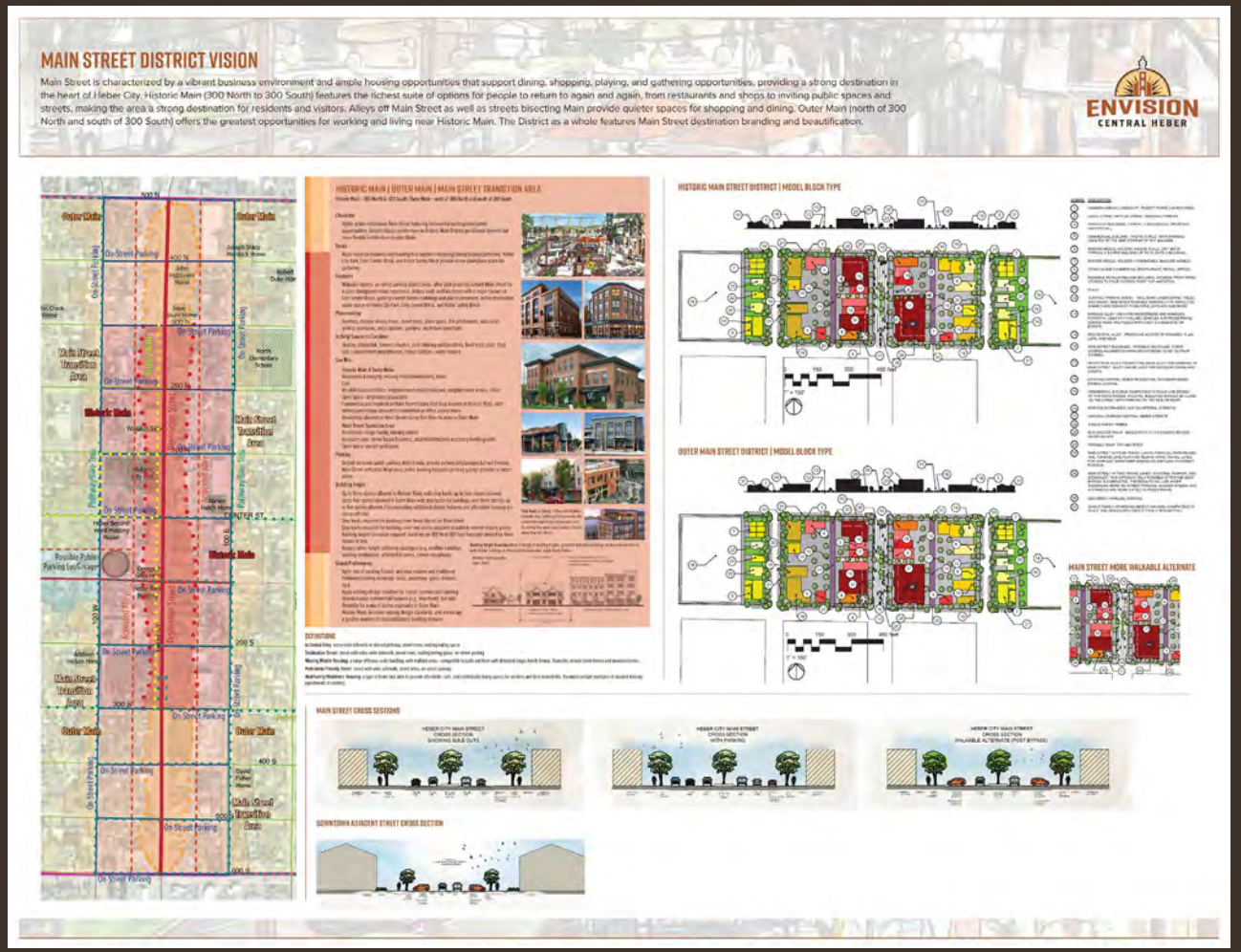
Recreation & Tourism District

- New neighborhood by planned high school
- West Gateway mixed use space supporting local and regional recreation and outdoor lifestyle
- Trails, trail depot, access to nature
- Retail to support train/ballfields



Vibrant & Friendly Main Street

- New housing and businesses help support shopping, dining, gathering
- Destination street and alley, improved parking
- Historical focus at Civic Center Block and along Main Street



Imagine 2050…

Imagine 2050…

Imagine 2050…

Imagine 2050…

Updating Envision Heber 2050 Plan

- The general vision for the community
- The product of two years of public input
- Provides guidance on planning issues, future land uses, and various approaches to achieve the vision

- Addresses the overall vision for Heber
  - Future land use map
  - **Quality Neighborhoods (Housing)**
  - **Center and Gathering Places**
  - Open Space and Rural Character
  - Outdoor Recreation Parks and Trails
  - **Mobility and Streetscapes**
  - Jobs and Economic Development

Envision Central Heber Process Provides:

- Significant new detail and vision statements for these general plan sections:
  - Quality Neighborhoods (Housing)
  - Center and Gathering Places
  - Mobility and Streetscapes
- Minor modifications to:
  - The future land use map
  - Trails section
  - Jobs and Economic Development

How would the Envision Heber 2050 plan change?

