REDLINED EDITION

Pleasant View City Corporation

Development, Design, & Construction Standards

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Prepared by

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DEVELOPMENT, DESIGN, AND CONSTRUCTION STANDARDS

for

PLEASANT VIEW CITY

SUBMITTED & RECOMMENDED:

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SECTION 1 GENERAL

1.01 Ordinances Govern

Nothing in this document shall be construed to be contrary to Pleasant View City Ordinances. Should a conflict exist between this document and the Ordinances, the Ordinances shall govern.

1.02 Conformance with Federal, State, and Local Laws

Nothing in this document shall relieve the Developer, Engineer, or Contractor from abiding by any and all Federal, State, and local laws.

1.03 Definitions

A. Chapter – When "Chapter" is written, it shall be as if "Pleasant View City Ordinance, Chapter" is written.

B. Contractor – The individual, firm, co-partnership, or corporation, and his, their, or its heirs, executors, administrators, successors, and assigns, or the lawful agent of any such individual firm, partnership, covenanter, or corporation, or his, their, or its surety under the contract bond, constituting one of the principals to the contract and undertaking to perform the Work.

C. Drawings – The City-approved construction drawings, the Pleasant View City Public Works Standard Drawings, and/or the Manual of Standard Drawings, as applicable.

D. Developer – The person sponsoring construction of the improvements.

E. Development – The subject subdivision, minor subdivision, or building.

F. Improvements – See "Work."

G. Improvement Plans – See "Drawings."

H. Inspector – The authorized representative of the City or City Engineer assigned to make all necessary inspections of the Work performed or being performed, or of materials furnished or being furnished by the Contractor.

I. Work – All types of work necessary to provide safe access and utility service to and within proposed subdivision or site, including, but not limited to, site grading, utility installation, and street construction. Work includes all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning.[1]

[1] From EJCDC© C-700, Standard General Conditions of the Construction Contract.

J. See also "Title 17 – Subdivisions" of the Pleasant View City Ordinances. Where definition conflicts arise between City Ordinance and this document, the definitions in this document shall take precedence when in reference to this document.

1.04 Acronyms

A. BMP – Best Management Practice

B. CFP – Capital Facilities Plan

C. DDW – Division of Drinking Water

D. DWQ – Division of Water Quality

E. DWRi – Division of Water Rights

F. FEMA – Federal Emergency Management Agency

G. HOA – Homeowners' Association

H. LID – Low Impact Development

I. PVC – Pleasant View City

J. RCP – Reinforced Concrete Pipe

K. UAC – Utah Administrative Code

L. UDEQ – Utah Department of Environmental Quality

M. UDOT – Utah Department of Transportation

N. UPDES – Utah Pollutant Discharge Elimination System

O. UPRR – Union Pacific Railroad

P. USACE – United States Army Corps of Engineers

Q. UTA – Utah Transit Authority

1.05 Public Works Standards

This document is commonly known as the "Public Works Standards," "City Standards," or "the Standards."

1.06 Variances from the Public Works Standards

A. ~~A.~~ When a Developer believes that meeting a specific requirement contained within the current edition of the Public Works Standards is technically infeasible, Developer may ~~make application to the for~~ request a variance from the Standards.

B. This ~~application~~request shall include technical reasoning for the proposed variance along with a proposed solution and mitigation measures, if applicable.

~~Q.~~ A panel consisting of the City Engineer, and the Public Works Director shall assess whether the request meets the goals and requirements of the Standards without unduly jeopardizing the public's safety and interest. Upon review of the application, the Panel may grant or deny

the variance from the Standards.

