



OGDEN CITY'S ENGINEERING STANDARDS FOR PUBLIC IMPROVEMENTS

2025 Edition

***Ogden City Public Services
Prepared by the Ogden City Engineering Division***



Exhibit A

***OGDEN CITY'S
ENGINEERING STANDARDS FOR PUBLIC
IMPROVEMENTS***

2025 EDITION

October 7, 2024

***ADOPTED BY THE ADMINISTRATIVE ORDER OF THE OGDEN CITY
ENGINEER***

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Introduction

This Manual sets forth the standards for the preparation and processing of improvement plans of all related public work projects to be constructed under permit through Ogden City Engineering Division, and all documents supplemental to the improvement plans required by Ogden City Engineering Division for construction of improvements under the jurisdiction of said Division.

The preparation of plans and specifications in conformity with these standards will expedite the processing, reviewing, and filing of the submitted improvement plans and plats with Ogden City and thus shorten the time necessary for plan approval through the City Engineer's Office.

Changes, Amendments, or Revisions may occur to these standards and specifications. It is the intent of Ogden City to be in the mode of constantly improving this document. On a periodic basis proposed changes, revisions or amendments will be reviewed and incorporated as necessary into this document.

Copies of APWA Manual of Standard Specifications, Manual of Standard Plans, Ogden City Standards and amendments to Specifications and Standard Plans are available for purchase, during normal working hours, from:

Ogden City Public Services Department, Engineering Division

2549 Washington Boulevard, Suite 760, Ogden, Utah

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General Instructions

i-1 References

1. The 2017 APWA Manual of Standard Specifications
2. The 2017 APWA Manual of Standard Plans
3. Utah Code Title 17, Chapter 23, Section 17: Map of boundary survey – Procedure for filing – Contents – Marking of monuments – Record of corner changes – Penalties
4. Ogden City Ordinance, Title 14 – Subdivision Regulations, Chapter 2: Plans Required.
5. Ogden City Ordinance, Title 14 – Subdivision Regulations, Chapter 3: Standards and Improvements for Subdivisions.

i-2 Instruction to Developer

This section defines the general requirements for Public improvements to be designed and constructed as public infrastructure.

A. Preliminary Subdivision Plat Approval

1. The preliminary Subdivision Plat and application shall be submitted to the City for review.
2. Initial application must include a preliminary public improvement plan.
 - a. This plan identifies how the sub-divider intends to extend water and sanitary sewer services, provide storm drainage and storm detention facilities, and extend public streets to and through the subdivision.
 - b. All or some portions of the plan may be depicted on the preliminary plat.
 - c. The plan shall:
 - 1) Identify the proposed location and size of all proposed sanitary sewers, water mains, storm sewers and storm detention basins, and their connection to existing facilities, including manholes, fire hydrants, and valves, and identifying the water pressure in existing water mains.
 - 2) Identify proposed grades and widths of streets.
 - 3) Provide sufficient information to show how proposed mains and lines will be fed by gravity.
 - 4) Identify proposed variations from the standards for public improvements adopted Title 14 Subdivision Regulations, Chapter 3: Standards and Improvements for Subdivisions.
 - 5) Identify all private streets and any or all portions of water, sanitary sewer, or storm sewer facilities within private streets, which the sub divider is requesting to be owned and maintained by the City.

B. Subdivision Plat Approval

1. The Subdivision Plat is to be reviewed by the City Engineer, Planning Manager, City Attorney, and accepted by the Mayor. The following items must be completed prior to final Subdivision Plat Approval:
 - a. Current title report is submitted.

- b. Taxes have been brought current.
- c. Improvement plans must be approved by the City (see Ogden Municipal Code 14-3-6).
 - 1) Final civil improvements plans include, but are not limited to:
 - a) Grading plan
 - b) Utility plan and profile sheets
 - c) Roadway plan and profile sheets
 - d) Erosion control (Storm Water Pollution and Prevention)
 - 2) The format, size and content must comply with standards published in the City's Engineering Standards.
- d. The improvements must include a security to guarantee completion of the public improvements, drainage improvements, and landscaping within two (2) years from Plat Approval (see Ogden Municipal Code 14-3-7).
 - 1) The amount of the security is based on the estimated quantities supplied to the City Engineer by the Developer's Engineer (see Ogden Municipal Code 14-3-7 B.1.).
 - a) The costs for the estimated quantities will be assigned by the City Engineer.
 - b) The security can be a Letter of Credit, Third Party Escrow, or Cash.
 - 2) The Developer must pay the City a fee for the review of the improvement drawings and any applicable subdivision plat as well as the subsequent construction inspection of such improvements.
 - 3) The Developer must pay the utility fees associated with the project.
- e. Plat shows surveyed subdivision boundary line including the following (see Ogden Municipal Code 14-2-6):
 - a) The location of the survey by quarter section and township and range.
 - b) The date of survey.
 - c) The scale of drawing and north point.
 - d) The distance and course of all lines traced or established, giving the basis of bearing and the distance and course to two or more section corners or quarter corners, including township and range, or to identify monuments within a recorded subdivision.
 - e) All measured bearings, angles, and distances separately indicated from those of record.
 - f) A written boundary description of property surveyed.
 - g) All monuments set and their relation to older monuments found.
 - h) A detailed description of monuments found and monuments set, indicated separately.
 - i) The surveyor's seal or stamp.
 - j) The surveyor's business name and address.
 - k) A written narrative that explains and identifies the following:
 - i. The purpose of the survey.
 - ii. The basis on which the lines were established.
 - iii. The found monuments and deed elements that controlled the established or reestablished lines.
- f. Plat reflects all existing and newly created easements within plat boundaries.
- g. Utility Companies who have existing or newly created easements within plat boundaries have

- already signed the plat.
- h. Appropriate fees have been paid.

C. Construction Requirements

1. Inspections and Civility

- a. It is the expectation of the City that all contractors and developers will be responsive to concerns and attempt to resolve problems at the most appropriate level.
- 1) If problems still arise, the matter should be referred to the lead inspector, or their designee, and:
- 2) If necessary, subsequently to the City Engineer or their designee.
- b. It is neither required nor desirable that a city employee face abusive language or behavior.
- c. Ogden City promotes mutual respect, civility, and orderly conduct among city employees, contractors, and the public.
- d. Ogden City does not intend to deprive any person of their right to ask questions. But doing so must maintain a safe, harassment-free workplace for city staff and responsible parties.
- e. In the interest of promoting positive development in Ogden, city staff encourages positive communication and will not tolerate volatile, hostile, or aggressive behavior.
- 1) Any such behavior deemed by the inspector to be volatile, hostile, or aggressive will result in:
- a) An immediate stop work order being placed on the permit and;
- b) A hold placed on the contractor receiving additional right-of-way permits until the City Engineer has addressed the situation.

2. Pre-Construction Meeting

- a. The Pre-Construction meeting is held to review the project requirements with the Developer and its Contractors.
- b. These Standards and APWA Specifications and the testing requirements applicable to the project will be reviewed at this meeting as well as any applicable security releases.

3. Permits, Fees, Escrow, and Bonding Requirements

- a. The Contractor shall contact the Engineering Division to obtain a Permit for all matters dealing with work within the Right-of-Way or with any work connecting to a City Utility.
- 1) Permits, Bonding (Surety Bond), and Insurance (Liability Insurance) are required for all work within the Right-of-Way.
- a) Adequate and up-to-date Insurance and Permit Bonding must be on file with the City prior to issuance of any permit.
- 2) The Contractor is required to obtain a permit prior to commencing any portion of the work.
- 3) The Contractor's signature must be on the application to be accepted. No Contractor shall start Work until a permit is issued AND a City Inspector has been assigned.
- b. Before a City permit is issued, a permit fee and an inspection fee shall be paid to the City.
- 1) The amount of such fees will be set by resolution of the City Council (see Ogden Municipal Code 14-1-7).

- 2) All fees must be paid at the time of the issuance of a permit or prior to recording a subdivision plat.
- c. The escrow shall be held by the City to ensure (see Ogden Municipal Code 14-3-7 and 15-13-23):
 - 1) Required improvements have been installed and completed in regard to the site plan, permit or other development.
 - 2) Construction work is completed, and As-Built drawings are submitted and approved.
 - 3) A final inspection is conducted, and the Work is found to comply with the City Standards and Specifications.
 - 4) Repairs and/or replacement of public improvements are finished and found acceptable to the City.
 - 5) Contractor complies with all requirements of the Standards and Specifications.
 - 6) Failure of the Contractor to maintain safe conditions, to restore the area to "better than or equal to" condition during the first year, or to comply with any other provision of these Construction Standards and Specifications shall entitle the City to execute on the bond and to use the proceeds to take whatever action may be necessary to bring the Work into compliance with the Improvement/Construction Plans.
 - a) The City retains the right to charge the Contractor for any additional amounts in excess of the bond which the City expends to bring the work into compliance with the Improvement/Construction Plans.
 - b) Any such additional expenses not covered by the bond must be paid to the City before the Contractor is allowed to restore its bond and do any further work in the City.

4. Construction

- a. Project improvements must be installed in accordance with the approved plans, the APWA Standard Plans, the APWA Standard Specifications, the Ogden City Specifications and Standard Plans, and any other Federal and State requirements.
- b. The City will assign an Inspector to monitor construction.
- c. The Developer is required to provide and pay for material testing during construction.
- d. Acceptance of the work is based on material test results meeting or exceeding minimum standards as defined by the APWA, AWWA, Ogden City, State of Utah, or other approved agency.
 - 1) If no testing has been provided or referred to, then the minimum standard will be per the direction of the City Engineer.
- e. The Permit Holder is responsible to contact Ogden City to setup inspections and activate the permit.
 - 1) The issued permit will not be active until it has been called in. Issuance of the permit does not activate the permit. For questions call (801) 629-8986.
- f. Upon completion of the project improvements, a final inspection will be required.
 - 1) Any punch list items must be complete within 30 days from issuance.
 - 2) If all work is accepted, then a substantial completion date is assigned.
 - a) The Substantial completion issuance begins the warranty period.
 - b) The City will retain 10% of the escrow during the warranty period.

- g. Record Documents or "As-Built" plans must be submitted to the City prior to obtaining acceptance of the work and releasing that portion of the escrow.
- h. The improvements are to be completed within two (2) years of the recordation of the subdivision plat or within the time period indicated in the security escrow document, whichever is less.
- i. Issuance of building permits may commence only after substantial completion of the development is achieved.

5. Escrow Security Releases

- a. Requests for release of the security or any portions thereof must be received in writing from the Developer (see Ogden Municipal Code 14-3-7.C.).
 - 1) The request must itemize in detail the items being requested for release.
- b. Releases will be processed at a frequency not exceeding one per month.
- c. Only items which have been inspected and authorized for release by the City Inspector will be considered for release.
- d. Record Documents or As-Built plans must be submitted to the City.
- e. 10% of the authorized released will be retained until the end of the warranty period.

6. Warranty Period

- a. The warranty period starts when the City Inspector has issued Substantial Completion for the entire scope of the project and the As-Built data has been submitted and approved by the City.
 - 1) The Bond and Insurance will be held by the City for a minimum of two (2) years after the Substantial Completion has been issued from the City (see Ogden Municipal Code 7-5-14).
- b. The improvements must remain in good condition during the two-year correction period.
 - 1) At the end of the period, a final warranty review of the project will be made.
 - 2) If the improvements have:
 - a) Been accepted, then the remaining 10% of the security will be released at the one-year mark. (But the City will hold insurance and bonding for an additional year as mentioned above). Once the second year has passed, the City will accept the project after a final inspection.
 - b) Failed during the period, the defective work must be replaced at no cost to the City to a condition as approved by the City.
 - 3) Landscaping warranty period differs from that of other improvements, in that it is for one (1) year plus one (1) continuous growing season.
- c. During the warranty period, the Developer will perform required maintenance of improvements installed and landscaping.

7. Bond Requirements

- a. Conditions: The security required by this Section shall be conditioned as follows:
 - 1) That the permittee shall fully comply with the requirements of the City ordinances and regulations, specifications and standards promulgated by the City relative to work in the public way, and respond to the City in damages for failure to conform therewith;
 - 2) That after work is commenced, the permittee shall proceed with diligence and expedition

and shall promptly complete such work and restore the public way to construction specifications, so as not to obstruct the public place or travel thereon more than is reasonably necessary.

- 3) That the permittee shall guarantee the materials and workmanship for a period of two (2) years from completion of such work, with reasonable wear and tear excepted; and
- 4) That unless authorized by the City Engineer on the permit, all paving, resurfacing or replacement of street facilities on major or collector streets shall be done in conformance with the regulations contained herein within three (3) calendar days, and within seven (7) calendar days from the time the excavation commences on all other streets, except as provided for during excavation in winter or during weather conditions which do not allow paving according to engineering regulations.

8. Road Restoration Requirements

- a. In all excavations, restoration of pavement surfaces shall be made within the time limits set forth in the permit (per Ogden Municipal Code 7-5-12).
- b. All paving, resurfacing or replacement of street facilities:
 - 1) On Arterial or Collector streets shall be done within three (3) calendar days.
 - 2) On all other streets shall be done in within seven (7) calendar days from the time the excavation commences.
- c. During excavation in winter or during weather conditions which do not allow paving according to engineering regulations a temporary patch must be provided.
- d. If work is expected to exceed the above duration, the permittee shall submit a detailed construction schedule for approval.
 - 1) The schedule will address means and methods to minimize traffic disruption and complete the construction as soon as reasonably possible.

D. Variance Request and Appeal Process for the Engineering Division

The design engineer must be present during all variance and appeal discussions, unless indicated otherwise by the City Engineer.

Variance Request Process

1. Variance Request Review Submittal.
 - a. The variance process is intended to provide a substitute to the Ogden City Engineering Standards and/or the Standards in the Ogden City Storm Water Design Manual in scenarios where:
 - 1) An unreasonable hardship is created that cannot be remedied by standard means; or
 - 2) Constraints or other site factors limit the ability to meet the minimum requirements.
 - b. Approval or denial of a variance request is at the discretion of the City Engineer.
 - 1) The decision of the City Engineer shall be the final binding interpretation of the facts which are the subject of the variance.

- c. Any variance to the Standards will require a variance request application to be submitted, reviewed, and approved.
 - 1) Variance request applications will have a 15-business day review period.
 - 2) The City Engineer may require supplementary information or documents to the proposed alternative. If further information is required, the 15-business day review period will restart.
 - 3) The City Engineer may identify additional Conditions of Approval to ensure that the intent of the Standards is met.
- d. Design variances shall be approved prior to the final approval of any engineering plans for construction.
- e. Approval of a variance does not constitute site plan, building or subdivision approval. Site plan, building or subdivision review processes must still be completed and approved prior to permit issuance or construction.
- f. The variance approval is tied to the current permit and will be subject to review upon application for any subsequent permits.

2. Criteria for a Variance.

- a. In order for a variance request to be considered, ALL of the following criteria must be met. **Any request that does not meet ALL of the following criteria will be denied.** Meeting all criteria does not guarantee approval of a variance.
 - 1) The standard would cause an unreasonable hardship for the applicant that is not necessary to carry out the intent of the Standards.
 - 2) The intent of the Standards is being met in the proposed alternative.
 - 3) There are special circumstances associated with the property that do not apply to other similar properties, with similar uses.
 - 4) The variance will not increase the burden on public infrastructure or negatively impact public or private property.
 - 5) Requirements for safety, function, fire protection, appearance and maintainability, based on sound engineering judgment, are fully met.
 - 6) Design variance does not conflict with, nor modify, any Condition of Approval for the development.
- b. An engineering variance may not be granted if the:
 - 1) Variance is intended as a temporary measure only;
 - 2) Variance deviates further from the Standards than necessary to relieve the hardship demonstrated by the applicant;
 - 3) Variance violates any ordinance, law, or regulation.
 - 4) Hardship is self-imposed or economic.
- c. The City Engineer will determine if all of the variance criteria have been met.

- 1) *The applicant shall bear the burden of proving that all of the criteria justifying a variance have been met.*

3. Revoking of Variances

- a. *An Engineering Variance may be revoked if ANY of the following occur:*
 - 1) *Permit(s) necessary to construct the variance have not been acquired within 18 months after the engineering variance application date.*
 - 2) *As determined by the City Engineer, relevant items on the improvement plans differ, or are changed, from what was reviewed/approved in the variance review.*
 - 3) *The Criteria for a Variance or Conditions of Approval, specific to that variance, are no longer being met.*
 - 4) *The property is redeveloped or has undergone a change of use.*
 - 5) *The City Engineer determines that it is in the public's best interest.*
- b. *If a variance is revoked a new variance may be applied for, but it is subject to all current Ogden City Standards and Ordinances.*

Engineering Standards Appeal Process

1. Dispute Resolution Process

- a. *Any decision made by the Engineering Division interpreting the requirements of the Federal, State, or Local ordinances may be appealed, in writing, to the Assistant City Engineer within 15 business days after the applicant is notified of the decision.*
- b. *The Assistant City Engineer shall issue a decision, in writing, and a copy shall be mailed or otherwise furnished to the applicant within 15 business days from the receipt of any such appeal. The decision of the Assistant City Engineer shall be final and conclusive unless, within 15 business days from the date of receipt of such copy, the applicant mails or otherwise furnishes to the Assistant City Engineer a written appeal to the Standing Appeals and Dispute Committee.*
 - 1) *The applicant will be given the opportunity to meet once in person with the Assistant City Engineer to discuss the appealed decision prior to the Assistant City Engineer providing a decision on the appeal.*
- c. *The Standing Appeals and Dispute Committee shall consist of a City Attorney, the Director of Public Services, and the City Engineer or their designee. The decision of said Committee shall be rendered in writing within 15 business days from receipt of the appeal and mailed or otherwise delivered to the applicant. The decision of said Committee shall be the final binding interpretation of the facts which are the subject of the appeal.*
 - 1) *The Assistant City Engineer issuing the decision appealed from shall present the case prior to deliberations of the Committee. However, the Assistant City Engineer shall be disqualified and excluded from the Committee's decision process.*

i-3 Definitions

1. *City: The City of Ogden.*
 - a. *The authorized representative of the City of Ogden dealing with matters in the City's Right-of-Way shall be the City Engineer and any other City employees as designated by the City Engineer.*
2. *Work: Any Excavation, Construction, Maintenance, Repairs, or Improvements within the Right-of-Way including any restriction of or closure of the use or access to the City's Right-of-Way.*
 - a. *The term "Work" also includes any street, curb, gutter, sidewalk, sewer line, water line or other public utility maintenance or installation.*
3. *Contractor: The term Contractor means any individual or entity that performs Work within the Right-of-Way including but not limited to: Contractors, Sub-Contractors, Developer(s), Owner(s), Owners' Agents, Utility Companies, and/or City Crews.*
4. *Right-of-Way: The City of Ogden's Public Right-of-Way and Public Utility Easements.*
 - a. *This includes but is not limited to public streets, curbs, gutters, sidewalks, easements, and other areas owned or maintained by the City of Ogden. Records of ownership are kept at the Weber County Recorder's Office.*
5. *Standards: Refers to both Engineering Standards and Storm Water Design Manual Standards.*
6. *Standard Drawings: The term means the plans which are attached at the end of these Standards and Amendments.*
7. *Estimated Quantities: The Estimated Quantities are based on improvements for the site plan, landscaping, utilities, etc. (This estimate does not include the building.)*

Chapter 1 – General Improvement Requirements

1-1 References

1. The 2017 APWA Manual of Standard Specifications
2. The 2017 APWA Manual of Standard Plans
3. Ogden City Standard Drawings
4. Utah Administrative Code R156-22. Professional Engineers and Professional Land Surveyors Act Rule.
5. Utah Administrative Code R156-3a. Architect Licensing Act Rule.

1-2 Scope of Work

1. *This section defines the general requirements for Commercial, Residential, and/or any other Public Improvements to be designed and constructed as public infrastructure.*
 - a. *The improvements shall include:*
 - 1) Public Utilities (e.g. sanitary sewer, culinary water, storm sewer, irrigation, etc.)
 - 2) Grading and Drainage
 - 3) Erosion control (Storm Water Pollution and Prevention)
 - 4) Traffic signing and traffic control
 - 5) Street improvements adjacent to and in front of all lots
 - a) *Such improvements shall be along all dedicated streets, alleys or other easements which connect existing improvements to the boundary of the development.*
 - b. *Layout must provide for future extension beyond proposed development*
 - 1) *The layout must be compatible with the contours of the ground for proper drainage and for servicing future development.*
 - 2) *All utility lines and street improvements shall be installed to the boundary lines of the development.*
2. *When development occurs beyond the reach of available utilities or undeveloped streets, it shall be the responsibility of the developer to improve the infrastructure within the City Right-of-Way.*
 - a. *Required improvements shall be as required by the City Engineer. Typical improvements can include:*
 - 1) *Streets of sufficient size to accommodate all the current and potential properties serviced by the roadway.*
 - a) *At no time shall the street width be less than the minimum street standard for public or private roads (see Ogden Municipal Code 14-3-2).*
 - b) *Any reductions to the minimum width of minor streets shall not result in a violation of the fire code.*
 - 2) *Extend any and all required utilities or street improvements to service the Developer's property.*
 - 3) *Provide utilities of sufficient capacity to accommodate all the current and potential property serviced by the utilities.*
 - b. *The developer is encouraged to work with adjacent property owners that may benefit from said*

utility or roadway improvements for the purpose of mutual participation.

- 1) *The developer is responsible for all upfront costs associated with the design, acquisition, and construction of the improvements.*
3. *If existing infrastructure fails to meet current standards, or has deteriorated, the applicant shall be responsible for improving all relevant components to comply with current regulations and standards.*
 - a. *It shall be the applicant's responsibility to prove the condition of underground infrastructure evidenced through, among other methods, camera footage, physical inspection, pressure tests, and flow tests.*
 - b. *Evidence must be provided to Ogden City for Review.*
4. *All necessary Right-of-Way or easements necessary for development shall be acquired by the developer and dedicated to Ogden City.*
 - a. *The acquisitions shall be at no cost to the City except as covered in other applicable City Ordinances.*
5. *Professional Engineers, Surveyors and Architects should review the State of Utah Code R156-22-502 and R156-3a-502 Unprofessional Conduct prior to submittal of plans, drawings, etc. Any Unprofessional Conduct will be reported to the state licensing board.*
6. *Any plan, map, sketch, survey, drawing, document, plat, specification, and/or report shall bear the seal of a Professional Engineer and/or Surveyor when filed with Ogden City.*
 - 1) *The signature of the individual named on the seal and the date shall appear across the face of each original seal.*
 - b. *The seal of the responsible party is a State requirement and applies to all documents filed with Ogden City including but not limited to filings related to:*
 - 1) *Site plans*
 - 2) *Preliminary and final plats*
 - 3) *Improvements plans*
 - 4) *Right of Way Improvement Plans*
 - 5) *Traffic Control Plans*
 - 6) *Storm Water Pollution Prevention Plans (see Ogden Municipal Ordinance 9-7 B-4, B.)*
 - 7) *Specifications*
 - 8) *Reports*
 - 9) *Buildings or Structures*

A. Improvement Plan Submittal Requirements

1. *Copy of Preliminary Plat and Title Report*
2. *Three (3) sets of the complete improvement plans and final plat or digital submittal as required*

3. Drainage calculations
4. Engineer's estimates of construction costs
5. Survey Notes
6. Escrow Agreement
7. Easement Agreement(s)
8. Master Plan layout (if development is to be constructed in phases)
9. Soils report and boring logs
10. Associated Studies (Geological, Flood Plain, or other hazard studies)
11. Other information or documents as deemed necessary by the City Engineer depending on the project

B. Subdivision Plats (Contents)

1. The following instructions are for the purpose of standardizing the preparation of plat drawings to obtain uniformity in appearance, clarity, size, and style.
 - a. Compliance with Ogden Municipal Code 14-2-6 shall govern should any disparities between these standards and the City Ordinance.
2. All plats shall:
 - a. Be clear and legible.
 - b. Conform to accepted engineering and drafting practice.
 - 1) Size of plat sheets shall be 24-inch x 36-inch with 1½ inch border on the left side and ½ inch on the remaining three (3) sides
 - 2) Final Plats shall have one copy Plotted on Mylar sheets (4 mil)
 - 3) Additionally, an electronic submission **shall** be required as well as the plotted drawing. Submit a pdf and CAD of all the documents contained in the Subdivision submittal.
 - c. The title (subdivision name) of the plat shall appear across the top of the page along with Section, Township and Range information.
 - d. The boundary of the platted land shall be shown with bearings and distances.
 - 1) The basis of the Point of Beginning shall be shown and tied to two (2) Weber County or Ogden City Monuments using NAD 83 Utah State Plane North Zone.
 - e. The plat shall include a narrative describing the intended purpose of the plat and for whom it is being prepared, along with any other pertinent information.
 - f. The plat shall include certifications of the City Engineer, City Attorney, Planning Manager, and Acceptance by the Ogden City Mayor.
 - a. Additional certifications may be required upon request.

- g. A block for Weber County recording information shall appear in the bottom right hand corner of the plat sheet.
- h. Include with the Surveyor's Certification:
 - 1) Written legal description
 - 2) Dedications
 - 3) Existing easements
 - 4) Addresses and acknowledgement
 - 5) The plat shall conform to applicable State Statutes for plat preparation
- i. All owners of record shall be required to sign the plat, and an appropriate notary acknowledgement, for an individual, corporation or partnership shall be included.
 - 1) Addresses shall be included on the final plat. These may be incorporated either by table or directly indicated on the specific lot.

C. Construction Drawings

- 1. Complete and detailed construction plans and drawings of all proposed improvements shall be submitted to the City Engineering Division for review and approval prior to issuance of a permit.
 - a. Construction drawings submitted for Engineering review must be drafted using a Computer Aided Drafting program.
- 2. Construction drawings shall be accompanied by other development plans showing the following information:
 - a. Grading plan
 - b. Erosion, Sedimentation and Pollution Control Plan prepared in accordance with the requirements of the Municipal Code 9-7. Erosion control measures may be shown on the Grading Plan, if desired.
 - c. Location and size of all proposed utility improvements, and all proposed easements,
 - d. Profiles of all storm drainage pipes and slope of receiving channels. Hydraulic grade line is to be shown on all pipes (except roof drains) for the required design flow. On storm drainage profiles a pipe chart will be shown which will include
 - e. Pipe numbers, pipe size, pipe material, pipe slope, pipe length, contributing drainage area, design flow, design storm frequency, runoff coefficient and velocity. On all pipes, the hydraulic grade line shall be shown. Profiles of all open channels and ditches including the design flow normal depth and velocity. On storm drainage profiles an open channel chart will be shown which will include open channel numbers, conveyance size, lining material, length, channel slope, contributing drainage area, design flow, design storm frequency, runoff coefficient and velocity for the required design flow.
 - f. Acreage of drainage areas and Hydrological study used in determining size of structures, including map of all contributing drainage basins and acreages.
 - g. Sanitary Sewer Plans, including the profiles and other information as may be required by the Engineering Division.
 - h. Street widening and construction data prepared in accordance with the requirements of this standard.
 - i. Centerline profiles and typical roadway sections of all proposed streets, as well as plans and profiles for all proposed thoroughfares. Profiles (and plans, where required) shall be drawn on

- standard plan and profile sheet with plan section showing street layout, pavement and right-of-way width, curvature, and required drainage facilities. Typical roadway sections shall be provided for street widenings.
- j. Profiles covering roadways that are extensions of existing roadways shall include; elevations at 50 foot intervals for such distance as may be adequate to provide continuity consistent with the standards required for street improvements, but no less than 200 feet.
 - k. All elevations shall be per the requirements of the City Surveyor.
 - l. Specimen Tree Concept Plan. If specimen trees are located on the property a Specimen Tree Concept Plan is required to be submitted prior to the Site Development Plans.
 - m. Floodplain Management Plans; if any floodplain areas are located on the property.
 - n. Water System Plans prepared in accordance with the requirements of the Water Main and Sanitary Sewer Design and Construction Standards and Specifications.
 - o. Water Main Extension plans, if any, are to be designed in accordance with the current Water Main Specifications.
 - p. Private Water System Plans, if any, indicating proposed devices, water main size and location, with fire hydrants, on the site. The distance and direction to all other fire hydrants within 500 feet of the site or buildings along existing streets or other access drives shall also be indicated.
 - q. Street striping plan, showing striping in accordance with the Manual on Uniform Traffic Control Devices, for any street newly constructed to four or more lanes, and all newly constructed or widened major thoroughfares.
3. Prior to receiving final plat approval for a subdivision, completed construction drawings must be approved by Ogden City.
4. The plans, containing the appropriate approval signatures and the current adopted specifications, shall be the only valid documents from which the contractor shall construct the permitted improvements.
- a. Additionally, an electronic submission shall be required as well as the plotted drawing. Submit a pdf and CAD of all the documents contained in the Construction Documents.
 - b. Any changes to the original accepted plans must be approved by Ogden City.
5. The contractor shall have available, at all times, at the construction site a copy of the approved plans and permit. These items shall be made available to the City's representative upon request.

D. Requirements for Electronic Deliverables

- 1. Prior to probationary acceptance, As-Built drawings in electronic format shall be submitted to the Ogden City Engineering Division and shall meet the requirements set forth in Ogden Municipal code 7-6-2.
 - a. The As-Built drawings must be acceptable to the Engineering Division.
- 2. The electronic drawings shall be a PDF and either a Computer Aided Drafting (CAD) or Geographic Information Systems (GIS) file format.
 - a. AutoCAD deliverables:

- 1) The deliverables for CAD submittals are AutoCAD drawing files and Microsoft Excel files.
- b. Geographic Information Systems (GIS) deliverables:
 - 1) The deliverables for GIS submittals will be ArcInfo export files or ArcView shapefiles with applicable geodatabases and referencing information.
3. All CAD and GIS files shall be registered to the North American Datum 83 (NAD 83) Utah State Plane North Zone coordinate system (grid) with ties to two public monuments.
 - a. Information on monuments is available through the Ogden City Surveyor or Weber County Surveyor.
 - b. File Content and Layering
 - 1) Referenced existing utilities need not conform to this standard regarding attribute definition but shall be drawn on appropriate layers (gas, electric, etc.)
 - c. Geometry
 - 1) All files shall be constructed in a format which is geometrically correct.
 - a) This means all lines which intersect are snapped together at a common point (no overlapping lines or short shots).
 - 2) Street centerlines shall be segmented to be a continuous polyline from intersection centerline to intersection centerline.
 - a) When a median exists, a centerline of each side of the divided roadway shall be surveyed.
 - 3) Structures (bridges, box culverts, and arch culverts) shall be surveyed at the four corners of the structure.
 - a) The structure shall be drawn to form an enclosed polygon. There shall be a separate polygon for each structure.
 - b) Bridges shall also be surveyed at the top of the bridge abutments on the four corners.
 - 4) Storm and sanitary sewer pipes shall be drawn in the direction of flow and shall be a continuous polyline from structure to structure and snapped together at the centerline of the structure.
 - 5) Water lines shall be segmented to be a continuous polyline from pipe intersection to pipe intersection or at a change in pipe size.
 - a) Water lines shall be drawn without curves. A series of lines shall be used to represent smooth curves, and all bends must be called out.
 - b) Joints, valves, and hydrants shall be identified along the waterline alignment.
 - 6) The edge of pavement, curb and gutter, sidewalks, and street centerlines shall be three dimensional polylines representing their actual horizontal and vertical location.
 - 7) Where text is being used for a polygon feature, the text justification point shall be placed within the boundary of the polygon or an arrow shall be used to identify the polygon.
 - d. Attributes
 - 2) Attributes for the As-Built survey entities are to be compiled using either AutoCAD or Arc GIS and Microsoft Excel.

E. Engineer's Seal Requirements

1. State law requires an Engineer, Surveyor, and/or Architect's seal shall be applied to all documents filed with the Ogden City Engineering Division.
 - a. Professional Seals must be in accordance with Utah Administrative Code R156-22-601.
 - b. Each original set of final plans, specifications, reports, maps, sketches, surveys, drawings, documents, and plats, as a minimum, shall have the original seal imprint, original signature and date placed on the cover or title sheet.
 - c. Professional Engineers, Surveyors and Architects should review the State of Utah Code R156-22-502 and R156-3a-502 Unprofessional Conduct prior to submittal of plans, drawings, etc.
 - 1) Any Unprofessional Conduct will be reported to the state licensing board.

F. Standards of Construction Drawings

The following instructions are for the purpose of standardizing the preparation of drawings to obtain uniformity in appearance, clarity, size and style. These plans and designs shall meet the standards defined in the specifications and drawings herein outlined.

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 practice. The drawings and prints must be completed using a Computer Aided Drafting program.
2. Size of drawings sheet shall be 22 inch x 34 inch with 1½ inch border on left side and ½ inch on the remaining three (3) sides.
 - a. An 11x17 should be produced for inspection review purposes.
 - b. An electronic copy of the drawings shall be submitted along with the final mylar being appropriately stamped & signed.
 - c. As-Built drawings shall be plotted on Mylar sheets (4 mil) or have a CAD file submitted for record keeping with all associate plan layout and review data required to recreate the same plans provided to the City.
3. In general, the following shall be included on all drawings unless otherwise directed by the Engineering Division:
 - a. North arrow (plan)
 - b. Scale:
 - 1) 1" = 40' horizontal (maximum)
 - 2) 1" = 4' vertical (maximum)
 - 3) Scale of each Detail
 - 4) Other appropriate scales as approved by the City Engineer
 - c. Elevations referenced to NAVD 88. (North America Vertical Datum 1988)
 - 1) No assumed elevations will be acceptable without an equation to tie the assumed elevations back to actual elevations.
 - a) Assumed elevations must be approved by the City Surveyor prior to use.
 - d. Stationing and elevations for profiles

- e. Location map
 - f. Index map
 - g. General and Construction notes
 - h. Title block, located in lower right corner of sheet to include:
 - 1) Name of City
 - 2) Project title (subdivision, site plan, etc.)
 - 3) Specific type and location of work
 - 4) Signature block for approval signature of City Engineer and date
 - 5) Name, address, phone, etc. of engineer or firm preparing drawings with license number, stamp and signature
 - a) Plans stamped, signed, and dated by Registered Professional Engineer, Architect, Landscape Architect, or Surveyor as applicable
 - i. Record drawings or "As-Built" drawings are required on all projects and infrastructure installations or modifications.
4. Curb and gutter, drains, drainage structures, sidewalks, and street surfacing drawings shall show:
- a. Profile views shall:
 - 1) Be shown for top back of curb and centerline.
 - a) Profiles of both top back of curbs and centerline are required only where approved deviations from standard cross sections are proposed.
 - 2) Show the edge of pavement when no curb is proposed.
 - 3) Label both right-of-way lines and profile of centerline accordingly.
 - b. All existing utilities within and adjacent to the area proposed for construction.
 - 1) Plan must include existing elevations obtained from field survey/pothole when potential conflicts, cover, or clearance requirements exist.
 - c. The stationing, top back of curb elevations, centerline elevations, and curve data.
 - d. The flow direction and type of cross drainage structures at intersections with adequate flow line elevations.
 - e. The typical cross section for all street sizes and variations
 - f. Include important details at 1" = 10' or other appropriate scale to adequately provide required information.
 - g. Show 100' minimum radius of existing infrastructure when connection to existing improvements.
 - 1) Show 300' minimum of future plan and profile design when roadway is to be extended (must also include 300' of existing profile along future Right-of-Way lines)
 - h. Include the benchmark location and elevation (use NAD 83 Utah State Plane North Zone and NAVD 88)
 - i. FEMA Floodplain and Floodway information.
 - j. Include General and Construction notes.
 - k. Include a Soil Boring Log along centerline of a new road as required by City Engineer.
5. Sewer drawings shall show:
- a. Minimum scale: 1" = 40' horizontal, 1" = 4' vertical
 - b. Location, size and slope of mains.

- c. Type of mainline pipe material.
 - d. Stationing of manhole center lines, lateral connections and crossings.
 - e. Plan and Profile, bearings and lengths of segments when not parallel with centerline of road or easement.
 - f. Manhole size, location and flow line elevation, lid elevations.
 - g. Profile crossings of all other existing or proposed utilities with invert elevation with type and size of utility.
 - h. All existing utilities within and adjacent to area proposed for construction. Must include actual existing elevations obtained from field survey/pothole where potential conflicts, cover, or clearance requirements exists.
 - i. Details at 1" = 10' or other appropriate scale to adequately provide required information
 - j. Benchmark location and elevation (use NAD 83 Utah State Plane North Zone and NAVD 88).
 - k. An overall development plan view of the sewer (Horizontal scale 1" = 200').
6. Culinary Water drawings shall show:
- a. Minimum scale: 1" = 40' horizontal, 1" = 4' vertical
 - b. Location and size of water mains, valves, hydrants, appurtenances, etc.
 - c. Type of pipe material, hydrants, valves, appurtenances.
 - d. Stationing of valves, hydrants, lateral connections, hydrants, crossings, and any other appurtenances or necessary for design.
 - e. Profile of new proposed water main
 - f. Bearings and lengths of segments when not parallel with centerline of road or easement.
 - g. Profile crossings of all other existing or proposed utilities with invert elevation with type and size of utility.
 - h. Details at 1" = 10' or other appropriate scale to adequately provide required information.
 - i. Benchmark location and elevation (use NAD 83 Utah State Plane North Zone and NAVD 88).
 - j. When development occurs across pressure zones include PRV stations into improvement designs.
 - k. All existing utilities within and adjacent to area proposed for construction.
 - 1) Must include actual existing elevations obtained from field survey/pothole where potential conflicts, cover, or clearance requirements exists.
 - l. General and Construction notes.
 - m. Current pressure readings and fire flow test results from adjacent fire hydrant(s).
 - n. Calculated pressure(s) and fire flow(s) at proposed and existing fire hydrant(s).
 - o. An overall development plan view of the water (Horizontal scale 1" = 200').
7. Storm Sewer drawings shall show:
- a. Minimum scale: 1" = 40' horizontal, 1" = 4' vertical
 - b. Location, size and slope of mains and lateral connections.
 - c. Location, size and details of inlets, junction boxes, etc.
 - d. Stationing of manhole center lines, inlet structures, control structures, lateral connections, and crossings.
 - e. Manhole size, location and flow line elevation, lid elevations.
 - f. Flow rate (10 year storm for main lines), HGL and velocity (all indicated in profile for each pipe)

- section).
- g. Type of mainline pipe material.
 - h. Profile crossings of all other existing or proposed utilities with invert elevation with type and size of utility.
 - i. All existing utilities within and adjacent to area proposed for construction.
 - 1) Must include actual existing elevations obtained from field survey/pot hole where potential conflicts cover or clearance requirements exists.
 - j. Details at 1" = 10' or other appropriate scale to adequately provide required information.
 - k. Benchmark location and elevation (use NAD 83 Utah State Plane North Zone and NAVD 88).
 - l. General and Construction notes.
 - m. On one sheet show proposed storm drain system, including sub-drain areas, inlets and other structures.
 - n. An overall development plan view of the storm sewer (Horizontal scale 1" = 200').
8. Drainage and Grading Plans:
- a. Minimum scale: 1" = 40' horizontal
 - b. Plans showing site general layout and drainage patterns with spot elevations of final grades.
 - c. Existing and proposed contours at one foot intervals, five foot intervals for steep terrain.
 - d. Details at 1" = 10' or other appropriate scale to adequately provide required information
 - e. All existing utilities within and adjacent to area proposed for grading.
 - 1) Must include actual existing elevations obtained from field survey/pothole where potential conflicts cover or clearance requirements exists.
 - f. Detention facility details as well as inlets, outlets and piping facilities.
 - 1) Or Retention facility as applicable.
 - 2) Calculations to substantiate design.
 - g. General, Grading and Construction notes.
 - h. Proposed Pad elevation(s) for each lot or building location.
 - i. Swales or other drainage conveyance devices to allow for multi-lot or cross lot drainage.
 - j. Drainage arrows showing general direction and slope of drainage routes.
 - k. Standard Industry Code Designation (SIC) for commercial and industrial sites listed on the plan.
9. Storm Water Pollution Prevention Plan (Erosion Control Plans):
- a. Minimum scale: 1" = 40' horizontal
 - b. Plans showing site general layout and drainage patterns and outlets for water exiting construction site.
 - c. Details at 1" = 10' or other appropriate scale to adequately provide required information. These may include, but are not limited to, check dams, berms, de-silting fences, sand bag and/or hay bale details and other BMPs as may be applicable.
 - d. De-silting basin details as well as inlets, outlets and piping facilities.
 - e. Calculations to substantiate design (include in submittal but not required to be shown on plans).
 - f. Erosion Control Construction notes.
 - g. Plan shall include an emergency phone number and name of the Developer's responsible

- person who will be available 24 hours a day should an emergency situation arise.
- h. Construction Entrance/Exit Stabilization details.
 - i. Storm Drain Inlet Protection.
 - j. Dust Control measures.
 - k. Show all BMP's being used on the general layout.
 - l. Indicate construction and BMP sequencing for project on plan.
10. Traffic Signing and Traffic Control Plans.
- a. All traffic signing and traffic control plans shall be designed and installed according to current (MUTCD) the Manual on Uniform Traffic Control Devices.
 - b. All traffic signing and traffic control plans shall be submitted to Ogden City Traffic Engineer for review and approval prior to field installation.
11. Each set of plans, as identified above, shall be accompanied by a separate sheet of details for structures which are to be constructed.
- a. All structures shall be designed in accordance with the requirements established by Ogden City Engineering Standards.

Chapter 2 – Roadway Design

2-1 References

1. Ogden City Standard Drawings: RD-1 Standard Roadway Section, RD-2 Cul-De-Sac, RD-3 Asphalt Patch, RD-4 Type A Curb and Gutter, RD-5 Sidewalk Detail, RD-6 Waterway Transition Structure, RD-7 Driveway Approach, RD-8 Utility Potholing, RD-9 Standard Local Street Sign, RD-10 Parkway Drain, RD-11 & RD-12 Decorative Street Light, RD-13 Hardscape Tree Planter Box, SUR-1 Monument Cap & Base, SUR-2 Survey Monument Placement Under Asphalt, SUR-3 Frame and Cover for Monument.
2. APWA Section 03 11 00: Concrete Forming
3. APWA Section 03 20 00: Concrete Reinforcing
4. APWA Section 03 30 04: Concrete
5. APWA Section 03 30 05: Concrete Testing
6. APWA Section 03 30 10: Concrete Placement
7. APWA Section 03 35 00: Concrete Finishing
8. APWA Section 03 39 00: Concrete Curing
9. APWA Section 26 56 19: Roadway Lighting
10. APWA Section 31 05 13: Common Fill
11. Ogden City Amendments to APWA Section 31 05 13: Common Fill
 1. Part 2 Products; 2.5 Native, Addition of paragraph B; 2.8 Gravel, addition of Table 3 to paragraph A.
12. APWA Section 31 05 19: Geotextiles
13. APWA Section 31 05 21: Geogrids and Geocomposites
14. APWA Section 31 23 16: Excavation
15. APWA Section 31 23 26: Compaction
16. APWA Section 31 25 00: Erosion and Sedimentation Control
17. APWA Section 32 01 05: Information, Regulatory, and Warning Signs
18. APWA Section 32 01 06: Street Name Signs
19. APWA Section 32 01 07: Relocate Post Mounted Signs and Mail Boxes
20. APWA Section 32 01 10: Relocate Fences and Gates
21. APWA Section 32 01 13.64: Chip Seal
22. Ogden City Amendments to APWA Section 32 01 13.64: Chip Seal
 1. Part 2 Products; 2.6 Cover Aggregate, A. Gradation, Addition of subparagraph 1.
23. APWA Section 32 01 17: Sealing Cracks in Bituminous Paving
24. APWA Section 32 01 19: Patching Rigid Paving
25. APWA Section 32 01 91: Tree Root Cutting
26. APWA Section 32 05 10: Backfilling Roadways
27. APWA Section 32 11 23: Aggregate Base Courses

28. APWA Section 32 12 13.13: *Tack Coat*
29. APWA Section 32 12 16.13: *Plant-Mix Bituminous Paving*
30. *Ogden City Amendments to APWA Section 32 12 16.13: Plant-Mix Bituminous Paving*
 1. *Part 1 General, 1.5 Weather, A. Temperature; Amend subparagraph 1.*
 2. *Part 3 Execution, 3.7 Pavement Placement, A. General, Amend Table 3 – Minimum Pavement Temperature in Degrees F.)*
31. APWA Section 32 12 16.19: *Cold-Mix Bituminous Paving*
32. *Ogden City Amendments to APWA Section 32 12 16.19: Cold-Mix Bituminous Paving*
 1. *Part 1 General, 1.4 Weather, Addition of paragraph A.*
33. APWA Section 32 13 73: *Concrete Paving Joint Sealants*
34. APWA Section 32 16 13: *Driveway, Sidewalk, Curb, Gutter*
35. *Ogden City Amendments to APWA Section 32 16 13: Driveway, Sidewalk, Curb, Gutter*
 1. *Part 3 Execution, 3.4 Contraction Joints, A. Curb, Gutter, Waterway; Amend subparagraph 1.; 3.5 Expansion Joints, A. Curb, Gutter, Waterway; Addition of subparagraph 4.*
36. APWA Section 32 16 14: *Curb Cut Assembly*
37. APWA Section 32 17 23: *Pavement Markings*
38. APWA Section 33 05 20: *Backfilling Trenches*
39. APWA Section 33 05 25: *Pavement Restoration*
40. *Ogden City Amendments to APWA Section 33 05 25: Pavement Restoration*
 1. *Part 1 General, 1.4 Weather, A. Bituminous Pavement Restoration (Remove paragraph and replace).*
41. *The Current Edition of the MUTCD (Manual on Uniform Traffic Control Devices) with Revisions as approved by the State of Utah.*
42. *Occupational Safety & Health Administration (OSHA) Standards – 29 CFR, Part Number 1910 and 1926 or comparable OSHA-approved state plan requirements.*
43. *Six-State ESR, Electric Service Requirements Manual – Service and Metering Requirements for Residential, Commercial, Agricultural and Industrial Customers, January 2011. Produced by Pacific Corp and Rocky Mountain Power.*
44. *State of Utah Code Section 41-6a-1401. Standing or parking vehicles – restrictions and exceptions.*

2-2 Roadway Design Standards

1. A traffic control plan shall be submitted to and approved by the Ogden City Traffic Engineer prior to any work in the Right-of-Way.
2. All proposed streets, whether public or private, shall conform to the City Street Cross Section Standards as adopted by the City (see Ogden Municipal Code 14-3-2 for subdivisions and new street dedications).
3. All cut and fill slopes shall not exceed a maximum 3:1 unless otherwise justified by a detailed soils investigation and analysis.
 - a. Cut/Fill slopes within the public right of way exceeding the guidelines as established by the AASHTO Roadside Design Guide shall undergo a review with recommendations to address clear zone recovery conflicts.
4. Any work being completed in the Right-of-Way must be permitted by Ogden City. It will be the responsibility of the Contractor to obtain the necessary permits through Ogden City prior to any work being completed.
 - a. Once a permit has been obtained, the permit will not be active until it has been called and scheduled with Engineering.

A. Right-of-Way Width

1. The width of any Right-of-Way is under the direction of the City Engineer.
 - a. The width will be based on different factors including but not limited to:
 - 1) Current traffic volume
 - 2) Future development plans
 - 3) As indicated on the current Transportation Master Plan
 - 4) Horizontal and/or vertical curves
 - 5) Locations and requirements for utilities
 - 6) Adjacent zoning/density
 - 7) If the street is adjacent to community facilities such as schools, recreation centers, or libraries.
2. Arterial streets shall refer to current UDOT standards.
3. Collector streets shall have a minimum Right-of-Way width of 72 feet.
4. Local streets:
 - a. Shall have a minimum Right-of-Way width of 60 feet.
 - b. Local terminal streets shall refer to the fire code in relation to street length and turn around.
5. Alternate cross sections may be required under the direction of the City Engineer but must be approved by the Mayor (see Ogden Municipal Code 14-3-2 B. 3).

B. Pavement Design Criteria

1. *Roadway structural section investigation must include a soils investigation. This investigation shall be submitted to the City which includes but is not limited to:*
 - a. *Soil borings along the roadway centerline every 500 feet, intersections of roadways, and other areas as required by the Geotechnical Engineer or the City.*
 - b. *Analysis on the overall bearing capacity of the soil.*
 - c. *Recommendation for structural fill through street cross sections.*
 - d. *Recommendation as to the requirements for land drains to adequately collect groundwater which could adversely affect development.*
 - e. *Requirements to aid the contractor how to obtain 95% compaction within the City Right-of-Way.*
 - f. *Provide the amount of traffic volume, accurate vehicle classifications, and forecast of future loadings.*
2. *The roadway structural sections shall be designed by the Developer's Geotechnical Engineer and approved by the Ogden City Engineer.*
 - a. *Minimum Pavement Thickness shall be three inches (3") of asphalt and eight inches (8") of base course.*
3. *Maximum recycled asphalt content cannot exceed 15%.*
4. *Road paving will follow APWA specification 32 12 05 (Bituminous Concrete) Superpave Mix Design, SP-1/2, PG 58-28 Class II on single family residential roadways. Class III HMA will be required on all City Collectors or Arterial roadways.*

C. Vertical Alignment

1. *The Vertical Alignment shall be such as to minimize grade breaks along the centerline and curb lines.*
 - a. *Allowable grade breaks shall not exceed 1% for local streets and 0.5% for collectors and arterials.*
 1. *Crest curves and sag curves must refer to the current edition of the Geometric Design of Highways and Streets from AASHTO.*
 - b. *Eliminate grade breaks in excess of the above criteria by means of a vertical curve of a seventy feet (70') minimum in length for local streets and three hundred (300') feet for collectors and arterials.*
 - c. *All vertical curve lengths shall be dependent upon three factors:*
 1. *Design speed*
 2. *Algebraic differences in grades*
 3. *Design constant*

D. Curved Alignments

1. Horizontal Curve Alignment shall be based on the design speed of the roadway based on to the current edition of the Geometric Design of Highways and Streets from AASHTO.
 - a. Curve data is required for all centerline and curb line curves and for all curb returns within intersections.
 - b. Compound Curves, Broken Back Curves and Spiral Curves are not allowed on any roads within Ogden City.
 - c. Minimum required tangent between curves shall be twice the Right-of-Way width or 67% of the curve length tangent, whichever is greater. This is required along the centerline of all public roads.
 - d. Minimum centerline radius for major and collector roads shall be as per the design speed but in no case shall be less than a 200-foot (200') radius.
 - e. Local streets (minimum right of way 60 feet cross section design) shall be designed with a minimum centerline radius of 100 feet (100').
 - 1) These requirements may be waived by the City Engineer to provide a means for traffic calming. No angle points shall be allowed along centerlines except as allowed within intersections.
 - 2) No parking shall be allowed within any centerline radius layout.

E. Street Slopes

1. Street Grades
 - a. Street grades shall not exceed the following percentages:
 - 1) Arterial streets: eight percent (8%)
 - 2) Collector and Local streets: 10 percent (10%)
 - 3) Any grade which does not meet the above standards must be approved by the City Engineer and the Fire Marshal.
 - b. Minimum street grades shall be 0.5 percent (0.5%).

F. Intersections

1. The intersection of two streets shall have an angle of 90°.
 - a. Intersecting street angles may vary between 85 and 95 degrees with approval from the City Engineer.
 - b. The intersection of more than two streets at one point shall not be allowed.
2. Curb Return of Radius:
The radius is measured at the lip of gutter.
 - a. 20 feet (20') for intersections of local to local.
 - b. 30 feet (30') for intersections local to collector, local to arterial, collector to collector or collector to arterial streets.
 - c. Refer to UDOT standards for intersections of arterial to arterial streets.
3. If possible, the horizontal alignment should be straight through the intersections, but where horizontal curves cannot be avoided, the following should be observed:

- a. Use a curve of sufficient radius to provide adequate sight distance and minimize the need for super elevation.
 - 1) Under no condition should the curve radius be less than that required for the street classification.
 - b. Do not begin or end a curve within an intersection.
 - c. Angle points up to five (5°) degrees are permissible at the intersection of two local streets with approval from the City Engineer.
 - 1) Maximum allowable slope for the following speeds is as follows:
 - a) 25-35 mph – five percent (5%)
 - b) 35-45 mph – four percent (4%)
4. Jogs between intersecting centerlines of streets shall be a:
 - a. Minimum of 300 feet (300') for any street classification intersection.
 5. Street grades near intersections shall be designed for adequate stopping and starting.
 - a. Grades on both sides of the intersection must be adjusted to match the current traffic speeds.
 - 1) The maximum difference in curb elevations shall not exceed one foot (1') and must have the approval of the City Engineer.

G. Landings

1. The landing is defined as that portion of the side street beyond the curb projection of the through street. A maximum landing grade of 3% will be used in all conditions with the exception of hillsides, where 5% may be utilized with approval from the City Engineer.
2. The required minimum lengths of the landings are as follows but the landing distance should be designed using the roadway design speed:
 - a. Arterial 200 feet
 - b. Collector 100 feet
 - c. Local 50 feet
 - d. Cul-de-sac 50 feet
3. Sag vertical curves shall include calculations for minimum breaking distance.
4. Crest vertical curves shall also account for signs/paint and minimum landing distances.

H. Turn Around Areas/Cul-de-sac

1. Temporary turnarounds shall be required on all streets which are intended to be extended in the future and which exceed three hundred lineal feet (300') from the centerline intersections of the closest intersecting street.
 - a. The development shall provide additional Right-of-Way or any easements necessary to construct and maintain the required temporary turnaround area.
 - b. If a temporary turnaround is not extended within one year from the final inspection, then it must be asphalted by the developer.

2. Cul-de-sacs and dead ends or streets which are temporarily terminated shall be limited in length as determined by the Fire Marshall.
 - a. Such streets must be terminated by a turnaround of a minimum radius of 50 feet 6 inches (50'-6") at the property line.
 - b. If surface water drains into the turnaround due to the grade of the street, necessary catch basins, drainage systems, and easements shall be provided.
3. Where a street dead-ends against property which is not part of a subsequent development phase, a turn around with a permanent easement of Right-of-Way (from the adjacent property owner) shall be installed.
 - a. Additional Right-of-Way may be required to sustain future development.

I. Street Layout in New Subdivisions

1. The arrangement of streets shall make provisions for the continuation of the existing streets in adjoining areas.
 - a. Local streets shall approach arterial or collector streets at an angle of less than five degrees (5°). (See Ogden City Municipal Code 14-3-1)
2. Arterial, Collector, and Local streets shall conform to the width designated on Standard Drawing RD-1 Standard Roadway Section.
 - a. Private roadways must also conform to these standards.
 - b. All travel lanes should be approved by the City Engineer and in no instance shall the travel lane be smaller than:
 - a. 10 feet on local roads.
 - b. 11 feet on collector roads

J. Roadway Drainage

1. Roads must convey drainage for a 100-year flood discharge within the street Right-of-Way.
2. Downhill cul-de-sacs and dead ends shall not be allowed unless specifically approved by the City Engineer.
3. Downhill "T" intersections will need to have additional requirements to ensure all flooding will be contained within the Right-of-Way.
 - a. These requirements will be on a case-by-case basis as determined by the City Engineer.
4. The drainage contained in the roadway shall be to the standards listed in the table below.
 - a. The depth of flow shall not exceed the existing curb height.

Suggested Minimum Design Frequency and Spread			
Road Classification		Design Frequency	Design Spread
Collector	<45 mph	25-year	1/2 Driving Lane
	>45 mph	25-year	Shoulder
	Sag Point	25-year	1/2 Driving Lane
Local Streets	Low ADT	25-year	1/2 Driving Lane
	High ADT	25-year	1/2 Driving Lane
	Sag Point	25-year	1/2 Driving Lane

*Arterial roadway drainage design requires approval from the City Engineer

K. Asphalt Road Patch

1. A traffic control plan shall be submitted to and approved by the Ogden City Traffic Engineer prior to any work in the Right-of-Way.
2. Patching and potholes requires following APWA Specification 32 12 05. Maximum recycled asphalt content cannot exceed 15%.
3. Recently chip sealed roadways or other wearing surfacing shall be under a three year moratorium, and recently constructed roads (including 2" or greater overlays) shall be under a five year moratorium. Any pavement removal during the moratorium must have the approval of the City Engineer and require:
 - a. A 50 foot (50') road patch on either side of the trench. This trench shall span across the entire width of the roadway.
 - b. If the road has a chip seal coat:
 - 1) The chip seal coat shall be reapplied by the developer or contractor.
 - c. All road striping must be restored to previous alignment unless otherwise indicated by the Traffic Engineer.
4. If multiple road cuts are required for a site plan or a subdivision then:
 - 1) The patch shall encompass all trenches and shall extend across the entire roadway.
5. Additional pavement removal shall be required if the edge of patch is within two feet (2') of:
 - a. Painted stripe
 - b. Lip of gutter
 - c. A curb
 - d. An existing pavement patch
 - e. Another saw cut
 - f. Poor conditioned asphalt near the new patch
6. Asphalt pavement shall be placed when the temperature is greater than 50 degrees Fahrenheit and rising by 10:00 a.m.
 - a. Cease paving if ground temperature falls below 50 degrees Fahrenheit.
7. The new patch shall have the following associated thickness:

- a. 8" minimum thickness UTBC required for all patch and repair work.
- b. Match existing asphalt thickness plus one inch (1").
 - 1) Minimum asphalt patch thickness shall be four inches (4").
 - 2) Maximum asphalt patch thickness shall be seven inches (7").
8. If concrete is encountered below asphalt, follow APWA standard plan number 255 for Composite Restoration.
9. Compact the asphalt to a relative density of 94 percent (94%) per ASTM D 2041 with no density test results less than 92 percent (92%) or higher than 96 percent (96%).
 - a. Complete compaction before asphalt temperature drops below 220 degrees Fahrenheit.
 - b. Patching will follow the Superpave Mix Design per APWA specification 32 12 05. HMA shall meet SP-1/2, PG 58-28 Class II on single family residential roadways. Class III HMA will be required on all City Collectors or Arterial roadways.
10. Tack coat coverage shall be applied on all surfaces.
11. All cuts for patching over-cuts shall have crack seal applied.
 - a. Crack seal may also be required around the trench area to preserve the roadway.

L. Pavement Markings

1. Pavement and curb markings shall be the responsibility of the contractor with the approval from Ogden City.
 - a. Any Arterial or Collector road will require a pavement markings plan submitted to the Traffic Engineer for approval.
2. Pavement markings shall be placed when the temperature is greater than 55 degrees Fahrenheit and rising by 10:00 a.m.
 - a. Cease marking if ground temperature falls below 55 degrees Fahrenheit.

M. Stopping Sight Distance

1. The minimum clear sight distance on any safety zone shall be based on the speed of the roadway.
 - a. If no curb and gutter exists, then the edge of pavement may be used.
 - b. An engineered report must be submitted to Ogden City regarding the stopping sight distance if one of the following applies:
 - 1) The speed limit on the roadway is above 25 miles per hour,
 - 2) The vertical grade exceeds 3%,
 - 3) The road has a horizontal curve within 300 feet
 - 4) The road has any combination of horizontal and vertical curves.
 - c. Where medians are utilized, landscaping and obstructions within the medians need to be minimized within the stopping and intersection sight distance setbacks.
2. Sight Triangles minimums have been set forth (see Ogden Municipal Code 7-3-2)

3. Generally, obstructions shall not be placed within the three points (sight triangle) described as follows:
 - a. Stopping sight distance based on the posted speed, aligned using the most conservative of:
 - 1) Three feet (3') off center line paint,
 - 2) Three feet (3') off perceived centerline of traveled path, or
 - 3) Five feet (5') off of fog line paint.
 - 4) The point where the two vehicles would collide within the intersection, and
 - 5) The point where the vehicle or pedestrian on the minor road is directed to stop/yield.
*In the event the street is unmarked, the selected alignment shall be five (5) feet off the edge of gutter for the approaching vehicle on the major street from both directions.

N. Traffic Impact Studies

Applicability

A Traffic Impact Study (TIS) shall be required for all proposed developments or changes in land use that meet one or more of the following conditions:

- a. *Trip Generation:*
 - 1) Any development that generates **100 or more vehicle trips per day** as determined using the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.
 - 2) For residential developments, a TIS is required if the development includes **50 or more dwelling units**.
 - 3) For commercial or industrial developments, a TIS is required for any project exceeding **30,000 square feet** of building area or any development type that is expected to generate significant peak hour trips (e.g., restaurants, gas stations).
- b. *proximity to Sensitive Areas:*
 - 1) Any development located within **1,000 feet** of a school, hospital, or emergency service facility shall be required to submit a TIS.
 - i. The study must evaluate **pedestrian safety, school zone impacts**, and the interaction of development traffic with existing public safety operations.
- c. *Location-Based Requirements:*
 - 1) A TIS is required for any development within:
 - . **500 feet of an arterial or collector road, railroad crossing, or a highway interchange.**
 - i. The **Central Business District (CBD)** or other areas designated by Ogden City as high-traffic zones.
 - 2) Developments in these areas must include an evaluation of **intersection impacts, vehicular congestion, and access management** to ensure safety and efficient flow of traffic.

Scope of Traffic Impact Study

Each Traffic Impact Study shall be prepared by a licensed professional engineer specializing in transportation planning and analysis. The scope of the TIS should include, but not be limited to, the following:

1. *Trip Generation Analysis:*
 - a. Use ITE Trip Generation rates to estimate the daily and peak hour trips generated by the proposed development.
4. *Traffic Distribution and Assignment:*
 - a. Analyze how the generated trips will distribute across the transportation network, taking into account the likely routes used by vehicles accessing the site.
5. *Intersection Capacity Analysis:*
 - a. Conduct intersection-level analysis for all intersections within a **1,000-foot radius** of the project boundary.
 - b. Evaluate existing and future levels of service (LOS) and recommend mitigation measures where LOS falls below acceptable levels as defined by the Traffic Engineer.
6. *Pedestrian and School Zone Impacts* (if applicable):
 - a. Evaluate the safety of pedestrians, especially near schools and hospitals, and determine if pedestrian crossings, signage, or school zone enhancements are necessary.
7. *Safety Review:*
 - a. Review the accident history within the study area and identify any potential safety concerns. Recommend improvements to reduce crash potential, such as signal modifications, turn lane additions, or signage enhancements.
8. *Mitigation Measures:*
 - a. Provide specific mitigation measures to address any identified deficiencies or adverse impacts on traffic operations, safety, or pedestrian activity. Developers shall be responsible for implementing these improvements, which may include roadway widening, signalization, or turn lanes, as required by the TIS recommendations.

Exemptions

Certain developments may be exempt from the requirement of submitting a Traffic Impact Study, including:

1. Small-Scale Developments:

- a. Projects generating fewer than **50 vehicle trips per day**, as determined by ITE standards, are exempt unless otherwise directed by the Traffic Engineer.

9. Minor Modifications:

- a. Minor expansions or renovations to existing developments that do not significantly increase traffic volumes or alter access configurations may be exempt at the discretion of the Traffic Engineer.

10. Developments in Well-Served Areas:

- a. Projects located in areas with existing infrastructure that can handle the additional traffic without substantial impact may be exempt, provided a preliminary review by the Traffic Engineer supports this conclusion.

Approval Process

The Traffic Impact Study shall be submitted as part of the development application and reviewed by the Traffic Engineer. Approval of the TIS is required before any final development approval is granted. The Traffic Engineer shall have the discretion to request additional information or revisions to the study based on specific site conditions or concerns raised during the review process.

Implementation of Mitigation Measures

If the TIS identifies mitigation measures to address traffic impacts, the developer is responsible for the cost and implementation of those improvements. Mitigation measures must be completed within **2 years** from the date of development approval or prior to the issuance of the final occupancy permit, whichever occurs first.

Required Items for a Traffic Study

1. Project Overview:

- . A **project description**, including the type of development (residential, commercial, industrial, etc.), site location, and the development's scope (number of units, square footage, etc.).
- a. A **site plan** showing access points, proposed buildings, parking lots, internal roadways, and any relevant on-site transportation features.

2. Existing Conditions:

- . A description of the **current traffic conditions** in the area, including existing roads, nearby intersections, and traffic control devices (signals, signs, etc.).