- Changes to the Quality Neighborhoods section based on the Central Neighborhoods
- Changes to the Centers and Gathering Places section based on the Historic and Outer Main Vision and the Tourist/Recreation District
- Changes to the Mobility and Streetscapes section for updates to Main Street and 100 East and 100 West

- Examples:
  - Future land use map would change to reduce the mixed use concept to just 100 East and 100 West – now shows 200 East and 200 West
  - Neighborhoods section would show a lower density and housing concepts limited to IADUs, detached ADUs, flag lots
  - The Main Street “Center” would have a new discussion of uses, heights, alleys, activation, beautification, building design/materials, etc.

Adopted Plans Lead to Ordinance and Programmatic Changes

First, this vision needs to be adopted!

- PC public hearing
- Council adoption

Then…

- Ordinance updates
- Design requirements
- Building types standards
- Housing options incentives
- Projects

Projects are a large part of this effort!

For example…

- Pedestrian-focused alley off Main
- Additional Main Street Parking
- Historic preservation
- Central neighborhoods street improvements
- Main Street Beautification
- West Gateway area

Poster Session and Feedback

(dots & post its & conversation!)

ORDINANCE NO. 2023-22

AN ORDINANCE APPROVING THE ENVISION CENTRAL HEBER VISION STATEMENT AS AN AMENDMENT TO THE GENERAL PLAN.

BE IT ORDAINED by the City Council of Heber City, Utah, the Envision Central Heber Vision Statement is hereby adopted as an Appendix to Heber City's General Plan as illustrated in Exhibit A.

This Ordinance shall take effect immediately upon passage.

PASSED, APPROVED and ORDERED TO BE PUBLISHED BY THE HEBER CITY COUNCIL this _____ day of _____ 2023.

	AYE	NAY	ABSENT	ABSTAIN
Rachel Kahler	_____	_____	_____	_____
Michael Johnston	_____	_____	_____	_____
Ryan Stack	_____	_____	_____	_____
Scott Phillips	_____	_____	_____	_____
Yvonne Barney	_____	_____	_____	_____

APPROVED:

_____
Mayor Heidi Franco

ATTEST:

_____ Date: _____
RECORDER

Exhibit A: Envision Central Heber Vision

CENTRAL HEBER VISION

The heart of our community and region, Central Heber is a destination area featuring unique shopping, dining, and gathering areas for residents and visitors who enjoy a welcoming and peaceful environment with a sense of history and place in a beautiful mountain valley. The Main Street District is our economic catalyst, featuring our historic center and working, living, and public gathering areas in a mixed use environment, which help support street level retail, restaurants, and entertainment. Outdoor-oriented local and regional recreation are features at our Recreation and Tourism District, which is the place to go to enjoy the train, rent a bike, enjoy a ballgame, or plan regional recreational adventures. Heber's quiet central neighborhoods provide places to live that are rooted in our history while also conveniently located nearby places to work, play, shop and dine.

GENERAL RECOMMENDATIONS

1. Highlight Heber's sense of history and place in a beautiful mountain valley, and its welcoming and peaceful environment.
2. Create a walkable, bikeable central city, with safe and pleasant streets.
3. Connect destination places and districts with interesting, pedestrian-friendly routes.
4. Create increased living and working opportunities in the Main Street area, for economic resilience and to better support uses like shopping, dining, gathering, and entertainment.
5. Activate and connect public spaces on Main Street, including Heber City Park, Civic Center Block, and the Public Safety Block, adding amenities, activities, and attractions that people return to again and again.
6. Enliven the streets in Heber's Main Street area with features that provide interest and comfort and encourage repeat visits.
7. Create a new recreation/lifestyle gateway on the west side of town that supports existing and new recreation, tourism, and outdoor-oriented pursuits, better positioning Heber as a destination for regional recreational opportunities.
8. Provide a small neighborhood dining/shopping area near the train station to provide amenities adjacent to tourism and sporting events.
9. Create a new missing middle neighborhood east of the planned high school to provide needed housing options.
10. Preserve Central Heber's neighborhoods, enhancing their quiet, friendly atmosphere while providing options for new housing that fits into the historic fabric.

RECREATION & TOURISM DISTRICT

The western gateway into Heber from Midway at 600 West and 100 South is anchored by a flex-space venue and plaza supporting recreational opportunities and lifestyle. It includes mixed uses focusing on meeting day-to-day needs of nearby residents and visitors, and supporting and expanding local and regional recreation and tourism opportunities. A small commercial area adjacent to the railroad depot provides convenient options for dining and services. Needed missing middle and more reasonably priced housing is provided east of the planned high school.

WEST GATEWAY | NEW SCHOOL NEIGHBORHOOD | RAILROAD AREA

Character
An outdoor-oriented district that lets Main Street shine while supporting local recreational activities and regional recreational destination pursuits.