~~**1.05 Modification Process**~~

~~A. Whenever, in the opinion of the City Public Works Department, the City Engineer, or the Superintendent having jurisdiction, a literal enforcement of these regulations may work create an undue hardship or a literal enforcement of the provisions may be otherwise unnecessary to meet the goals and standards of the City, the City may modify those standards in the following manner:~~

~~B.~~C. ~~Modifications may be granted when there are practical difficulties involving carrying out the provisions of the Public Works Standards and Technical Specifications and a panel consisting of the City Planner, City Engineer, and the Public Works Director or his Representative determine that granting of a modification for an individual case will meet the goals and requirements of the City without unduly jeopardizing the public and the individual's interest.~~

~~1. The City shall first receive a written request for a modification to the standards from any interested party.~~

~~2. Upon receipt of the request, the panel of three discussed above shall find that a special individual reason makes the strict letter of the standard impractical, and shall find the modification is in conformance with the intent and purpose of the standards and shall find that such modification does not in any way lessen the integrity of the standards.~~

~~3. When such findings of fact are made, the panel may grant such modification as it deems appropriate. The details of any action granted as modification by this panel shall be recorded and entered in the files of the City, with the specific reasons for the granting of said modification.~~

SECTION 2 DEVELOPMENT STANDARDS

2.01 Approval Procedure

See Title 17 – Subdivisions of the Pleasant View City Ordinances for details not contained in this document.

2.02 Developer Responsibilities

A. Required Improvements and Guarantees – see Chapter 17.20 of Pleasant View City Ordinances.

B. Permits and Approvals

1. Developer is responsible for obtaining all necessary permits and approvals for the construction of the Improvements. Copies of all applications and approved permits shall be submitted to the City. Agencies/permits that may be required include, but are not limited to:

   a. DDW Plan Approval (pre-construction)

   b. DDW Operating Permit (post-construction)

   c. UPDES NOI and NOT

   d. DWRi Stream Alteration

   e. DWRi Dam Safety

   f. EPA 404 Wetlands

   g. FEMA LOMA and/or LOMR

   h. UDOT

   i. Others as applicable

C. Improvements

~~1. The required improvements shall include:~~

~~a. All street improvements in front of all lots along all dedicated streets to a connection with existing improvements of the same kind and to the boundary(ies) of the subdivision(excluding through remnant or remainder parcels).~~

~~2.~~1. All street, storm drain lines, water lines, sewer lines, and any other buried utility lines and conduits shall be installed to the boundary lines of the subdivision where reasonably expected to extend as determined by the City Engineer and based on anticipated future development and the City's capital facilities plans and/or master plans. Design must provide for future extension to adjacent development and be compatible with the contour of the ground.

See Chapters 17.18 and 17.20 of Pleasant View City Ordinances for more information.

~~3.~~2. Upsizing based on CFPs – The Developer will be required to construct/install infrastructure sized in accordance with the City's currently adopted CFPs. The City will be responsible for paying difference in cost between the master planned infrastructure size and the minimum infrastructure size required for the development.

~~4. Seal Coat Escrow – See City Ordinances.~~

~~5. Street Lighting Escrow – See City Ordinances.~~

~~6. Street Signage Escrow – See City Ordinances.~~

~~7.~~3. Temporary Turnaround ~~Escrow~~ – See Section ~~3.05.I~~6.09 of this document.

~~8.~~4. Materials and Construction Testing ~~Escrow~~ – Developer ~~shall escrow for all~~is responsible for all materials and construction testing. ~~Testing will be performed by one of the City's pre-selected testing agencies. Developer/contractor is responsible for all coordination. See Section 4.03.I for more information.~~

~~9.~~5. Survey and GIS Mapping of ~~Existing~~ New Improvements – Developer shall reimburse City for City Engineer's time spent surveying and mapping ~~in locations of~~ new improvements, including but not limited to manholes, catch basins, detention basins, LID measures, valves, services, ~~and~~ fire hydrants, signs, and striping.

2.03 Subdivision Standards

A. The general standards for subdivision layout and development are found in Chapters 17.18 and 17.20 of Pleasant View City Ordinances.

B. See also Sections 3 through 8 ~~– Design Standards and Section 4 – Construction Standards~~ of this document.

2.04 Geotechnical Investigation

A. A geotechnical investigation ~~should be conducted~~is required for the following:

1. All new subdivisions with more than two (2) lots (excluding residential minor subdivisions where no infrastructure is required);
2. All commercial subdivisions and sites;
3. Any subdivision that includes public infrastructure improvements;
4. Any development in the Sensitive Lands zone; and
5. Upon request of the City Engineer.