- a. Existing **traffic volume data** for nearby streets and intersections, including daily and peak-hour volumes.
 - b. A **description of nearby land uses**, such as schools, hospitals, residential areas, or major employers that might influence traffic patterns.
3. *Trip Generation:*
 - . **Trip generation estimates** based on the most recent edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.
 - a. *Estimation of peak-hour trips* for the AM and PM periods, as well as total daily trips.
 4. *Trip Distribution and Assignment:*
 - . A map or diagram showing the expected **distribution of trips** (inbound and outbound) across the transportation network, including which streets and intersections will be impacted.
 - a. **Assignment of trips** to the roadway network, identifying which routes drivers are expected to use when accessing the development.
 5. *Intersection and Roadway Analysis:*
 - . **Capacity analysis** of nearby intersections and roadways, both for existing conditions and future conditions (with and without the development). This analysis should include:
 - . Levels of Service (LOS) for intersections.
 - i. Queue lengths for key movements.
 - ii. Delays and volume-to-capacity ratios for each approach at major intersections.
 - a. **Traffic signal warrant analysis** (if applicable) based on anticipated traffic volumes and intersection conditions.
 6. *Pedestrian and Bicycle Analysis (if applicable):*
 - . **Evaluation of pedestrian and bicycle impacts**, especially near schools, hospitals, parks, or areas with significant foot or bike traffic.
 - a. *Identification of existing pedestrian crossings*, sidewalks, and bicycle lanes, along with any proposed improvements or modifications.

7. **Safety Analysis:**

- . *Crash data* for nearby intersections and roads, including the number and types of crashes over the past three to five years.
 - a. *Identification of any existing safety concerns*, such as poor sightlines, high speeds, or frequent accidents, and recommendations for mitigating those concerns.

8. **Parking and Access Analysis:**

- . An evaluation of *site access*, including the number, location, and configuration of driveways, as well as any potential conflicts with existing traffic patterns.
- a. *On-site parking analysis*, including parking lot layout, circulation, and the adequacy of parking supply relative to city standards.

9. **Future Traffic Projections:**

- . *Future traffic volumes*, taking into account projected growth in the area, background traffic increases, and the proposed development.
- a. A *20-year projection* of traffic conditions, if applicable, for long-term planning and infrastructure needs.

10. **Mitigation Measures:**

- . A list of proposed *mitigation measures* to address any adverse traffic impacts identified in the study. These measures could include:
 - . *Roadway improvements* (e.g., additional lanes, turn lanes, road widening).
 - i. *Traffic signal upgrades or installations*.
 - ii. *Changes to access points* (driveway consolidation, turn restrictions, etc.).
 - iii. *Pedestrian and bicycle safety improvements*.
- a. *Cost estimates* and timelines for implementing the mitigation measures.

11. **Conclusions and Recommendations:**

- . A *summary* of the Traffic Impact Study's findings, including the overall impact of the development on the transportation network.

- a. Specific **recommendations** for roadway or intersection improvements, safety enhancements, or other actions needed to maintain acceptable traffic conditions.

Additional Considerations:

- **Technical Appendices:** All supporting data, such as traffic counts, signal timing plans, and detailed calculations, should be included in an appendix for city review.

O. Monuments

1. Permanent survey monuments shall be accurately set and established at:
 - a. The intersections of centerlines of streets within the development.
 - b. Intersections with centerlines of existing streets.
 - c. The beginning and ends of curves on centerlines or points of intersections or tangents.
 - d. Locations determined necessary by the City Surveyor.
2. All permanent survey monuments shall remain in place during construction.
 - b. Prior to removal of any City Survey Monument, the City Surveyor must be notified.
 - c. If at any point a survey monument is removed then the contractor shall be responsible for resetting the monument after curbs and gutter, sidewalks, base and pavement are installed.
 - 1) The reset monuments shall be approved by the City Surveyor.
3. Monuments shall be as specified in the City Standard Plans, and all development plans shall be tied to an acceptable section corner or monument of record, as established by the Weber County Surveyor or Ogden City Surveyor.

P. Bridges

1. Design and construction of new bridges shall be approved in advance by the City Engineer.
2. The developer shall comply with all the conditions imposed by the City and State of Utah relative to the bridge location, design, and construction.
3. All bridge design shall be performed by a professional engineer as per applicable state laws.

Q. Winter Work

1. Pavement operations shall follow the requirements within APWA Section 32 12 16.13 under 1.6 Weather.
 - a. During excavation in winter or during weather conditions which do not allow paving according to engineering standards a temporary patch must be provided immediately after backfilling is completed or concrete is cured.
 - b. Before April 15 and after October 15: Provide a cold weather paving plan. The City must accept the plan before proceeding. The plan must include the following:
 1. Haul details
 2. Placement details
 3. Compaction aids used in production
 4. Coordination procedure for acceptance testing.

5. The schedule will address means and methods to minimize traffic disruption and complete the construction as soon as reasonably possible.

2-3 Sidewalks, Curb and Gutter, ADA Ramps, Approaches

1. Any section of curb, gutter, sidewalk, ADA ramp, waterway, and/or approach improperly installed or damaged during construction shall be removed and replaced at the Contractor's expense.
 - a. The City will decide the extent of removal, replacement, and/or repair.
 - b. Concrete removal shall be removed from joint to joint.
2. A concrete curing compound shall be applied to all new and finished concrete.
 - a. Curing compound must meet specifications ASTM C-309, Type 1 or 2, Class A
3. All surface concrete must be batched concrete.
 - a. Underground concrete may utilize Kapp Ucart or Sandies.
 - b. No bag mixes allowed.

A. Curb and Gutter Design

1. Minimum slope allowed is 0.5% (this applies to all gutter grades).
2. Curb and gutter shall be installed on existing and proposed streets.
 - a. Allowable curb section within the right of way shall be 30-inch (30") Type 'A' per APWA Standards.
 - 1) Other types of curb and gutter must be approved by the City Engineer.
 - b. Expansion Joints shall be:
 - 1) Spaced a maximum of 40 feet (40') for all curb and gutter regardless of installation type.
 - 2) Placed at any location where the curb and gutter changes direction.
 - 3) When work stops and begins at a different time.
 - c. Base course thickness under curb and gutter shall be eight inches (8").
 - d. Insert dowelled cold joint when connecting new curb and gutter to existing curb and gutter (See 2017 APWA Standard Plan 206)

B. Sidewalks

1. All new projects require the installation of sidewalks along the roadway.
 - a. New sidewalk shall be located within the public Right-of-Way.
 - 1) Unless the City Engineer accepts the sidewalk with a Public Access Easement.
2. Sidewalks within the Right-of-Way shall be a minimum of four feet (4') wide.
 - a. Sidewalks directly adjacent of the back of curb must be a minimum of six feet (6') wide and will only be allowed with approval from the City Engineer.
 - b. Sidewalks shall slope at two percent (2%) towards the street.
 - c. Sidewalk widths shall be minimum six feet (6') wide in downtown zoned areas per ordinance 15-34-5.F

3. *Sidewalks shall be installed with a landscaped park strip and be located a minimum of:*
 - a. *Arterial streets: six feet (6') behind the back of curb*
 - b. *Collector and Minor streets: seven feet (7') behind the back of curb*
 - c. *Cul-De-Sac: five feet (5') behind the back of curb*
 - 1) *All trees planted in the city Right-of-Way shall be approved by the City Urban Forester*
 - 2) *No small or medium tree shall be planted in a park strip that is less than five feet (5') wide, or no large tree shall be planted in a park strip that is less than eight feet (8') wide, unless approved by the City Urban Forester. Tree sizes are designated by the City Urban Forester*
4. *Sidewalk concrete thickness shall be:*
 - a. *Eight inches (8") when located directly behind a commercial, industrial, non-single family dwelling approach.*
 - b. *Six inches (6") when located directly behind a single-family residential approach; along all commercial and industrial areas; and adjacent to curb.*
 - c. *Four inches (4") for all other residential areas.*
5. *Sidewalk base thickness shall be equal to or greater than the concrete thickness.*
6. *When a drive approach intersects the sidewalk, the drive approach shall match the level of the sidewalk. See APWA standard plans for driveway approached for additional slope information for all approach connections.*
7. *When installing Stamped Concrete, the stamp pattern shall closely resemble the pattern of adjacent brick pavers.*
 - a. *The concrete dye color shall be the color brown, unless stated otherwise by the Engineer. All concrete shall receive medium broom finish. The sealant finish shall be evenly applied and shall be the color charcoal, unless stated otherwise by the Engineer.*

C. ADA Ramps

1. *Handicap ramps shall be constructed at legal pedestrian crossings or a marked crosswalk.*
 - a. *Ramp running slope shall not exceed 8.33%. Side flare slopes shall not exceed 10%.*
2. *The bottom of diagonal or corner type curb ramps shall have a clear space of four feet (4') minimum outside active traffic lanes of the roadway*
3. *Tactile warning pads shall be Gray unless otherwise approved by the City Engineer.*
 - a. *Pad shall extend the full width of the curb ramp (exclusive of flared sides) and extend a minimum of two feet (2') deep in the direction of pedestrian travel.*
 - b. *Pad shall be anchored.*
4. *ADA ramp base thickness shall be equal to or greater than the concrete thickness.*

D. Waterways

1. *Waterways in a public Right-of-Way shall be a minimum of six feet (6') wide.*

2. Waterways cannot be installed within 500 feet (500') of a storm drain system. Connections to the storm drain system will be required. Waterways within this distance must be approved by the City Engineer.

E. Driveway Approaches

1. Driveways shall be set back from the nearest intersection face of curb (see Ogden Municipal Code 15-12-11):
 - a. A minimum of 80 feet (80') from the intersection of two streets when at least one is not local.
 - b. A minimum of 50 feet (50') from the intersection of any local to local connection.
 - c. A traffic study may be required at the discretion of the Traffic Engineer for new driveway approaches.
2. Overhead approaches shall not be allowed in Ogden City unless approved by the City Engineer.

3. Residential Approaches

Driveway Width - Residential			
	Lots with 1-2 Units	Lots with 3-4 Units	Lots with 5 or more Units
Minimum Width	10 feet	16 feet	24 feet
Maximum Width	32 feet or 50% of lot frontage (whichever is less)	32 feet or 50% of lot frontage (whichever is less)	35 feet or 50% of lot frontage (whichever is less)
Minimum Concrete Thickness	6 inches	6 inches	6 inches

- a. All single-family residential driveways shall not be within three feet (3') of an interior property line
 - 1) Non-residential driveways shall not be within five feet (5') of an interior property line.
- b. Single-family homes shall be allowed one access-way onto the public street for each lot
 - 1) One additional access may be permitted for single-family homes if the access meets the additional City municipal code requirements.
 - i) Additional accesses must be approved by the City prior to installation.
- c. Corner lots with more than 250 feet (250') of combined street frontage can request a third access for circular drives.

4. Commercial/Industrial Approaches

Driveway Width - Commercial/Industrial		
	Tractor/Trailer Use Only	General Use
Minimum Width	35 feet	24 feet
Maximum Width	50 feet	35 feet
Minimum Concrete Thickness	8 inches	8 inches

- a. All Commercial/Industrial driveways shall be offset from driveways on other properties by 10 feet (10').
 - 1) Approaches shall not be within five feet (5') of an interior property line.
- b. A maximum of two (2) approaches will be permitted per parcel. Additional approaches will require the approval of the City Engineer and a traffic impact study be completed. Other approach restrictions are as follows:
 - 1) The driveway width and separation on State maintained roadways shall be as required by the Utah Department of Transportation.
 - 2) In parcels accommodating twenty (20) or more parking spaces, driveways must be separated by at least 250 feet (250'). Any requested reduction will require a traffic impact study and approval from the City Engineer.
 - 3) In parcels with less than twenty (20) parking spaces, driveways must be separated by at least 100 feet (100'). Any requested reduction will require a traffic impact study and approval from the City Engineer.

2-4 *Landscape, Lighting, and Layout*

A. *Park Strip*

1. A parking or park strip is a narrow strip of land between the sidewalk and the street often used as a right of way for public utilities and traditionally planted with street trees and turf.
2. The contractor shall be responsible for all surface restoration within the construction area.
3. The surface restoration shall be completed as soon as the improvements are installed, and the concrete has cured.
4. Typical park strip slope is 2%.

B. *Street Trees*

1. Trees must be pruned to the following height:
 - a. 14 feet (14') when above a lane of travel
 - b. Seven feet (7') when above a sidewalk and/or park strip area
2. Trees placement should have an approved stopping sight distance plan submitted to ensure sight is not obscured (see 2-2 Roadway Design Standards - Part M Stopping Sight Distance).

C. *Street Signs*

1. All signs and traffic control devices shall be designed and installed according to the current Manual on Uniform Traffic Control Devices (MUTCD).
 - a. The developer shall install and pay the cost of traffic control signs, street name, and other street signs required for the development.

- b. The required signage shall be included in the escrow for improvements of the development and will not be released until installed by the developer.
2. Street signs installed on a collector or higher roadway shall meet UDOT standards for tubular steel, breakaway base (see current UDOT Standard Drawings SN Series), and sign placement.
 - a. Signs installed on a local road can meet the standard as listed in RD-9 of this book.

D. Street Signs and Identification Numbering

1. All numbers and letters shall be designed and implemented according to the Manual on Uniform Traffic Control Devices (MUTCD).
2. Names of new streets shall not duplicate existing or platted street names.
 - a. Unless a new street is a continuation of, in the alignment with, the existing or platted street.
3. All property address (residential, commercial, and industrial) numbers shall be assigned by the City Engineer.
 - a. House numbers shall be assigned in accordance with the house numbering system now in effect in the city.
 - b. All new streets shall be numbered if they are in alignment with the existing grid.
 - c. New streets shall be named if not in alignment with the grid or are not easily aligned by their curved or non-linear nature.
 - 1) No Directional Names - Street names should avoid the use of words or syllables that might be confused with directional or street type designations (e.g. Northglenn Drive or Circle Drive).
 - d. Street names shall not be duplicated. All street names within Ogden City must be unique. A street name is considered to be a duplicate if any of the following conditions exist:
 - 1) Same Names/Different Suffixes - Two streets have the same name, but two different suffixes, are still considered a duplicate street. (e.g. Oak Lane and Oak Avenue)
 - 2) Same Sounding Names - A street name sounds similar phonetically to the name of another street, despite differences in spelling, is still considered a duplicate street. (e.g. Beach Avenue and Beech Avenue, Main Street and Maine Street, Apple Road and Apple Hill Road).

E. Street Lights

1. All work shall be installed in accordance with the current edition of the Six States ESR, Electrical Service Requirements Manual and any additional standards produced by PacifiCorp and Rocky Mountain Power, and N.E.C. (National Electric Code).
 - a. All service points shall be coordinated with Rocky Mountain Power.
2. All new street lights shall have 120 volt input Voltage (nominal).
3. The Public Services Director shall administer all City street lighting.
 - a. The Developer shall be responsible to install additional street lighting. The locations in which lights shall be required, but not limited to:
 - 1) Half block street intersection

- 2) Cul-de-sacs
 - 3) Bending roadways
 - 4) Parking lot entrances and exists
 - 5) Busy intersections
 - 6) Bridges
 - 7) Busy private roadway intersections
4. Street Light Location within the Right-of-Way
- a. Street lights shall be installed at least five feet (5') away from a driveway.
 - b. Street light poles shall not be installed within five feet (5') of a fire hydrant.
 - 1) The location of the street light shall be such that it does not hinder the operation any hydrant or any water valves.
 - c. Street lights shall have a minimum of 18 inch (18") separation on all sides between any structure (e.g. wall, fence, etc.).
 - d. Street lights shall not be installed within five feet (5') of a tree unless there is written approval from the City Engineer.
 - e. Any utility conflict with the installation of the street light circuit and/or street light pole must be resolved by the Developer with the utility provider. This resolution will be at no cost to Ogden City.
5. Street lighting shall be provided and installed by the permittee in all new residential, commercial and industrial subdivisions or developments. Variance from the approved plans will require a written approval from the City Engineer.
- a. This plan shall show:
 - 1) Wiring location
 - 2) Wiring type
 - 3) Voltage
 - 4) Power source location
 - 5) Conduit size and location
6. The lighting shall conform to the goals and policies of Ogden City and as indicated on the Ogden City Street Lighting Standard Maps.
- a. The developer is responsible for all coordination with Rocky Mountain Power Company relating to design and installation requirements of Rocky Mountain Power.
7. Refer to Ogden City General Plan for the street light type and frequency.
- a. Provide street lighting at a level which reflects traffic safety needs.
8. Provide a minimum of one Cobra Regular, Cree TRV, 13000lm -- TRVLG-A-HT-2ME-13L-40K7-UL-BK (or approved equal).
- a. These intersections include only those roadway junctions which carry through traffic or which are formed by roadways which serve more than three residences.

- b. Downtown street lighting has a different specification for approval depending on the location of the development.
9. Wire/Conductors
- a. Aluminum wire is prohibited.
 - b. Wire shall be black, white, green or phased taped at both ends.
 - c. The minimum wire size shall be #6 AWG RHW-2 copper lines from the power source to the ground boxes.
 - d. From pole base (hand hole) or to the fixture head shall be #10 or #12 THHN copper.
 - e. Multiple pole installations shall have the wire sized by an Electrical Engineer with no more than three percent (3%) drop in the nominal voltage at the base of each pole.
 - 1) The minimum wire size shall be a #6 AWG RHW copper wire suitable for wet conditions and must be approved by the City prior to installation.
 - f. Downtown lighting will require an additional three (3) amp plug to be installed on the light pole according to the standard.
 - 1) The plug must be connected in accordance with Rocky Mountain Power Standards.
10. Connections
- a. All connections must be water resistant.
 - b. Wire nuts shall meet the specifications of a "Wet Location Installation" with silicone inside and will be allowed in the pole base only.
 - c. Crimp connections will not be allowed.
 - d. Mechanical lugs NSi ESSLK – 2/0 gel packs (or approved equal) must be used in the ground box and shall meet NEC specifications, be UL labeled and listed and be designed for this purpose.
 - e. Littelfuse LEBJJ fuse holder (or approved equal) with weatherproof rubber boots, mechanical connection, 600 volt rated and 30 AMP rated shall be used.
 - f. Fuse shall be 10 AMP BLF, 20 AMP BLN, and/or 30 AMP BLN.
 - g. Fuse holder shall be placed on all hot leads.
 - h. Fuse holder shall be installed only in pole bases.
11. Grounding
- a. The city may at any time require third party testing at the expense of the Developer to remedy any deficiency in the line.
 - b. All grounding shall be installed according to the current edition of NEC Section 250 and UL labeled and listed.
 - c. When non-metered street lights are installed, article 250.24 shall be applied for bonding & grounding applications for service supplied AC systems.
 - d. Conductor: Solid, cu, bare, soft drawn
 - e. Ground Rod or Ring:
 - 1) Ground Rod
 - a) Eight feet (8') x 5/8 inch (5/8") diameter copper weld / bonded copper.
 - 2) Ground Ring

- a) #6 AWG copper clad per the current edition of the NEC Section 250
- f. Clamp: 5/8 inch (5/8") copper clad
- g. Burndy KA25U 14 – 1/0 AWG AL/CU mechanical lugs or equivalent shall be used to connect the ground wire to the group clip inside the street light pole.
- h. Ground rod shall be a minimum of 2 inches (2") above finished concrete grade for the street light base and a maximum of 3 inches (3") above finished concrete grade for street light bases.

12. Conduit

- a. Conduit shall be a minimum of one and a half inch (1-1/2") schedule 40 and must be grey in color.
 - 1) Larger conduits may be required to accommodate multiple pole installations.
- b. All installations of HDPE shall be per the current edition of the NEC Article 353 and must have the UL labeled and listed.
- c. HDPE conduit shall be schedule 40, grey in color, and be sized according for the intended wire size.
- d. 90 degree sweeps/bends shall have a maximum radius 24 inch (R=24") and a minimum radius of 18 inches (R=18").
- e. Conduit shall have a minimum of 18 inches (18") and maximum of 30 inches (30") of cover.
- f. All conduits shall have an approved cap or duct seal on any exposed opening to prevent debris from entering the conduit during and after construction.
- g. All conduits shall have a pull string for future use.
- h. Finished conduit shall extend between one inch (1") and three inches (3") above the finished street light base.
 - i. Run conduit to the lock side of the transformer. Leave eight feet (8') of excess wire to the transformer or six feet (6') of excess wire to a secondary box.
 - 1) Rocky Mountain power will make these connections into the box.

13. Ground Box

- a. This section includes flush mounted, pull, enclosure, and junction boxes.
- b. Lid must be secure with proper stainless steel bolts.
- c. Six inches (6") of 3/4" gravel shall be placed prior to setting the ground box. Pea gravel is not acceptable.
- d. Top of ground box shall be at finished grade.
- e. One ground box shall be installed within four feet (4') of a power source (or as required by Rocky Mountain Power).
- f. One ground box shall be installed within two feet (2') of a street pole base. This item may be modified with approval of the street inspector.
- g. Wire must extend 18 inches (18") above the grade to splice in the ground box.

14. Street Light Bases

- a. All bases shall be a maximum of two inches (2") above the sidewalk or top back of curb (whichever is higher).

15. Construction which involves the removal of street lighting shall require the installation of temporary lights to maintain the proper level of safety.
 - a. The temporary lighting shall be the responsibility of the Contractor.

16. As-Built Drawings
 - a. Contractor shall submit all lighting data in a GIS or CAD format to Ogden City. The data must be collected using survey equipment. The data must be labeled appropriately. The data shall include:
 - 1) Light pole location
 - 2) Ground boxes
 - 3) Conduit lines
 - 4) Wire
 - 5) Any additional data as seen fit by the Inspector or Engineer

2-5 Project and Development Layout

A. Blocks

Follow all block requirements set forth in Ogden Municipal Code 14-3-3

B. Lots

Follow all lot requirements set forth in Ogden Municipal Code 14-3-4.

C. Alleys

1. Alleys shall have a minimum width of twenty feet (20') and adhere to the following requirements:
2. Alleys may be required in the rear of business lots
3. May be accepted in residential blocks with approval by the planning commission, the City Engineer and the Fire Marshal.
4. Alleys shall be a concrete surface
5. No city owned utilities can be installed under an alley.
6. Any directional change will require a "L" type alley configuration as shown....
7. Alleys shall not extend beyond 500 feet (without Fire Marshal approval) from any public right-of-way.
8. Dead end alleys are not allowed.
9. No parking allowed.
10. City would not facilitate garbage pickup on an alley.
11. City would not facilitate snow removal on an alley.

2-6 Traffic Control Plan

1. *Traffic control plans shall meet the MUTCD requirements for all cases.*
2. *A traffic control plan shall be submitted to the Traffic Engineer for approval for all work in the right-of-way.*
3. *If the work is on a collector or higher roadway, then the traffic control plan will need to be stamped by a licensed Engineer.*
 - a. *Advanced approval is required for any traffic control measures.*
 - b. *Closures of any type will not be permitted without advanced notice (except during an emergency situation).*

2-7 Definitions

1. *OSHA: Occupational Safety & Health Administration*
2. *DOL: United States Department of Labor*
3. *P.U.E. : Public Utility Easement*
4. *M.U.E.: Municipal Utility Easement*

Chapter 3 - Sanitary Sewer Design

3-1 References

1. Ogden City Standard Drawings: SS-1 Sewer Manhole, SS-2 Sewer Lateral Connection, SS-3 Sewer Main Trench, SS-4 Sewer Main Pipe Zone, SS-5 Sewer Manhole Lid and Frame, SS-6 Manhole Step Detail (Typical), SS-7 Gravity Grease Interceptor, SS-8 Sewer Lateral Cleanout.
2. APWA Section 03 20 00: Concrete Reinforcing
3. APWA Section 03 30 04: Concrete
4. APWA Section 03 30 05: Concrete Testing
5. APWA Section 03 30 10: Concrete Placement
6. APWA Section 03 39 00: Concrete Curing
7. APWA Section 03 40 00: Precast Concrete
8. APWA Section 31 05 13: Common Fill
9. APWA Section 31 23 23: Backfilling for Structures
10. APWA Section 31 23 26: Compaction
11. APWA Section 31 41 00: Shoring
12. APWA Section 32 05 10: Backfilling Roadways
13. APWA Section 32 11 23: Aggregate Base Courses
14. APWA Section 33 05 01: Acrylonitrile-Butadiene-Styrene (ABS) Pipe
15. APWA Section 33 05 02: Concrete Pipe and Culvert
16. APWA Section 33 05 07: Polyvinyl Chloride Pipe
17. APWA Section 33 05 14: Utility Grade Adjustment
18. APWA Section 33 05 20: Backfilling Trenches
19. Ogden City Amendments to APWA Section 33 05 20: Backfilling Trenches
 1. Part 2 Products, 2.1 Backfill Materials, A. Common Fill (Amendment) and E. Gravel (Addition);
 2. Part 3 Execution, 3.5 Pipe Zone, F (Addition); 3.6 Trench Above Pipe Zone, D. (Amendment)
20. APWA Section 33 05 25: Pavement Restoration
21. APWA Section 33 31 00: Sanitary Sewerage Systems
22. Ogden City Amendment to APWA Section 33 31 00: Sanitary Sewerage Systems
 1. Part 2, 2.3 Manholes, C. (Amendment) and D. (Amendment).
 2. Part 3, 3.2 Pipe and Fittings, F (Addition)
23. Occupational Safety & Health Administration (OSHA) Standards – 29 CFR, Part Number 1910 and 1926 or comparable OSHA-approved state plan requirements.

3-2 Sanitary Sewer Design Standards

1. All Sanitary Sewer installation and design shall comply with Ogden City's Sanitary Sewer Master Plan.
2. New sewer lines shall be inspected by closed circuit television after completion of the backfill and finish grading, but prior to the placement of pavement or other resurfacing.
 - a. Sewer lines less than eight feet (8') in length, and can be visually inspected, are not required to be televised.
 - b. All closed circuit television work shall be done at the expense of the contractor.
 1. CCTV personnel are to be certified under the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP).
 2. Ogden City reserves the right to have any portion of the pipe televised again, at the Contractor's expense, based on inaccurate or unclear information.
3. New sewer main shall require an air test to pass per APWA standard specifications.

A. Sewer Pipe Main Standards

4. Minimum mainline size shall be 8" in diameter.
5. Allowable sanitary sewer main pipe material for all projects in the City of Ogden:
 - a. PVC (Polyvinyl Chloride) SDR 35 or other approved wall thickness for mainlines and laterals. Sewer main shall be green in color.
 - b. HDPE (High Density Polyethylene) SDR 19 or SDR 17 (green stripe) or approved equal for other wall thickness (corrugated HDPE pipe is not approved for use).
 1. HDPE material must be approved by the City Engineer prior to being installed.
 - c. CIPP Lining (Cure in Place Pipe) can be used to repair a main with the approval of the City Engineer.
 1. Installation and material tests of cured-in-place-pipe (CIPP) must meet the minimum requirements demonstrated in the following ASTM standards:
 2. ASTM F-1216 Standard Practice for the Installation of C.I.P.P. Pipe by Inversion Lining
 3. ASTM D-638 Test Method for Tensile Properties of Plastics Tensile Strength 3,000 psi
 4. ASTM D-790 Test Method of Flexural Properties of Plastic Flexural Strength 4,500 psi Flexural Modulus 250,000 psi
 5. NASSCO Wastewater Collection Systems Maintenance and Rehabilitation- 10th Edition: Chapters titled "TV Inspection" and "Sewer Line Cleaning."
6. Sewer mainlines shall be marked with a six inch (6") detectable green colored locator tape, and shall display "Sanitary Sewer", or "Underground Utility" on it.

7. Standard sewer mainline alignment within the public Right-of-Way shall be 10 feet (10') west or 10 feet (10') south of the roadway centerline.
8. Minimum depth of the sewer mainlines shall be 7 feet (7') of cover to the finish grade. Maximum depth will be set forth by the manufacture recommendations and will need to be verified if over 12 feet.
9. Horizontal clearance to any culinary water line shall be at least 10 feet (10').
 - a. Any other utility crossing the sewer main shall do so as close to a right angle as possible.
 - b. Perpendicular or skewed crossings between other utilities and sewer mains shall have a minimum clearance of 18 inches (18") (or as approved by the Utah Department of Health).
 1. Closer tolerances require a protection between the mains/services in combination with no mechanical joints on either utility within a 10 foot (10') radius of the crossing. All crossings must have the approval of the City Engineer.
10. Sewer Mainline grades shall provide a minimum velocity of 2.5 feet per second (2.5 ft/sec) when flowing 3/4 full are as follows: (grades less than what is listed below may be acceptable upon submittal, and approval by the City Engineer, of a detailed hydraulic analysis proving the minimum velocity can be met.)

Example Minimum Pipe Slope to Ensure Table 2.5 feet per second (2.5 ft/sec) Velocity in Sanitary Sewer Flowing 3/4 Full (n=0.011 for PVC Pipe)		
Pipe Size (inch)	3/4 Pipe Flow (cfs)	Minimum Slope
8	0.70	0.40%
10	1.11	0.32%
12	1.60	0.24%
15	2.48	0.18%
18	3.63	0.14%
21	5.03	0.12%
24*	6.50	0.10%

*Note: Any mainline 12" and larger must be approved by the City Engineer

Table 1- Minimum Sewer Main Pipe Slope

B. Manhole Design Standards

1. Sewer manholes shall be installed:
 - a. At a maximum spacing of 400 feet (400').
 - b. At all changes in pipe size, slope, or alignment.
 - c. At any junction with other sewer lines

2. *No drop manholes shall be allowed.*
3. *Sewer manholes shall be sized based on the following:*
 - a. *Four-foot (4') diameter for:*
 - 1) *In-line manholes*
 - 2) *Pipes under 12 inches (12") in diameter.*
 - b. *Five-foot (5') diameter shall be required for the following:*
 - 1) *The deflection angle between pipes is greater than or equal to 45 degrees.*
 - 2) *When the manhole services three (3) or more lines.*
 - 3) *For pipes with a diameter of 12 inches (12") or greater.*
 - 4) *When the cover is greater than 15 feet (15').*
4. *Concrete thickness requirements for decking shall be a minimum of nine inches (9") thick for precast and cast in place manhole structures.*
5. *Entry into a manhole will require approval from the Ogden City Sewer Department.*
 - a. *Entry into manholes must be per OSHA and DOL guidelines.*
6. *No low-profile sewer manhole frames will be allowed in any public Right-of-Way.*
7. *Contact the Ogden City Sewer Department for details and ordering information for a sewer lid and frame at (801) 629-8282 or (801) 629-8331.*
8. *The developer will provide all operations pertaining to the adjustment of existing manhole structures to grade.*
 - a. *All broken and/or missing manhole components shall be replaced with new materials by the developer/contractor at no cost to the city. All components must be approved by the City prior to use.*
9. *The connection of a sewer line into a manhole shall be grouted smooth and sealed to prevent infiltration.*
 - a. *If attaching using a boot connection, no grout shall be used, except to fill the bottom void gap between the pipe and manhole. Pipe must be seated to the trough leaving no gap for sediment.*

C. Sewer Pipe Main Trench Standards

1. *Backfilling of the trench*

- a. The pipe zone requirements can change with approval from the City Engineer.
 - 1) Any damage caused to the pipe system shall be replaced by the contractor.
 - b. Compaction tests are required every 200 linear feet (200') and must follow APWA requirements. Contractor is responsible to provide test results to the City.
 - 1) Compaction shall be to a 95% or greater density.
 - c. Excavated native material shall not be used as structural fill in any portion of the trench within the public Right-of-Way without approval of the City Engineer and an approved testing method to verify compaction.
2. If groundwater is found during a Sewer Main installation:
 - a. Trenches must be kept free from water during excavation, pipe installation, and the installation of material in the pipe zone.
 - b. Pipes must be properly sealed so no water is allowed to infiltrate the Sanitary Sewer system.
 - c. The sewer must pass an air test after the trench has been backfilled and the dewatering system has been removed to ensure the new sewer has no groundwater inflow.
 3. Pea Gravel is not allowed in any part of the trench.
 4. Excavation of any trench must be to OSHA safety standards.
 5. Do not use recycled fill material in the pipe zone without the approval of the City Engineer.

D. Sewer Lateral Design Standards

1. Connection fees for a sewer lateral will be assessed at the time a permit is issued.
 - a. A Sewer tap will be performed by Ogden City Personnel, if the applicable fees have been paid.
 - b. Wye connections will be installed by the contractor under the supervision of Ogden City.
 - 1) Sewer taps into an existing eight inch (8") main shall not be greater than four inches (4"). If a six inch (6") connection is required, a portion of the sewer main must be removed, and a wye installed.
 - 2) A wye shall not be installed within 24" inches of bell or other connections.
 - 3) Inserta Tees, or an approved equal, can be used when the connection is smaller than two-thirds of the main line and when approved by the City Engineer.
 - c. No lateral shall be allowed to enter a manhole directly unless the lateral is over six inches (6") in diameter, ties in near the flow line, and is approved by the City Engineer.
 - 1) Connections larger than six inches (6") require a manhole to be installed.
2. Allowable sanitary sewer lateral pipe material is as follows:
 - a. PVC (Polyvinyl Chloride) SDR 35, green in color.

- b. HDPE (High Density Polyethylene) SDR 19 or SDR 17, green in color.
- c. CIPP Lining (Cure In Place Pipe) can be used for repair of old laterals with the approval of the City Engineer. The repair must not decrease the volume of the lateral.
 - 1) Installation and material tests of cured-in-place-pipe (CIPP) must meet the minimum requirements demonstrated in the following ASTM standards:
 - 2) ASTM F-1216 Standard Practice for the Installation of C.I.P.P. Pipe by Inversion Lining
 - 3) ASTM D-638 Test Method for Tensile Properties of Plastics Tensile Strength 3,000 psi
 - 4) ASTM D-790 Test Method of Flexural Properties of Plastic Flexural Strength 4,500 psi Flexural Modulus 250,000 psi
 - 5) National Association of Sewer Service Companies (NASSCO) Wastewater Collection Systems Maintenance and Rehabilitation- 10th Edition: Chapters titled "TV Inspection" and "Sewer Line Cleaning."
 - 6) 4" and 5" MaxLiner or approved equivalent. Minimum thickness – 3mm
 - 7) 6" and 8" MaxLiner or approved equivalent. Minimum thickness – 4.5mm
- 3. Sewer lateral location shall be marked in the curb face by a stamped 'S' in the concrete.
- 4. Minimum lateral size shall be as follows:
 - a. Four inches (4") in diameter for a single family residential use with a minimum slope of 2%.
 - b. Six inches (6") in diameter for all other uses with a minimum slope of 1%.
 - 1) The sewer lateral shall be based on actual project flows, but in no case shall the lateral be less than six inches (6") in diameter. All project flows and sizing calculations shall be in accordance with the most current manual of the International Plumbing Code (IPC), the State of Utah, and as designed by a licensed engineer and approved by the City.
 - c. Laterals on private property must conform to the current adopted edition of the International Building Code.
- 5. No common use (shared use) laterals shall be allowed.
 - a. Such practice of common use laterals shall be eliminated as redevelopment of the site occurs, or if repair or replacement is needed. The repair or replacement cost will be the responsibility of the Owner.
- 6. Sewage Collection: The developer shall connect to the sanitary sewer and provide adequate individual lateral lines to each property being developed. All proposed sewer connections must provide the future use of the property along with the necessary sized pipe with associated calculations.
 - a. Sewer laterals shall not be allowed to connect into any private sewer system.
 - b. Any new developments shall be subject to the following sewer lateral requirements:

- 1) *Developer will stub into each lot a minimum of one lateral with a factory wye, or tap, from the sewer main. Lateral size will depend on usage and current and future anticipated zoning for the lot.*
 - 2) *The lateral shall be extended to the back of the existing sidewalk, or beyond the property line, whichever is further.*
 - 3) *The end of the lateral must be marked with a 2x4 minimum, set in the ground, and have the end colored green.*
 - 4) *A cleanout must be installed on the sewer lateral stub one foot (1') back of the sidewalk or beyond the property line, whichever is further.*
7. *Joint trench with a sewer and water lateral is not allowed. All sewer laterals shall maintain a 10-foot (10') horizontal separation from all water lines.*
 8. *Cleanouts shall be required every 100 feet (100').*
 - a. *A minimum of one (1) cleanout must be installed per lateral.*
 9. *Location of the cleanout can be in the City's Right-of-Way so long as it is a landscaped area and maintains a minimum distance of one foot from sidewalk, curb and gutter, etc.*
 10. *Cleanout shall be placed in an Oldcastle precast G08, G05, or approved equal type box.*
 11. *Cleanout needs to have a glue on thread adapter and a threaded brass cap.*

E. Grease Traps and Grease Interceptors

1. *All Gravity and Hydromechanical Grease Interceptors shall be sized according to the current manual of the Uniform Plumbing Code (UPC).*
 - a. *All Drainage Fixtures (DFU) in any food and beverage preparation area or an area which can be contaminated with organic fats, oils, or greases (FOG) shall be routed through the Interceptor.*
 - b. *Restroom waste shall not be routed through the Interceptor.*
 - c. *The Interceptor capacity is defined as the storage volume of the vault below the elevation of the outlet flow line or as defined by the manufacturer.*
2. *The Gravity Interceptor shall have manhole rings and covers rated for traffic loading when in areas which experience vehicular traffic.*
3. *The Interceptor shall be water and airtight.*
 - a. *All pipe openings shall be mechanically sealed or grouted to prevent infiltration and exfiltration.*

- b. Direct venting of the gravity grease interceptor shall not be allowed unless it follows the requirements of the International Building Code.
 - c. All access manholes must be sealed to prevent air and fumes from escaping the containment unit.
4. Outlet pipe flowline shall be a minimum of 2.5 inches (2.5") below the inlet pipe flowline.
 5. The inlet and outlet piping shall have a two-way cleanout. The cleanout must be a minimum of four inch (4") PVC tee installed vertically inside the interceptor.
 6. The baffle wall shall have a six inch (6") minimum PVC cleanout tee installed vertically.
 7. If the inlet is greater than six inches (6") a plan will need to be submitted and approved by the City.
 8. A sampling manhole shall be installed no more than 10 feet (10') downstream from any interceptor.
 - a. The required vault shall be a five foot (5') diameter manhole.
 9. The sampling vault or manhole shall have a 12 inch (12") minimum hydraulic jump between the inlet and outlet pipe.
 - a. A six inch (6") minimum clearance is required from the end of the inlet pipe to the bottom of the sampling manhole flowline.
 10. The bottom of the sampling manhole shall be formed to slope the water towards the outlet pipe.

F. Pipe Bursting

1. The minimum allowable slope from the building to the main is 1% for a 6" service and 2% for a 4" service.
2. A video (CCTV) internal inspection of the cleaned existing piping shall be performed to assure that the piping conditions are acceptable to pipe bursting (e.g. no sags or obstructions in the pipe).
3. All sewer pipe must be green in color or marked with a green stripe.

3-3 Easements/Access Design Standards

- A. Should easements be necessary for the installation and maintenance of a Public Sanitary Sewer system, such easements shall be:
 1. Based on the pipe size and the depth of the pipe. For every one foot of depth, to pipe invert, with easement must be two feet wide, with the pipe centered in the easement. The minimum easement width is 20 feet wide.

- a. *If a sewer and water main share an easement, the minimum easement width is 20 feet.*
 2. *Extend a minimum of 10 feet (10') beyond the last manhole or structure on a line.*
 3. *Submitted to the City Engineer before final approval.*
- B. *No buildings, utilities or structures shall be erected or constructed within or over such easements as to interfere with the activities necessary to properly access, maintain and/or replace the main lines.*
- C. *Legal and physical access is required for all sewer manholes.*
 1. *Physical access shall consist of an all-weather surface sufficient to provide the needs of all routine maintenance and repair equipment.*

3-4 Definitions

1. *Drainage Fixture Units (DFU): A measure of the probable discharge into the drainage system by various types of plumbing fixtures. The measure is expressed in units of cubic volume per minute. The value for a particular fixture depends on the volume rate of drainage discharge, the time duration of a single drainage operation, and the average time between successive operations.*
2. *DOL: United States Department of Labor*
3. *Fats, Oils, and Grease (FOG): Organic polar compounds derived from animal and/or plant sources. These oils are used in, or a byproduct of, the cooking or food preparation process. The oils turn or may turn viscous or may solidify with a change in temperature or other condition.*
4. *OSHA: Occupational Safety & Health Administration*
5. *Uniform Plumbing Code (UPC): A model code developed by the International Association of Plumbing and Mechanical Officials (IAPMO) to govern the installation and inspection of plumbing systems as a means of promoting the public's health, safety and welfare.*
6. *International Building Code (IBC): is a model building code developed by the International Code Council (ICC). It has been adopted for use as a base code standard in Ogden City.*
7. *International Plumbing Code (IPC): is a model plumbing code developed by the International Code Council (ICC). It has been adopted for use as a base code standard in Ogden City.*

Chapter 4 - Storm Sewer Design

4-1 References

1. Ogden City Standard Drawings: SD-1 Catch Basin with Curb Inlet, SD-2 35 1/2" Grate and Frame with Adjustable Curb Box, SD-3 Combination Inlet/Cleanout Box, SD-4 Storm Drain Manhole (Precast), SD-5 Storm Drain Manhole Frame and Cover, SD-6 Storm Drain Pipe Zone (Concrete Pipe)
2. Ogden City Storm Water Design Manual
3. APWA Section 03 20 00: Concrete Reinforcing
4. APWA Section 03 30 04: Concrete
5. APWA Section 03 30 10: Concrete Placement
6. APWA Section 03 39 00: Concrete Curing
7. APWA Section 03 40 00: Precast Concrete
8. APWA Section 31 05 13: Common Fill
9. APWA Section 31 23 23: Backfilling for Structures
10. APWA Section 31 23 26: Compaction
11. APWA Section 32 05 10: Backfilling Roadways
12. APWA Section 32 11 23: Aggregate Base Courses
13. APWA Section 33 05 02: Concrete Pipe and Culvert
14. APWA Section 33 05 06: Polyethylene Pipe
15. Ogden City Amendments to APWA Section 33 05 06: Polyethylene Pipe
 - a. Part 2 Products, new article 2.4 HDPE (High Density Polyethylene) Pipe
 - b. Part 3 Execution, 3.1 Installation, C. (Addition)
16. APWA Section 33 05 07: Polyvinyl Chloride Pipe
17. APWA Section 33 05 14: Utility Grade Adjustment
18. APWA Section 33 05 20: Backfilling Trenches
19. Ogden City Amendments to APWA Section 33 05 20: Backfilling Trenches
 - a. Part 2 Products, 2.1 Backfill Materials, A.(Amendment) and E. (Addition);
 - b. Part 3 Execution, 3.5 Pipe Zone, F.(Addition); 3.6 Trench Above Pipe Zone, D.(Amendment)
20. APWA Section 33 05 25: Pavement Restoration
21. Ogden City Amendments to APWA Section 33 05 25: Pavement Restoration
 - a. Part 1 General, 1.4 Weather A. (Remove and Replace)
22. APWA Section 33 41 00: Storm Drainage Systems
23. Ogden City Amendment to APWA Section 33 41 00: Storm Drainage Systems
 - a. Part 2, 2.1 Piping and Fittings, D., E., and F. (Addition); 2.5 Manholes, B. Steps, C. Top, and D. Frame & Cover (Amend)
 - b. Part 3 Execution, 3.7 Installation Sub Drain Systems, E. and F. (New Paragraphs)

*Ogden City Engineering Division
Storm Sewer Design*

24. *Occupational Safety & Health Administration (OSHA) Standards – 29 CFR, Part Number 1910 and 1926 or comparable OSHA-approved state plan requirements.*

4-2 Storm Drain Design Standards

1. The Storm Drain Design section of the Ogden City Engineering Standards focuses on the installation standards for storm drain systems. All design criteria for storm water systems has been consolidated into the Storm Water Design Manual; engineers are required to consult this manual for comprehensive storm water design requirements.
2. All Storm Drain installation and design shall comply with the City's Storm Drain Master Plan.
3. Storm water design and construction methods must adequately address potential problems which may arise during construction.
 - a. The storm water leaving the site must not pollute, deposit sediment, or cause any other degradation or erosion to the existing natural condition of the site.
4. Storm water developed on site shall not drain directly into any canal, irrigation ditch, or subdrain system.
5. All storm water facility outfalls shall be protected with a trash rack per current APWA Standards.
6. All storm drainage quality standards must refer to the Ogden City Storm Water Design Manual.
7. New storm drain lines shall be inspected by closed circuit television after completion of the backfill and finish grading, but prior to the placement of pavement or other resurfacing.
 - a. Storm drain lines less than eight feet (8') in length, and which can be visually inspected, are not required to be televised.
 - b. All closed-circuit television work shall be done at the expense of the contractor.
 - 1) CCTV personnel are to be NASSCO PACP certified.
 - 2) Ogden City reserves the right to have any portion of the pipe televised again based on inaccurate or unclear information at no cost to the city.

A. Storm Pipe Main Standards

1. Pipe size shall be determined by required capacity but in no instance shall the minimum size be less than 15-inch (15") diameter. This includes any pipe located within an Ogden City Right-of-Way.
2. Allowable storm sewer pipe material for all projects within the Ogden City Right-of-Way:
 - a. RCP (Reinforced Concrete) - Class III or greater.
3. Clearance between other utilities shall be at least 18 inches (18").
 - a. Closer tolerances require reinforcement, concrete cradle, or other acceptable separation.
 - 1) Reinforcement shall be as per the current specifications.
4. Standard storm drain mainline alignment within the public Right-of-Way shall generally be on the North side or the West side of the road, near the curb/gutter.

5. Minimum cover required for Storm Drain mainlines:
 - a. Two feet (2') for Reinforced Concrete Pipe
 - b. Cover over utilities and between railroad tracks or roadways shall be sufficient to adequately protect such utilities from potential loading of track or roadway both during construction and after final finished surfacing.
 - 1) Should cover be insufficient to adequately protect utility, encasement or casings shall be provided to protect affected utility.
6. Storm Drain Mainline grades shall provide a minimum velocity of three feet per second (3 ft/sec) when flowing full are as follows: (grades less than what is listed below may be acceptable upon submittal and approval of a detailed hydraulic analysis proving the minimum velocity can be met.)

<i>Example Minimum Pipe Slope at three feet per second (3 ft/sec) in Storm Drain Main Line Flowing Full</i>		
<i>Pipe Size (inch)</i>	<i>Minimum Slopes</i>	
	<i>Concrete (n=0.013)</i>	<i>Full Pipe Flow Concrete (cfs)</i>
15	0.32%	3.65
18	0.25%	5.26
21	0.21%	7.16
*24	0.17%	9.36

*Note: Pipes 24" and larger must be approved by the City Engineer

B. Manhole Design Standards

1. Storm Drain manholes shall be installed:
 - a. At a maximum spacing of 400 feet (400').
 - b. At all changes in pipe size, slope, or alignment.
 - c. At a junction with other storm drain lines
2. No drop manholes shall be allowed.
3. Storm Sewer manholes within the Right-of-Way shall be a minimum of five feet (5') in diameter.
4. Entry into a manhole will require approval from the Ogden City Sewer Department.
 - a. Entry into manholes must follow OSHA and DOL guidelines.

5. No low-profile storm drain manhole frames will be allowed in any public Right-of-Way.
6. The Contractor/Developer will provide all operations pertaining to the adjustment of existing manhole structures to grade.
 - a. All broken and/or missing manhole components shall be replaced with new materials by the developer at no cost to the city.

C. Storm Pipe Main Trench Standards

1. Backfilling of the trench:
 - a. Typical pipe zone requirements are based on the manufacture recommendations.
 - 1) Any damage caused to the pipe system shall be repaired or replaced by the Contractor.
 - b. Compaction tests are required every 200 linear feet (200') at half and full depth for any storm drain main installation. Contractor is responsible to provide test results to the City.
 - 1) Compaction shall be to a 95% or greater density.
 - c. Excavated native material shall not be used as structural fill in any portion of the trench within the public Right-of-Way.
2. If groundwater is encountered, then:
 - a. Trenches must be kept free from water during excavation, pipe installation, and the installation of material in the pipe zone. If required, a dewatering permit through the state of Utah must be obtained and Ogden City must be notified prior to discharging water off site.
 - b. Pipes must be properly sealed so no water is allowed to infiltrate the Storm Drain system.
3. Pea Gravel is not allowed in any part of the trench.
4. Excavation of any trench must be to OSHA safety standards.
5. Do not use recycled fill material in the pipe zone without the approval of the City Engineer.
 - a. If the manufacture recommends anything contrary to these standards, consult with the Ogden City Engineering Department.

D. Storm Water Storage Facilities

1. All new developments must meet the latest Ogden Storm Water Design Manual and any requirements from the current MS4 permit.
2. Detention/Retention Facilities
 - a. Submission of "As-Built" Drawings to Ogden City for all Storm Water Facilities is required.

E. Storm Water Pollution Prevention Plans (SWPPPs) & SWPPP Permits

Any construction activity and land disturbing activity, directly or indirectly associated with construction projects, and all persons engaged in such activity within the corporate limits of Ogden City must protect the storm system from pollutants associated with the activity. The owner or operator of a construction site or project shall provide, at their own expense, reasonable protection from discharge of materials or other wastes associated with the construction activity into the city storm water system or waters of the state of Utah through the use of structural and nonstructural BMPs. **SWPPP permits and all associated SWPPP BMPs must be in place prior to any land disturbing activity.**

Any project required to obtain a Utah Pollutant Discharge Elimination System (UPDES) permit for construction activity must maintain compliance with all terms and conditions of that permit and shall submit to the City evidence of compliance with the UPDES permit upon request. Furthermore, any project required to obtain a UPDES permit for construction activity must also obtain an Ogden City SWPPP permit.

For additional SWPPP requirements, refer to the Ogden City website and the UPDES information on the DEQ DWQ website.

4-3 Definitions

1. *Average Rainfall Intensity: Rainfall intensity shall be obtained from the National Weather Service's Precipitation Frequency Data Server (http://hdsc.nws.noaa.gov/hdsc/pfds/sa/ut_pfds.html).*
2. *BMPs: Best Management Practices: A BMP is a procedure, technique, or structure used to reduce the pollutant content of storm water discharge from a specific location.*
3. *Detention Facility: The facility used to store storm water runoff for controlled release during and/or following a storm event.*
4. *Discharge Point: A point or location where surface or storm water runoff is concentrated before being released from the property.*
5. *DOL: United States Department of Labor*

6. *Drainage Area: Consists of the entire catchment area which contributes surface and storm water runoff to a specific point.*
7. *Emergency Overflow: A waterway in or about a hydraulic structure which allows the release of excess water.*
8. *Erosion Control: Control the unwanted movement of soil*
9. *Freeboard: The distance from the top of a bank or embankment to the high-water elevation during a design storm.*
10. *Groundwater: Concentrated water beneath the earth's surface.*
11. *Historic Flow: The runoff which has historically flowed off from the property in question for the specified storm frequency and duration prior to development. This would be either the land's pre-development agricultural (to be calculated as grass pasture in good condition) or native condition.*
12. *Natural Drainage Channel: Drainage structures which occur naturally prior to any manmade disturbance which could convey storm water to a creek, canal, or stream.*
13. *OSHA: Occupational Safety & Health Administration*
14. *Peak Flow: Maximum rate of storm water runoff at a point under investigation*
15. *Regional Detention Facility: The facility used to store storm water for a large area of runoff for controlled release during and/or following a storm event.*
16. *Retention Facility: The facility used to store storm water runoff during and/or following a storm event.*
17. *Roughness Coefficient: Value used in Manning's equation to estimate a material's resistance to the flow of water. Usually represented as n.*
18. *Runoff Coefficient: Value used in the Rational Method to estimate the permeability of ground cover to water runoff.*
19. *Sheet Flow: A shallow mass of storm water runoff in the upper reaches of a sub-basin.*

20. *Spread: A measure of transverse lateral distance from the curb face to the limit of water flowing on the roadway.*
21. *Storm Water Pollution Prevention Plan: Drawing which represents the Best Management Practices used in preventing polluted storm water from leaving the site.*
22. *Storm Water Runoff: Water resulting from precipitation running off the surface of a drainage area during or immediately following a storm event.*
23. *Time of Concentration: The time it takes a drop of water falling on the hydraulically most remote point in the watershed to travel through the watershed to the outlet.*

Chapter 5 – Water Utility

5-1 References

1. Ogden City Standard Drawings: W-1 Fire Hydrant Assembly, W-2 Fire Hydrant Location, W-3 Typical Service Installation for 1" Meters, W-4 Typical Service Installation for 1 ½" & 2" Meters, W-5 3" Compound Meter with 3" Bypass, W-6 4" Compound Meter with 4" Bypass, W-7 6" Compound Meter with 3" Bypass, W-8 8" Compound Meter with 6" Bypass, W-9 Concrete Meter Vaults, W-10 Typical Valve Location, W-11 Typical Valve Detail, W-12 Standard Valve Can Assembly, W-13 Phase Break End, W-14 3" Air Combination Valve, W-15 Secondary & Culinary Water Irrigation Connection, W-16 Direct Bearing Thrust Block, W-17 Separation Criteria for Culinary Water and Sewer Mains, W-18 Typical Waterline Trench, W-19 Parkway Vault Lid for Meters 3" and Larger
2. Ogden City Water Department Approved Materials List
3. APWA Section 03 20 00: Concrete Reinforcing
4. APWA Section 03 30 04: Concrete
5. APWA Section 31 05 13: Common Fill
6. APWA Section 31 23 23: Backfilling for Structures
7. APWA Section 31 23 26: Compaction
8. APWA Section 32 01 17: Sealing Cracks in Bituminous Paving
9. APWA Section 32 05 10: Backfilling Roadways
10. APWA Section 32 11 23: Aggregate Base Courses
11. APWA Section 33 05 03: Copper Pipe
12. Ogden City Amendments to APWA Section 33 05 03: Copper Pipe
 1. Part 2 Products, 2.2 Connections, A (Amendment).
13. APWA Section 33 05 05: Ductile Iron Pipe
14. APWA Section 33 05 07: Polyvinyl Chloride Pipe
15. APWA Section 33 05 14: Utility Grade Adjustment
16. APWA Section 33 05 20: Backfilling Trenches
17. Ogden City Amendments to APWA Section 33 05 20: Backfilling Trenches
 1. Part 2 Products, 2.1 Backfill Materials; A. Common Fill, (Addition of subparagraphs 1, 2, and 3); E. Gravel (Addition)
 2. Part 3 Execution, 3.5 Pipe Zone, F (Addition).; 3.6 Trench Above Pipe Zone, D (Amendment).
18. APWA Section 33 05 25: Pavement Restoration
19. Ogden City Amendments to APWA Section 33 05 25: Pavement Restoration
 1. Part 1 General, 1.4 A Bituminous Pavement Restoration (remove and replace paragraph)
20. APWA Section 33 08 00: Commissioning of Water Utilities
21. Ogden City Amendments to APWA Section 33 08 00: Commissioning of Water Utilities
 1. Part 1 General; 1.2 Definitions, Addition of paragraph C; 1.3 Submittals, A. Amend subparagraph 5.

2. *Part 2 Products, New article 2.2.*
3. *Part 3 Execution; 1 Preparation, Amend paragraph C; 3.2 Alignment and Grade Test, Addition of paragraph D; 3.3 Pressure Test, Amend paragraphs A and B; Amend article 3.4; 3.8 Pipe Testing Schedule, B. Landscape Irrigation, Addition of subparagraph 4, F. Potable Water System, Amend subparagraph 3 and addition of subparagraph 5; Addition of article 3.9 - Disinfection Test and 3.10 - Hydrant Flow Test.*
22. APWA Section 33 11 00: *Water Distribution and Transmission*
23. *Ogden City Amendments to APWA Section 33 11 00: Water Distribution and Transmission*
 1. *Part 1 General; 1.2 References, Addition of paragraph F, C. AWWA Standards; Add AWWA C900.*
 2. *Part 2 Products; 2.6 Tapping Saddles, Addition of paragraph E and F; 2.8 Accessories, Addition of paragraph I and J.*
 3. *Part 3 Execution, 3.2 Preparation, Amend paragraph B; 3.8 Installation – Taps, Amend Paragraph D.; 3.9 Installation – Service Line, A. Replacing Existing Water Service Line: APWA 541, Addition of subparagraph 5 thru 9, Addition of paragraph D.; 3.12 Backfilling, Addition of Paragraph D; Add Article 3.14 Installation – Meter Boxes, Add Article 3.15 Poly Wrap.*
24. APWA Section 33 11 11: *Relocate Water Meters and Fire Hydrants*
25. APWA Section 33 12 16: *Water Valves*
26. APWA Section 33 12 19: *Hydrants*
27. *Ogden City Amendments to APWA Section 33 12 19: Hydrants*
 1. *Part 3 Execution, 3.4 Paint, Amend paragraph B.*
28. APWA Section 33 12 33: *Water Meter*
29. APWA Section 33 13 00: *Disinfection*
30. *Occupational Safety & Health Administration (OSHA) Standards – 29 CFR, Part Number 1910 and 1926 or comparable OSHA-approved state plan requirements.*
31. *Utah Administrative Code R309-550, Facility Design and Operation: Transmission and Distribution Pipelines.*

5-2 Water System Design Standards

All Water System installation and design must conform to Ogden City's Culinary Water Master Plan.

All water system installation and design must conform to State of Utah Drinking Water Rules. R309-550 is of relevance to this section and should be consulted frequently. If a conflict arises between Ogden City Standards and Utah Drinking Water Rules, Utah Drinking Water Rules shall govern.

A. Culinary Pipe Main Standards

1. All material that comes in contact with drinking water, including pipes, gaskets, lubricants and O-Rings, shall be ANSI-certified as meeting the requirements of ANSI/NSF Standard 61. Pipe, joints, fittings, valves and fire hydrants shall also conform to AWWA Standards (C104-A21.4-08 through C550-05 and C900-07 through C950-7). All components shall be appropriately stamped with the NSF logo (R309-550-6).
2. Installation shall conform to Utah Drinking Water Rule R309-550-8. This rule references AWWA standards for various pipe materials.
3. Under no circumstances shall the pipe or accessories be dropped into the trench (R309-550-8(4)).
4. The pipe diameter used shall be approved by the City Engineer (or his representative) and must adhere to the Culinary Water Master Plan.
 - a. Minimum allowable main shall be eight inches (8") in diameter.
 - b. If the Master Plan is not clear in the area about pipe size and location, then the City Engineer shall give final approval.
5. All culinary water pipe shall be designed using a 120-psi design and a surge pressure of 225-psi unless otherwise indicated by the City Engineer or his designee.
6. Allowable culinary water pipe material for all projects within the City of Ogden:
 - a. PVC C900 (8")
 - b. Ductile Iron Pressure Class 350 (12"-48" diameter)
 - c. Where highly corrosive soils are known in the City, the use of PVC is allowed for larger diameter pipe under direction of the City Engineer.
 - d. Coated, Welded Steel is allowable for large diameter pipe with approval from the City Engineer.
7. Standard centerline alignment within the public right-of-way shall be 10 feet (10') north or 10 feet (10') east of the centerline.
8. Horizontal clearance between a water main and any parallel aligned utility shall be at least 10 feet (10'). When another utility crosses a water line then:
 - a. The other utility shall cross perpendicularly.

- b. Sanitary sewer lines shall not cross above the water main. If this is determined to be unfeasible by the City Engineer, then:
 - 1) A minimum 20 foot (20') long sleeve is required for the sewer line.
- c. A minimum of 18 inch (18") vertical separation is required between the two mains.
 - 1) If a vertical separation of 18 inches (18") is determined unfeasible by the City Engineer, then:
 - a) A reinforced concrete cradle is required (reinforcement shall meet current specifications).
 - b) No joints of either utility will be allowed within a 10-foot (10') radius of the crossing.
9. Minimum cover required shall be 48 inches (48").
 - a. Cover over utilities and between roadways or railroad tracks shall be sufficient to protect from potential loading either during construction or final finished surface.
 - 1) Should cover be insufficient to adequately protect the utility from any loading, encasement or casings shall be provided to protect affected utility.
10. Maximum allowable lay depth cover for any main line or service line shall not exceed 5' – 6" without a variance approved by the City Engineer.
11. Pressure Test on the water line is required to hold 225 pounds per square inch (225 psi) test pressure for two (2) hours unless otherwise required.
 - a. If pipe fails the pressure test, locate and repair any defective materials in the line and retest.
 - b. Pressure testing against any valve is prohibited.
 - c. Any stretch of installed main greater than 20 feet (20') long will require a pressure test.
12. Tracer wire shall be installed on the underside of the culinary water pipe
 - a. Tracer wire shall be 12-gauge, blue, insulated copper wire for direct burial.
 - b. Continuity tests will be performed by or under the supervision of the Water Department. Schedule test one (1) week in advance. Contact Maintenance Supervisor at (801) 629-8363.

B. Disinfection

1. Only materials that have been used previously for conveying drinking water may be reused. Used materials shall conform to drinking water rules, be thoroughly cleaned, and be restored to their original conditions (R309-550-6(4)).
2. All new waterlines are to be disinfected in accordance with AWWA Standard C651-05 and a passing bacteria test obtained prior to connecting any to any Ogden City infrastructure.
 - a. Bacteria test will be performed by Ogden City Personnel, and tests will be performed Monday – Thursday before 2:30 p.m. Schedule tests a minimum of 48 hours ahead of time.
 - b. If the first test fails, Contractor will be required to pay for any additional bacteria tests on a costs basis.
 - c. The sample must be obtained from a sampling pipe of fitting no smaller than two inches in diameter.
 - d. Chlorination of the completed water lines shall be completed by the Contractor and no

additional cost to the City.

3. Bacteria samples will be collected by Ogden City Personnel, with the approval of the City Inspector.
4. Any stretch of water main installed greater than 20 feet (20') shall require bacteriological test sampling.
5. In an effort to facilitate successful disinfection, the open ends of all pipelines under construction shall be covered and effectively sealed at the end of the day's work (R309-550-8(9)).

C. Culinary Water Trench Standards

1. Maximum backfill particle size is 3/8 inch (3/8") in the pipe zone. The gradation shall be a well-graded mix that is typical for pipe bedding materials.
2. Pea Gravel is not allowed in any part of the trench.
3. Backfilling of the trench
 - a. The pipe zone requirements are based on the manufacture recommendations but shall be no larger than 3/8 inch without special approval from the City Engineer.
 - 1) Any damage caused to the pipe system by the Contractor shall be replaced or repaired at the Contractor's expense as directed by the City.
 - b. Compaction tests are required every 200 linear feet (200') at half and full depth for any water main installation. Contractor is responsible to provide test results to the City.
 - 1) Compaction shall be to a 95% or greater relative to a modified proctor density.
 - 2) If the City determines an additional test is required, then it shall be provided by the contractor.
 - c. Excavated native material shall not be used as structural fill in any portion of the trench within the public Right-of-Way.
4. If groundwater is encountered, then:
 - a. Trenches must be kept free from water during excavation, pipe installation, and the installation of material in the pipe zone.
5. Excavation of any trench must be to OSHA safety standards.
6. Do not use sewer rock or recycled RAP aggregate in the pipe zone without the approval of the City Engineer.

D. Valves

1. Valves shall be located in all intersections and shall equal number of legs.
2. All valves 12 inch and larger (12") shall be butterfly design.

E. Joints

1. Joints shall be restrained at all valves, tees, crosses, bends and wyes.
2. The number of joints that need to be restrained back from thrust producing fittings shall be determined by the design engineer. The lengths must also be approved by the City Engineer.

F. Fire Hydrants

1. Fire Hydrant spacing:
 - a. Shall not exceed 300 feet (300') in areas of multi-family dwellings, commercial and manufacturing uses.
 - b. In single-family dwelling use areas hydrant spacing shall not exceed 500 feet.
2. Arterial roads shall have fire hydrants placed on both sides of the roadway every 300 feet (or 500 feet around single-family dwellings) to provide for Fire Department access to such hydrants.
3. Hydrants shall be connected to the main using a minimum six-inch (6") diameter ductile iron (D.I.) pipe.
4. All newly constructed fire hydrants shall be flow tested and then painted according to the NFPA color-coding.
 - a. Ogden City Water and the Inspector must witness the flow test.
 - b. The fire hydrant bonnet shall be painted by the developer or contractor and approved by Ogden City.
 - c. All fire hydrants shall be classified based upon the actual flowrate and shall be painted based upon the following color-coding per NFPA:
 - 1) Blue – 1500 gallons per minute or more
 - 2) Green - 1000 to 1499 gallons per minute
 - 3) Orange - 500 to 999 gallons per minute
 - 4) Red – 0 to 499 gallons per minute
5. Permanent dead-end lines shall require a fire hydrant and in line valve installed.
6. Fire hydrants shall not be located within 10' of sanitary sewers and, where possible, within 10' of storm sewers (R309-550-6(5a)).

