PART III – SANITARY SEWER
POLICIES AND DESIGN CRITERIA MANUAL

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SECTION 1.0

INTRODUCTION AND GENERAL POLICIES

1.1 SCOPE

The following Policies & Design Criteria Manual has been adopted by the City Council of the City of West Jordan to govern and regulate sanitary sewer work pertaining to the City of West Jordan and for the benefit of the City. Persons and/or entities performing sanitary sewer work must be come familiar with and follow this Policies & Design Criteria Manual. City personnel and representatives are not authorized to waive the requirements set forth herein or to excuse performance on the par of persons or entities doing sanitary sewer work. These regulations may be amended from time to time by the City Manager.

The design and construction of sanitary sewer mains and other sanitary sewer appurtenances in the City of West Jordan shall comply with these policies, design criteria and standards herein called the "Engineering Policies & Design Criteria Manual, Part III – Sanitary Sewer Policies & Design Criteria", or the permit requirements of various governing bodies, except where specific modifications have been approved, in writing, by the City Engineer.

This document sets forth minimum standards, policies, procedures, and design criteria for designing and preparing plans and specifications for culinary water systems built in the City. Wherever there are differences between these standards and other county, state or federal regulations, the most stringent or highest requirement shall govern.

Other policy and design criteria standards, which are separate from these documents, also exist for land disturbance, transportation, stormwater, water, parks & trails, and secondary water systems.

1.2 CITY OF WEST JORDAN, SEWER COLLECTION, TRANSMISSION, AND TREATMENT SYSTEMS

The City of West Jordan owns and operates the sanitary sewer collection and transmission systems servicing the City, and the City is also a joint owner of the regional sewer treatment plant serving West Jordan and neighboring communities called the South Valley Water Reclamation Facility (SVWRF). A brief description of these facilities and their history is contained in the following paragraphs.

A. Sewer Collection and Transmission Systems - West Jordan incorporated in 1941 as the Town of West Jordan. In the 1950's there were efforts to construct a community sewer system. Construction of a sewer collection system began in 1957 and by 1958 portions of the system were operational. The current collection system has grown and been expanded over the years to meet the service needs of this growing community. At the present time the collection system includes nearly 300-miles of pipeline ranging in size from 8-inch to 60-inch in size. The collection system generally flows by gravity down hill from the west, toward the east, and has three major trunk lines located in: 7000 South, 7800 South, and 9000 South, and one smaller trunk line on 8050 South. The trunk lines connect to interceptor sewers that carry the flows to the treatment plant site which is located near the Jordan River at approximately 7500 South. There is currently one

City operated sewer pump station located at approximately 8600 South and 1200 West to serve the local neighborhood area and lift the sewer flows into the gravity flow sewer in 1300 West.

The collection system transports flows that range between a low-flow of 4-million gallons per day (MGD) to a peak high-flow of 14-MGD. The current average daily flows are approximately 8-MGD. The collection system has approximately 20,000 connections serving individual residents, multi family residences, business, and variety of commercial and industrial users. The flows are monitored and measured at four permanent meter stations located on the four trunk lines servicing the City. Samples of the wastewater are regularly collected and tested to measure the sewer strength and contaminate levels.

B. Sewer Treatment Plant - Sewer flows from the collection system were originally treated at the Midvale sewer treatment plant constructed in about 1950 and located east of the Jordan River at 7100 south. In 1957 Midvale allowed West Jordan to join the treatment plant. In 1958 Midvale, West Jordan, and Salt Lake City Suburban Sanitary District #2 (currently Mid Valley Sewer District) agreed to jointly operate the sewer treatment plant located in Midvale. Two years later the Tri Community Treatment Plant Board was formally organized. Then sewer flows from the Salt Lake County Sewer Improvement District No 1. (currently the South Valley Sewer District) jointed the existing treatment plant. The combined flow of these agencies overloaded the capacity of the existing trickling filter plant system and as a result the plant was expanded with the addition of an aerated lagoon system. The expanded Tri-Community Treatment Plant became operational in June 1977. The expanded treatment plant was considered a temporary facility and the governing agencies began negotiations and planning for construction of a new regional waste water treatment facility.

In 1978, by execution of an inter-local agreement, a new sewer treatment plant governing board was formed that included Midvale City, Mid-Valley Sewer District, West Jordan City, South Valley Sewer District, and the Sandy Suburban Improvement District. The new governing board began the planning and design of a new regional waste water treatment facility to be known as the South Valley Water Reclamation Facility (SVWRF). In 1982 construction began on a new treatment plant located west of the Jordan River at approximately 7500 South in West Jordan. The new treatment plant began operation in 1985 with a capacity to treat 25.5-MGD. The plant was expanded in 1992 and currently is rated for a design capacity of 38-MGD, or a population equivalent of 380,000 people. Present average daily flows at the plant are approximately 30-MGD and peak flows are approximately 47-MGD.

The plant utilizes an aeration activated sludge treatment process, and has 3 bar screens, 2 aerated grit chambers, 4 oxidation ditches, 6 final clarifiers, UV disinfection with backup chlorine contact basins, and 1 cascade aerator, one dissolved air filtration sludge thickener and 4 belt presses. The plant effluent discharges to the Jordan River through a permit with the State of Utah. Bio-solids are shipped to an offsite facility where 20 to30-percent of the bio-solids are composed and 65 to 70-percent are shipped to a solids regeneration site and the remainder is disposed in a solid waste landfill.

The treatment plant is currently engaged in an additional expansion and up-grade project that will increase the capacity to 50-MGD and treat bio solids using a thermal drying process. This expansion project is scheduled for completion in 2008.

The SVWRF (treatment plant), administers a Waste Water Pretreatment Program to sample and monitor all commercial and industrial accounts requiring a pretreatment permit. Users that exceed the standards for sewer strength and contaminant levels are required to pre-treat sewer discharges or pay assessments for exceeding discharge standards.

1.3 AUTHORITY

Titles 87, 89, and 90 of the City of West Jordan Municipal Code, establishes the legal authority for the planning, design and construction of the City's sanitary sewer systems and appurtenances. In addition to these City ordinances, the State of Utah, Rules for Sanitary sewer Systems, most current version apply to the City's sanitary sewer systems as well.

1.4 INTERPRETATION

The City Engineer will decide all questions of interpretation of "good engineering practice" being guided by "Design and Construction of Sanitary and Storm Sewers" (ASCE Manual of Engineering Practice No. 37 or WPCF Manual of Practice No.9) both prepared by joint committees of the American Society of Civil Engineers and the Water Pollution Control Federation.

1.5 QUALITY ASSURANCE

All work shall be performed in accordance with City drafting/submittal requirements. Design work shall be accomplished under the direct supervision of a Utah Registered Professional Engineer, and shall carry the seal and signature of the same supervising Professional Engineer. All submitted designs, specifications, reports and plans shall be signed by a civil engineer, registered in the State of Utah, and all work shall be in accordance with good engineering practice.

1.6 SUBMITTALS

A. Design Data - Provide data on peak, average, and maximum daily flow.

B. Project Documents - Meet all checklist items required by Engineering Department before document submission.

C. Easements and Land Acquisition

1. All easements and land acquisitions shall be submitted on the city's standard easement form and shall be included on the recorded subdivision plat.
2. One copy of all necessary easement forms shall be submitted to the City Engineer for review.
3. All necessary permits shall be submitted to the City Engineer for final approval. Required permits include but are not limited to state and county utility line permits, canal crossing permits, Railroad crossing permits, Army Corp. of Engineer permits, etc.
4. All necessary permits and easements must be submitted prior to final approval being granted by the City.

D. All commercial or industrial developments must be submitted to the pretreatment coordinator of the South Valley Water Reclamation Facility for approval.

E. Where required by the City Engineer, detailed computations, including hydraulic calculations showing depth of flow, velocity, water surface profiles and gradients shall be submitted with the plans.

1.7 DEFINITIONS AND TERMS

Whenever in these specifications or in any document or instruments where these specifications govern, the following terms, abbreviations or definitions are used, the intent and meaning shall be interpreted as follows:

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ANSI	American National Standards Institute
APWA	American Public Works Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
Ft	Feet
GPAD	Gallons per acre per day
GPM	Gallons per minute
IBC	International Building Code
IPC	International Plumbing Code
IPS	Iron Pipe Size
IRC	International Residence Code
MDD	Maximum daily demand
MG	Million gallons
MGD	Million gallons per day
O&M	Operations and Maintenance
PWD	Public Works Department
PSI	Pounds per square inch
UBC	Uniform Building Code
UPC	Uniform Plumbing Code
USGS	United State Geologic Survey
WPCF	Water Pollution Control Federation

Pipe Types**:**

ABS	Acrylonitrile Butadiene Styrene
AC	Asbestos Cement
CI	Cast Iron
CMP	Corrugated Metal Pipe
DIP	Ductile Iron Pipe
ML & C Steel	Mortar Lined and Coated Steel Pipe
PB	Polybutylene.
PE	Polyethylene
PVC	Poly-Vinyl Chloride

RC	Reinforced Concrete
VC	Vitrified Clay

DEFINITIONS

"Acceptance"	Field acceptance is when the Engineering Department inspector approves the physical installation of the sanitary sewer system, completes the required checklist for water systems, signs, and dates the checklist and also obtains the other necessary approvals indicated on the checklist form. The City Engineer acceptance or final acceptance follows field acceptance and is when the City Engineer approves both physical improvements as well as the administrative items associated with development, the public improvement bonds have been processed, and the Public Works Department accepts ownership and operations and maintenance responsibilities.
"Approved"	Unless specifically otherwise indicated, this shall mean approval by the City Engineer.
"Approved Drawings"	Final construction drawings approved by the City of West Jordan in the form of the "Released for Construction Drawings".
"Bedding"	A bed of small aggregate or sand used to support the piping materials prior to backfilling and sometimes a larger aggregate for encasing the pipe.
"City"	City of West Jordan, Utah
"Casing"	A steel or PVC pipe shell, placed after drilling subsoil, to a predetermined elevation.
"City Engineer"	City Engineer shall mean the City Engineer of the City of West Jordan, or the person(s) engaged by the City and authorized to perform the duties assigned to the City Engineer, and shall include any deputies and representatives.
"City Engineering Inspector"	The Engineering Department Inspector assigned to perform compliance to Drawings inspections for the City.
"Consolidated Fee Schedule"	A summary document, which identifies all of the fees and charges, allowed to be charged by City staff for various services, fees, requests, and documents. This document is adopted by the City Council and is changed upon occasion as needed, and is done so by Resolution adopted by the City Council.

"Contract Documents"	Includes the written contract specifications and drawings for a given project. Includes what is termed as the *"Released for Construction Drawings"*.
"Contractor"	The person, company or firm performing the construction work.
"County"	Salt Lake County, Utah
"Developer"	An individual or organized group; partnership, corporation, etc.; proposing to subdivide or improve land.
"Developer's Engineer"	The engineer licensed by the State of Utah as a civil engineer, employed by the developer, under whose direction construction plans, profiles and details of the work are prepared and submitted to the City for review and approval.
"Director"	Director shall mean the Director of Engineering of the City, or the person(s) engaged by the City and authorized to perform the duties assigned to the Director of Engineering, and shall include his/her duties and representative.
"Drawings"	These are the 'Released for Construction Drawings' prepared by the Developer and his/her consultants, submitted to the City for their review, and released by the City Engineer for construction of indicated improvements.
"Easement"	A recorded document in which the landowner gives the City permanent rights to construct and maintain improvements across private or other property.
"Engineer"	A professional engineer or firm of professional civil engineers appointed by and acting for the Engineering Department in the case of a City sponsored capital project. In the case of a developer-sponsored project, the term refers to the engineer hired by the developer and may also be referred to as "developer's engineer".
"Engineering Department"	The City department responsible for planning, designing and construction of the City's culinary water, roadways, sanitary sewer, storm drain and secondary water systems.
"Fire Department"	City of West Jordan Fire Department
"Fixture Unit"	The unit equivalent of plumbing fixtures as tabulated in the Uniform Plumbing Code.
"House Plumbing"	Plumbing fixtures, devices and piping within a building or structure, including pipes on the property, contributing wastes to he City's sewers.

"House Sewer" or "Building Sewer"	A sewer on private property connecting a building with the lateral on public property at the lot line.
"Inspector"	An employee or agent of the City engaged to observe and record field compliance with design criteria, plans and construction standards. In most cases, this refers to the Engineering Department inspector(s).
"Lateral"	The sewer line and appurtenances extending from the building to the public sewer.
"Master Plan"	As used in this Standard, this refers to the City of West Jordan, Sanitary sewer Master Plan. This plan is updated upon occasion and is adopted by the City Council. The use of this term shall mean the most up-to-date version of this document.
"Offsite" or "Off-Project Improvement"	An improvement beyond project boundaries connecting the development/project to the City's systems.
"Plans"	Drawings of infrastructure improvements such as transportation, water, secondary water, storm drainage and sanitary sewer systems and their appurtenances within the City.
"Private Sewer"	The sewer line, 8 inch or larger, which is privately owned, which collects and transports sewage.
"Public Sewer"	The sewer line, 8-inch or larger, owned by the city of West Jordan, which collects and transports sewage.
"Public Works Department (PWD)"	The City department responsible for operations and maintenance of the City's culinary water, roadways, sanitary sewer, storm drainage, and secondary water systems.
"Required"	Unless specifically otherwise indicated, this shall mean a requirement of the Engineering Department.
"Resident Project Representative"	For each project, the City will designate a person through whom all reviews and approvals will flow, and the Developer is also responsible for designating such a person. The 'Resident Project Representative' is just that, the person on-site, one who acts on behalf of the City, and one that acts on behalf of the Developer.
"Service"	A term used to identify the primary connector from the public utility to a building or site system.

"Service Lateral"	A service sewer in a public street or easement connecting a house or building sewer to the street or main sewer.
“Sewer” or “Sewerage”	Sanitary sewer main or sanitary sewer facilities and/or appurtenances, or sanitary sewer being transported or treated by the sanitary sewer system.
“Staff Engineer”	A registered civil engineer employed by the City and designated by the City Engineer to act on the City’s behalf.
“Standard Drawing”	Where not specified to the contrary, this refers to standard drawings which are part of these standards.
“Subdivision Sewers”	The system of street sewers, house laterals, and manholes constructed by a developer within an approved subdivision.
“Subdivision Sanitary sewer Lines”	The system of street sanitary sewer lines and service laterals constructed by the developer within an approved subdivision.
"Trunk Sewer"	A main sewer which receives flow from tracts and other collecting sewers.
“Thrust Block”	Cast-in-place concrete place at a change in pipe direction to resist pipe movement caused by water hammer or rapid change in flow rate.
“Wastewater”	A different term meaning the same thing as “sewer” or “sewerage”.

1.8 APPLICABLE CODES, MANUALS AND POLICIES

A. Ordinances and Codes - Ordinances, requirements and applicable standards of governmental agencies having jurisdiction within the City’s service area shall be observed in the design and construction of water systems. Such requirements include but are not limited to current revisions of the following:

1. The International Building Code, most current version.
2. The International Plumbing Code as amended by the Building Department, City of West Jordan, Utah.
3. ASCE Manual and Reports on Engineering Practice No. 60, Gravity Sanitary Sewer Design & Construction.
4. Utah State Department of Health Code of Waste Disposal Regulations
5. Utah Division of Water Quality Administration Rules for Design Requirement for Sanitary sewer Collection, Treatment and Disposal Systems.
6. W.E.F Manual of Practice FD-4, Design of Sanitary sewer and Stormwater Pumping Stations.
7. Municipal Code of City of West Jordan.
8. Road encroachment regulations of City of West Jordan, State of Utah, and Salt Lake County, as applicable.

9. Standard Specifications – American Public Works Association, State of Utah Chapter, Standard Specifications, current Edition.
10. City of West Jordan, Engineering Policies & Design Criteria Manual.

B. City Manuals – In addition to the Codes indicated above, the City has prepared and adopted the following manuals, which provide additional City requirements and procedures.

1. Development Processing Manual – Describes processes, procedures and requirements for various City processes, i.e. subdivision or site plan processing, for private development projects. It contains detailed, step-by-step processes and requirements for each step to assist developers and their engineers through a particular process.
2. Private Development Construction Inspection Manual – Prepared to describe the processes and procedures required of all construction inspection of private development projects. In addition to processes and procedures, it also includes various forms and checklists to be used with private development projects.
3. Capital Improvement Project (CIP) Construction Inspection and Management Manual – Prepared to describe the processes and procedures required of all City CIP projects. In addition to processes and procedures, it also includes various forms and checklists to be used with CIP projects.

C. City Policies – The following policies also apply to private development projects and CIP projects alike:

1. Design Regulations
   a. In new subdivisions, where sanitary sewer service is available, all lots within the subdivision shall be connected to the sanitary sewer system.
   b. Design shall conform to this "Policies & Design Criteria Manual".
   c. All sanitary sewer lines shall be designed to protect them from freezing.
   d. All sanitary sewer systems shall be designed to exclude all storm water and water from under drain systems, roofs, streets, and other paved areas.
   e. Down spout connections, foundation and basement drains, storm drain sumps and storm drain connections shall be prohibited from discharging into the sanitary sewer system.
   c. Each dwelling unit shall be served by an individual lateral. A common lateral of appropriate size may serve stacked dwelling units.
   d. There shall be no physical connection between a public or private potable water supply system and a sewer, or other appurtenances thereto, which could permit the passage of any sanitary sewer or polluted water into the potable supply.
   e. Sewers shall be laid at least ten feet horizontally from any existing or proposed water main. Separation distances shall be measured pipe edge to pipe edge.
   f. Where a water and sewer line must cross, the water main shall be at least 2 feet above the sewer line measured from pipe edge to pipe edge.
   g. Water mains and sewer lines shall not be installed in the same trench.
   h. Sanitary sewer shall be designed to flow by gravity. Use of sanitary sewer pumping stations shall be avoided wherever possible and shall not be permitted within the public sewer line.
2. Design Capacity - Design average flow shall be estimated at not less than 100 gallons per capita day, including infiltration at 200 gallons per diameter inch per mile per day. To

accommodate peak flows, sewers shall be designed, flowing full, to carry not less than the following contributions:

Table 1.8.1.

Minimum Sanitary Sewer Design Peak Flow	
4 inch and 6 inch laterals	400 gallons per capita day
8 inch through 12 inch sewers	400 gallons per capita day
15 inch sewers	300 gallons per capita day
larger than 15 inch sewers	250 gallons per capita day
Flow from commercial, municipal and industrial connections	**
Additional ground water infiltration	**
** Submit calculations for approval by Utilities Engineer	

3. If the City General Plan for sanitary sewer shows a sewer passing through the proposed development, which will service other areas, the developer shall install the sewer line of proper diameter, as determined by the City Engineer.
4. Construction Water Use Policy – All water used for any purpose is to be metered through a City issued meter containing an approved backflow prevention device. Violation of this requirement will make the person and company subject to the City's Municipal Code and its penalties. Check with the City's Engineering Inspector for information on how to obtain the requirement meter.
5. Confined Space Entry Policy - All Developer/Contractor and City staff is subject to the City's Confined Space Entry Program requirements and as such shall meet its requirements. Confined spaces shall not be entered until all requirements of the City's Program have been made and approved by the City's Inspector on the project and all applicable permits have been received. Also of concern is that all "Lock-out, Tag-out" procedures be complied with to provide for a safe working environment for all personnel. Personnel not complying with the City's requirements for these items is subject to penalties.
6. Material/Product Suppliers Approval Process - Materials not indicated in this manual as being approved for use in the City's stormwater system must be approved by the City Engineer. The process for approval of these materials will be as follows:
   a. Material supplier submits a written request to the City Engineer for consideration of the material/product to be considered. The request must contain a letter making the request along with any material/product data sheets the City will need in determining its compatibility in the City's stormwater system.
   b. The City will form a Review Committee comprising of Engineering Department engineers and Public Works Department staff to review, discuss, and evaluate the material's/product's acceptability to the City.
   c. The material/product supplier will be asked to come and make a presentation on their material/product to the City's Review Committee where additional questions will be

asked of the supplier. Additional information will be required to be submitted as indicated by the Review Committee.

d. Based upon all information, the Committee will make a recommendation to the City Engineer for his review and approval.
e. The City Engineer will make a finding based upon the Committee's information and his own experience and render that decision to the supplier in writing.

7. Public/Private Sewage Disposal - As required by the Municipal Code, which should be referred to for a complete explanation, a public sewer connection is required where anyone or more *of* the following situations exist:
   a. "... any part of a parcel of property is situated within 300 feet from an accessible public sewer."
   b. "... the Council declares a private disposal facility to be a public nuisance."
   c. There is a change of ownership and a public sewer is accessible.
   d. All new developments (except single family dwellings) not included in a new subdivision and greater than 300 feet away from a public sewer.

   Also, connections of any cesspool seepage pit or septic tank or any other private disposal system to any sewer main line or service lateral is strictly prohibited.

1.9 CITY DEPARTMENTS' RESPONSIBILITIES/JURISDICTIONS

A. Engineering Department - The Engineering Department is responsible for the approval of plans and inspection of all public main sanitary sewer lines and service laterals, within the public right-of-way of the City's sanitary sewer service area. The Building Department is responsible for all systems beyond the connection to the main line.

B. Public Works Department - The Public Works Department (PW) is responsible for the operation and maintenance of all public main sanitary sewer lines, manholes and other sanitary sewer facilities within the public right-of-way. The property owner is responsible for operation and maintenance of his/her own sewer lateral beginning at the nose-on at the main, to structure which it is serving.

C. Community Development Department, Building Division - The Building Division is responsible for the residential and commercial building sites after final grade has been reached.

1.10 CITY ENGINEER'S RESPONSIBILITY

The City Engineer, and his/her staff, has the following responsibilities in regards to review and approval of projects:

A. The City Engineer shall review submitted "Released for Construction Drawings" and accompanying studies and reports for compliance with these "Policies & Design Criteria Manual", the City's Municipal Code, and the most current version of the City's Sanitary Sewer Master Plan.

B. The City Engineer shall note any changes to the "Released for Construction Drawings", required to bring the "Drawings" into compliance with the documents mentioned above.

C. Required changes to the Construction Drawings shall be made by the Developer's Engineer and returned to the City Engineer or his or her designee for final approval.

D. The City Engineer shall have additional authority as provided in this Policies & Design Criteria Manual.

E. The City shall not be responsible for any errors in the design and construction required due to an oversight of the Developer and/or Developer's Engineer, or upgrades/revisions required because of lack of planning, incompetence or negligence by the Developer and/or Developer's Engineer. By the Developer's Engineer signing the various studies, reports, other supporting documents, and the "Released for Construction Drawings", the Developer and Developer's Engineer accepts full responsibility for their studies, designs, "Released for Construction Drawings", and other supporting documents prepared for the project. The City's role in this process is to review the documents submitted by Developer and his/her Engineer for compliance with the City's "Policies & Design Criteria Manual(s)", the City's Municipal Code, and the most current version of the City's Sanitary Sewer Master Plan. If the Developer or Developer's Engineer do not agree with requirements of these documents, they shall submit their concerns in writing prior to the final approval of the "Released for Construction Drawings" stating their position, providing substantiating documents, and requesting a waiver to these standards. Requests for waivers will be submitted to the City Council for their approval.

F. The City Engineer's review of these various documents shall not be viewed as directing the design of the Developer's Engineer in the performance of his/her professional duties. The City Engineer's review is a review for compliance with the "Policies & Design Criteria Manual", the City's Municipal Code, and the most current version of the City's Sanitary Sewer Master Plan only.

1.11 DEVELOPER ENGINEER'S RESPONSIBILITY

These standards establish uniform policies and procedures for the design and construction of the City sanitary sewer system. They are not intended to be a substitute for engineering knowledge, judgment or experience. These procedures shall be reviewed by the developer's engineer and shall be applied as necessary to the project. Proposed deviations to these standards shall be submitted in writing, prior to preliminary plat and or development project approval.

It is the developer engineer's responsibility to be aware of the City's sanitary sewer system master plan for sanitary sewer system improvements and to indicate any main line relocations, extensions or oversizing on the project's construction plans. It is also the developer's engineer's responsibility to be familiar with these "Policies & Design Criteria Manual" and the City's Municipal Code as he/she prepares documents required to be prepared for this project.

A copy of the Executive Summary of the Sanitary Sewer System Master Plan is available on the City's website for information. A complete version of the master plan is available for review at the City's Engineering Department. This responsibility shall include investigating any changes from the Master Plan necessitated by development subsequent to the Master Plan, although the above shall not relieve the developer from the responsibility to provide an approved system consistent with Engineering Department requirements. Verification of the adequacy of the surrounding sanitary sewer system rests jointly with the Engineering Department and the developer.

All plans, specifications, reports or documents shall be prepared by a registered civil engineer, or by a subordinate employee under direction of a registered civil engineer. Each of these documents shall be signed and stamped with a professional engineer seal, to indicate responsibility for them. A wet stamp is required on all documents except reproducible plans, where a stamp on the original is acceptable.

A "Preliminary Review" and or "Released for Construction Drawings" stamp or signature of the City on the plans does not in any way relieve the developer's engineer of the responsibility to meet all requirements of the City. The plans shall be revised or supplemented at any time it is determined that the City's requirements have not been met. Generally, plans that are signed as being authorized for construction will not require revisions based upon subsequent revisions to these standards, however, when the Engineering Department's opinion, a change to the project is necessary, based upon a significant change in the standards, which significantly affects public safety, future maintenance costs, or similar concerns, such a charge may be required during construction by the City Engineer. Changes may also be required in the case where a developer does not proceed to construction within the time allowed in the agreement with the City.

1.12 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

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References to standards such as ASTM shall refer to the latest edition or revision of such standards unless otherwise specified.

1.13 CITY ENGINEER ACCEPTANCE

The City Engineer will not accept the sanitary sewer system until all applicable requirements of these standards and of the City of West Jordan Municipal Code have been met.

1.14 OCCUPANCY/SEWER SERVICE

As a part of the clearance procedure for individual house/building occupancy, the Engineering Department must "clear" the house/building. Such clearance is given after the Engineering Department's acceptance of the work through the bond release process for public improvements.

1.15 METRIC UNITS

The maximum extent practicable, 'standard' units are to be used as the primary method of displaying and indicating lengths, volumes, etc.

1.16 CONSTRUCTION SPECIFICATIONS

Nothing contained in the Construction Specifications Manual or in any other part of this standard as implying the City will pay for any of these improvements. In addition to the construction specifications being used for defining private development work, they are also used for City capital improvement projects, and therefore contain some language about methods of payment.

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SECTION 2.0

DESIGN CRITERIA

2.1 CITY SANITARY SEWER SYSTEM

A. General - There are two sanitary sewer companies within the boundaries of the City of West Jordan: the City of West Jordan (City) who collects the vast majority of sanitary sewer from these customers, and the Kearns Improvement District (KID) who serves a small area near 6200 South and 4200 West. The City's Engineering Department is responsible for all studies, design and construction for these sanitary sewer facilities and the Public Works Department is responsible for all operations and maintenance of these facilities.

B. South Valley Water Reclamation Facility (SVWRF) - The SVWRF is located at approximately 7600 South and 1500 West, just west of the Jordan River. This facility is a separate entity from the City with its own staff and governing board. It collects the effluent from five south valley agencies, treats the effluent, and then releases it to the Jordan River. The Developer and his/her Engineer are responsible for addressing all of the SVWRF's concerns as part of the review and approval process.

2.2 GENERAL SANITARY SEWER DESIGN STANDARDS

The following general requirements apply to design and construction of sanitary sewer systems in the City's sanitary sewer system.

A. General

1. In new subdivisions, where sanitary sewer service is available, all lots within the subdivision shall be connected to the sanitary sewer system.
2. Design shall conform to this "Policies & Design Criteria Manual".
3. All sanitary sewer lines shall be designed to protect them from freezing.
4. All sanitary sewer systems shall be designed to exclude all storm water and water from under drain systems, roofs, streets, and other paved areas.
5. Wherever possible, sanitary sewer lines shall be located in public streets. In locations where sanitary sewer lines must leave the public right-of-way, a 20-foot sanitary sewer easement will be required.
6. All sanitary sewer facilities shall be located a 10-foot minimum horizontal distance from culinary water lines.
7. Where possible, sanitary sewer lines shall be located at 10-foot minimum horizontal distance from all other public utilities including but not limited to storm drainage, and secondary waterlines.
8. Sanitary sewer grades shall be based upon Salt Lake County benchmark elevations.

B. Gravity Sanitary Sewer Mains

1. City sanitary sewer lines shall be a minimum of 8-inches in diameter.

2. Unless otherwise approved and/or required by the City Engineer, sanitary sewer lines 8 through 10-inches in diameter, shall be designed to flow no more than one-half (1/2) full during peak flow. Sanitary sewer lines 12 through 15-inches in diameter shall be designed to flow 60-percent full. Sanitary sewer lines larger than 15-inches in diameter shall be designed to flow three-fourths (3/4) full.
3. The minimum sanitary sewer line depth shall be at least 11.0-feet unless otherwise approved by the City Engineer.
    a. In areas of sanitary sewer service, the following note shall be written on the development plat: "Shallow Sanitary sewer Depths! Contractor shall verify sanitary sewer lateral depth and set foundation elevation to provide adequate fall into sewer lateral. Buildings with a basement may not have sanitary sewer service available for basement".
    b. The City Engineer may increase the minimum sanitary sewer line depth if required to meet overall system requirements.
4. Check topography for low lots and problem service connections.
    a. In areas of low lots, the following note shall be written on the development plat: "Low Lots! Contractor shall verify sewer lateral depth and set foundation elevation to provide adequate fall into sanitary sewer lateral. Buildings with basement may not have sanitary sewer service available for basement".
5. A minimum of 4-feet of cover shall be placed over all main sanitary sewer lines, unless additional cover is required by the City Engineer.
6. The invert of new sanitary sewer lines shall tie into existing sanitary sewer lines at the 0.75 depth of the existing sanitary sewer main; except where otherwise approved by the City Engineer.
7. Sanitary sewer main lines shall be extended to property lines as per the City Engineer's directive to service future developers.
8. Ten-foot sanitary sewer stubs shall be extended beyond terminal manholes to facilitate future developments.
9. No connections may be made to a sanitary sewer stub.