B. The geotechnical investigation should be complete in nature, and its findings shall be summarized in a Geotechnical Report. The Geotechnical Report shall be signed and sealed by a licensed Professional Engineer with expertise in the field of geotechnical engineering.

C. See Appendix B for requirements regarding the Geotechnical Report, including minimum testing requirements and design parameters.

SECTION 3 DESIGN STANDARDS – GENERAL

3.01 Required Improvements

A. See Chapter 17.20 of Pleasant View City Ordinances for information on the required improvements.

B. See also Section 2.02, Section ~~5~~ 9 – Standard Specifications, and Section ~~6~~ 10 – Standard Drawings, Plans, and Details of this document for additional information.

3.02 Improvement Plans

A. Complete and detailed, and signed and sealed (in accordance with Utah Code 58-22-602) improvement plans (e.g. construction drawings)~~plans and drawings of improvements~~ shall be submitted to the City for ~~the~~ review by the Development Review Committee in accordance with City Code.~~City Engineer prior to receiving final plat approval and prior to commencing construction~~. Per Title 17, no construction, including dirt work, shall begin until a) the approval of the Preliminary Subdivision Application by the approval authority and b) the holding of a preconstruction meeting~~plans have been checked and approved by the City Engineer, and final approval is granted by the City Council~~.

B. The following instructions are for the purpose of standardizing the preparation of drawings to obtain uniformity in appearance, clarity, size, and style. The plans and designs shall meet the standards defined in the specifications and drawings hereinafter outlined. The minimum information required on the drawings for improvements is as follows:

1. All drawings and/or prints shall be clear and legible and conform to industry standard engineering and drafting practices.
2. Drawings shall be legible and to a common scale (minimum scale of 1”=50’) when printed on 11”x17” paper.
3. Both plan view and centerline profile must be shown for all streets. On subdivisions along steep cross slopes, profiles for each side of the street may be required to be shown.
4. Plan and profiles shall indicate design and/or existing grades a minimum of 200 feet beyond the limits of the proposed project.
5. All wet utilities (water, sewer, storm drain, irrigation) shall be shown in plan and profiles views.

C. Each set of plans shall include ~~be accompanied by a separate sheet of~~ details for special structures which are to be constructed and are not covered by the City Standards. All structures shall be designed in accordance with the minimum Pleasant View City Standards and approved by the City Engineer.

D. Separate drawings of elements of the Pleasant View City Standards shall not be required to be redrawn and submitted with the construction drawings unless specific deviations from

the standards are requested for approval; however, the construction drawings shall refer to the specific items of the Standards that are to be incorporated into the Work.

E. The plan and profile construction ~~plans~~ drawings shall be submitted in portable document format (“pdf”). Upon approval, the developer’s engineer shall provide the City Engineer with electronic files of the final plat and improvement plans in AutoCAD or other City Engineer approved format. A hard copy of the approved construction plans bearing the ~~signature of the City Engineer~~blue stamp of DRC approval shall be kept available at the construction site. Prior to final acceptance by the City, the developer, developer’s representative, contractor, or project engineer shall submit to the City Engineer a set of "as built" drawings for permanent City file record.

SECTION 4 DESIGN STANDARDS – SANITARY SEWER ~~DESIGN~~

4.01 General Design Standards

A. All design shall be in accordance with Utah Administrative Code R317 or this Standard, whichever is stricter.

B. All sewer shall be gravity unless otherwise pre-approved by the Public Works Director and City Engineer in writing.

C. Separation of water mains and sewer lines shall be as per Utah Administrative Code (UAC) R309-550-7. Contact City Engineer for requested exceptions.

D. Sewers should be designed to avoid changes in direction greater than 90° (i.e. acute angles). Additional manholes shall be provided in lieu of acute angles.