Focus
Outdoor and recreational lifestyle

Features
Flex-space lifestyle center and gathering area; trails (including Spring Creek Canal Trail), trailheads, and a trail depot with bike rentals and repair; potential shuttle to Main Street, pedestrian and bike friendly boulevard along 600 West to connect the West Gateway and the Railroad Area

Placemaking
Wide sidewalks, benches, outdoor dining areas, street trees, plaza space, fire pits/heaters, bike racks, activity structures, art/sculptures, planters, attractive streetlights

Use Mix

West Gateway
Residential & Lodging: hotel, housing in mixed use buildings with ground floor commercial
Civic: cultural assembly, performance and/or museum
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (main floor retail/restaurant required)
Open Space: active plaza, pocket park, conservation garden
Parking: on-street public parking areawide, private parking lots

Railroad Area
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office
Parking: on-street public parking areawide, private parking lots

New School Neighborhood
Residential: missing middle, multifamily
Open Space: neighborhood park

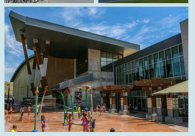
Building Height

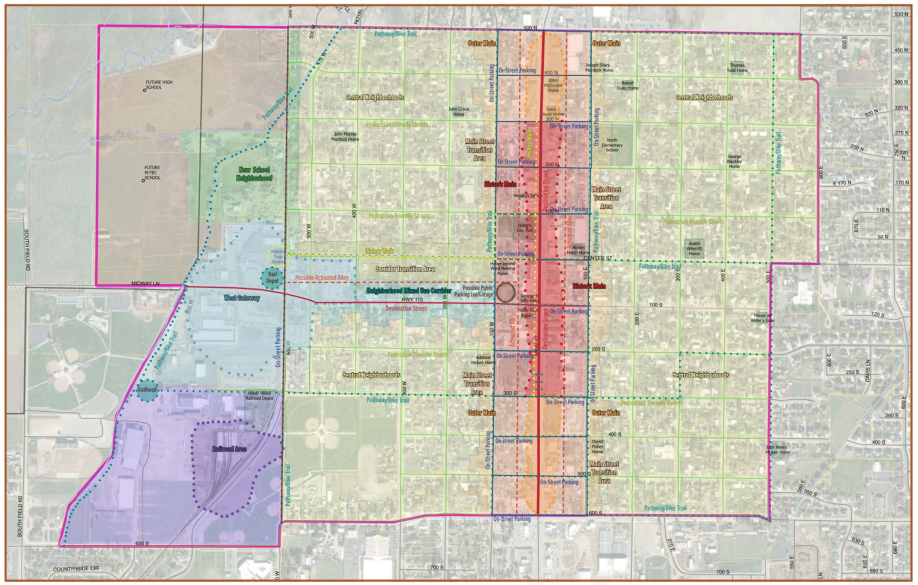
West Gateway
Up to four stories
Step backs required for buildings over three stories
Encourage other height-softening strategies (e.g. roofline variation, building modulation, attached features, corner cuts)

Railroad Area
Up to two stories

New School Neighborhood:
Up to three stories

Visual
Style: classic materials and features, modern/clean lines
Preferred building materials: brick, wood/composite siding, sandstone, timbers
Design standards requiring classic commercial features (e.g. storefront), but with flexibility for a variety of styles (e.g. mountain modern)





DEFINITIONS

Activated Alley: primarily a pedestrian space with extra-wide sidewalk or shared pathway, street trees, and seating/eating/gathering/event space.

Destination Street: a pedestrian-friendly street with extra-wide sidewalk, street trees, seating/eating space, and on-street parking.

Missing Middle Housing: a range of house-scale buildings with multiple units—compatible in scale and form with detached single-family homes that provide housing for middle income households. Examples include town homes and mansion homes.

Pedestrian Friendly Street: a street that feels comfortable for people with wide sidewalk, street trees, and on-street parking.

Workforce Housing: a type of home that aims to provide affordable, safe, and comfortable living spaces for workers and their households. Examples include multiplex or stacked housing (apartments or condos).

Legend

Historic Buildings
Potential Bypass
RAIL LINES
STREAMS
TRAILS & PATHWAYS
BIKE_PED_STREET
ALLEY_STREET
NEIGHBORHOOD_TRANSITION
MIXED_CORRIDOR
CENTRAL_NEIGHBORHOODS
STREET_DESTINATION
PEDESTRIAN_FRIENDLY
MINOR_DESTINATION
BIKE_PED_STREET
ALLEY_STREET_TYPE
STREET_PARK_ONCE
TRACK_DETAIL_COMMERCIAL
CulturalGateway
ENVISION CENTRAL HEBER STUDY BOUNDARY
HEBER CITY BOUNDARY
PARCELS
STREETS
FUTURE_SCHOOLS
FUTURE_HIGHSCHOOL_MTGC
HISTORIC_MAIN_STREET
MAIN_STREET_OUTER_NORTH
MAINSTREET_OUTER_SOUTH

MAIN STREET DISTRICT

Main Street is characterized by a vibrant business environment and ample housing opportunities that support dining, shopping, playing, and gathering opportunities, providing a strong destination in the heart of Heber City. Historic Main (300 North to 300 South) features the richest suite of options for people to return to again and again, from restaurants and shops to inviting public spaces and streets, making the area a strong destination for residents and visitors. Alleys off Main Street as well as streets bisecting Main provide quieter spaces for shopping and dining. Outer Main (north of 300 North and south of 300 South) offers the greatest opportunities for working and living near Historic Main. The District as a whole features Main Street destination branding and beautification.

HISTORIC MAIN | OUTER MAIN | MAIN STREET TRANSITION AREA

Historic Main – 300 North to 300 South | Outer Main – north of 300 North and south of 300 South

Character
Highly active destination Main Street featuring live/work/play/shop/dine/gather opportunities; historic/classic architecture in Historic Main District and historic themed but more flexible architecture in outer Main.