C. Sanitary Sewer Laterals

1. General
    a. Wherever possible, buildings shall be discharged to the sanitary sewer Main Line with a gravity flow sanitary sewer lateral.
    b. Sewer laterals shall conform to the requirements of the Salt Lake City – County Department of Health Regulations and the Uniform Plumbing Code.
    c. Each unit of separate ownership shall be required to have a separate sanitary sewer lateral, unless otherwise approved by the City Council.
    d. Sanitary sewer laterals shall have at least 4-foot of cover, unless otherwise approved by the City Engineer.
    e. Sanitary sewer laterals may tie directly into manholes.
2. Gravity Sanitary sewer Laterals
    a. The size of sanitary sewer laterals shall be determined on the basis of the total fixture units drained by such sewer, in accordance with the Uniform Plumbing Code. The minimum size for gravity sanitary sewer laterals shall be 4-inches in diameter.
    b. Sanitary sewer laterals shall be designed and constructed at a uniform slope of not less than 2-percent grade. Where it is impractical to run the sanitary sewer lateral at a 2-

percent grade due to the depth of the sanitary sewer main line, sanitary sewer laterals may be run at 1-percent grade if approved by the City Engineer.

c. Cleanouts shall be installed at no more than 100-foot spacing.
d. No more than two (2) bends in excess of 45-degrees will be installed without a cleanout.

3. Pressure Sanitary Sewer Laterals
   a. Professional engineering advice shall be obtained prior to installing pumping equipment or pressure sanitary sewer laterals.

D. Sanitary Sewer Casings

1. Sanitary sewer casings shall be required at locations where sanitary sewer lines cross rivers, streams, canals, aqueducts, railroads, box culverts and/or other locations as required by the City Engineer or other governing entity.
2. Sanitary sewer casings shall be sized at least twice the inner diameter of the sanitary sewer line, unless otherwise approved by the City Engineer.
3. Sanitary sewer pipe shall be supported in casing by casing insulators and sealed with manufactured end seals.
4. Casing wall thickness shall be as shown on the standard steel casing drawing.

E. Sanitary Sewer Manholes

1. The minimum size manhole shall be 4-foot in diameter.
2. Manholes must be constructed at the ends of sanitary sewer lines.
3. Drop manholes are not allowed unless approved by the City Engineer.
4. A minimum of 5-feet shall be maintained between the edge of all manhole collars and the edge of the street pavement.
5. Manholes on sewer lines larger than 12-inches in diameter, or with 3 or more connections, shall be 5-foot in diameter.

2.3 SANITARY SEWER CAPACITIES, HYDRAULICS AND SIZES

A. Quantity of Flow: Sewage flows shall be determined from maximum potential population of the tributary area. Unless otherwise approved, the following criteria shall be used. If the number of housing units is known:

Table 2.3.1.

3.64 persons/single family unit	100 gallons/capita/day (gpcd)
2. 15 persons/multiple family dwelling	100 gallons/capita/day (gpcd)

If the number of units is not known:

Table 2.3.2.

	Ground	Persons per	Computed Average

Type of Zoning	Slope	Acre	Flow
Residential	0-0.10	12.5	100 gpcd
Residential	0.10-0.25	7.0	100 gpcd
Residential	Over 0.25	1.0	100 gpcd
General Commercial	0-0.10	---	3870 gal/acre/day
Limited Commercial	0-0.10	---	3870 gal/acre/day
Hospital	Any	---	2.5×10^5 gal/acre/day
School	Any	---	4000 gal/acre/day
Light Industry	0-10	---	5160 gal/acre/day
Other Industry	Any	---	Varies*

*Contact City Engineer for approval of values.

After calculating the average flow, a peak factor shall be determined by Ratio of Peak to Average Flow.

An additional amount for infiltration shall be added when a sewer is to be constructed below the ground water level. This amount shall be approved by the City Engineer.

B. Hydraulics - Sewers shall be designed to accommodate future tributary flows, in addition to those from the project. Pipe capacities shall be determined for peak flow rates by Manning's Formula using an "n" value of 0.013 for all pipelines. Sewers less than 12-inches in diameter shall be designed to flow half full at peak flow rates. Sewers 12-inches and larger shall be designed to flow two-thirds at peak flow rate.

C. Velocity - A main line sewer shall be designed to provide a mean velocity of not less than two (2) feet per second flowing one-half full except that the City Engineer may approve a gradient that will develop a velocity of less than two (2) feet per second in unusual circumstances. Where there is conflict between design by velocity and design using minimum slopes in Section 2.6, the design resulting in the steepest slope shall be used.

D. Oversizing and Extra Depth - Oversizing of certain tract sewers may be required where such sewers can logically serve an upstream tributary area.

E. Minimum Line Size - All public sanitary sewer lines shall be 8-inches in diameter or larger.

G. PVC Pipes - PVC sewer pipe shall not be greater than 15-inches in diameter and shall be furnished in standard lengths not exceeding 20.0-feet. Use of 15-inch pipe requires special approval. In addition, the developer's engineer should be familiar with the "Design and Construction Handbook of PVC Pipe" as published by the Uni-Bell Plastic Pipe Association, most current version.

2.4 LOCATION OF LINES (Streets)

A. Location Requirements - The sanitary sewer line centerline, wherever possible, shall be located in public streets parallel to and 5-feet south or west of the street centerline, and a minimum of 5-feet

from the lip of gutters. No other utilities shall be located parallel to sewer lines within 5-feet (either side) of sanitary sewer main, measured pipe edge to pipe edge. Sanitary sewer mains shall be extended 10-feet past property lines if requested by the City Engineer to service future development. No lateral connections may be made to the sanitary sewer stub.

However, where storm drains are in the center of the street, the water or sanitary sewer lines should be located to provide a minimum of 4-feet clearance between the outsides of pipe (measured on a horizontal plane). This pertains as well to any case of paralleling lines.

Special care is required where storm drains or other pipes cross above flexible pipes to avoid deflection problems when the other lines are installed.

B. Sanitary Sewer Line Extension for Future Development - When an area outside the improvements can be logically served by future extension of the sewer, it shall extend to the improvement boundary or to the end of a paved street in a manner facilitating future extensions.

2.5 LOCATION OF LINES (Easements)

Easements should be avoided where a reasonable alternate solution exists. Unless there are either physical limitations or extreme economic penalties, sanitary sewer lines should be installed within streets. When easements are required, there shall be careful consideration of how the line is to be maintained and/or replaced, if necessary. Where easements are necessary and where the side slope (perpendicular to the pipe) exceeds 50-percent (1 vertical to 2 horizontal) then the plans shall clearly indicate appropriate contours within the easement.

In general, all manholes within easements shall be accessible by conventional maintenance vehicles traveling over paved roads or driveways unless otherwise approved. Thus manholes within private property are discouraged and subject to special approval, unless the above can be met.

Laterals should not be connected to a main line within an easement unless specifically approved. This is to avoid root intrusion into the main via the lateral. Specifically, laterals should not be connected into the main where such a tie-in would be between or adjacent to a structure.

A. Width - Sanitary sewer easements for pipes up to 15-inches in diameter should normally be a minimum of 20-feet wide. However, additional easement width shall be required where the depths of pipe exceed 15-feet or as deemed necessary. The plans should clearly indicate any known block walls, pavement, trees or other obstructions within a proposed easement. Such items are contrary to Engineering Department policy and require special approval. Included with such approval may be a monetary obligation towards the operation and maintenance of the sanitary sewer line within the easement; also, the "as-built" drawings are to indicate such approval.

B. Pipeline Location - Pipelines shall generally be placed in the center of easements; only in unusual circumstances will a line be approved which is closer than 5-feet from the easement edge. Unless specifically otherwise approved, the line shall be straight without horizontal bends or deflections.

C. Easement Location - The full easement width shall be on one lot or property in such manner that access to manholes will not be obstructed by walls, trees or permanent improvements. Where this requirement cannot be met without interfering with existing buildings, easements may straddle lot lines providing approval is received and the sewer is not located on the lot lines.

D. Oversizing of Line - If a sanitary sewer line within an easement is over 15-feet deep, the Engineering Department may require the oversizing (such as from an 8-inch to a 10-inch line) to facilitate future slip lining.

E. Deeds - Deeds for easements shall provide for restrictions of permanent construction within easement to provide ingress and egress for maintenance.

F. Easement Provisions - Easements shall be provided as follows:

1. For subdivisions - The owners of land included within the subdivision shall offer to dedicate, for public use, the sanitary sewer (sewer) easements so designated on the final plat map. Standard language is included in Appendix E of this Manual.
2. For other than subdivisions - Dedication of sewer rights of way shall occur by means of deeds of conveyance to the City of West Jordan for all dedications other than those dedications created by subdivision plat maps on a form and as approved.

2.6 SLOPES OF LINES

Minimum slope requirements are necessary to assure self-cleaning and self-oxidizing velocities to avoid significant generation of hazardous, odorous, and corrosive sulfur compounds. Where possible, use of the minimum slopes should be avoided and should not be construed as guidelines for system design.

A. Minimum Grade - All sewer lines shall be designed and constructed for mean flow velocities, when flowing full, of not less than 2.25 fps, based on Manning's formula using an n value of 0.013. The following are minimum slopes, which shall be provided; however slopes greater than these are desirable.

Table 2.6.1. – Sanitary Sewer Line Size and Minimum Slopes

Sewer Line Size	Minimum Slope

(inches)	(In feet per 100)
8	0.40
10	0.28
12	0.22
15	0.15
18	0.12
21	0.10
24	0.08

B. Maximum Grades - The maximum grade for sanitary sewer lines shall be 12-percent or less, and in no case shall the velocity exceed 15-fps, except in steep terrain where the sewer grade may approximate the finished grade over the sewer. In no case shall the grade exceed 45-percent without special approval. Prior to the design of any sewer on a slope over 12-percent, special approval shall be obtained from the City Engineer. Typical details required for such design and construction are contained in Appendix A of this Manual. To minimize the turbulence in manholes, the grade of any incoming sewer shall not exceed the grade of the outgoing sewer by more than 10-percent. Where this value is exceeded, the designer should check the hydraulic considerations and pay particular attention to the invert drop across the manhole. Refer to Section 2.13 for further discussion of steep grades. All high slope, high velocity sewer lines shall be properly restrained per state code.

C. Substandard Grades - If grades below the standard minimum must be used in order to avoid pumping, the designer shall advise the Engineering Department before proceeding with design. Grades below the standard minimum may be used only upon specific approval (with approval designated on the improvement drawings), solicited well in advance of completion of design.

2.7 DEPTH OF LINES

Depth of cover is measured as the distance to the top of pipe from the finished grade surface over the sewer centerline. Sewers shall be installed at a depth, which shall provide suitable service to the properties connected and will allow subsequent installation of water lines, in accordance with Standard Drawing Nos. SS-005 and SS-010.

A. Minimum Depth - Sewers shall be placed at an 11 foot minimum depth to service all basements. In areas of shallow sewer, the following note shall be added to the subdivision plat: Shallow Sewer Depths! Contractor to verify sewer depths before excavating for basement. Home(s) with a basement may not have sewer service available for basement. The City Engineer may increase the proposed depth if required to meet system requirements. 4 foot minimum depth to crown of pipe is required at all times in all locations. The top of the sewer line shall be a minimum 2 feet lower than the bottom of any water lines placed in the same street. Sewers at depths greater than 16 feet shall be given special design considerations. Sewer mains below 18-feet are allowed only with

written permission from the City Engineer.

B. Standard depth of cover is 7-feet in paved areas or 5-feet minimum in areas not expected to receive traffic. Where this cover cannot be maintained, other details may be required, such as higher strength pipe, pipe encasements, special backfill, or concrete trench slabs. Whereas depths of cover less than 7-feet require approval via the plan check process and are discouraged, the use of concrete encasements or trench slabs will in general be reserved for depths of cover below 5-feet in paved areas and 3-feet in non-traffic areas.

C. Designs not in accordance with standard depths shall be submitted to the City Engineer for prior approval.

2.8 HORIZONTAL AND VERTICAL CURVES

In curved streets, the sewer shall follow the street curvature, but not cross the centerline. In general, vertical plus horizontal curves will not be allowed between manholes unless it is demonstrated that another solution is not reasonably feasible. Vertical curves should not be used unless excessive extra depth of excavation would be otherwise incurred.

Allowable joint deflections shall be the more stringent of those set forth below and the manufacturer's recommendations.

A. Curves - PVC Pipe - Except for perhaps 4-inch and 6-inch diameter PVC pipe, deflection at the joints is very limited due to the joint design. Curvature can be obtained by bending the pipe along its length within the trench. Beveling pipe ends will not be allowed. The following table should be used as a basis for curvature:

Table 2.8.1.

Pipe Size (inches)	Minimum Radius of Curvature (feet)
6	175
8	225
10	275
12	325
15	400

The above values are independent of pipe length since curvature is not achieved through joint deflection. Curves with smaller radii require deflection fittings or smooth curve "sweeps."

B. Vertical Curves: Vertical curves in sewers shall conform to the requirements for horizontal curves except that the radius shall not be less than 400-feet. Vertical curves may be either circular or parabolic in profile. An approximate formula for determining the required minimum length of a parabolic curve is:

$L = R (S_1 – S_2)$ where
L = minimum length of curve
R = minimum radius of curve permitted
S_1 and S_2 are the two sewer grades being used, with S_1 being the steeper grade.

2.9 SELECTION OF PIPE MATERIAL

A. Acceptable Pipe Materials - All Sewer lines in the City shall be constructed of concrete, plastic, or ductile iron pipes. The designer is referred to Sections 3.7, 3.8, and 3.9 of this Manual, for further details on this subject.

2.10 MANHOLES

A. General – The following section describes various design criteria for manholes including minimum size, maximum spacing of manholes, location requirements, flow-line requirements, and construction requirements. Section 3.11 – Manholes, discusses appropriate manhole materials.

Unless otherwise approved, all manholes should be accessible to standard maintenance vehicles. Therefore, manholes placed in back or side yards will not normally be approved. Every reasonable effort should be made to provide a paved or gravel roadway to manholes in open space areas.

B. Design (Size) - Standard manholes shall be in accordance with Standard Drawing Nos. SS-030 and SS-035 (4-feet diameter). Shallow manholes shall be in accordance with Standard Drawing No. SS-065. Normally, manholes will be 4-feet diameter; 5-feet diameter manholes are required for lines 18-inches and larger or where the depth to pipe invert exceeds 18-feet. Where the depth exceeds 18-feet, the cover (lid) shal1 be 30-inches for safety reasons.

C. Minimum Size - The following rules shall apply to all sanitary sewer manholes:

1. Manhole diameters shall be at least 4-feet in diameter.
2. Manholes on sewer lines 12-inches and greater shall be 5-feet in diameter.
3. Manholes with three or more main lines connecting shall be 5-feet in diameter.
4. When the deflection angle of the pipeline exceeds 90-degrees manholes shall be 5-feet in diameter.
5. Manholes deeper than 14-feet shall be 5-feet in diameter.
6. When the deflection angle of the pipe exceeds 90-degrees and at intersections of 3 or more 8 inch pipelines, a 6-foot manhole is required.
7. Where incoming slopes at manholes are greater than or equal to 5-percent and the deflection angle within the manhole is greater than or equal to 45-egrees but less than 90-egree, a 5-foot manhole with an extra deep trough is required.
8. Where incoming slopes at manholes are greater than or equal to 5-percent and the deflection angle within the manhole is greater than 90-degrees, a 6-foot manhole with an extra deep trough is required.
9. Manholes deeper than 18-feet are not permitted except with written permission from the City Engineer.

D. Maximum Spacing - The maximum distance between manholes shall be 400-feet from centerline to centerline. Manholes shall be installed at the end of each line, at all changes in pipe size or alignment; and at intervals not to exceed 400-feet.

Although the approved distance for any particular reach may be modified by the items listed below. Brick and mortar blockouts for future extensions are preferred over stub and capped pipes except where the exact orientation and slope of the future extension is known at the time of plan submittal.

E. Location of Manholes – Manholes shall be located at the following:

1. At all abrupt grade changes (too large for a vertical curve).
2. At all changes in horizontal alignment (except on curves).
3. At all changes in pipe sizes.
4. At the terminal end of all lines exceeding 200-feet in length from the next downstream manhole. Manholes will be required in cul-de-sacs, which have three (3) or more fronting lots.
5. At all junctions of main sewers.
6. At the point of tangency of each reverse curve. (No reverse curves will be allowed between manholes, except where the Engineering Department determines that the nature of the reverse curve is not significant or detrimental to the system.)

F. Additional Manhole Requirements – In considering the placement of manholes, the following issues also need to be addressed:

1. Watertight, seal down covers shall be provided in areas subject to flooding.
2. Manholes shall not be positioned in waterways.
3. A minimum of 5-feet shall be maintained between the edges of manhole collars to the edge of the street pavement.
4. Manholes shall not be placed within 10-feet of storm drain catch basins or in low points where catch basins are located.
5. Manholes shall generally be located no less than 15-feet from the curb line when within a cul-de-sac.
6. Also, manholes shall not be located within the street such that rainfall runoff is directed to the manhole.
7. Manholes (and cleanouts) shall generally be located at least 10-feet past the downstream property line of the last property served.
8. Where future extensions of the sanitary sewer line will be required, then the manhole shall be located parallel with the upstream property line, if required (i.e. within the street along the property's entire frontage).

G. Slope of Manhole Channels - When sewers of uniform size and slope pass through a manhole, the slope shall be maintained and the invert at the center of the manhole shall be given. In sewers that change slope but are uniform in size, the slope of the incoming sewer (s) shall be carried through to the outlet and the invert elevations at the inlet (s) and the outlet shall be given. Where diameters of sewer pipes change, and in junctions involving major direction or slope changes, the various elevations shall be selected to match water surfaces under average (not maximum) flow conditions

at ultimate tributary area development.

The slopes in manhole channels indicated below are minimum values and must be increased where required by hydraulic consideration within the manhole.

Table 2.8.1. - Added Drop through Manholes (feet)

Diameter of Inlet Pipe (inches)	Diameter of Outlet Pipe				
	8”	10”	12”	15”	18”
8	---	0.08	0.33	0.50	0.67
10	---	---	0.25	0.42	0.58
12	---	---	---	0.17	0.33
15	---	---	---	---	0.17

When the incoming sewer makes an angle of 45-degrees to 90-degrees with the outlet sewer, add 0.10-foot to the above values with the exception that the minimum drop shall be 0.20-foot. When the angle is 15-degrees to 45-degrees, add 0.05-foot to the tabulated value with a minimum drop of 0.10-foot.

H. Flow-line Requirements

1. Flow channels through manholes shall be shaped to conform to cross section and slopes of connecting sewers. Floors and channels shall be shaped such that television camera and jet cleaning access will not be impeded.
2. A 0.20-foot minimum elevation step shall be provided in all junction manholes; except where accepted otherwise by the City Engineer.
3. The maximum allowable drop, between inlet and outlet inverts, through a manhole is two feet. When a drop manhole is required a 60-inch manhole is required. All drop manholes must be approved by the City Engineer.
4. Where incoming slopes at manholes are greater than or equal to 5-percent, the incoming slope shall be carried through the manhole, unless otherwise approved by the City Engineer.

I. Construction Requirements

1. See Standard Drawing No. SS-030, and SS-035 for Sewer Manhole construction requirements.
2. See Standard Drawing No. SS-045 for Sewer Drop Manhole construction requirements.
3. See Standard Drawing No. SS-040 for Sewer Cast in Place Manhole Base construction requirements.
4. See Standard Drawing No. SS-050 for Sewer Concrete Collar construction requirements.
5. See Standard Drawing No. SS-055 for Sewer Manhole Cover construction requirements.

J. Drop Manholes - While not encouraged, drop manholes may be necessary due to physical constraint; they should not be used to merely avoid extra depth in trench unless unusual

circumstances exist. Where approved, the drop shall not exceed 10-feet and shall be constructed in accordance with Standard Drawing No. SS-045.

K. Undeveloped Areas - Manholes in undeveloped areas require special protection as discussed in Section 3.11.

L. Rim Elevations of Manholes - Top elevations for all manholes shall be shown on the profile. In paved areas, the manhole rim elevation shall match the finished grade. In unpaved areas or traveled way, the height of the manhole rim will normally be 18-inches above the finished grade, high water mark, or above the top of future fill areas. The elevations shown for the tops of manholes on the design plans shall not relieve the contractor from making final adjustments to match street surfaces.

M. Protection - Where new sewers are to be connected to a manhole, which is in active use, the designer shall require such protection as is necessary to prevent construction debris from being washed into the active sewer. Plugged inlets or other suitable protection shall be required for the active manhole before beginning manhole modification or cleaning of new sewers. Bypass methods shall be to the satisfaction of the Engineering Department.

N. Safety - Refer Technical Specification No. 02606 – Manholes for discussion of manhole safety.

O. Pipe Transitions - At manholes, where sewer diameters change, the flow energy gradient shall be continuous. The 0.8 depth point of the two sewers shall be placed at the same elevation, with proper allowance for any manhole head loss or as required to provide proper flow.

P. No plugged ends of sewer lines will be allowed. Manholes must be constructed at the ends of sewer lines.

Q. Pipe Construction – See Standard Drawing No. SS-020 for pipe construction requirements

2.11 CLEANOUTS

Dead-end sanitary sewer lines under 200-feet long may terminate in a cleanout unless Section 2.10 requires a manhole. If a future extension of said dead-end line will include a manhole within 400-feet of the uppermost manhole, a temporary cleanout is permitted. The following also apply to cleanouts:

A. Location - Refer to applicable portion of Section 2.10.

B. Design - Cleanouts shall be constructed in accordance with Standard Drawing No. SS-081.

C. Clean-outs shall not be used as an alternative to manholes on sewer lines 8-inches in diameter or greater.

D. All sanitary sewer clean-outs shall conform to the requirements of the Utah State Department of Health Code and the International Plumbing Code.

E. All Clean-outs shall have a metal cap and shall not be placed any lower than 10-inches below finished grade.

2.12 SERVICE LATERALS

A. General –The private sanitary sewer line is the sanitary sewer line beginning at the "nose-off" at the public sanitary sewer main in the public street, extending to the building. The service lateral as defined above, is the responsibility of the private property owner, who is responsible for operations and maintenance of the service lateral. The Engineering Department will inspect the construction of service laterals from the main sewer line to the property line. The Building and Safety Division inspects the lateral from the property line to the building or house.

Wherever it is known or can be reasonably assumed that a building sewer connection is required, a service lateral shall be shown on the plans and installed to the property line as a part of the street sewer construction prior to paving. An independent service lateral shall be provided for each owner. Service laterals shall be installed in general conformity with Standard Drawing No. SS-020.

B. Tapping Requirements - Contractor shall not tap the existing sewer main using any method other than core drilling with a water tight rubber seal at the nose-on connection to the City sewer main.

C. Size and Slope Requirements - Service laterals for single-family dwellings shall normally be 4-inch minimum diameter, unless otherwise required by the Uniform Plumbing Code. Condominiums or townhouses shall normally be required to have separate 4-inch minimum diameter laterals, rather than one 6-inch minimum diameter lateral per building. All other laterals for commercial or industrial uses shall be no less than 6-inches minimum diameter.

Pipe lengths for laterals shall not exceed manufacturer's recommendations. The maximum size lateral connection by wye or tee fitting to a larger diameter sewer shall be 6-inches. A manhole shall be installed when an 8-inches or larger sewer is connected to an equal or larger diameter sewer.

1. The minimum lateral size shall be 4-inches.
2. A 6-inch sewer lateral may be constructed at a minimum slope of 1-percent.
3. A 4-inch sewer lateral shall be constructed at a minimum slope of 2-percent.

D. Depth - Service laterals from the main sewer to the property line shall be constructed at a 2.0-percent grade unless otherwise approved. In addition, the depth at the curb or property line shall normally be 6-feet minimum from top of pipe to ground surface.

E. The grade and location of laterals within the property are under the jurisdiction of the Building and Safety Division. As a guide, the laterals should be at a minimum 2.0-percent grade from the property line to the point of connection at the house.

F. Location - Sewer laterals shall tie directly into manholes in cul-de-sacs and at dead end manholes. Sewer laterals may tie directly into manholes wherever possible and practical.

G. Responsibility - The city does not assume responsibility for sewer laterals. It is the responsibility

of the home or business owner to construct, maintain, and operate any and all sewer lateral service connections.

H. Construction - See Standard Drawing No. SS-025 sewer lateral construction requirements.

I. Future Connection - Unused openings shall be tightly sealed and supported in a manner to facilitate their future location and use. Developer's engineer shall select appropriate service lateral locations and shall instruct contractor to locate lateral according to the design elevations and locations. Likewise, the adequacy of such in-place laterals shall be verified by the owner/developer prior to the future connection.

J. Manhole and Laterals in Cul-de-sac Streets - Where numerous laterals connect to the end of a sewer, they shall be brought into a standard manhole. Two such laterals may enter each of three inlet channels in preference to installing numerous wye branches in series downstream from the terminal manhole.

K. Backflow Prevention - It is the designer's responsibility to recognize the possibility of reverse flow in service laterals serving lots or buildings with plumbing fixtures below the nearest upstream sewer manhole rim (device required where pad elevation is below upstream manhole rim). In such instances, a suitable backflow or overflow device shall be provided. The lots where prevention is required shall be indicated on the plans; the device or valve used shall be approved and inspected by the Building & Safety Division. See Standard Drawing No. SS-082 for details regarding installation.

2.13 STRUCTURAL REQUIREMENTS

A. Under Roads - All structures and pipe placed under public roads shall be of sufficient strength to support, with an adequate factor of safety, the backfill, road surfacing and H-20 per AASHTO Standard Specifications, truck loading with Impact. Higher loading may be as specified by the Engineering Department or as required by good design.

B. Other Pipes and Structures - Sewers designed to cross under or over other pipes or structures shall be protected from damage and shall be constructed to prevent endangering the other pipe or structure. In this regard, particular attention should be given to the possibility and prevention of settlement-caused damage. Also where future replacement of any line may be extremely difficult due to the pipe or structure, special design consideration may be required. Any of the standard drawings, which detail various encasements or other protection, may be required in such instances.

C. Flexible Joints- Flexible joints which will allow for differential settlements or other movement of sewer pipe, sewer structures, adjacent pipe and adjacent structures shall be provided where sewer lines enter encasements, manholes or other structures. Flexible joints shall be within a minimum of 24-inches of such structure, except for ABS Composite pipe for which this requirement does not pertain.

D. Steep Grades - Sewers laid on grades steeper than 10-percent, which are not under, nor intended to be under pavement, should be examined for possible erosion protection. Where the slope exceeds 30-percent (3.33 horizontal to vertical) a redwood check dam (Standard Drawing No. SS-090)

shall be installed across the trench line at 20-feet intervals to reduce erosion.

Slopes above 35-percent (2.86 horizontal to 1 vertical) shall require sand/cement bags be placed along the trench line at the intervals specified in Standard Drawing No. SS-095 to reduce the flow of water within the pipe trench.

Concrete anchors in accordance with Standard Drawing No. SS-115 will only be required in special instances, where such anchorage is deemed necessary to prevent pipe movement.

2.14 PRIVATE SEWER LINE REQUIREMENTS

A. All private sewer line construction shall be required to meet these standards, and/or be subject to review of City Engineer.

B. Sanitary sewer pumping stations, where they cannot be avoided, may be permitted within a private sewer line and shall not be located within a public sewer line.

2.15 PRIVATE (RESIDENTIAL) PUMPING SYSTEMS

General City policy is to avoid private residential pumping systems except in those cases where such a system is either: (1) in the City's best interest or (2) the only method for sewering a lot which cannot be adapted to a gravity system or eliminated. In any case, the use of a private pumping system requires special Engineering Department approval.

Where such a system is employed, the City will not accept responsibility for the satisfactory operation and maintenance of the private system; a document recorded against the property shall confirm this.

A. All equipment and accessories shall be standard manufactured items with those in contact with sewage being specifically manufactured for sewage use.

B. The Engineer shall submit, if required, a listing of satisfactory installations using the same products.

C. Individual systems shall meet the City Engineer’s requirements. Of particular importance are the following:

1. The sump shall have a minimum 400-gallon capacity.
2. The system shall be of the duplex type (2 pumps) and have duplex controls, which will automatically alternate the pumps and energize both pumps and an alarm during high liquid level.
3. Pumps shall be heavy-duty centrifugal non-clog type with mechanical seals and cast iron construction. Each pump shall have a minimum 60-gpm capacity when pumping against a total dynamic head of 20-feet. The impeller shall have a 2-inch solids handling capacity. The motors shall be completely oil filled and fully submersible.
4. Discharge line shall be 3-inches in diameter with a working pressure of not less than 150-psi. All underground discharge piping shall be PVC schedule 40, and above ground piping shall be

PVC schedule 80.