G. Air Relief Valves and Blow-Offs

1. Blow-offs and air relief valves shall not be connected directly to a sewer R309-550-6(6c).

2. Drainage for vaults or manholes shall provide adequate drainage, preferably to daylight, in accordance with R309-550-6(7).

H. Concrete Thrust Block

1. Provide concrete thrust blocks at all taps, temporary dead ends and at the base of all hydrants.
 - a. Place thrust blocks directly against undisturbed earth.
 - b. Provide bond breakers on all thrust blocks.
 - c. For new waterline systems, new thrust blocks must cure for minimum 8 hours before hydrostatic testing.
 - d. All concrete must be a minimum of 4,000 psi.
 - e. No bag mixes will be allowed for thrust blocks.
2. All other locations shall rely on restrained joints to handle thrust unless directed otherwise by the City Engineer.

I. Water Vaults/Meter Boxes

1. No meter box shall be allowed in any street, driveway, driveway flare, or sidewalk.
2. Drainage for vaults or manholes shall provide adequate drainage, preferably to daylight, in accordance with R309-550-6(7).

J. Backflow Prevention Device or Assembly

1. Backflow prevention devices are required on all laterals 2 inches or smaller.
2. Refer to Section 33 12 17 – Backflow Prevention Device or Assembly in the Amendments to the APWA standards.
3. Backflow and Cross Connection Control shall adhere to Section 9, Chapter 4 of Ogden City Municipal Code. The Safe Drinking Water Act and Amendments of 1996, Utah Code 19-4-112 and Drinking Water Rule Section R309-105-12 are the authority under which Ogden City Ordinance operates. If a discrepancy arises between Ogden City Code and the codes that provide its authority, the strictest code shall govern.

K. Service Laterals

1. Connection fees for a water tap and meter will be assessed at the time a permit is issued.
 - a. Water taps two inches (2") or larger will be performed by Ogden City Personnel.
2. No common use laterals shall be allowed.
 - a. Common use laterals shall be eliminated as redevelopment of the site occurs, or if repair or replacement is needed. The construction or repair cost will be the responsibility of the Owner.
3. Allowable service line shall be constructed of, and shall meet Utah drinking water standards.
 - a. CTS Grade Poly per AWWA C901

- b. CTS Grade Poly PEXa pipe per AWWA C904. See approved materials list for more details.
 - c. Ductile iron leads shall be installed on all fire hydrants.
4. Minimum size shall be one inch (1") diameter for residential connections. All commercial connections shall be sized using AWWA sizing standards but shall in no instance be smaller than a 1" lateral and 1" meter.
 5. Location of water service shall generally run 10 feet to 15 feet from either property line of the lot served.
 6. Location of water meter shall be placed to make the service line run perpendicular to the roadway and water main.
 7. If an existing water service lateral is modified in any manner, the water meter assembly shall be replaced by the Contractor.
 8. Joint trench with the sewer lateral is not allowed.
 - a. The water lateral shall maintain a minimum of 1 foot (1') vertical and 10' horizontal clearance with a stepped trench, water above sewer.
 9. Location of service line shall be marked onto the top of the adjacent curb with a "W"
 - a. Location of extended service lateral towards building shall be located via a 2 x 4 minimum with a blue colored end visibly extended above adjacent surface.
 10. Minimum static pressure allowed to each individual service shall not drop below 50 psi (50 pounds per square inch) as measured at the water main without approval of the City Engineer.
 11. Three (3) piece unions shall not be allowed unless approved by the City Engineer.
 12. Service lines shall be capped until they are connected for service (R309-550-11(4a)).
 13. Any service lateral of 2" or larger shall conform to the same requirements of Disinfection as mentioned in part B. above.

5-3 Easements

1. Necessary easements for the installation and maintenance of a public culinary water system shall be based on the depth of bury, size of line, and any associated structures. The minimum easement shall be 10 feet (10') wide with the water main centered in the easement but may be larger based on requirements from the Utility Provider and the City Engineer.
 - a. No buildings, utilities, or structures shall be erected or constructed within such easements as to interfere with any associated access to properly maintain the water line or structure.

2. *Legal and physical access is required for all meter boxes.*
 - a. *Physical access shall consist of an all-weather surface sufficient to provide the needs of all routine maintenance and repair equipment.*

5-4 Definitions

1. *Pipe Zone: The zone in a backfilling operation which provides support and surrounds the pipe barrel. The zone extents are typically set by the pipe manufacture.*
2. *Bedding: The area of Pipe Zone located below the haunching of the pipe.*

Chapter 6 – Directional Bore Work

6-1 Design & Permitting Requirements

A. Engineered Plans

1. Ogden City Engineering requires engineered, detailed plans showing the following:
 - a. All excavation locations: (including bore pits, vaults, hand-hold boxes, pedestals, etc),
 - b. All proposed equipment locations,
 - c. Alignment of the Bore Path (dimensioned off of back of curb or off of sidewalk),
 - d. All utilities that are crossed or running near the proposed bore,
 - e. All utility easements (Public, Municipal or Private) that are being used within the scope of work being performed. Streets and properties that do not have utility easements must be identified by leadered notes on each page that said properties appear.
 - f. Plans cannot show work on private property or success-based (future) work; only currently proposed work that is located in the City right-of-way or in utility easements.
 - g. Equipment Specs: Specification sheets for all equipment being installed in the City Right-of-Way or utility easements MUST be included in the plan set.
 - h. All plans submitted for Directional Bore work must be produced by, stamped, signed and dated by a licensed professional Engineer.
 - i. Plans produced by a company that has a current franchise agreement with Ogden City do not need to be stamped but must bear the logo of the franchised company thereon.
 - j. Schematic drawings are not acceptable for submission as "Engineered Plans".

B. Drafting/Drawing Standards for Directional Bore Plans

1. Background: A recent aerial photo should be used as a background. This image should be screened or adjusted so that the utility and design linework is clear and legible, while still being able to distinguish surrounding structures (such as houses, sidewalks, streets, etc).
2. Drawing Scale: Acceptable drawing scales are as shown:
 - a. 1:10, 1:20 – For detailed drawings
 - b. 1:30, 1:40 – For standard Site Plan drawings
 - c. 1:50 – Maximum Scale for Site Plan drawings.

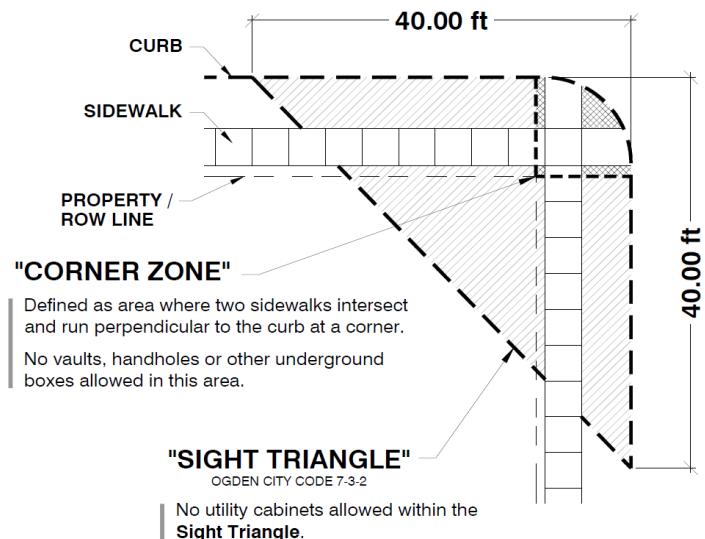
Drawing scales do not need to be exact, however, drawings with scales that exceed the 1:50 scale (1:60, 1:100, 1:200, etc) will be rejected.
3. Lineweights: Use a dark, bold or thicker line to show new, proposed work. Use thinner, lightweight lines to show existing utilities and other features (sidewalks, curb, etc.)
4. Legend: All symbols and linetypes used in a Site Plan for Directional Bore work should be included on a Legend page within the plan set.
5. General Notes: Notes specific to the proposed Directional Bore work in Ogden City should be included in the plan set. Whenever the proposed work encroaches into the UDOT Right-of-Way (including traffic control), then UDOT-specific notes should be included as well.

C. Bore Path Design Constraints

1. **Background:** A recent aerial photo should be used as a background. This image should be screened or adjusted so that the utility and design linework is clear and legible, while still being able to distinguish surrounding structures (such as houses, sidewalks, streets, etc).
2. **Path Location:** The bore path must be a minimum of 3 feet (3') BOC (Back of Curb) in areas with a park strip, and 3 feet (3') BOW (Back of Walk) where the sidewalk is directly behind the curb, to allow space for water meter boxes behind the curb.
3. **Deflection:** Maximum allowable horizontal deviation from bore path is 12 inches (12") in either direction.
4. **Minimum Utility Offsets:**
 - a. Sanitary Sewer Main & Water Main: 10 feet (10')
 - b. Storm Drain Main: 5 feet (5')
 - c. Gas & Power: 3 feet (3')
 - d. Low voltage/Telecom: 1 foot (1')
5. **Bore Depth:** Minimum allowable cover of conduit installed by directional bore is 24 inches (2'), unless a greater depth is specified in the submitted plans.
6. **Road Crossings:** All utilities must be potholed for depth & location verification wherever the bore path crosses a public or private road.
7. **Moratorium Roads:** Bore paths cannot cross Moratorium roads (roads that have been recently repaved or reconditioned) unless approved by City Engineer.

D. Equipment

1. All utility cabinets must be located back of walk in the PUE/MUE. No cabinets are allowed in the park strip unless expressly authorized by the City Engineer.
2. No vaults, handholes or other similar equipment shall be installed underneath the City sidewalk.
3. No bore alignments shall run underneath City sidewalks unless approved by City Engineer.
4. No utility cabinets are allowed within intersection sight triangles, as defined in Ogden City Code 7-3-2 and as shown in Figure 6-1.
5. No vaults, handholes or other underground boxes are allowed in the "corner zone" due to current and future ADA ramp placements.



SIGHT TRIANGLE & CORNER ZONE

Figure 6-1 – Restricted zones – Sight Triangle Zone & the Corner Zone

Please refer to Ogden City Engineering's web page for additional resources in bore path design.

E. Permitting Process

1. All required documents should be submitted to Ogden City Engineering permits team either in person, by email or online portal. Required documents include:
 - a. Site Plan (engineered drawing)
 - b. Traffic Control Plan (MUTCD-compliant drawing)
 - c. Insurance and Bond (Insured's name must match on both documents, and must also match name on permit)
2. Bore lengths 0-3000 linear feet (LF) shall be subject to typical permit review.
3. Bore lengths 3,000 to 20,000 linear feet (LF) in length require an Engineering Site Plan Review
4. Bore lengths greater than 20,000 linear feet (LF) are not accepted and must be broken into smaller projects.
5. Permit fees are based on number of excavations, road crossings and total bore length of project.

6-2 Construction Requirements

A. Preconstruction Meeting

1. An on-site Preconstruction Meeting is required with all directional bore jobs in Ogden City at least 1 business day prior to work starting. Please contact the assigned Engineering Inspector to schedule. The existing site condition will be assessed during the pre-construction meeting.
2. Business Depot Ogden (BDO): A preconstruction meeting with the contractor, sub-contractors, engineering inspector and Boyer Company personnel is required for all jobs located in the Business Depot Ogden. Preconstruction Meetings are typically held Friday mornings, beginning at 10:30am
3. It is recommended that the Contractor make record (either video or photographic) of the properties and infrastructure that will be affected by the scope of work PRIOR to work beginning, to document the condition of said infrastructure and properties.

B. Communication with Residents

1. Contractor shall notify residents whose property will be affected by directional bore work at least 2 business days prior to work beginning and should maintain polite and professional communications with said residents through the course of construction and restoration.

C. Bore Logs & Video Inspection

1. All bore logs must be submitted to the Engineering Inspector.
2. Video inspection may be required at the discretion of the Engineering Inspector to verify that utility laterals or city utility mains have not been damaged during the bore process.
3. The camera used in sewer lateral inspections must have recording capability and present a clear picture of the sewer lateral. Cell phone video of the inspection camera screen will not be accepted; the camera MUST have recording capability.

D. Water for Bore Work

1. Contractors shall not use water connections located on private property.

2. Contractors shall not use water connections located on commercial property without written consent from the water account holder.
3. Contractors connecting to the fire hydrants within Ogden City's water system MUST have a city-issued hydrant meter as part of that connection. Those connecting without a hydrant meter will be prosecuted for theft of services.

E. Repairs and Restoration

1. Contractor shall be responsible for damage or destruction to property and/or utilities during the course of construction, including pipelines, culverts, conduits, cabling, asphalt and concrete pavement. Such damages must be repaired quickly and restored to a condition equal to or better than it was before the bore work. The existing site condition will be assessed during the pre-construction meeting.
2. Landscaping at bore-pit locations or any other locations damaged or disturbed by contractor MUST be restored to a condition equal to or better than it was before the bore work.
3. Any components of an irrigation or sprinkler system (pipe, control wire) that are damaged as a result of permitted directional bore work must be repaired immediately upon discovery.
4. Testing of sprinkler (or irrigation) systems crossed by the bore is a requirement to finalize the permit and close out work. Contractor will still be liable for damage incurred to irrigation and sprinkler systems during the course of a directional bore job during the fall/winter/spring seasons when irrigation systems are not charged. Homeowner/Property owner will have until July 31st of the following summer to submit a damage claim to Ogden City. Upon discovery that the reported damage was indeed caused by the bore work, the Contractor will immediately repair said damage.
5. Failure to repair or replace damaged landscaping, utilities, and infrastructure or to respond to damage complaints in a timely manner may result in the suspension of current and future work and will result in claims filed against the contractor's bond.

F. Boring Under a River

1. Boring under a river requires approval from state and federal agencies. Those approvals must be in place prior to permit issuance.

G. Working Near Trees in the Right-of-Way

1. Trees in the park strip and other areas of the Right-of-Way are owned and maintained by Ogden City. All concerns dealing with tree trimming, broken branches or the health of city trees should be directed to the Ogden City Urban Forester (801-629-8284)
2. Contractors must take measures to protect the trees while working in the City Right-of-Way. Please contact the Urban Forester, and/or visit the Forestry page on the Ogden City website.

Exhibit B

***2025 EDITION OF OGDEN CITY'S
AMENDMENTS AND CLARIFICATIONS, A
SUPPLEMENT TO THE:***

***2017 EDITION OF THE MANUAL OF STANDARD
SPECIFICATIONS by the Utah Chapter of the APWA***

October 7, 2024

***ADOPTED BY THE ADMINISTRATIVE ORDER OF THE OGDEN CITY
ENGINEER***

2025 Edition of Ogden City's Amendments and Clarifications

A supplement to the 2017 Edition of the Manual of Standard Specifications by the Utah Chapter of the APWA

A-1 References

6. The 2017 APWA Manual of Standard Specifications
7. The 2017 APWA Manual of Standard Plans

A-2 Changes to General Conditions Document 00 72 00

G. Document 00 72 00 – General Conditions

2. PART 1 GENERAL

a. DEFINED TERMS (Amended or added Definitions)

- A.1. **Addenda:** Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Contract Documents. The term Addendum shall include bulletins and all other types of written notices issued to potential bidders prior to opening of Bids.
- A.2a. **AGENCY:** The public body with which the DEVELOPER has entered into a Development Agreement and for whom the Work is to be provided. The Agency is also known as the OWNER.
- A.13. **Construction Contract:** The entire and integrated compact between the OWNER and CONTRACTOR or AGENCY and DEVELOPER, memorialized in the Contract Documents concerning the Work to be performed which supersedes prior negotiations, representations or agreements, either written or oral.
- A.14. **Contract Documents:** The Bid Documents, Agreement, Agreement Supplement, Development Agreement (for Developer related projects or subdivisions), General Conditions, Supplementary Conditions, Specifications, Standard Specifications, Drawings, Standard Plans together with all Modifications issued pursuant to Article 3.3 herein after the Effective Date of Construction Contract or Development Agreement (for Developer related projects or subdivisions).
- A.17. **CONTRACTOR:** The person, firm or corporation named as such in the Agreement. If the provisions are applicable to work performed by City personnel, under a permit or as a condition of development, the term shall also include the person, firm or corporation responsible for such work.
- A.20a. **DEVELOPER:** The person, firm or corporation named as such in the Development Agreement.
- A.20b. **Development Agreement:** A written instrument which is signed by the AGENCY and DEVELOPER, and when executed, establishes a contractual relationship between the two parties as to each parties responsibilities related to the development of a specific project or projects.
- A.23. **ENGINEER:** The person, firm or corporation designated in the Agreement as the OWNER's representative and agent for the Construction Contract, acting within the scope of the particular duties entrusted to such a person, firm or corporation. The person may be a

licensed architect, licensed landscape architect, licensed engineer, licensed land surveyor or other individual. For Subdivisions and other development projects constructed under an Engineering permit with Ogden City, the responsibilities of ENGINEER shall reside with Ogden City Engineer. Such developments may have also entered into a Development Agreement, which may include additional language providing further definitions or responsibilities of the ENGINEER.

- A.23a **Failure:** A Work Site Restoration which fails to meet City Engineer Specifications or which results in a deteriorated or substandard condition within the duration of the warranty period. Failure may be settlement of surfaces, deterioration of materials, or other surface irregularities.
- A.31a. **Measurement of Failure:** The act of performing quality assurance through measurement by the City Engineer in accordance with the Specifications for Work which meet the definition of Failure as in the Amendments and Clarifications to the APWA or Defective as defined in the Standard Specifications.
- A.36. **OWNER:** The public body or authority, corporation, association or firm with whom CONTRACTOR has entered into the Agreement. Public works projects shall name Ogden City, a Utah Municipal Corporation, as the public body with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided. The OWNER is also known as the AGENCY when involving projects with which DEVELOPER has entered into the Development Agreement for Work to be provided.
- A. 40. **Plans:** Drawings. Graphic and pictorial productions from the ENGINEER or DEVELOPER, prepared or approved by the City, showing the design, location and dimensions of the Work, and generally include, the plan, elevations, sections, details, schedules and diagrams.
- A.42a. **Public Works Inspector:** The Resident Project Representative furnished by the ENGINEER and assigned the duties of "inspection".
- A.47a. **Schedule of Values:** The CONTRACTOR'S best estimate of costs associated with various portions of the Work.
- A.50 **Standard Plans:** The drawings (both graphical and text) contained in the latest edition of the Manual of Standard Plans published by the Utah Chapter of the American Public Works Association; and the Amendments to the Manual of Standard Plans entitled "Standard Drawings" amended by Ogden City.

b. TERMS (New Article)

- 1) Unless otherwise stated, the words directed, required, permitted, ordered, instructed, designated, considered necessary, prescribed, approved, acceptable, satisfactory, or words of like meaning, refer to actions, expressions, and prerogatives of the ENGINEER.

c. APPLICABILITY (New Article)

- 1) Document 00 72 00, GENERAL CONDITIONS; Division 1, GENERAL REQUIREMENTS; and the Ogden City Amendments and Clarifications to the APWA shall apply to all public works

projects performed under contract with the City and also projects done under permit with Ogden City Engineering for work done on City property or within the City Right-of-Way, except as otherwise required by City Ordinance or recommended by the City Attorney. Except for definitions and terms applicable to other provisions of the manual, its provisions shall have no application to other work not performed under contract or permit with the City as indicated above.

2. PART 2 PRELIMINARY MATTERS

2.2 COPIES OF DOCUMENTS (Addition of paragraph B and C)

- B. OWNER shall not furnish to CONTRACTOR published Contract Documents which include the Manual of Standard Plans and the Manual of Standard Specifications. Such documents shall be purchased separately by the CONTRACTOR.
- C. Copies of all Contract Documents including the Manual of Standard Plans and the Manual of Standard Specifications shall be provided on site by the CONTRACTOR.

3. PART 3 CONTRACT DOCUMENTS, INTENT, AMENDING, RESUE

3.1 INTENT (Amend paragraph B)

- B. **Contract Documents are Complementary:** The Contract Documents are complementary and cooperative and are intended to describe and provide for a complete project; what is required by one document or provisions thereof is binding as if required by all the documents or provisions thereof. Anything in the Specifications and not on the Plans, or on the Plans and not in the Specifications, shall be as though shown or mentioned in both.

5. PART 5 BONDS AND INSURANCE

5.1 PERFORMANCE, PAYMENT, AND OTHER BONDS (Article 5.1 of the General Conditions is hereby repealed and the following is submitted therefore)

- A. Prior to OWNER executing the Agreement, CONTRACTOR shall file with the OWNER a good and sufficient performance Bond and a payment Bond, each in the sum of not less than 100 percent of the Contract Price.
- B. The Bonds shall be executed by the CONTRACTOR and secured by a company duly and regularly authorized to do a general surety business in the State of Utah and named in the current list of Companies holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in current Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department, with an underwriting limitation equal to or greater than the Contract Price which the Bond guarantees or with a current "A-" rating or better in A.M. Best Co., Inc.'s, Best Insurance Reports, Property and Casualty Edition.
- C. Said Bonds shall guarantee the faithful performance of the Construction Contract by the CONTRACTOR and payment of labor and materials. They shall inure by their terms to the benefit of the OWNER. Neither this nor any other provision requiring a performance Bond shall be construed to create any rights in any third party Claimant as against the OWNER for performance of the Work under the Construction Contract.
- D. If the surety on any Bond furnished by CONTRACTOR is subject to any proceeding under

the Bankruptcy Code (Title 11, United States Code) or becomes insolvent or its right to do business is terminated in the State of Utah or it ceases to meet the requirements of this Article, CONTRACTOR shall, within 15 days thereafter, substitute another Bond and surety, both of which must be acceptable to OWNER.

5.2 INSURANCE (Article 5.2 of the General Conditions is hereby repealed and the following is substituted therefore)

- A. *In General: All policies of insurance provided shall be issued by insurance companies qualified to do business in the State of Utah and listed on the U.S. Treasury Department's current Department of Treasury Fiscal Services List 570, or having a general policy holder's rating of not less than "A-" in the most current available A. M. Best Co., Inc.'s, Best's Insurance Report.*
1. *Each insurance policy required by the Agreement, excepting policies for Workers' Compensation and Professional Liability, shall include an endorsement providing that Ogden City, its elected and appointed officials, employees, agents and volunteers are to be named as additional insured as respect to operations and activities of, or on behalf of, the named insured as performed under Agreement with the City.*
 2. *Insurance is to be placed with insurers acceptable to and approved by the CITY. CONTRACTOR's insurer must be authorized to do business in Utah at the time the contract is executed and throughout the time period the contract is maintained, unless otherwise agreed to in writing by the CITY. Failure to maintain or renew coverage or to provide evidence of renewal will be treated by CITY as a material breach of contact.*
 3. *The CITY shall be furnished with original certificates of insurance and endorsements effecting coverage required within, signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements are to be received by the CITY before signing the Agreement.*
 4. *Any deductibles or self-insured retentions must be declared to and approved by the CITY. At the option of the CITY, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the CITY, its elected and appointed officials, employees, agents and volunteers; or CONTRACTOR shall provide a financial guarantee satisfactory to the CITY guaranteeing payment of losses and related investigations, claim administration and defense expenses.*
 5. *In addition to any other remedies CITY may have if CONTRACTOR fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time limits required, CITY may, at its option:*
 - a. *Obtain such insurance, deduct and retain the amount of premiums for such insurance from any sums due under the Agreement,*
 - b. *Order CONTRACTOR to stop work under this Agreement and/or withhold any payment(s) which become due to CONTRACTOR until CONTRACTOR demonstrates compliance with requirements,*
 - c. *Terminate this Agreement*
 - d. *Or other reasonable remedy*

6. CONTRACTOR shall include all subcontractors and insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein.
7. Nothing contained herein shall be construed as limiting in any way the extent to which CONTRACTOR may be held responsible for payments of damages to persons or property resulting from CONTRACTOR's or its subcontractor's performance of the work covered under this Agreement.
8. If requested, CONTRACTOR shall also furnish copies of the insurance policies secured for the Work. The CITY reserves the right to require complete, certified copies of all required insurance policies at any time. CONTRACTOR shall procure and maintain for the duration of the contact, insurance against claims for injuries to persons or damages to property, which may arise from or in connection with the performance of the work hereunder by the CONTRACTOR, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in CONTRACTOR's Bid. The amount of the insurance shall not be less than the following:
 - a. **Worker's Compensation Insurance:** In addition to other required insurance, the CONTRACTOR shall obtain and maintain during the life of the Construction Contract, worker's compensation insurance as required by Laws and Regulations for all of CONTRACTOR's employees employed at the site of the Work, and in case any Work is subcontracted, the CONTRACTOR shall require the subcontractor similarly to provide worker's compensation insurance for all of the latter's employees, unless such employees are covered by protection as required by Laws and Regulations. Worker's compensation limits as required by the Labor Code of the State of Utah and employers' liability limits are \$1,000,000 per accident.
 - b. **Business Automobile Liability:** \$1,000,000.00 combined single limit per accident for bodily injury and property damage for owned, non-owned and hired vehicles.
 - c. **Commercial General Liability Insurance:** CONTRACTOR shall secure and maintain during the life of the Construction Contract and at all times thereafter when CONTRACTOR may be correcting, removing or replacing Defective Work, a comprehensive commercial general liability insurance policy. The policy shall protect the CONTRACTOR, the OWNER, the ENGINEER, and any subcontractor performing work covered by the Construction Contract from claims for damages for personal injury, including accidental death, and from claims for property damage which may arise from CONTRACTOR's operations under this Construction Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by either of them. Unless specified otherwise in the Supplementary Conditions, the minimum amounts of such insurance for combined single limit per occurrence shall be \$1,000,000.00 for bodily injury, personal injury and property damage and \$3,000,000 general aggregate.
9. The policies are to contain, or be endorsed to contain, the following provisions:

- a. The Contractor's insurance coverage shall be primary insurance and any insurance or self-insurance maintained by the City, its officers, official employees or volunteers shall be excess of the Contractor's insurance and shall not contribute with insurance provided by this policy. Each policy shall be endorsed to state that coverage shall not be suspended, voided, canceled, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City.
- b. Policy to include coverage for premises and operations. Contractual liability, personal injury liability, products/completed operations liability, broad-form property damage (if applicable) and independent Contractor's liability (if applicable) written on an occurrence form.
- c. Any deductibles or self-insured retention must be declared to and approved by the City. Insurance is to be placed with insurers acceptable to and approved by the City. The City shall be furnished with certificates of insurance and with original endorsements affecting coverage required within, signed by a person authorized by the insurer to bind coverage on its behalf. All certificates and endorsements are to be received and approved by the City before work commences. The City reserves the right to require complete, certified copies of all required insurance policies at any time.
- d. The CONTRACTOR shall include all subcontractors as insured under its policies or shall furnish separated certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein.
- e. **Automotive Public Liability Insurance:** Whenever CONTRACTOR or any subcontractor shall use and operate automobiles, trucks or other vehicles on public streets and highways in complying with the terms and conditions of the Construction Contract, CONTRACTOR or each subcontractor shall carry automobile public liability insurance with limits not less than \$1,000,000.00 for any one accident or loss.
- f. **Insurance Non-cancelable for 30 Days:** Each policy of insurance provided in the Contract Documents shall be absolutely non-cancelable for a period of not less than 30 days after notice and shall contain the following provisions or one substantially the same as the following: "This policy shall not be subject to cancellation, change, or reduction of coverage by the other party or parties hereto, unless notice, as defined herein is sent to the OWNER, with a copy to the ENGINEER and the OWNER's attorney."
- g. **Builder's Risk:** CONTRACTOR agrees to and assumes the risk of loss for any damage or loss to the Work and Project by any means or occurrence until Substantial Completion. CONTRACTOR further agrees to obtain builder's risk or course of construction insurance in the total amount of the Contract Price.
- h. **Ogden City Corporation Additional Insured:** Each policy of insurance provided in the Contract Documents shall also protect the government of O.C.C. during the life of the Construction Contract and at all times thereafter from public liability and property damage claims indicated in paragraph 5.2D,

and automotive public liability damage claims indicated in paragraph 5.2E above.

6. PART 6 CONTRACTOR'S RESPONSIBILITIES

6.2 LABOR, MATERAILS, AND EQUIPMENT (Amend paragraph C)

- C. **Overtime:** If CONTRACTOR permits overtime work beyond the standard hours of operation for Ogden City Engineering employees or permits the performance of Work on Saturday, Sunday or any Ogden City legal holiday CONTRACTOR shall do so at no increase to the Contract Price and shall give prior written notice to ENGINEER. CONTRACTOR shall be responsible for all additional costs associated with overtime incurred by OWNER, ENGINEER or their representatives or assistants. Said costs may be considered as deductions from the amounts payable to the CONTRACTOR at the discretion of the ENGINEER.

6.7 PERMITS (Addition of paragraph H)

- H. **Ogden City Permits:** In addition to any other permits required for the Work, the CONTRACTOR shall obtain permits from Ogden City Corporation for Work on the Project.
1. **OWNER-Paid Permits:** CONTRACTOR shall be responsible for submitting plans, scheduling inspections and paying all costs incidental to such actions as required for any building, plumbing, mechanical, electrical, water, sewer or drainage permit required by Ogden City Corporation. Except for construction water meter fees, the fees for these permits shall be paid by the OWNER and shall not be included in CONTRACTOR's bid. The following listed permit is not exclusive and does not relieve CONTRACTOR of the responsibility of obtaining all permits.
 - a. **Permit for Work in the Public Way:** From Ogden City's Engineering Division, One Stop Counter, 2549 Washington Boulevard, Suite 240, Ogden City, Utah 84401. Phone (801) 629-8986.
 2. **CONTRACTOR-Paid Permits:** The fees for permits not paid for by the OWNER shall be included in the CONTRACTOR's Bid. The following list is not exclusive and does not relieve CONTRACTOR of the responsibility of obtaining all permits:
 - a. **Construction Water:** If water for construction is required to be taken from fire hydrants or from a new water service, CONTRACTOR shall be solely responsible for obtaining and paying for necessary permits and water usage to Ogden City. Construction water permits to connect to a new water service can be obtained, along with a description of backflow requirements at Ogden City One Stop Counter, 2549 Washington Boulevard, Ogden City, Utah 84401. (801) 629-8985. Construction water obtained from a fire hydrant must be metered from an Ogden City hydrant meter. Meters can be rented with a deposit from Ogden City Utilities 133 W. 29th St. Ogden City, Utah 84401. (801) 629-8321. Connections made without proper backflow prevention or hydrants connected without an Ogden City hydrant meter may be subject to penalties or fines.

- b. **Building, Electrical and Plumbing Permits:** From Ogden City Building Services Division, Inspections office, 2549 Washington Boulevard, Ogden City, Utah, 84401. Phone (801) 629-8985.
- c. **Permit and Fees for Tap of Water Mains:** From Ogden City One Stop Counter, 2549 Washington Boulevard, Suite 240, Ogden, Utah 84401, (801) 629-8986 or Ogden City Water Utility, 175 West 29th Street, Ogden, Utah, (801) 629-8321.
- d. **Permit and Fees for Tap of Sewer Mains:** From Ogden City One Stop Counter, 2549 Washington Boulevard, Suite 240, Ogden, Utah 84401, (801) 629-8986.
- e. **General Permit for Storm Water Discharge:**
 - 1) Between 5,000 square feet and 0.99 acres: From Ogden City One Stop Counter, 2549 Washington Boulevard, Suite 240, Ogden, Utah 84401, (801) 629-8986
 - 2) 1 acre or more: From the State of Utah, Department of Environmental Quality, Division of Water Quality. Fee varies; contact the State for a quote.
- f. **Ogden City Business Licenses:** From Ogden City One Stop Counter, 2549 Washington Boulevard, Suite 240, Ogden, Utah 84401, (801) 629-8687.
 - 1) In addition to any other licenses required for the Work, the CONTRACTOR shall obtain a business license from Ogden City Corporation for Work on the Project.
 - a) A general contractor who performs labor will be required to show evidence of a current Ogden City Business License, if he/she has a business in Ogden City.
 - b) Only those major subcontractors, i.e. mechanical, electrical, and plumbing that are required to secure permits from the Ogden City Inspection Division will be required to secure an Ogden City Business License, if they have a business in Ogden City.
- g. **Other Permits:** All other permit fees required by Ogden City, the State of Utah, the United States of America, and any of their agencies, or by any private utility companies, shall be paid for and obtained by the CONTRACTOR and included in the CONTRACTOR's Bid. The following list is not exclusive and does not relieve CONTRACTOR of the responsibility of obtaining all permits:
 - 1) **UDOT Permits:** From UDOT Region 1 Permits Officer; Phone (801)-620-1639.
 - 2) **Private Property Owner Permit:** Written permission to use private water.
 - 3) **Private Property Owner Permit:** Written permission to store product, equipment materials and supplies outside of Work site boundaries.
 - 4) **Flood Control Permit:** From Weber County, Department of Public Works, Engineering, Ogden City, Utah.

6.15 CONTINUING THE WORK (Repeal paragraph B and substitute the following)

B. No Damage for Delay:

1. *In all cases where CONTRACTOR is delayed, hindered, or obstructed in the execution of the work, or any part thereof, for any reason whatsoever, the CONTRACTOR shall not be entitled to claim or recover any damages or additional payment from the OWNER or ENGINEER. It is however, the intent of this contract that in all cases where the CONTRACTOR is substantially delayed, hindered, or obstructed in the execution of the work through no fault of the CONTRACTOR and because of conditions beyond the CONTRACTOR's control, the contract time shall be extended by change order by such amount as conditions, in the judgment of the ENGINEER, justify, and such extension of Contract Time shall be the exclusive remedy of the CONTRACTOR.*
2. *Claims relating to time shall be made in accordance with the applications provisions of Part 12 CHANGE OF CONTRACT TIME, 12.1 CONTRACT TIME ADJUSTMENT. CONTRACTOR'S plea that insufficient time was specified is not a valid reason for extension of Contract Time.*
3. *Permitting the CONTRACTOR to continue and finish the work or any part of it after the time fixed for its completion, or after that date to which the time may have been extended, will in no way operate as a waiver on the part of the OWNER of any of its rights under the Contract.*

6.16 INDEMNIFICATION (Amend paragraph A and B)

- A. ***Indemnification of OWNER:** CONTRACTOR shall indemnify, defend and hold harmless OWNER and ENGINEER, and their elected officials, officers, agents, employees, and volunteers from and against any and all claims, damages, losses and expenses, direct, indirect or consequential (including, but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) arising out of or resulting from the negligent acts or omissions in performance of Work by CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not the claim, damage, loss, etc. arising from the act or omission is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.*
- B. ***Indemnification Not Limited:** In any claims against OWNER or ENGINEER or any of their elected officials, officers, agents, employees or volunteers by any employees of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.17A shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor or other person or organization under workers' compensations acts, disability benefit acts or other employee benefit acts.*

PART 14 PAYMENTS TO CONTRACTOR AND COMPLETION (New Article 14.11)

14.11 POST CONSTRUCTION CONFERENCE

- A. *Within 20 days after the CONTRACTOR has completed all Punch list Work to the satisfaction of the ENGINEER and after the ENGINEER has indicated that the Work is acceptable, but prior to final application for payment, the CONTRACTOR shall attend a conference with the ENGINEER and others to:*
 1. *Discuss the project's successes and failures;*
 2. *Discuss project procedures;*
 3. *Discuss change orders or work directives from the project;*
 4. *Discuss retainage and final payment;*
 5. *Discuss procedures pertaining to the processing of payments;*
 6. *Discuss the submittal of the "as-built" drawings; and*
 7. *Review or discuss other items deemed necessary by ENGINEER or CONTRACTOR.*
- B. *The conference will be held at a mutually agreed time and place attended by CONTRACTOR, its superintendent, and its Subcontractors as appropriate. Other attendees will be:*
 1. *ENGINEER and/or Resident Project Representative(s)*
 2. *Representative(s) of OWNER.*
 3. *Governmental representative(s) as appropriate*
 4. *Others as requested by CONTRACTOR, OWNER, or ENGINEER.*
- C. *ENGINEER will preside at the Post-Construction Conference and will arrange for recording and distributing minutes to all persons in attendance.*

PART 15 SUSPENSION OF WORK AND TERMINATION

15.2 OWNER MAY TERMINATE (Amend paragraph F)

- F. *Termination for OWNER'S Convenience:* Upon 10 day's written notice to CONTRACTOR, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Construction Contract. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but is not limited to, direct, indirect and consequential costs, less OWNER's costs. Anticipated profit upon terminated work shall not be included as part of CONTRACTOR's termination costs.

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A-4 DIVISION 31 EARTH WORK

A. SECTION 31 05 13 – COMMON FILL

1. PART 2 PRODUCTS

2.5 NATIVE (Addition of paragraph B)

B. Maximum particle size shall not exceed 6" in the longest direction. All other larger native material, which must be removed, shall be deposited offsite from work zone at no additional cost to the OWNER. Native material meeting the above specification of maximum particle size shall not be removed from the work zone until ENGINEER has made a written determination that said material would not be reused in any application within the scope of the project.

2.8 GRAVEL (Addition of Table 3 to paragraph A)

Table 3 – Sizes of Processed Aggregate	
US Sieve Size	Gravel (% Passing by Weight)
2"	
1 1/2"	100%
1"	75%
3/4"	15%
1/2"	10%
3/8"	
No. 4	
No. 16	
No. 200	

B. SECTION 31 25 00 – EROSION AND SEDIMENT CONTROL

2. PART 3 EXECUTION

3.1 PREPARATION (Addition of paragraph E)

E. CONTRACTOR must implement construction site erosion controls sufficient to meet the requirements of the EPA Phase II Storm Water Pollution Control requirements as authorized in the Clean Water Act. CONTRACTOR may select whichever best management practices will, in his opinion, best address these requirements. CONTRACTOR must formalize these measures into an Erosion Control Plan and submit such to the City for review and approval. CONTRACTOR may not commence any site work, except mobilization, until the approved erosion control plan has been installed and the ENGINEER concurs with its proper installation.

A-5 DIVISION 32 EXTERIOR IMPROVEMENTS

A. SECTION 32 01 13.64 – CHIP SEAL

2. PART 2 PRODUCTS

2.6 COVER AGGREGATE

A. GRADATION (Addition of subparagraph 1)

1. Grade A is the only acceptable cover aggregate.

B. SECTION 32 12 16.13 – PLANT-MIX BITUMINOUS PAVING

1. PART 1 GENERAL

1.5 WEATHER

A. Temperature (Amend subparagraph 1)

1. Do not pave until the ground temperature is 50 deg F. and rising.

2. PART 3 EXECUTION

3.7 PAVEMENT PLACEMENT

A. General (Amend Table 3 – Minimum Pavement Temperature in Degrees F.)

Air Temperature Deg F.	Compacted Mat Thickness					
	3/4"	1"	1-1/2"	2"	3"	4"
50-59	-	295	290	280	270	255
60-69	-	290	285	275	265	250
70-79	285	285	280	270	265	250
80-89	280	275	270	265	260	250
90+	275	270	265	260	250	250

C. SECTION 32 12 16.19 – COLD-MIX BITUMINOUS PAVING

1. PART 1 GENERAL

1.4 WEATHER (Addition of paragraph A)

A. Temperature:

1. Construct road mix bituminous surface course only when air temperature in the shade and roadbed temperature are less than 40 degrees F. The temperature restrictions may be waived only upon written authorization from ENGINEER.
2. Cease use of cold - mix - asphalt concrete when air temperature rises above 40 degrees F.

D. SECTION 32 16 13 – DRIVEWAY, SIDEWALK, CURB, GUTTER

3. PART 3 EXECUTION

3.4 CONTRACTION JOINTS

A. Curb, Gutter, Waterway: (Amend subparagraph 1)

1. Place joints at intervals not exceeding 10 feet.

3.5 EXPANSION JOINTS

A. Curb, Gutter, Waterway: (Addition of subparagraph 4)

1. For all form placed curb and gutter, place expansion joints at intervals not exceeding 40 feet. Use preformed expansion material, type F1.

A-6 Division 33 UTILITIES

A. SECTION 33 05 03 – COPPER PIPE

2. PART 2 PRODUCTS

2.2 CONNECTIONS (Amend paragraph A)

- A. Compression Only.

B. SECTION 33 05 06 – POLYETHYLENE PIPE

2. PART 2 PRODUCTS (New article 2.4)

2.4 HDPE (High Density Polyethylene) PIPE

- A. **Material:** AASHTO M-252 & M-294 Corrugated Polyethylene Pipe, solid or perforated. Smooth Inner Wall Type S, 4 inch to 36 inch inside diameter.
1. 4 inch to 10 inch inside diameter meeting AASHTO M-252, and 12 inch to 36 inch inside diameter meeting AASHTO M-294.
 2. The appropriate material specification to be embossed on the pipe every 10 feet.
 3. Slots or perforations shall be in corrugation valleys only and should be clean and free of burrs.
 4. The longitudinal green stripe is simply a logo and its location has nothing to do with the pipe installation. However, use of these lines may help in avoiding misalignment.
- B. **Fitting:** Separate couplings and fittings should be marked with pipe manufacture name or logo. Tape shall not be used to join pipe sections unless intended for temporary use and then only as approved by the ENGINEER.
- C. **Joint:** Joints specified to have gaskets per ASTM F-477 have a rubber gasket seated in a groove on the spigot end. Foam-type weather stripping material is not in compliance.

3. PART 3 EXECUTION

3.1 INSTALLATION (Addition of paragraph C)

- C. Installation of HDPE pipe shall be as follows:
1. Handle the larger sizes (24 inches – 48 inches) with slings, not chains, preferably at two (2) pick-up points. When unloading do not drop pipe on end.
 2. HDPE corrugated pipe is lightweight, which makes handling easy. However, it can be shifted laterally in the trench or may float if not held in place with soil or other methods.
 3. The pipe depends on a combination of pipe stiffness and select and common backfill strength to perform as a structure. Select material in the pipe-zone should be compacted to at least 90% in non-traffic easement areas and 95% in traffic areas and should contain no particles, which do not comply with the gradation of untreated base course, Grade 1.
 4. Heavy construction equipment and vehicles should not be permitted to pass over the pipe unless a minimum of two (2) feet or one pipe diameter (whichever is greater) of well compacted (min. 90% Proctor) soil or gravel is covering the pipe.

5. High-energy compactors such as Hydro-Hammers should not be used until the pipe is covered by at least 4 feet of soil.
6. In the absence of a special provision provided by the CITY, use ASTM D-2321 as a recommended installation guide.
7. To ensure adequate compaction in the haunches, lift thickness prior to compaction from the bedding to the pipe spring line shall not exceed 4 inches, and shall be worked in around the pipe by hand to ensure uniform support.

C. SECTION 33 05 20 – BACKFILLING TRENCHES

2. PART 2 PRODUCTS

2.1 BACKFILL MATERIALS (Amend paragraph A, Addition of paragraph E)

- A. Common fill, Section 31 05 13. (Addition of subparagraph 1, 2, and 3)
 1. Sand is prohibited for use as backfill material in the trench above the pipe zone. Sand may be used immediately adjacent to culinary pipes and/or pipe coverings requiring protection from damage, which may be caused by larger aggregate backfill material.
 2. An exception to this prohibition may be granted by the ENGINEER if adjacent native material consists entirely of a sandy material as defined by a geotechnical report.
 3. Common fill used as bedding and backfill material must be of a granular composition, non-expansive material, well graded material containing a wide range of sizes and possesses the qualities to meet the required compaction requirements.
- E. Gravel, Section 31 05 13.
 1. Pea Gravel and Squeegee material are prohibited for use as backfill material in the pipe zone or trench above the pipe zone. No exception to this prohibition may be granted by the ENGINEER. Gravel used as bedding and backfill material must meet ASTM No. 4 size.

3. PART 3 EXECUTION

3.5 PIPE ZONE (Addition of paragraph F)

- F. **Tracer Wire:** Required for all potable water lines or other non-metallic water lines.
 1. Tracer wire shall be installed above and in immediate contact with and along the pipe centerline. Tracer wire shall be attached to pipeline to minimize movement during backfill process. Attachments shall be by means of zip ties at 10 foot increments.
 2. Tracer wire shall be extended to and rise to the surface with valve box installation.
 3. An additional 12 inch loop will be added at each end of the tracer wire to allow for slack during adjustment in road elevation.
 4. S curves in the tracer wire, equal to the diameter of the pipe, shall be installed and added to at each bell to allow for the wire to be moved during tapping or additional maintenance or repair work on the water main. When the pipe consists of a continuous material lacking joints or bells, provide S curves at 10 foot increments.

3.6 TRENCH ABOVE PIPE ZONE (Amend paragraph D)

- D. *Install continuous identification tape directly over buried lines 12 inches to 18 inches above the top of pipe.*

D. SECTION 33 05 25 – PAVEMENT RESTORATION

1. PART 1 GENERAL

1.4 WEATHER (Remove paragraph A and replace)

- A. Bituminous Pavement Restoration
1. *If air and roadbed temperatures in the shade are less than 50 deg F asphalt placement is considered a temporary patch.*
 2. *Remove any temporary patching and provide permanent patch material when temperature exceeds 50 deg F CONTRACTOR may perform work after cold weather season if authorized in writing by ENGINEER.*

E. SECTION 33 08 00 – COMMISSIONING OF WATER UTILITIES

1. PART 1 GENERAL

1.2 DEFINITIONS (Addition of paragraph C)

- C. ANSI/NSF 60: Drinking Water Treatment Chemicals.

2. PART 2 PRODUCTS (New article 2.2)

2.2 DISINFECTANTS

- A. *All chemicals used in performing the disinfection test shall conform to ANSI/NSF 60. Chemical containers shall bear the ANSI/NSF 60 certification mark.*

3. PART 3 EXECUTION

3.2 PREPARATION (Amend paragraph C)

- C. *Remove debris, sediment and/or other material from installed pipe prior to testing, leaving pipe in a clean manner. All material collected shall be removed from pipe prior to connecting to existing piping system. It is forbidden to discharge or flush sand, gravel, concrete, debris or other foreign material into existing pipeline system. Flushing with clean water only will be allowed but with minimal flows to eliminate exceeding capacities of the existing gravity systems. Flushing into existing pressurized water systems is NOT ALLOWED.*

3.3 GRADE AND ALIGNMENT TEST (Addition of paragraph B)

- B. *Do not exceed deflections allowed by pipe manufacturer.*

3.6 EXFILTRATION TEST (Amend paragraphs B and C)

- B. *Air Test: The low pressure air test shall be conducted by the following method under the direction of the ENGINEER:*

1. *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 connections or extensions.*
2. *After 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. The second hose shall be used for continuous reading of the air pressure in the sealed line. The third hose shall be used for introducing low pressure air into the sealed line.

3. There shall be a 3-1/2 inch or larger diameter, 0.30 psig gauge 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 percent of the complete dial range.
4. 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 groundwater that may be over the pipe. Groundwater's contribution to the head pressure shall be at a rate of 0.433 psi per foot of head. At least 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.
5. The pipe and joints shall 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 groundwater that may be over the pipe) shall not be less than the time shown for the given diameters in the following table:

Pipe Diameter (inch)	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

6. If the installation fails to meet these requirements, the CONTRACTOR shall determine at his own expense the source of leakage and shall repair or replace all defective materials and/or workmanship.
- C. Hydrostatic test:
1. Pressure During Test: After the pipe has been laid and partially backfilled, all newly laid pipe, or any valve section of it shall, unless otherwise specified, be subjected to hydrostatic pressure of 225 psi.
 2. Duration of Pressure Test: The duration of each pressure test shall be at least two (2) hours.
 3. Test Procedure: Each pipe segment shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a satisfactory manner. Testing against closed valves will be not be allowed as long as the pipe segment is physically connected to the existing potable water system. No pressure testing

may occur against a valve connected to any existing piping system. The pump, pipe connection and all necessary apparatus, including gauges and meters, shall be furnished by the CONTRACTOR. The OWNER will make all taps into the pipe, but the CONTRACTOR shall furnish all necessary assistance for conducting the tests.

4. *Expelling Air Before Test: Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, air release mechanisms shall be installed, if necessary, at points of highest elevation, and afterwards tightly capped.*
5. *Examination Under Pressure. All pipes, fittings, valves, hydrants and joints will be subject to examination under pressure during the hydrostatic test. Any defective pipes, fittings, hydrants or valves discovered in consequence of this pressure test shall be removed and replaced by the CONTRACTOR with sound material, at no expense to the OWNER, and the test shall be repeated until satisfactory to the ENGINEER.*
6. *No piping installation will be acceptable until the leakage is less than the amount allowed by industry standards for the type of pipe material being tested or if no standard prevails, than the number of gallons per-hour is determined by the formula:*

$$Q = [LD \times (P)^{\frac{1}{2}}]/133,200$$

Where: Q = allowable leakage, in gallons per-hour
 L = length of pipe under test in feet
 D = diameter of pipe in inches
 P = average test pressure, in pounds per square inch (gauge)

3.8 OBSTRUCTION AND DEFLECTION TEST (Amend Paragraph A, Addition of Paragraphs B, C, D, E, and F)

- A. *Obstructions: Maximum protuberance is 1-inch.*
- B. *Visually examine pipe internally for obstructions, reductions in pipe shape, grade, infiltration and required lateral connections by means of a closed circuit televised recording. Said inspection shall be by closed circuit video inspection of the completed section or sections and shall log the location of all service taps and problem areas which shall include the actual footage of the line being inspected. Videotape shall become the property of CITY. Any defective workmanship indicated by video inspection shall be repaired by the CONTRACTOR at no expense to the OWNER.*
- C. *Prior to commencement of Obstruction and Deflection tests, the pipe must be water flushed to clean and remove all debris. All debris must be trapped on a screen and/or blocked and removed from the downstream manhole and not allowed to enter the existing piping network.*
- D. *For all flexible pipes, (PVC, HDPE, CMP, DI or other flexible materials), Deflection testing is required.*
- E. *Deflections: Maximum reduction of internal diameter in any plane when measured not*

less than 30 calendar days following the installation, backfill and compaction with compaction results which are acceptable to the City Engineer are as follows:

1. Use ASTM D 3034 for determining mandrel size.
 - a) Polyvinyl Chloride Pipe – 7.5%
 - b) High Density Polyethylene Pipe – 5%
 - c) Corrugate Metal Pipe – 5%
- F. *When a visual test is not feasible, and when approved by the ENGINEER, The CONTRACTOR, with INSPECTOR present, shall pull a "Go/No-Go" Mandrel or provide a Laser Deflection Test. The test must be inspected and approved by the ENGINEER, through the full length of the installed flexible pipe.*
 1. *The Mandrel shall be fabricated from suitable metal with a minimum of nine (9) properly sized radial fins mounted upon a center pulling shaft. In any case, the Mandrel shall be provided with an odd number of rigidly mounted radial fins.*
 2. *The Mandrel shall be provided with a proof-sizing ring that can demonstrate that the Mandrel's minimum outside diameter (OD) is not less than 100% minus the above specified deflection limit of the specified minimum inside diameter of the installed flexible pipe.*
 3. *The Mandrel shall be pulled by the CONTRACTOR through one-hundred percent (100%) of the installed flexible pipe without using mechanical equipment.*
 4. *Failure of the Mandrel to pass through a pipeline shall be deemed evidence of inadequate installation by the CONTRACTOR not in compliance with the Project Specifications. Where mandrel testing would damage pipe coatings, an alternative method of deflection measurement shall be submitted by the CONTRACTOR and may be approved by the ENGINEER.*
 5. *The ENGINEER may require, if deemed appropriate or necessary, additional proof testing of designated lengths of buried flexible pipe approximately on year (1yr) after installation by prior to the expiration of the CONTRACTOR's Warrante Period. The flexible pipeline shall be cleaned adequately prior to performing the deflection proof test. If pipeline deflection exceeds deflection limits during proof testing, the pipeline shall be removed and replaced at the CONTRACTOR's expense.*
 6. *The Laser Deflection Test shall be conducted at least 30 days after backfill and prior to video inspection.*
 7. *The Laser Deflection Test shall inspect, measure, and record host pipe conditions using digital video recording equipment in MPEG 1 format with 352x240/320x240x30 fps resolution and audio bit rate of 256 Kbps.*
 8. *The Laser Deflection Test shall identify the date, pipe reach, slope, upstream and downstream manhole numbers, and manhole to manhole footage.*
 9. *The Laser Deflection Test shall provide a video inspection log as a computerized data report with a map of the system inspected with appropriate identification labels as referenced in the video.*

3.10 COMMISSIONING TEST SCHEULE (Amend Paragraph A)

- A. Potable Water System: (Amend Table 3 to include the following)
 1. Add Tracer Wire Test

2. Hydrant Flow Test.

F. SECTION 33 11 00 – WATER DISTRIBUTION AND TRANSMISSION

1. PART 1 GENERAL

1.2 REFERENCES (Addition of paragraph F)

F. ANSI/NSF 61: Drinking Water System Components – Health Effects

2. PART 2 PRODUCTS

2.6 TAPPING SADDLES (Addition of paragraphs E and F)

- E. CONTRACTOR to provide tapping saddles (sizes less than two (2) inch) shall be FORD Stainless Steel Saddles Style FS300.
- F. Tapping Saddles for sizes two (2) inch and greater shall be ROMAC, double strap service saddles, style 202N.

2.8 ACCESSORIES (Addition of paragraphs I and J)

- I. Wires:
1. General: Wire shall conform to applicable requirements of NEMA WC 3-80, WC 5-73 and WC 7-88.
 2. Test Wires:
 - a) No. 12 AWG wire for prepackaged galvanic anode and test leads and No. 14 AWG reference electrode lead wires shall be single-conductor, stranded copper wire with 600-volt, TW, THWN, THHN or HMWPE insulation.
 - b) No.2 AWG, No.4 AWG and No.8 AWG for bond and pipe lead wires shall be single-conductor, stranded copper wire with 600-volt, HMWPE insulation.
 3. Tracer Wire:
 - a) No.10 AWG wire for tracer wire shall be single-conductor, solid copper wire with 600-volt, TW, THWN, THHN or HMWPE insulation.
 4. Wire Identification:
 - a) Wire insulation color shall indicate the function of each wire and shall be as shown on the Drawings and as follows:
 - 1) Pipeline test wires:

Water Pipeline:	Blue
Other Pipeline:	White or as requested by ENGINEER
Unprotected Pipe:	Black
 - 2) Casings: Orange
 - 3) Anode lead wires: Black
 - 4) Reference electrode wires: Yellow
 - 5) Tracer wires: Green

J. Thermite Weld Materials

1. Electrical connection of copper wire or copper strap to metallic (steel, ductile iron,

and cast iron) fittings and pipe shall be by the thermite weld (Caldweld) method.

3. PART 3 EXECUTION (Addition of article 3.16, 3.17, 3.18, 3.19, 3.20)

3.8 INSTALLATION - TAPS (Remove and replace paragraph C and D)

- C. Taps 2 inches and larger on culinary main lines will be performed by the Ogden City Water Department.
 - 1. Service taps on private mains will be performed by the CONTRACTOR and observed by the Ogden City Water Department.
- D. Minimum distance between taps and other taps, fittings, and appurtenances shall be 24 inches with a (5) degree stagger. However, minimum distances between taps on the same side of the main shall be 36 inches for accessibility/maintenance. Do not make service taps within 24 inches within the end of the pipe. Install taps at 60 degrees from vertical, or authorized by ENGINEER.

3.9 INSTALLATION – SERVICE LINE (Addition of paragraph D)

- A. Replacing Existing Water Service Line: APWA Plan 541. (Addition of subparagraphs 5 thru 9)
 - 5. Apply for and pay applicable connection fees to Ogden City for the indicated size and location of tap to water main.
 - a) Comply with all requirements of Ogden City relating to excavation, traffic control, backfill and protection of the water main as related to the water main tap.
 - 6. Ogden City Water Utility will perform the tap to the water main.
 - 7. Install service lines as indicated or directed by ENGINEER to meter.
 - a) Additionally, extend the service line to three (3) feet beyond sidewalk towards structure being serviced. Provide a 2 x 4 wooden stake at the end of the service line, visibly extended above the finished ground surface and having a blue colored painted end.
 - 8. Prior to Ogden City Water Utility performing the water main tap, the CONTRACTOR shall supply, at CONTRACTOR's expense, any required tapping saddles for taps less than two inches in diameter.
 - 9. When existing meter and meter boxes are relocated, CONTRACTOR is required to reconnect the existing service line from property side to the new meter box location.
- D. Location of service line shall be permanently etched into the top of curb with a "W" and the lateral terminus shall be indicated at the ground surface by a means, which is easily recognizable.

3.12 BACKFILLING (Addition of paragraph D)

- D. Prior to the execution of backfilling procedures for ductile iron pipe or other metallic pipe and fittings CONTRACTOR must request inspection by OWNER's representative to verify compliance with installation requirements.

3.16 INSTALLATION – METER BOXES

- A. Ensure all parts are in working order.
- B. Where water lines are located below paved streets or public Right-of-Way containing curbs, install meter boxes at the back of the curb. Such installation shall be in accessible locations beyond limits of walks and driveway approaches or other pedestrian and vehicular interference.
- C. Where no curbing exists, install valves and boxes in accessible locations beyond limits of street surfacing, walks and driveway approaches or to other location with no pedestrian or vehicular interference.
- D. Meters shall not be installed in any driveway, pedestrian sidewalk or other location which may be a life or safety concern when requiring access and/or maintenance of such meters.

3.17 POLY WRAP

- A. Unless otherwise directed by the ENGINEER, the pipe (ductile iron) and associated fittings and valves will be encased in an 8 mil polyethylene wrap.
 - 1. The wrap may be in either tube or sheet form and installed as described in *Installation Guide for Ductile Iron Pipe* by DIPRA.
 - 2. Locations for service taps must be prepared by fully taping the location following re-excavation. All holes must be recovered and properly sealed prior to burial.

3.18 DISINFECTION TEST

- A. The disinfection test shall be performed by Ogden City's Water Utility Department with cooperation from the CONTRACTOR in performing any necessary excavation and subsequent backfilling at no additional cost to the CITY.
- B. Chlorination of Completed Water Line: The new water line shall be disinfected by chlorination. The CONTRACTOR will be responsible for all associated costs and fees related to the chlorination of the completed water line. This test shall be performed prior to connection of the new water lines to the existing Ogden City culinary water system. The CONTRACTOR shall notify Ogden City Water Utility at least 48 hours before the chlorination is desired.

3.19 HYDRANT FLOW TEST

- A. The flow test of each fire hydrant shall be performed by the CONTRACTOR and witnessed by personnel from Ogden City Water Utility or Ogden City Fire Department and performed at no additional cost to the CITY.
- B. Flow test shall be completed prior to construction of any structures dependent upon such hydrant for fire protection.
 - 1. Flow test shall be conducted according to the requirements of the Water Utility and shall be at a time and date to correspond with Water Utility or Fire Department personnel schedules.

2. As a result of the flow test the fire hydrant shall be painted in accordance with the colors indicated per current NFPA standards.
- C. The disinfection test shall be performed by Ogden City's Water Utility Department with cooperation from the CONTRACTOR in performing any necessary excavation and subsequent backfilling at no additional cost to the CITY.

3.20 INSTALLATION - BACKFLOW PREVENTION DEVICES & ASSEMBLIES

- A. Ensure all parts are in working order.
- B. Set location of backflow prevention devices and boxes outside of sidewalk limits, driveway approaches and other pedestrian or vehicular interference.

G. SECTION 33 12 33 – WATER METER

3. PART 3 EXECUTION

3.1 INSTALLATION (Addition of paragraph E)

- E. No meter box shall be allowed in any street, driveway, driveway flare, or sidewalk.

H. SECTION 33 12 17 – BACKFLOW PREVENTION DEVICE OR ASSEMBLY (ADD NEW SECTION)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Air Gap, Reduced Pressure Assembly (RP), Double Check Valve Assembly (DC), Pressure Vacuum Breaker (PVB), Spill-Resistant Vacuum Breaker, Atmospheric Vacuum Breaker (AVB), Hose Bib Vacuum Breaker (HBAVB), and Dual Check Valve Device.

1.2 REQUIREMENTS

- A. All backpressure and back siphon prevention devices or assemblies shall ensure that the requirements of federal, state, and local agencies pertaining to the quality of water delivered to consumers are met.

1.3 REFERENCES

- A. **AWWA Standards:**
 1. AWWA M14: AWWA Recommended Practice for Backflow Prevention and Cross- Connection Control
 2. AWWA C510-07: Double Check Valve Backflow Prevention Assembly
 3. AWWA C511-07: Reduced-Pressure Principle Backflow Prevention Assembly
- B. University of Southern California Manual of Cross-Connection Control Tenth Edition
- C. ASSE 1024-2004: Performance Requirements for Dual Check Backflow Preventers
- D. The current edition of the International Plumbing Code and Amendments as adopted by the State of Utah.

- E. Cross Connection Control Program of Utah January 2010
- F. List of Approved Backflow Assemblies/Devices can be found online at
http://www.drinkingwater.utah.gov/documents/compliance/AppendixB_1-19-11.pdf

1.4 SUBMITTALS

- A. Provide technical information as required for evaluating the quality of the backflow prevention device or assembly and its components.
- B. All Backflow prevention devices must have third party certification. To gain Division of Drinking Water approval for use within a public culinary water system, all backflow prevention assemblies must:
 1. Be in-line serviceable (repairable)
 2. In-line testable and have certification through third party certifying agencies.
 - a) Third party certification will consist of any combination of two (2) laboratory or field test certifications.
 - b) Acceptable third party laboratory certifying agencies are:
 - 1) ASSE (American Society of Sanitary Engineers)
 - 2) IAPMO (International Association of Plumbing/Mechanical Officials)
 - 3) The University of Southern California - Foundation for Cross Connection Control and Hydraulic Research (USC-FCCCHR).

PART 2 PRODUCTS

2.1 AIR GAP

- A. Air gap is a physical separation between the discharge end of a drinking water supply pipe and a receiving vessel.
- B. The air gap shall be one inch, or twice the diameter of the incoming pipe (measured within 10 pipe diameters of the termination of the line), WHICHEVER IS GREATER.
 1. This measurement will be taken from the end of the water line to the flood rim of the receptacle or vat (the overflow or drain line will not be construed as the flood rim level).
- C. Where the air gap is within two (2) pipe diameters (horizontal measurement) of a wall or vertical surface, the air gap shall be increased to a minimum of 1.5 inches or to three times the incoming pipe diameter, WHICHEVER IS GREATER.
- D. In any high hazard installation the air gap will be inspected after initial installation and at least annually thereafter by a Certified Backflow Technician.

2.2 REDUCED PRESSURE PRINCIPLE ASSEMBLY

- A. An RP assembly consists of two (2) independently acting internally loaded check valves,

together with a hydraulically operated mechanically independent pressure differential relief valve located between the check valves and below the first check valve, four (4) properly located test cocks and two (2) tightly closing shut off valves.

- B. *An RP assembly may be used to protect against a high (health) hazard or low (non-health) hazard and against back siphonage and/or backpressure type backflows.*
- C. *Assemblies shall be maintained as an intact assembly.*
 - 1. *The assembly shall be protected from freezing and vandalism where applicable.*
- D. *The bottom of the RP assembly shall be a minimum of 12 inches above the ground or floor.*
 - 1. *The assembly owner, when necessary, shall provide devices or structures to facilitate testing, repair, and/or maintenance and to insure the safety of the backflow technician.*
- E. *The body of the RP assembly shall not be closer than 12 inches to any wall, ceiling, or obstacle, and shall be readily accessible for testing, repair and/or maintenance*
- F. *RP assemblies shall not be installed in a pit.*
- G. *The relief valve on the RP assembly shall not be directly connected to any waste disposal line, including sanitary sewer, storm drains, or vents.*
 - 1. *RP's installed inside buildings must have relief valve piping plumbed to the nearest adequately sized floor drain. The connection shall be indirect, and air gap requirements apply.*
- H. *The assembly shall be installed in a horizontal position only.*
 - 1. *A vertical installation orientation must be approved and shown on the Division of Drinking Water Approved Assembly List.*

2.3 DOUBLE CHECK VALVE (DC) ASSEMBLY

- A. *A DC assembly consists of two (2) independently operating internally loaded check valves, two (2) tightly closing shutoff valves, and four (4) appropriately located test cocks.*
- B. *A DC assembly may be used to protect against low (non- health) hazards only and back siphonage and/or backpressure backflow conditions.*
- C. *The bottom of the DC assembly shall be a minimum of 12 inches above the ground or floor.*
 - 1. *The assembly owner shall provide devices or structures to facilitate testing, repair and/or maintenance and to insure the safety of the Backflow Technician.*
- D. *The body of the DC assembly shall be a minimum of 12 inches from any walls, ceilings,*

or obstacle and shall be readily accessible for testing, repair and maintenance.