Focus
Major focus on business and housing that supports shopping/dining/playing/gathering; Heber City Park, Civic Center Block, and Public Safety Block provide active park/plaza space for gathering

Features
Walkable streets, on-street parking district wide, alley pilot project(s) behind Main Street for a quiet dining/pedestrian experience, history walk on Main Street with a major feature at Civic Center Block, publicly owned historic buildings and places preserved, active destination public space at Heber City Park, Civic Center Block, and Public Safety Block

Placemaking
Benches, outdoor dining areas, street trees, plaza space, fire pits/heaters, bike racks, activity structures, art/sculptures, planters, attractive streetlights

Activity Spaces to Consider
Skating ribbon/rink, farmer's market, rock climbing wall/boulders, food truck court, food hall, concert/event amphitheater, fitness stations, water feature

Use Mix

Historic Main & Outer Main
Residential & Lodging: missing middle/multifamily, hotel
Civic
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office
Open Space: destination plaza/park
Commercial use required on Main Street-facing first floor facades in Historic Main, with limited percentage allowed for residential or office access doors
Residential allowed on Main Street-facing first floor facades in Outer Main

Main Street Transition Area
Residential: single family, missing middle
Accessory uses: home-based business, attached/detached accessory dwelling units, Open space: pocket park/plaza

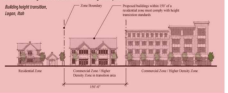
Parking
Striped on-street public parking district wide, private parking lots/garages but not fronting Main Street in Historic Main area, public parking lot/public parking garage possible in future phase

Building Height
Up to three stories allowed in Historic Main; with step backs up to four stories allowed
Up to four stories allowed in Outer Main with step backs for buildings over three stories; up to five stories allowed if incorporating additional design features and affordable housing (on site or off site)
Step backs required for buildings over three stories on Main Street
Step backs required for buildings over two stores adjacent to publicly-owned historic places
Building height transition required; buildings on 100 West/100 East frontage limited to three stories or less
Require other height-softening strategies (e.g. roofline variation, building modulation, attached features, corner cuts/plazas)

Visual Preferences
Style: mix of existing historic and new modern and traditional
Preferred building materials: brick, sandstone, glass, timbers, rock
Apply existing design standard for classic commercial requiring historic/classic commercial features (e.g. storefront), but with flexibility for a mix of styles, especially in Outer Main
Historic Main: increase existing design standards, and encourage a greater number of classical/historic building features

Step Back: a change in the vertical plane of multi-story buildings that preserves the pedestrian experience at sidewalk-level by setting the upper story building facade away from the street

Building Height Transition Area: a change in building heights, generally with taller buildings on more internal streets, with shorter buildings on the transition area near single family homes.



CENTRAL NEIGHBORHOODS DISTRICT

In central neighborhoods, changes to housing is typical of older neighborhoods: maintaining and enhancing existing homes, rebuilding those that owners deem are no longer satisfactory, and adding attached accessory dwelling units. Detached accessory dwellings and flag lots are allowed to provide more neighborhood housing options, but in keeping with the feel of a predominantly single family residential area. The 100 South corridor between 600 West and Main includes new missing middle housing and neighborhood retail, restaurants, and services.

CENTRAL NEIGHBORHOODS & MIXED USE CORRIDOR

Character
Quiet, pedestrian-friendly streets with a range of homes built across decades, supported by a neighborhood corridor that includes additional housing options and convenient neighborhood retail, restaurants, and services.

Focus
Residential, with some neighborhood retail and commercial along 100 South

Features
Pedestrian-friendly streets with bike network, neighborhood parks, a potential alley pilot project between 100 South and Center Street, history walk connecting the original train depot and the Civic Center Block, historic structures and homes enhanced

Use Mix

Neighborhoods
Residential: single family
Open Space: neighborhood park

Accessory Uses: home-based business, attached accessory dwelling units, detached accessory dwelling units with height equal to or lower than main home height, flag lots

Neighborhood Mixed Use Corridor
Residential & Lodging: missing middle multifamily, hotel
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (on commercial corners on 100 South)
Open Space: pocket park/plaza, neighborhood park
Parking: on-street public parking, private parking lots behind buildings

Corridor Transition Area (area between mixed use corridor and neighborhoods)
Residential: missing middle, single family
Open Space: pocket park/plaza, neighborhood park

Building Height
Upto three stories

OUR MAIN STREET DISTRICT IS FOR NURTURING COMMUNITY

As we grow, our Main Street District will feature new places to live and work, and especially places to gather together, to celebrate, to share a meal, to support a local artisan or shopkeeper. This is where we enjoy life together and practice our tradition of being friendly, warm, and welcoming.