5. The shutoff valve shall be either the ballcentric or eccentric type with a working pressure of not less than 150-psi and suitable for sanitary sewer use. The check valve shall be a rubber flapper swing non-slamming type with a working pressure of not less than 150-psi and suitable for sanitary sewer use.

D. The discharge lines shall be arranged such that there is gravity flow into the main sewer from the property line.

E. Where a unit serves a number of homes, it shall be sized to handle daily flows of at least 500-gallons per day and a peak discharge into the unit to reflect the number of residences.

F. All controls shall be non-fouling type and all mechanical and electrical equipment shall equal or exceed City or other pertinent codes.

G. Backflow prevention devices as required to prevent water system contamination shall be installed.

H. Where a pumping unit is proposed, it shall be requested prior to preliminary plat map approval, except for those cases where the City may decide to approve the unit at a later date.

2.16 FORCE MAINS AND LIFT STATIONS

All sewage shall reach the system by gravity flow, in a fresh (non-septic) condition susceptible to conventional sewage treatment processes. Where extreme hardship conditions prevail and a substantial area cannot be sewered by gravity sewers, in accordance with these requirements, a sewage pumping station may be considered. No pumping facilities shall be designed or incorporated in sewer plans without prior approval.

A. Lift Stations Design: Lift stations, where permitted, shall be of the dry-pit type incorporating the following features:

1. Pumps or other devices shall be provided in duplicate, arranged for positive priming.
2. Capacity shall be provided to handle ultimate peak flow from the tributary area with the largest pump out of service. Stage installation of pumps will be permitted if space is provided for future pump units.
3. Access shall be provided to site for removal and repair of equipment.
4. A means for dewatering force mains shall be provided.
5. Holding capacity in the wet well equivalent to a 24-hour accumulation of sewage from the fully developed area tributary to the pump station.
6. Bottom of wet well shall slope to suction lines at least 1.75 vertical to 1.0 horizontal. It is recommended that the width of the flat bottom in the wet well not exceed twice the diameter of the suction pipes.
7. Pump stations for newly developed areas shall not be located in road right of way, but shall be located on a separate parcel of land and shall include fence, gates, landscaping, etc. Pump stations located in road right of way will only be considered when it can be demonstrated to

the governing body of the road right of way and the Director of Engineering that no other site out of the road right of way is possible and such facility is not temporary.

8. A pump station shall have suitable adjustable level control, sump pump, dehumidifier, ventilation, lights, locking entrance door, running time meters, and cathodic corrosion control.
9. Pump and fittings shall be designed to permit the passage of a 3-inches diameter sphere through the pump.
10. Standby power with automatic pump drive transfer shall be provided except when waived by the Director of Engineering. Consideration should be given to using natural gas engines.
11. Compressor to inject air into the force main at a point outside of pump station so that air will not collect back of check valve with possibility of air locking pump.

B. Force Mains - Force mains shall be laid on a continuous positive grade and to grades designed to eliminate air pockets in the line.

C. Construction of Special Structures - Design criteria for special facilities (i.e. junction boxes, etc.) that are not covered in previous sections are to be prepared individually for each specific job, and shall be as approved.

2.17 INDUSTRIAL WASTE DISCHARGE

The Developer/Developer's Engineer is to be aware that the City regulates the physical and chemical content of sanitary sewers discharged to the sewerage system. These regulations are contained in an Appendix G to this Manual and are the requirements of the South Valley Water Reclamation Facility (SVWRF). The SVWRF requirements have been adopted by the City by Ordinance in Title 90 of the City's Municipal Code.

Typically, this ordinance only applies to those developments without a discharge of other than domestic sanitary sewer. However, the ordinance should be reviewed if sanitary sewer will contain any hazardous toxic materials, heavy metals, or any other substances, which may be harmful to the operation and maintenance of the sewerage system. The ordinance then requires either the substance be prohibited from discharge or pretreated prior to its discharge to the sewer. Questions and further details concerning these regulations should be directed to the South Valley Water Reclamation Facility industrial waste inspector.

2.18 ABANDONMENT OF SANITARY SEWER LINES

Refer to Section 8.0 of this Manual.

2.19 SPECIAL REQUIREMENTS

A. Commercial, and Industrial Uses - Prior to the installation of a sewer lateral into a commercial, industrial, or municipal building the developer is required to obtain approval from South Valley Water Reclamation Facility. They will determine the requirements related to the installation of a grease interceptor, sand trap, or sewer monitoring manhole. The city will not grant a Certificate of Occupancy until written notification of compliance is received from a SVWRF representative.

B. Special Impact Fees - There is a possibility in the future of a sewer surcharge fee to facilities generating high levels of BOD5 and/or TKN concentrations because of the treatment process limitations at South Valley Water Reclamation Facility. Regulations regarding this subject are currently under review by the State.

C. Easements

1. Easements shall be required on all public sewer lines not located in a Public Street.
2. All easements must be a minimum of 20-feet wide.
3. Combined sewer and storm drain easements shall be a minimum of 25-feet wide.
4. Easement shall be centered on the sewer line, unless otherwise directed by the City Engineer.
5. Easements shall extend 10-feet beyond the last manhole on a line.
6. When a sewer is located in an easement, not abutting a public street right of way, access easements shall be provided for maintenance purposes and shall be a consistent width of 20-feet the entire length of the easement.
7. All easements shall be submitted and approved by the City Engineer, or his designee, before Final development approval shall be granted.

D. Boring

1. Boring under canals, pipelines, watercourses shall be steel encased, or other material as approved by the City Engineer.
2. Minimum clearance between outside of casing and other utilities shall be 18-nches, unless otherwise approved by the City Engineer.

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SECTION 3.0

MATERIALS

3.1 GENERAL REQUIREMENTS

This section discusses the materials involved in sanitary sewer pipeline, appurtenances, and associated construction activities. Design and construction related to land disturbance and other underground infrastructure are subject to the policies and design criteria manuals for that specific type of facility. Separate policies and design criteria are available from the City's Engineering Department. Materials shall be chosen for their strength, durability and ease of maintenance, with due consideration for dead and live loads, beam strength and resistance to corrosion. Pipe joints are to be selected to provide positive protection against entrance of roots and ground water, with sufficient flexibility to adjust to the trench bedding. All materials, unless specifically approved otherwise, shall be new and unused.

The *'Sanitary Sewer Policies & Design Criteria Manual'* establishes the material requirements for pipe products, backfill materials, manholes, and other sanitary sewer related appurtenances. Approval to use any of these materials on a specific sanitary sewer project is subject to the constraints imposed by other pertinent sections of these standards or as required by the Engineering Department.

The City has adopted the use of the *'Manual of Standard Specifications'*, prepared by the American Public Works Association (APWA), 2007 or latest version, as the primary source for construction specifications for its public roadway improvements. The APWA Manual of Standard Specifications does not provide sufficient detail to address the City's concerns regarding the construction of sanitary sewer, and therefore this *'Sanitary sewer Policies & Design Criteria Manual'* has been prepared to be the *'primary sources'* for sanitary sewer related design and construction activities. Where this *'Manual'* does not address issues of concern, then the *'APWA Manual of Standard Specifications'* can reviewed as a *'secondary source'* for information. This applies to both private development projects as well as City Capital Improvement Projects (CIP). In the case of CIP projects, the Contract Documents take precedence over any other documents.

Where applicable, American Society of Testing Materials (ASTM), American Association of State Highway Transportation Officials (AASHTO) or other standards have been referenced and it shall be the responsibility of the developer/engineer/contractor to be familiar with those standards to insure compliance. Titles corresponding to the specific numbers are given in the reference section of the standards.

In some instances, particular manufacturers and product names have been mentioned as being approved. Other products may also meet the requirements, but must be first approved in writing by the City Engineer. One factor, which may be considered by the City Engineer in any consideration of other products, is the need for some degree of standardization.

If at any time the Engineering Department believes that the use of a specific product must either be halted or changed, the City Engineer has the authority to make the change providing the decision is based upon an engineering, performance or maintenance evaluation.
In general, pipe installations for most projects will either be PVC, concrete, or ductile iron products. Unless the Engineering Department takes exception during the plan review process, it can be assumed

that these materials are acceptable. However, if exception is made, such shall be reflected in the next plan redline. Where alternate materials are shown, the various load factors for each reach must be indicated by the corresponding material type.

3.2 TESTING AND FINAL ACCEPTABILITY OF MATERIALS

The Engineering Department will require such tests and certifications as deemed necessary to show the specified materials have been employed. Notwithstanding prior factory or yard inspections, the City Engineer shall have the right to reject any damaged or defective materials found on the job and order its removal from the site. Further information on testing is contained in the *'Private Development Construction Inspection Manual'*.

3.3 OTHER UTILITIES MATERIALS (Trench Zone)

Please refer to the following policies & design criteria manual for the appropriate utility to specify other materials for these other infrastructure:

A. Culinary Water Policies & Design Criteria Manual
B. Land Disturbance Policies & Design Criteria Manual
C. Stormwater Policies & Design Criteria Manual
D. Secondary Water Policies & Design Criteria Manual
E. Landscape & Irrigation Policies & Design Criteria Manual

3.4 GENERAL SANITARY SEWER SYSTEM REQUIREMENTS

A. General – This work includes the general materials, processes and other requirements related to sanitary sewer infrastructure construction. The Engineer shall provide for these items as part of his/her design using he following technical specifications sections for items:

    1. Section 02667 – Hydraulic Structures and Pipeline Testing
    2. Section 02719 – Sanitary Sewer System
    3. Section 02750 – Sanitary and Storm Drainage System Testing

3.5 SITE WORK RELATED TO SANITARY SEWER INFRASTRUCTURE CONSTRUCTION

A. General – This work includes the materials, processes and other requirements coincident with sanitary sewer infrastructure construction during the construction process. The Engineer shall provide for these items as part of his/her design using he following technical specifications sections for items:

    1. Section 01525A – Temporary Construction Aids
    2. Section 01554A – Traffic Control
    3. Section 02005 – Diversion and Cre of Stream During Construction
    4. Section 02105 – Dust Control
    5. Section 02112 – Clearing, Grubbing, and Stripping
    6. Section 02140 – Dewatering

7. Section 02160 – Excavation Support Systems
8. Section 02161 – Care of Water
9. Section 02200 – Earthwork
10. Section 02222 – Excavation and Backfill for Structures
11. Section 02224 – Trenching, Backfilling, and Compacting
12. Section 02227 – Sand-Cement Slurry
13. Section 02228 – Blasting
14. Section 02276 – Stablilized Construction Entrance
15. Sectrion 02313 – Trench Excavation
16. Section 02316 – Trench Backfill and Compaction

3.6 RIGID PIPES

Rigid pipe, fittings and joint materials specified consist of Reinforced Concrete (RC), and Ductile Iron (DI).

A. Reinforced Concrete Pipe and Fittings - Reinforced concrete pipe and fittings shall conform to the following:

1. Section 02617 – Reinforced Concrete Pipe
2. Section 02618 – Reinforced Concrete Pressure Pipe
3. Section 02621 – Reinforced Concrete Cylinder Pipe

B. Ductile Iron Pipe and Fittings - Ductile Iron pipe and fittings shall conform to the following:

1. Section 02625 – Ductile Iron Pipe

3.7 PLASTIC PIPE

Plastic pipe, fittings and joint materials specified herein consist of PolyVinyl Chloride (PVC) and shall conform to the following:

1. Section 02645 – PVC Schedule Rated Pipe
2. Section 02648 – PVC Sewer Force Mains
3. Section 02649 – PVC Gravity Sewers

3.8 OTHER PIPE MATERIALS

With prior written request and approval, the Engineering Department may consider the use of other pipe materials for a specific project.

3.9 PIPE TRENCH MATERIALS

Refer to Standard Drawing No. SS-020 for trench cross section terminology.

The follow sections define the types of materials to be provided:

1. Section 02224 – Trenching, Backfilling and Compacting
2. Section 02316 – Trenching, Backfilling and Compacting

This material is primarily intended where the trench has been over-excavated so that a firm foundation can be made in areas of excessive groundwater flow. In such cases, a transition material must be used to separate the pipe from the coarser type G material. Such transition material must be well chocked into the voids of the coarser material.

3.10 MANHOLES

Manhole materials shall conform to those listed in Standard Dawing Nos. SS-030 through SS-075. The following sections also provide additional details regarding City requirements for this item:
, in addition to the following:

1. Section 02606 – Manholes
2. Section 02608 – Diversion Structures
3. Section 02719 – Sanitary Sewer System

3.11 MANHOLE/CLEANOUT LIDS

All public manhole covers shall have “West Jordan Sewer” cast around the perimeter of the top with minimum 1-1/2-inch letters, indicating the use of the manhole. Two-inch letters are preferable but not required. For private sewers omit “West Jordan” on the lid and substitute “Private”. Cleanout lids shall include the word “Sewer”.

3.12 TESTING

A. General - This work includes the testing of the sanitary sewer system(s) and materials. The Engineer shall design the City’s sanitary sewer using the following technical specifications sections for items.

1. Section 02667 – Hydraulic Structures and Pipeline Testing
2. Section 02719 – Sanitary Sewer System
3. Ssection 02750 – Sanitary and Storm Drainage System Testing

3.13 CONCRETE MATERIAL

Approved concrete material shall be based on the 28-day compressive design strength and shall be chosen according to the following chart showing its intended use:

Class	Application	28-Day Compressive Strength (psi –min)	Maximum Aggregate Size (inches)	Slump (inches)

A	Walls, drip structures, and reinforced structural encasement	3,500	1-1/2	3	6
B	Manhole bottoms, drop pipe encasement, pipe bedding, non-structural use	3,000	1-1/2	2	6
C	Pump mix for abandoning lines	2,000	3/8	--	--

The following Sections apply to concrete and related work in the City's sanitary sewer system:

1. Section 03100 – Concrete Formwork
2. Section 03102 – General Concrete Construction
3. Section 03210 – Reinforcement Steel
4. Section 03300 – Cast-in-Place Concrete
5. Section 03401 – Precast Concrete Vaults
6. Section 03480 – Precast Concrete Specialties

3.14 REINFORCING STEEL

The following section defines the City's requirements in regards to reinforcing steel:

1. Section 03210 – Reinforcmeent Steel

3.15 GENERAL ROADWAY CONSTRUCTION

Pavement materials for resurfacing of trenches cut Into existing pavement shall comply with the requirements of the City of West Jordan, Road & Bridge Policies & Design Criterial Manual adopted by the City Council on January 22, 2008 and all subsequent amendments thereto (for Information, Standard Drawing No. SS-020 contains portion of those requirements. Asphalt, aggregate base and aggregate sub-base specifications are those set at by the latest publlshed edition of American Public Works Association *"Manual of Standard Specifications"*.

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SECTION 4.0

PLAN PREPARATION

4.1 GENERAL

Section 4.0 of the manual identifies work which is to be coordinated through the Engineering Department. The Developer is responsible for obtaining the necessary City design and construction standards, permits and for coordinating with the Engineering Department to ensure its requirements have been met. It is the Developer's responsibility to complete the work required. The Developer is responsible for expediting the work and obtaining the necessary approvals and permits to proceed with construction.

In the case of construction of secondary water canal weirs, the Developer is responsible for processing these approvals through the respective canal company prior to preliminary plat approval. The Developer is to provide all fees and securities necessary to construct these facilities.

For the most part, these requirements apply equally to commercial and industrial site plans as well as residential construction plans. Commercial sites include all commercial buildings and church sites.

4.2 MASTER PLANS

One of the first items the Developer needs to do is to review the City's master plans prior to starting design of various utilities or street systems. The City has completed the following master plans:

1. Culinary water system
2. Secondary water system
3. Transportation
4. Storm drainage system
5. Sanitary sewer system
6. Parks and trails

The Developer needs to contact the Engineering Department and review these documents with them prior to proceeding with design.

4.3 DESIGN AND CONSTRUCTION STANDARDS

The Developer is responsible for obtaining the City's design and construction standards for land disturbance, roads and bridges, culinary water, and storm drain facilities. These standards are available through the Engineering Department for a fee, which covers the cost of reproduction of these documents. The fee is indicated in the City's Consolidated Fee Schedule and is available on the City's Website *www.wjordan.com*. Please see the Finance Department for the most current version.

4.4 PRELIMINARY DESIGN

All preliminary and final design is to be in compliance with the City's master plans and design and construction standards and is to include the following:

A. Master Plan Compliance – Prior to beginning design of any facilities, the Developer is to meet with the Engineering Department and receive information regarding facility sizing/locations for the proposed project. Call ahead and set up an appointment through the Engineering Department secretary.

B. Fire Flow Calculations – The Developer is to demonstrate to City Staff, through engineering calculations prepared by a registered civil engineer, that the fireflow required by the Fire Department can be met, prior to the construction of buildings being started. Prior to an outside consultant preparing these calculations, the Developer's consultant must obtain Engineering Department approval of the modeling technique and assumptions.

C. Flood Plain Evaluation – The Developer is to submit a flood plain evaluation performed and stamped by a registered civil engineer to document whether the property lies within a flood plain or not.

D. Drainage Calculation – The City has completed a storm drain and flood control master plan, which identifies major storm drain facilities to which each Developer must connect. The Developer is responsible for constructing pipelines and other facilities to the master plan facilities. Calculations must be prepared for the Developer provided facilities by a registered civil engineer and submitted to the Engineering Department for review and comment. The City will return an approved set of calculations to the Developer once these calculations are deemed to meet the City's requirements.

E. Traffic Impact Study – The Developer may be required to pay for a traffic impact study to be prepared by a registered traffic engineer, under the Engineering Department's direction that addresses the traffic and transportation impacts of the project. The extent of investigation and scope of work is defined in Appendix R – Guidelines for Traffic Impact Studies and will be determined by the Engineering Department. All original copies of the report are to be wet stamped and signed by the traffic engineer.

F. Geotechnical Report – The Developer is to submit to the Engineering Department for approval, a geotechnical report prepared by a registered geotechnical engineer. This report is to contain a soils report of the project's underlying soils, which is to identify groundwater levels and other soils data important to construction of the road and structures. The report is to contain recommendations to correct problems in the field and is to also contain a section that identifies pavement design for all facilities to be dedicated to the City. Appendix S – Guidelines for Geotechnical Reports identifies the extent and scope of work for the geotechnical report and the report is to be delivered to the Engineering Department directly from the geotechnical engineer preparing the report. All original copies of the report are to be wet stamped and signed by the engineer.

G. Subdrain/basement Drain Report – A separate report is to be prepared by a registered civil or geotechnical engineer which identifies design of subdrain/basement drains for the project. Those projects of specific concern are those, which lie near to, or adjacent to irrigation canals which run through the City. The City will, however, determine whether such a report needs to be prepared and what its extent will be. All original copies of the report are to be wet stamped and signed by the engineer.

H. Grading Report – The City has established a Land Disturbance Ordinance as part of its Municipal Code and will require a grading report including drawings prepared for each project. The report will need to identify where dirt will be move from, where its final placement will be, how it will be placed and methods of placement and compaction to meet the City's land disturbance ordinance. Prior to performing any grading on the project, the Developer is to obtain a Land Disturbance Permit from the Engineering Department. All projects over 5 acres in size are also required to have Utah Pollution Discharge Elimination System (UPDES) and Storm Water Pollution Prevention (SWPP) permits from the State of Utah, Department of Environmental Quality.

4.5 FINAL DESIGN AND DRAWING PREPARATION

Final design is to take into account the City's design and construction standards for all publicly dedicated facilities. These standards are available through the City's Engineering Department for a fee or online at *www.wjordan.com.*

A packet is to be submitted to the City's Engineering Department that includes all design assumptions and calculations and certifies the City's standards have been followed. Final drawings are to be submitted on the City's standard size sheets of 24x 36. Final drawings will be signed and stamped by the Developer's registered professional engineer for the project.

For commercial site plans, the Engineering Department will review all sheets which show the site improvements outside the building envelope, including site grading, drainage facilities, on-site public water lines, and hydrants, overland release path for storm water overflows, street lighting, and landscaping on street frontages.

Drawings submitted to the Engineering Department are to be organized according to the following order:

1. Cover Sheet
2. Abbreviations, Legends and Sheet Index Sheet
3. General Notes Sheet
4. Typical Sections Sheet
5. Survey Control Plan
6. Overall Utility Plan
7. Site Demolition Plan
8. Subdivision Plat or Site Plan
9. Street Signs and Striping Plan
10. Overall Grading and Master Storm Drainage Plan
11. Grading and Storm Drainage Details
12. Grading and Drainage Plan Key Sheet
13. Grading and Drainage Plan
14. Overall Storm Water Pollution Prevention Plan
15. Street Plan and Profile Sheets
16. Traffic Signal Plan

Additional information is provided in the Engineering Department, Construction Drawings Checklist contained in Appendix M – Subdivision Final Plat Process. This completed and filled-out checklist is required to be submitted with the copies of the check prints submitted for City review.

The following items are required as part of the construction plans:

A. Copies - Three copies of construction plans are to be submitted:

1. One set for Engineering Department review
2. One set for the City
3. One set returned to the Developer for corrections and revisions

B. All drawings are to be clear and legible and conform to good engineering and drafting practice.

C. Drawings are to have signature blocks for Engineering, Community Development, Public Works, Fire Department and other City departments on all sheets. Departments will sign off on their block as they review it.

D. Size - 24x36 with ½-inch border on top, bottom, and right sides; left side is to be 1 ½-inches.

E. Plans are to include the following information:

1. North arrow (plan)
2. Elevations reference to USGS datum
3. Stationing and elevations for profiles
4. Title block located in lower right corner of sheet to include:
   a. Project title
   b. Specific type and location of work
   c. Name of engineer with license number and Utah Engineer's stamps
5. Scale: 1"=20' or 1"=40' horizontally, 1"=2' or 4' vertically
6. Both plan and profile views for curb and gutter plans for:
   a. Each side of the street
   b. Center line, may be eliminated
   c. Top of curb elevations with curve data must be shown for all curb returns
7. Culinary water system - Size and location of mains, laterals, mains, valves, hydrants and pipe type.
8. Secondary water system - Size and location of mains, laterals, vales, fittings, etc.
9. Sanitary Sewer system - Size and location of mains, laterals, mains, valves, hydrants and pipe type.
10. Storm Drain system - Size and location of mains, laterals, mains, valves, hydrants and pipe type.
11. Subdrains, their manholes and cleanouts
12. Irrigation facilities
    a. Size and location of all required irrigation piping
    b. Data regarding flow and outfall of affected irrigation water
    c. Separate sheets of details for structures, etc.

4.6 GUIDELINES AND CRITERIA FOR PLAN PREPARATION

A. Plan Submittal - Submittal to the city generally falls into three categories:

1. Initial submittal,
2. Resubmission addressing City comments and
3. The final submittal of the originals for City approval. The general requirements for each of these submittals are outlined in Table 1.1.

Table 4.6.1. – Submittal Requirements

Item	Required for initial Screening Acceptance	Required for Resubmmittal	Required for Approval
Number of Plan Sets (bluelines)	4	As Requested	Original Mylar Duplicate Mylar
Bond Estimate Form (completed by engineer)	1 Copy	As Requested	Approved Estimate
Tentative Map or other Conditions	1 Copy	-	On File
Final Map Conditions	-	1 Copy	On File
Geotechnical Soils Investigation Report (1)	2 Copies	-	On File
Traffic Impact Analysis (2)	2 Copies	Approved	On File
Drainage Study (2)	2 Copies	Approved	On File
Notarized Off-Site Grading Authorization Letter (3)	-	1 Copy	On File
Developer Agreement Information Form (5)	-	1 Copy	On File
Subdivision or Improvement Agreement	-	-	Completed
Improvement Bonds	-	-	Posted
Plan Review and other Fees	-	-	Paid

(1) – if construction of public street is required
(2) – if required as a condition of approval
(3) – if offsite grading or construction is required
(4) – if design deviates from Guidelines or Standard Requirements
(5) – Required if Subdivision Agreement is to be used

The specific requirements of each of these categories are discussed in greater detail in the following subsections.

B. Plan Submittal - Engineers submitting plans to the City for initial screening are to provide:

1. Three (3) sets of complete plans (check prints) sealed by a registered Engineer in responsible charge.
2. One (1) copy of the completed bond estimate form with quantities for all public improvements, also quantities should be shown on construction plans.

In addition, the following items are required as part of the initial review submittal:

1. Two (2) copies of the geotechnical soils investigation report if the project includes construction of public streets. The report must include a pavement section recommendation for all proposed public streets.
2. Verification of traffic impact analysis (TIA) submittal to the traffic engineer if a TIA is a condition of approval.
3. Verification of drainage study submittal to Engineering Department if a drainage study is a condition of approval.
4. When a project requires grading or construction off-site, One (1) copy of a notarized authorization from every private property owner on whose property work is required.
5. Completed Development Agreement information form if a Subdivision Agreement will be prepared.
6. Written notice of deviations. If the plan submittal contains deviations from either these guidelines or the requirements of the uniform standards and City policy, the design engineer is to as part of the initial submittal include a letter to the City outlining all deviations and substantial reasons for requesting the deviations.

In addition to the items outlined above the Assessor's Parcel Number (APN#) is to be placed on the cover or title sheet of the submittal. Fire flow information is to be placed on the water plan and secondary water information is to be placed on the master utility plan.

All initial submittals are reviewed for conformance to the Engineering Department initial plan screening checklist. Failure of the design engineer to include the required information with the initial submittal will result in rejection of the plan submittal and the return to the design engineer. If the submittal contains sufficient information to be processed for review, the submittal will be accepted and both the design engineer and developer will be notified. Following the initial plan screening, the three plan sets submitted will be circulated to various sections within the City for review and comment. This process generally takes two weeks. When comments are received from the other City reviewing groups, the Engineering Department will consolidate the comments and review the plans for conformance to City standards. The entire initial review process generally takes 4 to 6 weeks depending on the current workload and complexity of the project. The Engineering Department will transmit the review comments to the design engineer and either request the plans be resubmitted for review or that mylars be submitted following corrections.

C. Resubmittal - If the conditions of approval or the Engineering Department require a drainage study or traffic impact analysis, those studies are to be approved prior to resubmittal of the improvement plans to the Engineering Department.

Engineers resubmitting plans to the City for review are to provide:

1. One (1) to three (3) sets of complete plans (check prints) as requested from the initial review sealed by the Engineer in responsible charge.
2. One (1) copy of the initial plan review comments (redlined plans). The redline of the fire plan should be retained by the engineer for use in obtaining fire signature on the Mylar.
3. Verification of Traffic Impact Study (TIS) approval by the Engineering Department if a TIS is a condition of approval.
4. Verification of drainage study approval by Engineering Department if a drainage study is a condition of approval.

5. Design engineer's certification that the grading plan is in conformance with the approved drainage study.
6. Design engineer's certification that the plans are in conformance with the approved traffic impact study.

Plans resubmitted to the City for subsequent review are to address all previously made land development review comments. The design engineer is to certify the grading plan conformance to the approved drainage study with the initial resubmittal and subsequently thereafter. All redesign from the previous submittal is to be clearly identified. In the event of major changes or significant redesign from the previous submittal, the design engineer should contact the Engineering Department to schedule a meeting to discuss the redesign concurrent with the resubmittal. Failure to meet with the Engineering Department to resubmitting a major redesign may delay the plan process.

The resubmittal review process generally takes between 5 and 15 working days depending on the current workload, complexity of the project, and thoroughness of the design engineer in addressing previously made comments. After reviewing the plans, the Engineering Department will either return the plans to the design engineer to address comments or request that original and duplicate mylars be submitted to the City for approval.

D. Required Easements and Rights-of Way - When improvement plans indicate easements to be dedicated or rights-of-way granted a complete package must be submitted prior to approval of the plans. This package must include legal descriptions, 8 ½ by 11 sketch and current vesting document. Easements may include ingress/egress, drainage, sewer, and intersite easements.

E. Final Submittal and Plan Approval - Improvement plans for subdivisions cannot be approved until after the final plat is approved. Prior to submitting original mylars and duplicate mylars to the Engineering Department for approval, certain prerequisite items must be submitted to and approved by the City. As part of the initial plan submittal the design engineer is required to submit a complete bond estimate form. This form is reviewed and if it is deemed accurate with no major design issues outstanding, an approved bond estimate form will be provided to the design engineer. The process of completing the bond estimate and obtaining the required bond estimate form is the responsibility of the developer and should be commenced early on in the process.

F. Request for Deviation Procedure - All deviations from these guidelines, the uniform standards or City policy are to be submitted to and approved by the Engineering Department. There are two types of deviations the engineer may need to address during the design process. First, deviations from the guideline requirements. All deviations from the guidelines are to be listed and submitted with the plans and other documents identified in " Initial plan submittal". Upon receipt, the deviation listing will be reviewed by the plan screener and supervisor. If the deviations are deemed to have merit, the plans will be screened and either accepted or rejected. If the deviations are considered to be only for the convenience of the design engineer, the Engineering Department will review the deviation request. If the Engineering Department considers the deviations acceptable, the plans will be screened and either accepted or rejected. If the plans are rejected and the design engineer desires to appeal the decision, the appeal is to be made in writing to the City. Upon receipt of the design engineer appeal, the engineer will schedule a meeting with the design engineer and the City staff engineer. The purpose of the meeting is to allow the design

engineer the opportunity to present its case to support the request. Within five working days following the appeal meeting, the Engineering Department is to inform the design engineer of its decision. The decision of the Engineering Department is to be final at this time.