- E. If installed in a pit, the DC assembly shall be installed with a minimum of 12 inches of clearance between all sides of the vault including the floor and roof or ceiling with adequate room for testing and maintenance.
- F. The DC assembly shall be maintained as an intact assembly.
- G. The DC assembly may be installed in the horizontal position only if it appears on the Division of Drinking Water Approved Assembly List.
- H. The assembly shall be protected from freezing and vandalism where applicable.

2.4 DUAL CHECK VALVE DEVICE

- A. A Dual Check Valve device consists of two (2) independently operating, spring loaded check valves, and must conform to ASSE 1024 Standard.
- B. A Dual Check Valve device may be installed, as a secondary protection method of the drinking water system, within the meter setter of non-industrial, low hazard connections.
- 1. All other points of cross connection would then require the isolation method of protection (i.e., lawn sprinkling system, home boiler, etc.).

2.5 PRESSURE VACUUM BREAKER (PVB) BACKSIPHONAGE ASSEMBLY

- A. A PVB assembly consists of an internally loaded check valve, an internally loaded air inlet valve (poppet) located on the discharge side of the check valve, two (2) tightly closing shut off valves, and two (2) appropriately located test cocks.
- B. A PVB assembly may be used to protect against high (health) hazard or low (non-health) hazards, back siphonage backflow conditions only.
- C. The PVB assembly may be subjected to continuous pressure.
- A. The PVB assembly shall not be installed in an area that could be subjected to backpressure or back drainage conditions.
- B. The PVB assembly shall be installed a minimum of 12 inches above all downstream piping and the highest point of use.
- C. The PVB assembly shall be readily accessible for testing, repair and/or maintenance.
- D. The PVB assembly shall not be installed below ground or in a vault or pit.

2.6 ATMOSPHERIC VACUUM BREAKER

- A. Use only where cross connection is introduced through back siphonage. This assembly shall not be used in systems where there can be backpressure. No shutoff valves may be placed downstream of the assembly.
- B. Assembly consists of a float check, a check seat, and an air inlet port. An upstream

shutoff valve may be an integral part of the assembly.

- C. The assembly must be installed at least six (6) inches above the highest outlet or tank.
- D. Where freezing temperatures potentially exist, self-draining atmospheric vacuum breakers must be used.

PART 3 EXECUTION

3.1 INSTALLATION - AIR GAP

- A. The air gap is not to be installed in a pit below ground level. Semi buried pits are acceptable if the air gap is installed above the ground or the maximum flood level.
- B. The air gap shall be located and monitored in such a way as to prohibit bridging of the air gap resulting in cross connection and possible backflow.
- C. In any high hazard installation the air gap shall be inspected within 10 days after initial installation and at least annually thereafter by a certified backflow technician.

3.2 INSTALLATION - REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY

- A. The assembly shall be installed with adequate space to facilitate maintenance and testing. Ideally, the installation should not require platforms, ladders, or lifts for access.
 - 1. If assembly is installed five (5) feet above finished floor, a platform shall be required for testing and repair of the assembly.
- B. Adequate clearance from the floor, ceiling, and walls must be provided to facilitate the removal of the relief valve and/or check valves.
- C. The assembly shall be designed to function properly under projected extreme temperature ranges.
- D. The assembly shall not be installed in a pit below ground level.
 - 1. Semi buried pits are acceptable if the assembly is installed above the ground or the maximum flood level with an approved air gap between the relief valve port and the daylight drain.
 - 2. The bottom of the assembly shall be a minimum of 12 inches above the ground or floor.
- E. All reduced pressure backflow prevention assemblies shall be installed in the horizontal alignment unless otherwise approved by the State of Utah-Division of Drinking Water
- F. Thoroughly flush the lines before installing the assembly.
- G. The relief valve on the assembly shall not be directly connected to any waste disposal line. This includes any sanitary sewer, storm drain, vents, and shall be piped to the nearest adequately sized floor drain.

- a. The relief pipe must have an Air Gap installed in the nearest floor drain.

3.3 INSTALLATION - DOUBLE CHECK VALVE ASSEMBLY

- A. The assembly shall be installed with adequate space to facilitate maintenance and testing and should have free access without the use of platforms, ladders, or lifts for access.
 1. If assembly is installed five (5) feet above finished floor, a platform shall be required for testing and repair of the assembly.
- B. The assembly should not be installed below ground level unless provided with adequate drainage to maintain a dry location.
 1. Where an assembly must be installed in a location that is susceptible to flooding, the test cocks shall be plugged.
- C. Thoroughly flush the lines before installing the assembly.
- D. The assembly shall be installed in a horizontal position unless otherwise approved by the State of Utah-Division of Drinking Water.

3.4 INSTALLATION - DUAL CHECK VALVE DEVICE

- A. The device shall be installed with adequate space to facilitate maintenance and testing and should have free access without the use of platforms, ladders, or lifts.
- B. The device should not be installed below ground level unless provided with adequate drainage to maintain a dry location.
- C. Thoroughly flush the lines before installing the device.
- D. The Dual Check Valve Device shall conform to ASSE 1024 Standard.

3.5 INSTALLATION - PRESSURE VACUUM BREAKER

- A. The assembly shall be installed at least 12 inches above all downstream piping and the highest fixture flood level rim, outlet, or highest point of water use.
- B. The assembly shall be installed in a vertical position with adequate space to facilitate maintenance and testing.
- C. The assembly shall not be installed in a vent hood or where toxic or objectionable fumes could enter and contaminate the potable water piping.
- D. The assembly shall be designed to function properly under projected extreme temperature ranges.
- E. The assembly shall not be installed below ground in a vault or pit.

3.6 INSTALLATION - ATMOSPHERIC VACUUM BREAKER

- A. *The device shall not be installed in applications where it will be in continuous operation for more than 12 hours.*
- B. *The device shall be installed downstream of the last shutoff valve in a system, such that the discharge side is exposed to the atmosphere.*
- C. *The device shall be installed a minimum of six (6) inches above all downstream piping and the highest outlet or flood level rim.*
- D. *The device shall not be installed in a vent hood or where toxic or objectionable fumes could enter and contaminate the potable water piping. The device shall be installed in a visible location for maintenance.*
- E. *The device shall be designed to function properly under projected extreme temperature ranges.*

3.7 TESTING AND START-UP

- A. *All backflow prevention assemblies shall be tested within 10 days of initial use by a licensed backflow device tester.*
- B. *The backflow prevention assembly report shall be presented to the City's Cross Connection Control Administrator no later than 30 days of a passing test.*
- C. *All backflow prevention assemblies are to be tested annually by a certified tester and repairs or maintenance completed as needed.*
 - 1. *All test reports must be presented to the City's Cross Connection Control Administrator.*

I. SECTION 33 12 19 – HYDRANTS

PART 3 EXECUTION

3.4 PAINT (Amend paragraph B)

- B. *Paint hydrant barrel and caps with one coat primer and final coat per the Water Division and NFPA standards as follows:*
 - 1. *Hydrant barrel color shall be **yellow***
 - 2. *Hydrant cap color shall be as follows, based upon the results of the flow test:*
 - a) **Blue** - Flow measured at 1500 gpm or more
 - b) **Green** - Flow measured between 1000 gpm and 1499 gpm
 - c) **Orange** – Flow measured between 500 and 999 gpm
 - d) **Red** – Flow measured between 0 and 499 gpm

J. SECTION 33 31 00 – SANITARY SEWERAGE SYSTEMS

PART 2 PRODUCTS

2.3 MANHOLES (Amend paragraph C and D)

- C. Top: Offset Cone or Offset flat slab concrete.
- D. Frame and Cover: Scoriated, asphalt coated, heavy duty, ductile iron Section 05 56 00, with flat top design meeting load rating H-20 and appropriate utility lettering. Shape, size and lifting device as necessary.
- 1. Low profile lids will not be allowed in any Right-of-Way without approval from OWNER.

PART 3 EXECUTION

3.2 PIPE AND FITTINGS (Addition of paragraph F)

- F. Location of sanitary sewerage laterals shall be permanently etched into the top of curb with an "S" and the lateral terminus shall be indicated at the ground surface by a means, which is easily recognizable.

K. SECTION 33 41 00 – DRAINAGE SYSTEMS

PART 2 PRODUCTS

2.1 PIPING AND FITTINGS (Addition of paragraph D, E, and F)

- D. Storm drain pipe main lines shall be minimum class III reinforced concrete. Exceptions may only be granted by the City Engineer.
- E. For all Sub-Drains, lateral piping for individual service connections shall be HDPE or similar product, from the mainline to the edge of the public right-of-way. When Sub-Drain mainline piping is of a material other than HDPE, provide appropriate adapter to the 4" or 6" HDPE lateral.
- F. For all Storm Drains and Sub-Drains, material for piping shall be concrete, except as noted in paragraph D above. Pressurized Irrigation may use material for appropriate pressure rating requirements.

2.5 MANHOLES (Amend paragraph B, C, and D)

- B. Steps: Required
- C. Top: Offset Cone or Offset flat slab concrete.
- D. Frame and Cover: Scoriated, asphalt coated, heavy duty, ductile iron Section 05 56 00, with flat top design meeting load rating H-20 and appropriate utility lettering. Shape, size and lifting device as necessary.
- 1. Low profile lids will not be allowed in any Right-of-Way without approval from OWNER.

PART 3 EXECUTION

3.7 INSTALLATION SUB DRAIN SYSTEMS (Addition of paragraph E and F)

- E. Laterals for all sub drain systems shall be extended from the mainline to the property line and shall be connected to the mainline by means of an appropriate adapter.

F. Location of sub drain system laterals shall be permanently marked or etched into the top of curb and the lateral terminus shall be indicated at the ground surface by a means, which is easily recognizable.

Exhibit C

*OGDEN CITY'S STANDARD DRAWINGS, 2025
EDITION, A SUPPLEMENT TO THE:*

2017 EDITION OF THE MANUAL OF STANDARD PLANS *by the*
Utah Chapter of the APWA

October 7, 2024

Ogden City's Standard Drawings 2025 Edition

A supplement to the 2017 Manual of Standard Plans by the Utah Chapter of the APWA

The following contains the 2025 Edition of the Standard Drawings for Ogden City, A Supplement to the 2017 Edition of the Manual of Standard Plans as adopted by Ogden City entitled Ogden City's Standard Drawings 2025 Edition. The reference to the sections in the Ogden City Standard Drawings is to the 2017 APWA Manual of Standard Specifications unless otherwise noted. These 2025 edition amendments are effective as of the date indicated in the specific administrative order.

These amendments set forth supplementary standard plans for construction related to all public works projects to be constructed under permit through Ogden City Engineering Division and all other public works improvements or repairs under the jurisdiction of the Public Works Department.

Should there be conflicts between the Standard Drawings, 2020 Edition and Ogden City's Standard Drawings 2025 Edition the latter shall govern and take precedent.

The construction of projects in conformity with these standard plans will expedite the completion and acceptance of the work permitted under direction of the Ogden City Engineer.

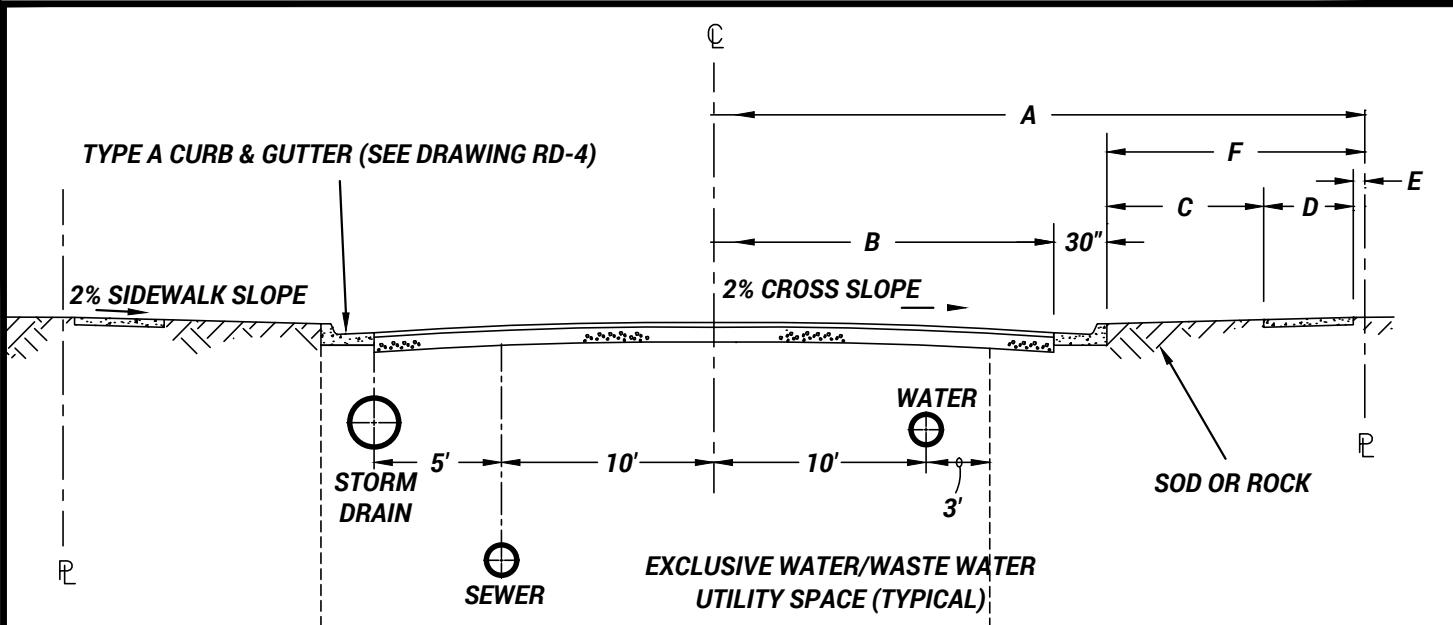
All work within the Ogden City Right-of-Way, public easements or for other Ogden City Public Works Projects shall conform to these as contained within this document and also project specific *Supplementary Conditions under the direction of the City Engineer*, where applicable.

Copies of the above referenced Amendments, Specifications, and Modifications to the Standard Plans are available for purchase from Ogden City Engineering, 2549 Washington Blvd, Suite 760, Ogden, Utah, during normal working hours.

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TYPE	WIDTH OF R.O.W.	A	B	C	D	E	F	ROAD BASE	ASPHALT THICKNESS
ARTERIAL	100'	50'	37'	6'	4'	0'-6"	10'-6"	12"	6"
COLLECTOR	72'	36'	22'	7'	4'	0'-6"	11'-6"	8"	5"
LOCAL	60'	30'	16'	7'	4'	0'-6"	11'-6"	8"	3"

* 56' RIGHT OF WAY MUST BE APPROVED BY THE CITY ENGINEER AND THE FIRE MARSHALL AND FOLLOW MUNICIPAL CODE 14-3-2.

** SIDEWALK DIRECTLY BEHIND THE CURB AND GUTTER SHALL BE SIX FEET (6') WIDE AND IS ALLOWED WITH APPROVAL FROM THE CITY ENGINEER.

*** ALTERNATIVE CROSS SECTIONS MAY BE REQUIRED BY THE CITY ENGINEER BASED ON TRAFFIC OR OTHER NEEDS.

THE ABOVE SHOWN ASPHALT AND ROAD BASE DEPTHS ARE MINIMUM ACCEPTABLE THICKNESS WITHIN THE RIGHT OF WAY.

NOTES:

1. CROWN OF STREET SHOULD BE LEVEL WITH THE TOP OF THE CURB (EXCEPT ON ARTERIAL ROADS).
2. UNTREATED BASE COURSE: PROVIDE MATERIAL SPECIFIED IN APWA SECTION 32 11 23.
 - 2.1. PLACE MATERIAL PER APWA SECTION 32 05 10.
 - 2.2. COMPACT PER APWA SECTION 31 23 26 TO A MODIFIED PROCTOR DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
3. BITUMINOUS CONCRETE PAVING PER 2017 APWA MANUAL OF STANDARD SPECIFICATION & OGDEN CITY STANDARDS.
4. A SPECIAL DESIGN IS REQUIRED FOR HEAVY TRAFFIC WHEN DEEMED NECESSARY BY THE CITY ENGINEER.
5. ROADWAY SECTIONS WITHIN THE BUSINESS DEPT OF OGDEN (BDO) VARY. SEE CITY ENGINEER FOR SPECIFIC DETAILS AND SPECIFICATIONS.
6. CHIPSEAL COAT SHALL FOLLOW 2017 APWA MANUAL OF STANDARD SPECIFICATIONS SECTION 32 01 13.64, AND THE 2025 EDITION OF OGDEN CITY AMENDMENTS.
7. FOR STREET DESIGNATIONS REFER TO THE CURRENT OGDEN CITY TRANSPORTATION MASTER PLAN.
8. ROADWAY STRUCTURAL SECTION SHALL BE RECOMMENDED BY THE DEVELOPER'S GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY ENGINEER.
9. PAVEMENT IS PERMITTED TO BE INSTALLED BETWEEN APRIL 15 AND OCTOBER 15. PAVEMENT INSTALLED OUTSIDE OF THIS TIME SHALL BE CONSIDERED TEMPORARY.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

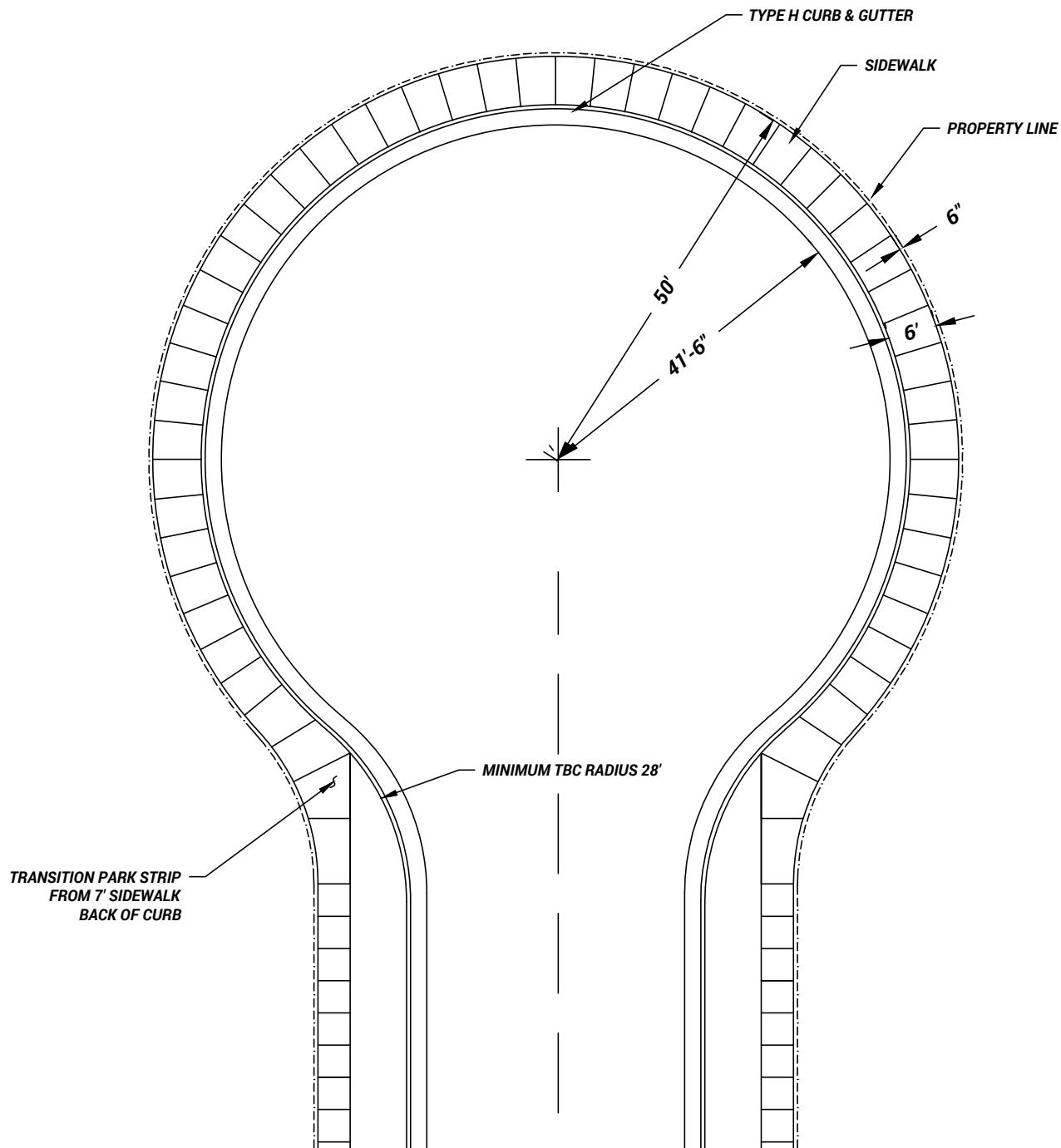


STANDARD ROADWAY SECTION

RD-1

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



NOTES:

1. CURB AND SIDEWALK TRANSITION SECTIONS WILL VARY.
2. ROAD TYPICAL SECTION SHOULD REFER TO THE ROAD DETAILS.
3. CUL-DE-SACS DIMENSIONS MUST MEET THE MINIMUM IFC REQUIREMENTS.
4. MOUNTABLE CURB AND GUTTER SHOULD BE USED FOR LAYOUT SHOWN ABOVE TO MEET THE MINIMUM IFC REQUIREMENTS.
5. ALTERNATE CUL-DE-SAC LAYOUTS MAY BE NECESSARY FOR DEVELOPMENT, BUT MUST BE APPROVED BY THE CITY ENGINEER AND THE FIRE MARSHAL.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

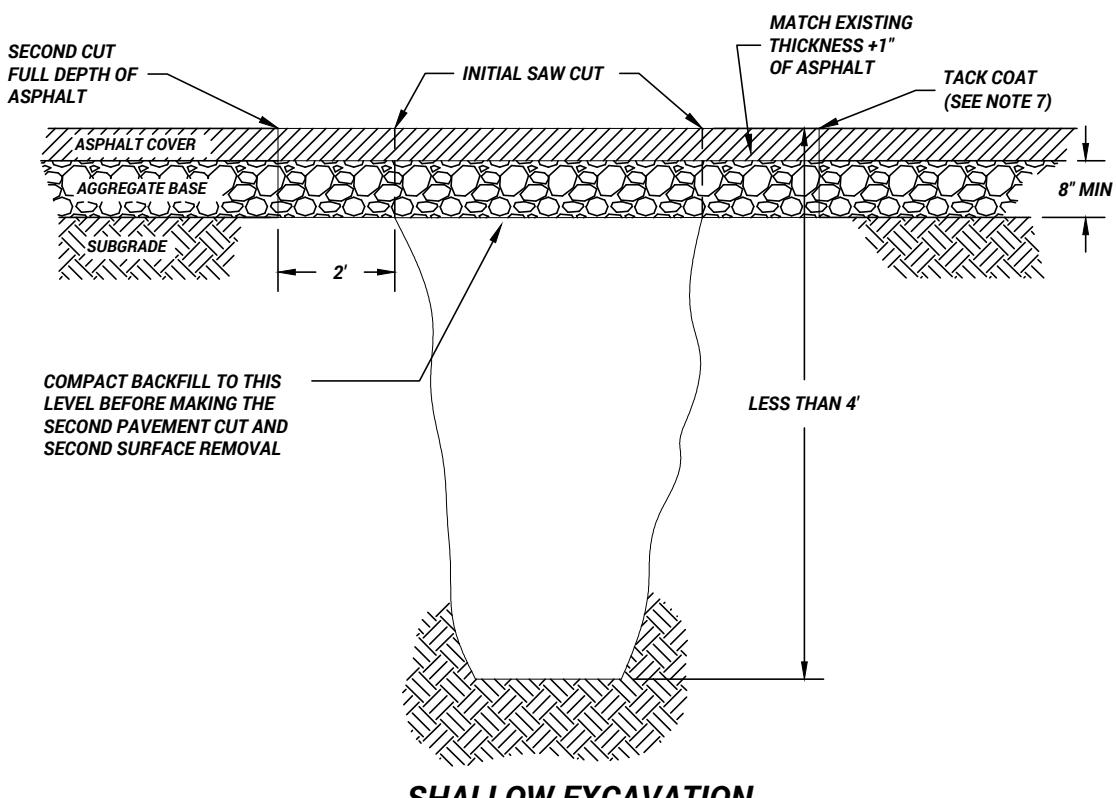
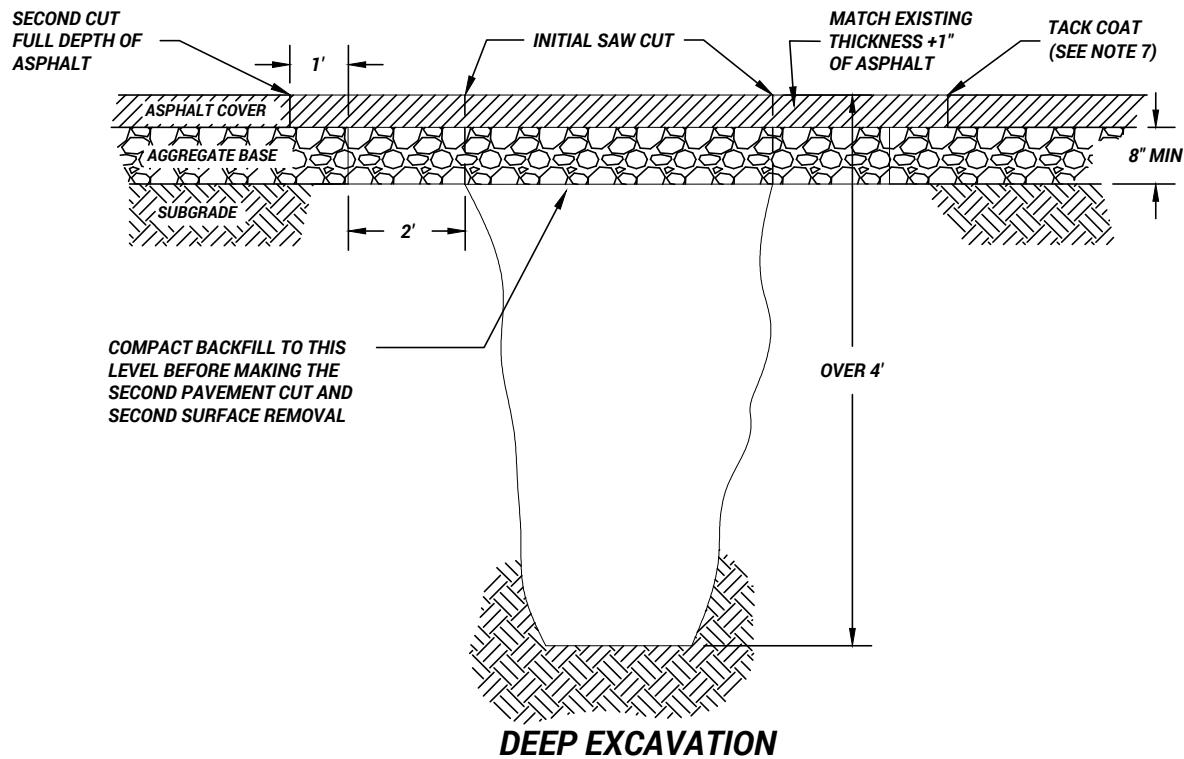
Ogden
UTAH
Still Untamed™

TYPICAL CUL-DE-SAC

RD-2

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



OGDEN CITY ENGINEERING - STANDARD DRAWINGS



ASPHALT PATCH

RD-3

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 2 2025

NOTES:

1. REMOVE ADDITIONAL PAVEMENT TO THE MENTIONED FEATURE IF IT IS WITHIN TWO FEET OF:
 - 1.1. A NEW SAWCUT
 - 1.2. A PAINTED LINE STRIPE
 - 1.3. A LIP OF GUTTER
 - 1.4. A CURB
 - 1.5. AN EXISTING PAVEMENT PATCH
2. ALL EXCAVATIONS WITHIN THE CITY RIGHT-OF-WAY REQUIRE AN EXCAVATION PERMIT FROM THE OGDEN CITY ENGINEERING DEPARTMENT.
 - 2.1. ALL WORK IN THE RIGHT-OF-WAY MUST BE PERFORMED BY A LICENSED CONTRACTOR FOR THE STATE OF UTAH WHO IS BONDED AND INSURED THROUGH OGDEN CITY.
3. NOTIFY UNDERGROUND SERVICE ALERT (BLUE STAKES) TWO (2) WORKING DAYS PRIOR TO THE START OF EXCAVATION AT 1 (800) 662-4111.
4. NOTIFY ENGINEERING DEPARTMENT ONE (1) WORKING DAY (24 HOURS) PRIOR TO START OF CONSTRUCTION TO ARRANGE INSPECTIONS BY CITY PUBLIC WORKS INSPECTORS.
5. ALL EXCAVATIONS SHALL BE MADE, PROTECTED, AND SUPPORTED AS REQUIRED FOR SAFETY BY OSHA REGULATIONS.
6. BASE COURSE: PROVIDE MATERIAL SPECIFIED IN APWA SECTION 32 11 23.
 - 6.1. PLACE MATERIAL PER APWA SECTION 32 05 10.
 - 6.2. COMPACT THE MATERIAL PER APWA SECTION 31 23 26. THE MINIMUM APPROVED COMPACTION SHALL BE 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING EQUIPMENT AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
7. TACK COAT PER APWA SECTION 32 12 14. PROVIDE FULL TACK COAT COVERAGE ON ALL VERTICAL SURFACES.
 - 7.1. JOINT REPAIR: IF A CRACK OCCURS AT THE PATCH CONNECTION TO THE EXISTING PAVEMENT OR ANY STREET FIXTURE, SEAL THE CRACK PER APWA SECTION 32 01 17.
8. USE BITUMINOUS CONCRETE PAVING AS PER APWA 32 12 16 05 AND THE CURRENT EDITION OF THE OGDEN CITY STANDARDS.
 - 8.1. MATCH EXISTING THICKNESS PLUS ONE (1) INCH, MINIMUM OF FOUR (4) INCHES, BUT NOT TO EXCEED SEVEN (7) INCHES (OR AS SPECIFIED BY THE CITY ENGINEER).
9. REPAIR THE ASPHALT PAVEMENT IF ANY OF THE FOLLOWING CONDITIONS WITHIN THE PATCH OCCUR:
 - 9.1. PAVEMENT SURFACE DISTORTION EXCEEDS 1/4" DEVIATION IN 10'.
 - 9.1.1. REPAIR OPTION: PLANE OFF SURFACE DISTORTIONS. COAT PLANED SURFACES WITH A CATIONIC OR ANIONIC EMULSION THAT COMPLIES WITH APWA SECTION 32 12 93 AND PROVIDE SAND BLOTTER.
 - 9.2. CRACKS AT LEAST 1' IN LENGTH AND 1/4" WIDE OCCURRING MORE OFTEN THAN ONE (1) IN 10 SQUARE FEET.
 - 9.2.1. REPAIR OPTION: CRACK SEAL
 - 9.3. ASPHALT Raveling IS GREATER THAN ONE (1) SQUARE FOOT PER 100 SQUARE FEET.
 - 9.3.1. REPAIR OPTION: MILL AND INLAY
10. ALL PAVING, RESURFACING OR REPLACEMENT OF STREET FACILITIES:
 - 10.1. ON MAJOR OR COLLECTOR STREETS SHALL BE DONE WITHIN THREE (3) CALENDAR DAYS.
 - 10.2. ON ALL OTHER STREETS SHALL BE DONE IN WITHIN SEVEN (7) CALENDAR DAYS FROM THE TIME THE EXCAVATION COMMENCES.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



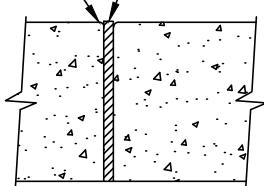
ASPHALT PATCH

RD-3

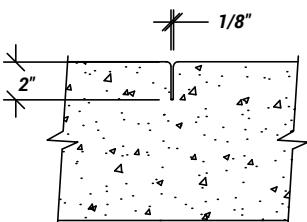
TAYLOR NIELSEN, CITY ENGINEER

SHEET 2 OF 2 2025

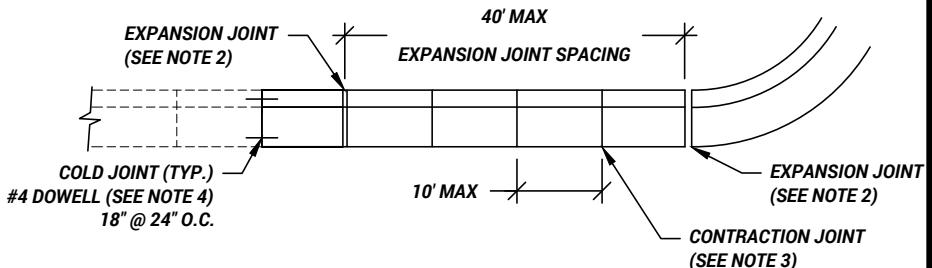
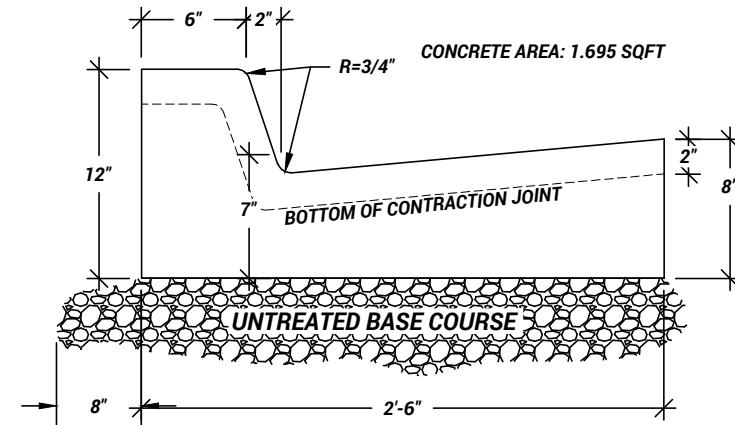
R=1/2" TYPE F1 JOINT FILLER (SEE NOTE 2)



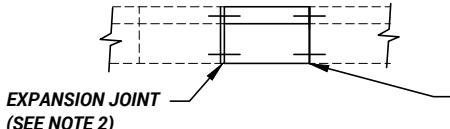
EXPANSION JOINT



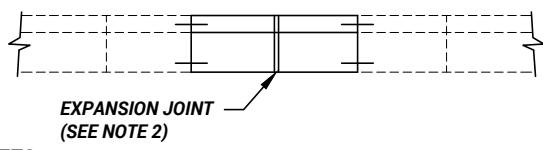
CONTRACTION JOINT



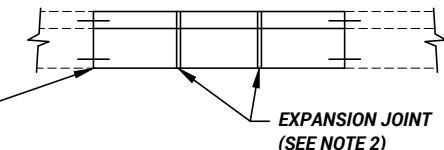
CURB & GUTTER PANEL REPLACEMENT



COLD JOINT (TYP.)
#4 DOWELL (SEE NOTE 4)
18" @ 24" O.C.



EXPANSION JOINT (SEE NOTE 2)

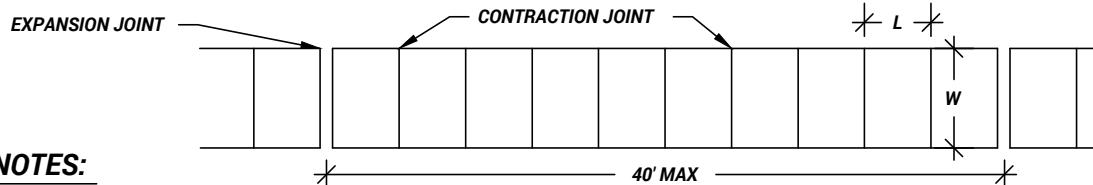
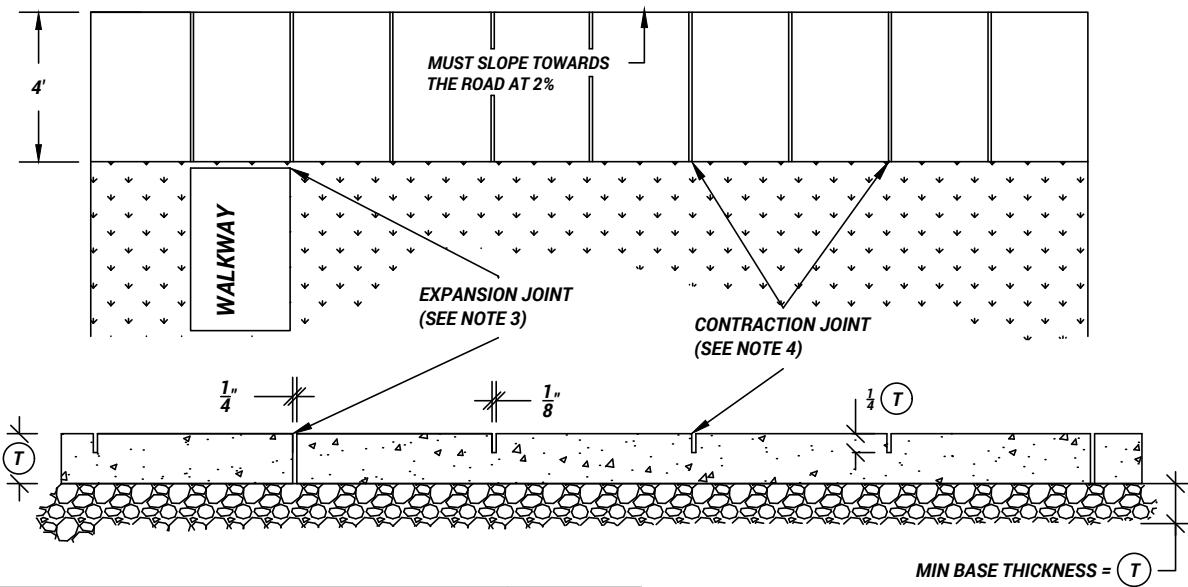


EXPANSION JOINT (SEE NOTE 2)

NOTES:

1. BASE COURSE SHALL BE PER APWA SECTION 32 11 23.
 - 1.1. EXTEND BASE 8" BEHIND THE CURB AND GUTTER.
 - 1.2. PROVIDE MINIMUM 8" THICK OF COMPACTED BASE COURSE.
 - 1.3. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.
2. MAKE EXPANSION JOINTS VERTICAL, FULL DEPTH, 1/2" WIDE WITH TYPE F1 JOINT FILLER MATERIAL PER APWA SECTION 32 13 73.
 - 2.1. SET TOP OF FILLER FLUSH WITH THE CONCRETE.
 - 2.2. EXPANSION JOINTS ARE REQUIRED AT THE START OR END OF A STREET INTERSECTION CURB RETURN. SPACE EXPANSION JOINTS NO MORE THAN 40'.
 - 2.3. MACHINE - SLIPPED CURB & GUTTER SHALL ONLY REQUIRE EXPANSION AT START, STOP, AND CHANGE OF DIRECTION.
3. MAKE CONTRACTION JOINTS VERTICAL.
 - 3.1. 1/8" WIDE AND 2" DEEP FOR CURB & GUTTER.
4. USE No. 4 SMOOTH DOWELL BAR AT ALL COLD JOINTS. IF NO SMOOTH DOWELL BAR IS AVAILABLE, No. 4 REBAR WITH 12" PLASTIC REBAR SLEEVES IS ACCEPTABLE. ALL DOWELLS TO BE EPOXY COATED.
5. BAG MIX: MARCH - NOVEMBER: 6 1/2, DECEMBER - FEBRUARY: 7 1/2.
6. APPLY A CONCRETE CURING COMPOUND TO ALL POURED CONCRETE THAT MEETS ASTM C-309, TYPE 1 OR 2, CLASS A.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



NOTES:

1. **BASE COURSE:** PROVIDE MATERIAL SPECIFIED IN APWA SECTION 32 11 23.
 - 1.1. PLACE MATERIAL PER APWA SECTION 32 05 10.
 - 1.2. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING EQUIPMENT AND 6" WHEN USING HAND COMPACTION EQUIPMENT.
 - 1.3. THICKNESS SHALL BE EQUAL TO OR GREATER THAN THE CONCRETE THICKNESS.
2. **CONCRETE:** CLASS 4000 PER APWA SECTION 03 30 04.
 - 2.1. CONCRETE MUST INCREASE FROM 4" THICK TO 6" FOR RESIDENTIAL DRIVEWAYS AND TO 8" FOR COMMERCIAL DRIVEWAYS.
 - 2.2. PLACE CONCRETE PER APWA SECTION 03 30 10.
 - 2.3. PROVIDE 1/2" RADIUS ON CONCRETE EDGES EXPOSED TO PUBLIC VIEW.
3. **EXPANSION JOINT:** MAKE EXPANSION JOINTS VERTICAL, FULL DEPTH, 1/2" WIDE WITH TYPE F1 JOINT FILLER MATERIAL PER APWA SECTION 32 13 73.
 - 3.1. SET TOP OF FILLER FLUSH WITH SURFACE OF CONCRETE.
 - 3.2. EXPANSION JOINTS REQUIRED AT CURB RETURNS, APPROACHES, AND ADJOINING WALKWAYS.
4. **CONTRACTION JOINT:** MAKE CONTRACTION JOINTS VERTICAL. TYPICAL SLAB RATIO IS 1 TO 1.
 - 4.1. 1/8" WIDE AND 1" DEEP (OR $\frac{1}{4}$ SLAB THICKNESS IF SLAB IS GREATER THAN 4" THICK).
 - 4.2. MAXIMUM LENGTH TO WIDTH RATIO FOR NON-SQUARE PANELS IS 1.5 TO 1.
5. **BAG MIX:** MARCH - NOVEMBER: 6 1/2, DECEMBER - FEBRUARY: 7 1/2.
6. APPLY A CONCRETE CURING COMPOUND TO ALL POURED CONCRETE THAT MEETS ASTM C-309, TYPE 1 OR 2, CLASS A.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

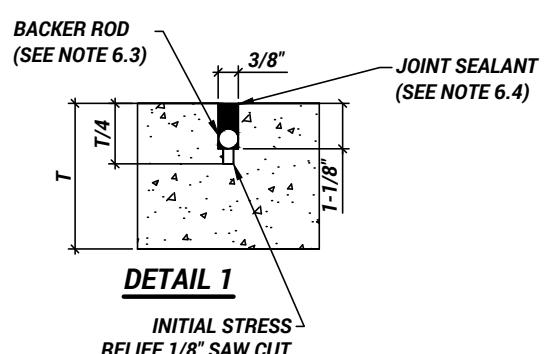
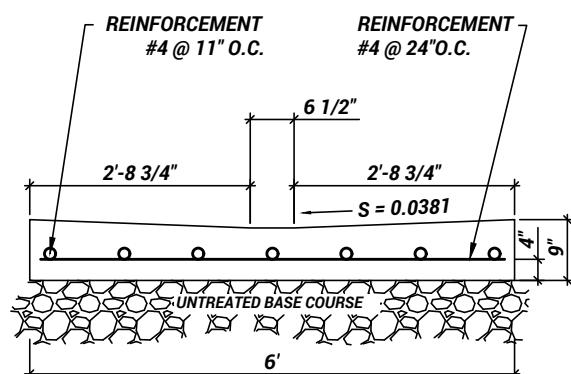
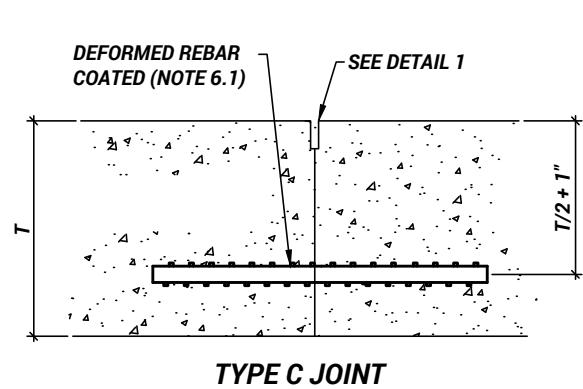
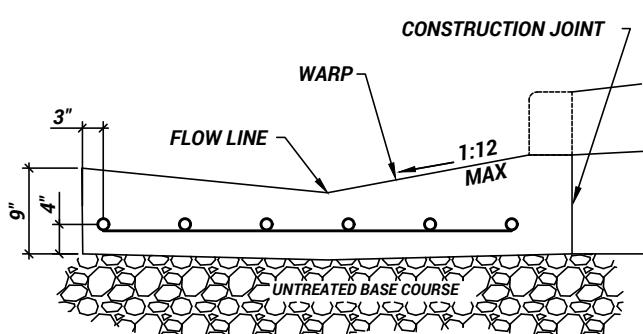
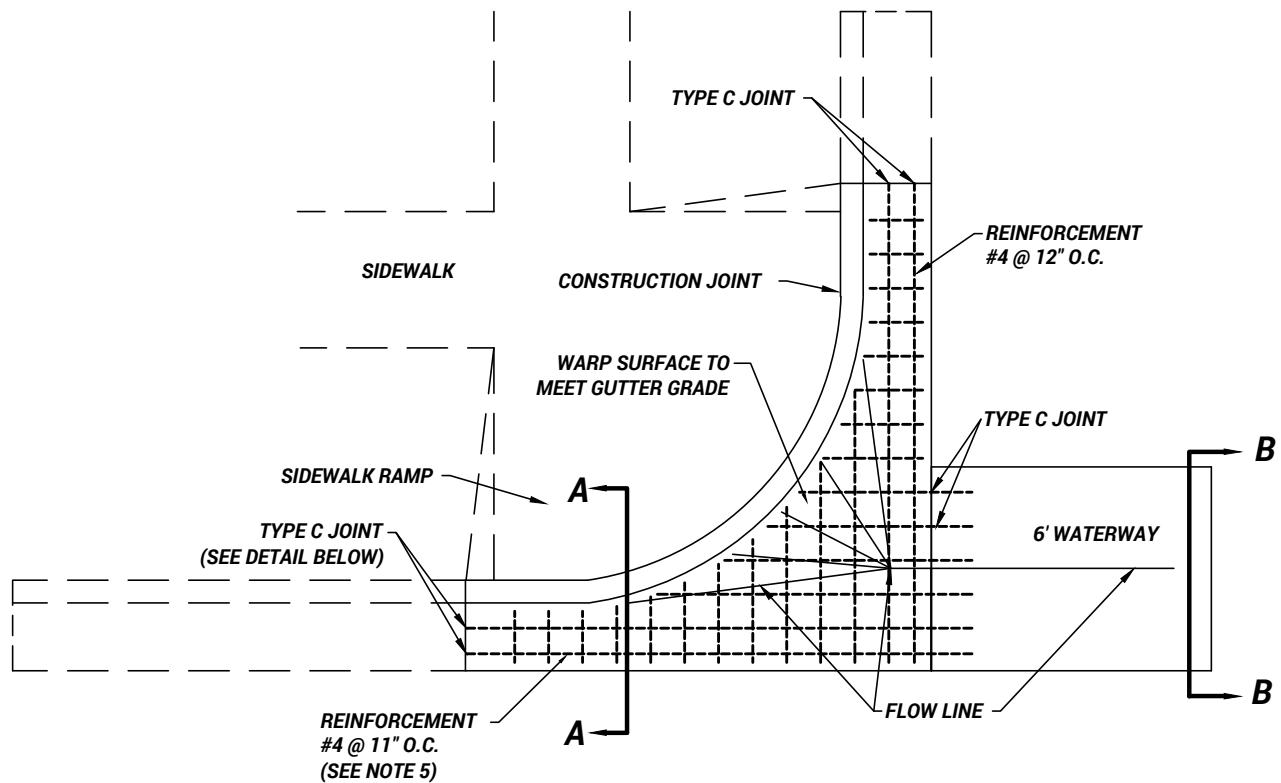


SIDEWALK DETAIL

RD-5

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



OGDEN CITY ENGINEERING - STANDARD DRAWINGS

NOTES:

1. **UNTREATED BASE COURSE:** PROVIDE MATERIAL AS PER APWA 32 11 23. REQUIRES 8" THICK OF BASE FOR WATERWAYS SUBJECT TO ANY VEHICULAR TRAFFIC.
 - 1.1. PLACE MATERIAL PER APWA SECTION 32 05 10.
 - 1.2. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
2. **CONCRETE:** CLASS 4000 AS PER APWA 03 30 04.
 - 2.1. PROVIDE 1/2" RADIUS ON CONCRETE EDGES EXPOSED TO VIEW.
3. **EXPANSION JOINTS** SHALL BE VERTICAL, FULL DEPTH 1/2" WIDE. USE TYPE F1 JOINT FILLER AS PER APWA 32 13 73. SET TOP OF FILLER FLUSH WITH CONCRETE SURFACE.
4. **CONTRACTION JOINTS** SHALL BE VERTICAL, 1/8" WIDE AND 1/4 SLAB THICKNESS.
 - 4.1. MAXIMUM PANEL LENGTH OF WATERWAY IS 15'.
5. **REINFORCEMENT** SHALL BE PER ASTM A 615, GRADE 60 GALVANIZED OR EPOXY COATED DEFORMED STEEL. SEE APWA SECTION 03 20 00 REQUIREMENTS.
6. **TYPE C JOINT:**
 - 6.1. **REINFORCEMENT:** SPACE BARS 12" TO 15" ON CENTER. GREASE DOWELS TO PROVIDE MOVEMENT IN EXPANSION JOINTS.
 - 6.2. **JOINTS:** LAY OUT JOINTS TO AID CONSTRUCTION AND CONTROL RANDOM CRACKING.
 - 6.2.1. LONGITUDINAL JOINT SPACING IS 12' FOR CONCRETE PAVEMENT LESS THAN 9" THICK AND 15' FOR PAVEMENT OVER 9" THICK.
 - 6.2.2. TRANSVERSE JOINT SPACING IS $30 \times T$ (SLAB THICKNESS IN FEET) WHERE THE MAXIMUM SLAB LENGTH TO SLAB WIDTH RATION IS 1.5 TO 1.
 - 6.2.3. EXTEND TRAVERSE CONTRACTION JOINTS CONTINUOUSLY ACROSS THE FULL WIDTH OF THE CONCRETE. MATCH JOINTS WITH CURB AND GUTTER.
 - 6.3. **BACKER ROD:** TYPE 1 (ROUND ROD) APWA SECTION 32 13 73. IT MUST BE OVERSIZED APPROXIMATELY 25 PERCENT TO FIT TIGHTLY INTO EACH JOINT AND COMPATIBLE WITH HOT Poured SEALANT.
 - 6.4. **JOINT SEALANT:** HOT APPLIED, APWA SECTION 32 13 73. REMOVE DIRT, OIL AND CURING COMPOUNDS FROM JOINT RESERVOIR. SEAL JOINTS IMMEDIATELY AFTER CLEANING.
7. **BAG MIX:** MARCH - NOVEMBER: 6 1/2, DECEMBER - FEBRUARY: 7 1/2.
8. **APPLY A CONCRETE CURING COMPOUND** TO ALL Poured CONCRETE THAT MEETS ASTM C-309, TYPE 1 OR 2, CLASS A.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

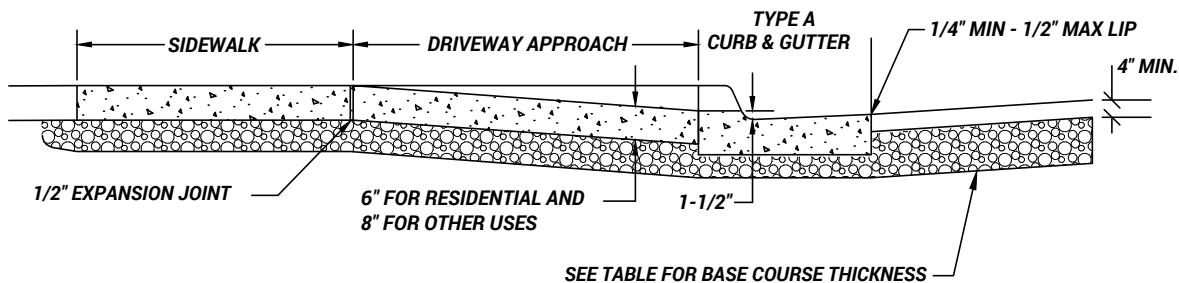
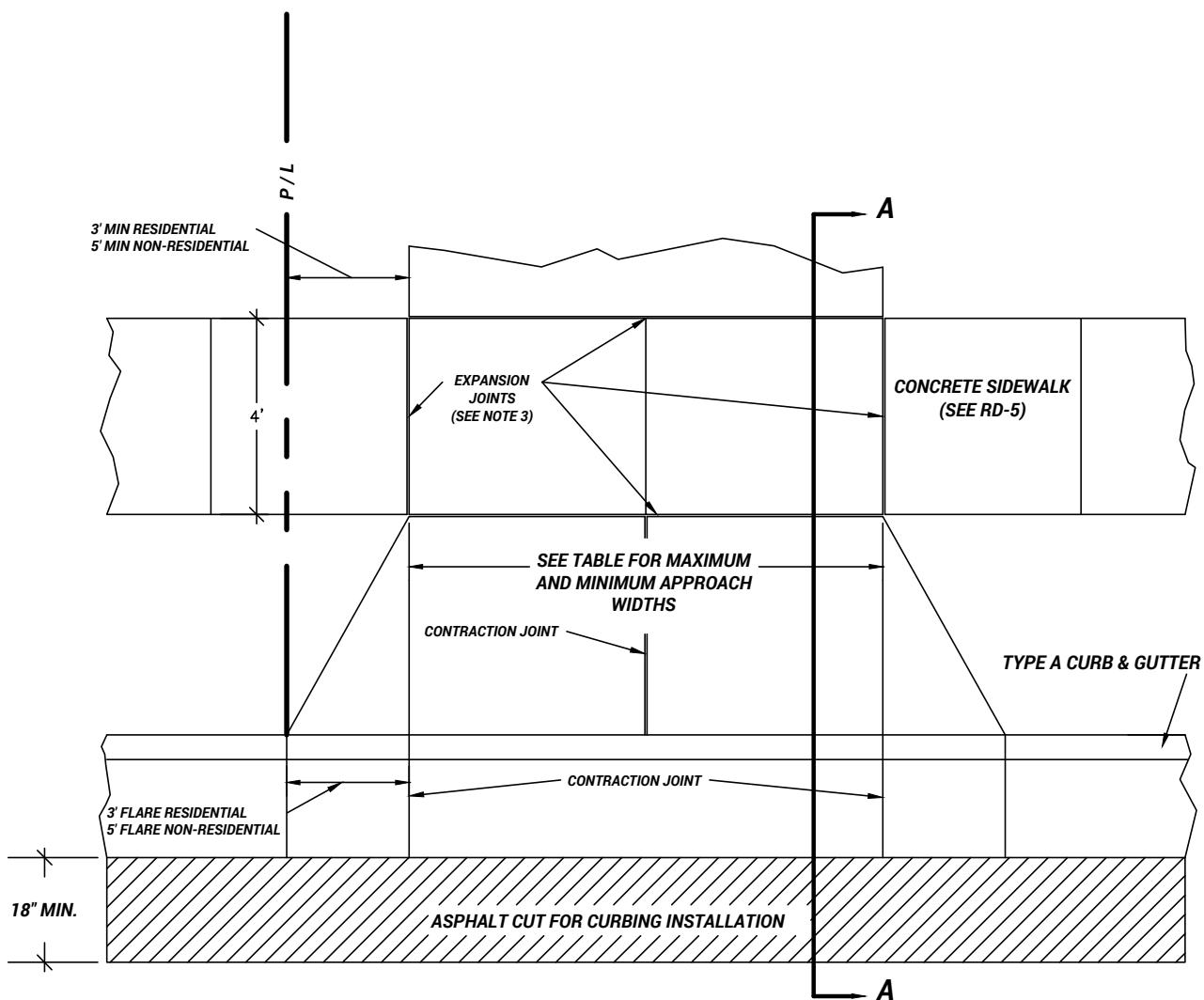


WATERWAY TRANSITION STRUCTURES

RD-6

TAYLOR NIELSEN, CITY ENGINEER

SHEET 2 OF 2 2025



SIDEWALK, APPROACH, CURB AND GUTTER
SECTION A-A

OGDEN CITY ENGINEERING - STANDARD DRAWINGS		
Ogden UTAH Still Untamed™	DRIVEWAY APPROACH	RD-7
	TAYLOR NIELSEN, CITY ENGINEER	SHEET 1 OF 2 2025

NOTES:

1. **BASE COURSE: PROVIDE MATERIAL AS PER APWA 32 11 23.**
 - 1.1. **PLACE MATERIAL PER APWA SECTION 32 05 10.**
 - 1.2. **COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.**
2. **CONCRETE SHALL BE CLASS 4000 AS PER APWA 03 30 04.**
 - 2.1. **PROVIDE 1/2" RADIUS ON CONCRETE EDGES EXPOSED TO VIEW.**
3. **EXPANSION JOINT SHALL BE VERTICAL, FULL DEPTH 1/2" WIDE. USE TYPE F1 JOINT FILLER AS PER APWA 32 13 73. SET TOP OF FILLER FLUSH WITH CONCRETE SURFACE.**
4. **CONTRACTION JOINTS SHALL BE VERTICAL.**
 - 4.1. **1/8" WIDE AND 1" DEEP (OR 1/4 SLAB THICKNESS IF SLAB IS OVER 4").**
 - 4.1. **MAXIMUM LENGTH TO WIDTH RATIO FOR NON-SQUARE PANELS IS 1.5 TO 1.**
 - 4.2. **MAXIMUM PANEL LENGTH (IN FEET) IS 2.5 TIMES THE SLAB THICKNESS (IN INCHES) TO A MAXIMUM OF 15'**
5. **REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 60 GALVANIZED OR EPOXY COATED DEFORMED STEEL. SEE APWA SECTION 03 20 00 REQUIREMENTS.**
6. **BAG MIX: MARCH - NOVEMBER 6 1/2, DECEMBER - FEBRUARY 7 1/2.**
7. **APPLY A CONCRETE CURING COMPOUND TO ALL POURED CONCRETE THAT MEETS ASTM C-309, TYPE 1 OR 2, CLASS A.**

	LOTS WITH 1-2 UNITS	LOTS WITH 3-4 UNITS	LOTS WITH 5 OR MORE UNITS
MINIMUM WIDTH	10'	16'	24'
MAXIMUM WIDTH	32'	32'	35'
* OR 50% OF LOT FRONTAGE (WHICHEVER IS LESS)			
MINIMUM CONCRETE THICKNESS	6"	6"	6"
MINIMUM BASE	6"	6"	6"

	COMMERCIAL/MANUFACTURING (TRACTOR/TRAILER USE ONLY)	COMMERCIAL/MANUFACTURING (GENERAL USE)
MINIMUM WIDTH	35'	24'
MAXIMUM WIDTH	50'	35'
*SEE SECTION I5-I2-II OF THE OGDEN CITY CODE FOR EXCEPTIONS		
MINIMUM CONCRETE THICKNESS	8"	8"
MINIMUM BASE	8"	8"

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

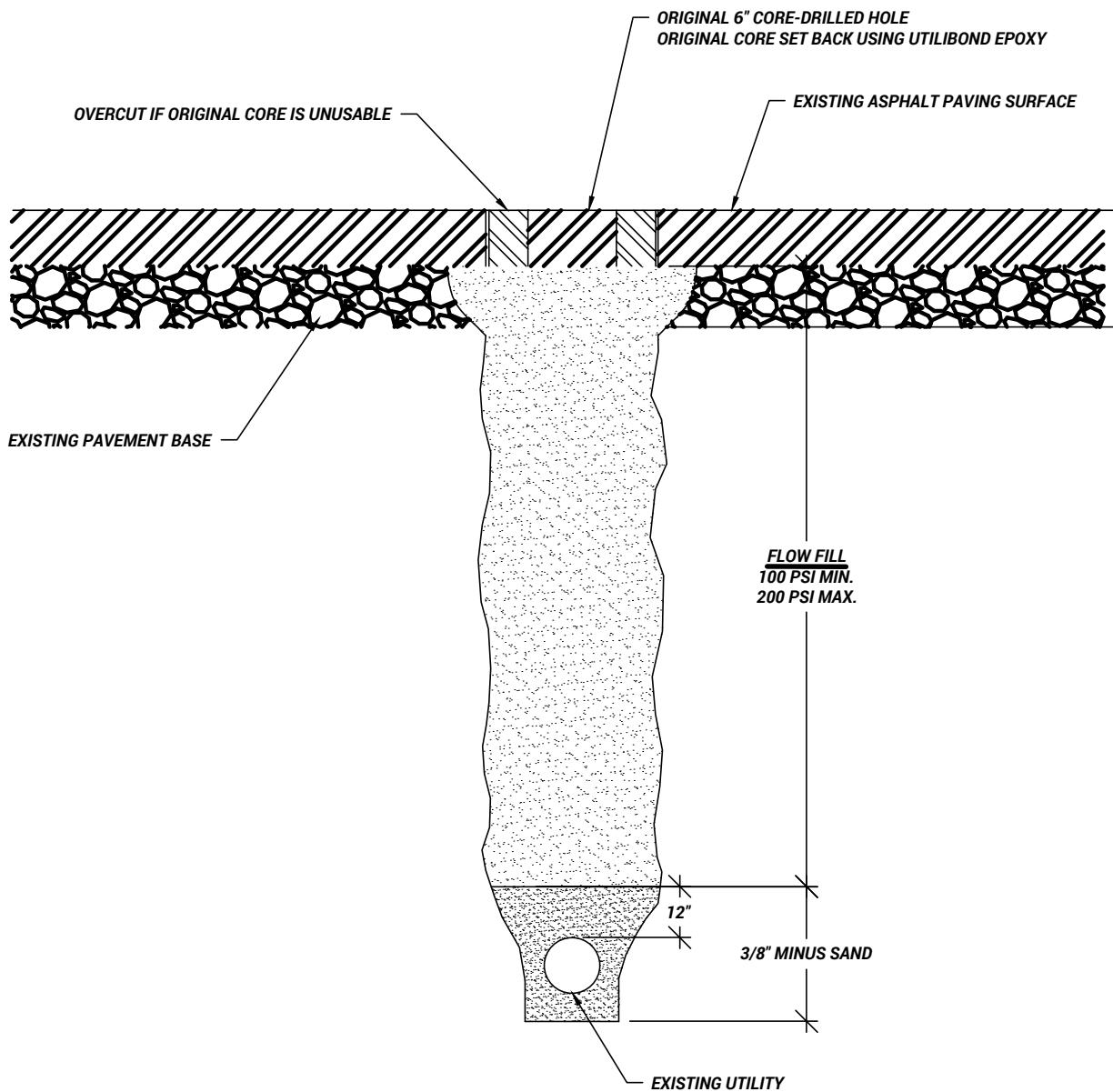


DRIVEWAY APPROACH

RD-7

TAYLOR NIELSEN, CITY ENGINEER

SHEET 2 OF 2 2025



NOTES:

1. IF ORIGINAL CORE CANNOT BE USED, THEN 12" DIAMETER CORE MUST BE CUT AND THEN FILLED WITH HOT MIX ASPHALT.
2. FLOWFILL MUST BE BATCHED. SUBMIT ALL BATCH TICKETS FOR APPROVAL TO OGDEN CITY ENGINEERING.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



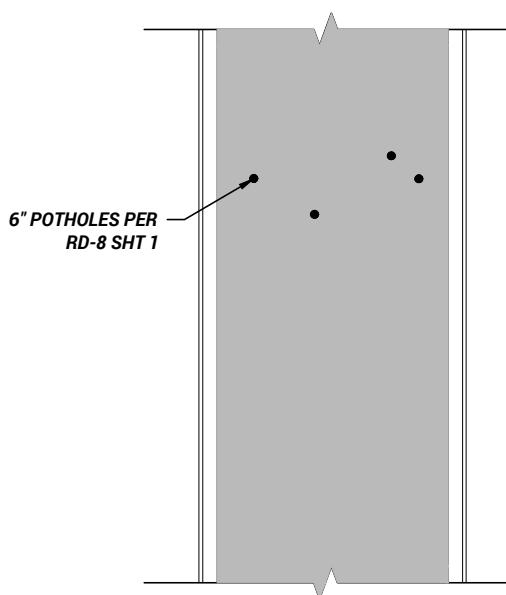
UTILITY POTHOLING

RD-8

TAYLOR NIELSEN, CITY ENGINEER

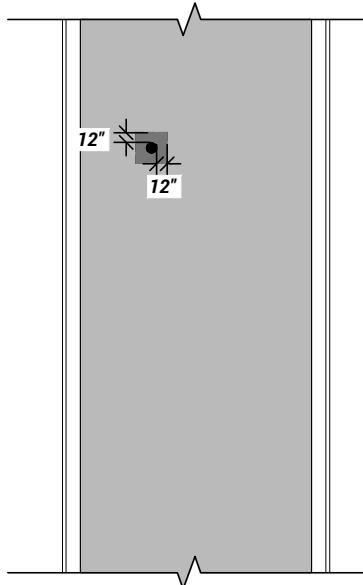
SHEET 1 OF 2 2025

STANDARD POTHOLE (6")



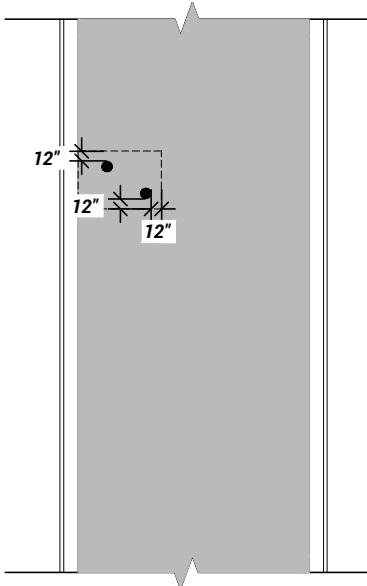
LARGER POTHOLE (8" +)

SINGLE



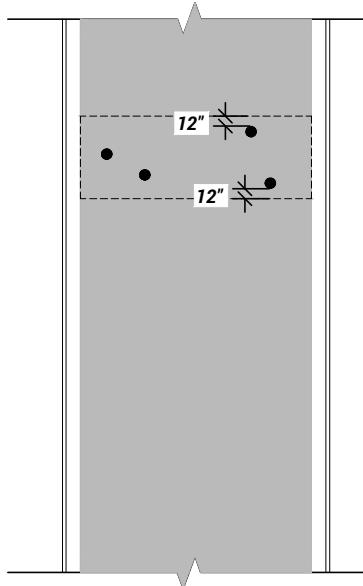
SINGLE UTILITY POTHOLES LARGER THAN 6" CAN BE FILLED PER RD-8 SHEET 1. PATCH MUST BE MINIMUM 12" OVERCUT WITH ALL EDGES CRACK-SEALED. AVOID PLACING EDGE OF PATCH IN WHEEL PATH, EXPAND PATCH SIZE IF NECESSARY.