ENVISION CENTRAL HEBER

MAIN STREET DISTRICT VISION

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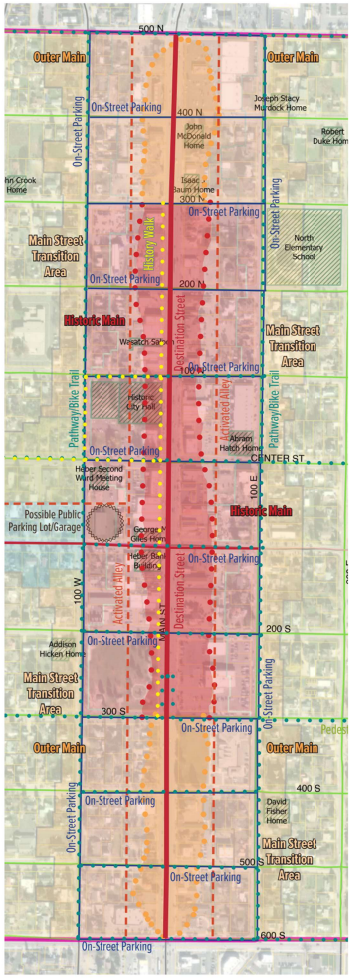

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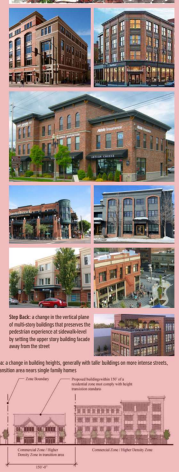

Step Back: a change in the vertical plane of multi-story buildings that preserves the pedestrian experience at sidewalk-level by setting the upper story building facade away from the street

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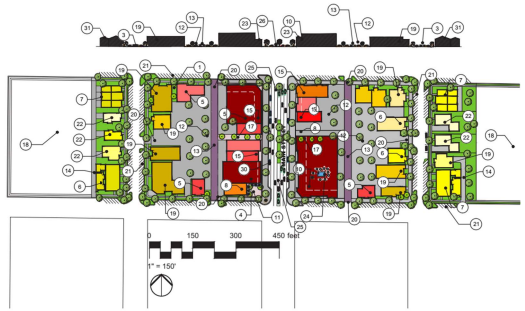
Multifamily/Workforce Housing: a type of home that aims to provide affordable, safe, and comfortable living spaces for workers and their households. Examples include multiplex or stacked housing (apartments or condos).

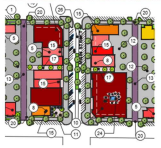
HISTORIC MAIN STREET DISTRICT | MODEL BLOCK TYPE



OUTER MAIN STREET DISTRICT | MODEL BLOCK TYPE

SYMBOL	DESCRIPTION
1	COMMON AREAS (LANDSCAPE, POCKET PARKS, COURTYARDS)
2	LOCAL STREET WITH ON STREET DIAGONAL PARKING
3	MIXED-USE BUILDINGS (TYPICALLY RESIDENTIAL OR OFFICE OVER RETAIL)
4	COMMERCIAL BUILDING - FACING STREET WITH PARKING LOCATED TO THE SIDE OR REAR OF THE BUILDING
5	MISSING MIDDLE HOUSING (HOUSE SCALE UNIT MIX IS TYPICALLY 3-5 PER BUILDING UP TO 12 UNITS A BUILDING)
6	MISSING MIDDLE HOUSING (TOWNHOMES, MANSION HOMES)
7	STAND ALONE COMMERCIAL (RESTAURANT, RETAIL, OFFICE)
8	POSSIBLE HOTEL/MIXED USE BUILDING. SETBACK FROM THREE STORIES TO FOUR STORIES. ROOF TOP AMENITIES.
9	PLAZA
10	SURFACE PARKING AREAS - INCLUDING LANDSCAPING, TREES, AND WALKS. WHENEVER POSSIBLE PARKING LOTS SHOULD BE SHARED AND CONNECT TO MUTIPLE LOTS AND BUILDINGS
11	PARKING ALLEY USED FOR PEDESTRIANS AND VEHICLES. POTENTIAL USES MAY INCLUDE VEHICLES AND PEDESTRIANS DURING WEEK AND PEDESTRIAN ONLY ON WEEKEND OR EVENTS.
12	RESIDENTIAL ALLEY - PROVIDING ACCESS TO GARAGES, FLAG LOTS, AND ADUS
13	MAIN STREET BUILDINGS - POSSIBLE MIXED-USE. THREE STORIES ALLOWED ON MAIN AND SETBACK TO GO TO FOUR STORIES.
14	PEDESTRIAN ALLEY CONNECTING BACK ALLEY AND PARKING TO MAIN STREET. ALLEY CAN BE USED FOR OUTDOOR DINING AND EVENTS.
15	EXISTING CENTRAL HEBER RESIDENTIAL NEIGHBORHOODS. MINIMAL CHANGE.
16	COMMERCIAL BUILDING COMPATIBLE IN SCALE AND DESIGN WITH MISSING MIDDLE HOUSING. BUILDINGS SHOULD BE CLOSE TO THE STREET WITH PARKING ON THE SIDE OR REAR.
17	PARKING ENTRANCES (NOT ON ARTERIAL STREETS)
18	DIAGONAL PARKING CENTRAL HEBER STREETS
19	SINGLE FAMILY HOMES
20	BUILDING STEPBACK. MAIN STREET AT 2-3 STORIES BEFORE GOING HIGHER.
21	POSSIBLE ROOF TOP AMENITIES.
22	MAIN STREET W FOUR TRAVEL LANES, PARALLEL PARKING AND ONE TURNING LANE/PLANTING MEDIAN. MORE TRAVEL LANES FOR VEHICLES, NARROWER SIDEWALKS AND LESS ON STREET PARKING.
23	MAIN STREET W TWO TRAVEL LANES, DIAGONAL PARKING, AND SIDEWALKS. THIS OPTION IS ONLY POSSIBLE AFTER THE UDOT BYPASS IS COMPLETED. THE RESULT IS INCLUDE WIDER SIDEWALKS, MORE ON-STREET PARKING, SLOWER SPEEDS AND A STREETSCAPE MORE SUITED TO PEDESTRIANS
24	ON-STREET PARALLEL PARKING
25	SINGLE FAMILY OR MISSING MIDDLE HOUSING (COMPATIBLE IN SCALE AND DESIGN WITH SINGLE FAMILY RESIDENTIAL)