The second type of deviation is a deviation from the requirements of the uniform standards and/or drawings or City policy. The design engineer is to identify and request a deviation from standards in writing and submit the request along with the other documents required in subsection 4.7.B., " Initial plan submittal". If the deviation is deemed to be in the best interest of the City and the project, the plans will be allowed to proceed through the plan review process. If the deviation as requested is determined to be unacceptable to the City, the Engineering Department is to schedule a meeting with the design engineer to attempt to resolve the issue. If the deviation is rejected and the design engineer desires to appeal the decision, the appeal is to be made in writing to the City Engineer. Upon receipt of the design engineer appeal, the City Engineer will schedule a meeting with the design engineer and the City staff engineer. The purpose of the meeting is to allow the design engineer the opportunity to present its case in support of the request. Within five working days following the appeal meeting, City staff engineer is to inform the design engineer of his decision. The decision of the City Engineer is to be final. If the denial of a deviation from standards or City policy will significantly impact a project, the design engineer is to contact the Engineering Department to review and resolve the design issue prior to making the initial submittal.

G. Plan Setup Requirements - The City is required to be the custodian of all improvement plans in perpetuity once they are approved. As the City moves to archiving plans on electronic media it is important that some degree of uniformity is maintained. The objective of the following plan setup requirements is to provide uniformity and standardization of plan submittal while allowing the design engineer flexibility with respect to presentation. Standardization of information along with uniformity in setup and presentation allows the review process to occur in a more orderly and timely fashion.

H. Plan Sheet Size - All plans submitted to the City of City of West Jordan must be signed and sealed by a civil engineer who is registered in the State of Utah. Plans are to be plotted or drafted onto mylar reproducible sheets and having an overall size of 24-inches wide by 36-inches long with margins placed accordingly. One and one-half inches on the left side and ½-inch on all remaining sides with a line thickness of 0.075 inches.

I. Title Block - Each plan sheet is to contain a title block located adjacent to the right side margin. The design engineer has the flexibility to determine the layout of the title block provided the following information is included somewhere in the title block. The title block is to include:

1. Title of sheet
2. Project name
3. Developer's or owner's name, address, and phone number
4. Engineering consultants name, address, and phone number
5. Professional engineer's name, P.E. number and seal and
6. Revision block

J. Benchmark - All projects are to utilize and reference an existing recorded City benchmark datum within one-quarter mile of the project site. If an existing benchmark is not located within the one-

quarter mile limit, a temporary benchmark on the project site suitable for the project construction/inspection purposes is to be established and referenced to the City datum. Every plan sheet to be utilized for construction of improvements is to indicate the referenced benchmark.

K. Drawing Scales - Drawing scales are to be a minimum of one-inch = forty feet (40') horizontal for plan views, unless otherwise noted in these guidelines. Drawing scales are to be a minimum of one inch = 40-feet horizontal, one inch = 4-feet vertical for plan and profile when slopes are less than 5 percent and a minimum of one inch = 40-feet horizontal, one inch = 8-feet vertical for plan and profile when slopes are greater than 5 percent. Plan and profile sheets are to be arranged such that the plan view is in the top half and the profile view is in the bottom half of the sheet. Profiles are to have vertical lines at every 50-foot station and horizontal lines at every 4-foot elevation.

All details are to be drawn to scale. The horizontal and vertical scale need not be the same. The purpose of requiring details be presented at scale is to allow the plan reviewer the ability to see spatial relationships of the various elements in the detail.

L. Plan Orientation - Generally, in lying out and developing the design, the design engineer is to consider the following hierarchy in establishing plan sheet orientation;

1. North should be to the top or right of the sheet
2. Stationing is to be left to right unless the sheet orientation with respect to North will not permit. The image is to only be drawn on the front side of the mylar.

M. Text Size and Line Weights - The final criteria for acceptance will be that all information provided on the plans be clear, concise and legible when the 24-inch x 36-inch sheet drawing is reduced to an 11-inch x 17-inch format. The following text size and line weight references are recommended for clarity but are not required. All text, which includes but not limited to dimensional text, spot elevations text, notes and other text are recommended to be leroy (L80) or romans. Shx font type with a text height of 0.08 inches and a pen thickness of 0.25mm. Profile elevations and stations are recommended to have a text height of 0.1 inches and a pen thickness of 0.50mm. Detail titles are recommended to have bold type font with a height of 0.20 inches. Street names are recommended to also have a bold type font with text height of 0.25 inches. All existing underground utilities are recommended to be shown dashed.

N. Line Type, Symbols and Abbreviations - The City requires the use of line types, symbols and abbreviations consistent with the *Uniform Standard Drawings for Public Works' Construction Off-Site Improvements, City of West Jordan City* Legends and abbreviation listings used on the plans are to only include those terms that are not included in the standards.

O. Plan Set Organization - The City requires that all sheets in the plan set be sequentially numbered, beginning with the title or cover sheet, with information presented and arranged in the following order:

1. Title/vicinity map/ quantities
2. Plat
3. Survey contour data sheet

4. Storm water pollution previous plan
5. General notes
6. Master utility plan
7. Grading plan and details
8. Street plan & profile/sections/details
9. Traffic signal plan
10. Striping/signage/streetlight plans
11. Sanitary sewer plan & profile/details
12. Storm drain plan & profiles/details
13. Water utility plan & profile/details

Depending on the complexity and scope of the project, a complete plan set may contain plan sheets from any or all of the above referenced groups. The guidelines indicate the minimum information. Data that must be presented and should not deter the design engineer from providing additional information as may be required. In the event the design engineer believes that the requirements of these guidelines are not applicable to a specific site or condition, the engineer is to request a deviation from the City. To facilitate the plan review and construction process, the City prefers that certain information be placed in a specific location on given sheets. The preferred location is identified in ***bold italics*** following the item description.

Example: North Arrow (upper right quadrant of sheet)

The above example indicates that the preferred location for the north arrow is in the upper right quadrant of the plan sheet. The City realizes that on rare occasions it may not be possible for the design engineer to comply with the City information placement preference. In those instances, the design engineer needs to identify all deviations from these guidelines in writing and submit the deviation listing to the City in accordance witH, “Request for deviation procedure”.

P. Cover Sheet Requirements - The design engineer may elect to provide a separate title sheet as part of the entire plan set or utilize the first sheet of the plan set to present additional information such as the vicinity map or quantities and thereby eliminate the need for separate sheets for those items. The guidelines allow the design engineer flexibility in the placement of information provided that such information is presented in a clear and concise manner. Regardless of whether or not the design engineer elects to utilize a separate title sheet, the first sheet of the plan set is to contain at a minimum the following information:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. “Call Before You Dig” symbol and telephone number is shown (plan sheets).
6. Revisions block is shown.
7. Sheet size of improvement plans is 24" x 36".
8. Mylar sepia or vellum drawing sheets, not paper sepia drawing sheets, has been used for all drawings (At final submittal).
9. All lettering in capital letters, 3/16-inch (0.120-inch) size minimum.
10. Accepted City layout of title block.
11. Initials and last name of designer, drafter and checker on the drawings.

12. Name of City is shown.
13. Shows name and address of owner and/or developer.
14. Must show the name, address, fax number, and telephone number of the engineering firm preparing the plans.
15. Assessor's Parcel Number is shown.
16. Must clearly show the name, and "Phase" or "Unit", of the project. For subdivisions the name is to agree with the final map. For multiple units, each final map is to have a separate set of improvement drawings.
17. Drawings must be numbered consecutively and show the total number of sheets.
18. Provide an area map showing the project and how it fits into the immediate area. The map is to include a north arrow and details about the project (1" = 500').
19. Provide a vicinity map showing the location of the project. The map is to include a north arrow.
20. Seal and signature of the design professional is shown.
21. Approval block - Engineering Department.
22. Approval block for design engineer and statement/disclaimer is provided.

Q. Vicinity Map Requirements - Every plan set submitted is to contain a vicinity map. The design engineer may elect to place the vicinity map on a separate sheet immediately following the title sheet or place the vicinity map on the title sheet. If the design engineer elects to place the vicinity map on the title sheet, no separate vicinity map sheet is required provided the information required by this subsection is presented on the title sheet. The vicinity map is to relate the project to major landlines and prominent geographic features on an expanded scale. The following information is to be provided either on the title sheet or the vicinity map sheet:

1. A map of the City of City of West Jordan area with the project highlighted
2. A site map of the project and construction area (*upper right quadrant of sheet)*
3. North arrow for City and site maps

In addition, the vicinity map may include the following items when applicable:

4. Highways, streets, roads and railroads
5. Channels, washes and bridges
6. Other pertinent geographic features

The City's information placement preference is not applicable when the vicinity map and associated required information is placed on the title sheet.

R. Abbreviations, Legends and Sheet Index – This drawing sheet is to include the necessary abbreviations, legends and sheet index necessary for the project and are to include the following:

1. Title block
2. Project title
3. North arrow
4. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
5. Revisions block is shown.
6. Provide a sheet index for all sheets in the lower right corner. All sheets are to be numbered consecutively.

7. Abbreviations are provided.
8. Legend is shown.
9. Section identification system is provided.
10. Detail identification system is shown.

S. General Notes Requirements - Every plan set submitted is to contain a General Note sheet that provides applicable City standard notes. The following information is to be presented on either the second or third sheet of the plan set depending on how the design engineer elected to present the information required for the title sheet and vicinity map. The General Note sheet is to contain the following information where applicable:

1. Title block
2. City of City of West Jordan General Notes
3. City of City of West Jordan Clearing and Grubbing Notes
4. City of City of West Jordan Grading Notes
5. City of City of West Jordan Sewer Notes
6. City of City of West Jordan Traffic Notes
7. City of City of West Jordan Streetlight Notes
8. City of City of West Jordan Fire Department Notes
9. City of City of West Jordan Water Standards Notes
10. City of City of West Jordan Dewatering Notes
11. City of City of West Jordan Storm Drainage and Flood Control Notes
12. City of City of West Jordan U.P.D.E.S. Notes
13. City of City of West Jordan Erosion Control Notes
14. "Call Before You Dig" symbol & telephone # (plan sheets)

T. Typical Sections – This drawing is to show the typical sections to be used for the project and may include the following:

1. Title block
2. "Call Before You Dig" symbol and telephone number is provided (plan sheets).
3. Local street, 60-foot right-of-way, minor collector, 72-foot right-of-way, major collector, 84-foot right-of-way, arterial, 106-foot plus right-of-way, cross-sections are shown. Drawings are to shown maximum cut and fill lines.
4. Residential collector, 57-foot right-of-way is shown.
5. Typical sections must have right-of-way or property line dimensions, cross slopes, type of curb, width of sidewalks, and the structural section material and thickness shown.
6. Typical utility locations
7. Typical trail sections

U. Survey Control Plan - Survey Control Data Sheet includes:

1. Title block
2. North arrow
3. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
4. Co-ordinates at each outside boundary corner are shown.
5. Basis of bearings is shown on the drawing.

6. Shows the bearing equation, 10,000/10,000 co-ordinate at section corner or at point of beginning is shown.
7. Shows survey monuments found with identifying marker plates.
8. Indicates the class of survey and references to appropriate Record of Survey plats.
9. Shows monument lines, bearings, and distances between monuments.
10. At least two section corner ties to boundary are provided.
11. Legal description of boundary is provided.
12. Benchmark acceptable to the County, with elevation is provided. The plan must show identification number, location, and elevation per NAVD 88.
13. USGS datum of elevations is shown on plans.
14. Signature and stamp of the registered land surveyor who prepared the survey.

V. Overall Utility Plan - Many design engineers find it useful to provide a master utility plan as part of the plan set. The inclusion of this sheet is mandatory. Master utility plans are generally provided for one of two purposes, either for construction or to indicate the schematic relationships of the various utilities. If the intent of the master utility plan is for construction, the plan is to have a scale of not less than one-inch = 40-feet to conform to the requirements of "General plan sheet requirements" and provide the information required by this subsection.

If construction plans are included in the submittal for the various utilities at a scale of not less than one-inch = 40-feet and the intent of the master utility plan is to indicate the schematic relationship of the utilities, then the plan scale can be reduced to a scale of not less than one-inch = 100-feet. Schematic master utility plans need to conform to the requirements of this subsection.

Master utility plans to be utilized for construction are to provide the following information:

1. Title block
2. Scale at 1"= 60' or 1"= 100'
3. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
4. Complete the separate Street Plan and Profile Checklist (C100) and show this information on this plan.
5. Complete the separate Sanitary Sewer Plan and Profile Checklist (SS100) and show this information on this plan.
6. Complete the separate Storm Drain Plan and Profile Checklist (D100) and show this information on this plan.
7. Complete the separate Culinary Water Plan and Profile. Checklist (CW100) and show this information on this plan.
8. Complete the separate Secondary Water Plan and Profile Checklist (SW100) and show this information on this plan. This will include pressurized secondary water design (pipelines) and unpressurized secondary water design (ditches and canals).
9. Shows relationship of utilities to each other on plan view.
10. Indicates all utilities including culinary water, sanitary sewer, storm drain, natural gas, secondary water, power, telephone, cable and all other utilities.
11. Water meter locations are shown.
12. Overhead utilities must be buried. Show existing overhead utilities on this drawing and indicate how and where they will be buried.
13. All utility stub-outs are to be shown. They are to be constructed into each lot past the City's right-of-way at least 10-feet.

14. Utility easements are to be shown. The City's standard is a 20-foot easement for one utility, and a 25-foot easement for two utilities.
15. All streets are named and existing and future right-of-way width to centerline is shown.
16. Existing and proposed hydrants and streetlights are shown.
17. Must show existing improvements in, and adjacent to, the project. Must clearly distinguish "existing" and "to be constructed" improvements (Plan Sheets).
18. Water and sewer facilities located and dimensioned from the centerline of the road or property line, are shown. Drawings must show a mandatory 10-foot separation between culinary water and sewer facilities.
19. Driveways, if known, are shown – sidewalk ramps are located.
20. Fire Department flow calculation information is indicated.
21. Fire Department approval block is shown.
22. Public Works Department approval block is shown.

Street Lighting

1. Streetlights are shown on the preliminary plat, final plat and construction drawings.
2. Developer contacts UP&L with plat information, UP&L designs street lighting, pull boxes, conduits, wires, etc.
3. UP&L gets City a letter or report indicating where the streetlights and facilities are to be located and their design.
4. Detail of streetlight locations is indicated.
5. Streetlights are provided at ends of cul-de-sacs, all street intersections, at 250-feet spacing.
6. A streetlight is located at the entrance to any pedestrian pass-through

If construction information and data is clearly and concisely presented on other sheets of the plan set and the intent of the master utility plan is to indicate the spatial relationships of the various utilities, the amount of information on this plan may be reduced.

W. Site Demolition Plan – In the event that site demolition is required, this plan will be required to be prepared. This drawing will show all demolition included as part of the project and the drawing is to include:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
6. Revisions block is shown.
7. Structures and other facilities to be removed are shown.
8. Complete the separate Street Plan and Profile Checklist (C100) and show this information on this plan.
9. Obtain State permit for demolition of structures.

X. Subdivision Plat or Site Plan – Plat/Copy of Plat that will be recorded with Salt Lake County Recorder's Office. The plat is to follow the guidelines/requirements of Salt Lake County requirements and is to included the following:
   1. Complete the separate Land Development, Concept Plan, Preliminary Plat and Final Plat or Site Plan Checklists to complete this item.

Y. Street Signs and Striping Plan – This drawing is to indicate all traffic control required during construction to adequately and safely construct the project. This drawing will require the following:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is indicated.
7. 12" x 36" W14-1P "Dead End" and W14-2P "No Outlet" placards are provided with street name sign on residential streets where they intersect with collector streets, when applicable – the sign is to face the collector street. Placards also provided on interior intersections if the end of the street is more than 300-feet from or not visible from the intersection.
8. 30" x 30" W14-1 "Dead End" and W14-2 "No Outlet" signs are provided on the lot line past a thru intersection when conditions are as above.
9. A 6" x 24" yellow "Temporary" placard with black lettering and border is included under any W14 sign, where applicable.
10. 30" x 30" R1-1 "Stop" signs are provided on residential streets at intersections with collector streets and where otherwise warranted – "T" intersections will not typically require a stop sign, but most 4-legged intersections should have stop signs on the lesser legs.
11. 24" x 30" R2-1 Speed limit signs (25mph) are provided at entrance points into the subdivision, generally located at the first lot line, and at intervals of approximately 1,500-feet.
12. Crosswalk, Trail crossing signs
13. Striping plan
14. Bike lanes

Z. Overall Grading and Master Storm Water Drainage Plan – This drawing is to provide a summary, or overall view, of the project's grading and master storm water drainage plan. Subsequent drawings also are required to provide additional detail, if required. These drawings are to include the following:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
6. Revisions block is indicated.
7. A note on the drawing from the design engineer verifying that the proposed improvements comply with the City's design and construction standards and master plan for storm drainage and flood control.
8. Location of FEMA 100-year flood plain and wetlands are shown.
9. Drainage calculations – These are to include the assumption of the 100-year storm event with 0.2 cubic foot per second/acre discharge in 24 hours and are to be stamped by a registered professional engineer. Engineer is to use TR55 or HEC1 and provide output from these calculations. (Separate report)
10. Orifice sizes, number of manholes, invert and rim elevations; required riprap, required double inlet/dissipator, etc. are indicated.

11. Detention areas and details are shown. This is to include spillways at a 3:1 maximum side slopes.
12. Permits – State stream alteration, county flood control, Corps of Engineer (COE), etc. permits have been obtained and evidence has been received by the City.
13. Cross-sections showing the elevational relationship, property line, and existing or "to be constructed" walls project's boundary with adjacent properties are provided.
14. Finished floor elevation of all buildings adjacent to this property and spot grades on adjacent properties to show elevational relationships.
15. Pad and finished floor elevations for all new structures are shown. (Site Plan only)
16. Street names are shown, show at the front of each lot.
17. Percentage of grade and direction of flow is indicated.
18. Proposed and existing drainage easements, with dimensions, elevations and typical sections as needed.
19. Size, slope, location, and description of existing and "to be constructed" storm drain facilities are shown.
20. All existing and "to be constructed" block walls are shown.
21. "Sight visibility easements", with dimensions, are shown.
22. Distance and bearing from project boundary to major intersection or major roadway is shown.
23. Sidewalk ramps with dimensions are indicated.
24. Engineer's note stating that the grading plan conforms to the approved drainage study is provided.
25. Elevations shown (top of curb, flowline and crownline) at limits of construction, P.C.'s, P.T.'s, and grade breaks.
26. Contours, at two-foot intervals, for undeveloped property are shown.
27. Dashed lines and labels showing existing improvements, with elevations noted, as needed, are provided to show the project's conformity with the existing conditions.
28. Shows existing or "to be dedicated" rights-of-way and easements.
29. Existing conditions - Must show "Existing Conditions" for the property being developed and within 100-feet of the project's boundary.
30. Existing contours are shown.
31. Slopes of 30-percent or greater are shown.
32. Proposed contours for parking lot and landscaping are shown.
33. Floodplain note/ evaluation was provided.
34. Road widths match Transportation Master Plan and/or Planning Commission requirements.
35. Road grades are minimum 0.5-percent and a maximum of 12-percent.
36. Sidewalks are provided as required.
37. Curb and gutter are provided as required.
38. Any waterways provided are 6-feet wide and only used with prior Engineering Department approval.
39. Erosion protection is provided for all cut and fill slopes.
40. Energy dissipaters are provided on the outfall of drain lines discharging into creeks and earthen channels capable of slowing velocities to 3-feet per second.
41. Storm drainage calculations were provided and reviewed.
42. Subdrain system – If project fronts canal property, the geotechnical report indicates groundwater within the footing zone, or the area is known for a high groundwater table.
43. Subdrain note was shown, if applicable.
44. Storm drains lines, catch basins, and clean out boxes are provided as needed.

45. Catch basins are provided at all sag points and every 500-feet. Doublewide catch basins, with two grates, are provided at sag points so the directional vanes can be installed in both directions.
46. Combination cleanout boxes provided at all changes in direction and every 500-feet.
47. An overland release for storm water is provided for all sag points such that no structures would be flooded if the underground drain system were blocked or the capacity exceeded.
48. Cul-de-sacs are graded to drain away from the bulb.
49. Drainage calculations were submitted and checked.
50. Storm drainpipe within paved area of City streets is reinforced concrete pipe (RCP), CL III and is a minimum 15-inch in diameter. Laterals may be sized to a 12-inch minimum size.
51. Smooth-wall corrugated HDPE pipe may be used in areas outside the City's right-of-way.
52. Subsurface drains are provided to an approved system or outfall where needed to lower groundwater levels to 3-feet below all basement levels. (To be maintained by Homeowner's Association)
53. Existing irrigation ditches have been piped or abandoned as approved by the ditch master.
54. Existing irrigation tailwater ditches or sheet flow is properly conveyed through the property.
55. All storm drainage conveyance systems have an oil water separator system, in heavily traveled areas (i.e. Commercial subdivisions, car washes, gas stations, etc.), in place before it discharges into the city system.

AA. Grading and Storm Drainage Details – This sheet is to include all of the details necessary to construct the grading and storm drainage facilities for the project. This sheet is to include:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is indicated.
7. Keyed Slope Detail
8. Backdrain Plan Section
9. Cut-Fill Transition Detail
10. Rear Lot Drainage Swale (Permanent)
11. Typical Section (Front to Back Lot Benching
12. Standard Rear Lot Inlet Box – Plan View
13. Standard Rear Lot Inlet Box – Profile View

BB. Grading and Drainage Plan Key Sheet – This sheet is to include the following:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is indicated.
7. Legend
8. Grading & Drainage Plan Key Drawing – Show adjacent roads, properties, etc.
9. Subdivision – Site Summary

CC. Grading and Drainage Plan - This sheet is to include the following:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is indicated.
7. Grading & Drainage Plan Key Drawing – Show adjacent roads, properties, existing contours, graded contours, vegetation, etc.

(One of Several Sheets)(For a portion of the Subdivision, based on the Key Sheet)

DD. Overall Storm Water Pollution Prevention Plan – This plan is meet the requirements of the City's ordinances and standards and the first part of the drawings/plan are to show the overall plan for erosion control and revegetation. Additional drawings may also be necessary to provide additional detail.

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are provided (plan sheets).
6. Revisions block is provided.
7. A verification from the design engineer that the proposed improvements comply with the City's design and construction standards for land disturbance.
8. Any project over 1-acre requires a SWPP plan and permit be prepared (permit application available in the Engineering Department).
9. Project description - Type of project, area to be disturbed, number of units (residential/commercial) or square feet (single-parcel commercial/industrial sites).
10. Description of existing site conditions - Topography, vegetation, streams, lakes, canals, drainage features.
11. Description of bounding areas that may be affected by land-disturbing activities - Streams, canals, roads, residential and commercial areas.
12. Critical areas called out on plan such as steep slopes and environmentally sensitive areas.
13. Erosion and Sediment control plan showing BMP practices
14. Permanent stabilization - Methods used to permanently stabilize the site (e.g., sod, seed.).
15. Grading report - Identify where dirt will be moved from, final placement, placement methods and compaction. Prior to any grading on project, this report is to be submitted to the Engineering Department for review.
16. Grading Permit from the Engineering Department.
17. Erosion protection is provided for all cut and fill slopes.
18. Energy dissipaters are provided on the outfall of drain lines discharging into creeks and earthen channels capable of slowing velocities to 3-feet per second.

EE. Street Plan and Profile - This drawing is to provide all necessary information required to review the street plan and underlying utility work for adequacy for design as well as for eventual construction of the project. This will require that the following be provided:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number are shown (plan sheets).
6. Revisions block is shown.

Typical Sections

1. Typical street cross-sections
2. Local street, 50-foot right-of-way, minor collector, 66-foot right-of-way, major collector, 80, 90-foot right-of-way, arterial, 126-foot plus right-of-way, cross-sections are shown. Drawings are to shown maximum cut and fill lines.
3. Show sidewalk ramps with dimensions.
4. Extend existing ground profile 200-feet beyond project.
5. Typical sections must have right-of-way or property line dimensions, cross slopes, type of curb, width of sidewalks, and the structural section material and thickness shown.

General Requirements

1. Profile view over plan view is shown.
2. A verification from the design engineer that the proposed improvements comply with the City's design and construction standards and master plan for roads and bridges and transportation.
3. Permits – Permits have been received by the developer and evidence has been provided to the City. This may include Utah Department of Transportation (UDOT) if the project impacts State roads, railroads, City encroachment permits, etc.
4. Design efficient for snow removal and storage, and for traffic circulation.
5. A soils report has been prepared, submitted, and reviewed by the City recommending a pavement design.
6. The roadway cross-section meets at least the minimum City standards of local residential streets. The actual thicknesses are to be determined by the soils report.
7. Roadway designs meet the City standard for curb radii for local residential streets of 28-feet; for collector roadways of 35-feet and cul-de-sacs of 40-feet.
8. Roadway designs meet the City standard for vertical/horizontal design of 10-percent maximum grade for residential roadways, 8-percent for collector roadways, 6-percent for arterial roadways, and 100-feet of 3-percent. The minimum slope for these roadways is 0.5-percent. These roadways are also to meet the requirements of 90-degrees at intersections, intersections spaced 300-feet apart, the correct K value, 2-percent cross-slopes, etc.
9. Driveway designs meet the City standard of concrete apron, 30-feet maximum; for residential roadways – 50-feet from intersections, for collector roadways – 150-feet from intersections, and for arterial roadways – 200 to 250-feet from intersections. The spacing of these accesses shall be 85 to 150-feet for collectors, and 200 to 275 for arterial roadways.
10. Street names with right-of-way and back of curb widths are indicated and a designation as "Public" or "Private" to be maintained by …. are shown on each street plan or section, if on each sheet.
11. Centerline bearing(s) and stationing are shown.
12. Curve data is indicated.
13. Profile for centerline, near and far curbs - Also show crown profile, if there is an offset crown.

14. Centerline profile view – Curb profile may be eliminated.
15. Top of curb elevations with curve data shown for all curb returns.
16. No scale larger than 1"= 40' horizontally / 1"= 4' vertically grades less than 5-percent are shown. Grades more than 5-percent can be 1"= 40' / 1" = 8'.
17. If vertical curve is shown on profile, the vertical curve is shown on the plan view.
18. Curve table is shown in plan view.
19. Line of sight line shown in plan view.

Culinary Water

1. A verification from the design engineer that the proposed improvements comply with the City's design and construction standards and master plan for culinary water.
2. Culinary water meter are located within the City's right-of-way and within landscaped areas unless otherwise directed by the City.
3. Drawings indicate water system line sizes, valve locations and that the water lines are looped.
4. Notes indicate the method/procedure for connecting onto existing water line source. Needs to indicate it will be done according to the City's Culinary Water Design and Construction Standards.
5. Plan view over profile view is shown (12-inch and over, or in unimproved areas).
6. Street names with right-of-way and back of curb dimensions are shown.
7. Waterline(s) located with dimensions from centerline (CL) or property line (PL), provide bearing of waterline if not parallel to CL or PL.
8. Length of pipe distance between valves, type, size and slope are shown.
9. Indicate separation at all utility crossings.
10. All waterline easements are shown (document no., if existing).
11. Culinary water lines are provided, 8-inch minimum PVC C-900 water pipe, generally located on the north and east sides of the streets.
12. All culinary water lines are required to show all valves, fittings, and thrust blocks.
13. Service laterals are provided to each lot.
14. Combination air/vacuum relief valve assemblies (Apco 140C Series, Crispin UL Series, or approved equivalent) are provided at all high points of the water system.
15. Fire hydrants are provided at 500-feet minimum spacing on residential streets, 400-feet on cul-de-sacs, 200-feet minimum on collector streets with commercial frontage, and where otherwise needed as marked by the Engineering Department.
16. Fire hydrants are located on lot lines whenever possible.
17. Fire hydrants are called out as Mueller Super Centurion, Waterous Pacer 100, or Clow Medallion.
18. Fire hydrants in cul-de-sacs are placed at the lot line closest to the neck of the bulb, where feasible.
19. Fire hydrants, which are preferred, or wash-out valves are placed at low points and end-of-line points of culinary water mains, to act as blow-offs.
20. Secondary water lines are located in the south and west side of roadways in the parkstrips.
21. Public Works Department approval signature block and Water Notes are indicated.
22. Fire Department signature block is shown.
23. Fire flow calculations have been provided and reviewed.
24. Centerline profile view – Curb profile may be eliminated
25. Top of curb elevations with curve data shown for all curb returns.
26. Scale no larger than 1"= 40' horizontally / 1" = 4' vertically are used.
27. If a vertical curve is shown on the profile view, a vertical curve is shown on plan view.