LARGER POTHOLE (8" +) MULTIPLE - SAME SIDE OF ROAD



MULTIPLE UTILITY POTHOLES, WHICH ARE LOCATED ON THE SAME SIDE OF THE ROAD AND ARE LARGER THAN 6" CAN BE FILLED ACCORDING TO RD-8 SHEET 1. THE POTHOLES MUST BE COVERED BY A SINGLE ASPHALT PATCH, WHICH TOUCHES THE CLOSEST CURB/GUTTER AND HAS A 12" OVERCUT MEASURED FROM THE THREE OUTERMOST EDGES. ALL EDGES OF THE PATCH MUST BE CRACK-SEALED. AVOID PLACING EDGE OF PATCH IN WHEEL PATH, EXPAND PATCH SIZE IF NECESSARY.

LARGER POTHOLE (8" +) MULTIPLE - BOTH SIDES OF ROAD



MULTIPLE UTILITY POTHOLES, WHICH ARE LOCATED ON THE SAME SIDE OF THE ROAD AND ARE LARGER THAN 6" CAN BE FILLED ACCORDING TO RD-8 SHEET 1. THE POTHOLES MUST BE COVERED BY A SINGLE ASPHALT PATCH, WHICH EXTENDS THE FULL WIDTH OF THE ROADWAY (LIP TO LIP) AND HAS A 12" OVERCUT MEASURED FROM THE OUTERMOST EDGES. ALL SAWCUT EDGES OF PATCH MUST BE CRACK-SEALED.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

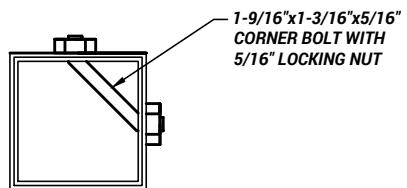
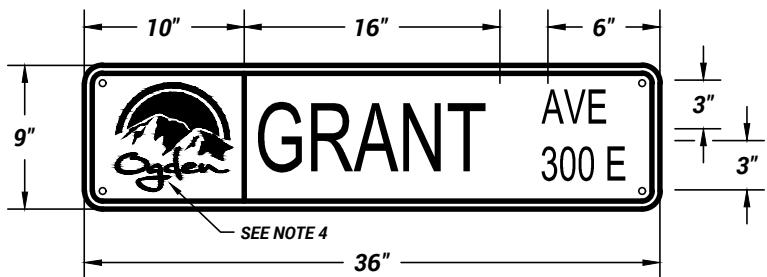


UTILITY POTHOLING

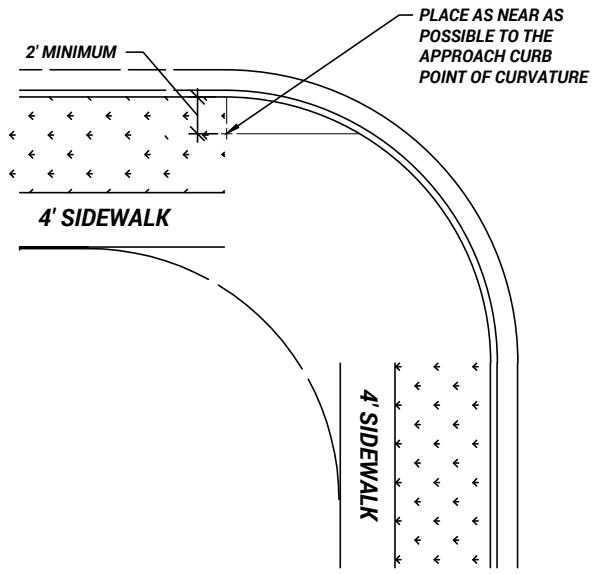
TAYLOR NIELSEN, CITY ENGINEER

RD-8

SHEET 2 OF 2 2025



**BREAKAWAY BASE
ANCHOR ASSEMBLY**



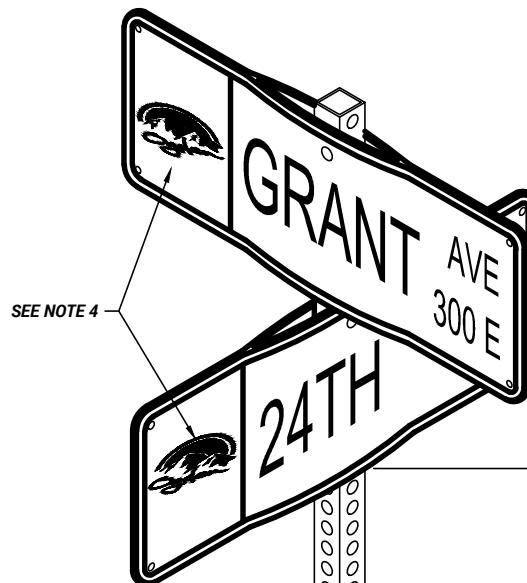
NOTES:

1. SIGN DETAIL:

- 1.1. CITY STREET SIGN SHALL BE GREEN ON WHITE BACKGROUND.
- 1.2. PRIVATE STREET SIGN SHALL BE BLUE ON WHITE BACKGROUND.
- 1.3. ALL OTHER STREET SIGNS SHALL ADHERE TO UDOT 2012 STANDARD SPECIFICATIONS SECTION 02891 AND STANDARD DRAWING SERIES SN.

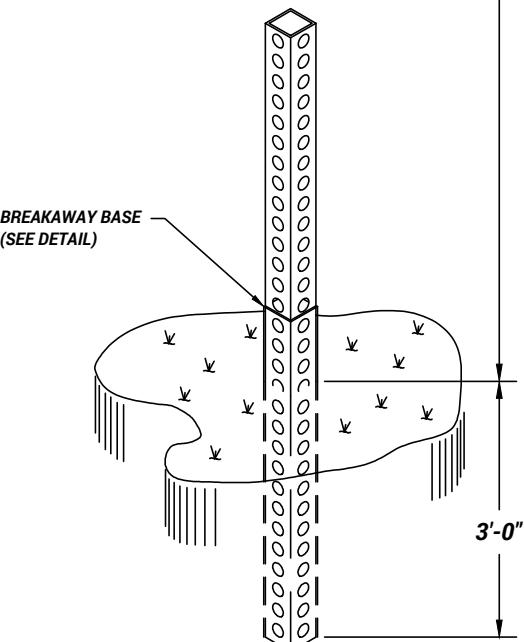
2. INSTALLATION:

- 2.1. INSTALL SIGNS ON THE NORTHWEST AND SOUTHWEST CORNERS OF THE INTERSECTION.
3. THESE STREET SIGNS SHALL ONLY BE USED ON LOCAL ROADS. REFER TO UDOT SIGN POST STANDARDS FOR SIGNS ON COLLECTORS & ARTERIALS.
4. COORDINATE WITH STREETS SUPERVISOR ON THE CURRENT STANDARD OF THE CITY LOGO AND PLACEMENT ON STREET SIGNS.



GALVANIZED STEEL TUBE
12" x 1-3/4" x 1-3/4"
7/16" DIAMETER HOLES
1" ON CENTER
(FULL LENGTH OF POST)

7'-9"



OGDEN CITY ENGINEERING - STANDARD DRAWINGS

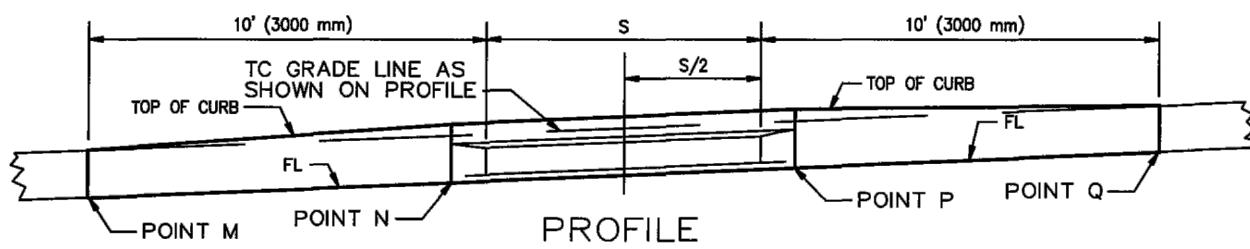
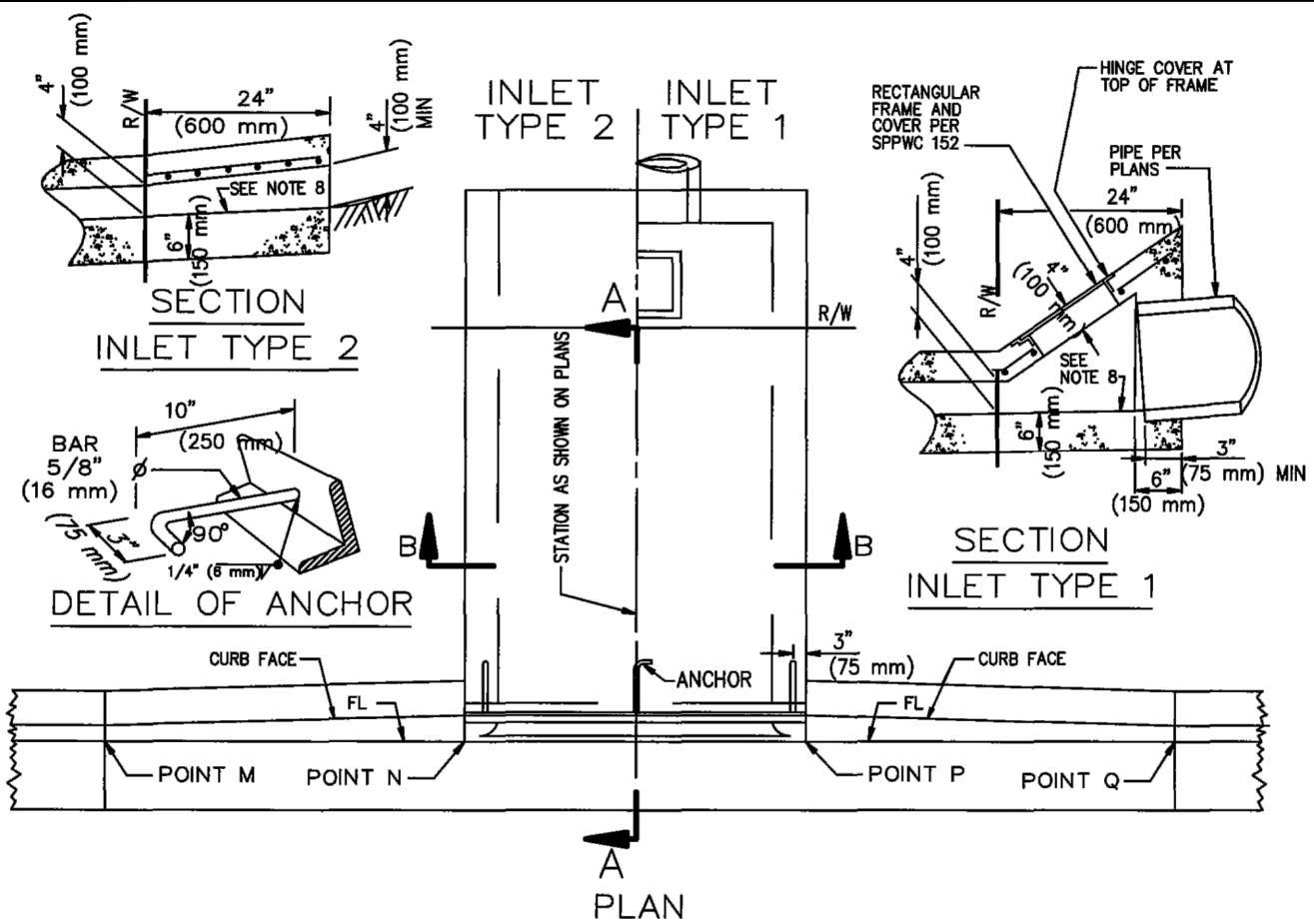


STANDARD LOCAL STREET SIGN

RD-9

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



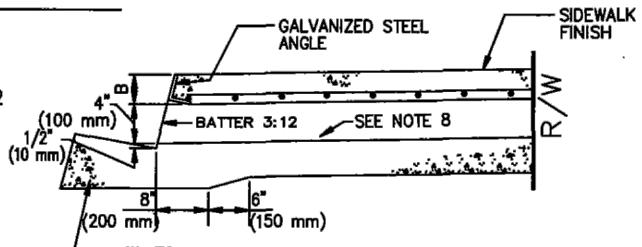
S, INCHES (mm)	J BAR SPACING
12" (300)	7" (240)
18" (450)	7" (240)
24" (600)	7" (240)
30" (750)	7" (240)
36" (900)	7" (240)
42" (1050)	6" (210)
48" (1200)	5" (180)
54" (1350)	6-1/2" (225)
60" (1500)	5" (180)
66" (1650)	4" (180)
72" (1800)	3-1/2" (120)

FOR S = 30" (750 mm) AND LESS, USE 2 ANCHORS. OTHERWISE, USE 3 ANCHORS.

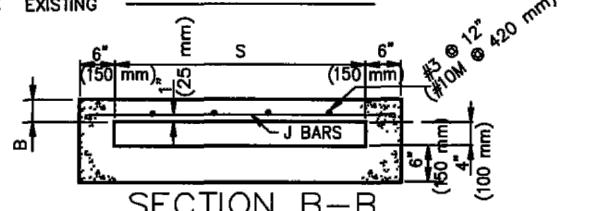
FOR S = 48" (1200 mm) AND LESS,
B = 3" (75 mm)
USE 2-1/2" x 2" x 3/8" (64x51x9.5)
GALVANIZED STEEL ANGLE.

OTHERWISE, B = 4" (100 mm). USE 3-1/2" x 3" x 1/2" (89x76x12.7) GALVANIZED STEEL ANGLE.

J BARS ARE #3 (#10M).

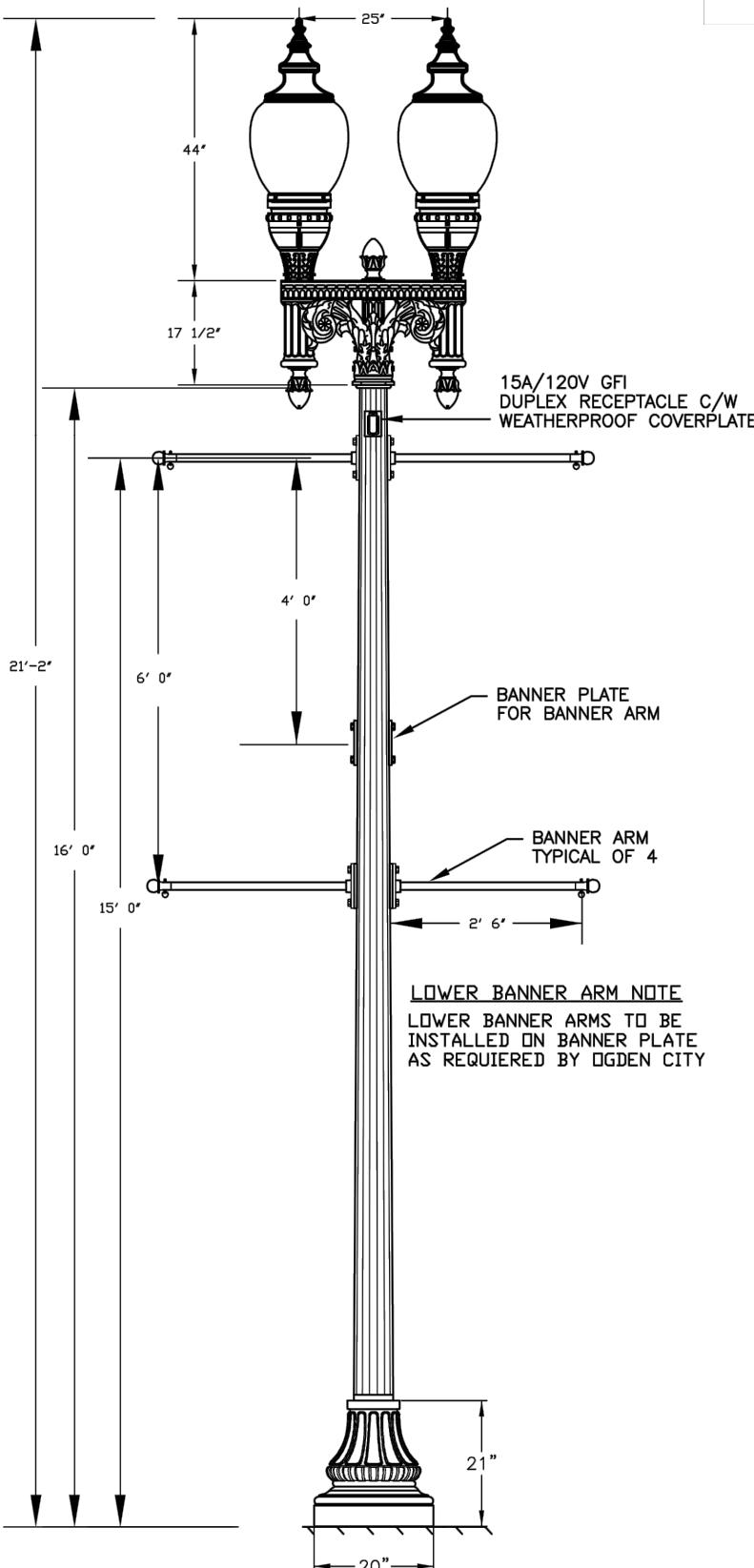


SECTION A-A



MAX OC
15 @ 12" (380 mm)
FROM (100 mm)

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



LUMINAIRE SPECIFICATIONS

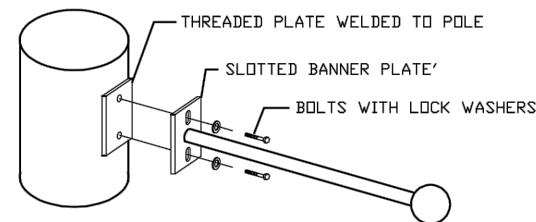
MSL NO.: MSLK118R-P4AR-V-100W(SSL)-1030
 -120;277V-K26-PR7-SST-3K-QD-#1
 OPTICAL SYSTEM: FLAT ARRAY, ACRYLIC RIPPLED
 IES CLASSIFIC.: TYPE V
 INPUT WATTS: 100W
 SERIES: 1030
 CCT: 3000K
 LINE VOLTAGE: 120;277V
 POLE ADAPTOR: K26
 PAINT: BLACK
 OPTIONS: TWISTLOCK RECEPTACLE
 RD8645-BK (10 YR WARRANTY)

POLE SPECIFICATIONS

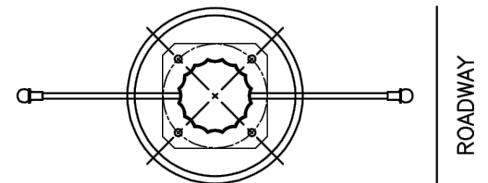
MSL NO.: 16RTFS-6.1/4.8-GFI-TT4X7-
 20"WASH-(2)UBA-(2)LBA-(2)BAP-BK
 PAINT: BLACK
 BASE MATERIAL: HIGH DENSITY ELASTOMER
 SHAFT MATERIAL: 11 GAUGE FLUTED
 FORMED STEEL
 SHAFT TAPER: 0.14"/FT.
 TOP SIZE: 4.8"
 BUTT SIZE: 6.1"
 OVERALL LENGTH: 16' 0"
 POLE WEIGHT: 300 lbs. APPROX.
 ANCHOR BOLTS: (4) 3/4" x 18" L (INCLUDED)
 BOLT CIRCLE: 12" Ø

ARM SPECIFICATIONS

MSL NO.: KA66-T-2
 PAINT: BLACK
 MATERIAL: ALUMINUM



ADJUSTABLE BANNER ARM DETAIL



ANCHOR BASE DETAIL
12" BOLT CIRCLE
ANCHOR BOLTS: 3/4" x 18"

BASE PLAN DETAIL

CARE MUST BE TAKEN WHEN INSTALLING
ANCHOR BASES TO ENSURE CORRECT
ORIENTATION WITH RESPECT
TO EDGE OF ROADWAY

Ogden
 UTAH
 Still Untamed™



Mountain States Lighting
 609 Krista Court
 Murray, Utah 84123
 Phone 801-268-4879
 Fax 801-605-9058

WASHINGTON BLVD OGDEN, UTAH ARTERIAL STREET LIGHT STANDARD

SCALE:	DATE:	DRAWN BY:	DRAWING NUMBER:
NTS	9-6-2023	TM	OGDEN # RD-11
OGDEN CITY APPROVAL:			WASH-ARTERIAL

Fixture Specifications:

MSL NO.: MSLK118R-P4AR-III-75W(SSL)-1030
-120,277V-K24-PR7-SST-3K-BELED-QD-#1

OPTICAL SYSTEM: FLAT ARRAY, ACRYLIC RIPPLED

IES CLASS.: TYPE III

INPUT WATTS: 75W

SOLID STATE LIGHTING

SERIES: 1030

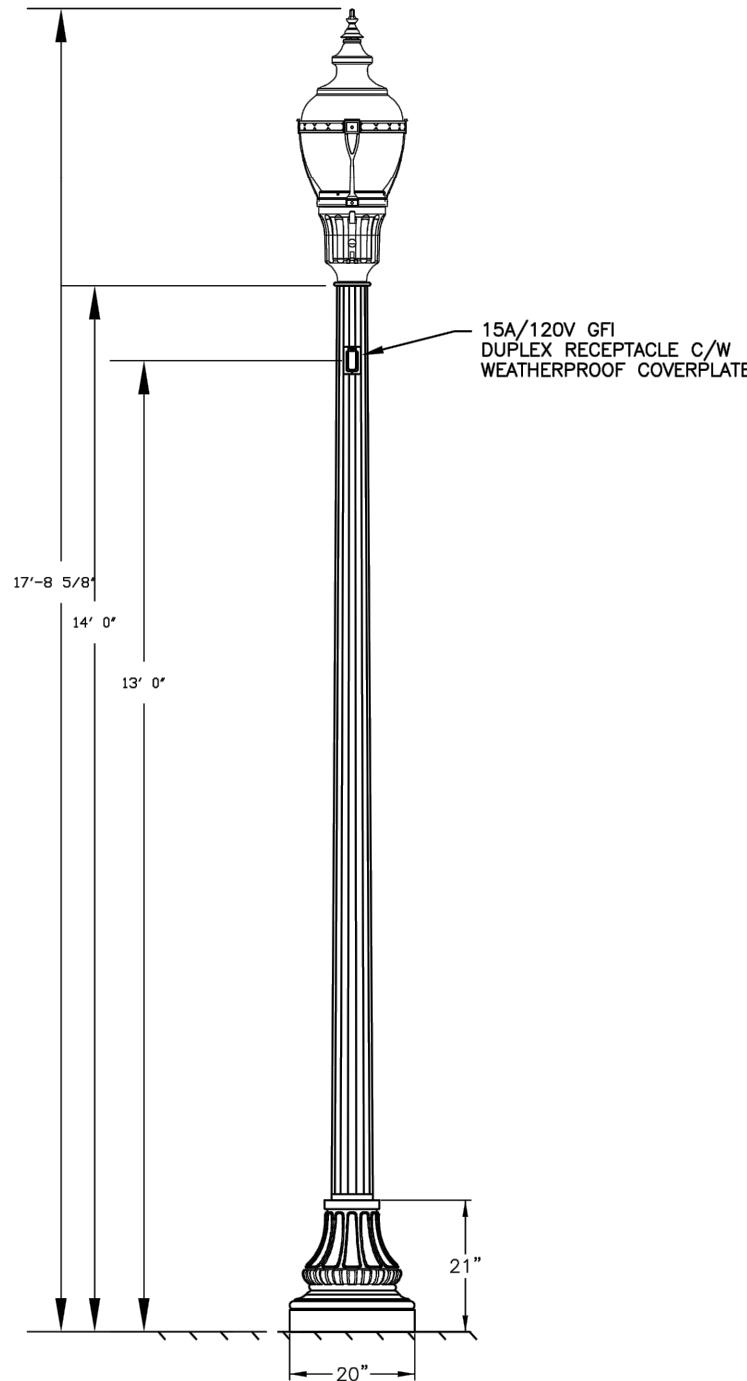
CCT: 3000K

LINE VOLTAGE: 120:277V

POLE ADAPTOR: K24

PAINT: BLACK

OPTIONS: TWISTLOCK RECEPTACLE
RD8645-BK (10YR WARRANTY)



Pole Specifications

CATALOG NO.: 14RTFS-6.1/4.8-TT3-20" WASH-GFI-BK

PAINT: BLACK

BASE MATERIAL: HIGH DENSITY ELASTOMER

SHAFT MATERIAL: 11 GAUGE FLUTED
FORMED STEEL

SHAFT TAPER: 0.14"/FT.

TOP SIZE: 4.8"

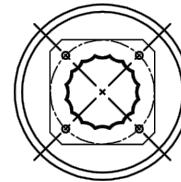
BUTT SIZE: 6.1"

OVERALL LENGTH: 14' 0"

POLE WEIGHT: 200 lbs. APPROX.

ANCHOR BOLTS: (4) 3/4" x 18" L (INCLUDED)

BOLT CIRCLE: 12" Ø



ROADWAY

ANCHOR BASE DETAIL
12" BOLT CIRCLE
ANCHOR BOLTS: 3/4" x 18"

Base Plan Detail

CARE MUST BE TAKEN WHEN INSTALLING
ANCHOR BASES TO ENSURE CORRECT
ORIENTATION WITH RESPECT
TO EDGE OF ROADWAY

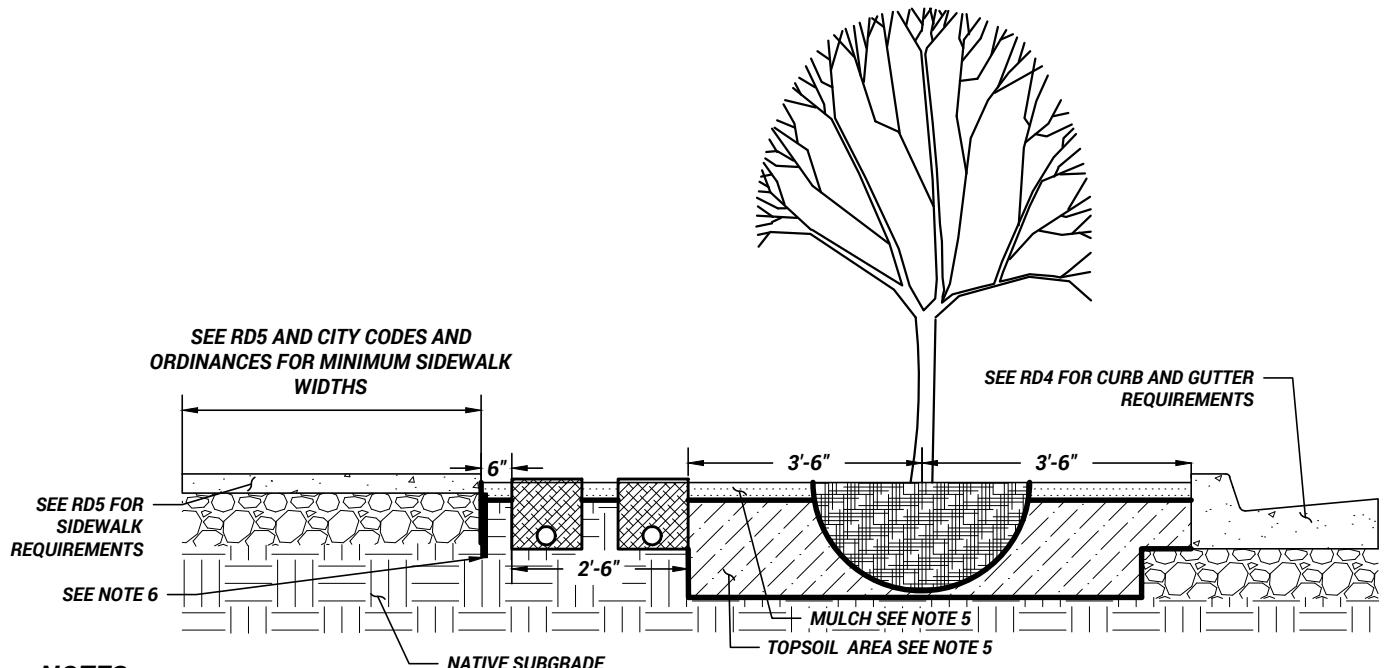
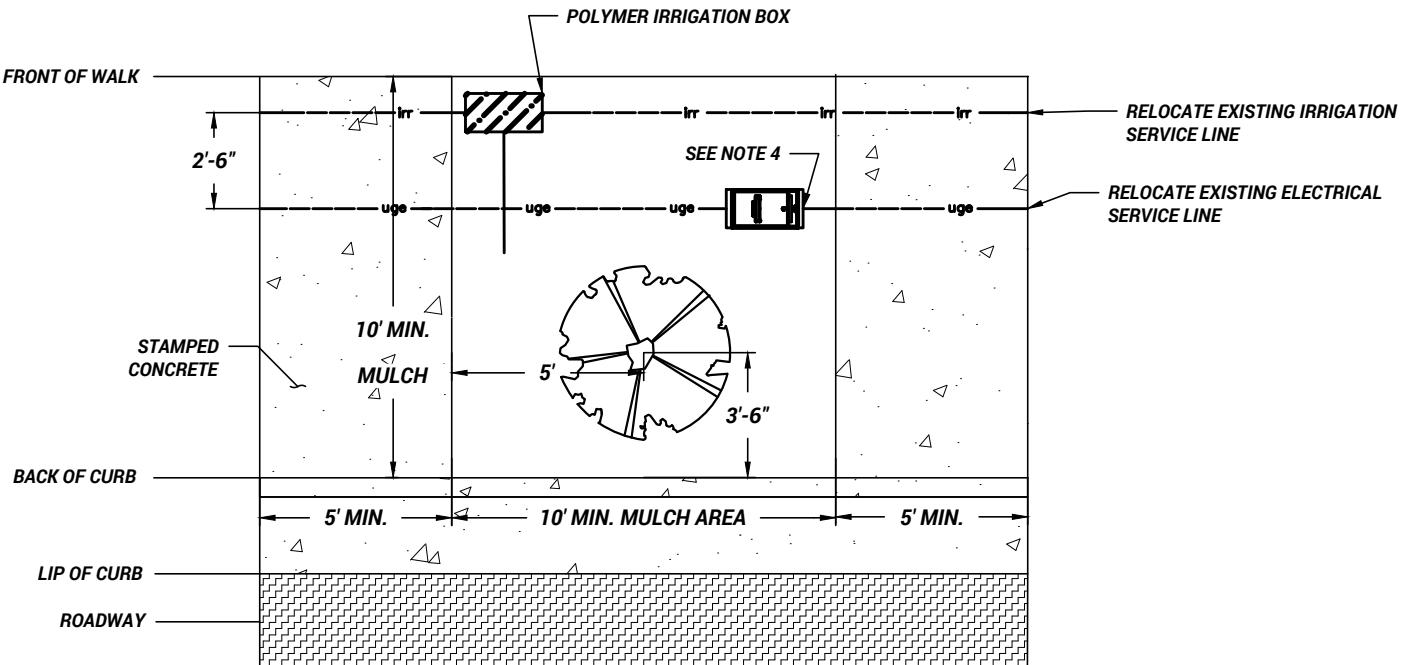
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Mountain States Lighting
609 Krista Court
Murray, Utah 84123
Phone 801-268-4879
Fax 801-605-9058

**OGDEN, UTAH
SECONDARY STREET LIGHT STANDARD**

SCALE:	DATE:	DRAWN BY:	DRAWING NUMBER:
NTS	9-6-2023	TM	OGDEN # RD-12
OGDEN CITY APPROVAL:			OGDEN # RD-12



NOTES:

1. REMOVE CONCRETE TO NEAREST JOINT ONCE SUFFICIENT SEPARATION DISTANCES HAVE BEEN MET.
2. CONCRETE AROUND PLANTER IS TO BE A STAMPED CONCRETE COLORED BROWN TO MATCH BRICK PAVERS. CONCRETE SHALL BE 4000 PSI, 6" THICK OVER 6" THICK ROADBASE.
3. EXISTING IRRIGATION SERVICE LINE MUST BE RELOCATED AS SHOWN. CONTACT THE URBAN FORESTER AND PARKS FOR MORE DIRECTION AND DETAILS FOR THE IRRIGATION SYSTEM.
4. EXISTING ELECTRICAL LINE AND CONDUIT SHALL BE RELOCATED AS SHOWN. INSTALL 8"x14" LEGRAND WIREMOLD OUTDOOR GROUND BOX WITH 4 RECEPTACLES.
5. MULCH AREA IS TO BE A MINIMUM OF 100 SQ FEET. MULCH IS TO BE APPROVED BY OGDEN CITY PARKS DEPARTMENT MANAGER AND IS TO BE PLACED 3" THICK SURROUNDING TREE. A SCREENED PREMIUM TOPSOIL PLACED TO A MINIMUM DEPTH OF 1' 6" BELOW THE MULCH. MULCH IS TO BE $\frac{1}{2}$ " BELOW EDGE OF CONCRETE.
6. INSTALL MINIMUM 12" TALL PLASTIC ROOT BARRIER AT EDGE OF MULCH AREA AND CONCRETE.
7. TREE IN PLANTER BOX MUST FOLLOW OGDEN CITY CODE OF APPROVED SPECIES FOR MEDIUM OR LARGE (IF SPACE PERMITS) TREES. REACH OUT TO OGDEN CITY URBAN FORESTER WITH ANY QUESTIONS REGARDING TREE SELECTION.
8. AREAS WHERE THESE STANDARDS CANNOT BE MET, CONTACT THE OGDEN CITY URBAN FORESTER AND ENGINEERING DIVISION FOR EXCEPTIONS.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

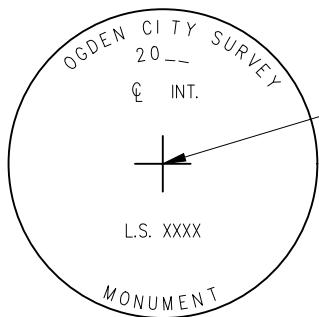


Hardscape Tree Planter Box

TAYLOR NIELSEN, CITY ENGINEER

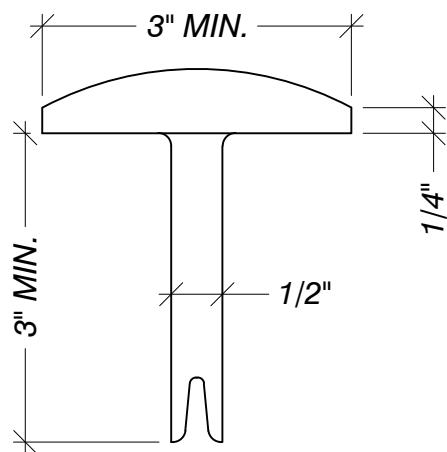
RD-13

SHEET 1 OF 1 2025



CAP PLAN

CAP CAN BE PURCHASED FROM
ENGINEERS OFFICE



CAP SECTION

NOTES:

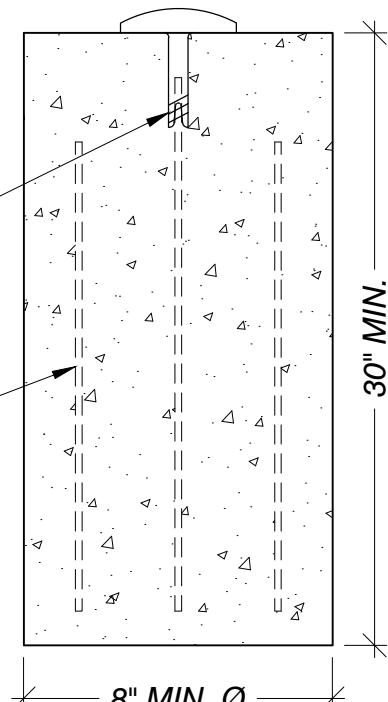
1. DATE: SHOW MONTH, DAY, AND YEAR WHEN CAP WAS MARKED.
2. LICENCE: SHOW LICENCE NUMBER OF LAND SURVEYOR WHO MARKED THE CAP.
3. CONCRETE: CLASS 4000 PER APWA SECTION 03 30 04.
4. REINFORCEMENT: ASTM A 615, GRADE 60, DEFORMED STEEL REBAR.

ABBREVIATIONS:

INT - INTERSECTION
 ML INT - MONUMENT LINE INTERSECTION
 P.C. - POINT OF CURVATURE
 P.C.C. - POINT OF COMPOUND CURVATURE
 P.I. - POINT OF INTERSECTION
 P.O.C. - POINT ON CURVE
 P.O.T. - POINT ON TANGENT
 P.R.C. - POINT OF REVERSE CURVE
 P.T. - POINT OF TANGENCY
 S.C. - SECTION CORNER
 W.C. - WITNESS CORNER

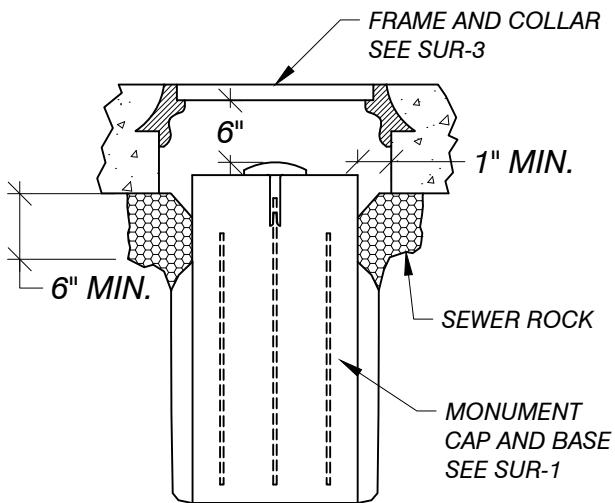
ATTACH CAP TO
REBAR WITH WIRE
FOR INITIAL PLACEMENT

REINFORCEMENT
(3) #5 @ 24"

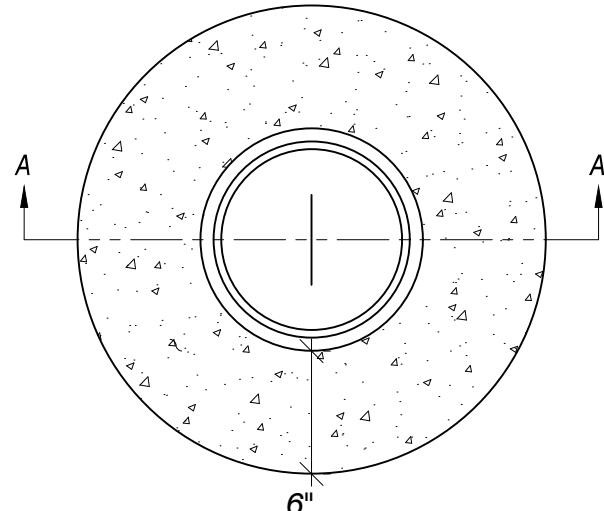


SECTION OF BASE (TYPICAL SETTING)

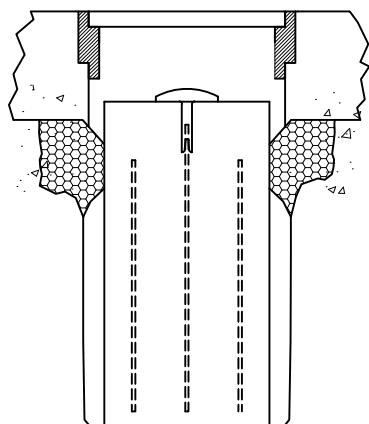
OGDEN CITY ENGINEERING - STANDARD DRAWINGS		
Ogden UTAH Still Untamed™	MONUMENT CAP & BASE	SUR-1
	TAYLOR NIELSEN, CITY ENGINEER	SHEET 1 OF 1 2025



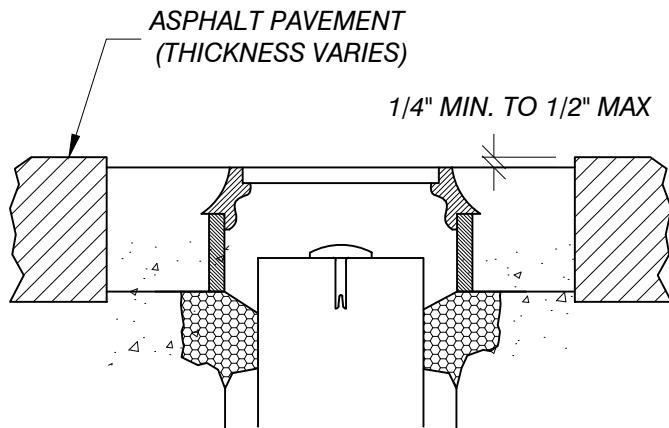
ASPHALT PAVING



PLAN



CONCRETE PAVING



SECTION A-A

NOTES:

1. BACKFILL: INSTALL AND COMPACT BACKFILL MATERIAL PER APWA SECTION 32 05 10.
2. FOUNDATION: COMPACT BOTTOM OF EXCAVATED HOLE BEFORE PLACEMENT OF PRECAST OR CAST IN-PLACE MONUMENT POST.
3. CONCRETE: CLASS 4000 PER APWA SECTION 03 30 04 WITH MICRO FIBER MESH ADDITIVE (FOR COLLAR)
4. JOINTS: PROVIDE A VERTICAL JOINT BETWEEN EXISTING AND NEW SURFACES. PROVIDE A CONCENTRIC CIRCLE CUT.
5. THE SURVEY MONUMENT BASE CONCRETE SHALL BE POURED SEPARATELY FROM THE FRAME AND COVER COLLAR CONCRETE.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

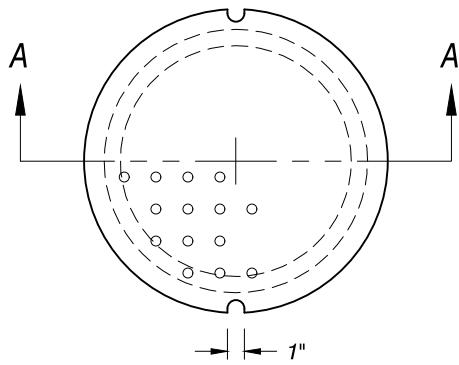


**SURVEY MONUMENT PLACEMENT
UNDER ASPHALT PAVEMENTS**

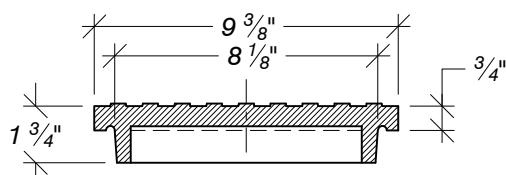
TAYLOR NIELSEN, CITY ENGINEER

SUR-2

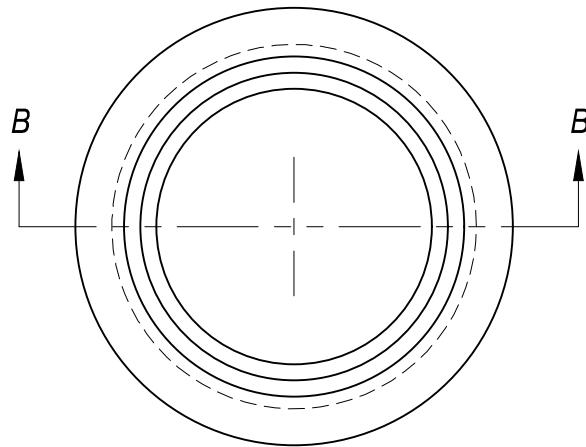
SHEET 1 OF 1 2025



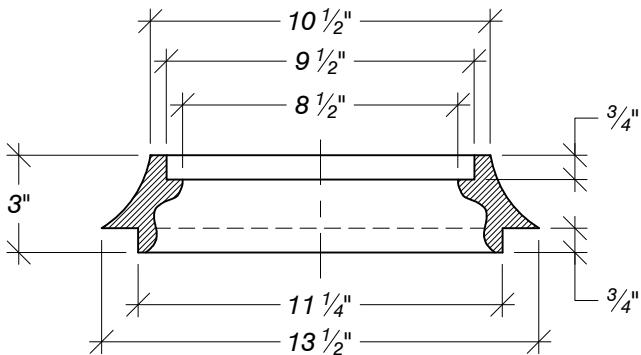
COVER



SECTION A-A

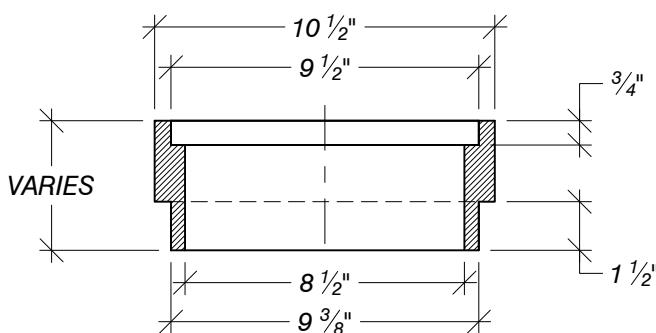


FRAME



SECTION B-B

NOTE: USE EXTENSION IN PORTLAND CEMENT CONCRETE PAVEMENTS.
USE FRAME IN ASPHALT CONCRETE PAVEMENT.



EXTENSION

NOTES:

1. CASTINGS: GREY IRON CLASS 20 MINIMUM PER ASTM A 48.
2. COATINGS: COAT ALL METAL PARTS WITH ASPHALTUM PAINT.
3. SETTING: SET FRAME INDEPENDENT OF MONUMENT BASE.
4. USE D&L /OLYMPIC COVER K-6313

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

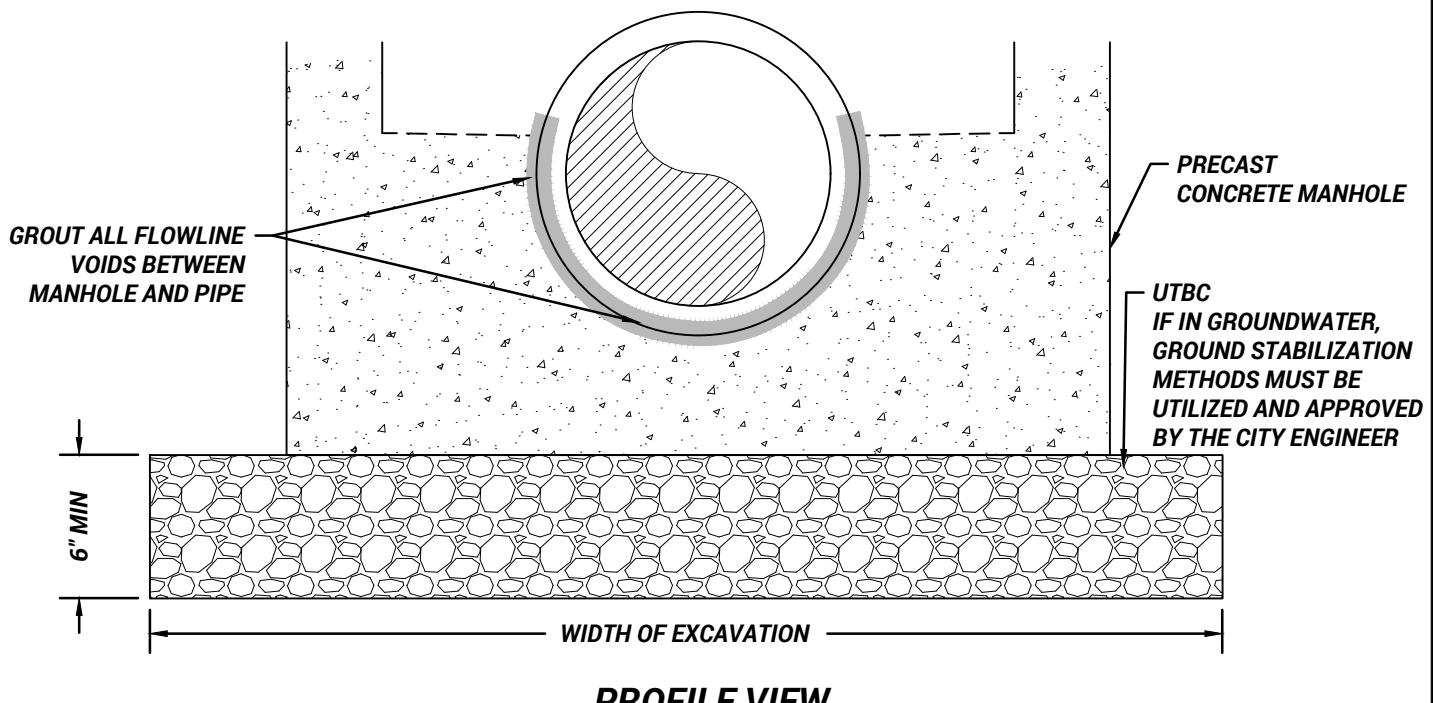
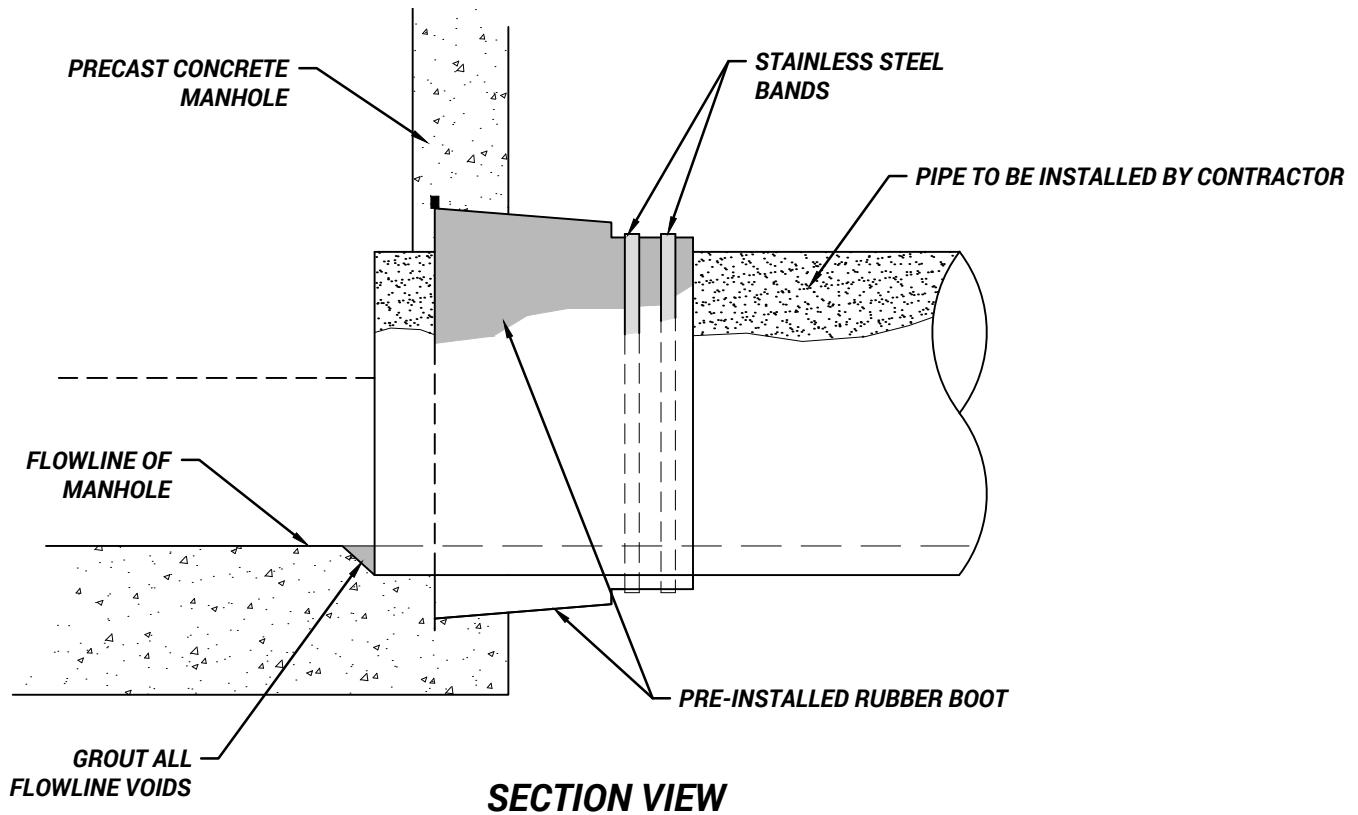
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FRAME AND COVER FOR MONUMENT

TAYLOR NIELSEN, CITY ENGINEER

SUR-3

SHEET 1 OF 1 2025



OGDEN CITY ENGINEERING - STANDARD DRAWINGS

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SEWER MANHOLE PRECAST

SS-1

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 2 2025

NOTES:

1. **BACKFILL: PROVIDE AND PLACE PER APWA SECTION 31 23 23.**
 - 1.1. **COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.**
2. **CONCRETE CLASS 4000 PER APWA SECTION 03 30 04. PLACE CONCRETE PER APWA 03 30 10.**
3. **MANHOLE SIZE**
 - 3.1. **4' DIAMETER FOR SEWER PIPES UNDER 12" IN DIAMETER AND NOT SUBJECT TO ANY CONDITIONS LISTED FOR THE 5' MANHOLE.**
 - 3.2. **5' DIAMETER FOR THE FOLLOWING:**
 - 3.2.1. **DEFLECTION ANGLE IS GREATER THAN OR EQUAL TO 45°**
 - 3.2.2. **WHEN THE MANHOLE HAS THREE OR MORE LINES**
 - 3.2.3. **FOR SEWERS WITH A PIPE DIAMETER OF 12" OR GREATER**
 - 3.2.4. **WHEN THE COVER IS GREATER THAN 14'.**
4. **SEE SS-5 FOR MANHOLE FRAME/COVER SPECIFICATIONS.**
5. **OUTLET PIPE TO BE A MINIMUM OF 1" BELOW INLET PIPE FLOW LINES EXCEPT AS NOTED BELOW IN FIG. 1 (BELOW).**
6. **STEEL FRAMES: USE ASTM A 36 STEEL.**
7. **LOW PROFILE LIDS WILL NOT BE ALLOWED IN ANY OGDEN CITY RIGHT OF WAY.**
8. **REINFORCEMENT: USE ASTM A 615, GRADE 60. REFER TO APWA 03 20 00.**
 - 8.1. **CAST IN PLACE REBAR SCHEDULE MUST BE STAMPED BY A STRUCTURAL ENGINEER.**
9. **COATINGS: EXCEPT MACHINED SURFACES, COAT ALL METAL WITH ASPHALTUM PAINT.**
10. **GROUT ALL PIPE OPENINGS WITH 2:1 SAND/CEMENT MORTAR.**
11. **PLACE FLEXIBLE GASKET-TYPE SEALANT IN ALL MANHOLE JOINTS. SEAL MUST MEET THE REQUIREMENTS OF SS-S-00210 (210A), AASHTO M-198, AND ASTM C990.**
12. **PRECAST REINFORCED CONCRETE WALLS MUST BE 5" THICK.**
13. **CAST-IN-PLACE CONCRETE WALLS MUST BE A MINIMUM OF 8" THICK.**
14. **CONTRACTOR SHALL CONTACT SEWER DEPARTMENT PRIOR TO ENTRANCE INTO MANHOLE**
 - 14.1. **ENTRANCE INTO MANHOLE SHALL BE PER OSHA STANDARDS**
15. **MINIMUM PIPE SLOPE: REFER TO TABLE 1 - MINIMUM SEWER MAIN PIPE SLOPE, OF THE OGDEN CITY ENGINEERING STANDARDS FOR MINIMUM SEWER MAIN PIPE SLOPE.**
16. **ALL CONCRETE UTILITY COLLARS (I.E. MANHOLES, VALVES, ETC.) SHALL BE CLASS 4000 CONCRETE WITH MICRO FIBER MESH ADDITIVE.**

NORMAL DROPS (IN FEET) STRAIGHT THROUGH MANHOLES AT INVERTS FOR MINIMUM GRADES OR GREATER EXCEPT AS NOTED BELOW						
INLET SIZE		8"	10"	12"	15"	18"
OUTLET SIZE	8"	0.10	---	---	---	---
	10"	0.17	0.10	---	---	---
	12"	0.33	0.17	0.10	---	---
	15"	0.58	0.42	0.25	CL	---
	18"	0.80	0.71	0.63	0.50	CL

FIGURE 1

CL INDICATES THE DROP THOUGH THE MANHOLE SHALL BE THE EXISTING FLOWLINE BASED ON THE PIPE SLOPE

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

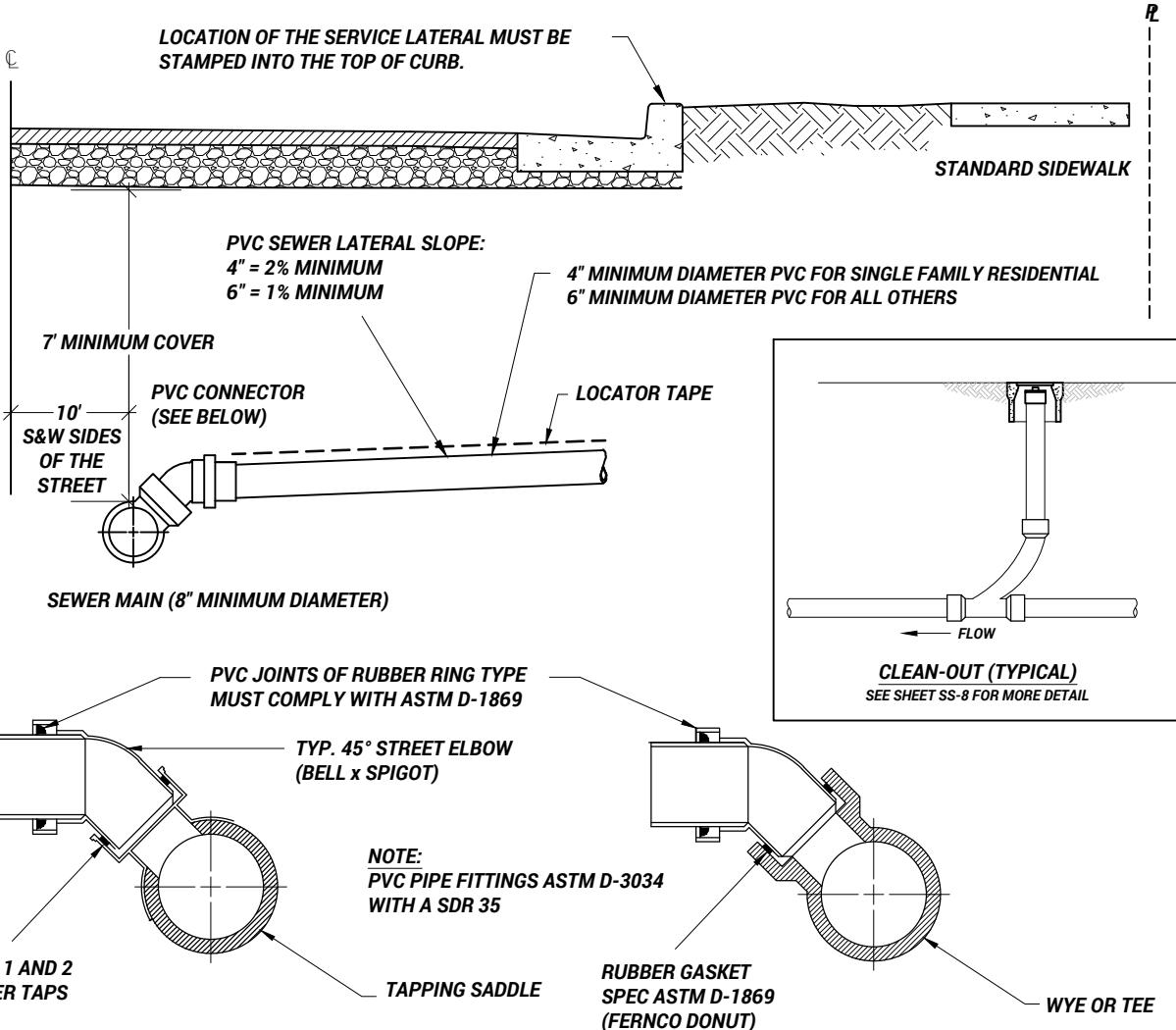


SEWER MANHOLE PRECAST

SS-1

TAYLOR NIELSEN, CITY ENGINEER

SHEET 2 OF 2 2025



TAPPING TO AN EXISTING MAIN

CONNECTING VIA WYE OR TEE

NOTES:

1. CONNECTION FEES WILL BE ASSESSED AT THE TIME A PERMIT IS ISSUED. SEWER TAPS WILL BE PERFORMED BY OGDEN CITY PERSONNEL, WYE CONNECTIONS WILL BE PERFORMED BY THE CONTRACTOR UNDER THE SUPERVISION OF AN OGDEN CITY INSPECTOR. ANY TAP CONNECTIONS PERFORMED BY THE CONTRACTOR MUST BE APPROVED BY THE SEWER MANAGER.
2. SEWER TAPS INTO EXISTING 8" DIAMETER SANITARY SEWER PIPES SHALL NOT BE GREATER THAN 4".
3. ALLOWABLE SANITARY SEWER LATERAL PIPE MATERIAL:
 - 3.1. PVC SDR-35, GREEN IN COLOR
 - 3.2. HDPE DR-17 WITH FACTORY GREEN STRIPE
4. REQUIREMENTS FOR THE BEDDING OF A LATERAL IS THE SAME AS SHOWN IN SS-4.
5. THE SEWER LATERAL LOCATIONS SHALL BE MARKED WITH AN "S" IN THE TOP OF THE CONCRETE CURB.
6. PVC JOINTS OF RUBBER RING MUST COMPLY WITH ASTM D-1869.
7. FOR NEW PROJECTS: EXTEND SEWER LATERAL 5' BEHIND THE BACK OF THE SIDEWALK OR PROPERTY LINE, WHICHEVER IS FURTHER. THE END OF A LATERAL SHALL BE MARKED WITH A 2x4, SET IN THE GROUND, AND HAVE THE END COLORED GREEN.
8. CLEANOUTS SHALL BE REQUIRED EVERY 100'.
9. SEWER PIPE SHALL BE MARKED WITH A 6" DETECTABLE GREEN COLORED LOCATOR TAPE LABELED "SANITARY SEWER"