MAIN STREET MORE WALKABLE ALTERNATE



MAIN STREET CROSS SECTIONS

DOWNTOWN ADJACENT STREET CROSS SECTION

WHAT COULD MAIN STREET BE LIKE IN 2050?

Implementing a community vision is a long-term endeavor. Imagine what Heber could be like in 2050 if we take a proactive approach to growth in coming decades. Our vision is a centers strategy. We want to focus growth in areas that are most appropriate, so we can take some pressure off surrounding open lands and beloved neighborhoods. The Main Street District is our primary center, the heart of our community and region.

ENVISION CENTRAL HEBER

WE CELEBRATE AND NURTURE OUR COMMUNITY IN OUR MAIN STREET DISTRICT

As we grow, our Main Street District will feature new places to live and work, and especially places to gather together, to celebrate, to share a meal, to support a local artisan or shopkeeper. This is where we enjoy life together and practice our tradition of being friendly, warm, and welcoming.

Current aerial photograph of the Blue Sword Block between Main Street & 100 South. Below, a rendering of the same concept in illustrative sketch and isometric 3d below.

Current aerial photograph of the Blue Sword District, looking south, with the Provo River Delta in the background. Below, in the foreground, view concept (scaled illustrative sketch) of the Blue Sword Block and 100 South intersection.

WE CELEBRATE THE HEART OF OUR REGION

As we grow, our Main Street District continues providing our economic energy, featuring new places to live and work, set among ample space to get outside and see outside. While we foster a vibrant economy and provide more options for living in the heart of our city, we maintain space to enjoy the views and outdoor lifestyle that people in Heber love.

WE CELEBRATE OUR HERITAGE

We reflect on, remember, and celebrate Heber's heritage at Civic Center Block, highlighting the historic tabernacle and theater, daylighting Lake Creek, and creating interpretive elements commemorating our history. This space is also the center of our history walk which runs along Main Street and then along Center Street, ending at the historic depot building.

Current aerial photograph of the Civic Center Block, location of the historic tabernacle and theater. Below, in the sketch illustration above, view concept created in below, looking at a new public conference building and the historic theater.

Current aerial photograph of the Public Safety Block. Below concept for the Public Safety Block as shown, view concept created in below.

WE CELEBRATE COMMON SPACES

Rather than developing all of the green space on the Public Safety Block, this concept preserves a large plaza for enjoying a meal in the shade or strolling through an exhibition or year round farmer's market out of the weather. The trees and buildings along the perimeter reduce traffic noise and provide space for a plaza, food hall, meeting rooms, or other amenities.

WE CELEBRATE LIFE TOGETHER

We cherish time with family and friends, and a community-friendly alley off Main Street provides space without the noise of traffic to enjoy time together, whether enjoying family fun at a market, an outdoor movie, or simply getting together for a meal with long-time friends.

WE CELEBRATE OUR PUBLIC SPACES

Our Civic Block, Public Safety Block, and our streets—including Main Street and adjacent side streets—all demonstrate care for our city and attention to maintaining high quality public spaces that people can use and enjoy.

RECREATION & TOURISM DISTRICT VISION

The western gateway into Heber from Midway at 600 West and 100 South is anchored by a flex-space venue and plaza supporting recreational opportunities and lifestyle. It includes mixed uses focusing on meeting day-to-day needs of nearby residents and visitors, and supporting and expanding local and regional recreation and tourism opportunities. A small commercial area adjacent to the railroad depot provides convenient options for dining and services. Needed missing middle and more reasonably priced housing is provided east of the planned high school.

ENVISION CENTRAL HEBER

WEST GATEWAY | NEW SCHOOL NEIGHBORHOOD | RAILROAD AREA

Character

An outdoor-oriented district that lets Main Street shine while supporting local recreational activities and regional recreational destination pursuits.