28. Curve table shown in plan view.
29. Curve table shown in plan view.
30. Line of sight line shown in plan view.

Storm Drainage and Flood Control

1. Plan view over profile view is shown
2. A verification from the design engineer that the proposed improvements comply with the City's design and construction standards and master plan for storm drainage and flood control.
3. Street names with right-of-way and back of curb dimensions are shown.
4. Drainage calculations (Separate Document from Drawings) - These are to include the assumption of the 100-year storm event with 0.2 cubic foot per second/acre discharge in 24 hours and are to be stamped by a registered professional engineer.
5. Orifice sizes, number of manholes, invert and rim elevations; required riprap, required double inlet/dissipator, etc. are indicated.
6. Detention areas and details are shown. This is to include spillways at a 3:1 maximum side slopes.
7. Ditch master approvals have been provided.
8. Storm drain line(s) are labeled as public or private.
9. Show all laterals and drop inlets.
10. Storm sewer(s) located with dimensions from centerline (CL) or property line (PL), provide bearing of storm sewer line if not parallel to CL or PL.
11. Manholes are numbered.
12. Indicate the length of pipe, distance between manholes, type, size, and slope.
13. Indicate separation at all waterline crossings.
14. All drainage easements are shown (document no., if existing).
15. Storm drainage calculations were provided and reviewed.
16. All catch basins or storm drain appurtenances are to have proposed rim elevations with invert elevations shown on plan. A 3-foot minimum distance is shown between the rim and invert of the pipeline, unless approved by the Engineering Department.
17. Floodplain notes / evaluation are provided.
18. Subdrain system – Provide a subdrain system if the project fronts canal property, the geotechnical report indicates groundwater within the footing zone, or the area is known for a high groundwater table.
19. Subdrain Note are shown, if applicable.
20. All curb and gutter PC/PT, direction changes, sidewalks, handicap ramps, are to have finish grade (FG) calculations shown on the plan.
21. Storm drain lines, catch basins, and clean-out boxes are provided as needed.
22. Catch basins are provided at all sag points and every 500-feet or at all intersections, to intercept storm water runoff discharge. Doublewide catch basins, with two grates are provided at sag points so the directional vanes can be installed in both directions.
23. Manholes are to be located every 400-feet.
24. An overland release for storm water is provided for all sag points such that no structures will be flooded if the underground drain system were blocked or the capacity exceeded.
25. Storm drainpipe within paved area of City streets is reinforced concrete pipe (RCP), CL 111 and is a minimum of 15-inches in diameter.
26. Smooth-wall corrugated HDPE pipe may be used in areas outside the City's right-of-way only.

27. Subsurface drains are provided to an approved system, or outfall, where needed to lower groundwater levels to 3-feet below all basement levels.
28. Existing irrigation ditches are piped or abandoned as allowed in writing by ditch master.
29. Existing irrigation tailwater ditches or sheet flow is properly conveyed through the property.
30. In heavily traveled areas, i.e. commercial subdivisions, car washes, gas stations, etc., all storm drainage conveyance systems are to have an oil water separator system .in place before it discharges into the City's system.
31. Centerline profile view – Curb profile may be eliminated on new street construction.
32. Top of curb elevations with curve data shown for all curb returns.
33. No scale larger than 1"= 40' horizontally / 1" = 4' vertically is used.
34. If a vertical curve shown on the profile view, a vertical curve is shown on plan view.
35. Curve table is shown in the plan view.

Sanitary Sewer

1. Complete the requirements for the Sanitary Sewer Plan and Profile Sheets as indicated by the South Valley Water Reclamation Plant and show this information on this set of drawings.

Secondary Water

1. Complete the Secondary Water Plan and Profile Sheets checklist and show the information.

FF. Traffic Signal Plan – When a project requires the construction or modification of a traffic signal, a separate traffic signal plan will be required. The traffic signal plan is to have a scale of one-inch = 20-feet. In addition to the general requirements of drawings, the signal plans are to contain the following information:

1. Title block
2. Project title
3. North arrow
4. Scale of drawing
5. "Call Before You Dig" symbol and telephone number is shown (plan sheets).
6. Revisions block is shown.
7. All streets are named and dimensioned.
8. Conduit runs are shown.
9. Detail of signal pole location are shown.
10. Detail of signal improvements, i.e. foundation and pole type/size, location of pull boxes, cabinets, conduits, detection facilities, are shown.
11. Traffic signal notes
12. All existing improvements including streetlights, signal poles, curb and gutter, driveways, sidewalk ramps, drop inlets, surface and subsurface utilities are to be shown and located by centerline stationing.
13. All existing or "to be constructed" hand holes, pull boxes, underground conduits and detector loops are to be shown and located by centerline stationing
14. All existing or "to be constructed" stop bars, cross walks and pavement markings are to be shown and dimensioned
15. All improvements "to be constructed" including streetlights, signal poles, pull boxes, driveways, sidewalk ramps, curb, drop inlets, and subsurface utilities are to be shown and located by centerline stationing
16. Each signal type and location

17. Street name sign schedule
18. Conduit and cable schedule
19. Phase diagram

GG. Quantity and Schedule Requirements - Every plan set submitted is to contain a quantity estimate. The City requires the quantity estimate to contain quantities of all public improvements in a format consistent with the City's bond estimate form. In addition, the City requires quantities of improvements constructed within public easements, whether or not they are publicly maintained. If the project contains both public and private improvements, the design engineer may elect to indicate both quantity estimates on the plans to facilitate the review of the public improvement bond estimate. The quantity estimate may be placed on a separate sheet or on the title sheet. The design engineer may elect to use schedules to clarify construction items, however; the use of schedules is not mandatory.

4.7 STANDARD NOTES

A. General Notes

1. All construction and materials are to be in accordance with the " City of West Jordan Design and Construction Standards"; and other applicable approved standards issued by the controlling agency; the International Building Code; and all local city codes and ordinances applicable, except as noted on this sheet as "Deviations from Standards".
2. The existence and location of any overhead or underground utility lines, pipes, or structures shown on these plans are obtained by a research of the available records. Existing utilities are located on plans only for the convenience of the Contractor. Existing utility service laterals may not be shown on the plans. The Contractor is to, at his own expense, locate all underground and overhead interference's, which may affect his operation during construction and is to take all necessary precautions to avoid damage to it. The Contractor is to use extreme caution when working near overhead utilities so as to safely protect all personnel and equipment, and is to be responsible for all cost and liability in connection therewith.
3. The Contractor is to take all precautionary measures necessary to protect existing utility lines, structures and street improvements which are to remain in place, from damage, and all such improvements or structures damaged by the Contractor's operations are to be repaired or replaced satisfactory to the Engineering Department and owning utility company at the expense of the Contractor.
4. All construction is to be as shown on these plans, any revisions are to have the prior written approval of the Engineering Department.
5. Type V cement is to be used in all off-site concrete work. Concrete to be 3,000 P.S.I. minimum @ 28 days. Mix designs to be approved by the City, prior to the use on the project.
6. Permits are required for any work in the public Right-of-way. The Contractor is to secure all permits and inspections required for this construction.
7. Expansion joints required, maximum every 300-feet in extruded-type curb.
8. Asphalt cement (AC) pavement to be ½-inch above lip of all gutters after compaction, except at sidewalk ramps and cross gutters.
9. Curb and gutter found to be unacceptable to the City is to be removed and replaced.
10. Sidewalk ramps are to be constructed in each quadrant of an intersection per standard drawing 234. Exact location of ramps may be adjusted in the field by a City inspector.

11. Contractor is to provide all necessary horizontal and vertical transitions between new construction and existing surfaces to provide for proper drainage and for ingress and egress to new construction. The extent of transitions to be as shown on plans.
12. All grading work is to conform to the soils report as prepared by the Soils Engineer approved by the Engineering Department, and as shown on these plans.
13. Exact location of all saw cut lines may be adjusted or determined in the field by a City of West Jordan Engineer if location on plans is not clearly shown, or existing pavement condition requires relocation.
14. The Contractor is to take all precautions necessary to protect existing permanent surveying monuments. Any monuments disturbed are to be replaced and adjusted per available records at the Salt Lake County Surveyors Office.
15. Utility company meter boxes, manhole lids, valve covers, etc., are to be located out of driveways, driveway aprons, flow lines, and cross gutters unless written approval is granted by the utility company and the Engineering Department.
16. Wall notes: (Below)
17. All walls, new or existing, are only shown on civil plans for the purpose of reviewing grading relationships; flood control and sight distance at intersections. New walls require a separate permit and inspection by the Building Department.
18. Asphalt mix design must be submitted and approved by the Engineering Department prior to the placement of Asphalt within City Right of Way.
19. Contractor is to adjust all new and existing inlets, valve boxes, manhole rims, and sewer clean outs, etc. to finish grade as applicable whether or not they are shown on the plans.

B. Traffic Notes

1. All construction signing, barricading, and traffic delineation is to conform to the "Manual on Uniform Traffic Control Devices", latest edition.
2. The street sign Contractor is to obtain street names and block numbering from the Engineering Department prior to construction.
3. Before any work is started in the right-of-way, the Contractor is to install all advance warning signs for the construction zone. The Contractor is to install temporary stop signs at all new street encroachments into existing City streets where warranted immediately after first grading work is accomplished, and is to maintain said signs until permanent signs are installed.
4. When a designated "Safe Route To School" is encroached upon by a construction work zone and the Traffic Engineer identifies a need for students to be assisted in the safe crossing through that work zone, the Contractor is to be required to provide a qualified "crossing guard". The guard is to be present for the full duration of time those children are likely to be present.
5. If the improvements necessitate the obliteration, temporary obstruction, temporary removal or relocation of any existing traffic pavement marking, such pavement marking is to be restored or replaced with like materials to the satisfaction of the Engineering Department.
6. The Contractor is to be responsible for providing and installing all permanent signs shown on the plans. Street name signs are to conform in their entirety to current City standards. All other signs are to be standard size unless otherwise specified on the plans. All signposts are to be installed in accordance with the current City standards.

7. When a proposed street light standard is located within 5-feet of any proposed sign shown on the plans to be mounted on a signpost, the sign is to be mounted on the street light standard and the signpost is to be eliminated.
8. All permanent traffic control devices called for hereon are to be in place and in final position prior to allowing any public traffic onto the portions of the road(s) being improved hereunder, regardless of the status of completion of paving or other off-site improvements called for by these plans.
9. Street signs and stop signs are to be installed per City standard specifications for placement of street name signs.
10. The Contractor is to provide barricades, signs, flashers, other equipment and flag persons necessary to insure the safety of workers and visitors.
11. Work in public streets as approved by City excavation permits, once begun, is to be expedited to completion so as to provide minimum inconvenience to adjust property owners and to the traveling public.
12. The Contractor is to be responsible for notifying for Utah Transit Authority (UTA) and the Jordan School District Transportation Services Department if the construction interrupts or relocates a bus stop or has an adverse effect on bus service on that street to arrange for temporary relocation of stop.

C. Streetlight Notes

1. No deviation of street light, pull box, conduits (etc.) locations are to be permitted without written approval of the Engineering Department. Any deviation from the plan location will require written notice from the Engineering Department.
2. All existing street lighting is to remain operational during construction.
3. All empty conduits are to have pull strings installed prior to final inspection.
4. Any structure such as block walls, chain link fences, retaining walls, etc., are to leave a minimum clearance of 18-inches to the face of street lightning pole on all sides when streetlight is installed behind sidewalk, and is to at no time completely enclose the street lighting pole.
5. As-built drawings are to be supplied to the Engineering Department who will provide copies to the Public Works Department prior to any pre-final inspection. The as-built drawing needs to be stamped as –built and signed by the preparer.
6. Service points are to be coordinated with Utah Power and Light, and wherever possible, be located near the center of the circuit. Service points are to be shown on the plans.
7. It is to be assumed that in the absence of an existing, workable circuit to attach to, all installations are to require a new service for operation of the circuit. In this case contact Utah Power and Light.
8. Wherever there is an overhead utility that may conflict with the installation of street lighting circuits and/or poles, these conflicts must be resolved between the developer and the utilities involved before streetlight bases are installed at no expense to the City of West Jordan and UPL.
9. The Contractor is to furnish complete service to transformers and control systems if required on plans, and is deemed necessary by UPL.

D. Grading Notes

1. In the event that any unforeseen conditions not covered by these notes are encountered during grading operations, the owner/engineer is to be immediately notified for direction.

2. It is the responsibility of the Contractor to perform all necessary cuts and fills within the limits of this project and the related off-site work, so as to generate the desired subgrade, finish grades and slopes shown.
3. Contractor is to take full responsibility for all excavation. Adequate shoring is to be designed and provided by the Contractor to prevent undermining of any adjacent features or facilities and/or caving of the excavation.
4. The Contractor is warned that an earthwork balance was not necessarily the intent of this project. Any additional material required or leftover material following earthwork operations becomes the responsibility of the Contractor.
5. The grading Contractor is responsible to coordinate with the owner to provide for the requirements of the project Storm Water Pollution Prevention Plan (SWPPP) and associated permit.
6. Contractor is to grade to the lines and elevations shown on the plans within the following horizontal and vertical tolerances and degrees of compaction, in the areas indicated:

		Horizontal	Vertical	Compaction
a.	Pavement area subgrade	0.1'+	+0.0' to –0.1'	See soils report
b.	Engineered fill	0.5'+	+0.1' to –0.1'	See soils report

   Compaction Testing will be performed by the owner or his representative.
7. All cut and fill slopes are to be protected until effective erosion control has been established.
8. The use of potable water without a special permit for building or construction purposes including consolidation of backfill or dust control is prohibited. The Contractor is to obtain all necessary permits for construction water.
9. The Contractor is to maintain the streets, sidewalks and all other public right-of-way in a clean, safe and usable condition. All spills of soil, rock or construction debris is to be promptly removed from the publicly owned property during construction and upon completion of the project. All adjacent property, private or public is to be maintained in a clean, safe and usable condition.
10. In the event that any temporary construction items is required that is not shown on these drawings, the owner agrees to provide and install such item at his own expense and at the direction of the Engineering Department. Temporary construction includes ditches, berms, road signs and barricades, etc.

E. Fire Department Notes

1. Authorized hydrants for this project are:
   a. Kennedy Guardian
   b. Mueller a-423 Centurion
   c. Clow Model 2546 Medallion
2. On any new home or building installation, accessible fire hydrants are to be installed before combustible construction commences and said fire hydrants are to be in good working order with an adequate water supply.
3. Contractor is to call the Public Works Department and Engineering inspector for underground inspection, pressure and flush verification of all fire hydrants and fire lines before back filling.
4. Painting of the curbs and hydrant and any work necessary for protection of hydrants from physical damage is to be completed before approval.

5. A permit is required from the Fire Department for on-site water lines and fire hydrants. The permit and Contractor's material and test certificate for underground piping form is to obtain the Fire Department prior to any work beginning.
6. A flow test must be witnessed by the Fire Department prior to occupancy for verification of required on-site water supply.
7. All on-site fire main materials must be U.L. listed and A.W.W.A. approved.
8. Fire Hydrant Spacing:
   Residential – 500-feet unsprinklered; 1,000-feet sprinklered.
   Commercial, including multi-family – 300-feet unsprinklered; 600-feet sprinklered.
9. Where new water mains are extended along streets, hydrants are to be spaced at maximum 1,000-foot spacing to provide for transportation hazards.
10. No fire hydrant is to be located within 6-feet of any curb return, driveway, power pole, street light or any other obstruction.
11. Two sources of supply are required whenever there are four or more fire hydrants installed on a single system.
12. Not more than two hydrants can be out of service due to a single main break.
13. Fire apparatus access roads are to have an unobstructed width of not less than 20-feet provided no parking is allowed, not less than 28-feet if parallel parking is allowed on one side, and not less than 36-feet if parallel parking is allowed on both sides. Vertical clearance is to not be less than 13-feet, 6-inches and is to be paved.
14. The turning radius for any fire apparatus access road and/or fire lane, public or private, is to be not less than 45-feet outside radius and 22-feet inside radius and is to be paved.
15. A fire apparatus road is to be required when any portion of an exterior wall of the first story is located more than 150-feet from Fire Department vehicle access roads and/or fire lanes, public or private, in excess of 150-feet in length is to be provided with an approved turn around area.
16. Access roads are to be marked by placing approved signs at the start of the designated fire lane, one sign at the end of the fire lane and width signs at intervals of 100-feet along all designated fire lanes. Signs to be placed on both sides of an access roadway if needed to prevent parking on either side. Signs to be installed no higher than 10-feet or less than 6-feet from roadway level. The curb along or on the pavement or cement if curb is not present, is to be painted with red weather resistant paint in addition to the signs.
17. Electrically controlled access gates are to be provided with an approved emergency vehicle detector/receiver system. Said system is to be installed in accordance with the City of West Jordan City F.D. approval. Gates are only allowed with prior approval.

F. Culinary Water Notes

1. No work is to begin until the water plans have been released for construction by the Engineering Department. Following water plan approval, 48-hour notice is to be given to the Public Works Department prior to the start of construction. Notice must be given by 2:00 P.M. the business day prior to an inspection.
2. All work is to conform to City of West Jordan City standard plates, drawing, and specifications and the Culinary Water Design and Construction Standards, latest edition.
3. All work, except as modified by these plans or by note 2, is to be done in accordance with the most current draft or edition of the Road and Bridge Design and Construction Standards for off-site improvements.

4. A single pipe material is to be used throughout the project, unless otherwise approved by the Engineering Department.
5. All service laterals 2-inches in diameter and smaller are to be copper tubing with City of West Jordan City approved service saddles.
6. All water meter boxes are to be located outside of driveway areas.
7. All valves are to be located outside of driveways, gutters, curbs and alley gutters.
8. The following requirements must be met in the event a water line and sanitary sewer or storm sewer line cross:

   A minimum 18-inch vertical separation (outside to outside) must be maintained when the water line is installed over the sanitary or storm sewer line. If the vertical separation cannot be maintained or the water line must be placed under the sanitary or storm sewer line, the sanitary or storm sewer line must be constructed with one of the following or, as shown on these plans:

   a. Potable water supply quality material
   b. Encasement, with 4-inch concrete (minimum)
   c. Sleeving with potable water supply quality pipe.

   Each provision must extend along the sanitary or storm sewer, on either side of the water main, a minimum 10-foot distance perpendicular to the exterior of main.
9. Warning tape is to be required over all mains, all 6-inch diameter and larger service laterals, and any service lateral not installed perpendicular to the main.
10. All water facilities are to be filled, disinfected, pressure tested, flushed, filled and an acceptance water sample obtained prior to connection to the City of West Jordan distribution system.
11. The Contractor must obtain all meters 2-inches and smaller from City of West Jordan Public Works – 48-hours prior to pick-up.
12. Construction may interrupt service, with City of West Jordan Public Works approval and proper notification, between the hours of 10:00 P.M. and 6:00 A.M. Sunday through Thursday. Circumstances that may require temporary service feed must have prior City of West Jordan Public Works approval.
13. All water facility construction materials used must be as listed on the City of West Jordan Public Works pre-approved materials and manufacturers listing for new facilities, latest revision or specifically approved on these plans.
14. Approval of these plans for the water used stubout installation will not be construed as a commitment for water service to this property.
15. Conditional approval of valved outlet (6-inch and larger)
    In the event the water plans show one or more valved outlets extending out of paved areas, installations of these outlets is acceptable, however, if the outlets are incorrectly located or not used for any reason when the property is developed, the developer is to abandon the outlets at the connection to the active main in accordance with the district's standards and at the developer's expense.

16. Water Crossing Note

    The following are the requirements that must be met when there is a water-sewer crossing:

When protection of the water line is considered, the minimum vertical distance 18-inches must be maintained when the water line is installed over the sewer/storm line. If this distance cannot be maintained because of physical obstructions or the water line must be placed under the sewer/storm line, the sewer/line must be constructed with any on if the following:

a. Extra heavy cast iron or ductile iron pipe
b. Water supply quality
c. Encasement with 4-inches minimum of concrete or sleeving with water quality pipe.

Each of these provisions must be extended for 10-feet on either sides of the water line at 90 degrees to the crossing.

4.8 PLAN CHECK

Two plan check reviews are provided as part of the engineering review fees. The Developer will be charged an additional $100.00 for each subsequent plan check, which must be paid to the City's Finance Department prior to the Engineering Department reviewing the drawings.

4.9 ENGINEERING DEPARTMENT APPROVAL

Once the Engineering Department staff has reviewed all corrections to the plans and have verified that the requested changes have been made, the plans will be submitted to the Engineering Department for review and approval. The Engineering Department will then notify the Developer in writing of that approval.

4.10 EASEMENT AND FEE PARCEL DEDICATIONS

The Developer is to verify to the Engineering Department's satisfaction that all easement and fee parcels needed for the project have been dedicated to the City. The Developer is to submit such recorded documents to the Engineering Department for their files.

4.11 SUBDIVISION INSPECTION

All improvements to be dedicated to the City for public use are to be inspected by the City's Engineering Department. A preconstruction meeting will be held for each project before any work is done. At this meeting the Developer and the Developer's contractor will be notified of the points when City staff must be present and have the facilities inspected prior to proceeding with the next step. No facilities are to be covered up or concrete poured without first receiving the proper inspection by the Engineering Department. Failure to comply with this requirement will result in the pipeline being uncovered, or concrete being removed and replaced, at the contractor's expense, to ensure proper procedures have been followed.

4.12 ENGINEERING DEPARTMENT APPROVAL LETTER

Once the Engineering Department is fully satisfied that all Engineering Department requirements have been met, the Engineering Department will notify the City's Building Department, through CityView, indicating that building permits may be issued for the project.

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SECTION 5.0

PLAN REVIEW & APPROVAL

5.1 GENERAL

A. General - The process of City staff review and correction of Developer provided building elevations, plats, site plan drawings, construction drawings, reports, studies, calculations, and other documents used in the processing of a private development project through the City, is called the *'Redline Review Process'*. *'Redlines'* refer to those hand written corrections, usually written in red pencil or pen, on building elevations, plats, site plan drawings, and construction drawings, and other hand-written or typed documents, which provide direction to the Developer and his/her engineer/architect on what items need to be changed on these documents. They also include written documentation of alternatives the Developer might consider in order to meet the City's requirements, or optional suggestions the Developer might wish to consider in finalizing his/her project.

The process is initiated by the Developer submitting ***all*** of the required documents the City has indicated are necessary for the review of the specific project type. ***All*** of the documents required by the City must be provided at the time of submittal after application, or the City staff will return the submitted materials back to the Developer, mark those documents that are missing on an appropriate checklist, and require that the Developer obtain the other documents prior to submitting the application packet back to the City. City staff will inventory the documents to ensure all of the documents are present, and the City's Project Review Team will complete the detailed review of the documents later. The City's project planner, engineer, and other City staff involved in the project are referred to as the City's 'Project Review Team' and they will be responsible for reviewing the project and processing it through the City.

B. Definitions – The following definitions apply when referring to the review process for private development:

1. Released for Construction Drawings (RFCD) – The Engineering Department has established a set of drawings required for these RFCD. It consists of all of the construction drawings necessary to construct the entire project, including public and private infrastructure such as roadways, water, sewer, storm drain lines, and landscaping & irrigation drawings. This set of drawings is combined into what is referred to as the *'Released for Construction Drawings'*. The purpose of this manual is to describe what is necessary to review and approve just the landscaping and irrigation portion of these *'Released for Construction Drawings'*.
2. Redline – City staff comments written on drawings, reports, plats, and other documents submitted by the Developer for review, for the project. These are meant to give direction as to what needs to be corrected to make them acceptable to the City for further processing.
3. Redline return – The redline process consists of an *'Initial or 1st Review'* of a given document, which contains City staff's redlines (comments), which is then followed by a *'Second Review', 'Third Review'*, etc., depending on how well the Developer's engineer addresses City staff's redlines. A *'redline return'* is that portion of the process where the

Developer returns the correct document from a City review, for additional City staff review.

4. *'Project Redline Memorandum'* – This is a memorandum prepared by City staff which has three main categories of comments: 1) comments made to address Code or Standards requirements, 2) alternatives for Code, standards, manual or other Planning Commission or City Council approved requirements, and 3) optional suggestions the Developer and his engineer may consider, and which are not required.

C. Purposes of Redlines – The purposes of the 'Redlining' process are as follows:

1. Explain and clarify the City staff's comments regarding various documents they have reviewed which were provided to the City staff for review as part of the private development project.
2. Create documentation, which sets the standard for what will be required of the project, in order for it to be processed through the City.

D. Types of Comments – Redline comments come in three distinct types, they are:

1. Comments Required to meet Code, standard, manual or other Planning Commission and/or City Council conditions or approved requirements – These are comments the Project Review Team will make on *'redline'* documents which are required by the City of West Jordan Municipal Code, standards, manuals, or other Planning Commission or City Council approved documents. These are required to be complied with by the Developer and his/her engineer and other professionals and are not optional for them to consider. If the Developer wishes to contest these requirements, they must be done through the appeal process set forth in *'Section 5.6 – Developer's Appeal Process'* and or Municipal Code. City staff does not have the authority to waive or change these requirements.
2. Alternatives for Code, standard, manual or other Planning Commission or City Council approved requirements – There are situations where a given project may have alternatives City staff may indicate are available to meeting City Code, standards, or manual requirements. These will be indicated in a separate *'Project Redline Memorandum'* which will detail the alternatives available to the Developer, along with any other information City staff may wish to communicate to the Developer for his/her consideration. It the responsibility of the Developer to weigh and select a given alternative and indicate so in writing to the Project Review Team. The project will not proceed with further review until the Developer provides this written decision.
3. Optional suggestions – There may also be optional suggestions the Project Review Team wishes the Developer to consider in the remaining preparations for the project. These will also be included in the *'Project Redline Memorandum'* and will be included under the heading of *'Optional Suggestions'*. The Developer must provide a written response to whether these suggestions will be included in the project and can be included with the *'Alternatives for Code Compliance'* items.

E. Types of Redline Documents – *'Redline Documents'* typically include building elevations, plats, site plan drawings, construction drawings, studies, reports, calculations, property documents of all types, and any other type of document which may be submitted to the Project Review Team in order to adequately address City requirements for a given project. The Project Review Team will mark on these *'Redline Documents'* any corrections, which may be necessary to meet City requirements. Redline comments are to be prepared after reviewing the City's Municipal Code, standards, and manuals.

F. All Redlines Must be Addressed in Order to Process Project – The Developer must note that all redlines must be addressed to the satisfaction of the City staff before the City Planner and City Engineer will schedule the project for Planning Commission or City Council review.

5.2 PROJECT REVIEW TEAM'S RESPONSIBILITIES IN THE REDLINE REVIEW PROCESS

The Project Review Team is responsible for reviewing the documents submitted by the Developer in accordance with the established Municipal Code, standards, policies and design criteria manuals, specifications, the Development Processing Manual, and any other City Council approved documents meant for this purpose. The Project Review Team will mark on the drawings, any corrections that are necessary in order for the project to meet the requirements indicated above. The Project Review Team will indicate the Code, standard, or manual requirement, which applies to the comment. If the Developer does not agree with the Project Review Team's interpretation of regulations, or wishes to challenge the requirement, the Developer needs to understand that City staff does not have the authority to waive, or not enforce these requirements. These are City Council approved requirements, and only the City Council can change or alter the requirement. The Developer will need to follow the appeal process outline in *'Section 5.6 – Developer's Appeal Process'* or Municipal Code appeal process.

In addition to the 'redline' marking of building elevations, plats, site plan drawings, construction drawings, or other types of drawings, City staff will also provide a separate hand-written or typed document called a *'Project Redline Memorandum'*, which provides alternatives to the Developer for meeting the City's codes, standards or manuals. Review will be based on code, general plan, standards and specifications. As part of this effort, the Project Review Team will provide a written description of what the alternatives are, any concerns that City staff may have regarding the alternatives, pros and cons they may be aware of, and other items which may be useful in the Developer's decision on which alternative to select. The Developer will then choose the alternative course of action. The Developer must indicate, in writing, to the Project Review Team which alternative he/she elects to select. ***The project cannot be further processed until the Project Review Team receives this document.***

City staff may also elect to provide *'Optional Suggestions'* they wish the Developer to consider in finalizing the project. These will be included in the *'Project Redline Memorandum'* under the heading of *'Optional Suggestions'*. The Developer is not required to include these suggestions in the project, but must provide in writing, an indication as to whether he/she intends to include them in the project.

City staff's responsibility is to be as clear as possible in defining the issue(s) for the Developer, so the Developer and his/her engineers/architects understand the issue(s), and what the resolution to the issue(s) may be. Typically there will be one to three 'redline reviews' produced for a given project unless the Developer and his/her engineer/architect are not adhering to the 'redline' comments, and additional 'redlines' are required. If the Developer's project requires more than 3 sets of 'redlines', the Developer will be charged extra for the review of these additional sets of 'redlines'.

5.3 DEVELOPER'S RESPONSIBILITIES IN THE REDLINE REVIEW PROCESS

The Developer and his/her engineer/architect have responsibilities for making the 'redline' process a productive and efficient effort.

The first responsibility the Developer and his/her engineer/architect have in the process is to understand the City's general plan, codes, standards, manuals and other documents, and that the project is planned and designed in accordance with these documents. If the Developer and his/her engineer/architect are not familiar with the City's requirements, the project will not be able to be processed as quickly as it would, if there aren't extensive 'redlines' to the project documents. The Project Review Team has extensive experience in these types of reviews and will 'redline' all deficiencies and require they be changed to meet City requirements prior to further processing the project. Not following these guidelines will result in delays to the Developer and his/her project.

The Developer has the responsibility of making the corrections noted on the 'redlines' if they are City code, standards, manuals, or other City Council approved documents comments. These corrections are not optional and are required to be made. If the Developer disagrees with these requirements, the Developer is required to indicate this disagreement in writing to the Project Review Team, once the Developer has received and reviewed the 'redlines'. *'Section 5.6 – Developer's Appeal Process'* must be followed in resolving these types of issues. Possible modification of project requirements/agreements are closed once the Planning Commission and/or City Council approve the project. If modifications are requested, the plan or application must go back to the Planning Commission and/or City Council for modification.

The Developer has the responsibility to respond to alternatives for code compliance contained in the *'Project Redline Memorandum'* in writing. The Developer is required to consider the alternatives and then select one for implementation into the project. City staff may indicate a list of items available for the Developer to consider in this process, but the decision to select one alternative over another is solely for the Developer to make.

The Developer has the responsibility to consider optional suggestions, but is not required to comply with these suggestions. The Developer does have the responsibility of responding to Project Review Team about whether he/she intends to implement these suggestions into the project.

The Developer and his/her engineer/architect have the responsibility of being as clear as possible in responding to the concerns expressed by the Project Review Team on the *'Redline Documents'*, so the Project Review Team understands the Developer's concerns, and what the Developer's proposed resolution to the concern(s) may be.