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

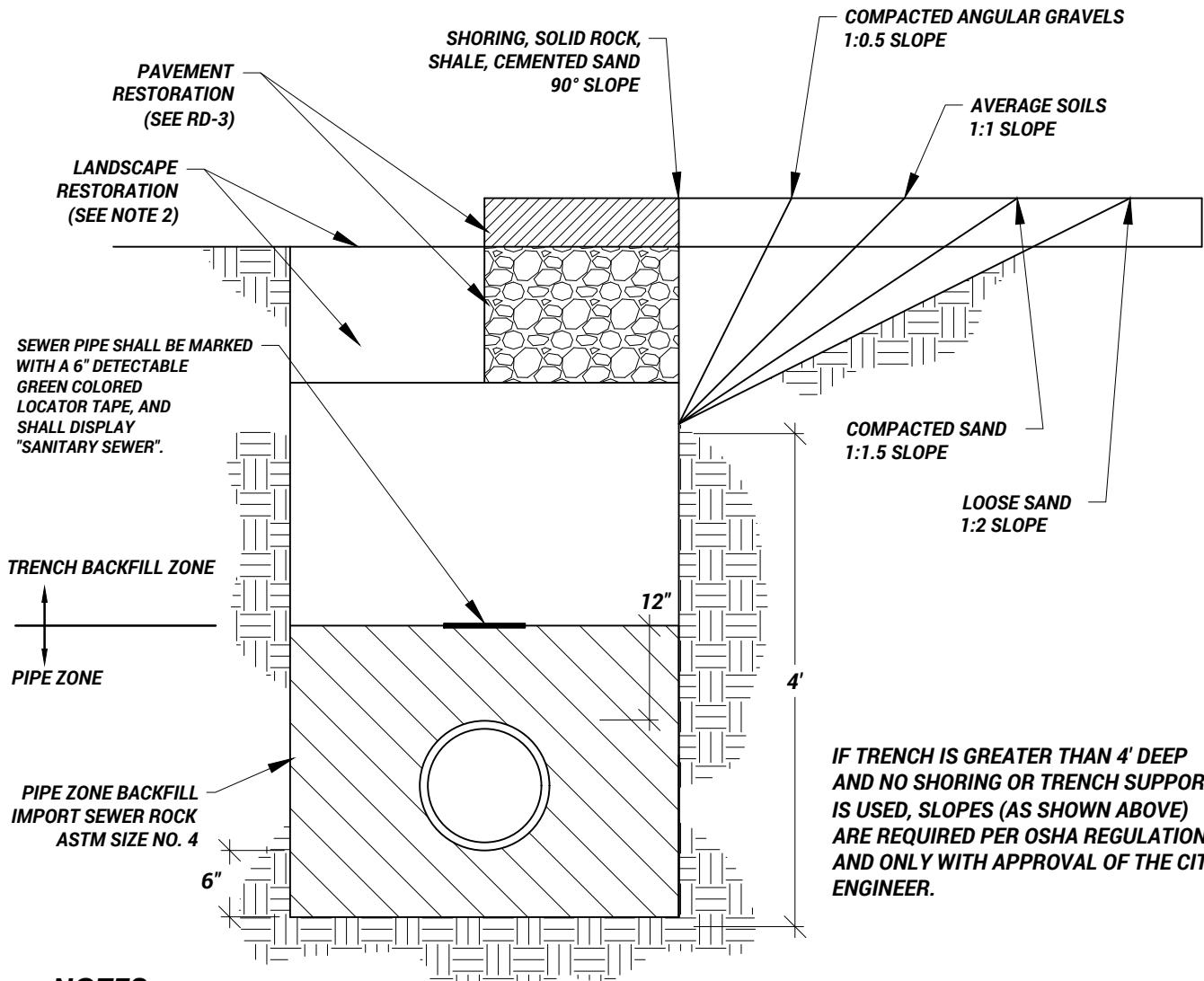


SEWER LATERAL CONNECTION

SS-2

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



NOTES:

1. **BACKFILL: ABOVE THE PIPE ZONE.**
 - 1.1. **GRANULAR IMPORT FILL:** PLACE FILL PER APWA SECTION 33 05 20.
 - 1.2. **COMPACT PER APWA SECTION 31 23 26** TO A STANDARD PROCTOR DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.
2. **LANDSCAPE RESTORATION:** LANDSCAPE MUST BE RETURNED TO PRE-CONSTRUCTION CONDITIONS OR BETTER.
3. **PAVEMENT RESTORATION:** DO NOT INSTALL ANY PORTION OF ASPHALT OR CONCRETE SURFACING UNTIL TRENCH COMPACTION IS ACCEPTABLE TO THE ENGINEER.
4. **PEA GRAVEL IS NOT ALLOWED IN ANY PART OF THE TRENCH.**
5. **STANDARD SEWER MAIN ALIGNMENT SHALL BE 10' WEST OR 10' SOUTH OF THE CENTERLINE IN THE PUBLIC RIGHT-OF-WAY (SEE RD-1).**
6. **HORIZONTAL CLEARANCE TO ANY WATER MAIN SHALL BE AT LEAST 10' (REFER TO UTAH ADMINISTRATIVE CODE # R309-550).**
7. **COMPACTION TESTS ARE REQUIRED EVERY 200 LINEAR FEET OF A MAIN INSTALLATION PER APWA SECTION 33 05 20.** COMPACTION TESTS ARE REQUIRED AT HALF AND FULL DEPTHS.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

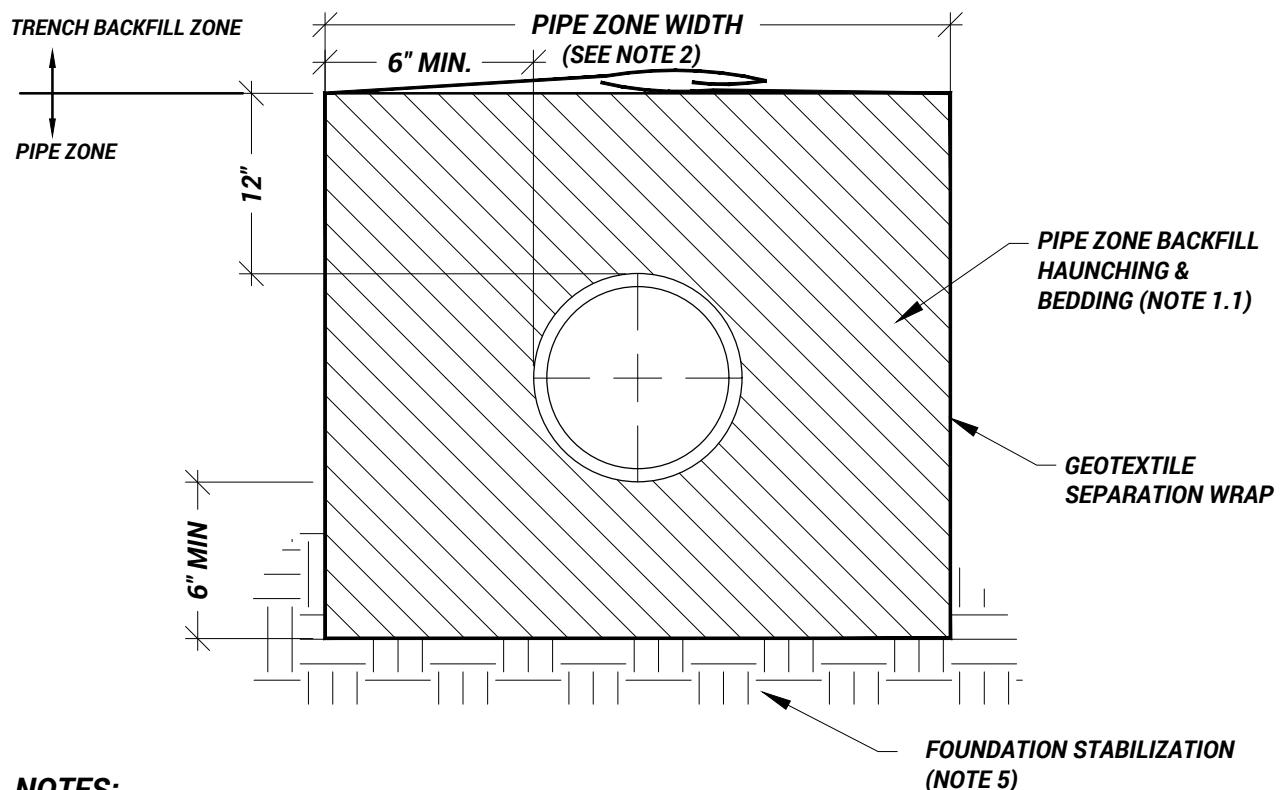


SEWER PIPE TRENCH

SS-3

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



NOTES:

1. **DO NOT USE RECYCLED FILL MATERIAL IN THE PIPE ZONE WITHOUT THE APPROVAL OF THE CITY ENGINEER. IF MANUFACTURE RECOMMENDS ANYTHING CONTRARY TO WHAT IS LISTED BELOW, CONSULT WITH THE ENGINEERING DEPARTMENT.**
 - 1.1. **HAUNCHING/BEDDING: INSTALL AND COMPACT PER MANUFACTURER RECOMMENDATIONS AND ASTM SPECIFICATIONS. IMPORT SEWER ROCK ASTM SIZE NO. 4 WITH GEOTEXTILE WRAP.**
 - 1.1.1. **WATER JETTING IS NOT ALLOWED.**
2. **PIPE ZONE WIDTH IS RECOMMENDED BY THE MANUFACTURE OF THE PIPE. WIDTH OF PIPE ZONE IS MEASURED AT THE PIPE SPRING LINE AND INCLUDES ANY NECESSARY SHEATHING. FOLLOW MANUFACTURE RECOMMENDATIONS FOR ANY TRENCH BOX APPLICATIONS.**
3. **INSTALL THE PIPE IN THE CENTER OF THE TRENCH. THE EDGE OF THE PIPE WALL SHALL BE A MINIMUM DISTANCE OF 6" FROM THE TRENCH WALL.**
4. **PEA GRAVEL OR ANY GRAVEL LESS THAN 3/4" NOMINAL IS NOT ALLOWED IN ANY PART OF THE PIPE ZONE.**
5. **FOUNDATION STABILIZATION REQUIRES SEWER ROCK PER APWA SECTION 31 05 13.**
 - 5.1. **INSTALLATION OF STABILIZATION-SEPARATION GEOTEXTILE PER APWA SECTION 31 05 19 WILL BE REQUIRED TO SEPARATE PIPE ZONE MATERIAL AND NATIVE SUBGRADE MATERIAL IF NATIVE SOIL IS FINE AND SEWER ROCK CANNOT PROVIDE A WORKING SURFACE OR PREVENT SOIL MIGRATION.**
6. **REFER TO APWA SECTION 33 05 07 FOR ADDITIONAL INFORMATION ON PVC PIPE.**

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

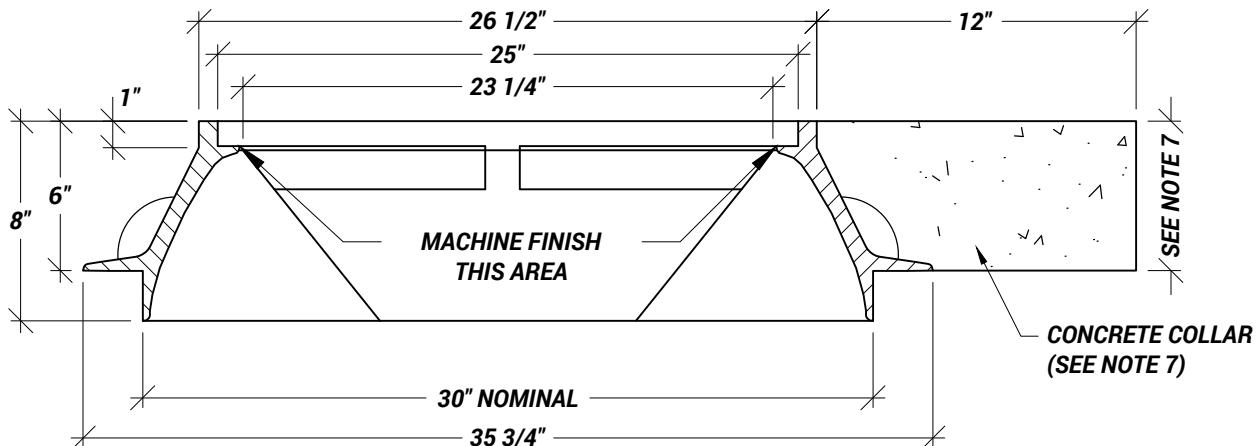
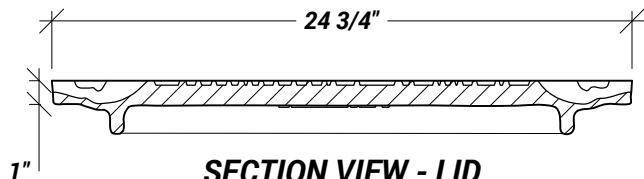
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SEWER MAIN PIPE ZONE

SS-4

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



NOTES:

1. CONTACT THE OGDEN CITY SEWER DEPARTMENT FOR DETAILS AND ORDERING INFORMATION FOR SEWER LID AND FRAME (801) 629-8331 OR (801) 629-8282.
2. LOW PROFILE LIDS WILL NOT BE ALLOWED IN ANY OGDEN CITY RIGHT OF WAY.
3. CASTINGS: GREY IRON CLASS 35 MINIMUM PER ASTM A 48.
4. COATINGS: EXCEPT MACHINED SURFACES, COAT ALL METAL PARTS
5. HEAT NUMBER: PLACE FOUNDRY AND HEAT NUMBER ON THE INSIDE OF THE FRAME AND ON THE BOTTOM OF THE COVER.
6. SEE SS-1, FOR SEWER MANHOLE DETAILS.
7. MANHOLE COLLAR THICKNESS TO BE FROM THE SURFACE TO THE MANHOLE CONE BUT NO LESS THAN 8" THICK (8" - 12" THICKNESS RANGE). THE WIDTH IS TO BE 12" MINIMUM AND CIRCULAR. ALL CONCRETE COLLARS TO HAVE A MICRO FIBER MESH ADDITIVE TO THE 4000 PSI CONCRETE BATCH.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

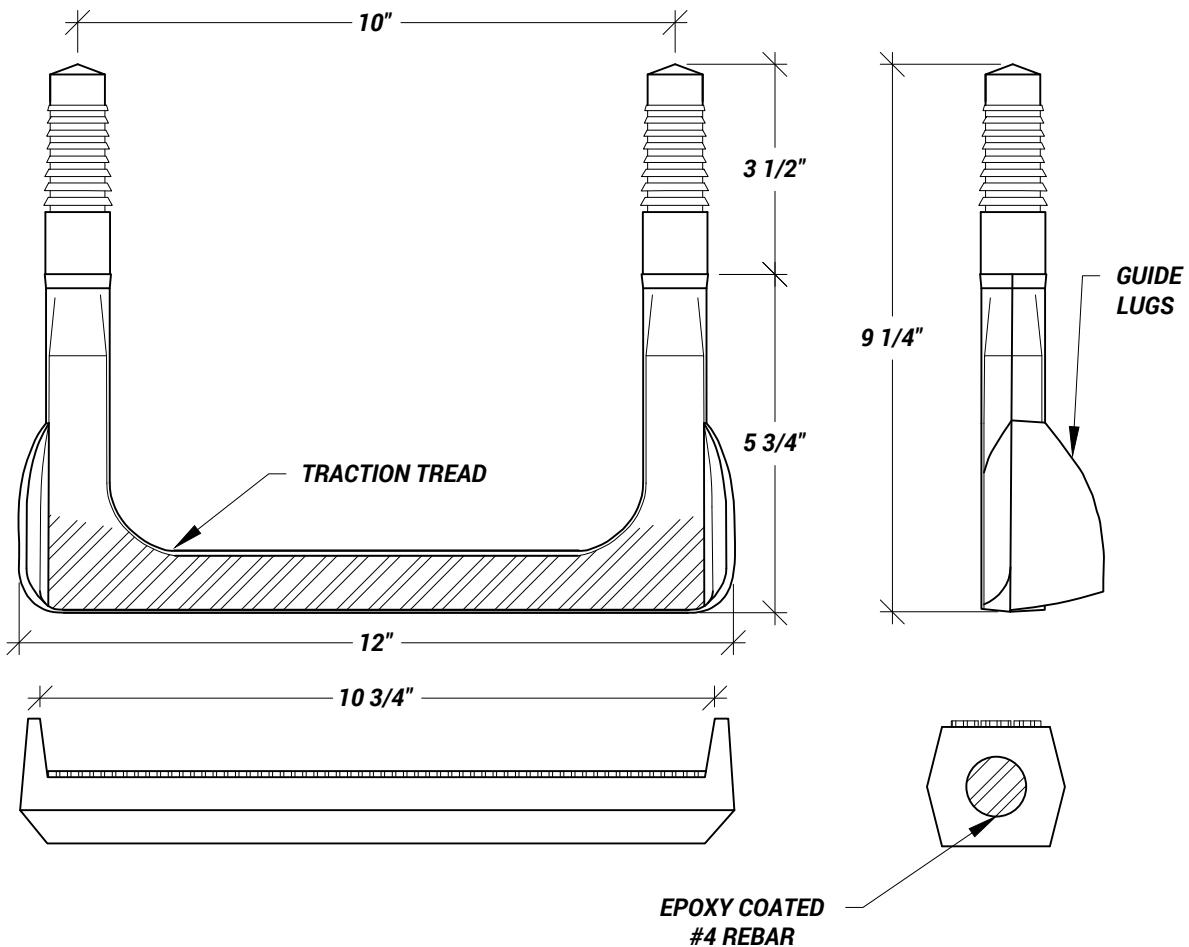
Ogden
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SEWER MANHOLE LID AND FRAME

SS-5

TAYLOR NIELSEN, CITY ENGINEER

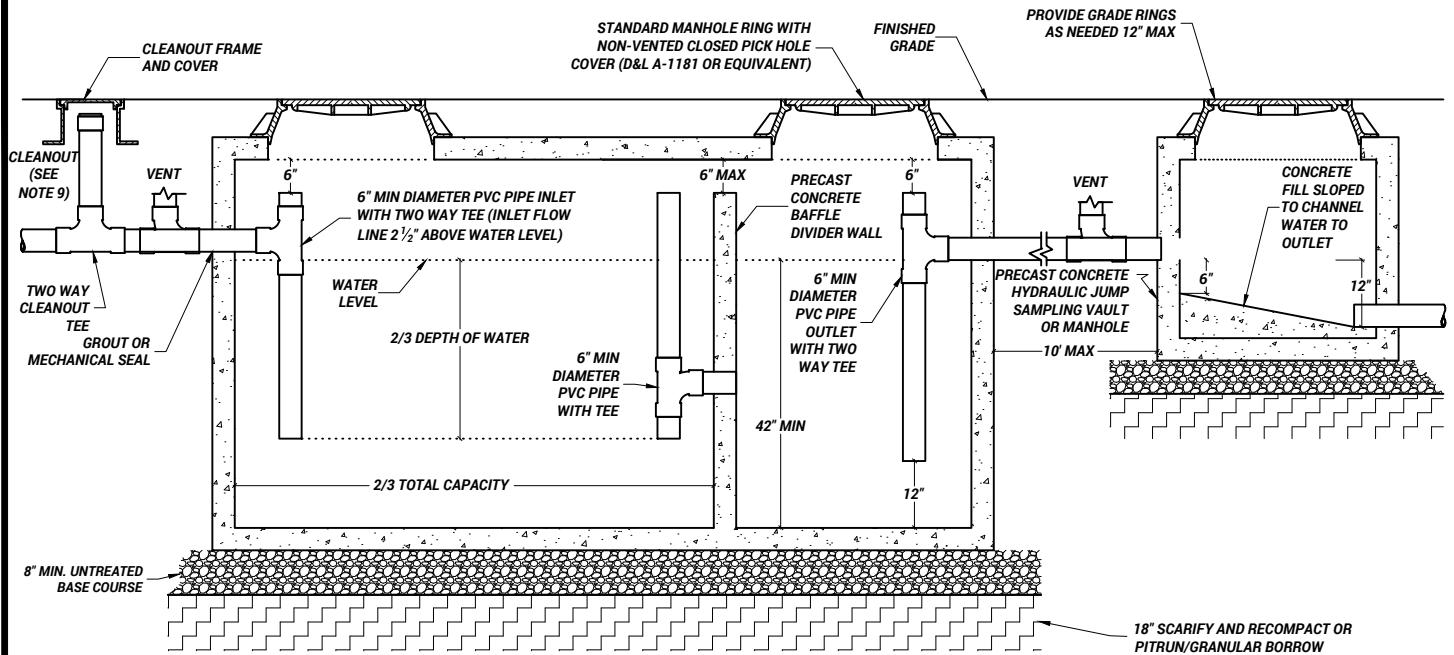
SHEET 1 OF 1 2025



NOTES:

1. LADDER RUNGS ARE REQUIRED IN ALL MANHOLES AND BOXES
2. MANHOLE STEPS SHALL BE PLACED AT 12" ON CENTER
3. STEPS SHALL BE AN EPOXY COATED REBAR OR OTHER APPROVED EQUAL
 - 3.1. REINFORCEMENT: ASTM A 615, GRADE 60, DEFORMED STEEL. SEE APWA SECTION 03 20 00.
4. THE STEPS MUST BE BETWEEN 10" AND 13" WIDE
5. THE UPPER SURFACE OF EACH STEP SHALL HAVE A TRACTION TREAD AND GUIDE LUGS ON EACH SIDE
6. INSTALLATION METHOD MUST PRODUCE A STEP CAPABLE OF RESISTING A 300 POUND VERTICAL LOAD
7. THE INSTALLED STEPS SHOULD MEET THE MINIMUM REQUIREMENTS OF ASTM C 478 AND THE REQUIREMENTS OF OSHA

OGDEN CITY ENGINEERING - STANDARD DRAWINGS		
Ogden UTAH Still Untamed™	MANHOLE STEP DETAIL (TYPICAL)	SS-6
TAYLOR NIELSEN, CITY ENGINEER		SHEET 1 OF 1 2025



NOTES:

1. **BACKFILL: PROVIDE AND PLACE PER APWA SECTION 31 23 23.**
 - 1.1. **COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.**
2. **GRAVITY GREASE INTERCEPTOR (GGI) SHALL BE PRECAST REINFORCED CONCRETE WITH A MINIMUM OF 4" THICK WALLS.**
 - 2.1. **CONCRETE CLASS 4000 PER APWA SECTION 03 30 04.**
 - 2.2. **THE GGI SHALL HAVE A MINIMUM OF TWO COMPARTMENTS.**
 - 2.2.1. **THE INLET COMPARTMENT SHALL BE 2/3 OF THE TOTAL LIQUID CAPACITY AND THE OUTLET COMPARTMENT SHALL BE 1/3 OF THE TOTAL LIQUID CAPACITY OF THE GGI.**
 - 2.2.2. **GGI COMPARTMENTS SHALL BE SEPARATED BY A SEALED BAFFLE WALL 3" MINIMUM THICK.**
3. **THE GGI SHALL BE SIZED ACCORDING TO THE CURRENT MANUAL OF THE UNIFORM PLUMBING CODE (UPC).**
 - 3.1. **RESTROOM WASTE SHALL NOT BE ROUTED THROUGH THE GGI.**
 - 3.2. **THE GGI CAPACITY IS DEFINED AS THE STORAGE VOLUME OF THE VAULT BELOW THE ELEVATION OF THE OUTLET FLOW LINE.**
4. **ACCESS TO GGI SHALL BE PROVIDED BY A MINIMUM OF ONE MANHOLE RING AND COVER PER INTERCEPTOR DIVISION (BAFFLE CHAMBER) AND OF 24-INCH DIAMETER MINIMUM DIMENSIONS.**
 - 4.1. **ONE MANHOLE RING AND COVER SHALL BE LOCATED DIRECTLY ABOVE THE INLET TEE AND ONE MANHOLE RING AND COVER SHALL BE LOCATED DIRECTLY ABOVE THE OUTLET TEE.**
 - 4.2. **MANHOLE COVER SHALL HAVE A CLOSED PICK HOLE OR APPROVED GAS TIGHT EQUIVALENT AND SHALL BE MARKED "SEWER".**
5. **GGI SHALL BE LOCATED AS CLOSE AS PRACTICAL TO THE SOURCE OF THE WASTE WATER.**
 - 5.1. **GGI LOCATION SHALL BE EASILY ACCESSIBLE FOR INSPECTION AND CLEANING AND SHALL AVOID AREAS THAT COULD BE PERIODICALLY BLOCKED BY A VEHICLE, DUMPSTER, OR OTHER SIMILAR OBSTRUCTIONS.**
6. **WHEN LOCATED IN PAVED AREAS THE GRAVITY GREASE INTERCEPTOR SHALL HAVE MANHOLE RING AND COVERS RATED FOR TRAFFIC.**
 - 6.1. **LOW PROFILE MANHOLE RING AND COVERS SHALL NOT BE ALLOWED.**
7. **GRAVITY GREASE INTERCEPTOR SHALL BE WATER TIGHT AND GAS TIGHT.**
 - 7.1. **ALL PIPE OPENINGS SHALL BE MECHANICALLY SEALED OR GROUTED WITH 2:1 SAND/CEMENT MORTAR.**
 - 7.2. **DIRECT VENTING OF THE GRAVITY GREASE INTERCEPTOR SHALL NOT BE ALLOWED.**
 - 7.3. **INTERCEPTOR SHALL BE VENTED IN ACCORDANCE WITH THE CURRENT ADOPTED INTERNATIONAL PLUMBING CODE AND UNIFORM PLUMBING CODE.**
8. **OUTLET PIPE FLOW LINE TO BE A MINIMUM OF 2.5" BELOW INLET PIPE FLOW LINE. THE INLET AND OUTLET PIPING SHALL HAVE 4" MIN PVC TWO WAY CLEANOUT TEES INSTALLED VERTICALLY INSIDE THE GGI.**
9. **THE BAFFLE WALL SHALL HAVE A 6" MIN PVC TWO WAY CLEANOUT TEE INSTALLED VERTICALLY. ALL PIPING SHALL MATCH THE SIZE OF THE INLET PIPE WHEN THE SIZE OF THE INLET PIPE EXCEEDS 4" DIAMETER.**
10. **THE CLEANOUT UPSTREAM OF THE GGI MAY BE ELIMINATED IF THE CLEANOUT AT THE BUILDING IS WITHIN 15 FEET OF THE GGI AND THE LINE BETWEEN THE GGI AND THE CLEANOUT IS A STRAIGHT SEGMENT.**
11. **A 3'X3' MINIMUM PRECAST VAULT OR 4' DIAMETER MINIMUM PRECAST MANHOLE SHALL BE INSTALLED NO MORE THAN 10' DOWNSTREAM FROM ANY GGI.**
 - 11.1. **THE SAMPLING VAULT OR MANHOLE SHALL HAVE A 12" MINIMUM HYDRAULIC JUMP BETWEEN THE INLET PIPE AND THE OUTLET PIPE WITH A MINIMUM OF A 6" CLEARANCE UNDER THE END OF THE INLET PIPE FOR PROPER SAMPLING OF GGI OUTFLOW.**
 - 11.2. **THE BOTTOM OF THE SAMPLING VAULT OR MANHOLE SHALL HAVE A WATER TIGHT CONCRETE FILL SLOPED TO CHANNEL THE WATER TO THE OUTLET PIPE.**

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

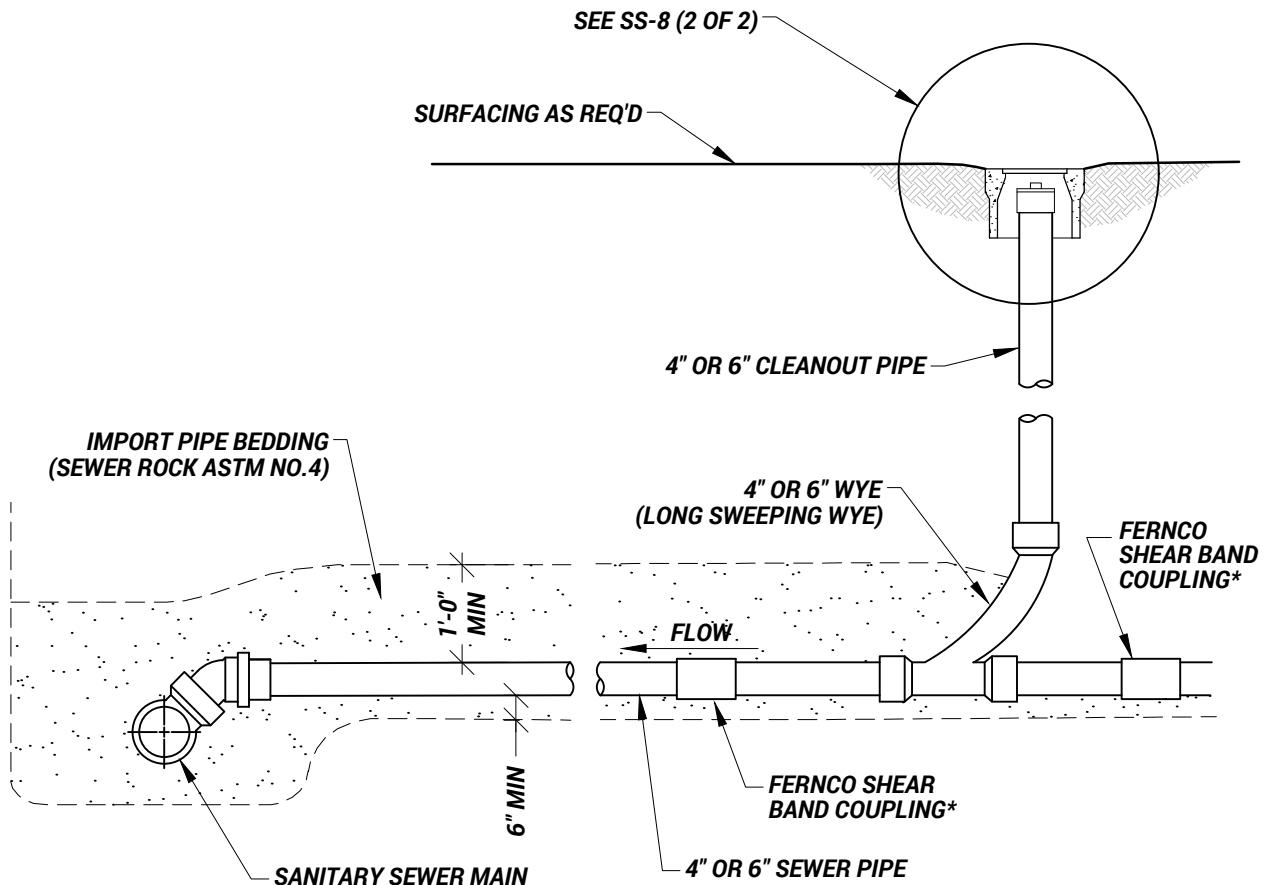


GRAVITY GREASE INTERCEPTOR

SS-7

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



*NOTE: FERNCO SHEAR BAND COUPLINGS USED FOR LATERAL REPAIRS ONLY.

NOTES:

1. OBTAIN PERMIT
2. OGDEN CITY IS NOT RESPONSIBLE FOR FLUSHING LATERALS. OWNER IS RESPONSIBLE FOR LATERAL FROM CONNECTION AT THE MAIN TO THE HOME.
3. CLEANOUTS SHALL BE PLACED EVERY 100 FEET.
4. ALL FITTINGS EXCLUDING THE CAP NEED TO BE RUBBER GASKETED.
5. NO CLEANOUT SHALL BE INSTALLED IN ANY ROADWAY.
6. ALLOWABLE PIPE MATERIALS ARE ABS (ACRYLONITRILE BUTADIENE STYRENE) - SCH 40 GREEN IN COLOR; PVC (POLYVINYL CHLORIDE) SDR-35 (GREEN IN COLOR); OR HDPE - SDR 19 GREEN IN COLOR OR FACTORY GREEN STRIPE. SEE SHEET SS-8 (SHEET 2 OF 2) FOR FURTHER DETAIL.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

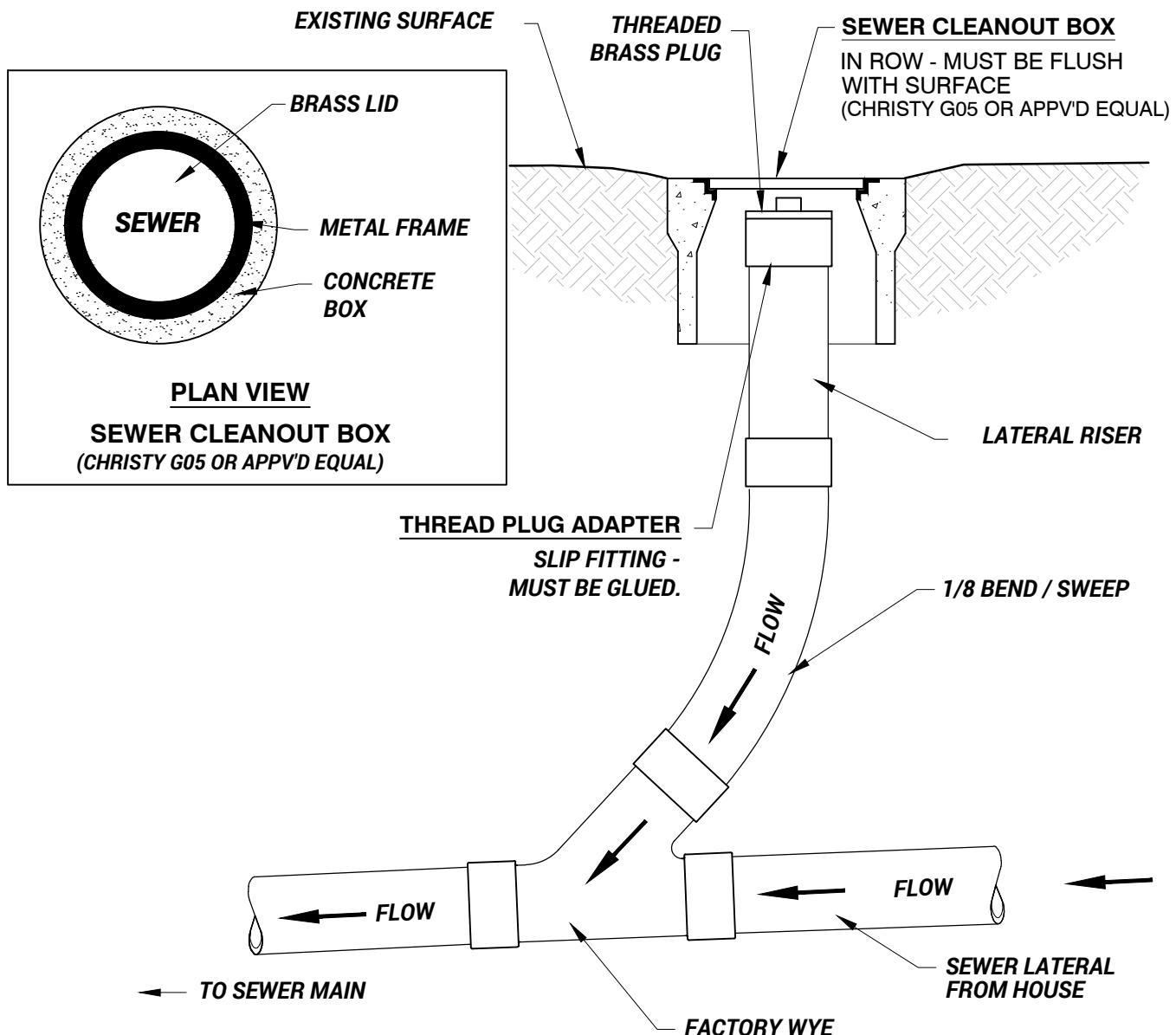
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SEWER LATERAL CLEANOUT

SS-8

TAYLOR NIELSEN, CITY ENGINEER

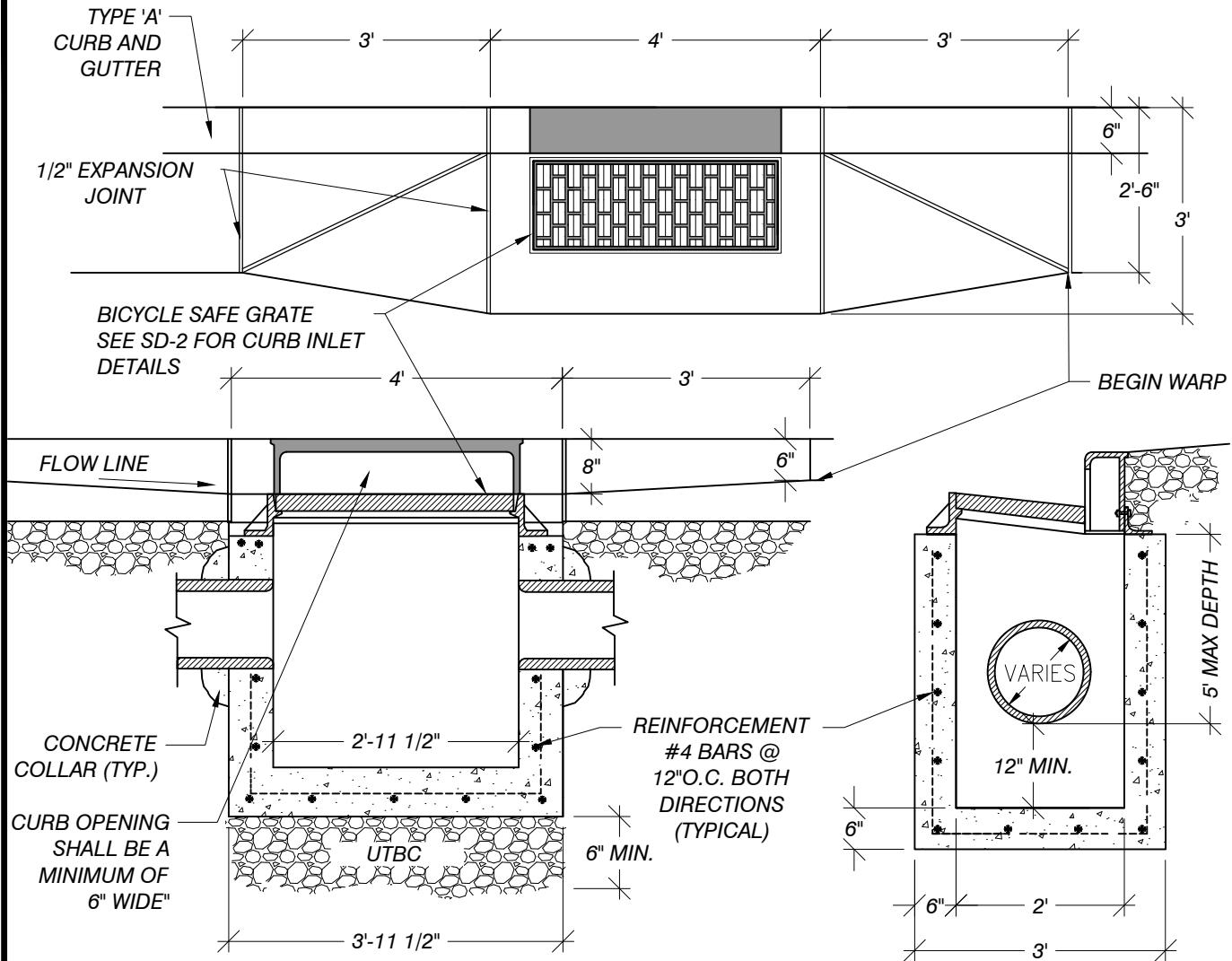
SHEET 1 OF 2 2025



NOTES:

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OGDEN CITY ENGINEERING - STANDARD DRAWINGS		
Ogden UTAH Still Untamed™	SEWER LATERAL CLEANOUT	SS-8
TAYLOR NIELSEN, CITY ENGINEER		SHEET 2 OF 2 2025



NOTES:

1. COMPACT BASE COURSE AND BACKFILL PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT. MAXIMUM LIFT THICKNESS IS 8" BEFORE COMPACTION.
 - 1.1. BACKFILL: PROVIDE AND PLACE PER APWA SECTION 31 23 23 ON ALL SIDES OF THE BASIN.
 - 1.2. PROVIDE BASE COURSE MATERIAL PER APWA SECTION 32 11 23. PLACE MATERIAL PER APWA SECTION 31 23 23.
2. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 60, DEFORMED STEEL.
3. CONCRETE SHALL BE CLASS 4000 PER APWA SECTION 03 30 04. PLACE CONCRETE PER APWA SECTION 03 30 10. CURE PER APWA SECTION 03 39 00. PRECAST CATCH BASINS ARE ACCEPTABLE.
4. CURB FACE OPENING SHALL BE AT LEAST 6" WIDE. PROVIDE A 2" DROP BETWEEN THE 'BEGIN WARP' LINE IN THE GUTTER AND THE TOP OF THE GRATE AT THE CURB OPENING.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

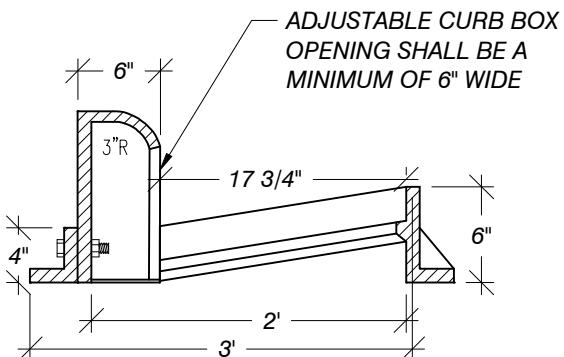
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CATCH BASIN WITH CURB INLET

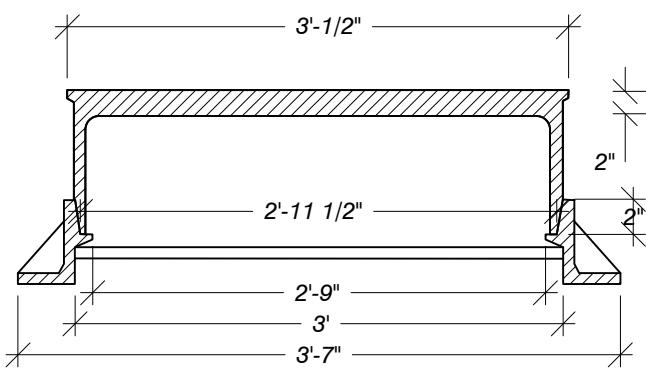
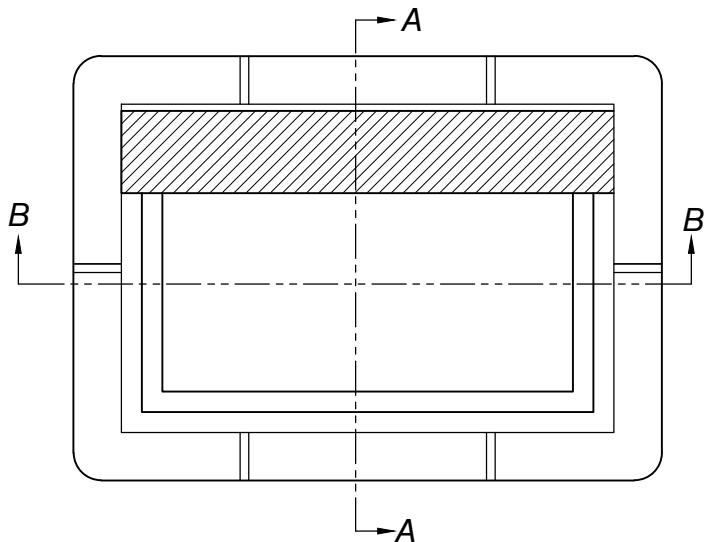
SD-1

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



SECTION A-A

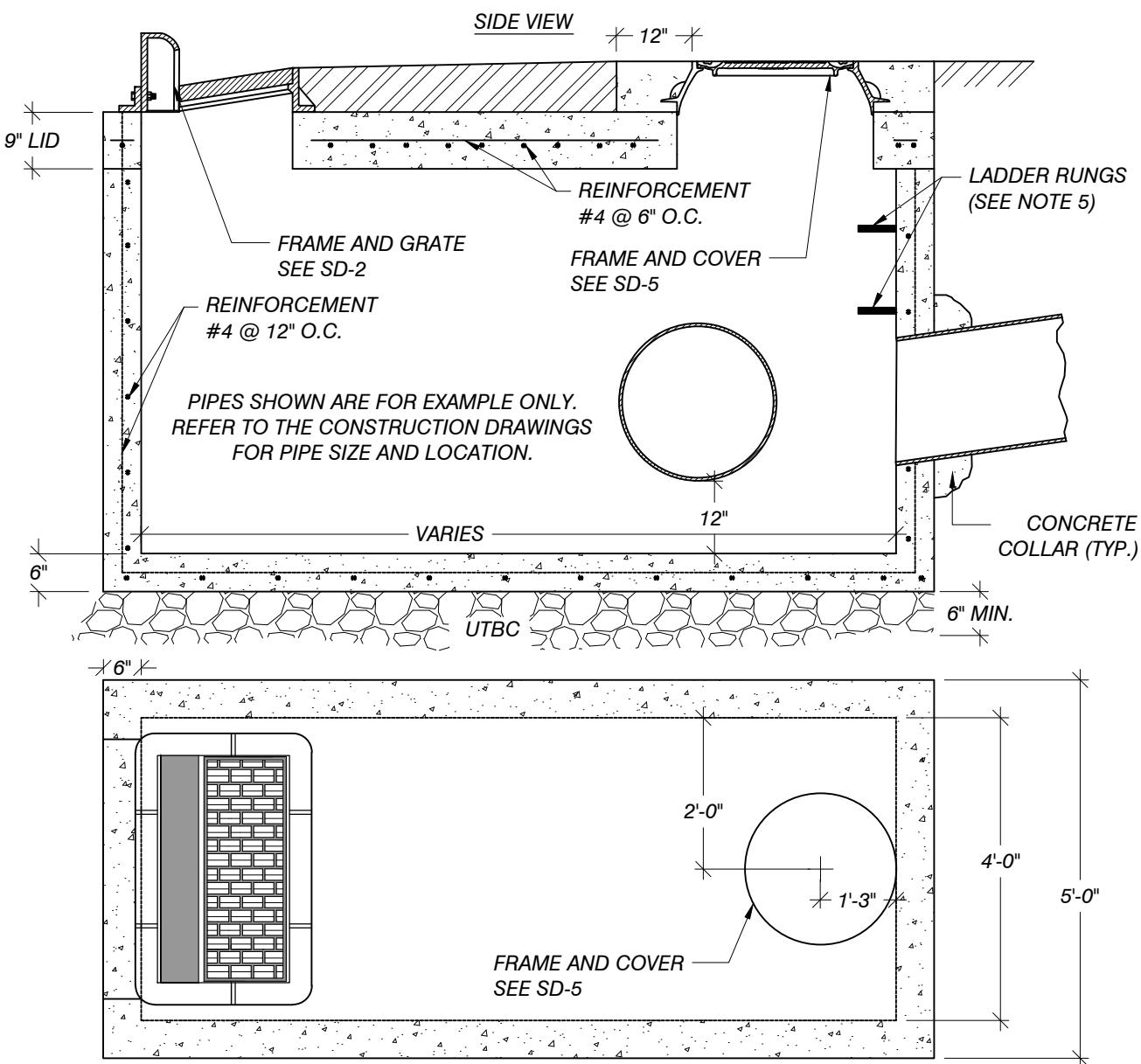


SECTION B-B

NOTES:

1. CASTING: GREY IRON CLASS 35 MINIMUM PER ASTM A 48.
2. COATINGS: EXCEPT MACHINED SURFACES, COAT ALL METAL PARTS WITH ASPHALTUM PAINT.
3. USE STAINLESS STEEL BOLTS, NUTS, AND WASHERS.
4. SEE SD-1 FOR INLET BOX DETAILS.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



NOTES:

TOP VIEW

1. COMPACT BACKFILL AND BASE COURSE PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.
 - 1.1. BACKFILL: PROVIDE AND PLACE PER APWA SECTION 31 23 23 ON ALL SIDES OF THE BASIN.
 - 1.2. UNTREATED BASE COURSE: PROVIDE MATERIAL PER APWA SECTION 32 11 23. PLACE MATERIAL PER APWA SECTION 31 23 23.
2. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 60, DEFORMED STEEL. SEE APWA SECTION 03 20 00.
3. CONCRETE SHALL BE CLASS 4000 PER APWA SECTION 03 30 04. PLACE CONCRETE PER APWA SECTION 03 30 10. CURE PER APWA SECTION 03 39 00. PRECAST BOXES ARE ACCEPTABLE.
4. CURB FACE OPENING: OPENING SHALL BE AT LEAST 6" WIDE. PROVIDE A 2" DROP BETWEEN THE 'BEGIN WARP' LINE IN THE GUTTER AND THE TOP OF THE GRATE AT THE CURB OPENING.
5. LADDER RUNGS ARE REQUIRED IN ALL BOXES. SEE SS-6 FOR TYPICAL STEP REQUIREMENTS.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



COMBINATION INLET / CLEANOUT BOX

SD-3

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025

A

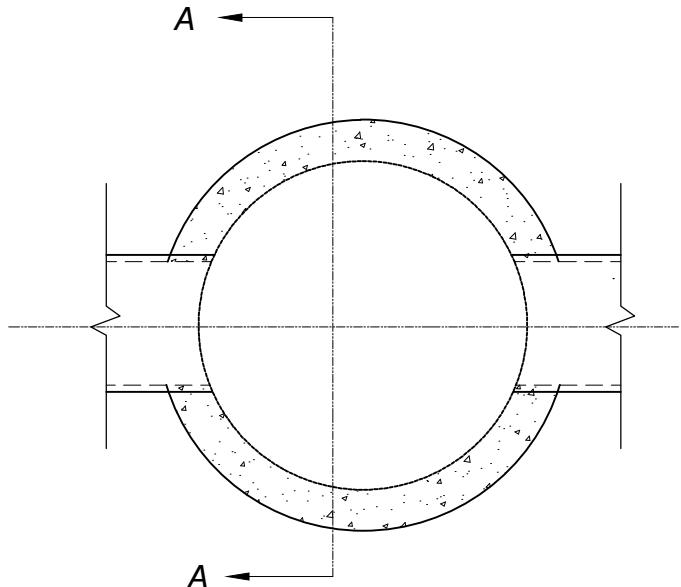
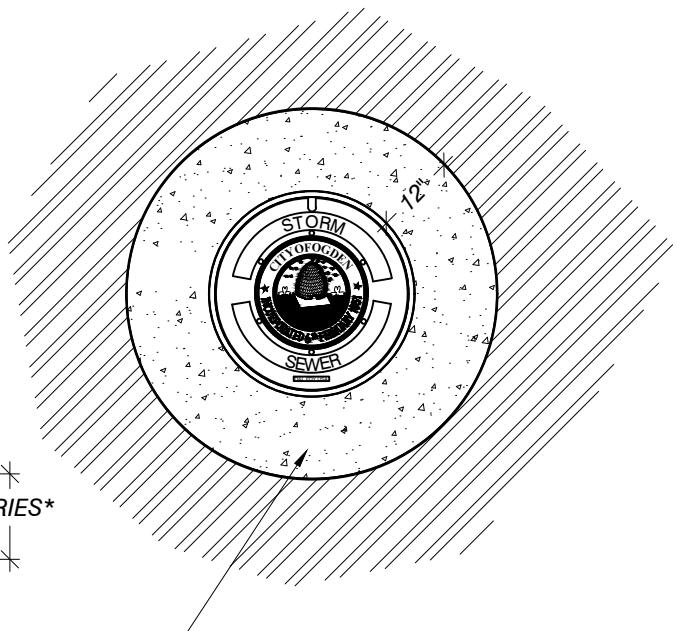
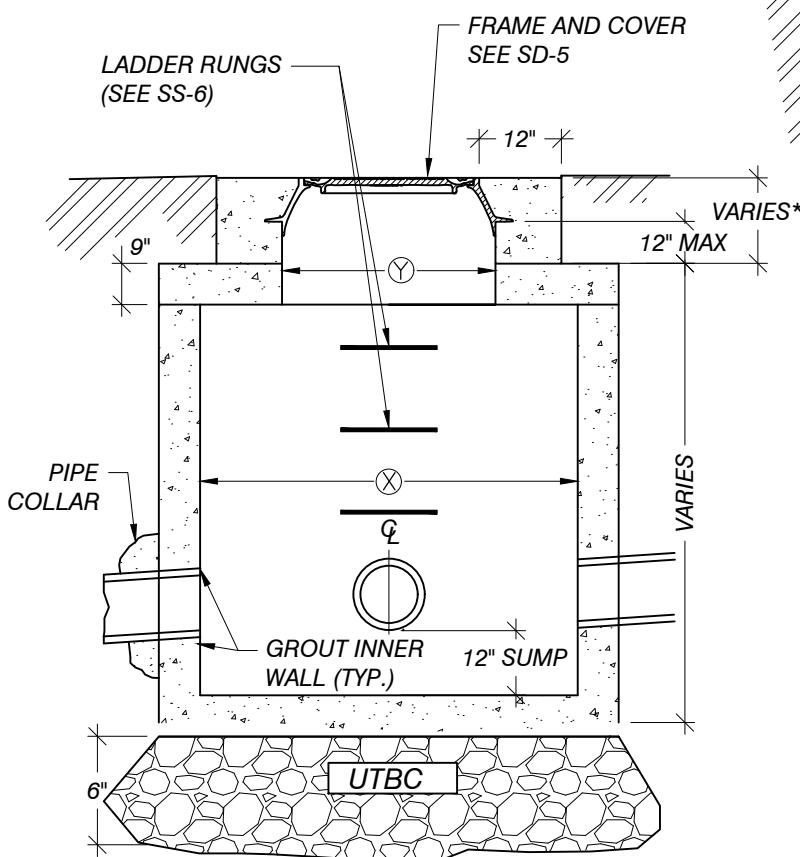


TABLE OF DIMENSIONS

MANHOLE TYPE	DIMENSION
5'	X=60" Y=31"
6'	X=72" Y=31"



COLLAR SHALL BE BATCHED, CLASS 4000 CONCRETE WITH MICROFIBER MESH ADDITIVE. COLLAR THICKNESS SHALL EXTEND FROM THE TOP OF THE FRAME/COVER TO THE TOP OF THE MANHOLE LID.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

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STORM DRAIN MANHOLE (PRECAST)

SD-4

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 2 2025

NOTES:

1. COMPACT BACKFILL AND BASE COURSE PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.
 - 1.1. BACKFILL: PROVIDE AND PLACE PER APWA SECTION 31 23 23 ON ALL SIDES OF THE BASIN.
 - 1.2. PROVIDE UNTREATED BASE COURSE MATERIAL PER APWA SECTION 32 11 23. PLACE MATERIAL PER APWA SECTION 31 23 23.
 - 1.3. SEWER ROCK (ASTM No. 4) WITH SEPARATION FABRIC IS ACCEPTABLE FOR MANHOLE BEDDING.
2. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 60, DEFORMED STEEL. REFER TO APWA 03 20 00.
3. CONCRETE SHALL BE PER CLASS 4000 PER APWA SECTION 03 30 04. PLACE CONCRETE PER APWA SECTION 03 30 10. CURE PER APWA SECTION 03 39 00.
4. STATIONING AND ELEVATIONS SHOWN ON THE DRAWING SHOULD MATCH THE CENTERLINE OF THE MANHOLE.
 - 4.1. INV IN: (FLOW LINE IN) ELEVATION APPLIES TO THE POINT OF INTERSECTION OF THE INLET PIPE INVERT AND THE MANHOLE WALL.
 - 4.2. INV OUT: (FLOW LINE OUT) ELEVATION APPLIES TO THE PONT OF INTERSECTION OF THE OUTLET PIPE INVERT AND THE MANHOLE WALL.
5. LOW PROFILE MANHOLE LIDS WILL NOT BE ALLOWED IN ANY OGDEN CITY RIGHT OF WAY.
5. LADDER RUNGS ARE REQUIRED IN ALL BOXES. SEE SS-6 FOR TYPICAL MANHOLE STEP REQUIREMENTS.
6. GROUT ALL PIPE OPENINGS WITH 2:1 SAND/CEMENT MORTAR.
7. PLACE FLEXIBLE GASKET-TYPE SEALANT IN ALL MANHOLE JOINTS. SEAL MUST MEET THE REQUIREMENTS OF SS-S-00210 (210A), AASHTO M-198, AND ASTM C990.
8. PRECAST CONCRETE WALLS MUST BE A MINIMUM OF 5" THICK.
9. CAST-IN-PLACE CONCRETE MUST BE A MINIMUM OF 8" THICK.
10. THE INSTALLED PIPE SHALL BE PLACED SUCH THAT THE HORIZONTAL INSIDE DIAMETER OF THE PIPE INTERSECTS THE INSIDE FACE OF THE RISER.
11. PROVIDE A SMOOTH AND NEAT FINISH ON THE INTERIOR OF THE CONES, SHAFT, RINGS, AND FLOOR. IMPERFECT MOLDINGS OR HONEYCOMBS WILL NOT BE ACCEPTED.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

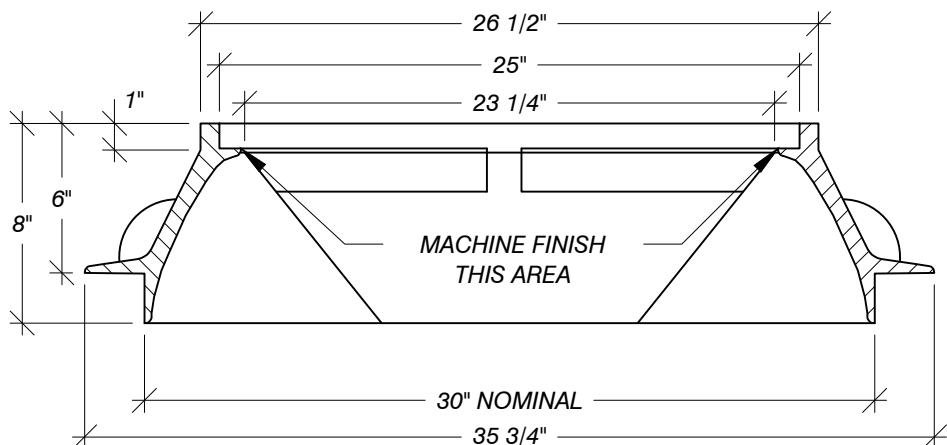
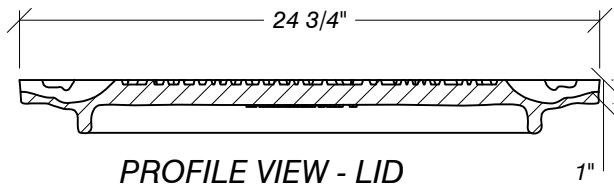
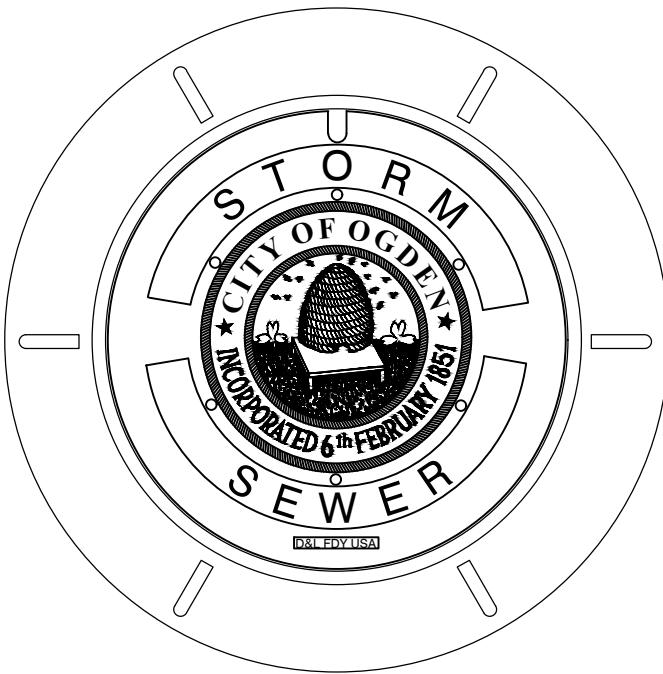


STORM DRAIN MANHOLE (PRECAST)

SD-4

TAYLOR NIELSEN, CITY ENGINEER

SHEET 2 OF 2 2025



PROFILE VIEW - FRAME

NOTES:

1. CONTACT THE OGDEN CITY STORM WATER DIVISION FOR DETAILS AND ORDERING INFORMATION FOR SEWER LID AND FRAME (801) 629-8331.
2. LOW PROFILE LIDS WILL NOT BE ALLOWED IN ANY OGDEN CITY RIGHT OF WAY.
3. CASTINGS: GREY IRON CLASS 35 MINIMUM PER ASTM A 48.
4. COATINGS: EXCEPT MACHINED SURFACES, COAT ALL METAL PARTS
5. HEAT NUMBER: PLACE FOUNDRY AND HEAT NUMBER ON THE INSIDE OF THE FRAME AND ON THE BOTTOM OF THE COVER.
6. SEE SD-3 FOR COMBINATION INLET / CLEANOUT BOX, SD-4 FOR STORM DRAIN MANHOLE DETAILS.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

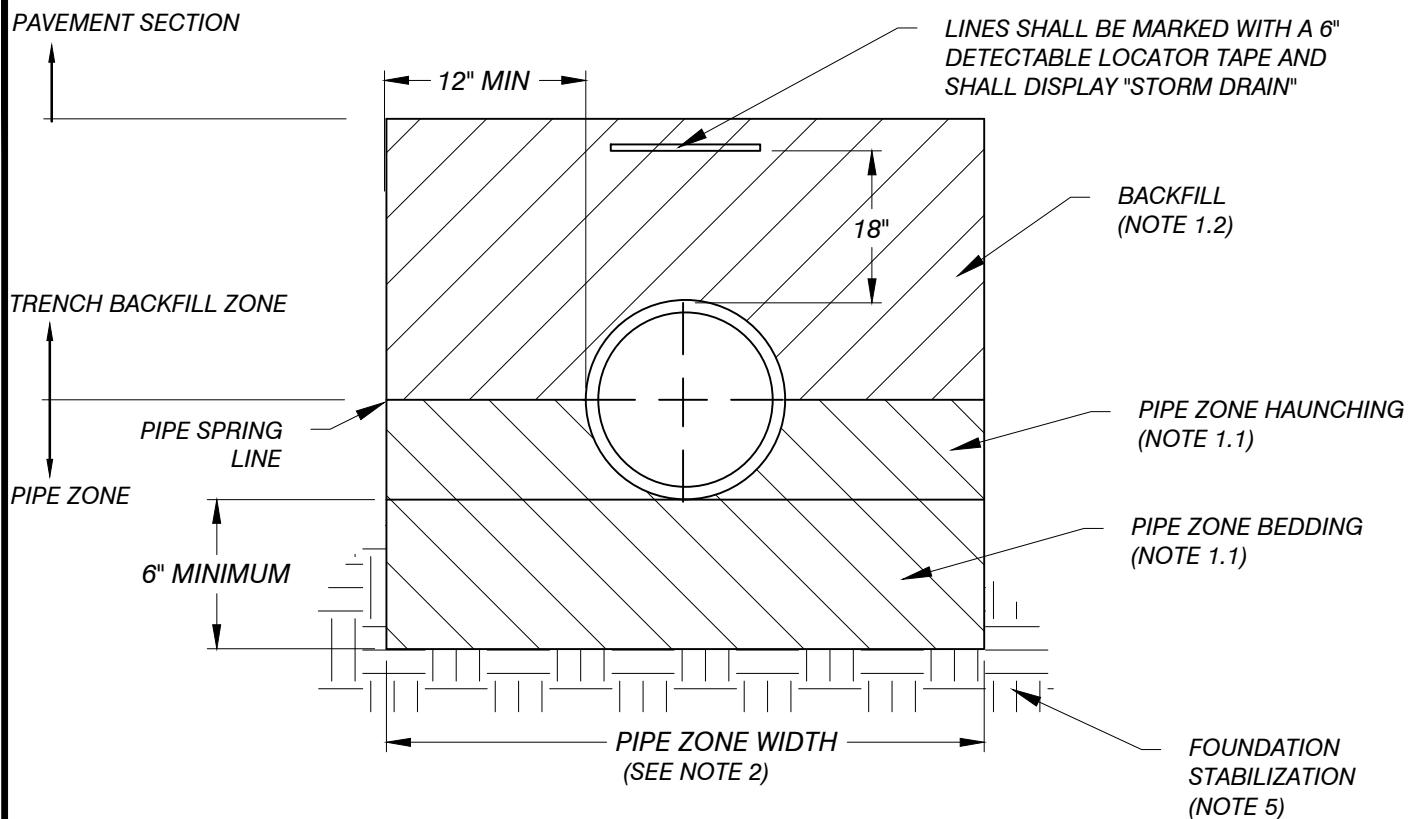
STORM DRAIN MANHOLE FRAME AND COVER

SD-5

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SHEET 1 OF 1 2025



NOTES:

1. DO NOT USE SEWER ROCK OR RECYCLED FILL MATERIAL IN THE PIPE ZONE WITHOUT THE APPROVAL OF THE CITY ENGINEER. IF MANUFACTURER RECOMMENDS ANYTHING CONTRARY TO WHAT IS LISTED BELOW, CONSULT WITH THE ENGINEERING DEPARTMENT.
 - 1.1. HAUNCHING/BEDDING: AGGREGATE BASE COURSE (UTBC) PER 32 11 23.
 - 1.1.1. WATER JETTING IS NOT ALLOWED.
 - 1.1.2. SUBMISSION OF COMPACTION TEST DATA FOR THE HAUNCHING AREAS MAY BE REQUESTED AT ANY TIME.
 - 1.2. BACKFILL (ABOVE THE PIPE ZONE): IMPORT STRUCTURAL FILL (3" MINUS PER APWA 31 05 13 OR UTBC PER 32 11 23).
 - 1.2.1. COMPACT PER SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.
2. PIPE ZONE WIDTH IS RECOMMENDED BY THE MANUFACTURER OF THE PIPE. WIDTH OF PIPE ZONE IS MEASURED AT THE PIPE SPRING LINE AND INCLUDES ANY NECESSARY SHEATHING. FOLLOW MANUFACTURE RECOMMENDATIONS FOR ANY TRENCH BOX APPLICATIONS.
3. INSTALL THE PIPE IN THE CENTER OF THE TRENCH. THE EDGE OF THE PIPE WALL SHALL BE A MINIMUM DISTANCE OF 12" FROM THE TRENCH WALL.
4. PEA GRAVEL (GRAVEL WITH NOMINAL SIZE LESS THAN 3/4") IS NOT ALLOWED IN ANY PART OF THE TRENCH.
5. FOUNDATION STABILIZATION REQUIRES SEWER ROCK PER APWA SECTION 31 05 13.
 - 5.1. INSTALLATION OF STABILIZATION-SEPARATION GEOTEXTILE PER APWA SECTION 31 05 19 WILL BE REQUIRED TO SEPARATE BACKFILL MATERIAL AND NATIVE SUBGRADE MATERIAL IF SEWER ROCK CANNOT PROVIDE A WORKING SURFACE OR PREVENT SOIL MIGRATION.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



STORM DRAIN PIPE ZONE

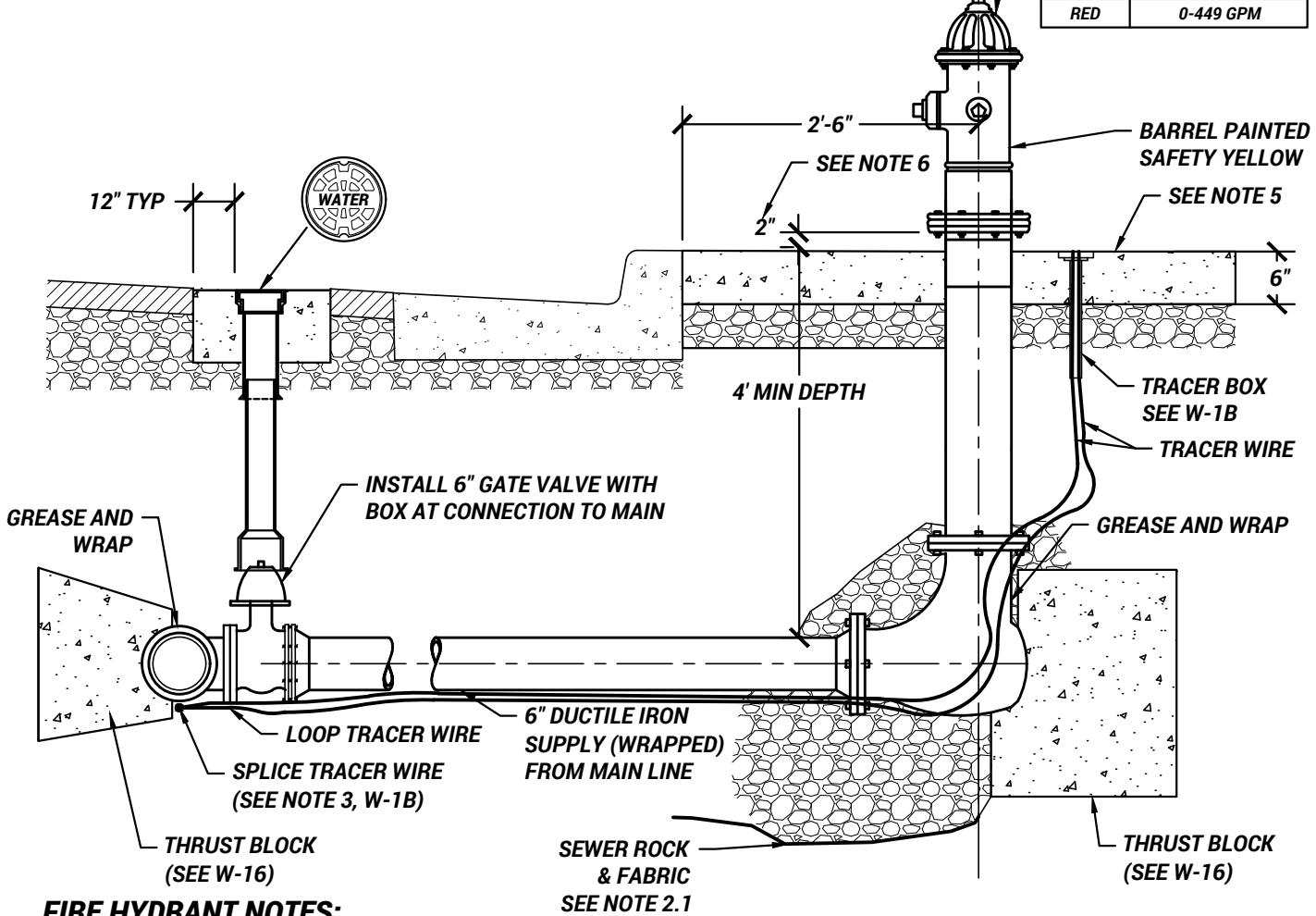
SD-6

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025

**SEE OGDEN CITY APPROVED MATERIALS
LIST FOR MANUFACTURER**

PAINT FIRE HYDRANT PER AWWA C502:
HYDRANT FLOW RATE
BLUE 1500 GPM OR MORE
GREEN 1000 TO 1499 GPM
ORANGE 500 TO 999 GPM
RED 0-449 GPM



FIRE HYDRANT NOTES:

1. PROVIDE AND PLACE BACKFILL PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A MODIFIED PROCTOR DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
 2. HYDRANT: DRY BARREL PER AWWA C502. ADDITIONAL WATER SYSTEM REQUIREMENTS SPECIFIED IN APWA SECTION 33 11 00.
 - 2.1. PROVIDE AT LEAST ONE (1) CUBIC YARD OF SEWER ROCK AROUND DRAIN HOLE OF FIRE HYDRANT. WRAP GEOTEXTILE AROUND SEWER ROCK AND TAPE GEOTEXTILE TO HYDRANT SPOOL TO PREVENT SILTING.
 - 2.2. APPLY NON-OXIDE GREASE TO ALL BURIED METAL SURFACES. WRAP WITH 8 MIL THICK POLYETHYLENE SHEET AND TAPE WRAP.
 - 2.3. NOTIFY FIRE DEPARTMENT AS SOON AS HYDRANT IS PLACED IN SERVICE.
 - 2.4. BLACK-WRAP ANY HYDRANT NOT IN SERVICE.
 3. THRUST BLOCKS:
 - 3.1. PRIOR TO POURING CONCRETE, WRAP PIPE SYSTEM WITH 8 MIL THICK PLASTIC SHEET TO PREVENT BONDING OF CONCRETE TO PIPE SYSTEM.
 - 3.2. NOT REQUIRED AT THE MAIN FOR FLANGED OR RESTRAINED PIPE SYSTEMS.
 4. VALVE BOXES ARE TO BE SLIP-TYPE, ADJUSTED TO GRADE, AND PAVED WITH A CONCRETE COLLAR.
 5. CONCRETE PAD AROUND HYDRANT SHALL ONLY BE REQUIRED AS STIPULATED IN W-2
 6. HYDRANT BASE HEIGHT MUST BE APPROVED BY AN OGDEN CITY ENGINEERING INSPECTOR.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

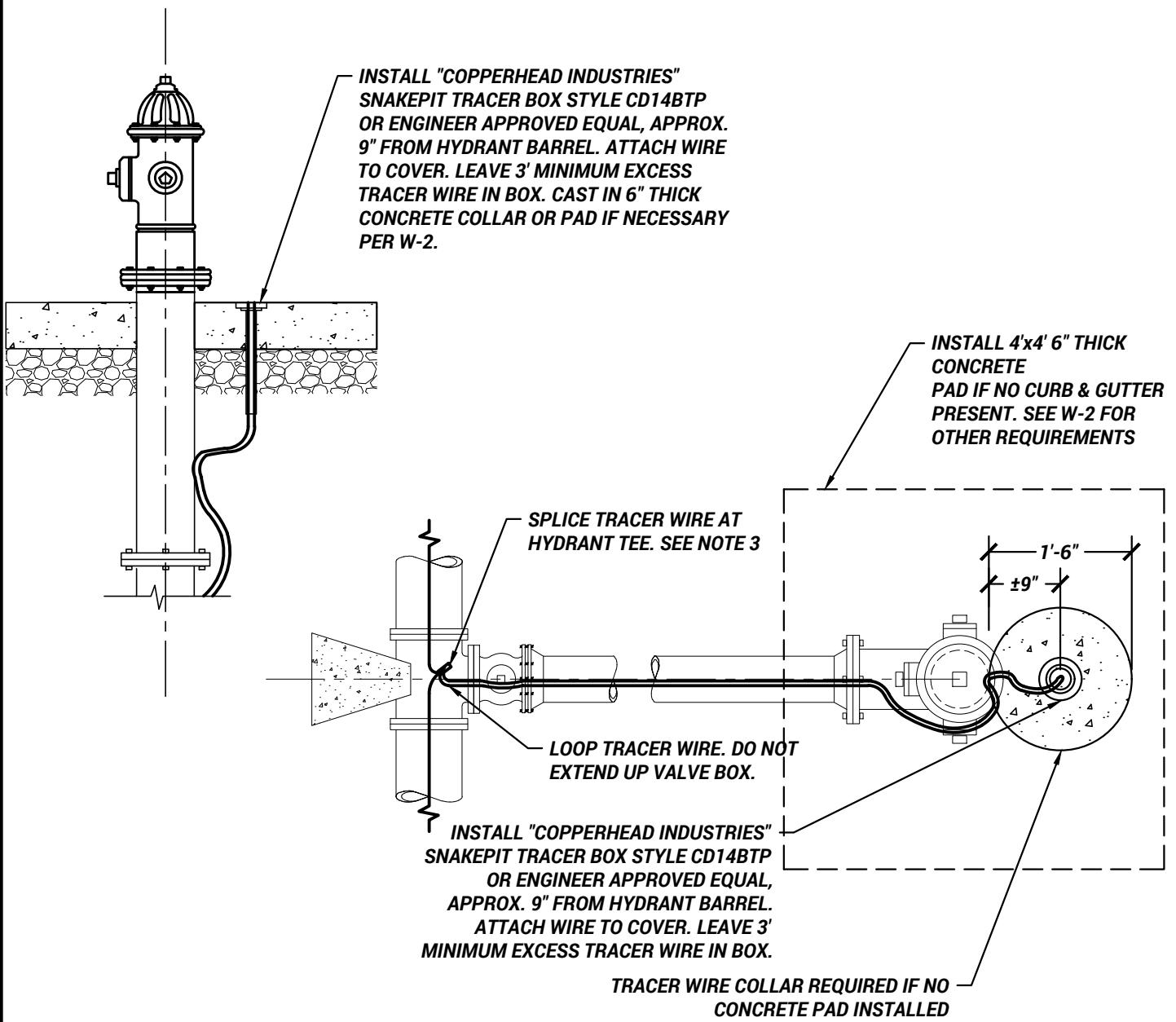
FIRE HYDRANT ASSEMBLY

W-1A

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TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 2 | 2025



TRACER WIRE NOTES:

1. TRACER BOX TO BE LOCATED ON BACK SIDE OF HYDRANT UNLESS DIRECTED OTHERWISE BY ENGINEER.
 2. ALL TRACER WIRE TO BE 12 GA INSULATED, BLUE TRACER WIRE PLACED BENEATH PIPE.
 3. TRACER WIRE SHALL BE COPPER WIRE WITH BLUE INSULATION RATED FOR DIRECT BURIAL. ALL WIRE CONNECTORS SHALL BE 3M DBR DIRECT BURY SPLICE OR ENGINEER APPROVED EQUAL AND SHALL BE WATERTIGHT TO PROVIDE ELECTRICAL CONTINUITY.
 4. ALL TRACER WIRE SHALL BE TESTED FOR CONTINUITY IN THE PRESENCE OF A REPRESENTATIVE FROM OGDEN CITY WATER PRIOR TO ASPHALT PLACEMENT. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE PRIOR TO ASPHALT PLACEMENT.
 5. ALL TRACER WIRE WILL BE RE-TESTED AT THE 1-YEAR WARRANTY INSPECTION. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

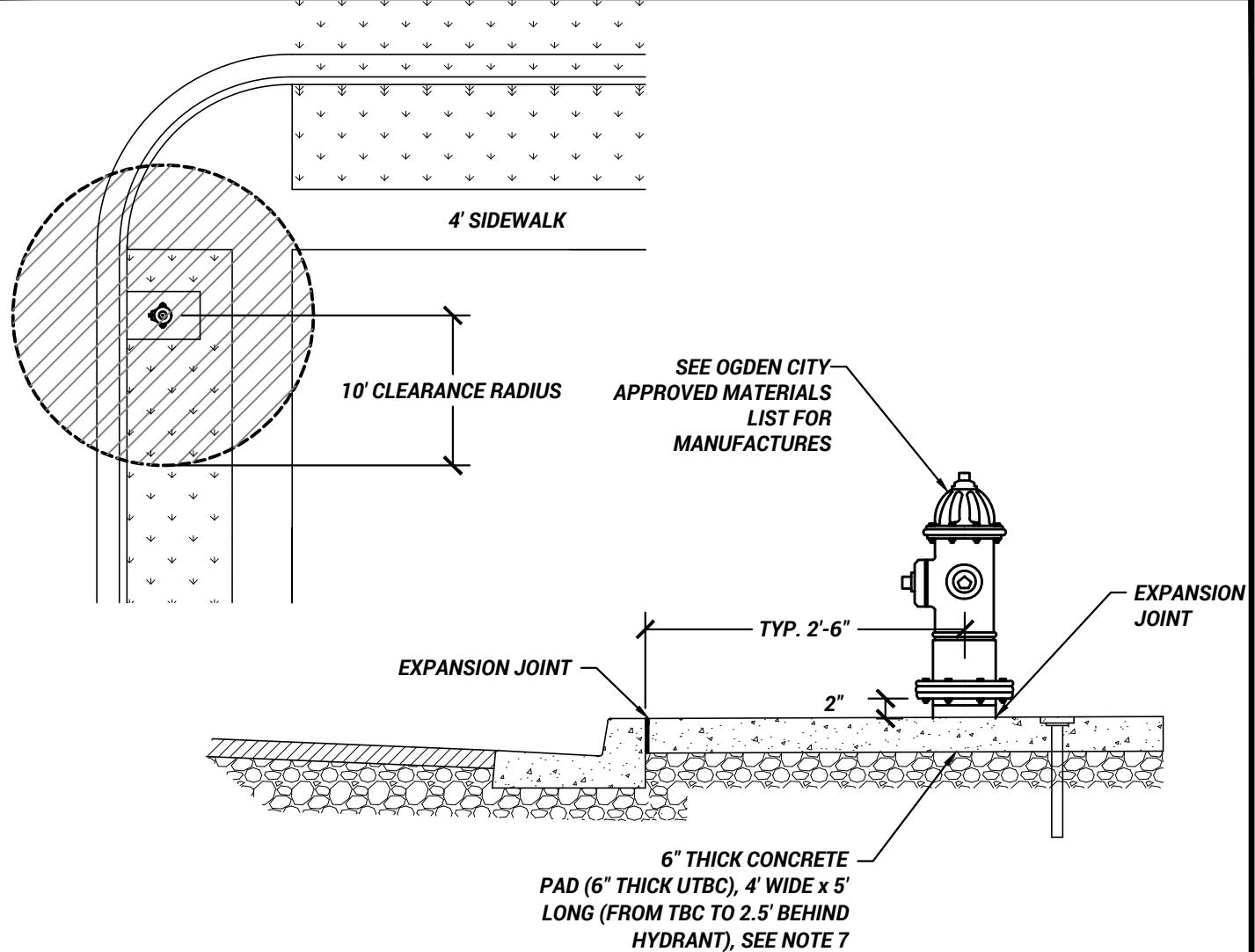
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FIRE HYDRANT ASSEMBLY

W-1B

TAYLOR NIELSEN, CITY ENGINEER

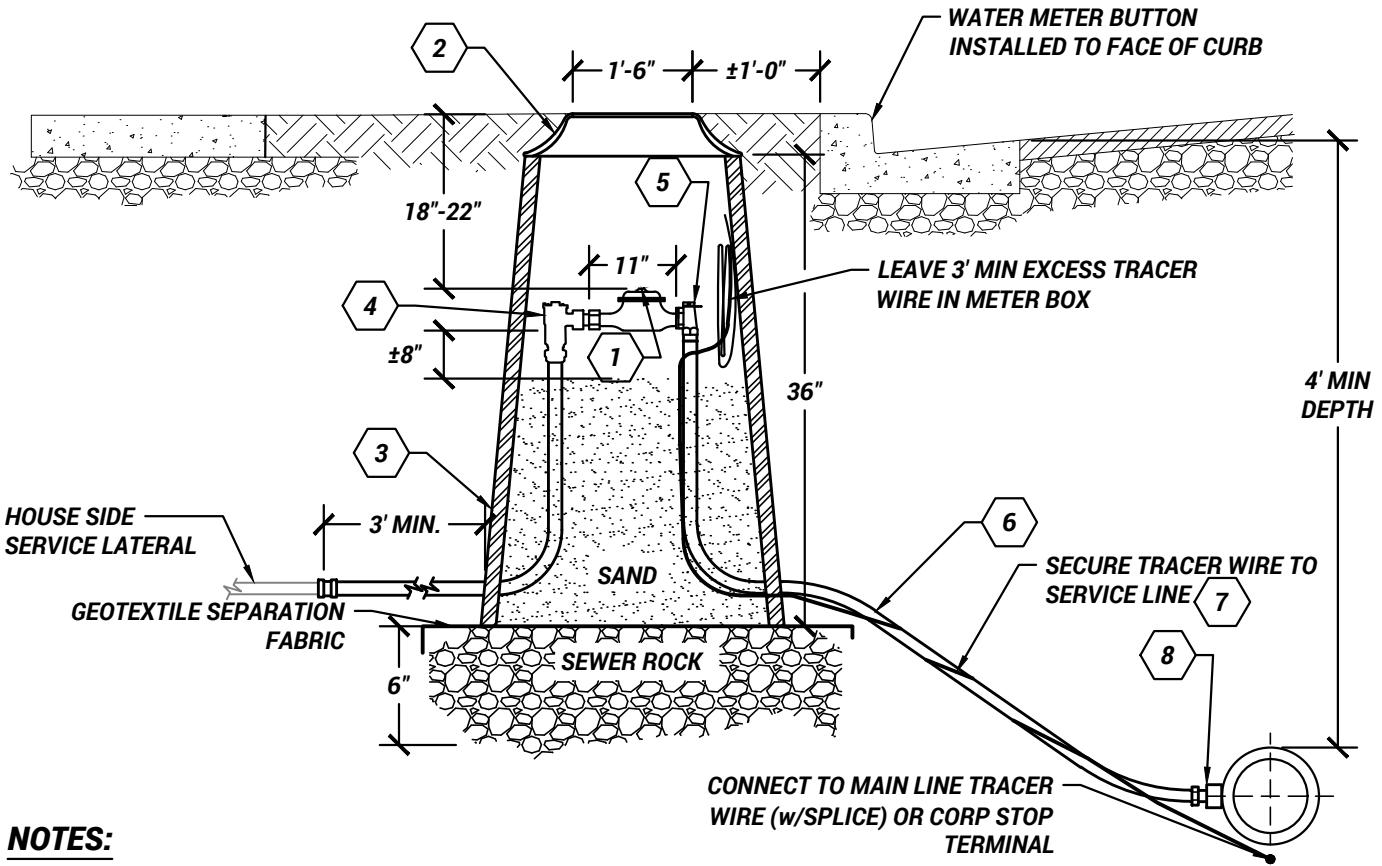
SHEET 2 OF 2 | 2025



NOTES:

1. PAINT TOP AND FACE OF CURB, 15' ON BOTH SIDES, WITH RED PAINT TO INDICATE NO PARKING.
2. NO TREES, PLANTS, FLOWERS, SHRUBS, OR ANY OTHER ITEM WHICH MAY OBSTRUCT THE VIEW OR ACCESS TO A FIRE HYDRANT, SHALL BE INSTALLED/PLANTED WITHIN 10' OF ANY FIRE HYDRANT.
3. HYDRANT SHALL BE 2'-6" BEHIND THE BACK OF CURB OR AS SPECIFIED BY THE CITY ENGINEER.
4. ARTERIAL ROADS SHALL HAVE FIRE HYDRANTS ON BOTH SIDES OF THE ROADWAY.
5. INSTALL A 4'x4' 6" THICK CONCRETE PAD AROUND THE BASE IF NO CURB AND GUTTER IS PRESENT.
 - 5.1. BOLLARD INSTALLATION MAY BE REQUIRED BASED ON THE HYDRANT LOCATION.
6. FIRE HYDRANT SPACING:
 - 6.1. SHALL NOT EXCEED A 500' RADIUS IN AREAS WITH SINGLE FAMILY DWELLINGS.
 - 6.2. SHALL NOT EXCEED A 300' RADIUS IN ALL OTHER AREAS.
 - 6.3. OR AS DETERMINED BY THE FIRE MARSHAL.
7. CONCRETE PAD ON HYDRANTS SHALL BE REQUIRED ON ALL ARTERIAL CLASSIFIED ROADWAYS AND IN THE DOWNTOWN AREA (20TH STREET TO 30TH STREET, WALL AVE THRU ADAMS AVE)

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



NOTES:

1. CONTRACTOR TO PROVIDE AND INSTALL ALL MATERIALS AS SHOWN ON THE DETAIL, UNLESS DIRECTED OTHERWISE BY OGDEN CITY WATER.
2. METERS TO BE INSTALLED IN THE PARK STRIP, 1' BEHIND THE BACK OF CURB, OR 1' BEHIND THE SIDEWALK WHERE THE SIDEWALK IS ADJACENT TO THE CURB. DO NOT PLACE METER BOXES IN OR UNDER DRIVEWAY APPROACHES, SIDEWALKS, OR CURB AND GUTTER. IN THE CASE OF NO CURB AND GUTTER, PLACE METER WITHIN 7' OF THE PROPERTY LINE (STREET SIDE).
3. FILL METER BOX WITH SAND IN 8" THICK LIFTS UP TO APPROXIMATELY 8" FROM BOTTOM OF METER. TAMP SAND TO STABILIZE METER. SEPARATE SAND FROM SEWER ROCK WITH A GEOTEXTILE SEPARATION FABRIC.
4. PROVIDE AND PLACE IMPORT BACKFILL PER APWA SECTION 33 05 20 SURROUNDING THE METER ASSEMBLY. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER, MODIFIED PROCTOR DENSITY. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
5. ALL TRACER WIRE SHALL BE TESTED FOR CONTINUITY IN THE PRESENCE OF A REPRESENTATIVE FROM OGDEN CITY WATER PRIOR TO ASPHALT PLACEMENT. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE PRIOR TO ASPHALT PLACEMENT.
6. ALL TRACER WIRE WILL BE RE-TESTED AT THE 1-YEAR WARRANTY INSPECTION. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
7. DO NOT CONNECT THE HOUSE SIDE LATERAL DIRECTLY BENEATH THE SIDEWALK.

ITEM	QTY	DESCRIPTION
1	1	1" OR SMALLER WATER METER (CITY PROVIDED WITH METER/TAPPING FEE)
2	1	18" FRAME AND COVER WITH RECESSED HOLE FOR ANTENNA READ WITH LARGE BOLT "LB" OPTION
3	1	RAVEN METER BOX OR APPROVED EQUAL
4	1	1" ASSE 1024 DUAL CHECK VALVE (BACKFLOW PREVENTER, TOP ENTRY ONLY)
5	1	1" BALL ANGLE VALVE - FORD BA43-444W-Q-NL, MUELLER - B-24258N
6	VARIABLES	1" AWWA C901 CTS POLY TUBING
7	VARIABLES	TRACER WIRE
8	1	CORP STOP WITH TEE-HEAD CAP ADAPTOR (TAP HORIZONTALLY)

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

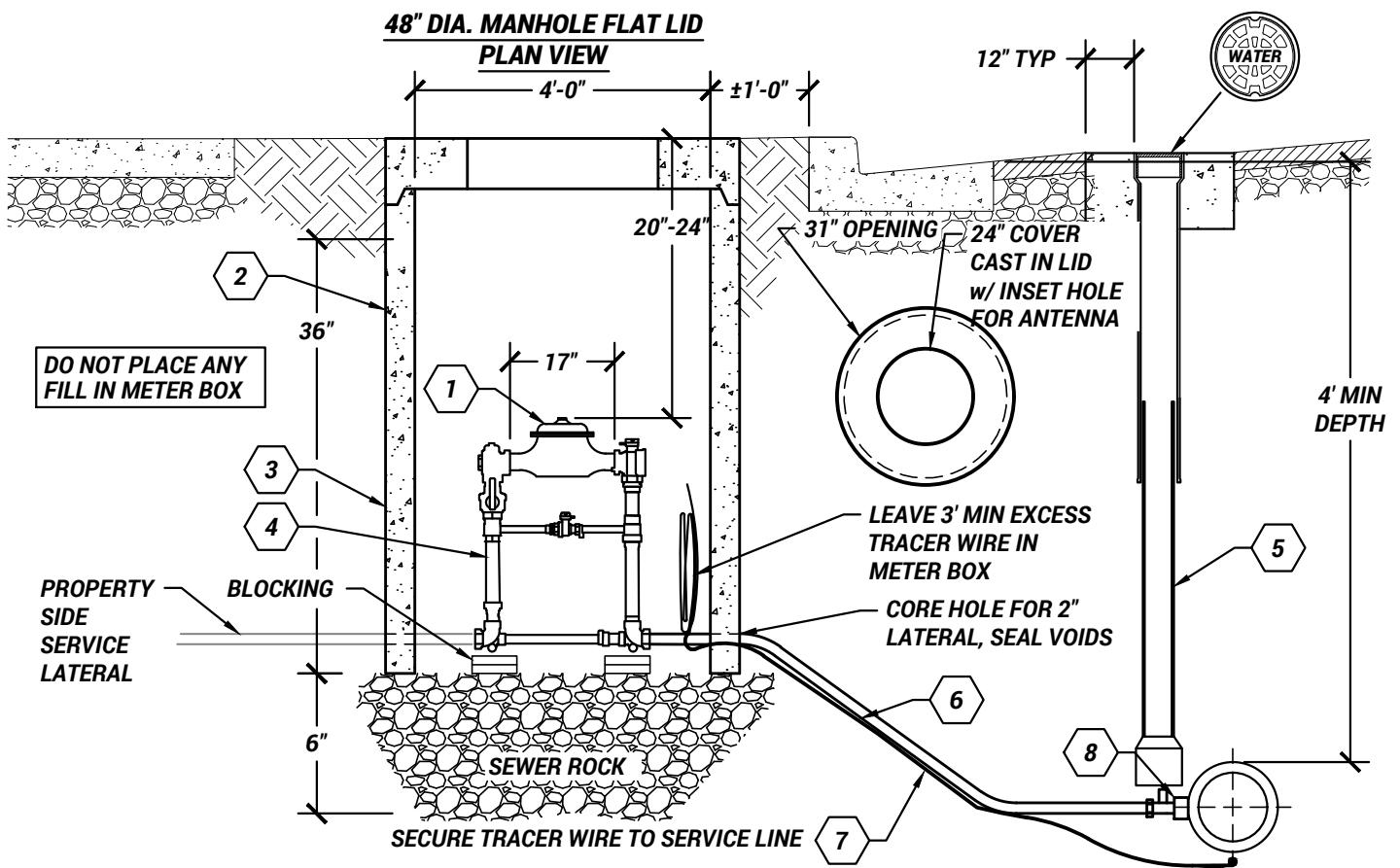


**TYPICAL SERVICE INSTALLATION
FOR WATER METERS 1" OR SMALLER**

TAYLOR NIELSEN, CITY ENGINEER

W-3

SHEET 1 OF 1 2025



NOTES:

CONNECT TO MAIN LINE TRACER WIRE WITH SPLIC

1. CONTRACTOR TO PROVIDE AND INSTALL ALL MATERIALS AS SHOWN ON THE DETAIL, UNLESS DIRECTED OTHERWISE BY OGDEN CITY WATER (OCW).
2. METERS TO BE INSTALLED IN THE PARK STRIP, 1' BEHIND THE BACK OF CURB, OR 1' BEHIND THE SIDEWALK WHERE THE SIDEWALK IS ADJACENT TO THE CURB. DO NOT PLACE METER BOXES IN OR UNDER DRIVEWAY APPROACHES, SIDEWALKS, OR CURB AND GUTTER. IN THE CASE OF NO CURB AND GUTTER, PLACE METER WITHIN 7' OF THE PROPERTY LINE (STREET SIDE).
3. INSTALL VALVE BOX PER STANDARD DRAWING W-12 OVER CORP STOP. DO NOT EXTEND TRACER WIRE UP VALVE BOX.
4. PROVIDE AND PLACE BACKFILL PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
5. ALL TRACER WIRE SHALL BE TESTED FOR CONTINUITY IN THE PRESENCE OF A REPRESENTATIVE FROM OGDEN CITY WATER PRIOR TO ASPHALT PLACEMENT. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE PRIOR TO ASPHALT PLACEMENT.
6. ALL TRACER WIRE WILL BE RE-TESTED AT THE 1-YEAR WARRANTY INSPECTION. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

ITEM	QTY	DESCRIPTION
1	1	1.5" OR 2" (MACH 10) WATER METER (CITY PROVIDED, FEE REQ'D)
2	1	48" CENTER MANHOLE LID (FLAT)
3	1	4' MANHOLE BASE
4	1	2" SETTER (18" HEIGHT) - FORD 1-VBHH77-18HB-11-77-TP6-NL
5	1	SLIP-TYPE VALVE BOX
6	VARIABLES	2" CTS POLY TUBING
7	VARIABLES	12 GA, INSULATED BLUE TRACER WIRE
8	1	CORP STOP (FORD FB1100-7-TA-Q-NL), TAP FEE PAID BY CONTRACTOR - OCW TO TAP THE MAIN

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

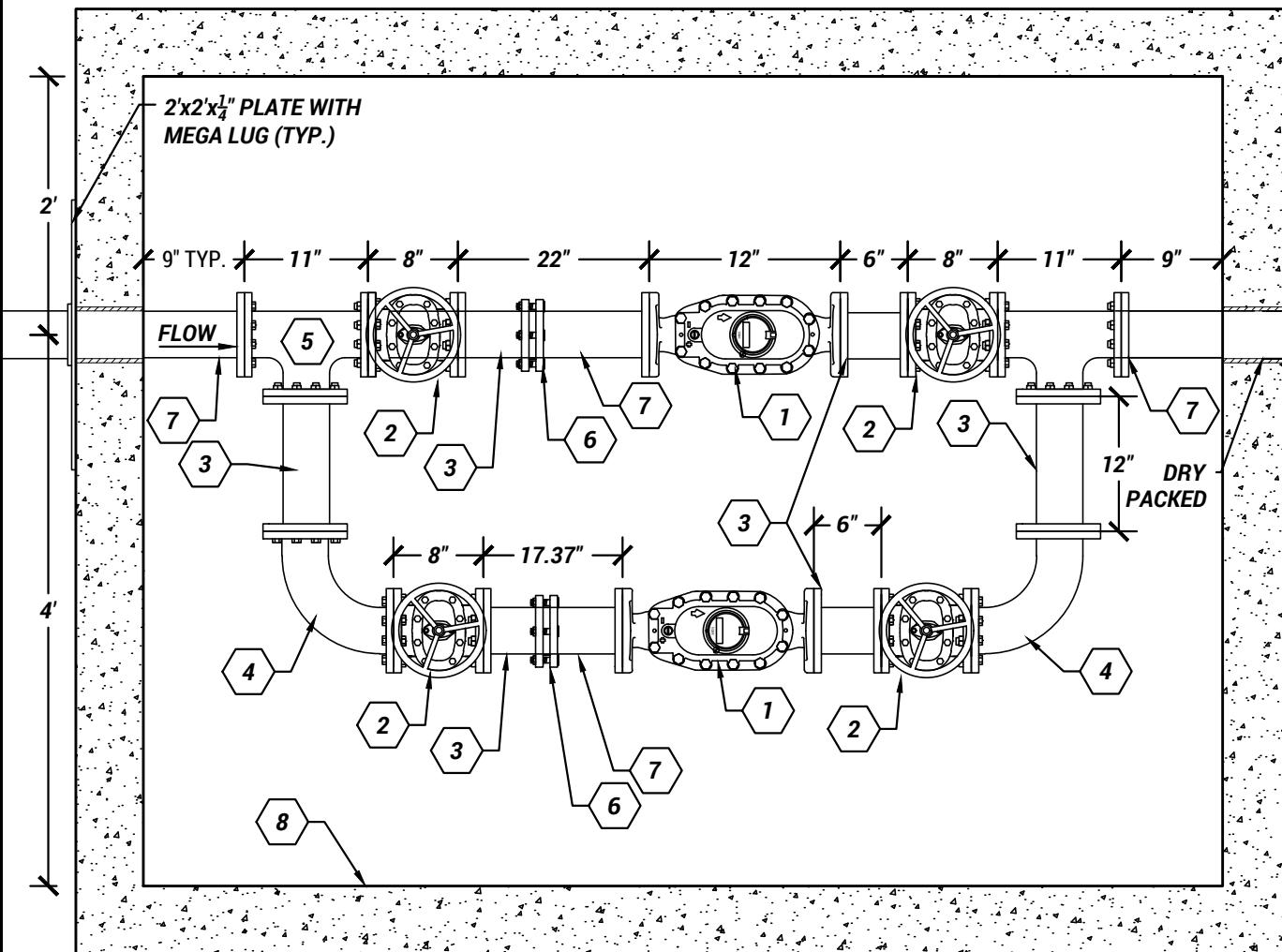


**TYPICAL SERVICE INSTALLATION
FOR 1.5" & 2" WATER METERS**

TAYLOR NIELSEN, CITY ENGINEER

W-4

SHEET 1 OF 1 2025

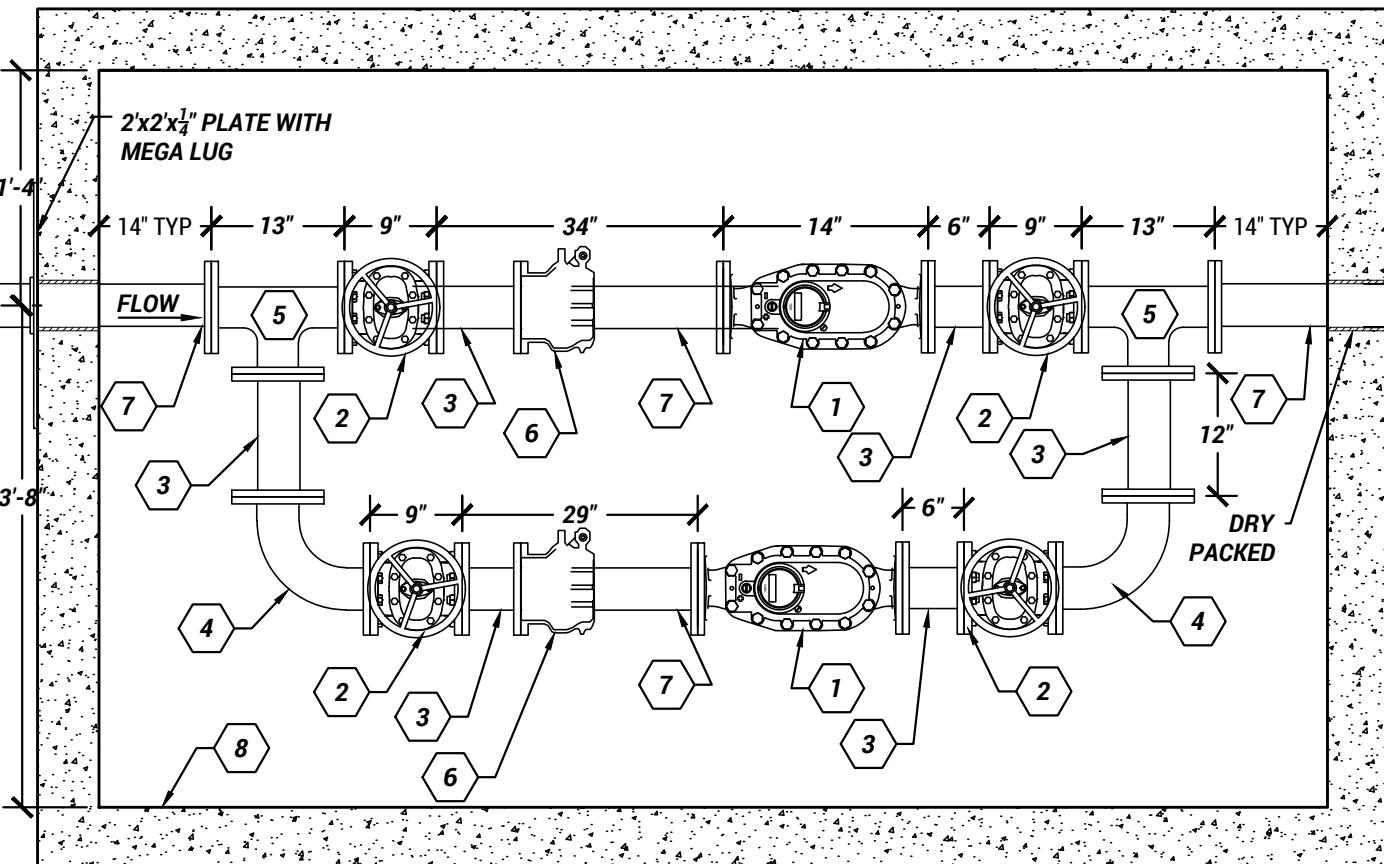


NOTES:

1. CONTRACTOR TO PROVIDE AND INSTALL ALL MATERIALS AS SHOWN ON THE DETAIL, UNLESS DIRECTED OTHERWISE BY OGDEN CITY WATER. REFER TO W-19 DETAIL FOR HATCH/LID.
2. PROVIDE AND PLACE BACKFILL PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
3. SEE STANDARD DRAWING W-9 FOR ADDITIONAL VAULT DETAILS. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND THE PIPE. SUPPORT WATER METER ON LATERAL AND BYPASS WITH JACK STANDS. ANY REQUIRED REDUCERS (4"x 3") ARE TO BE INSTALLED OUTSIDE OF THE VAULT.
4. ALL FITTINGS TO BE FLANGED, AND ALL JOINTS MUST BE RESTRAINED.
5. IF GROUNDWATER CONDITIONS ALLOW, CORE A 6" Ø HOLE IN THE LOWEST POINT OF THE FLOOR FOR A RELIEF DRAIN.

ITEM	QTY	DESCRIPTION
1	2	3" NEPTUNE MACH 10 WATER METER (CITY PROVIDED - FEE REQUIRED) EU3B2G1SG90
2	4	3" GATE VALVE (FLxFL) WITH HANDWHEEL
3	6	3" DUCTILE IRON SPOOL (FLxFL)
4	2	3" LONG RADIUS 90° BEND (FLxFL)
5	2	3"x3"x3" TEE (FLxFLxFL)
6	2	3" DRESSER (FLANGED COUPLING ADAPTER)
7	4	3" DUCTILE IRON PIPE (FLxCUT TO FIT)
8	1	6'x8' (INTERIOR) PRECAST CONCRETE VAULT (SEE STD DWG W-9)

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



NOTES:

CONTRACTOR TO PROVIDE AND INSTALL ALL MATERIALS AS SHOWN ON THE DETAIL, UNLESS DIRECTED OTHERWISE BY OGDEN CITY WATER. REFER TO W-19 DETAIL FOR HATCH/LID.

1. PROVIDE AND PLACE BACKFILL PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
2. SEE STANDARD DRAWING W-9 FOR ADDITIONAL VAULT DETAILS. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND THE PIPE. SUPPORT WATER METER ON LATERAL AND BYPASS WITH JACK STANDS.
3. ALL FITTINGS TO BE FLANGED, AND ALL JOINTS MUST BE RESTRAINED.
4. IF GROUNDWATER CONDITIONS ALLOW, CORE A 6" Ø HOLE IN THE LOWEST POINT OF THE FLOOR FOR A RELIEF DRAIN.

ITEM	QTY	DESCRIPTION
1	2	4" NEPTUNE MACH 10 WATER METER (CITY PROVIDED - FEE REQUIRED) - EU3D2G1SG90
2	4	4" GATE VALVE (FLxFL) WITH HANDWHEEL
3	6	4" DUCTILE IRON SPOOL (FLxFL)
4	2	4" LONG RADIUS 90° BEND (FLxFL)
5	2	4"x4"x4" TEE (FLxFLxFL)
6	2	4" RESTRAINED FLANGE COUPLING ADAPTOR
7	4	4" DUCTILE IRON PIPE (FLxCUT TO FIT)
8	1	5'x10'-6" (INTERIOR) PRECAST CONCRETE VAULT (SEE STD DWG W-9)

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

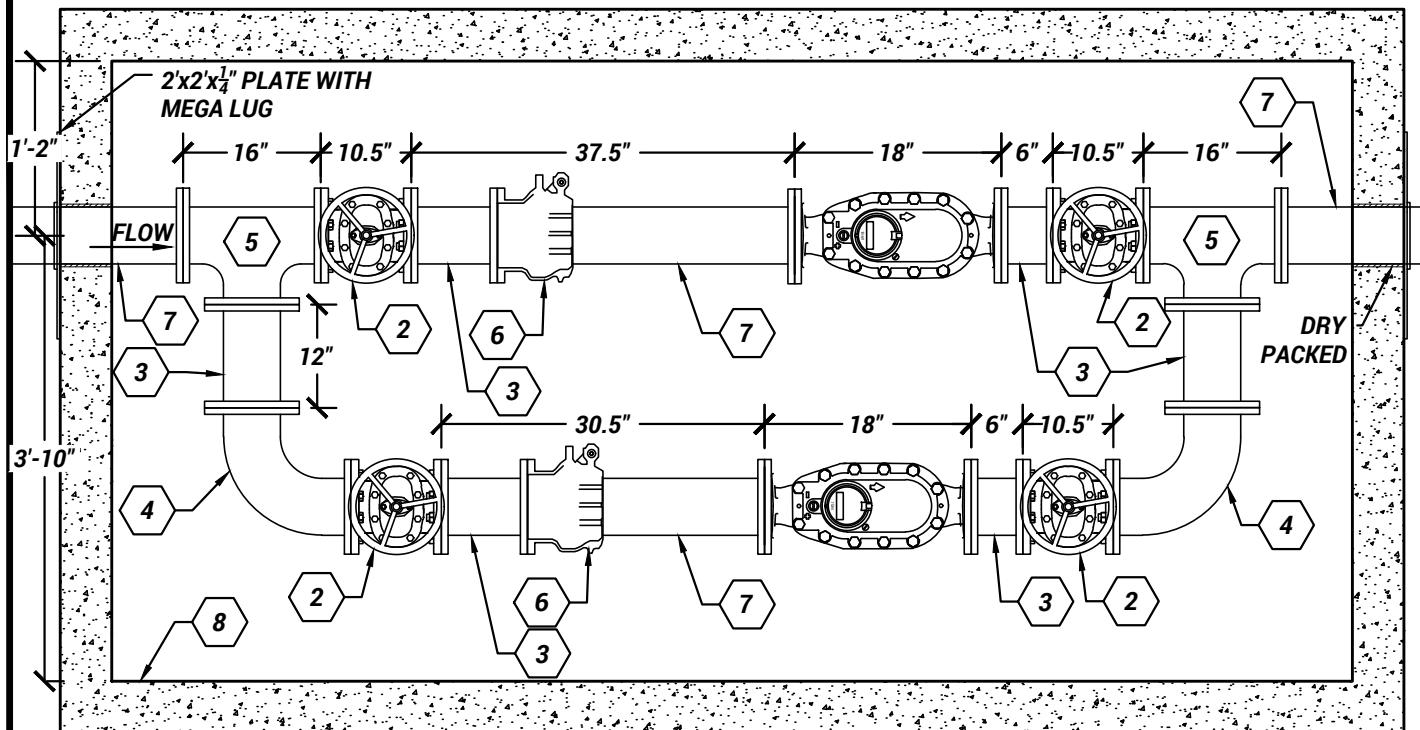
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4" MACH 10 ULTRASONIC WATER METER
WITH 4" BYPASS

W-6

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



NOTES:

CONTRACTOR TO PROVIDE AND INSTALL ALL MATERIALS AS SHOWN ON THE DETAIL, UNLESS DIRECTED OTHERWISE BY OGDEN CITY WATER. REFER TO W-19 DETAIL FOR HATCH/LID.

1. PROVIDE AND PLACE BACKFILL PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
2. SEE STANDARD DRAWING W-9 FOR ADDITIONAL PRECAST VAULT DETAILS. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND THE PIPE. SUPPORT WATER METER ON LATERAL AND BYPASS WITH JACK STANDS.
3. ALL FITTINGS TO BE FLANGED, AND ALL JOINTS MUST BE RESTRAINED.
4. IF GROUNDWATER CONDITIONS ALLOW, CORE A 6" Ø HOLE IN THE LOWEST POINT OF THE FLOOR FOR A RELIEF DRAIN.

ITEM	QTY	DESCRIPTION
1	2	6" NEPTUNE MACH 10 WATER METER (CITY PROVIDED - FEE REQ'D) EU3F2G1SG90
2	4	6" GATE VALVE (FLxFL) WITH HANDWHEEL
3	6	6" DUCTILE IRON SPOOL (FLxFL)
4	2	6" 90° BEND (FLxFL)
5	2	6"x6"x6" TEE (FLxFLxFL)
6	2	6" RESTRAINED FLANGE COUPLING ADAPTOR
7	4	6" DUCTILE IRON PIPE (FLxCUT TO FIT)
8	1	5' x 10'-6" (INTERIOR) PRECAST CONCRETE VAULT (SEE STD DWG W-9)

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

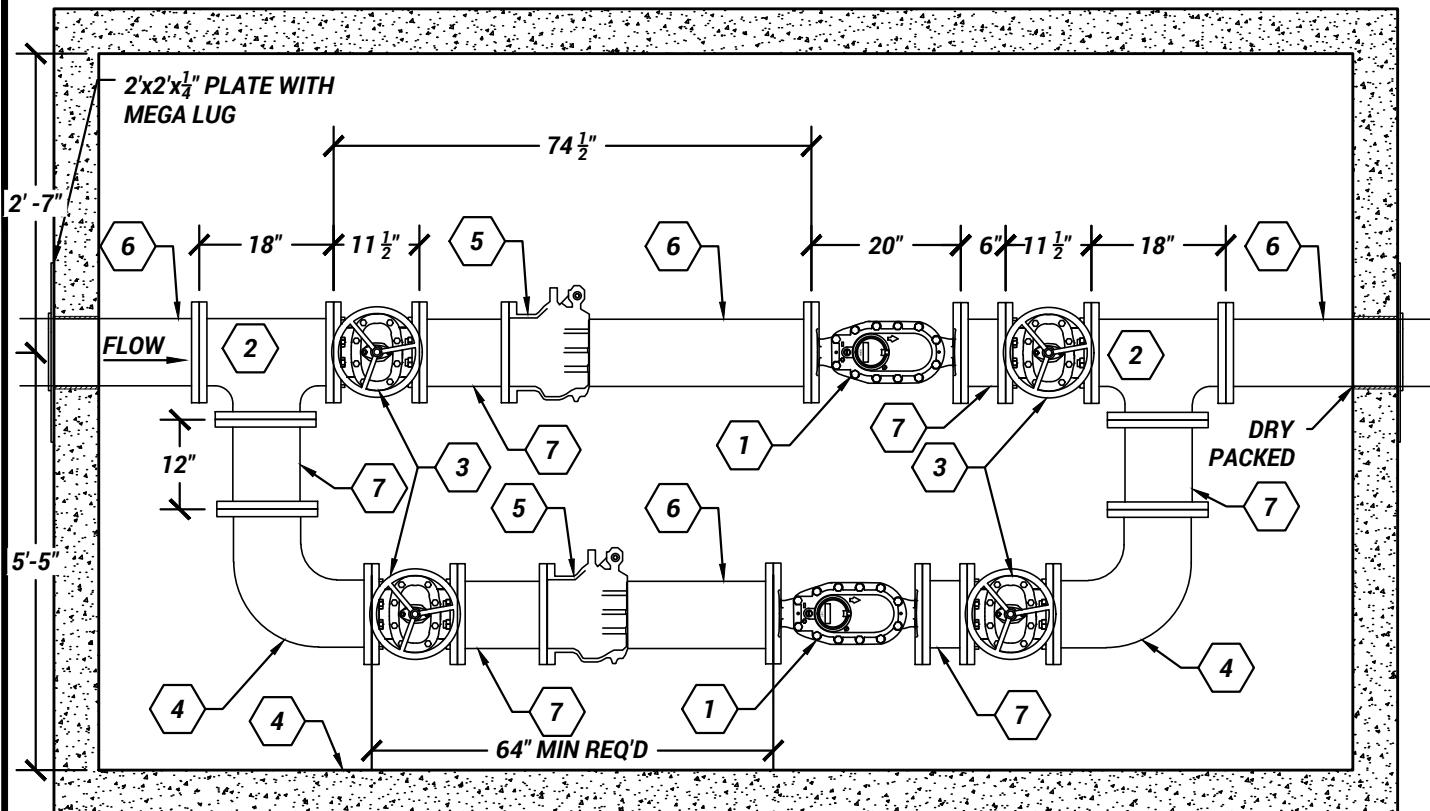
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6" MACH 10 ULTRASONIC WATER METER
WITH 6" BYPASS

W-7

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



NOTES:

CONTRACTOR TO PROVIDE AND INSTALL ALL MATERIALS AS SHOWN ON THE DETAIL, UNLESS DIRECTED OTHERWISE BY OGDEN CITY WATER. REFER TO W-19 DETAIL FOR HATCH/LID.

1. PROVIDE AND PLACE BACKFILL (IMPORT) PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
2. PRECAST VAULT TO BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER. SEE STANDARD DRAWING W-9 FOR ADDITIONAL PRECAST VAULT DETAILS. VAULT LAYOUT FOR AN 8" WATER METER WITH BYPASS MUST BE APPROVED BY OGDEN CITY ENGINEERING. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND PIPE. SUPPORT WATER METER, PIPING, AND BYPASS WITH PIPE JACK STANDS ANCHORED TO FLOOR.
3. ALL FITTINGS TO BE FLANGED, AND ALL JOINTS MUST BE RESTRAINED.
5. IF GROUNDWATER CONDITIONS ALLOW, CORE A 6" Ø HOLE IN THE LOWEST POINT IN THE FLOOR FOR A RELIEF DRAIN.

ITEM	QTY	DESCRIPTION
①	2	8" WATER METER WITH RADIO HEAD (CITY PROVIDED - FEE REQUIRED)
②	2	8"x8"x8" TEE (FLxFLxFL)
③	4	8" GATE VALVE (FLxFL) WITH HANDWHEEL
④	2	8" LONG RADIUS 90° BEND (FLxFL)
⑤	2	8" RESTRAINED FLANGE COUPLING ADAPTOR
⑥	4	8" DUCTILE IRON PIPE (FLxCUT TO FIT)
⑦	6	8" DUCTILE IRON SPOOL PIECE (FLxFL)
⑧	1	8'x14' (INTERIOR) PRECAST CONCRETE VAULT (SEE STD DWG W-9)

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

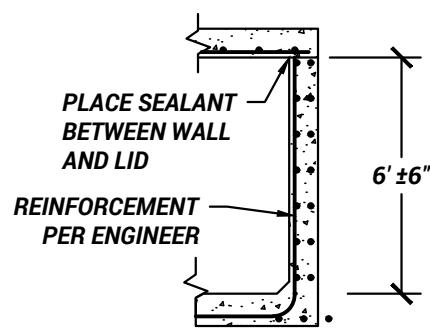
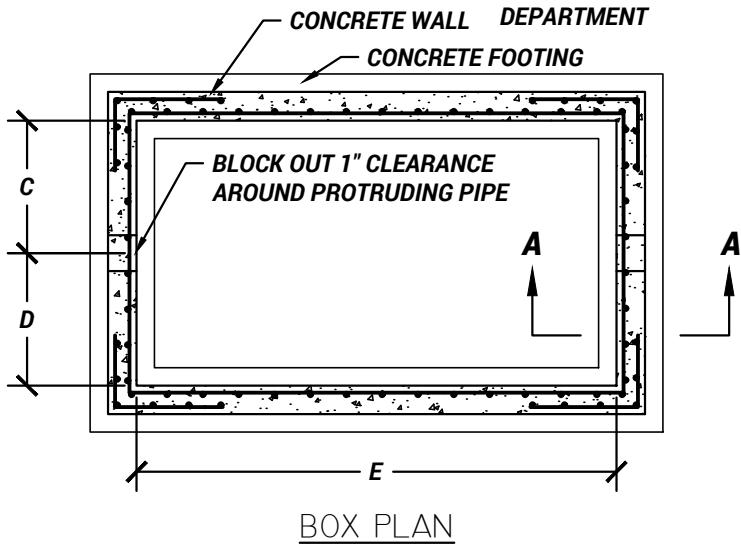
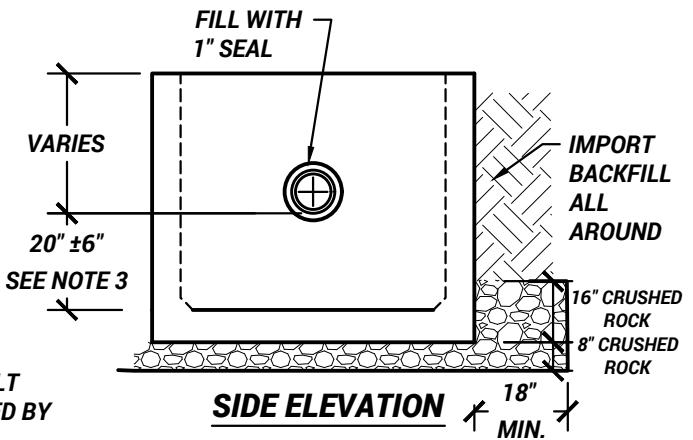
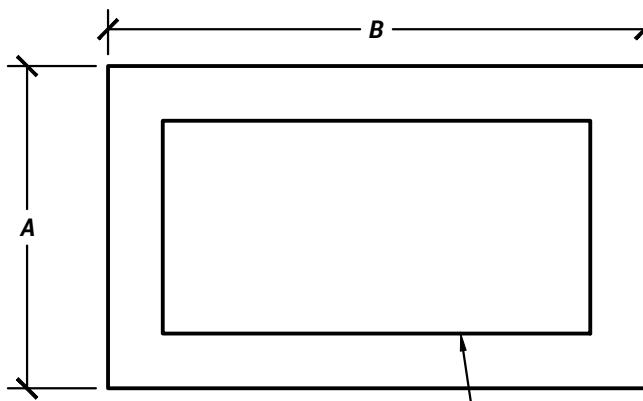
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8" MACH 10 ULTRASONIC WATER METER
WITH 8" BYPASS

W-8

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



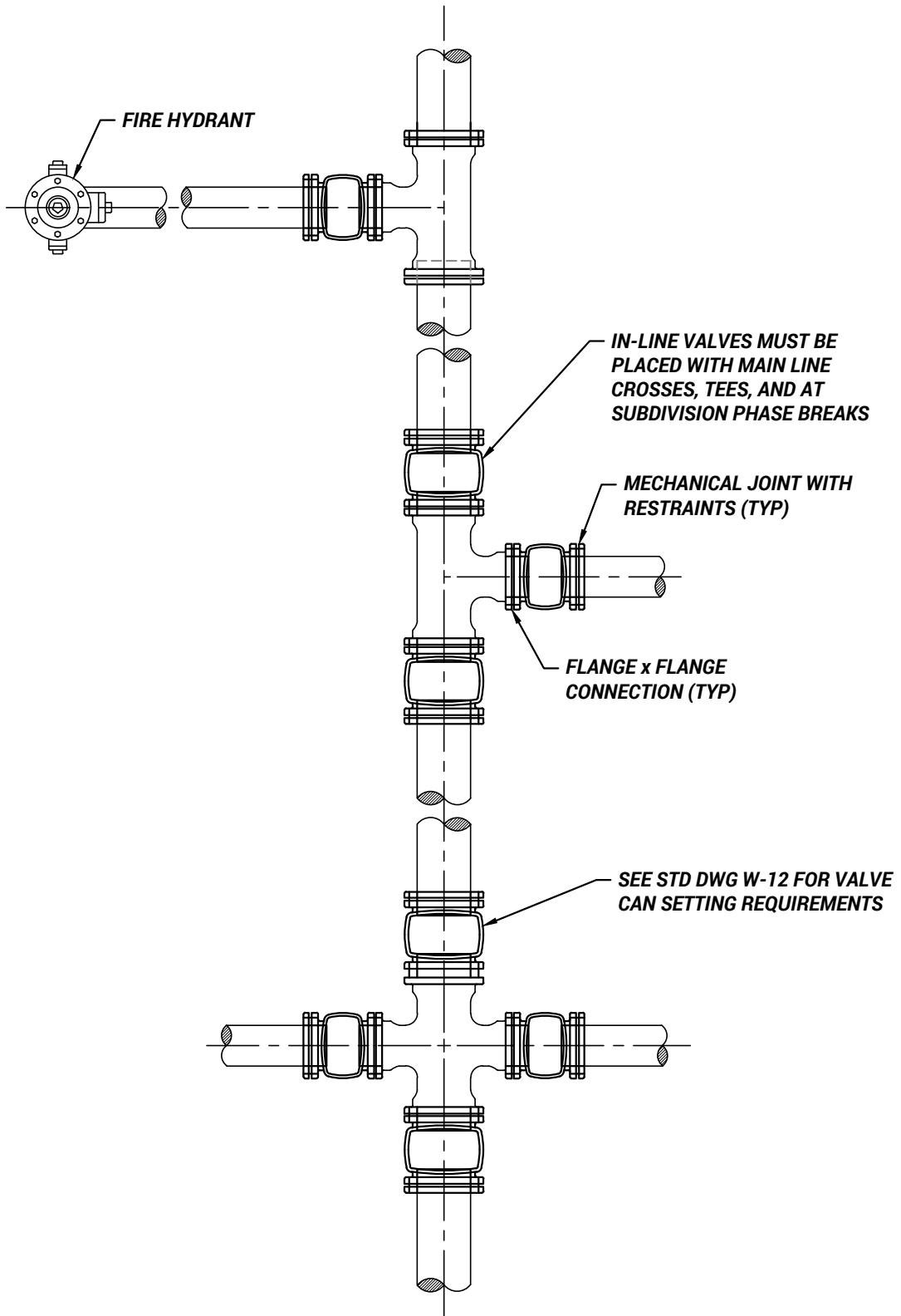
SECTION A-A

No.	METER SIZE			
	8"	6"	4"	3"
A	9'-0"	7'-0"	6'-0"	7'-0"
B	15'-0"	13'-0"	11'-6"	9'-0"
C	3'-4"	1'-8"	1'-11"	1'-11"
D	4'-8"	4'-4"	4-1"	4-1"
E	14'-0"	12'-0"	10'-0"	8'-0"

NOTES:

1. ALL VAULTS TO BE TRAFFIC RATED, DESIGNED, AND APPROVED BY A LICENSED STRUCTURAL ENGINEER.
 - 1.1. PROVIDE CLASS 4000 CONCRETE, APWA 03 30 04. VAULT SHALL BE APPROVED BY OGDEN CITY ENGINEERING PRIOR TO INSTALLATION. VAULT LAYOUT FOR AN 8" WATER METER WITH BYPASS MUST BE APPROVED BY OGDEN CITY ENGINEERING.
2. BACKFILL: PROVIDE AND PLACE PER APWA SECTION 31 23 23. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" BEFORE COMPACTION.
3. 8" MINIMUM OF CRUSHED ROCK (WITH SEPARATION FABRIC) TO BE PLACED BELOW FOOTING. 12" MINIMUM CLEAR SPACE FROM BOTTOM OF PIPE TO CRUSHED ROCK.
4. FILL ANNULAR SPACE AROUND PIPE WALL PENETRATIONS WITH WATERPROOF SEAL.
5. PRE-CAST VAULTS ARE ALLOWED, DRAWINGS MUST BE APPROVED BY THE CITY. REFER TO W-19 DETAIL FOR HATCH/LID.
6. PRE-PLUMBED VAULTS ARE ALLOWED, DRAWINGS MUST BE APPROVED BY THE CITY.
7. CENTER THE VAULT HATCH LID OVER THE METER.
8. ALL METER VAULTS (AND PRV VAULTS) ARE REQUIRED TO HAVE A BOLT-ON ALUMINUM LADDER WITH SAFETY EXTENSION DEVICE. SUBMITTAL OF LADDER/EXTENSION DEVICE ALONG WITH LOCATION WILL BE REQUIRED FOR APPROVAL ON ALL VAULTS.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



OGDEN CITY ENGINEERING - STANDARD DRAWINGS

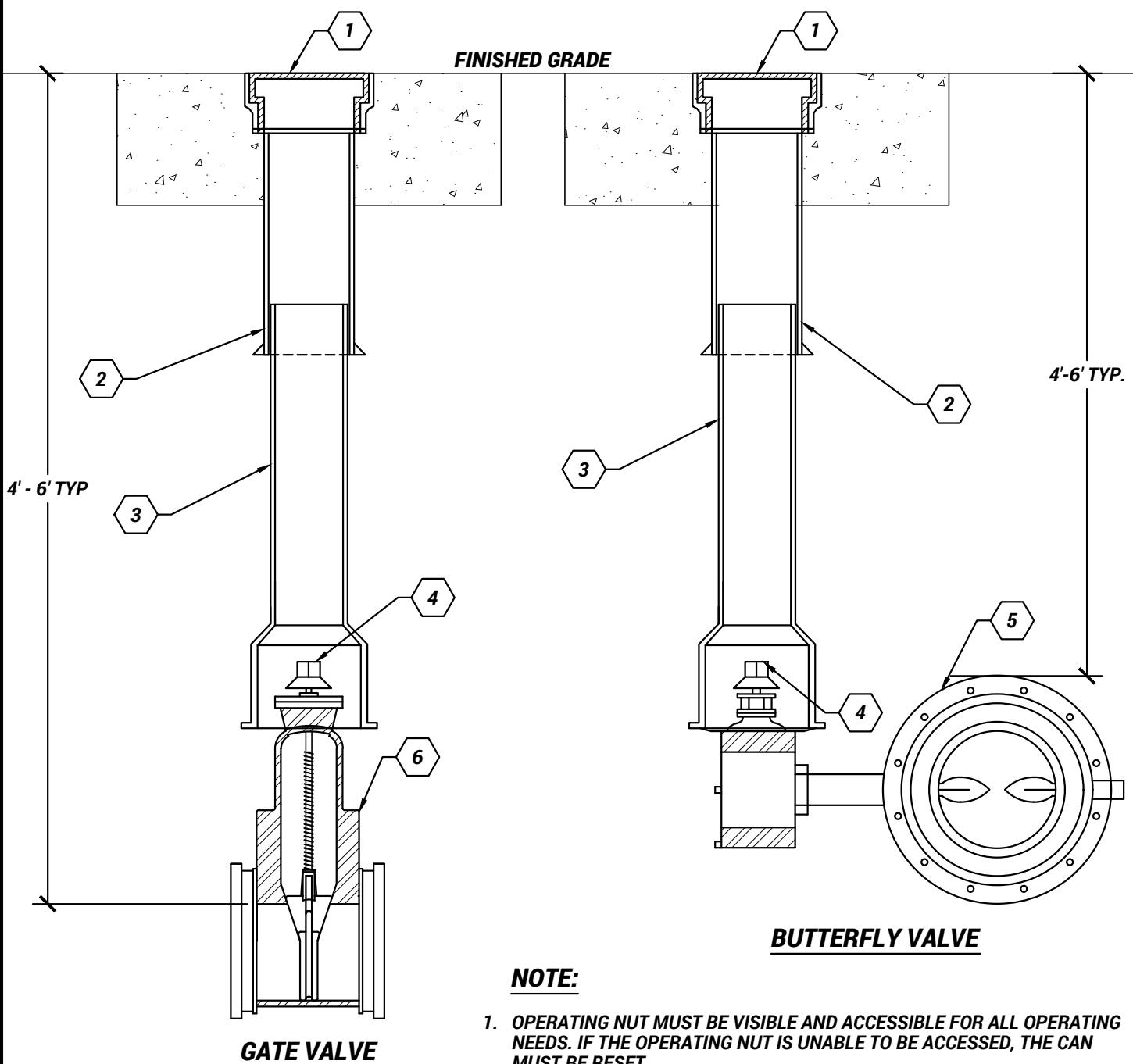
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TYPICAL VALVE LOCATION DETAIL

W-10

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025



NOTE:

1. OPERATING NUT MUST BE VISIBLE AND ACCESSIBLE FOR ALL OPERATING NEEDS. IF THE OPERATING NUT IS UNABLE TO BE ACCESSED, THE CAN MUST BE RESET.