Focus

Outdoor and recreational lifestyle

Features

Flex-space lifestyle center and gathering area; trails (including Spring Creek Canal Trail), trailheads, and a trail depot with bike rentals and repair; potential shuttle to Main Street, pedestrian and bike friendly boulevard along 600 West to connect the West Gateway and the Railroad Area

Placemaking

Wide sidewalks, benches, outdoor dining areas, street trees, plaza space, fire pits/heaters, bike racks, activity structures, art/sculptures, planters, attractive streetlights

Use Mix

West Gateway
Residential & Lodging: hotel, housing in mixed use buildings with ground floor commercial

Civic: cultural assembly, performance and/or museum

Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (main floor retail/restaurant required)

Open Space: active plaza, pocket park, conservation garden

Parking: on-street public parking areawide, private parking lots

Railroad Area
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office

Parking: on street public parking areawide, private parking lots

New School Neighborhood
Residential: missing middle, multifamily

Open Space: neighborhood park

Building Height

West Gateway
Up to four stories

Step backs required for buildings over three stories

Encourage other height-softening strategies (e.g. roofline variation, building modulation, attached features, corner cuts)

Railroad Area:
Up to two stories

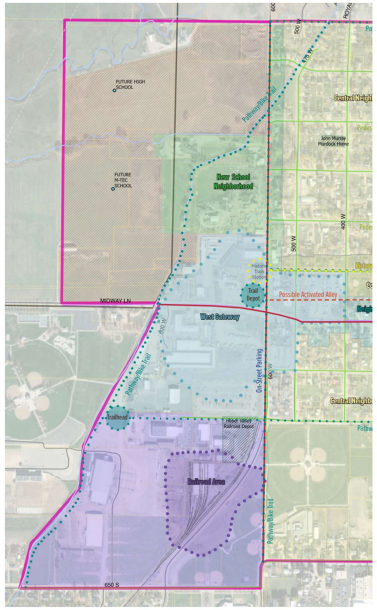
New School Neighborhood:
Up to three stories

Visual

Style: classic materials and features, modern/clean lines

Preferred building materials: brick, wood/composite siding, sandstone, timbers

Design standards requiring classic commercial features (e.g. storefront), but with flexibility for a variety of styles (e.g. mountain modern)

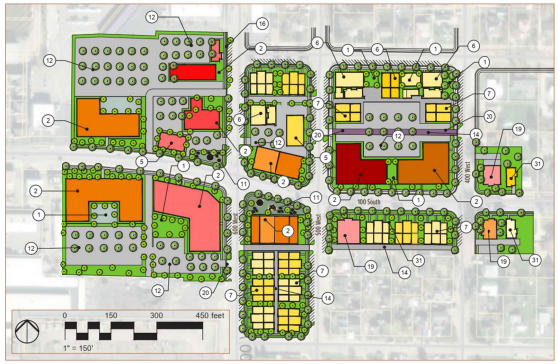


DEFINITIONS

Missing Middle Housing: a range of house-scale buildings with multiple units—compatible in scale and form with detached single-family homes. Examples include town homes and mansion homes.

Multifamily/Workforce Housing: a type of home that aims to provide affordable, safe, and comfortable living spaces for workers and their households. Examples include multiplex or stacked housing (apartments or condos).