5.4 TYPES OF REDLINE DOCUMENTS

A. Building Elevations – One of the documents which may be redlined are the building elevations. These drawings depict the appearance of the structure from various vantage points and provide the Developer and City staff an opportunity to review the outward appearance of the structure to ensure it meets the City's codes and other requirements.

B. Plats – These are official property documents which depict how property is presently configured, or how the Developer wishes to configure property as part of the proposed project. It consists of a drawing of the property with various notations, acknowledgements, legal descriptions of the property and easements, signature blocks, etc. This document is recorded at the Salt Lake County Recorder's Office.

C. Site Plan Drawings – These drawings may depict property information but they are not legal, recordable documents, which alter property configurations. These documents are *'plan view*

drawings' which indicate what the project will look like once the project is complete. It will indicate locations of property lines and easements, building, parking, landscaping, infrastructure and other site improvements required for the project.

D. Construction Drawings – These are specific drawings used by engineers, contractors, and others in the actual construction of the project. They consist of a number of different types of drawings including erosion control, sanitary sewer system, stormwater system, water system, secondary water system, roadway improvements, notes, details, etc., which depict in detail how the project is to be constructed. The City requires that *'Approved for Construction Drawings'* be provided and followed in the construction of approved projects.

E. Studies and Reports – Projects may require the preparation of various types of studies and reports in order to quantify issues related to the project. These may include geotechnical reports, geologic reports, traffic impact studies, drainage studies, development plans, modifications of various master plans, etc., which may be required for the individual project. The Project Review Team will identify which reports are necessary at the beginning of the project and may require additional studies/reports as work on the project progresses.

F. Property Documents – Various types of property documents may be required for the project including warranty deeds, permanent easements, temporary easements, etc.

G. Other Types of Documents – Each project is unique and may require other types of documents to be submitted for the project to be processed. As the project is processed through the City, the documents will become evident and will be indicated to the Developer by the Project Review Team.

5.5 REDLINES

The Project Review Team will provide responses to the Developer's project submittals in three different forms. These are:

A. *'Project Redline Memorandum'* – In every case, the Project Review Team will assemble a *'Project Redline Memorandum'* which indicates the status of the project and provides code requirements, *'Alternatives for Code Compliance'* issues, *'Optional Suggestions'*, and any other comments the Project Review Team feels will help the Developer revise the *'Redline Documents'* and allow them to be further processed. The Memorandum may or may not include the items listed above, depending upon the needs of the specific project. This Memorandum will act as a summary of the 'redline' effort by the City staff.

B. *'Redlined Drawings'* – Most projects will contain some type of drawing or drawings. The Project Review Team may mark on these drawings any changes they wish to see made, as long as the comments were identified *as 'code requirements'*, *'alternatives'*, or *'Optional Suggestions'*, or they may include this discussion in the *'Project Redline Memorandum'*.

C. Other Redline Documents – There are a variety of these types of documents and the Project Review Team may mark on these documents, or may include a summary of concerns in the *'Project Redline Memorandum'*.

The Developer needs to check all documents for comments, which are returned to the Developer from the Project Review Team.

5.6 DEVELOPER'S APPEAL PROCESS

The *'Appeals Process'* to the Project Review Team's conditions and corrections as part of the 'Redline review process' is contained in the City's Municipal Code. This includes Title 89-1-201 and 89-2-303. Please refer to these sections for additional information regarding this process.

It needs to be noted that the appeals process will take time and will delay the Developer's project until a resolution of the issues can be finalized.

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SECTION 6.0

CONSTRUCTION & CONSTRUCTION INSPECTION

6.1 GENERAL REQUIREMENTS

This section describes the use of materials and workmanship to be employed in construction of roads and bridges. Construction of other infrastructure needs to be completed in accordance with those policies & design criteria manuals. The developer/engineer shall prepare such general and special specifications as are necessary to define the nature and location of the work, contractual arrangements, payment for work and any other matters concerning the owner or his contractor; these items are not discussed within the standards presented here.

A. Use of This Section - The construction section is intended to highlight the features of construction, which are deemed to be most significant. In any construction activity, the recommendations of the manufacturer of a product, especially where more stringent, should apply. Also, the omission of a particular practice, which is not considered to be a good construction technique common to the construction industry, should not be construed to mean that it is not required.

   Finally, Section 4.0 of this Manual contains material descriptions and the developer/contractor is required to use that section along with this section, and the respective plates as a reference. Section 6.0 describes testing procedures and requirements.

B. Quality of Materials - Materials and equipment to be incorporated into the work shall be new. In case a reference is not clear as to which of several available grades is desired, the highest quality material shall be used. When construction bids are received directly by the City such bids shall show the proposed pipe material and the manufacturer's name, if more than one type is allowed.

   Contractor shall have at the job site or be able to supply upon request, certified copies of factory or laboratory test reports showing the strength characteristics of any materials used in the work. For all reinforced concrete work, the contractor shall furnish in advance of pouring concrete and, if requested, the mix design and calculated concrete strength as prepared by the concrete supplier.

C. Substitutions - Where articles or materials are specified by brand or trade name, alternate materials or articles equal to those specified may be approved provided the request for approval is in writing accompanied by supporting data, in ample time to permit investigations without delaying the work. Unless substitutions have received prior approval, no deviation from the Standards will be allowed.

D. Quality of Workmanship - All work will be done by persons experienced in the specific work, under competent supervision and in a first class manner to the City's complete satisfaction. When work is being done directly for the City, the contractor in the proposal shall name each subcontractor and no substitutions will be permitted without prior approval.

E. Defective Work - Any defective materials or workmanship, which shall become evident within one year after field acceptance of completed work shall be replaced or repaired without cost to the City. Refusal of the contractor to correct defective work, which is clearly his responsibility, will

be considered just cause for exclusion from performing future work for the City. Such exclusion does not impair the City's right to bring legal action to correct the deficiencies as well as to withhold release/exoneration of cash/letter of credit bond and payment bond.

F. City Inspection, Field Acceptance and Guarantee Period - The Engineering Department is responsible for inspection of all excavation, pipe laying including appurtenant structures, trench backfill within the pipe zone and testing. The administration of this work is described in more detail in the City's *'Private Development Construction Inspection Manual'* which is available from the Engineering Department. All such work shall be available for inspection at all times. It will be the contractor's responsibility to provide a working day notice to the Engineering Department prior to the start of any work. Such notification will allow for scheduling a preconstruction meeting between interested parties. Failure to provide proper notification may delay the starting date since the Engineering Department may not be able to inspect the work and cannot accept any work for which inspection has not been arranged. It must be emphasized that the primary responsibility for compliance with all City requirements and standards rests with the developer and/or contractor. Any acceptance of a portion of the work by a construction inspector does not relieve the developer/contractor of this basic responsibility.

   Field acceptance is made by the inspector and will not coincide with the date of City Engineer acceptance of the work. However, the one year guarantee period for all work shall begin as of City Engineer acceptance. As mentioned in Section 6.I.E., any deflective work discovered during this period shall be repaired or replaced but a new one year period will not begin for the corrected work.

   All holiday or weekend inspection will be subject to additional charges as detailed in the City's standard rates for such work.

G. Public Relations - The contractor shall conduct its affairs in a manner which will lessen the disturbance to residents in the vicinity of the work. In this regard, standard working hours as specified in the Municipal Code (currently 7:00 a.m. to 7:00 p.m., Monday through Friday) shall be observed unless prior approval is received, which also includes City observed holidays. The job site shall be maintained in a condition which shall bring no discredit to the City or its personnel, and all affected private improvements shall be restored to at least their original condition. Saturday work may be provided for only by approval of the Engineering Department an the contractor will be responsible for payment of all overtime and other charges associated with having City staff available for inspection and other coordination. Special care must be taken in regards to school zones. These zones must be maintained open at all times and any alterations to existing shall be coordinated with the School District and the City's Engineering Department.

6.2 PERMITS

The following permits may be required of the contractor:

A. Encroachment - Where construction or other types of activities will encroach into the public right-of-way or easements, the contractor shall obtain all necessary Encroachment Permit. Within City of West Jordan right-of-way, the permit is secured from the Engineering Department. Within the County areas, a similar permit is required from the County. State roads require a

permit from UDOT. Particular attention is called to Section 6.15 and the appropriate standard drawings.

B. Explosives - Where the contractor anticipates the use of explosives in conjunction with construction, a blasting permit shall be first obtained from the City of West Jordan Fire and Police Departments, and all nearby property owners shall be notified. These permits are discretionary and may not be given for a particular circumstance.

C. Land Disturbance Permit – Prior to the movement of any dirt on the site, the Contractor shall obtain a land disturbance permit from the City for the project. The land disturbance permit application may be obtained from the Executive Secretary of the Engineering Department. In obtaining the necessary information required for this permit, the Contract should also obtain a copy of the City's most current version of the *Land Disturbance Policies & Design Criteria Manual*. This Manual contains all of the particulars for obtaining this permit which also contains information about erosion control, revegetation and sedimentation control.

D. Other Permits - Other permits may also be required by other agencies, which must be applied for and obtained by the developer or his contractor. Certain permits are also required as part of the development conditioning process which must be provided prior to beginning construction of the project. Please refer to the City's *'Development Processing Manual'* for additional information.

6.3 TRAFFIC REGULATION

A. General - The Contractor shall submit a traffic control plan to the City for review and approval. The traffic control plan shall include the times the work shall be ongoing, streets affected, the proposed plan for dealing with traffic as well as a schedule for work to be performed. This work shall be done in accordance with the following technical specification and the City Traffic Engineer's additional requirements:

1. Section 02010 – Traffic Regulation

6.4 CLEARING AND GRUBBING

A. General - Clearing and grubbing which consists of removal of objectionable material from the right-of-way shall be done with caution such that existing sanitary sewer improvements, adjacent property and trees and shrubbery that are not to be removed shall be protected from injury or damage.

Within water easements or rights-of-way, trees, shrubs, fences and all other improvements that have to be removed to permit construction and which are intended for replacement, shall be replaced in kind or size (excluding native trees under 2-inch diameter or native brush) or with approved substitutes unless permission to exclude such replacement is obtained from the owner/agency or granted by the Engineering Department. Replacement trees shall have a minimum diameter at breast height (DBH) recommended by the American Association of Nurserymen, but shall be larger if so required. This work shall be done in accordance with the following technical specification:

1. Section 02112 – Clearing, Grubbing and Stripping

B. Removal and Disposal of Material - The contractor shall be responsible for leaving the site in a neat and finished appearance, free from debris and/or inflammable material.

6.5 UTILITIES, EXISTING FACILITIES AND CONCRETE REMOVAL

A. Abandonment - Refer to Section 5.0 regarding abandonment of roadways and/or structures.

B. Utilities and Existing Facilities - The existing utilities and/or facilities shown on the drawings or the location of which is made known to the contractor prior to excavation, by contacting Blue Stakes 2 working days prior, shall be protected from damage during the excavation and backfilling of trenches and, if damaged, shall be repaired by and at the contractor's expense. Any existing utility or facility not shown on the drawings or the location of which is not shown to the contractor in sufficient time to avoid damage, if inadvertently damaged during excavation, shall be repaired by the contractor; and adjustment in payment, if any, is subject to negotiation between the contractor and the developer without any City liability, unless it is a City sponsored project.

Whether expressly indicated on the drawings or not, all contractors shall call Blue Stakes prior to any construction of pipelines. Failure to do so shall not relieve the contractor of any liability associated with disturbance/ breakage of existing utilities. This work shall be done in accordance with the following technical specification:

1. Section 02223 – Protecting Existing Underground Utilities

In case it shall be necessary to remove any such utilities, facilities or any portions thereof, the contractor shall notify the Engineering Department and the owner of the structure. The contractor shall not interfere with said utility and/or facility structures until disposition of the obstruction to the work has been determined and/or notice to relocate or remove has been given by the Engineering Department or authorized agent of the owner of the utility and/or facility so affected.

The fact that any underground utility and/or facility is not shown on plans shall not relieve the contractor's responsibility to comply with these standards. It shall be the contractor's responsibility to ascertain prior to commencing work the existence of any underground utilities or facilities which may be subject to damage by reason of operations performed by the contractor.

The Public Works Department will provide service line location services of existing services upon request and with satisfactory notification in advance.

C. Concrete, Masonry or Mortared Construction Removal - At locations shown on plans, portions of existing concrete pavement, curbs, gutters, sidewalks, foundations and other concrete or mortared structures shall be removed to the lines and elevations specified. Concrete structures or objects not shown or noted on the plans shall be removed where necessary and disposed of by the contractor.

Concrete removal operations in connection with the reconstruction of existing structures shall be performed without damage to any portion of the structure that is to remain in place. If damage

occurs, the contractor shall repair any such damage at his own expense, to the satisfaction of the Engineering Department. Repair/replacement of any sidewalks, curbs and/or gutters shall be to the satisfaction of the Engineering Department, as appropriate. Where existing reinforcement is to be incorporated in new work, such reinforcement shall be protected from damage and shall be thoroughly cleaned of all adhering material before being embedded in new concrete.

6.6 EXCAVATION AND TRENCHING

A. General - Trench excavation shall consist of all excavation involved in the grading and construction of water lines as shown on plans. The contractor shall perform all excavation of every description and of whatever substances encountered, to depths indicated on the drawings or otherwise specified or required. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. The material piles shall also not obstruct existing sidewalks or driveways unless it cannot be avoided. All excavated materials not required or unsuitable for backfill shall be removed. Such grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water from any source accumulating therein shall be removed by pumping or by other approved methods. Such sheeting and shoring shall be done as may be necessary for the protection of the work and for the safety of personnel.

Unless otherwise indicated, excavation shall be by open cut except that short sections of a trench may be tunneled if, in the opinion of the Engineering Department, the pipe or duct can be safely and properly installed and backfill can be properly tamped in such tunnel sections. If blasting is necessary, the contractor shall notify the City of his blasting schedule and procedures and obtain a blasting permit, and shall observe all reasonable precautions in protecting life and property. This work shall be done in accordance with the following technical specification:

1. Section 02200 - Earthwork
2. Section 02201 – Earthwork (For Roads and Highways Only)
3. Section 02211 - Rough Grading

B. Excavation - Excavation for water lines shall be made only after pipe and other necessary materials are delivered on the work site. After such delivery, trench excavation shall proceed as rapidly as possible, and the pipe installed and the trench backfilled without undue delay.

C. Shoring - All shoring for open excavations shall conform to the State of Utah, Department of Industrial Relations, and Division of Industrial Safety "Construction Safety orders (O.S.H.A)."

The contractor shall be responsible for adequately shored and braced excavations so that the earth will not slide, move or settle, and so that all-existing improvements of any kind will be fully protected from damage.

No shoring once installed shall be removed until the trench has been approved for backfill operations. Removal of shoring shall only be accomplished during backfill operations and in such a manner as to prevent any movement of the ground or damage to the pipe or other structures.

The contractor shall obtain and pay for all permits for any excavations over 5 feet (1.5m) in depth into which a person is required to descend or any excavation less than 5 feet (1.5m) in depth in soils where hazardous ground movement may be expected and into which a person is required to descend.

6.7 BACKFILL AND COMPACTION

A. General - There are several distinct zones to be considered in the backfilling procedure as follows (refer to Plate No. 3).

1. Pipe Zone. This area is from the trench bottom to 12 inches (300 mm) above the pipe. This zone is to be backfilled under the strict jurisdiction of the Engineering Department.

2. Above pipe zone but below pavement subgrade plus the zone including the subgrade and pavement Backfill and compaction in existing streets and in the area above the pipe zone shall be in full accordance with the City excavation permit issued for the specific work, and with the City land development specifications. In both cases, the filling of trenches shall be subject to approval by the City or Engineering inspector who shall have full authority to order compaction tests to demonstrate the actual backfill density.

Section 3.12 of the Culinary Water Design and Construction Standards contains the material designations for both the pipe zone and above pipe zone regions.

6.8 BORING AND JACKING OPERATIONS

A. General - Placement of pipe by boring or jacking methods requires special Engineering Department approval for each instance. However, as a general guideline, the following shall pertain:

1. Except for the use of air or water, the methods and equipment used in boring and jacking operations shall be optional to the contractor provided that the Engineering Department reviews them prior to any work.
2. The placement of pipe shall be to the lines and grades shown on the plans.
3. Voids remaining outside the pipe (or carrier pipe if applicable) shall be backfilled with 200 psi concrete.
6. Where a casing pipe is used, it shall be no less than 8 inches (200 mm) greater in diameter than the pipe to be installed.
5. The placement of pipe in casings shall be supported with redwood skids, shims or wedges to the lines and grades shown on the plans.

B. Bores - The boring machine shall cut a true circular bore to the required line and grade. The bored tunnel shall be no more than 2-inches larger in diameter than the maximum outside diameter of the casing or water pipe to be installed.

C. Jacked Steel Casings - In addition to applicable portions above, the following shall pertain:

1. Where casings are used, the size and wall thickness of the casing shall be at the contractor's option except that the minimum casing thickness shall be not less than 3/8 inch.
2. Field joints of steel casings shall be welded with a continuous circumferential weld.
3. The placement of pipe in casings shall be supported with redwood skids, shims or wedges to the lines and grades shown on the plans.
6. Prior to backfilling the annular space between the pipe and casing, the pipeline shall be tested in accordance with Section 6.0 – Testing.
5. The annular space shall be backfilled with washed concrete sand blown or rammed into place until the entire cavity is filled. Concrete bulkheads shall be placed at each end of the cased section to retain the backfill material.

6.9 CONSTRUCTION WATER

A. General - The developer/contractor shall not take unmetered water from the City's culinary water system. Instead, he or she should sign up at the Public Works Department for one or more construction meters after receipt of a deposit amount. The developer/contractor is not to move the construction meters. Charges for construction water are covered by City Council Resolution. The developer/contractor is put on notice that unpaid invoices will result in removal of the construction meter. This work shall be done in accordance with the following technical specification:

1. Section 02161 - Care of Water

6.10 SUBGRADE PREPARATION AND PLACEMENT OF BASE MATERIALS

A. General – This work shall provide for the preparation of natural, filled, or excavated roadbed material prior to the placement of subbase or base material, pavement, curbs and gutters, driveways, sidewalks, or other roadway structures.

B. Subgrade Preparation – This work shall be done in accordance with the following technical specification:

1. Section 02227 - Sand-Cement Slurry
2. Section 02280 - Soil Treatment
3. Section 02514 - Soil Cement Base

C. Untreated Base – This work provides for untreated base for pavement, curb, gutter and similar types of improvements that shall be constructed according to their technical specification sections.

6.11 ROADWAY SURFACING

A. General – This section provides for work related to finish surfacing of roadways including oiled roadways and shoulders, granular surfacing, chip seals, asphalt concrete pavement, portland cement concrete pavement and pavement fabrics.

B. Oiled Roadways and Shoulders – The roadway or shoulder to be oiled shall be prepared in accordance with these specifications following which it shall be uniformly water sufficiently to

eliminate dust, but not to such extent as to form mud or pools of water. Grade SC-70 liquid asphalt shall then be applied to the dampened surface at a uniform rate of 0.35 gallon per square yard unless otherwise specified.

The application of oil to the roadway or should shall be scheduled to commence after 7:00 a.m. and shall be completed prior to 1:00 p.m., and is further specified that no oil shall be applied when the air temperature is less than 40-degrees Fahrenheit.

During all oiling operations, precautions shall be exercised to prevent marring or discoloring adjacent improvements and adequate protection against such possibility shall be provided.
After the applied oil has dried, or penetrated to such extent that no free oil remains on the surface, and the condition of the oiled area will otherwise permit, the roadway or shoulder shall be opened to traffic.

C. Granular Surfacing – This work shall be done in accordance with the following technical specification:

1. Section 02506 – Granular Surfacing

D. Asphalt Concrete Pavement – Asphalt concrete pavement shall consist of one or more course of mixture of paving asphalt and graded aggregate placed upon a prepared roadbed or base, or over existing pavement. The courses shall be of the type of mixture and the dimensions shown on the plans and specifications. This work shall be done in accordance with the following technical specification:

1. Section 02510 – Asphaltic Concrete Paving
2. Section 02511 - A.C. Pavement and Base
3. Section 02513 - Asphalt Concrete Pavement and Base

E. Portland Cement Concrete Pavement – This work shall be done in accordance with the following technical specification:

1. Section 02520 - Portland Cement Concrete Paving

F. Pavement Fabric – Pavement fabric shall be nonwoven polyester or polypropylene materials conforming to the following:

Property	ASTM Test No.	Requirements
Weight, oz./sq.yd.	D3776	3.5 to 5.0
Grab Tensile Strength (1-inch grip), lbs	D1682	90 Min.
Elongation at Break, Percent	D1682	40 Min, 100 Max.
Fabric Thickness, Mils	D461	30 to 50

Pavement fabric shall be accompanied with a test certificate from an approved testing laboratory with actual identification test results. Additional testing may be required of the City Engineer. The fabric shall be protected from exposure to ultraviolet rays.

The surface of the distressed pavement shall be prepared by sweeping and removal of all loose materials prior to placement of the tack coat and pavement fabric. The fabric shall then be covered with an overlay of asphalt concrete.

6.12 CONCRETE AND MASONRY CONSTRUCTION

A. General – This work provides for construction of concrete structures, curbs & gutter, sidewalks, cross gutters and driveways connected to road and bridge projects. This work shall be done in accordance with the following technical specification:

1. Section 03100 - Concrete Formwork
2. Section 03102 – General Concrete Construction
3. Section 03200 - Concrete Reinforcement Steel
4. Section 03300 - Cast-in-Place Concrete
5. Section 03304 – Minor Concrete

B. Concrete Structures – Concrete bridges, culverts, catch basins, retaining walls, abutments, piers, footings foundations, and similar structures shall be constructed in conformity with the plans and specifications.

C. Concrete Curbs & Gutters, Sidewalks, Cross Gutters, and Driveways – Concrete curbs, walks, gutters cross gutters, alley intersections, access ramps, and driveways shall be constructed of portland cement concrete of the class and other requirements prescribed in the plans and specifications. The finish coat to be applied to curbs shall consist of Class “B” mortar.

6.13 LANDSCAPE AND IRRIGATION SYSTEMS

A. General – This section shall govern the preparation, planting, and irrigation system construction for landscape areas required by the City.

Existing utilities and improvements not designated for removal shall be protected in place. Unless otherwise provided, walls, curbs, planter boxes, walks, irrigation systems, and similar improvements required by the City shall be constructed following rough grading and before landscaping.

B. Testing - All work on the irrigation system, including hydrostatic and coverage tests, preliminary operational tests of the automatic control system, and the backfill and densification of trenches, and other excavations shall be performed after topsoil work and before planting. This work shall be done in accordance with the following technical specification:

1. Section 02811 - Landscape Irrigation System

6.14 WINTER-TIME WORK REQUIREMENTS

Winter-time work is defined as time past November 1st of each year, where temperatures are typically consistently lower than the 50-degree F requirement and weather conditions are such, that they bring into question the quality of the materials, ability to properly place and compact them, or otherwise perform proper construction of the given facility.

The asphalt placement requirement is 50-degrees F and rising and whether work proceeds, is dependant upon the City Engineer with advice from the Engineering Inspector and Engineering Inspection Supervisor.

Placement of other materials after the November 1st date are subject to the approval of the City Engineer. Situations and weather conditions may also be such that even prior to November 1st, that the ability of the Contactor to adequately construct a facility may result in the City Engineer directing that the construction stop until further directed.

6.15 CONSTRUCTION INSPECTION

All construction inspection is to be done in accordance to the City's most recent version of the City Council adopted *'Private Development Construction Inspection Manual'*. This manual provides the detail for City staff and the Developer and his consultants to provide for inspection during the construction phase of the work. This manual contains the following table of contents:

PRIVATE DEVELOPMENT
CONSTRUCTION INSPECTION
MANUAL

ABBREVIATED
TABLE OF CONTENTS

Appendix I – Construction Forms
Appendix J – Project Closeout Forms
Appendix K – Warranty Inspection/Acceptance Requirements Forms
Appendix L – Final Inspection/Acceptance Requirements Forms

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SECTION 7.0

IMPROVEMENT BONDS & ACCEPTANCE

7.1 GENERAL

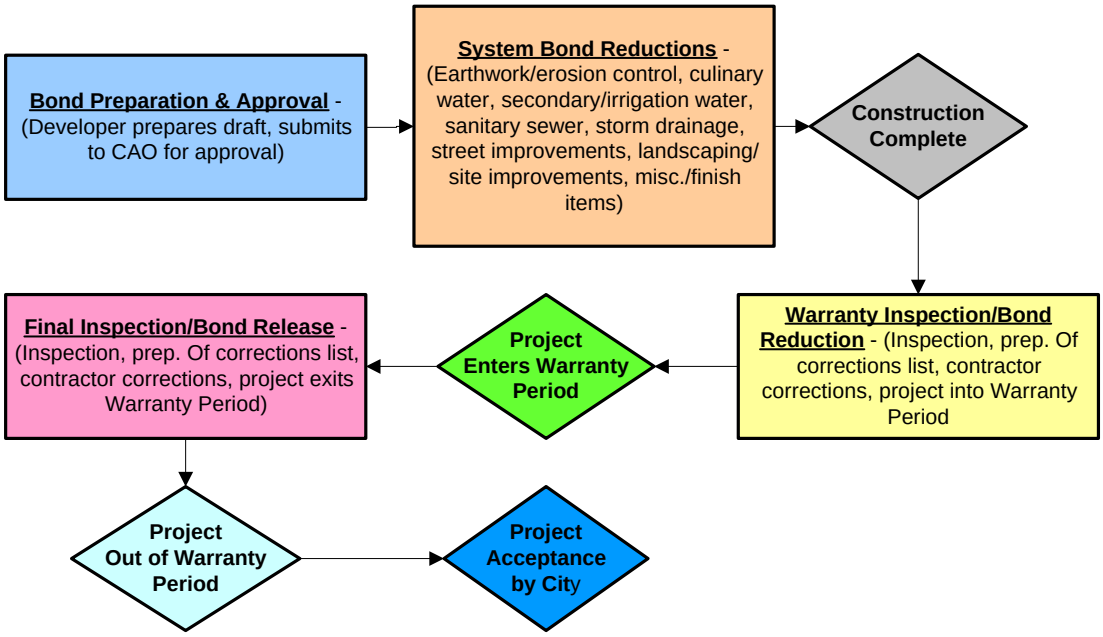
A. General – The purpose of this section is to address issues related to *the 'Public Improvement Bond'* and its various parts. There are four main parts to this process which include:

1. Bond preparation and approval *(7.3,7.4)**
2. System bond reductions *(7.5)**
3. Warranty inspection/bond reduction, *(7.6)** and
4. Final inspection/bond release *(7.7)**

**Note: Denotes subsection references.*

The *'Public Improvement Bond'* consists of processes as shown below:

Flowchart No. 8-01 Overall Public Improvement Bond Process



B. Municipal Code – As indicated above, bond preparation, establishment, reductions and releases are specified in various sections of the City Municipal Code. Developers, their contractors and staff are to be familiar with the various provisions of the Code and how they might apply to the various bonds described in *'Section 7.2 – Private Development Project Bonds – General'* (see Title 89-6-12).

C. Development Processing Manual (DPM) – The City has also adopted a *'Development Processing Manual'*, which is required to be followed in relation to this issue. Various sections of the DPM have been prepared to provide a step-by-step process for preparation, establishment, reductions and releases of various types of bonds. Please refer to this Manual for additional information.

D. Private Development Construction Inspection Manual (PDCIM) – The City has also adopted a *'Private Development Construction Inspection Manual'* which is required to be followed in relation to bond this issue. Various sections of the PDCIM have been prepared to provide a step-by-step process for preparation, establishment, reductions and releases of various types of bonds. In addition, the Manual contains appendices, which include inspection and certification checklists for the various systems to be released for the Public Improvement Bonds. Please refer to this Manual for additional information.