E. Changes in pipe size shall occur in a manhole. Match 0.8 depth point of sewer lines. (R317-3-2-2.3-H)

F. All terminating sewer mains shall end with a city standard manhole.

G. Service lateral connection(s) less than 6-in shall not be allowed in sewer manholes.

H. All sanitary sewer lines and systems serving multiple properties shall be public and shall connect to a public sewer line. Private sanitary sewer systems may be permitted on singularly-owned property provided they discharge directly to a public sewer.

I. Stream Encroachments and Crossings – contact City Engineer.

4.02 Manholes

A. Manholes shall not be located in areas subject to inundation. Where this cannot be avoided:

1. Manhole lid shall be located at least 1-ft above high water level, or

2. Manhole lid shall be gasketed and bolted down to prevent inflow.

~~A. Changes in pipe size shall occur in a manhole. Match 0.8 depth point of sewer lines. (R317-3-2-2.3-H)~~

B. Manhole Sizing:

1. For a manhole with two (2) or less 8-in and 10-in sewer line connections and a change in direction of not more than 45°, a 4-ft diameter manhole shall be used.

2. For a manhole with two (2) 8-in and 10-in sewer line connections and a change in direction between 45° and 90°, a 5-ft diameter manhole shall be used.

3. For a manhole with more than two (2) 8-in and 10-in sewer line connections (i.e. intersections), a 5-ft diameter manhole shall be used.

4. For a manhole with two (2) or less 12-in to 18-in sewer line connections and a change in direction of not more than 45°, a 5-ft diameter manhole shall be used.

5. Contact City Engineer for guidance on manholes not meeting the above criteria.

C. Assuming all pipes of the same size, there shall be at least a 0.1-ft drop through a manhole between the outlet and the inlet located at 180°, and at least a 0.2-ft drop for all other inlet pipes.

D. Flow Channels and Bench

1. For a manhole containing pipes smaller than 15-in, the channel depth shall be ½ to ¾ of the largest pipe's diameter.

2. For a manhole containing pipes between 15-in and 21-in, the channel depth shall be at least ¾ of the largest pipe's diameter.

3. For a manhole containing pipes 24-in and greater, the channel depth shall be at least equal to the largest pipe's diameter

4. A manhole invert must be filleted to prevent solids from being deposited if a collection system pipe enters a manhole between 6 and 24 inches above a manhole invert.

~~Changes in pipe size shall occur in a manhole. Match 0.8 depth point of sewer lines. (R317-3-2-2.3-H)~~

5. In a manhole with pipes of different sizes, the flow channels in the invert must be sloped evenly from pipe to pipe to prevent backpressure.

6. Bench (adjacent floor area) should drain to the channel with the minimum slope of 1 inch per foot.

E. Drop Manholes

1. A drop manhole is required when the elevation difference between the incoming pipe and outgoing pipe is 24-in or greater. (UAC R317-3)

2. To avoid excessive velocities, drop manholes should be used on streets with grades of 10% or greater or as otherwise directed by the City Engineer.

3. All drop manholes shall be a minimum of 5-ft diameter.

~~B. All terminating sewer mains shall end with a city standard manhole.~~

~~C. Service lateral connection shall not be allowed in sewer manholes.~~

~~D.A. All sewer shall be gravity unless otherwise approved by the City.~~

~~E. Collection lines shall be located in public rights-of-way or private road rights-of-way. Collection lines shall not be located on private property (easements) without the express written permission from the City. If such case is granted, easement shall be a minimum width of 20 and shall be dedicated to Pleasant View City.~~

~~All sanitary sewer systems shall be public and shall connect to a public sewer line. Private sanitary sewer systems may be permitted on singularly owned property provided they discharge directly to a public sewer system and obtain the express written permission from the City.~~

4.03 Easements

A. Sanitary sewer lines shall be located in public rights-of-way or private street rights-of-way. Sanitary sewer lines shall not be located on private property (easements) without the express written permission from the Public Works Director and City Engineer. If such case is granted, easement shall be a minimum width of 20-ft and shall be dedicated to Pleasant View City. In the case where a culinary water line and sanitary sewer line are contained in a single easement, the easement shall be no less than 30-ft wide.