ITEM	DESCRIPTION
1	VALVE COVER, 8" O.D. CAST IRON, HEAVY-DUTY STAMPED "WATER"
2	VALVE SLIP CAN, SLIP CAN LENGTH 18" (ADJUST TO GRADE) (ONE ONLY)
3	VALVE SLIP CAN BASE (24", 30", OR 36" LENGTHS)
4	2" SQ. OPERATING NUT
5	BUTTERFLY VALVE (FLxFL OR FLxMJ) FOR ALL VALVES 12" OR GREATER
6	GATE VALVE (FLxFL OR FLxMJ) FOR VALVES 6"-10"

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

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TYPICAL VALVE DETAIL

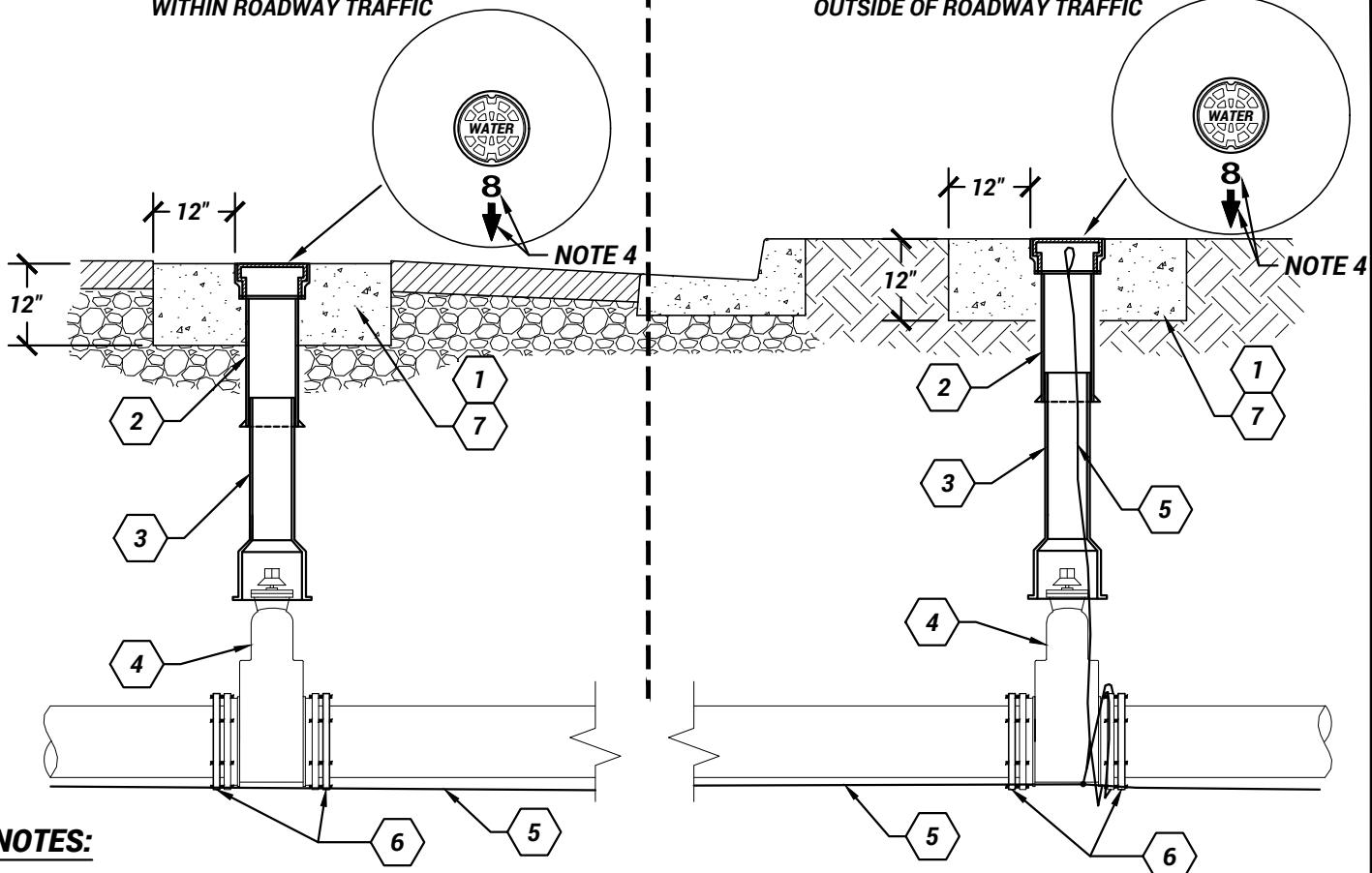
W-11

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025

WITHIN ROADWAY TRAFFIC

OUTSIDE OF ROADWAY TRAFFIC

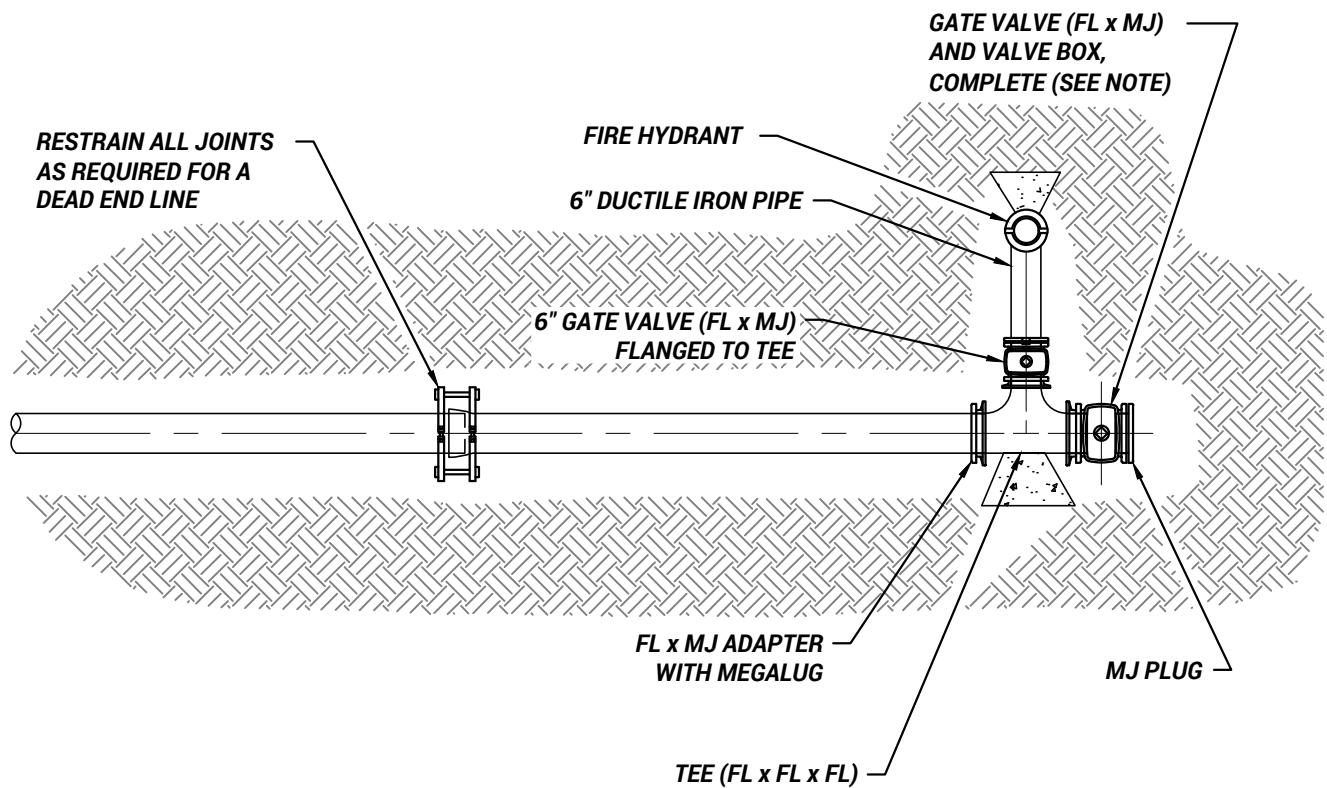


NOTES:

1. UNTREATED BASE COURSE: PROVIDE MATERIAL SPECIFIED IN APWA SECTION 32 11 23.
2. BACKFILL: PROVIDE AND PLACE PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A MODIFIED PROCTOR DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" BEFORE COMPACTION. BEFORE PLACEMENT OF VALVE BOX, PARTIALLY BACKFILL AND COMPACT TO THE BACKFILL LINE (SEE ABOVE). DO NOT INSTALL VALVE BOX DIRECTLY ON THE VALVE.
3. CONCRETE: CLASS 4000 PER APWA SECTION 03 30 04.
4. STAMP ALL VALVE COLLARS (AT TEES AND CROSSES) WITH AN ARROW (MIN 3" ARROW) POINTING IN THE ISOLATION DIRECTION IN ADDITION TO A STAMP OF THE SIZE OF VALVE (MIN 2" NUMBERS). HYDRANT VALVES SHOULD ONLY HAVE AN "H" STAMPED IN THE COLLAR.
5. NO VALVES ARE ALLOWED WITHIN THE CURB/GUTTER FOOTPRINT.
6. THE CONTRACTOR IS RESPONSIBLE FOR RAISING VALVE BOXES AND COLLARING AFTER STREET PAVING IS COMPLETED.
7. ALL TRACER WIRE SHALL BE TESTED FOR CONTINUITY IN THE PRESENCE OF A REPRESENTATIVE FROM OGDEN CITY WATER PRIOR TO ASPHALT PLACEMENT. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE PRIOR TO ASPHALT PLACEMENT.
8. ALL TRACER WIRE WILL BE RE-TESTED AT THE 1-YEAR WARRANTY INSPECTION. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

ITEM	DESCRIPTION
①	VALVE COVER, 8" O.D. CAST IRON, HEAVY-DUTY, STAMPED "WATER"
②	VALVE SLIP CAN, SLIP CAN LENGTH 18" (ADJUST TO GRADE) (ONE ONLY)
③	VALVE SLIP CAN BASE (24", 30", OR 36" LENGTHS)
④	VALVE, PER CONSTRUCTION DRAWINGS
⑤	TRACER WIRE
⑥	MEGALUG RESTRAINT OR APPROVED EQUAL
⑦	CONCRETE COLLAR (CLASS 4000 CONCRETE WITH MICROFIBER MESH) WITH SIZE AND DIRECTION STAMP

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

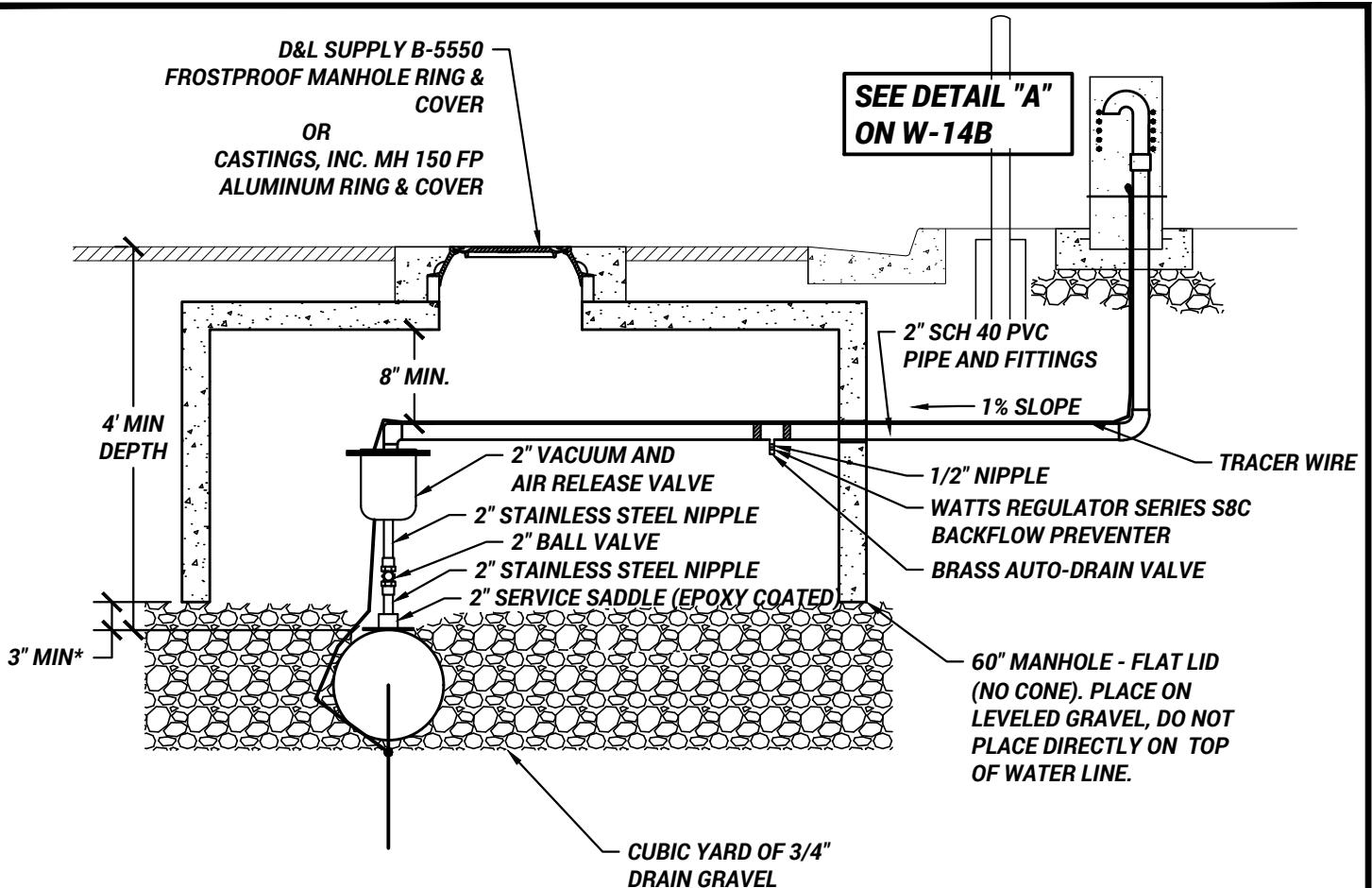


PLAN VIEW

NOTE:

1. A GATE VALVE AT THE END OF A DEAD END LINE WILL ONLY BE REQUIRED IN THE INSTANCE THAT FUTURE EXPANSION IS ANTICIPATED SUCH AS A FUTURE SUBDIVISION/DEVELOPMENT PHASE.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS		
Ogden UTAH Still Untamed™	SUBDIVISION PHASE BREAK END	W-13
TAYLOR NIELSEN, CITY ENGINEER		SHEET 1 OF 1 2025



NOTES:

1. FOLLOW AWWA AND NSF STANDARDS WHEN CONNECTING THE PIPE TO A WATER MAIN.
2. UNTREATED BASE COURSE: PROVIDE MATERIAL SPECIFIED IN APWA SECTION 32 11 23.
 - 2.1. PLACE MATERIAL PER APWA SECTION 32 05 10.
 - 2.2. COMPACT PER APWA SECTION 31 23 26 TO A MODIFIED PROCTOR DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
3. SEWER ROCK: INSTALL SEWER ROCK PER APWA SECTION 31 05 13, AROUND THE DRAIN PIPE AS NEEDED.
4. CONCRETE: CLASS 4000 PER APWA SECTION 03 30 04. PLACE CONCRETE PER APWA SECTION 03 30 10. PROVIDE 1/2" RADIUS ON ALL EDGES EXPOSED TO VIEW.
5. SMALL FITTINGS SHALL BE STAINLESS STEEL. DO NOT USE GALVANIZED MATERIALS.
6. SEAL MANHOLE JOINTS WATERTIGHT AND GROUND FLUSH WHEN CONNECTING PIPING.
 - 6.1. WATERTIGHT SEAL SHALL BE WATERPROOF AND COMPRESSIBLE.
7. VENT SHALL BE LOCATED IN THE PARKSTRIP.
8. AIR/VAC SHALL BE SIMPLE LEVER TYPE KINETIC COMBINATION AIR VALVE WITH CAST IRON BODY AND STAINLESS STEEL FLOATS.
9. SERVICE SADDLE IS REQUIRED ON ALL PIPES. USE EPOXY/NYLON COATED WITH DOUBLE STAINLESS STEEL STRAPS.
10. THE AIR VAC ASSEMBLY SIZE AND LOCATION MUST BE DESIGNED & STAMPED BY A PROFESSIONAL ENGINEER. THE DRAWING SHOWN IS AN EXAMPLE OF THE LAYOUT.
11. INSTALL TRACER WIRE FOR VENT PIPE.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

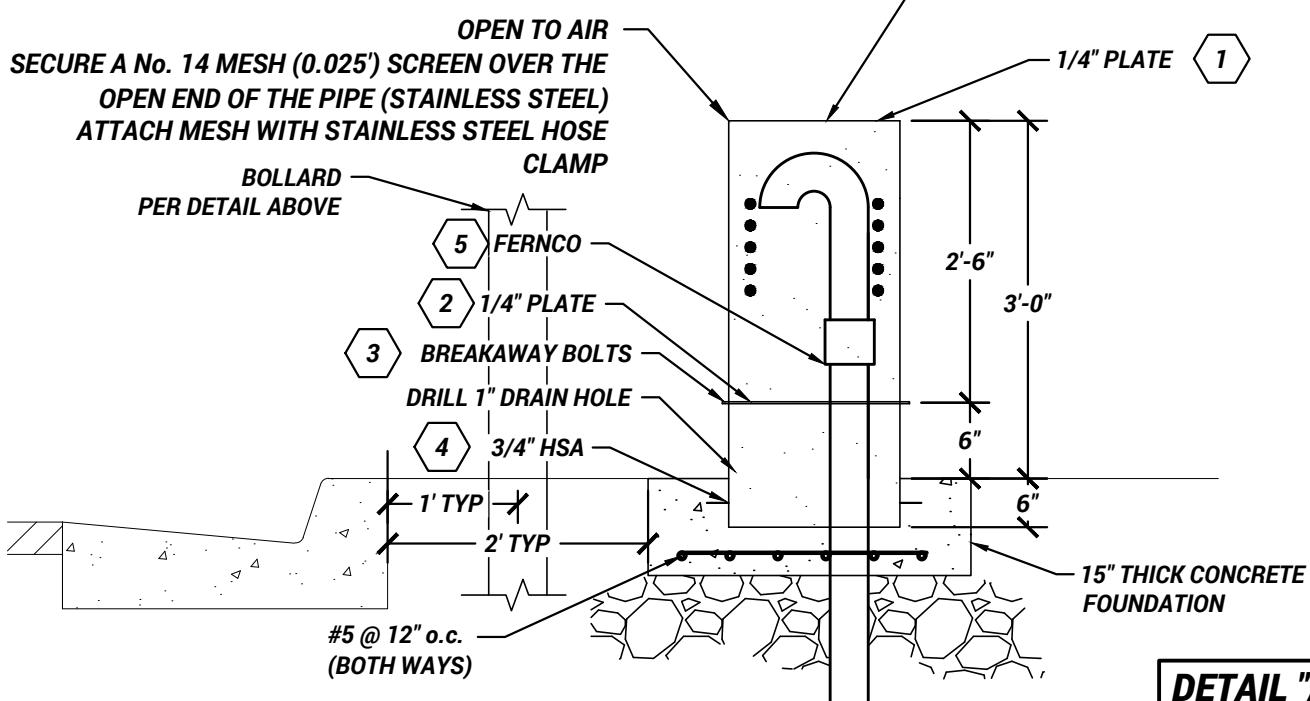
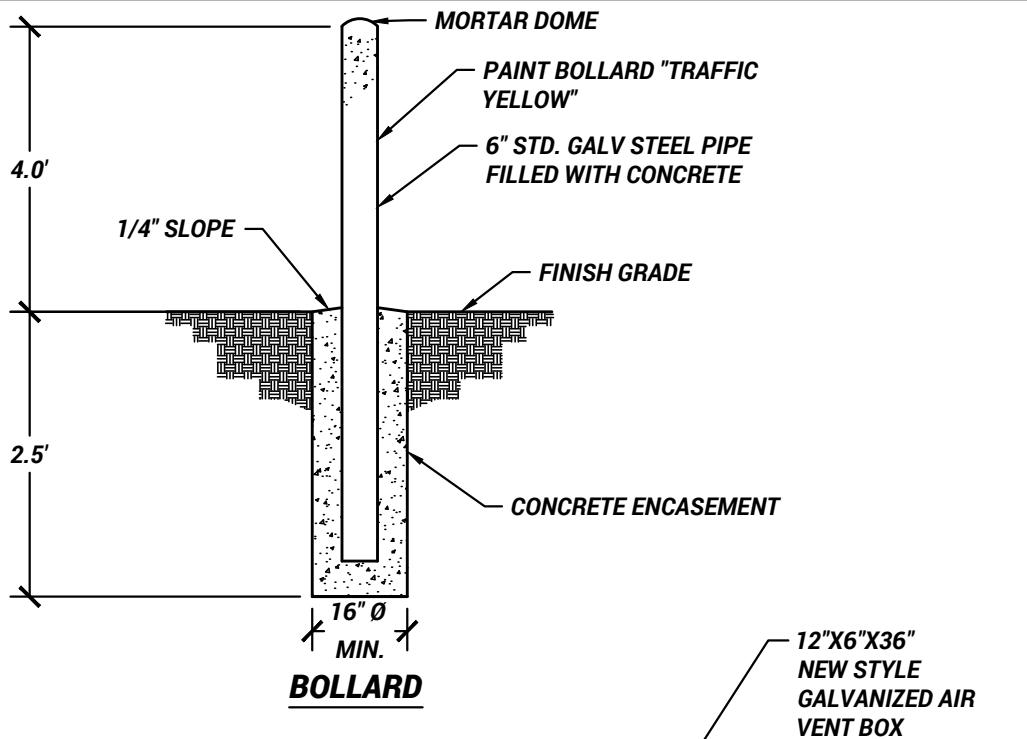
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2" AIR COMBINATION VALVE

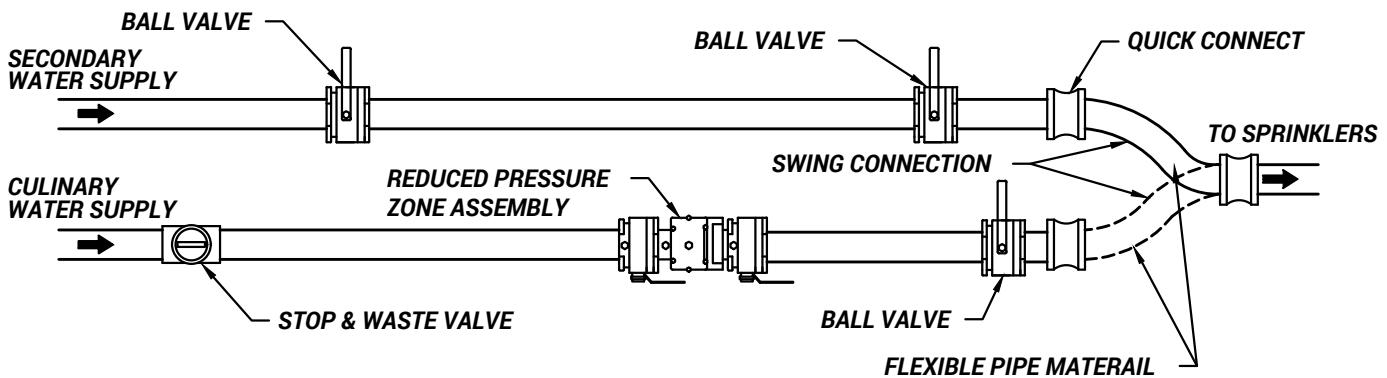
TAYLOR NIELSEN, CITY ENGINEER

W-14A

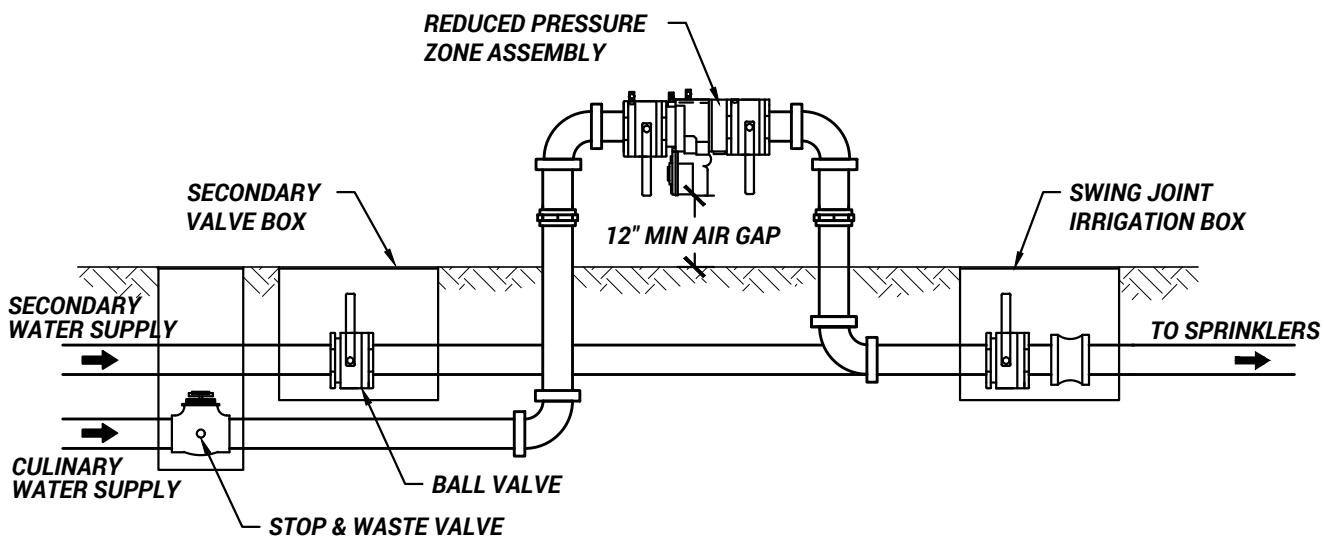
SHEET 1 OF 2 2025



ITEM	QTY	DESCRIPTION
1	1	1/4" PL - 6" x 1'-0"
2	2	1/4" PL - 9" x 1'-3"
3	10	1/2" x 3" BREAKAWAY BOLTS
4	4	3/4" x 4" HSA
5	1	FERNCO FITTING FOR BREAK-AWAY PURPOSES



PLAN VIEW



PROFILE VIEW

NOTES:

1. THE SWING CONNECTION IS INSTALLED SO EITHER THE SECONDARY IRRIGATION WATER OR THE CULINARY WATER IS CONNECTED AND FEEDING THE SPRINKLER SYSTEM.
2. THE REDUCED PRESSURE ZONE ASSEMBLY MUST BE LOCATED AT A MINIMUM OF 12" FROM THE WALL, FENCE, OR OTHER OBSTACLE.
3. THE REDUCED PRESSURE ZONE ASSEMBLY MUST BE LOCATED A MINIMUM OF 12" ABOVE GRADE.
 1. THE ASSEMBLY WILL NOT BE ALLOWED IN A PIT BELOW GRADE.
4. THE REDUCED PRESSURE ZONE ASSEMBLY MUST BE TESTED BY A CERTIFIED BACKFLOW TESTER WITHIN 10 DAYS OF INITIAL USAGE.
 1. THE ASSEMBLY MUST BE INSPECTED ANNUALLY AFTER THE INITIAL TEST AND INSPECTION.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

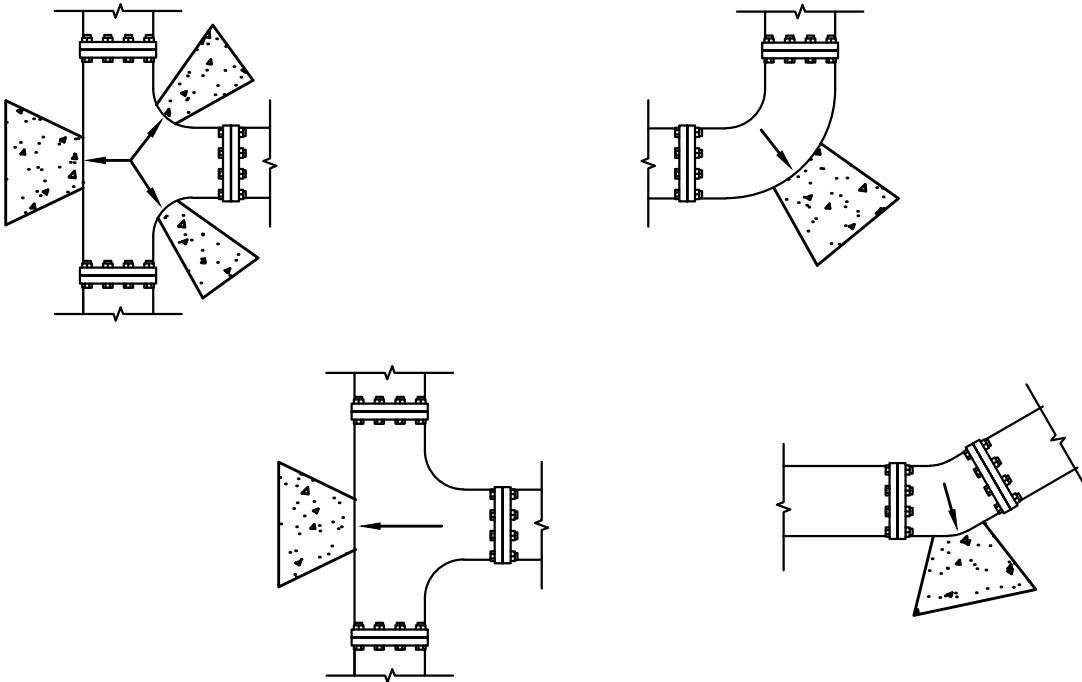


SECONDARY AND CULINARY WATER
IRRIGATION CONNECTION

TAYLOR NIELSEN, CITY ENGINEER

W-15

SHEET 1 OF 1 2025



MINIMUM BEARING AREA IN SQUARE FEET					
SIZE	TEES, VALVES, DEAD ENDS	90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS
4"	2	3	2	2	2
6"	4	5.5	3	1.5	1
8"	6	9.5	5	2.75	1.5
12"	14	20	11	5.5	3

NOTES:

1. ALL PIPES WITHIN OGDEN CITY MUST BE RESTRAINED USING JOINT RESTRAINT DEVICES. THRUST BLOCKS ARE ONLY TO BE USED IN SITUATIONS THAT WOULD REQUIRE A THRUST BLOCK SUCH AS AT HYDRANTS AND AT CONNECTIONS TO EXISTING.
2. CONCRETE: CLASS 4000 MINIMUM PER APWA SECTION 03 30 04. POUR AGAINST UNDISTURBED SOIL. NO BAG MIXES ALLOWED. SANDIES OR KAPP UCART ARE ALLOWED FOR USE FOR THRUST BLOCKS.
3. PIPE JOINTS: DO NOT COVER WITH CONCRETE. LEAVE COMPLETELY ACCESSIBLE.
4. GREASE: APPLY POLY-FM GREASE TO ALL BURIED METAL SURFACES. WRAP 8 MIL THICK POLYETHYLENE SHEET AND TAPE WRAP.
5. SPECIAL CONSTRUCTION REQUIREMENTS:
 - 5.1. THRUST DESIGN FOR PIPE SIZES OR CONFIGURATIONS NOT SHOWN REQUIRE A SPECIAL DESIGN.
 - 5.2. BEARING AREAS, VOLUMES, AND SPECIAL THRUST BLOCKING DETAILS SHOWN ON CONSTRUCTION PLANS TAKE PRECEDENCE OVER THIS PLAN.
6. INSPECTIONS: PRIOR TO BACKFILLING AROUND THE THRUST BLOCK, SECURE INSPECTION OF INSTALLATION BY ENGINEER.
7. BACKFILL: PROVIDE AND PLACE PER APWA SECTION 33 05 20. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HANDHELD COMPACTION EQUIPMENT.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS



DIRECT BEARING THRUST BLOCK

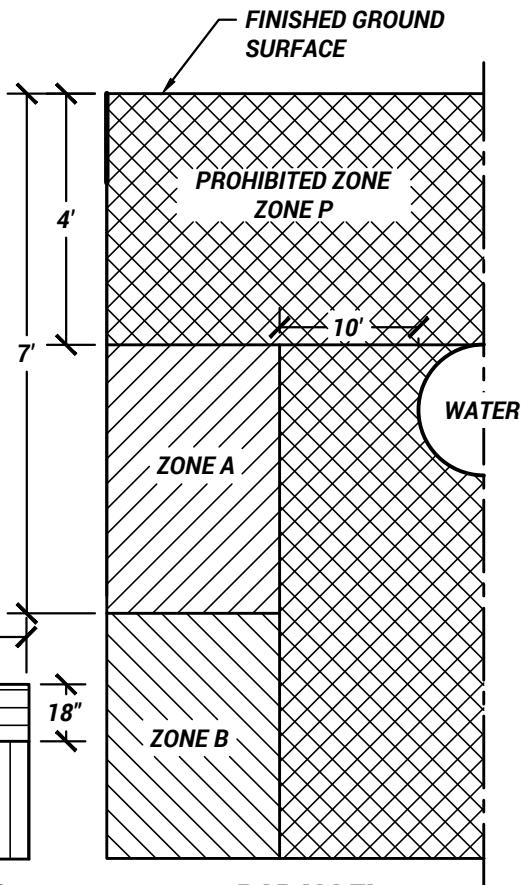
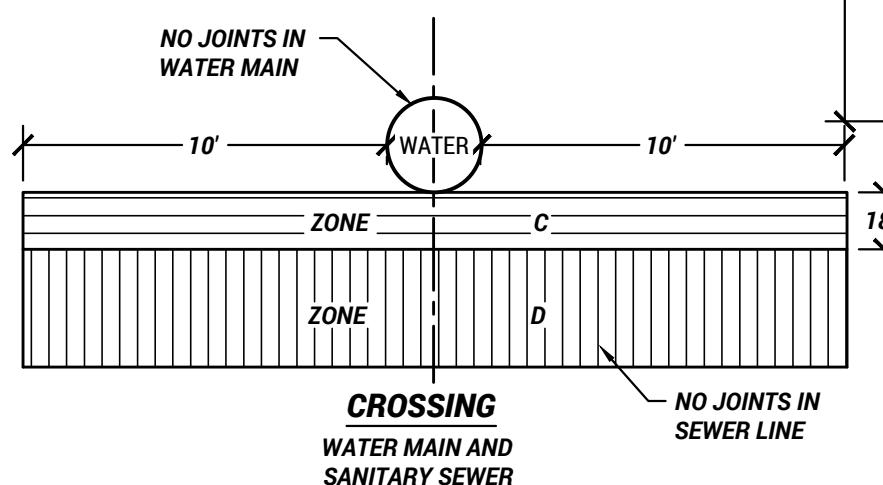
W-16

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025

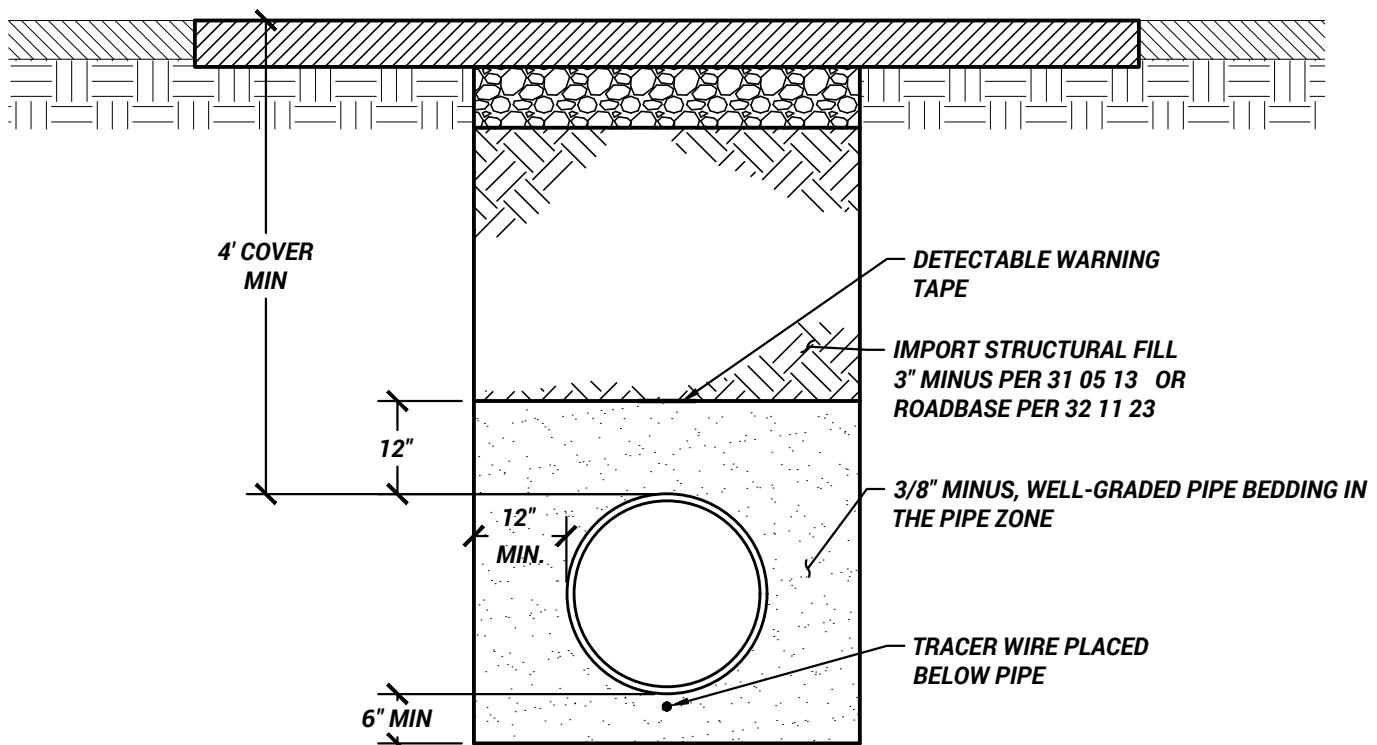
NOTES:

1. THE DIMENSIONS ON THIS DRAWING ARE FROM THE EDGE OF THE WATER MAIN TO THE EDGE OF THE SEWER LINE.
2. WATER SERVICE LATERALS SHALL BE AT LEAST 18" ABOVE A SEWER LINE.
3. SEWER LINES SHALL NOT BE INSTALLED WITHIN 25' HORIZONTALLY OF A LOW HEAD (5 PSI OR LESS) WATER MAIN.
4. EXCEPTIONS TO THE RULES MAY BE ACCEPTABLE IF IT CAN BE SHOWN THAT GRANTING OF SUCH AN EXCEPTION WILL NOT JEOPARDIZE THE PUBLIC HEALTH.
 - 4.1. APPROVAL WILL BE BASED ON A REVIEW FROM THE OGDEN CITY ENGINEER AND THE STATE OF UTAH.
5. SEWER FORCE SERVICES ARE NOT INCLUDED IN THIS DETAIL. ALL FORCE SERVICES MUST BE APPROVED BY THE CITY ENGINEER.



A	SEWER LINES WILL NOT BE PERMITTED IN THIS ZONE WITHOUT SPECIAL PERMISSION FROM THE OGDEN CITY WATER AND ENGINEERING DEPARTMENTS.
B	SEWER LINES WILL BE PERMITTED IN THIS ZONE.
C	THE SEWER LINE SHALL REQUIRE ADDITIONAL PROTECTION APPROVED BY OGDEN CITY IN COMBINATION WITH NO JOINTS OF EITHER UTILITY WITHIN A 10' RADIUS. REFER TO THE OGDEN CITY ENGINEERING STANDARDS. ADDITIONAL SPECIFICATIONS MAY BE REQUIRED BY THE CITY ENGINEER.
D	SEWER LINES ARE PERMITTED TO CROSS THE UNDER WATER LINES AT A 90° ANGLE.
P	ZONE P IS A PROHIBITED ZONE. REFER TO SECTION R309-550-7 OF THE UTAH ADMINISTRATIVE CODE AND THE OGDEN CITY ENGINEERING STANDARDS.

SEE DRAWINGS RD-3 FOR ASPHALT PATCH DETAILS



NOTES:

1. PIPE ZONE WIDTH IS RECOMMENDED BY THE MANUFACTURE OF THE PIPE. WIDTH OF THE PIPE ZONE IS MEASURED AT THE PIPE SPRING LINE AND INCLUDES ANY NECESSARY SHEATHING. FOLLOW MANUFACTURER RECOMMENDATIONS FOR ANY TRENCH BOX APPLICATIONS.
2. INSTALL THE PIPE IN THE CENTER OF THE TRENCH.
3. BASE COURSE PER APWA SECTION 32 11 23.
4. WIDTH OF EXCAVATION IS MEASURED AT THE PIPE SPRING LINE AND INCLUDES ANY NECESSARY SHEATHING.
5. USE 3/8" MINUS WELL-GRADED PIPE BEDDING IMPORT FILL IN THE PIPE ZONE. MAXIMUM LIFT THICKNESS IS 8" BEFORE COMPACTION.
6. DO NOT USE RECYCLED RAP AGGREGATE IN THE TRENCH. IF MANUFACTURER RECOMMENDS ANYTHING CONTRARY TO WHAT IS LISTED BELOW, CONSULT WITH THE ENGINEERING DEPARTMENT.
 - 6.1. HAUNCHING/BEDDING: INSTALL AND COMPACT PER MANUFACTURER RECOMMENDATIONS AND ASTM SPECIFICATIONS.
 - 6.1.1. WATER JETTING IS NOT ALLOWED.
 - 6.1.2. SUBMISSION OF COMPACTION TEST DATA FOR THE HAUNCHING AREAS MAY BE REQUESTED AT ANY TIME.
 - 6.2. BACKFILL: INSTALL AND COMPACT PER MANUFACTURER RECOMMENDATIONS AND ASTM SPECIFICATIONS. DO NOT PLACE IN LIFTS GREATER THAN 8" BEFORE COMPACTION.
 - 6.2.1. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS BEFORE COMPACTION IS 8" WHEN USING RIDING AND 6" WHEN USING HAND COMPACTION EQUIPMENT.
7. PEA GRAVEL OR ANY GRAVEL LESS THAN $\frac{3}{4}$ " NOMINAL SIZE IS NOT ALLOWED IN ANY PART OF THE TRENCH.
8. REFER TO APWA SECTION 33 05 07 FOR ADDITIONAL INFORMATION ON PVC PIPE.
9. ALL TRACER WIRE SHALL BE TESTED FOR CONTINUITY IN THE PRESENCE OF A REPRESENTATIVE FROM OGDEN CITY WATER PRIOR TO ASPHALT PLACEMENT. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE PRIOR TO ASPHALT PLACEMENT.
10. ALL TRACER WIRE WILL BE RE-TESTED AT THE 1-YEAR WARRANTY INSPECTION. ANY TRACER WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

OGDEN CITY ENGINEERING - STANDARD DRAWINGS

Ogden
UTAH
Still Untamed™

TYPICAL WATERLINE TRENCH

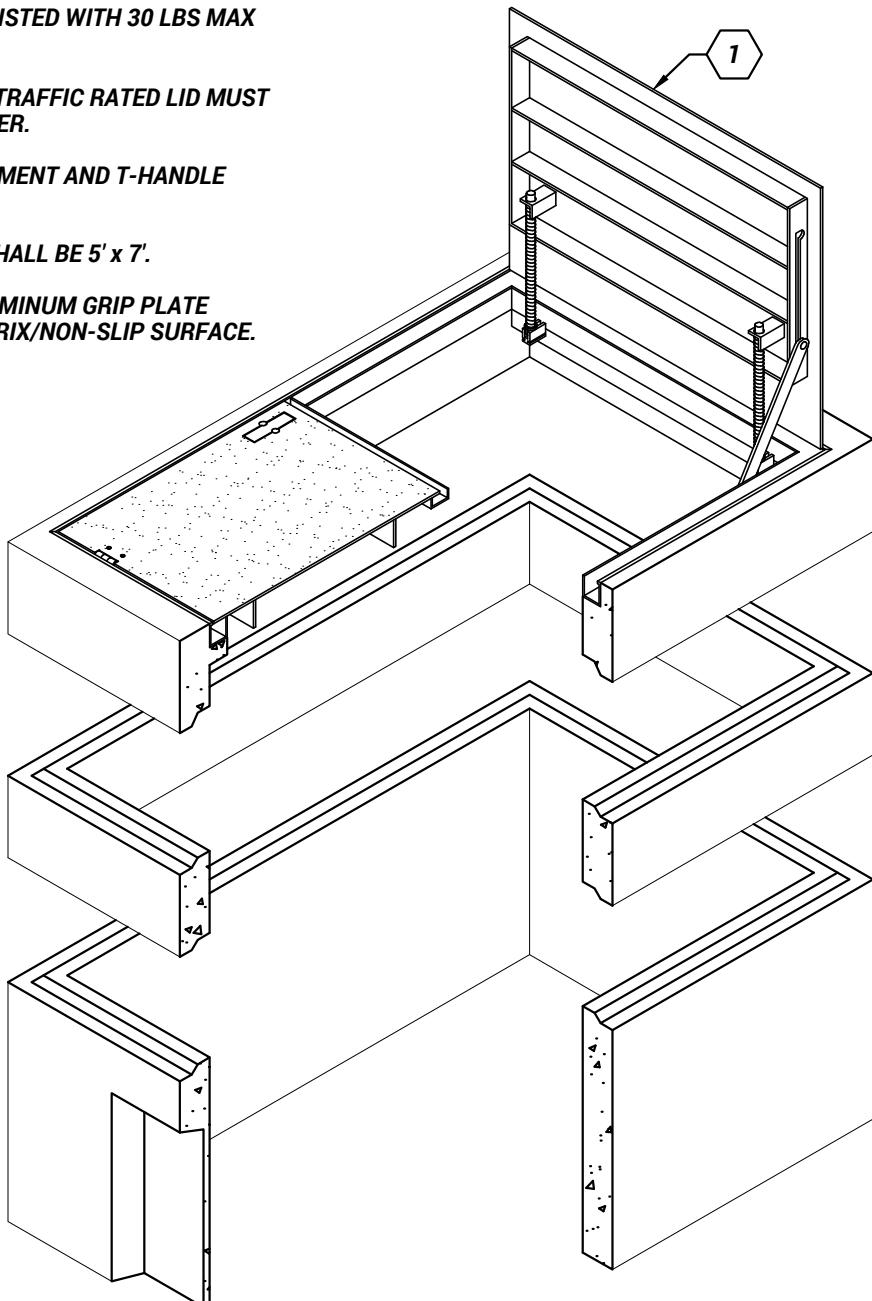
W-18

TAYLOR NIELSEN, CITY ENGINEER

SHEET 1 OF 1 2025

NOTES:

1. VAULT COVER TO BE CONCRETE OR APPROVED EQUAL. NO SECTIONAL VAULTS ALLOWED.
2. SEE STANDARD DRAWINGS FOR VAULT AND PIPING LAYOUT.
3. A JOINT SEALING COMPOUND SHALL BE USED AT ALL JOINTS.
4. LIDS SHALL BE ALUMINUM, SPRING ASSISTED WITH 30 LBS MAX LIFT (UNLESS OTHERWISE SPECIFIED).
5. TRAFFIC RATED LID MAY BE REQUIRED. TRAFFIC RATED LID MUST BE STAMPED/CERTIFIED BY THE SUPPLIER.
6. SUPPLY RECESSED PADLOCK COMPARTMENT AND T-HANDLE OPENING.
7. MINIMUM VAULT LID OPENING SPACE SHALL BE 5' x 7'.
8. TOP SURFACE SHALL BE A SLIPNOT[®] ALUMINUM GRIP PLATE CONSISTING OF A RANDOM HATCH MATRIX/NON-SLIP SURFACE.



ITEM	QTY	DESCRIPTION	LIST NUMBER
1	"U.S.F." PARKWAY THD ALUMINUM (OR APPROVED EQUAL), SPRING ASSIST COVER WITH STANDARD HARDWARE & OVERSIZED RECESSED PADLOCK HASP (NOT SHOWN FOR CLARITY). TOP PLATE SHALL HAVE SLIPNOT [®] GRIP PLATE.		-

OGDEN CITY ENGINEERING - STANDARD DRAWINGS		
PARKWAY VAULT LID FOR METERS 3" AND LARGER		W-19
TAYLOR NIELSEN, CITY ENGINEER		
Ogden UTAH Still Untamed™		SHEET 1 OF 1 2023

Ogden City Water Department Approved Materials List

PIPE (MUST BE NSF APPROVED)				
	4" to 8" PVC	C-900, Class 305 (DR 14) or Class 235 (DR 18)	JMEagle, Vinyl Tech, Westlake Pipe	-
	12" to 24" Ductile Iron Pipe	Class 52 or Pressure Class 350 psi, AWWA C151 with Push-on joints, AWWA C111.	American Ductile Iron, Pacific States Cast Iron Pipe, U.S. Pipe	-
	12" to 24" PVC w/Engineering Approval	C-900, Class 235 (DR 18) or Class 305 (DR 14)	JMEagle, Vinyl Tech, Westlake Pipe	-
	Poly - 1"	CTS Poly Tubing AWWA C901	Various	
	Poly - Larger than 1"	Service lines - CTS Poly pipe ASTM F876 Certified, AWWA C901, chlorine resistance ASTM F876 and UV resistance ASTM F2657	Various	
VALVES (4" AND LARGER)				
	Butterfly Valves	12" to 48", Cast Iron Body, Bronze Mounted. 250 psi rated, conforming to requirements of AWWA C504	Mueller Lineseal XPII Crispin K-FLO Class 250 Av-Tek DEX Class 250	
	Gate Valves	4" to 10", Resilient Wedge, Cast Iron Body, Bronze Mounted. Non-Rising Stems With "O" Ring Seals. 250 psi rated, conforming to requirements of AWWA C504. Open Counterclockwise.	Mueller A-2362 Clow 2639/2640 American 65 Series	
	Valve Box	2 Piece, Cast Iron, Slip Type, class 35 heavy duty, 5 1/4" Shaft with a Drop Lid	Castings, Inc D&L Supply	
VALVES (3" AND SMALLER) Purchase from City				
	Ball Valve (for Air Vac and Backflow preventer)	3/4" to 2"	Mueller	

*Ogden City Engineering Division
Water Department Approved Materials List*

	<i>Corporation Stop 1-inch Minimum 250 psi</i>	PVC/STEEL 1"-Ford: FB1100-4-TA-TW-Q-NL 1"-Mueller: B-2502810N	DUCTILE IRON 1"-Ford: FB1000-4-TA-TW-Q-NL 1"-Mueller: B-2500810N	
	<i>Angle Ball Meter Valve</i>	<i>Ford 1" CTS XMTR: BA43-444W-TW-Q-NL Mueller 1" CTS XMTR: B-24258N</i>		
	<i>Corporation Stop 2-Inch Minimum 250 psi</i>	PVC/STEEL 2"-Ford: FB1100-7-TA-TW-Q-NL 2"-Mueller: B-2502810N	DUCTILE IRON Same as PVC (tapping saddle req'd)	
FIRE HYDRANTS (AWWA C502)				
	<i>Standard Fire Hydrant</i>	<i>High Pressure Dry Barrel, 5 1/4" Valve Opening. Operating Cap and Nuts: Pentagon 1 1/2" Point to Flat</i>	<i>Mueller Clow</i>	<i>Centurion Medallion</i>
	<i>Pipe and Fittings</i>	<i>Ductile Iron</i>	<i>See Section Pipe Section</i>	
BACKFLOW PREVENTER				
	<i>RP Backflow Device DC (Sprinkler) PVB (Sprinkler) SVB (Sprinkler) AVB (Sprinkler)</i>	<i>Backflow assembly devices as approved by State of Utah Division of Drinking Water</i>		
	<i>1" - 2"</i>			
METERS (PURCHASE FROM THE CITY)				
	<i>3/4"- 1"</i>	<i>Typical Service Meter - City installs</i>	<i>Neptune (obtain from City)</i>	<i>T-10 w/r900i</i>
	<i>1.5" and above</i>	<i>For wide flow rate applications - installed by Contractor</i>	<i>Neptune Mach10 (obtain from City)</i>	
	<i>1" Meter Dual Check Valve</i>	<i>ASSE 1024 Dual Check Valve (Top Entry Only)</i>	<i>1" Mueller: H-14462-62 1" Ford: HHCA34-444-G-NL</i>	
<i>* Part numbers are subject to change and must be approved by Ogden City.</i>				
METER SETTER				

*Ogden City Engineering Division
Water Department Approved Materials List*

	2"	2" Setter – 18" Height	Ford 1-VBHH77-18HB-11-77-TP6-NL	
PIPE FITTINGS				
	Service Fitting	Compression Connection	Mueller Ford	110 Compression
	Ductile Iron Fittings	Tees and Crosses, Class 250, AWWA C110, C153	American Ductile Iron, Clow, U.S. Pipe	
	Ductile Iron Fittings	Bends, Reducers, and End Caps, Class 250, AWWA C110, C153	American Ductile Iron, Clow, U.S. Pipe	
	Fittings	Sleeves, couplers, adaptors	Romac Alpha or Macro couplers, American Ductile Iron, U.S. Pipe, Clow	
VAULTS				
	Pre-Cast Vault	Per Standard Drawing W-9, and/or W-19		
	Meter Box 2"	4' Precast manhole - provided by contractor (No floor)		
	Meter Box 1" or Less	Raven tapered meter box	SRMP162436RTPW – 162436W-WHITE SIGMA-RAVEN	
	Vault Ladder	Ladder with Pull-Up Safety Post		
LOCATING WIRE/TAPE				
	Wire	12 Gauge Insulated Copper tracer wire (Blue Wire)		
	Wire Splice	Direct Bury (DBR) Splice Kit		
COVER/LIDS				
	Valve Cover	8" Outside Diameter, Cast Iron, "Water" Should be Cast on the Cover	Castings Inc., East Jordan, D&L Supply	
	3/4" or 1" Meter Box Cover	18" Cover with Inset Lid with 2" Recessed Antenna Hole & Large Bolt "LB" option.	Ford Meter Box Co. A32-C-REC463-T-LB	
	2" Meter Box Cover	24" Cover with Inset Lid (With 2" Recessed Antenna Hole)	The Ford Meter Box Company, Inc.	

*Ogden City Engineering Division
Water Department Approved Materials List*

	Standard Vault Lid	300 psf pedestrian load rated lid	U.S.F. Fabrication	
	* Part numbers are subject to change and must be approved by Ogden City			
	Occasional Traffic Rated Vault Lid	H-20 load rating for Off street Locations	U.S.F. Fabrication	
	Traffic Rated Vault Lid	Per Plan	U.S.F. Fabrication	
	Water Hatch	For 3" or Larger Meters	U.S.F. Fab or approved equal	
	Tracer Wire Box	Snakepit Tracer box	Copperhead Industries	CD14BTP
MISCELLANEOUS				
	Bolts	Stainless Steel, American Standard Machined Heavy Hexagon Heads With Class 2 Fit and Threads. ASTM A325 (1/2" to 1 1/2") Xylan coated steel "blue bolts". ASTM B-117, Adhesion per ASTM D3359		
	Anchor Bolts	Stainless Steel, American Standard Machined Heavy Hexagon Heads With Class 2 Fit and Threads. ASTM A307, or ASTM F593 Stainless Steel.		
	Washers	Grey Iron, ASTM A126		
	Meter Bushing Meter Adaptors	1" x 1-1/4" Thread Size	Ford: A34NL-SHORT Ford: A24-NL-LONG	
	Steel Pedestal	Steel Pedestal Pipe Support Under Each Meter or As Directed By Inspector		
	Valve Stem Extension	Steel, Welded Construction, Hot Dipped Galvanized 7' or greater		
	Valve Screw	Steel Screw Can to fit Cover, class 35 heavy duty (minimum of 90 lbs.)	C.I. - 550 or approved equal	Castings, Inc.
	Tapping Saddle	1" Tap if Meter is New. All saddles must be IP threaded	Epoxy/Vinyl coated, dual stainless steel bands/straps	
	Polywrap	Buried Mechanical Ductile Iron Joints, Grease and 8 mil Vinyl Wrap Plastic Cover.		

*Ogden City Engineering Division
Water Department Approved Materials List*

	<i>Bond Breaker</i>	<i>8 MIL. Poly Wrap for concrete to fitting separation</i>		
	<i>Joint Restraints</i>	<i>Class 250 minimum</i>		
<i>* Part numbers are subject to change and must be approved by Ogden City</i>				
COMBINATION AIR/VACUUM VALVES				
	<i>Air/Vacuum Valve</i>	<i>1"- 2" Single Body</i>	<i>APCO Val-Matic OR City approved equal</i>	<i>140C 201C & 203C</i>
	<i>Air/Vacuum Valve</i>	<i>3"- 4" Dual Body</i>	<i>APCO: 140C Val-Matic: 201C & 203C A.R.I: D-46 250PSI OR City Approved equal.</i>	

Ogden City Sanitary Sewer Department Approved Materials List

NO	ITEM	DESCRIPTION	MANUFACTURER	MODEL
	PIPE (GRAVITY FED)			
	4" to 27" PVC	SDR 35, Solid Smooth Wall, ASTM D3034, Green in Color	JM EAGLE, VINYL TECH, WESTLAKE	
	Acrylonitrile-Butadienen-Styrene (ABS)	Rigid ABS, 2"-12" pipe - ASTM D 2751, 8"- 15" pipe ASTM D 2680 composite, schedule 40, Green in Color	JM EAGLE, CRESTLINE-WEST	
	4" to 18" HDPE	<i>HDPE DR-17 is the minimum pipe class that will be accepted for this type of material (HDPE pipe will be produced from resins meeting the requirements of ASTM D3350, designation PE4710 and cell classification PE445574C, and will meet the requirements of ASTM F714 and AWWA C906. HDPE pipe will meet the minimum stability requirements of ASTM D3350. Pipe will be legibly marked at intervals of no more than five feet with the manufacturer's name, trademark, pipe size, HDPE cell classification, appropriate legend such as DR 17, ASTM F714, and C906, date of manufacture and point of origin) needs to be green in color.</i>	JM EAGLE, HIGH COUNTRY FUSION PREFORMANCE PIPE ISCO, WL PLASTICS	
	CIPP Lining (Cure In Place Pipe)	4" and 5" 3mm minimum thickness and 6" and 8 inch 4.5mm minimum thickness, ASTM F-1216, ASTM D-638, ASTM D-790, NASSCO		
	PIPE FITTINGS			
	Shear Bands	Series 300 Stainless Steel Band	FERNCO/ MISSION	

*Ogden City Engineering Division
Sanitary Sewer Department Approved Materials List*

	<i>PVC Fittings</i>	<i>11.25° & 22.5° & 45° Elbows ASTM D-3034 with SDR 35 (Rubber Gasket spec ASTM D-1869)</i>	<i>MULTI FITTINGS, PLASTIC TRENDS</i>	
	<i>Cleanout Capp</i>	<i>Threaded Brass Capp Plug with flush top. Plastic Capp approved only when cleanout is contained within a Christy G05 or G08 concrete box</i>	<i>SIOUX CHIEF</i>	
	<i>Cleanout box</i>	<i>Christy G05 or G08 concrete box w/ flush cast iron cover</i>	<i>OLDCASTLE</i>	
	<i>Cleanout WYE</i>	<i>45 degree WYE coupled with a 45 elbow (SDR 35) or a Long Sweeping WYE (SDR 35) (Rubber Gasket spec ASTM D-1869)</i>	<i>MULTI FITTINGS, PLASTIC TRENDS, IPEX USA</i>	
	<i>Main WYE</i>	<i>Elbows ASTM D-3034 with SDR 35 (Rubber Gasket spec ASTM D-1869)</i>	<i>MULTI FITTINGS</i>	
	<i>Inserta Tee</i>	<i>SDR 35 (Rubber Gasket spec ASTM D-1869)</i>	<i>INSERTA TEE</i>	

Ogden City Storm Water Department Approved Materials List

NO	ITEM	DESCRIPTION	MANUFACTURER	MODEL
	PIPE (GRAVITY SYSTEMS)			
	Reinforced Concrete	Class III or Greater, 15" or Larger (Sub-Drain 12" or Larger). Two feet (2') minimum cover required	OLDCASTLE PRECAST	
	CIPP Lining (Cure In Place Pipe)			
	PIPE FITTINGS			
	Shear Bands	Series 300 Stainless Steel Band	FERNCO/ MISSION	
	PVC Fittings	11.25° & 22.5° & 45° Elbows ASTM D-3034 with SDR 35 (Rubber Gasket spec ASTM D-1869)	MULTI FITTINGS, PLASTIC TRENDS	
	Cleanout box	Christy G05 or G08 concrete box w/ flush cast iron cover	OLDCASTLE, or approved equal	
	Cleanout Capp	Threaded Brass Capp Plug with flush top. Plastic Capp approved only when cleanout is contained within a Christy G05 or G08 concrete box	SIOUX CHIEF, or approved equal	
	Cleanout WYE	45 degree WYE coupled with a 45 elbow (SDR 35) or a Long Sweeping WYE (SDR 35) (Rubber Gasket spec ASTM D-1869)	MULTI FITTINGS, PLASTIC TRENDS, IPEX USA	
	Main WYE	Elbows ASTM D-3034 with SDR 35 (Rubber Gasket spec ASTM D-1869)	MULTI FITTINGS	
	Inserta Tee	SDR 35 (Rubber Gasket spec ASTM D-1869)	INSERTA TEE	