E. Acronyms and Definitions – The following acronyms and definitions apply to this section:

1. Acronyms
   a. CAO – City Attorney's Office
   b. CDD – Community Development Department
   c. DPM – Development Processing Manual
   d. ED – Engineering Department
   e. PDCIM – Private Development Construction Inspection Manual
   f. ODA – Office of Development Assistance
   g. PWD – Public Works Department
2. Definitions
   a. Bond estimate sheet – The spreadsheet used by the Private Development Projects Division of the Engineering Department to prepare cost estimates of the public infrastructure for which bonds will be prepared. Contact the City Engineer for the most current version of this document.
   b. Bond reduction – After the bond for the project has been established, the City will allow the bond to be reduced in its amount, as progress is made on constructing and inspecting those constructions. As the bond is reduced, this is called a bond reduction.
   c. Bond release – Once the *'system-by-system'* bond reductions have been performed, the project is complete, and the project has been through its *'Final Inspection'* and all correction items completed, then the project is ready for a complete release of all bond proceeds. This is called a *'bond release'*.
   d. Certification form – A City prepared form that is used by the Developer to certify the project has reached a certain stage in construction.
   e. Contractor – This is the general contractor for the project, or may be a subcontractor for a portion of the project. In either case, it is the entity that is responsible for the construction in question, and the entity to which the Developer looks to address a particular construction issue.
   f. Corrections list – A list of items needing to be completed or corrected for a given construction project. Is also referred to as a *'punchlist'*.
   g. Days – Unless otherwise so stated in this section, days refers to *'calendar days'*.
   h. Developer – The entity responsible from the private development side of the project, for due diligence, planning, designing, constructing, and getting the project accepted.

i. Final inspection – That inspection that comes at the end of the Warranty Period, once all City requirements have been met.
j. Final inspection bond release – That inspection and bond release that comes at the end of the Warranty Period, once all City requirements have been met.
k. Finish items – A category within the *'Public Improvement Bond'* list of items. It signifies those items, which are required to be completed in order to fully, complete the construction of the project, such as valve covers, street signs, etc. These are more fully defined on the *'bond estimate sheet'*.
l. Inspection checklist – These are the checklists used for inspection of the *'system'* improvements and are contained in the PDCIM in Appendices C, D, and E.
m. Manual – As used in this section, this refers to the Development Processing Manual.
n. Public infrastructure – Culinary water, secondary water, storm drainage, irrigation, roadways, fencing, etc. infrastructure construction which is to be dedicated to the City. This infrastructure is to be constructed in accordance with all requirements necessary to make them public facilities.
o. Project – The *'project'* is defined as the construction shown on the *'Released for Construction Drawings'*, and is also defined as the project reviewed and approved by the Planning Commission.
p. Punchlist – Please see *'Corrections List'*.
q. Released for Construction Drawings – This is the set of drawings reviewed and approved by the Engineering Department as part of the project approvals which are then signed by the Engineering Project Review Engineer, the City Engineer and other affected City departments.
r. System – These are the 8 items listed under *'Section 7.1 General, D. Public Improvement Bond'* which lists the 8 items considered to be *'systems'*.
s. Warranty bond reduction – This is the bond reduction, which comes after all City requirements have been met, after the Warranty Inspection has taken place.
t. Warranty inspection – The inspection performed at the time of completion of the project, and which is just prior to going into the Warranty Period.
u. Warranty period – That period of time between the Warranty Inspection and Final Inspection, when the City agrees that all items on these corrections lists have been completed, and the project meets all City requirements. The Warranty Period for the *'Public Improvement Bond'* is 2-years, and will be different for the other bonds.

F. Developer's Role – The Developer has the primary and an integral role in the preparation, establishment, reduction and release of these bonds. These responsibilities include:

1. Bond Estimate Sheet(s) - The Developer and his/her engineer, is to submit to the Engineering Department a complete bond estimate sheet(s), on the forms provided by the Engineering Department. The Engineering Department will review and either returns the bond estimate sheet(s) to the Developer and his/her engineer for additional work, or will approve the draft bond estimate sheet(s) for further processing. The Developer is responsible for submitting a reasonable listing of public improvements and *'non-public improvements in common* areas' and City staff will review this work. Developer delays in submitting a reasonable bond estimate sheet(s) will result in delays in completing the bond.
2. Bond Form Preparation - The Developer is to work with the City Attorney's Office in preparing the bond form(s). The Developer is responsible for this work, not City staff. The Developer and his/her bonding company must meet the City Attorney Office's

requirements prior to the bond being approved by the City Attorney's Office, and this approval being forwarded on to the Office of Development Assistance (ODA) and the Engineering Department. Developer delays in submitting the bond in the form required by the CAO will result in delays in completing the bond(s).

3. Developer/Contractor Certification for Bond Reduction/Release - The Developer is responsible for understanding and being involved with the progress on construction of his/her project, prior to submitting a written bond reduction or release request. Many times, the Contractor indicates he is ready for a bond reduction or release, when this is not the case. As such, the City has prepared a *'certification form'* for the various *'systems'*, which the Developer and his contractor are to complete as part of the written reduction/release request. This form must be properly completed and submitted to the Engineering Department before the Engineering Department inspection staff will initiate an inspection of the *'system'*, for which a reduction/release is being requested. Once the *'certification form'* is completed and submitted, an inspection by Engineering staff will be promptly completed. If it is found during the inspection that the *'system'* is not ready for inspection, the Engineering inspector will return a written response to the Developer indicating the items that are not complete. Subsequent inspections after the first inspection will be billed to the Developer on an hourly rate basis.
4. Timely Completion of Corrections List (Punchlist) - Once an inspection has been conducted by the Engineering Inspector, and a Corrections List (Punchlist) has been completed, the Developer and his Contractor are responsible for making the required corrections and notifying the Engineering Inspector that the corrections have been made within 30-calendar days, or the Corrections List becomes null and void and a new Corrections List will be required to be prepared. Again, additional inspection work required of the Engineering Inspector will be charged to the Developer for this additional work.

G. City's Role – The City also has an integral role in the review of the preparation, establishment, reduction and release of these bonds. These responsibilities include:

1. Bond Estimate Sheet – City staff are responsible for a timely and complete review of the bond estimate sheet, once it is provided to the Engineering Department by the Developer. The Engineering Department will review and either returns the bond estimate sheet to the Developer and his/her engineer for additional work, or will approve the draft bond estimate sheet for further processing.
2. Bond Form Preparation - The City Attorney's Office (CAO) is responsible for the review and approval of the bond agreement form. Once the CAO has completed its review, an approval of the bond will be forwarded to the ODA and ED for their information.
3. Developer/Contractor Certification for Bond Reduction/Release – City staff will review the *'certification form'* and perform an inspection on the *'system'* and will provide the Developer and Contractor a written response regarding their request within 7-days.
4. Timely Completion of Corrections List - Once the Developer has submitted a written indication that the Corrections List is complete; the Engineering Inspector will inspect the project again in relation to the Corrections List. The Engineering Inspector will provide a written response within 7-days as to whether the corrections list was completed, or whether items were not completed.

H. Payment for Extra Inspections – City inspection fee estimates include only one inspection for each type of inspection. The assumption is that the Developer and Contractor have

performed their own inspection based upon the City's inspection forms, that everything is complete, and that it is ready for City inspection. It is not the City's role to provide *'quality control/quality assurance'* for the developer's project, which we feel can be done in one inspection by City staff. Should the inspection require more than one inspection for a *'system'* bond reduction/release, the Developer will be charged on an hourly rate basis for the City's additional work effort.

I. Bond Estimate Unit Prices – The City Engineer is responsible for revising the City's bond estimate unit prices on at least a yearly basis (January or every year). The City Engineer may revise the bond estimate unit prices on a more frequent basis in cases where it is deemed necessary.

7.2 PRIVATE DEVELOPMENT PROJECT BONDS - GENERAL

A. There are also, several other different types of bonds used in the construction of private development projects. These bonds are generally described in this section so the Developer understands what each of these bonds are, what they are used for, who administers them, and where to find additional information concerning them. These bonds are:

1. Land disturbance activities and improvements bond
2. Revegetation bond
3. Restoration bond
4. Public improvement bond – landscaping & street lighting
5. Public improvement bond - infrastructure
6. Non-public improvement bond

B. Land Disturbance Activities and Improvements Bond, Revegetation Bond, and Restoration Bond – The Land Disturbance Activities and Improvements Bond, Revegetation Bond, and the Restoration Bond for the City of West Jordan are administered through *'Title 81, Chapter 4 – Bonds'*. Initiation, processing, reductions and releases of these bonds will be administered through this ordinance. The Developer is to be familiar with its particulars as the City will follow the provisions of the ordinance in administering these bonds.

The Engineering Department is responsible for establishing and releasing these three bonds related to land disturbance, grading, erosion control, revegetation, and restoration of areas disturbed as part of private development projects.

C. Public Improvement Bond – Landscaping & Street Lighting – This type of bond is required as its warranty period is different from the typical *'Public Improvement Bond - Infrastructure'* and it allows the *Public Improvement Bond – Infrastructure'* bond to be released more quickly As such, a separate, specific bond agreement is required to address issues specifically related to landscaping and street lighting.

D. Public Improvement Bond - Infrastructure – This type of bond addresses the public improvements required as part of the *'Released for Construction* Drawings', and only those public improvements shown on these drawings.

Public Improvement Bonds for the City of West Jordan are administered through *'Title 89, Chapter 6, Part 12 – Public Improvement Bonds'*. Initiation, processing, reductions and

releases of these bonds will be administered through this ordinance. The Developer is to be familiar with its particulars as the City will follow the provisions of the ordinance in administering these bonds.

The Engineering Department is responsible for establishing and releasing the Public Improvement Bond - Infrastructure related to public infrastructure improvements. This includes all of the items listed below, which are associated with public improvements.

1. Earthwork/erosion control
2. Culinary water
3. Secondary/irrigation water
4. Sanitary sewer
5. Storm drainage
6. Street improvements
7. Miscellaneous/finish items

Additional categories may be added if approved by the City Engineer. Reduction requests may be made only once every 30-days and no reduction is to be authorized until such time as the Engineering inspector has inspected the improvements and found them to be in compliance with the City's standards and specifications. Reductions are to be made only as they apply to the completion, satisfactory to the City Engineer, of entire systems.

The Warranty and Final bond reduction/release will be processed once all facilities have been completed, inspected and found to be acceptable by the City Engineer. The City will retain 10-percent of the bond amount plus the estimated cost of a one-inch thick asphalt concrete overlay for the roadways until Final Acceptance by the City Manager following the Warranty Period.

E. Non-public Improvement Bond – This bond is applied to projects where on-site, non-public, landscaping, or common area improvements is required as part of the Municipal Code or is conditioned by the Planning Commission. The Developer is to work with the Engineering Department, Community Development Department, and the City Attorney's Office in determining the amount of the bond. The Engineering Department is responsible for the administration of this bond with cooperation from the Community Development Department, which includes bond preparation, establishment, reductions and releases.

F. Planning Commission and Other Project Conditions – During the project review and approval process, a project may be conditioned to provide specified items as part of the project approval which does not fit into the bond categories indicated above. For instance, the Planning Commission may condition a project to construct a wall or landscaping which are on private property, which is not a common non-public improvement, and is not part of the already prepared *'Released for Construction Drawings'* set of drawings. In this situation, the Community Development Department may withhold the issuing of the *'Certificate of Occupancy'* for the project to ensure the completion of these conditions, or such improvements.

7.3 'RELEASED FOR CONSTRUCTION DRAWINGS'

A. General – These documents are mentioned in this section to indicate that it is from these documents that the bond estimate sheet and bond are to be prepared. Once these drawings are stamped and signed, then a final *'bond estimate sheet'* can be prepared.

B. Preparation and Finalizing – These drawings are initiated as part of a *'site plan'* project or the *'preliminary plat'* phase of a *'subdivision'* and are finalized as part of the *'final'* approval portions of these projects. The Developer and his/her engineer may submit draft *'bond estimate sheets'* from these preliminary reviews/approvals, however, only the finalized, stamped and signed version of these documents may be used to prepare the final *'bond estimate sheet'*, and subsequent final bond.

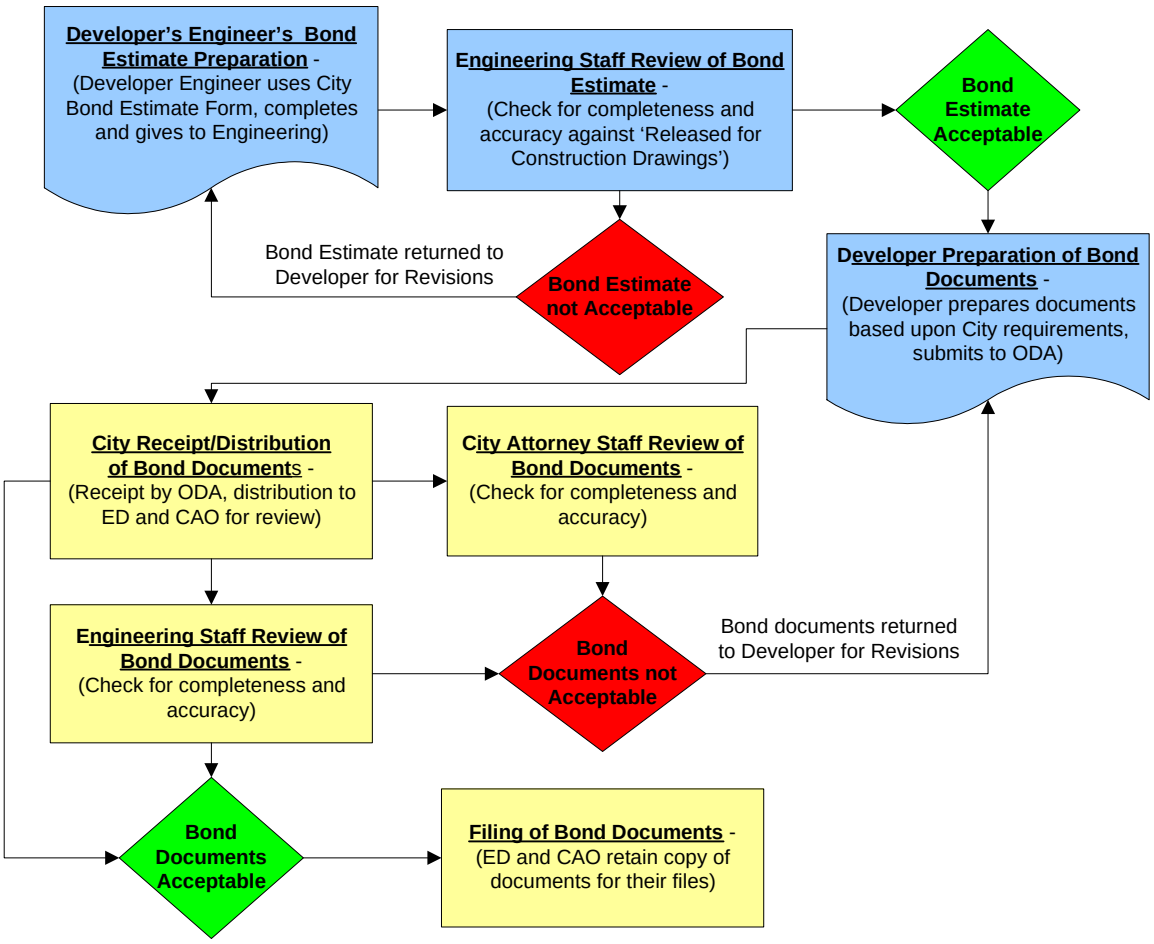
In the case where items are changed during construction, the Developer and his/her engineer/contractor are to submit proposed revised changes, which the City Engineer will then review, approve or deny, and make part of the *'Released for Construction Drawings'*. If the changes are significant enough, the *'bond estimate sheet'* must also be revised, and a new Public Improvement Bond prepared for these revisions.

C. City *'Released for Construction Drawings'* - *'Released for Construction Drawings'* are a specific set of documents which are signed by the City Engineer and other affected City departments and agencies, which define the specific *'public improvements'* which are to be constructed as part of the project. These drawings are the originating documents used for the preparation of the bond estimate sheet and subsequent bond.

7.4 BOND DOCUMENTS PREPARATION AND APPROVAL

A. General – The Developer has primary responsibility for bond document preparation and submission to the City and the City is responsible for review of these documents to ensure they meet City requirements. Corrections of these documents are the Developer's responsibility as is coordination with his/her staff and/or consultants used in the preparation of these documents. In general, the process is graphically described as follows:

Flowchart 8-02 – Bond Documents Preparation and Approval Process



B. Developer Engineer's Bond Estimate Preparation – The first step in the preparation of the bond documents, is the Developer's preparation of a draft *'bond estimate sheet'*. This is accomplished by obtaining a blank *'bond estimate sheet'* from the City Engineer, and using the finalized *'Released for Construction Drawings'* for the project to prepare a draft *'bond estimate sheet'* for the project. This document is to be stamped and signed by the Developer's engineer and submitted to the City Engineer for his/her review and approval.

C. City Staff Review of Bond Estimate – Once the *'bond estimate sheet'* has been prepared by the Developer's engineer and submitted to the City Engineer, he/she will review the estimate for completeness, comparing it against the *'Released for Construction Drawings'* and will provide a written response to the Developer and his/her engineer. The Developer is responsible for ensuring the necessary corrections are made and the document returned to the City Engineer for approval.

D. Developer Preparation of Bond Documents – Once the *'bond estimate sheet'* is approved by the City Engineer, he will provide a written response of such to the Developer and his/her engineer with copies to the CAO and ODA. The Developer is to work with the CAO in ensuring all CAO requirements are met.

E. Developer Submission of Bond – The Developer and his/her bonding company are to contact the CAO, ensure they understand the CAO's requirements, and then work toward addressing the CAO's requirements. Once the Developer feels the documents meet the CAO's requirements, submit these documents to the CAO for review. If the documents are acceptable, the CAO will notify the Developer of such in writing.

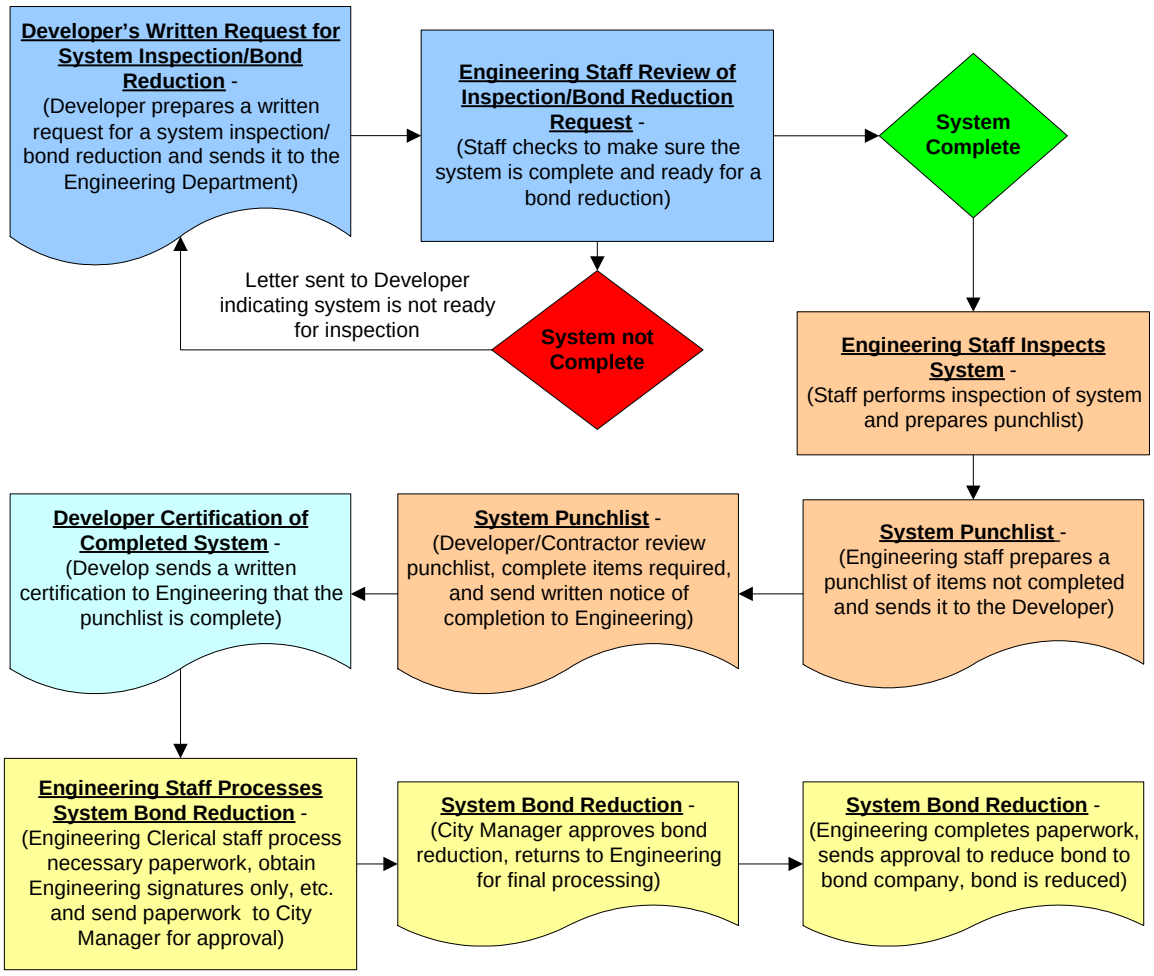
   If the documents are not acceptable, the CAO will also respond in writing to the Developer indicating what still needs to be provided and the ODA will be copied.

F. City Attorney Approval of Bond - Once the CAO is satisfied, it will stamp the documents as approved and send a written response to the Developer of their approval. Once all CAO requirements have been met, final documents will need to be submitted to the CAO and ODA for finalizing and filing with a copy to the ED.

7.5 SYSTEM BOND REDUCTIONS

A. General – The overall philosophy in requiring bond reductions on a *'system-by-system'* basis is ensure the quality of the end product and speed up the acceptance process. By doing this, the City can better ensure that each system, is complete and ready to be put into service, that fewer major fixes will be required at the end of the project, and that by requiring each *'system'* to be complete, that the Warranty Inspection and Final Inspections will be quicker and easier to accomplish, thereby saving. In general, the process is graphically described as follows:

Flowchart 8-03 – System Bond Reduction Process



B. Developer Written Request for System Inspection/Bond Reduction

1. General – The Developer is to provide the Engineering Department with a written request for a bond reduction/release and a certification that the *'system'* work is ready for inspection and reduction/release. A City form has been prepared for this purpose.

   The written request and certification sets the basis for the City inspecting the work, and ensures the Developer/his/her contractor understand what work must be completed and to what level this work must be completed in order to receive a bond reduction/release. It also ensures the City has *'systems'* which are ready to inspect, and results in a quicker reduction in bond proceeds.

   In the past, the City has reduced bond amounts based upon overall general completion of the project resulting a lot of work being delayed until the end of the project, and in not having completed *'systems'* until the very end of the project. This results in a number of difficulties in reducing or releasing bonds and completing items necessary to complete the Corrections List.

2. Developer written request – The Developer and his/her contractor are required to submit a written request for bond reduction/release along with a *'certification form'* for each *'system'* the Developer wishes to have a bond reduced/released. These forms are including in Appendix AA of the Development Processing Manual. The Developer and Contractor are to review the form and all of its provisions, sign and date the form certifying the *'system'* is ready for a bond reduction.
3. City staff review of request – City inspection staff will review the written request and certification and respond in writing to the Developer if the project is not ready for an inspection. If the request and certification are in order, the Engineering Inspector will complete the inspection.
4. City action – Once a completed *'certification form'* is received by the Engineering Department; the Engineering Inspector will schedule the project for an inspection.

C. City Staff Review of System Inspection/Bond Reduction Request

1. General – Once the Engineering Department has received a written request for a *'system'* bond reduction, Engineering inspection staff will review the request and project to ensure the project/system, is worthy of an inspection. If it is, an inspection will be performed. If it is not, the Developer and Contractor will be notified they have not sufficiently completed the project/system to allow an inspection to be completed.

D. System Inspection and Punchlist Preparation

1. General – Once it is determined the project/system is complete enough to inspect, an inspection will be performed, a punchlist prepared, and the punchlist will be sent to the Developer and Contractor.
2. Inspection checklists – City staff will be using the checklists contained in Appendices C, D, and E of the *'Private Development Construction Inspection Manual'* for inspection of the project. The Developer is required to have gone through these same checklists, and ensured each of the items is complete, prior to requesting a system release for that particular system.
3. Inspection of project – The Engineering inspection staff will use the *'system'* inspection checklist required, and will use it to inspect the *'system'* being requested to be released. If it appears the Developer and Contractor have not reviewed the checklist because there are so many items not completed, the Developer and Contractor will be notified of such. If the *'system'* is worthy of an inspection, then the inspection will be performed and a punchlist prepared.
4. Preparation and transmission of punchlist – Typically the Engineering Inspector and the Engineering Inspection Supervisor will be involved in the inspection. The inspection will be performed; a punchlist of uncompleted items prepared, and each person will sign the inspection form.

E. Developer Punchlist Corrections

1. General – The Developer/Contractor are required to complete all of the items indicated on the system/project punchlist and then notify the Engineering Department in writing through the use of the proper certification form, that the work is complete.
2. Developer completion of punchlist items – Once the punchlist has been prepared and sent to the Developer and Contractor, they are required to complete the items indicated on the

punchlist. If there are questions regarding any items on the punchlist, please contact the Engineering Inspector for additional information. The punchlist has a life of 30 calendar days. If items listed on the punchlist are not completed within the 30-day time period, the system/project will need to be reinspected and a new punchlist prepared, which will also have a life of 30-days. One inspection is included in the *'inspection fee'* and therefore, any inspections beyond the first inspection, must be paid for by the Developer in addition to the original inspection fee.

3. Developer Certificate of Completion – Once the Developer/Contractor has completed the City's inspection punchlist, the Developer is to certify the completion by the use of the forms contained in Appendix AA of the DPM. These forms are to be signed and dated, and then forward to the Engineering Department for processing.

F. Bond Reduction Processing

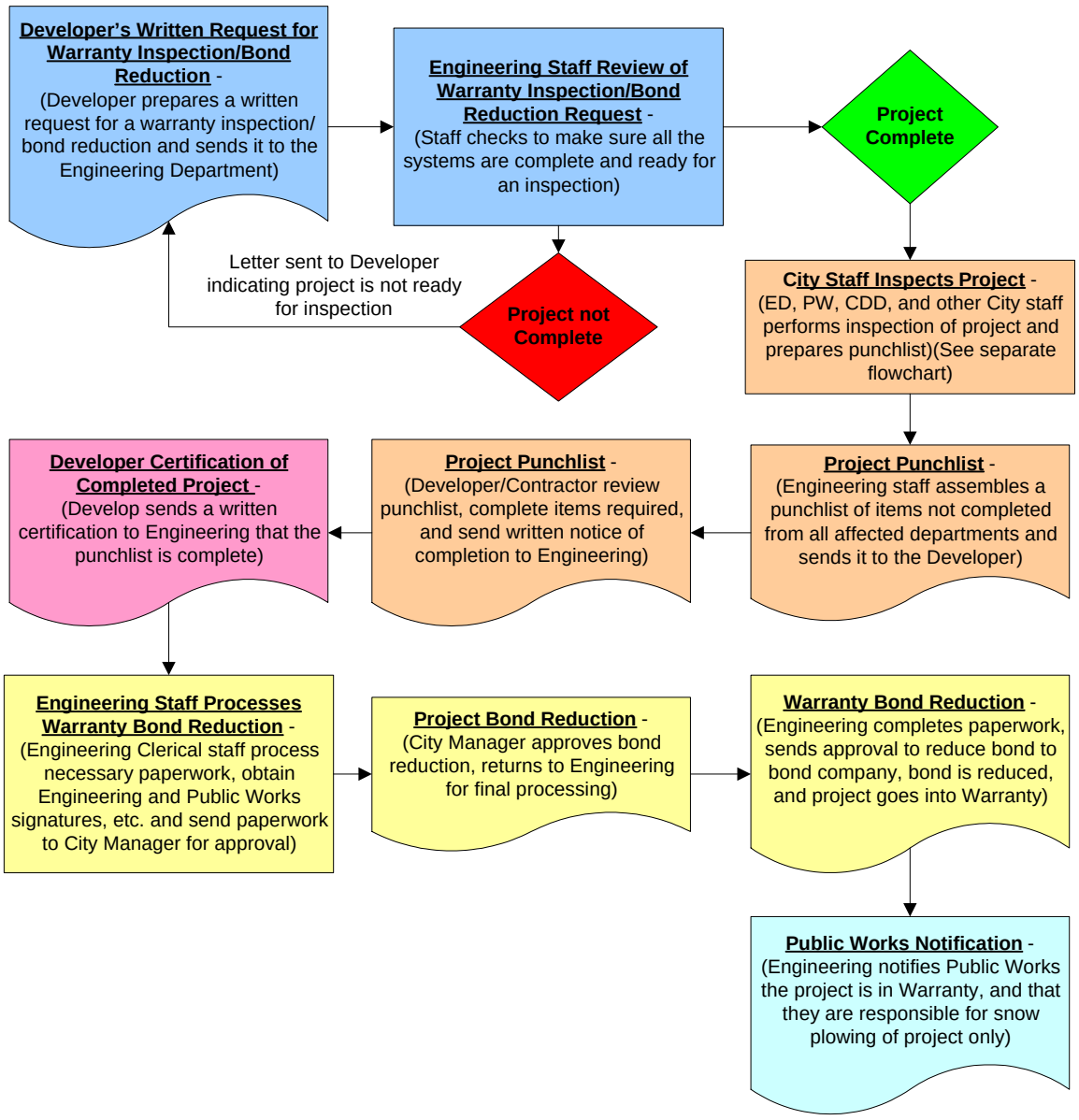
1. Certification of completion for system/project – Once the Engineering Department has received the Developer's/Contractor's certification that the punchlist has been completed, the Engineering inspection staff will reinspect the project and certify all items have been completed. If all items are complete, the Engineering Inspection Supervisor will forward his approval to the Engineering clerical staff for bond reduction processing.
2. Engineering clerical staff preparation of paperwork – With the receipt of certification from the Engineering inspection staff that the system/project is ready; the Engineering clerical staff will initiate the processing of the paperwork necessary to reduce the bond. This will require that the Engineering Inspector, Engineering Inspection Supervisor, and the City Engineer sign the form so the reduction can be processed.
3. Approvals by Engineering staff only – Bond reductions will require only the signatures of the Engineering Inspector, Engineering Inspection Supervisor, and the City Engineer for processing. Once the project reaches the Warranty Inspection, and Final Inspection stage, then other departments will be involved to ensure their concerns are also addressed. This is done in order to reduce the amount of time required to finalize a bond reduction.
4. Approval by City Manager – Once all items have been completed on the *'system'* bond reduction process applications and forms and have been reviewed by the City Engineer, and then the *'system'* bond reduction process documents are ready to be submitted to the City Manager for approval. If the documents are signed and approved by the City Manager, the Administrative Assistant will then copy the documents and distribute them to the Developer.