SECTION 5 DESIGN STANDARDS – CULINARY WATER ~~DESIGN~~

~~4.02~~5.01 General Design Standards

A. All design shall be in accordance with Utah Administrative Code R309.

B. Where a water line crosses surface water, designer/engineer shall contact the DDW and the DDW Engineer-of-Record prior to final design.

C. All angles and standard fittings shall be shown in the improvement drawings.

D. At dead end lines, including temporary dead ends, provide a fire hydrant at the termination point.

E. Connections to existing lines shall be made by cutting in a new tee or cross and installing all associated valves. A tapping sleeve and valve may be allowed only with permission from the Utilities Superintendent. Size-on-size tapping sleeves and valves are not allowed.

5.02 Valves

A. Gate valves shall be used on water lines up to and including 12-inch. Butterfly valves shall be used on water lines 14-inch and greater.

B. Valves are required on all branches of tees and crosses.

~~B. Where new lines connect to existing lines, valves should be added at such connections if necessary.~~

C. On unbroken lengths of water line, valves are required:

1. At 800-ft (maximum) spacing in residential areas, and
2. At 500-ft (maximum) spacing in commercial and industrial areas. (R309-550-5)

~~2.~~3. Valves shall be generally located near fire hydrants.

~~D. At dead end lines, including temporary dead ends, provide fire hydrant at termination point.~~

5.03 Curved Water Lines

A. Water lines may be curved, with a minimum radius of twice the manufacturer's recommended minimum radius (e.g. 8-in pipe with manufacturer's minimum radius of 200-ft would require a city minimum radius of 400-ft).

B. Curvature must be achieved through the longitudinal bending of the pipe barrel. No deflection at the joint is permitted.

~~E.~~C. A reduction in the radii may be granted with the following requirements:

1. No service connections are reasonably anticipated along the curvature, and
2. With the express ~~and~~ written approval by both the City Engineer and the ~~Water~~Utilities~~/Sewer~~ Superintendent.

~~4.03~~5.04 Fire H~~h~~ydrants

A. Fire hydrants are to be installed in locations as required by the fire code and approved by the Fire Marshal and City Engineer, with an ~~minimum~~approximate spacing of 500-ft, or as approved by the Fire Marshal.

B. Fire hydrants shall not be located within 10-ft of any sanitary sewer line or manhole.

C. Fire hydrants shall have a 3-foot radius that is clear of objects and obstructions, including driveways.

5.05 Fire Lines

A. All fire lines shall meet these Public Works Standards but shall remain privately owned and maintained. Private ownership and maintenance begins at the connection to the main line.

B. Post-indicator valves are required. Contact Fire Marshal for placement.

C. Master meters may be required. Contact Utilities Superintendent for meter model information and installation and testing requirements.

5.06 Easements

A. Culinary water lines shall be located in public rights-of-way or private ~~road~~street rights-of-way. Distribution lines shall not be located on private property (easements) without the express written permission from the Public Works Director and City Engineer. If such case is granted, water line shall be cased for the entire length of private property, and a minimum 20-ft wide easement shall be ~~a minimum width of 20 and shall be~~ dedicated to Pleasant View City. In the case where a culinary water line and sanitary sewer line are contained in a single easement, the easement shall be no less than 30-ft wide.

~~SECTION 5~~SECTION 6 DESIGN STANDARDS – STREET/ROAD, SIDEWALKS, AND STREET LIGHTS ~~DESIGN~~

6.01 General Design Standards

A. Streets shall be designed in accordance with these Standards, standard engineering practices, and AASHTO and MUTCD guidelines.

B. Sidewalks shall be designed in accordance with these Standards and Public Rights-of-Way Accessibility Guidelines (PROWAG).

C. Streets shall generally be designed with a standard 2% crown. Offset crowns may be approved by the City Engineer in specific circumstances. See *Public Works Standard Drawings*. Cross-sloped and superelevated streets may be approved by the City Engineer in specific circumstances.