WEST GATEWAY CONCEPT

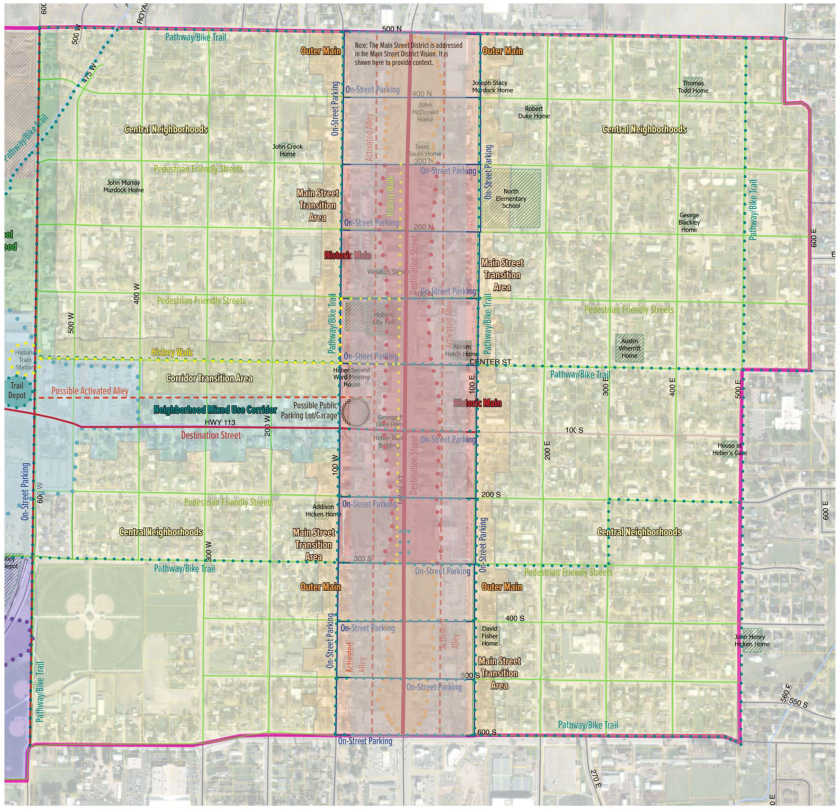


SYMBOL	DESCRIPTION
1	COMMON AREAS (LANDSCAPE, POCKET PARKS, COURTYARDS)
2	BUILDINGS (OPTIONS INCLUDE: MIXED USE, COMMERCIAL, HOTEL OR APARTMENTS)
5	COMMERCIAL BUILDING - FACING STREET WITH PARKING LOCATED TO THE SIDE OR REAR OF THE BUILDING
6	MISSING MIDDLE HOUSING (HOUSE SCALE, UNIT MIX IS TYPICALLY 3-5 PER BUILDING UP TO 12 UNITS A BUILDING)
7	MISSING MIDDLE HOUSING (TOWNHOMES, MANSION HOMES)
11	PLAZA
12	SURFACE PARKING AREAS - INCLUDING LANDSCAPING, TREES, AND WALKS. WHENEVER POSSIBLE PARKING LOTS SHOULD BE SHARED AND CONNECT TO MUTIPLE LOTS AND BUILDINGS.
14	RESIDENTIAL ALLEY - PROVIDING ACCESS TO GARAGES, FLAG LOTS, AND ADUS.
18	HISTORIC TRAIN BUILDING - TO BE PRESERVED IF POSSIBLE. POTENTIAL USES INCLUDE MUSEUM, RESTAURANT, OFFICE, OR RETAIL.
19	COMMERCIAL BUILDING COMPATIBLE IN SCALE AND DESIGN WITH MISSING MIDDLE HOUSING. BUILDINGS SHOULD BE CLOSE TO THE STREET WITH PARKING ON THE SIDE OR REAR.
20	PARKING ENTRANCES (NOT ON ARTERIAL STREETS)
31	SINGLE FAMILY OR MISSING MIDDLE HOUSING (COMPATIBLE IN SCALE AND DESIGN WIT4 SINGLE FAMILY RESIDENTIAL)

CENTRAL NEIGHBORHOODS VISION

In central neighborhoods, changes to housing is typical of older neighborhoods: maintaining and enhancing existing homes, rebuilding those that owners deem are no longer satisfactory, and adding attached accessory dwelling units. Detached accessory dwellings and flag lots are allowed to provide more neighborhood housing options, but in keeping with the feel of a predominantly single family residential area. The 100 South corridor between 600 West and Main includes new missing middle housing and neighborhood retail, restaurants, and services.

ENVISION CENTRAL HEBER



CENTRAL NEIGHBORHOODS & MIXED USE CORRIDOR

Character
Quiet, pedestrian-friendly streets with a range of homes built across decades, supported by a neighborhood corridor that includes additional housing options and convenient neighborhood retail, restaurants, and services.

Focus
Residential, with some neighborhood retail and commercial along 100 South

Features
Pedestrian-friendly streets with bike network, neighborhood parks, a potential alley pilot project between 100 South and Center Street, history walk connecting the original train depot and the Civic Center Block, historic structures and homes enhanced

Use Mix

Neighborhoods
Residential: single family
Open Space: neighborhood parc

Accessory Uses: home-based business, attached accessory dwelling units, detached accessory dwelling units with height equal to or lower than main home height, flag lots

Neighborhood Mixed Use Corridor
Residential & Lodging: missing middle multifamily, hotel
Retail/Restaurant/Office: neighborhood retail/restaurant, neighborhood service, office (on commercial corners on 100 South)
Open Space: pocket park/plaza, neighborhood park
Parking: on-street public parking, private parking lots behind buildings

Corridor Transition Area (area between mixed use corridor and neighborhoods)
Residential: missing middle, single family
Open Space: pocket park/plaza, neighborhood park

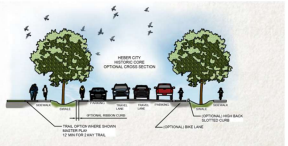
Building Height
Up to three stories

MODEL BLOCK TYPE | NEIGHBORHOOD MIXED USE CORRIDOR

0 150 300 450 feet
1" = 150'

SYMBOL	DESCRIPTION
3	LOCAL STREET WITH ON STREET DIAGONAL PARKING
6	MISSING MIDDLE HOUSING (HOUSE SCALE, UNIT MIX IS TYPICALLY 3-5 PER BUILDING UP TO 12 UNITS A BUILDING)
7	MISSING MIDDLE HOUSING (TOWNHOMES, MANSION HOMES)
8	STAND ALONE COMMERCIAL (RESTAURANT, RETAIL, OFFICE)
14	RESIDENTIAL ALLEY - PROVIDING ACCESS TO GARAGES, FLAG LOTS, AND ADUS.
19	COMMERCIAL BUILDING COMPATIBLE IN SCALE AND DESIGN WITH MISSING MIDDLE HOUSING. BUILDINGS SHOULD BE CLOSE TO THE STREET WITH PARKING ON THE SIDE OR REAR.
22	SINGLE FAMILY HOMES
27	DETACHED ACCESSORY DWELLING UNIT
28	ATTACHED ACCESSORY DWELLING UNIT
29	FLAG LOT
30	ON-STREET PARALLEL PARKING

CENTRAL NEIGHBORHOODS CONCEPTUAL STREETS CROSS SECTION



DEFINITIONS

Activated Alley: extra-wide sidewalk or shared pathway, street trees, seating/eating space

Destination Street: street with extra-wide sidewalk, street trees, seating/eating space, on-street parking

Missing Middle Housing: a range of house-scale buildings with multiple units—compatible in scale and form with detached single-family homes. Examples include town homes and mansion homes.

Pedestrian Friendly Street: street with wide sidewalk, street trees, on-street parking