7.6 WARRANTY INSPECTION/BOND REDUCTION

A. General – The overall philosophy in requiring a Warranty Inspection is to set the time at which the Developer/Contractor and City agree the project is complete, and the Warranty Period can begin. It assumes that an inspection of the entire project will be performed, a punchlist prepared and given to the Developer/Contractor, and that the punchlist is completed. Once it is agreed that the punchlist is completed, then the Warranty Period can begin. In addition to the descriptions contained in this Manual, also please refer to the PDCIM, *'Section 5.0 – Warranty Inspection/Acceptance Requirements'* for additional details regarding this process.

As is described in the Ordinance, bond proceeds will be reduced on a *'system-by-system'* basis, and at the most, once monthly. Once all items under a given *'system'* description have been constructed, inspected and deemed completed by the Engineering Inspector, a written request from the Developer will initiate the processing of the necessary bond reduction. This will result in a 75-percent total reduction in the bond amount for each system prior to the beginning of the Warranty Period, minus the *'Finish Items'* portion of the bond. Once the Warranty Inspection has been completed, all Corrections List items completed and verified by the Engineering Inspector, the remaining *'systems'* amounts plus the 90-percent of the *'Miscellaneous Items'* portion of the bond will be released at this time. At the end of the Warranty Period, the remaining 10-percent of the *'Public Improvement Bond - Infrastructure'* will be released. The *'Public Improvement Bond – Landscaping & Street Lighting'* which has a longer warranty period will not be released until its requirements have been met. In general, the process is graphically described as follows:

Flowchart 8-04 Warranty Inspection/Bond Reduction Process



B. Developer Application for Warranty Inspection

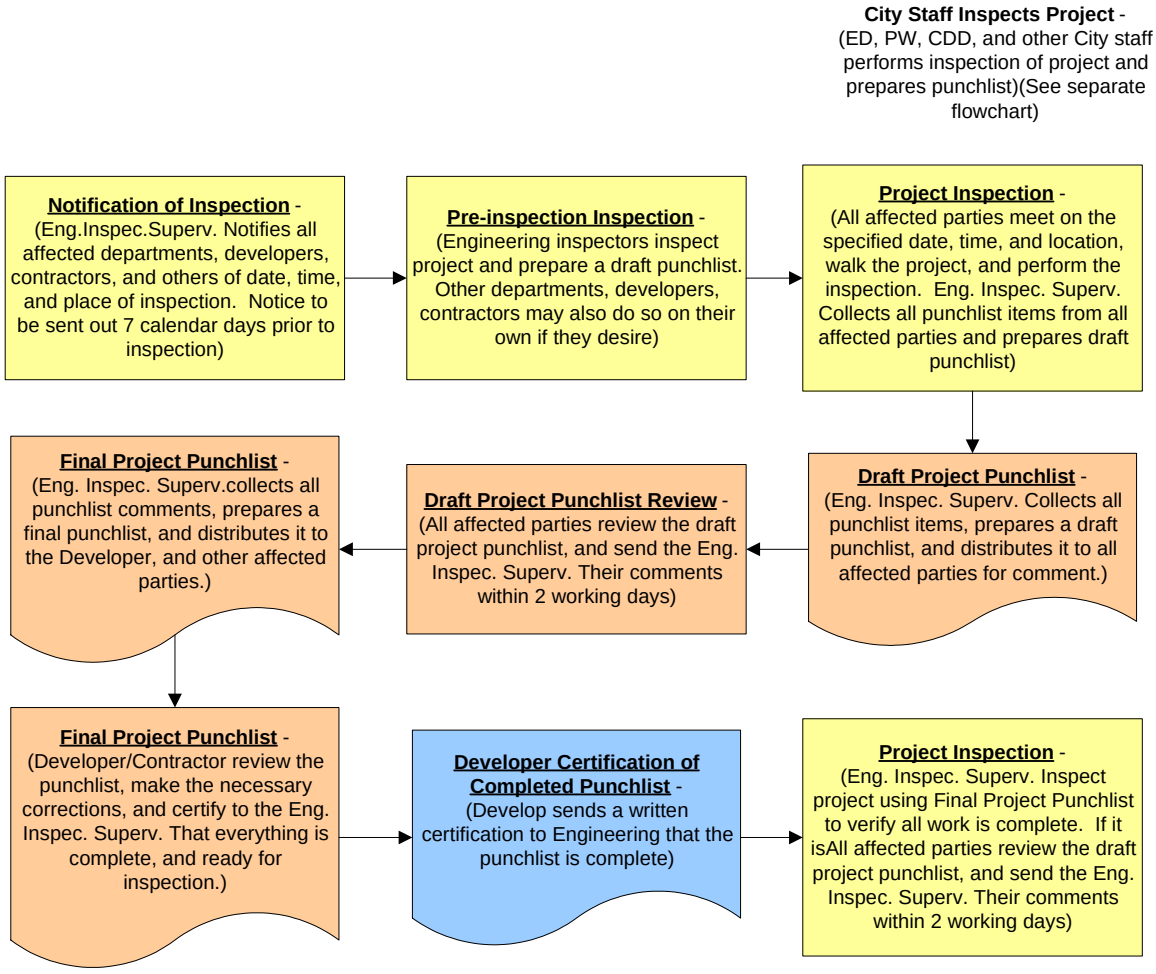
1. General – The Developer needs to provide the Engineering Department with a written request for a Warranty Inspection and a certification that the *'project'* work is ready for inspection and reduction/release. The written request and certification sets the basis for the City inspecting the work, and ensures the Developer/his/her contractor understands what work is to be completed and to what level this work needs to be completed in order to receive a Warranty Inspection. It also ensures the City has a project which is ready to inspect, and results in a quicker inspection, putting the project into the Warranty period, and reduction in bond proceeds.

2. Developer written request – The Developer and his/her contractor are to submit a written request for Warranty Inspection along with a *'certification form'* for each the 'project'. These forms are included in Appendix F of the Private Development Construction Inspection Manual. The Developer and Contractor are to review the form and all of its provisions, sign and date the form certifying the *'project'* is ready for a Warranty Inspection.
3. City staff review of request – City inspection staff will review the written request and certification and respond in writing to the Developer if the project is not ready for a Warranty Inspection. If the request and certification are in order, the Engineering Inspector will schedule a time for inspection of the project.
4. City action – Once a completed *'certification form'* is received by the Engineering Department; the Engineering Inspector will schedule the project for an inspection.

C. Project Inspection and Punchlist Preparation

1. General – Once it is determined the project/system is complete enough to inspect, an inspection will be performed, a punchlist prepared, and the punchlist will be sent to the Developer and Contractor. In general, the process is graphically described as follows:

Flowchart 8-05 Warranty and Final Inspection/Punchlist Preparation



2. Inspection checklists – Inspection checklists – City staff will be using the checklists contained in Appendices C, D, and E of the Private Development Construction Inspection Manual for inspection of the project. The Developer is to have gone through these same checklists, and ensured each of the items is complete, prior to requesting a system release for that particular system.
3. Inspection of project – The Engineering inspection staff will use the *'system'* inspection checklist required, and will use it to inspect the *'system'* being requested to be released. If it appears the Developer and Contractor have not reviewed the checklist because there are so many items not completed, the Developer and Contractor will be notified of such. If the *'system'* is worthy of an inspection, then the inspection will be performed and a punchlist prepared.
4. Preparation and transmission of punchlist – Typically the Engineering Inspector and the Engineering Inspection Supervisor will be involved in the inspection. The inspection will be performed; a punchlist of uncompleted items prepared, and each person will sign the inspection form.

D. Developer Punchlist Corrections

1. General – The Developer/Contractor is to complete all of the items indicated on the project punchlist and then notify the Engineering Department in writing through the use of the proper certification form, that the work is complete.
2. Developer completion of punchlist items – Once the punchlist has been prepared and sent to the Developer and Contractor, they are to complete the items indicated on the punchlist. If there are questions regarding any items on the punchlist, please contact the Engineering Inspector for additional information. The punchlist has a life of 30-calendar days. If items listed on the punchlist are not completed within the 30-day time period, the project will need to be reinspected and a new punchlist completed, which will also have a life of 30-days. One inspection is included in the *'inspection fee'* and therefore, any inspections beyond the first inspection must be paid for by the Developer in addition to the original inspection fee.
3. Developer Certificate of Completion – Once the Developer/Contractor has completed the City's inspection punchlist, the Developer is to certify the completion by the use of the forms contained in Appendix AA of the DPM. These forms must be signed and dated, and then forward to the Engineering Department for processing.

E. Warranty Bond Reductions Processing

1. Certification of completion for project – Once the Engineering Department has received the Developer's/Contractor's certification that the punchlist has been completed, the Engineering inspection staff will reinspect the project and certify all items have been completed. If all items are complete, the Engineering Inspection Supervisor will forward his approval to the Engineering clerical staff for Warranty inspection/bond reduction processing.
2. Engineering clerical staff preparation of paperwork – With the receipt of certification from the Engineering inspection staff that the project is ready, the Engineering clerical staff will initiate the processing of the paperwork necessary to put the project into the Warranty Period, and reduce the bond. This will require that the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and Public Works Department Director sign the form so the reduction can be processed.
3. Approvals by Engineering and Public Works departments' staff – Bond reductions will require only the signatures of the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and the Public Works Department for processing. Community Development Department concerns have already been addressed by either a separate bond, which they will administer, or through inclusion of their issues in the Public Improvement Bond, which will be inspected and processed by the Engineering Department. This is done in order to reduce the amount of time required to finalize a bond reduction.
4. Approval by City Manager – Once all items have been completed on the 'warranty' bond reduction process applications and forms and have been reviewed by the City Engineer, and then the 'warranty' bond reduction process documents are ready to be submitted to the City Manager for approval. If the documents are signed and approved by the City Manager, the Administrative Assistant will then copy the documents and distribute them to the Developer.

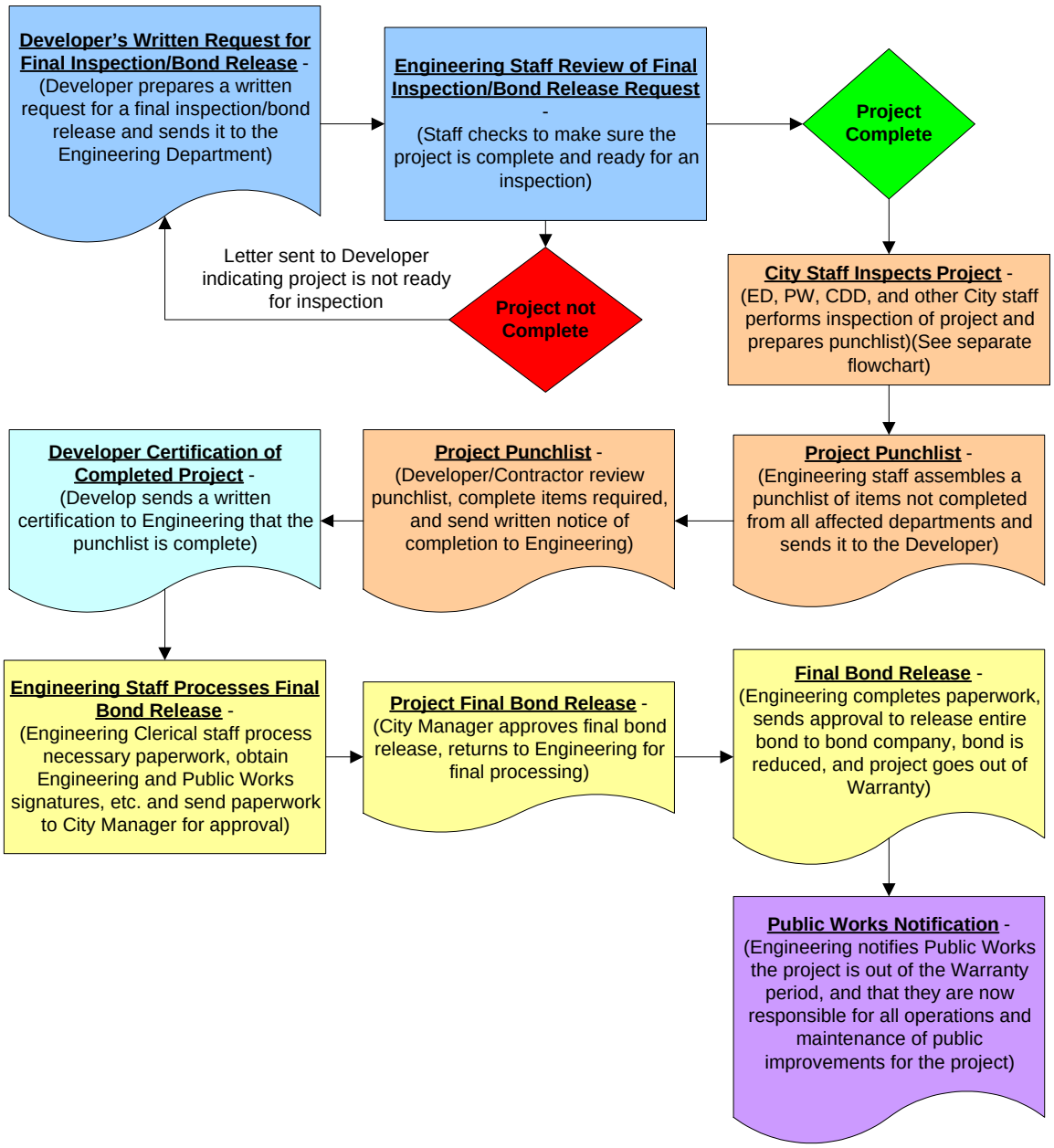
F. Public Works Department Notification

1. Engineering staff notifies Public Works they are responsible for now snow plowing for the project – Once the Warranty Inspection/bond reduction has been fully processed and approved by the City Manager, the City Engineer will notify the Public Works Department of such and inform them they are responsible for snow plowing operations of the project only. All other maintenance activities are still the responsibility of the Developer until the Warranty Period is complete, and the project accepted by the City.

7.7 FINAL INSPECTION/BOND RELEASE

A. General – The overall philosophy in requiring a Final Inspection is to set the time, at which the Developer/Contractor and City agree the project is complete, and the Warranty Period is complete, and the City is responsible for taking over the complete operations and maintenance of the public infrastructure. It assumes that an inspection of the entire project at the end of the Warranty Period will be performed, a punchlist prepared and given to the Developer/Contractor, and that the punchlist is completed. Once it is agreed that the punchlist is completed, then the Warranty Period is complete and the City assumes operation and maintenance activities. In general, the process is graphically described as follows:

Flowchart 8-06 Final Inspection Bond Release Process



B. Developer Application for Final Inspection

1. General – The Developer is to provide the Engineering Department with a written request for a Final Inspection and a certification that the *'project'* work is ready for inspection and release.

   The written request and certification sets the basis for the City inspecting the work, and ensures the Developer/his/her contractor understand what work must be completed and to

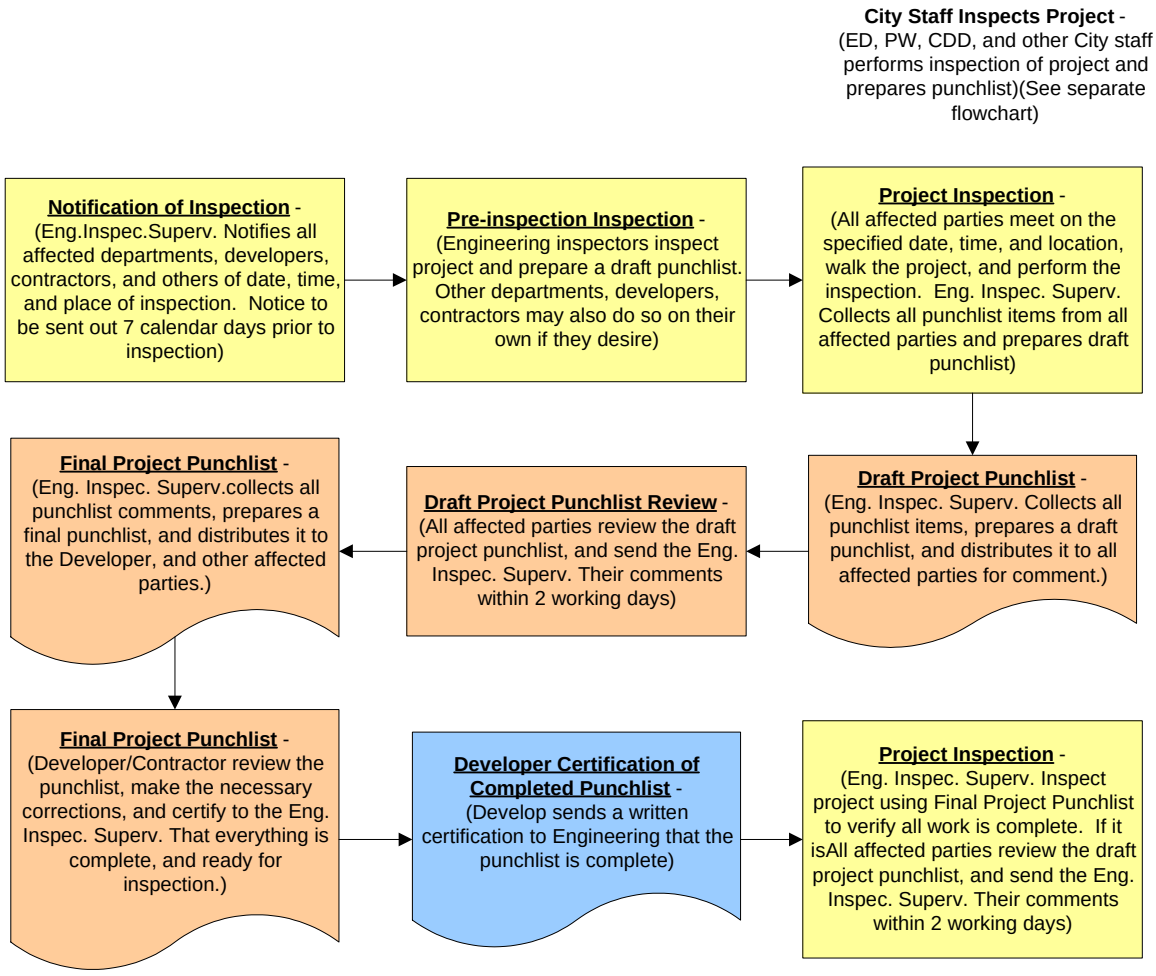
what level this work must be completed in order to receive a Final Inspection. It also ensures the City has a project which is ready to inspect, and results in a quicker inspection, taking the project out of the Warranty period, and release of the bond.

2. Developer written request – The Developer and his/her contractor are required to submit a written request for Final Inspection along with a *'certification form'* for each the 'project'. These forms are included in Appendix F of the Private Development Construction Inspection Manual. The Developer and Contractor are to review the form and all of its provisions, sign and date the form certifying the *'project'* is ready for a Final Inspection.
3. City staff review of request – City inspection staff will review the written request and certification and respond in writing to the Developer if the project is not ready for a Final Inspection. If the request and certification are in order, the Engineering Inspector will schedule a time for inspection of the project.
4. City action – Once a completed *'certification form'* is received by the Engineering Department; the Engineering Inspector will schedule the project for an inspection.

C. Project Inspection and Punchlist Preparation

1. General – Once it is determined the project is complete enough to inspect, an inspection will be performed, a punchlist prepared, and the punchlist will be sent to the Developer and Contractor. In general, the process is graphically described as follows:

Flowchart 8-05 Warranty and Final Inspection/Punchlist Preparation



2. Inspection checklists – Inspection checklists – City staff will be using the checklists contained in Appendices C, D, and E of the *'Private Development Construction Inspection Manual'* for inspection of the project. The Developer is required to have gone through these same checklists, and ensured each of the items is complete, prior to requesting a system release for that particular system.
3. Inspection of project – The Engineering inspection staff will use the *'system'* inspection checklist required, and will use it to inspect the *'system'* being requested to be released. If it appears the Developer and Contractor have not reviewed the checklist because there are so many items not completed, the Developer and Contractor will be notified of such. If the *'system'* is worthy of an inspection, then the inspection will be performed and a punchlist prepared.
4. Preparation and transmission of punchlist – Typically the Engineering Inspector and the Engineering Inspection Supervisor will be involved in the inspection. The inspection will be performed; a punchlist of uncompleted items prepared, and each person will sign the inspection form.

D. Developer Punchlist Corrections

1. General – The Developer/Contractor are required to complete all of the items indicated on the project punchlist and then notify the Engineering Department in writing through the use of the proper certification form, that the work is complete.
2. Developer completion of punchlist items – Once the punchlist has been prepared and sent to the Developer and Contractor, they are required to complete the items indicated on the punchlist. If there are questions regarding any items on the punchlist, please contact the Engineering Inspector for additional information. The punchlist has a life of 30-calendar days. If items listed on the punchlist are not completed within the 30-day time period, the project will need to be reinspected and a new punchlist completed, which will also have a life of 30-days. One inspection is included in the *'inspection fee'* and therefore, any inspections beyond the first inspection must be paid for by the Developer in addition to the original inspection fee. This will be done on an hourly rate basis of those involved in the inspection, or preparation of paperwork, in any way.
3. Developer Certificate of Completion – Once the Developer/Contractor have completed the City's inspection punchlist, the Developer must certify the completion by the use of the forms contained in Appendix AA of the DPM. These forms must be properly signed and dated, and then forward to the Engineering Department for processing.

E. Final Bond Release Processing

1. Certification of completion for project – Once the Engineering Department has received the Developer's/Contractor's certification that the punchlist has been completed, the Engineering inspection staff will reinspect the project and certify all items have been completed. If all items are complete, the Engineering Inspection Supervisor will forward his approval to the Engineering clerical staff for Final inspection/bond release processing.
2. Engineering clerical staff preparation of paperwork – With the receipt of certification from the Engineering inspection staff that the project is ready, the Engineering clerical staff will initiate the processing of the paperwork necessary to take the project out of the Warranty Period, and release the bond. This will require that the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and Public Works Department Director sign the form so the reduction can be processed.
3. Approvals by Engineering and Public Works department's staff – Bond releases will require only the signatures of the Engineering Inspector, Engineering Inspection Supervisor, the City Engineer, and the Public Works Department for processing. Community Development Department concerns have already been addressed by either a separate bond, which they will administer, or through inclusion of their issues in the Public Improvement Bond, which will be inspected and processed by the Engineering Department. This is done in order to reduce the amount of time required to finalize a bond reduction.
4. Approval by City Manager – Once all items have been completed on the 'final' bond reduction process applications and forms and have been reviewed by the City Engineer, and then the 'final' bond reduction process documents are ready to be submitted to the City Manager for approval. If the documents are signed and approved by the City Manager, the Administrative Assistant will then copy the documents and distribute them to the Developer, the developer's bonding company, and others as noted on the documents.
5.

F. Public Works Department Notification

1. Engineering staff notifies Public Works they are responsible for all operations and maintenance for the project – Once the Final Inspection/bond release have been fully processed and approved by the City Manager, the City Engineer will notify the Public Works Department of such and inform them they are responsible for all operations and maintenance of the project.

   A more complete description of the transition to the Public Works Department is described in the PDCIM, *'Section 6.10 – Public Works Department Assumption of Maintenance Responsibilities'*.

7.8 ACCEPTANCE BY CITY

A. General – The *'project'* will not be accepted by the City until all of the City's requirements have been met. Acceptance requirements are fully described in *'Section 6.0 – Final Inspection, Acceptance Requirements'* of the PDCIM.

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SECTION 8.0

ABANDONMENT

8.1 GENERAL

All existing sanitary sewer lines or structures which are to be abandoned shall be indicated on the Drawings by the developer's engineer along with the method of abandonment. In general, abandoned main lines that are in service will be replaced with a parallel line of equal or larger size, and the engineer shall demonstrate in any case that the abandonment does not adversely affect the sanitary sewer system.

All abandonment and construction techniques shall be discussed with the Engineering Department inspector and approved prior to any such work.

8.2 DEMOLITON/REPLACEMENT OF STRUCTURE(S) AND ABANDONMENT OF SANITARY SEWER LATERAL(S)

A. Demolition of Structure(s) and Abandonment of Sanity Sewer Lateral(s) - In cases where an existing structure is to be demolished and will not immediately be replaced with a new structure, the water service line and sanitary sewer lateral, and all appurtenances shall be removed and disconnected, at the respective main line.

The Applicant shall first coordinate with the Building and Safety Division of the City, to obtain a *'Building Permit'* and complete a *'Building Demolition(s)'* application.

As part of the *'Building Permit'* application, the Applicant shall also apply for a *'Public Right-of-Way Encroachment Permit'* (Appendix F) for the work in the City's right-of-way, and a *'Water/Sanitary Sewer Service Abandonment Permit'* (Appendix F), which are administered through the City's Engineering Department. The requirements of both of these Engineering Department permits shall be met, prior to the City Engineer issuing permits for this work. The *'Building Permit'* shall not be deemed to be complete

In processing and finalizing the *'Water/Sanitary Sewer Service Abandonment Permit'*, the following shall be complied with:

1. Demolition Plans – The Applicant shall submit drawings of the site that show the location of the structure(s), location and depth of all utilities including power, gas, water, sanitary sewer, and any other utility.
2. Termination Details – The Applicant shall provide detailed drawings and specifications of how the water and sanitary sewer services are to be terminated including methods and types of materials. New materials shall be used in all termination construction.
3. Inspection Prior to Covering - An Engineering Inspector shall see the work performed including the termination points at the main lines, prior to the Applicant or his Contractor covering these facilities. If these facilities are covered, and were not observed by the Engineering Inspector, they shall be uncovered for the Inspector's observation.

4. Encroachment Permit – All requirements of the City's *'Public Right-of-Way Encroachment Permit'* shall be met as part of this work.

B. Replacement of Structure(s) and Abandonment of Sanity Sewer - In cases where a structure is existing on a parcel, but the use of the property and types of building(s) are changing, the water service line and wastewater lateral, and all appurtenances shall be evaluated to determine whether the existing service line and lateral can be reused, or must be removed and replaced with another service line and lateral of a different material type and size.

The Applicant shall first coordinate with the Building and Safety Division of the City, to obtain a *'Building Permit'* and complete a *'Building Demolition(s)'* application.

As part of the *'Building Permit'* application, the Applicant shall also apply for a *'Public Right-of-Way Encroachment Permit'* for the work in the City's right-of-way, and a *'Water/Sanitary Sewer Service Abandonment Permit'*, which are administered through the City's Engineering Department. The requirements of both of these Engineering Department permits shall be met, prior to the City Engineer issuing permits for this work. The *'Building Permit'* shall not be deemed to be complete.

In evaluating whether the sewer lateral must be replaced or may remain in place, the information indicated below shall be submitted to the City Engineer for his/her evaluation. The City Engineer will determine the viability of the existing wastewater lateral and whether it can remain, or must be replaced. The Applicant shall provide the following information:

1. A video inspection tape of the lateral by a City approved contractor. City staff shall be present when the video inspection is being made.
2. Material type of the existing lateral.
3. Diameter of the existing lateral, and slope of the lateral if obtainable.
4. Indication of the proposed use of the property, type of building to be constructed, number of sewer fixtures in the building, any processes which will contribute to the sewer lateral.
5. The age of the existing sewer lateral.

Once the City Engineer has received and evaluated the information, he will make a finding of the lateral and provides his/her determination to the Applicant.

In processing and finalizing the *'Water/Sanitary Sewer Service Abandonment Permit'*, or the *'Sanitary Sewer Service Connection Permit'* (Appendix F) the following shall be complied with:

1. Structure Demolition/Replacement Plans – The Applicant shall submit drawings of the site that show the location of the structure(s), location and depth of all utilities including power, gas, water, wastewater, and any other utility.
2. Sewer Fixture Count/Processes which might contribute to sewer flows - The Applicant shall provide a detailed drawing of the proposed structure along with a fixture count of sewer fixtures for the proposed structure. The Applicant shall also identify any additional internal processes in the structure which might contribute flows to the sewer system along with anticipated flows, methods of operations, etc.
3. Inspection Prior to Covering - An Engineering Inspector shall see the work performed including the termination points at the main lines, prior to the Applicant or his Contractor

covering these facilities. If these facilities are covered, and were not observed by the Engineering Inspector, they shall be uncovered for the Inspector's observation.

4. Encroachment Permit – All requirements of the City's *'Public Right-of-Way Encroachment Permit'* shall be met as part of this work.

8.3 SANITARY SEWER LINES

Sanitary sewer lines to be abandoned shall be entirely filled by pumping concrete into them. The pump mix shall be a mixture sufficiently workable for the purposes intended and shall be a concrete mix of 2,000 psi minimum. Laterals to be abandoned shall be plugged at the property line or as directed by the Engineering Department.

8.4 STRUCTURES

Structures to be abandoned shall have all openings, inlets and outlets sealed off as set forth in Section 02719 – Sanitary Sewer System. The structure shall then be removed to a minimum depth of 9-feet below proposed finish grade and filled with imported sand (see materials section) if structure is within street right-of-way or filled with earth and compacted if outside of street right-of-way.

8.5 EASEMENTS OR RIGHTS-OF-WAY

All easement and right-of-way abandonments shall be provided for as part of the development processing, not during construction. If it is determined that easements or property must be abandoned during construction, the project will be put on hold until the property issues are resolved to the satisfaction of the City and the Salt Lake County Recorder's office.

8.6 SALVAGED MATERIALS

Disposal of salvaged metal castings such as frames and covers and other metal appurtenances, unless otherwise specified, shall be the Contractor's responsibility.

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