D. The design speed shall be the higher of the following or the posted speed limit along affected segment:

1. Residential streets – 25 mph
2. Minor collectors – 30 mph
3. Major collectors – 35 mph
4. Minor arterial – 40 mph
5. Other – consult with City Engineer

6.02 Street Right-of-Way Sections

A. Street right-of-way sections shall be per the Master Street Plan.

B. Minimum public street section for a non-residential street shall be 70-ft right-of-way.

~~A.~~C. When abutting multiple zones, use the wider of the specified rights-of-way.

6.03 Street Grades

A. The minimum grade of a street shall be 0.5%.

B. The maximum grade of a street shall be:

1. Residential streets – 12%
2. Minor collectors – 12%
3. Major collectors – 12%
4. Minor arterial – 8%
5. Other – consult with City Engineer

C. Grades approaching and through intersections shall meet AASHTO guidelines.

6.04 Horizontal Curves

A. Street centerlines shall have the horizontal curve minimum radii shall be as listed in *AASHTO A Policy on Geometric Design of Highways and Streets* (current edition) using a standard 2% crown. For example:

1. For a Design Speed of 25 mph, the~~Local (residential) streets shall have~~ centerline radius shall not be less than 198-ft.~~not less than 333-ft radius curves~~.[2]

B. Horizontal points of curvature shall not be located closer than 100-ft from the center of an intersection. Where topography or existing street geometry causes infeasibility of meeting this separation distance, a variance request may be submitted together with documentation providing intersection sight distances per *AASHTO A Policy on Geometric Design of Highways and Streets* (current edition) and other proposed mitigation measures as necessary.

6.05 Vertical Curves

~~C.~~A. No changes of grade in excess of 1.5% shall be permitted without a vertical curve.

B. Refer to *AASHTO A Policy on Geometric Design of Highways and Streets* (current edition) for minimum k-values for sag and crest vertical curves at the stated design speeds. For example:

1. Design Speed 25 mph

   a. Crest vertical curve k_{min} = 12

   b. Sag vertical curve k_{min} = 26

~~D.~~C. Vertical points of inflection shall not be located closer than 100-ft from the center of an intersection. Where topography or existing street geometry causes infeasibility of meeting this separation distance, a variance request may be submitted together with documentation providing intersection sight distances per *AASHTO A Policy on Geometric Design of Highways and Streets* (current edition) and other proposed mitigation measures as necessary.

~~5.021.01 Sight triangles shall be shown at the request of the City Engineer.~~

~~5.03~~6.06 Intersections

A. Roadway centerlines shall intersect at 90-degrees. Where a 90-degree angle is not feasible, the intersection angle may be reduced to as low as 80-degrees with the City Engineer's concurrence. In no case shall the angle be less than 80-degrees.

B. Spacing – The minimum distances between street intersections along the following street classification shall be as listed, as measured from centerline to centerline:

1. ~~Intersections of residential streets shall be no closer than 125-ft to one another, as measured from centerline to centerline.~~ Residential streets – 150-ft

2. Minor collectors – 300-ft

3. Major collectors – 300-ft

[2] AASHTO A Policy on Geometric Design of Highways and Streets (201~~1~~8); Table 3-13~~b~~.

4. Minor arterial – 660-ft
5. Other – consult with City Engineer

C. The crown along non-stop controlled through streets shall be maintained through an intersection. Stop- or yield-controlled intersecting streets' crowns shall transition to match the through-street's cross section.

D. Sight triangles shall be shown at the request of the City Engineer.

~~5.04~~6.07 Cul-de-~~S~~sacs

A. Length of cul-de-sac shall not exceed ~~500-ft as shown in the Standard Drawings~~that listed in Ch. 17.18.020 of the City Ordinances.

B. The maximum grade anywhere in a cul-de-sac bulb shall be 4%.

~~A.~~C. A no-access line shall be shown on the plat in the location of the snow storage area.

~~5.05~~6.08 Pavement/Pavement Section

A. Developments – Pavement section shall be designed by the developer's geotechnical engineer and included in the Geotechnical Report submitted to the City. See Appendix B of this document for Geotechnical Report Minimum Requirements, including testing requirements and design parameters.

B. City Projects – Pavement section shall be included in the Project plans.

C. See also sheet ~~CS-02~~R1 of the *Public Works Standard Drawings* for pavement notes.

~~5.06~~6.09 Temporary Turnarounds

A. When turnaround cannot be ~~constructed~~ located outside of subdivision, it shall be located on a portion of the subdivision lots (as needed) with the developer placing in escrow an amount of money sufficient to complete the street improvements to the subdivision boundary. These funds will be used at such time the street is extended.

B. The lot(s) on which the turnaround is ~~constructed~~ located shall be restricted as follows:

1. Platted as an "R" (restricted) lot, noting that the Lot cannot be issued building permits until the street is extended beyond the subdivision boundary, complete with curb, gutter, and sidewalk.
2. ~~This lLot cannot be sold or building permits issued for it until the road is extended beyond the subdivision boundary, complete with curb, gutter, and sidewalk~~An easement is placed on the lot dedicated to the public for the use of the temporary turnaround.

C. The maximum grade anywhere in a temporary turnaround area or bulb shall be 4%.

D. Drainage onto adjacent property must be by written approval (easement) of adjacent property owner.

E. When a temporary turnaround is required at the end of a ~~road~~street where the ~~road~~street and the extension of the ~~road~~street are parts of an approved phased development, in lieu of constructing a paved temporary turnaround in accordance with the *Public Works Standard Drawings*~~Standard Drawings~~:

1. When extension of the ~~road~~street is expected to begin construction within 12 months of conditional acceptance of the ~~road~~street and associated temporary turnaround, Developer may construct 12-inch thick untreated base course temporary turnaround (dimensions per the Standard Plans) and place in escrow the cost of the asphalt paving.

2. If construction of the extension of the ~~road~~street has not begun within 12 months of conditional acceptance of the ~~road~~street and associated temporary turnaround, City may, at its discretion, utilize the monies in escrow to pave the temporary turnaround.

~~**5.07 Landscaping**~~

~~A. When landscaping is required to be designed/installed, refer to the Standard Drawings.~~

6.10 UDOT

Roadway intersections with UDOT-controlled streets shall be in accordance with UDOT standards. A copy of the approved UDOT Conditional Access Permit shall be submitted to the City.

~~Roadway intersections with UDOT-controlled streets shall be in accordance with UDOT standards. A copy of the approved UDOT Access Permit shall be submitted to the City.~~

6.11 Sidewalks

A. All sidewalks shall be designed and constructed to meet PROWAG.

B. Storm water shall be captured and conveyed underground prior to crossing curb ramps or accessible routes.

C. Curb ramps at intersections shall be designed as directional ramps rather than corner cut ramps. Exceptions may be granted when directional ramps are deemed infeasible by the City Engineer and Public Works Director due to receiving ramp locations or other physical constraints.

6.12 Street Lights

A. Street lights and appurtenances shall be designed, ordered, and installed by developer/ contractor.

B. Developer/contractor shall coordinate order of street lights with Public Works Director at or before preconstruction meeting.

C. Spacing – Street lights shall be located at intersections, ends of cul-de-sacs greater than 400 ft in length, and along unbroken lengths of streets with greater than 600 ft between intersections at 400 ft intervals in residential areas and 300 ft along Corridors (see

paragraph D). City Engineer and/or Public Works Director may modify this requirement to a lesser standard on a case-by-case basis.

D. Streets designated as Corridors are:

1. Rulon White Boulevard
2. Parkland Boulevard, from Rulon White Blvd northwards
3. Pleasant View Drive, entirety
4. Elberta Drive, from Pleasant View Dr to east city limit line
5. 600 West, from 2550 N to Elberta Dr
6. 2550 North, entirety
7. 500 West, from Elberta Dr to 4300 N
8. 4300 North / Skyline Drive, entirety

~~SECTION 6~~SECTION 7 DESIGN STANDARDS – STORM DRAIN AND DRAINAGE ~~DESIGN~~

~~See Appendix A for Storm Drain and Drainage Design Standards.~~

7.01 Storm Drain and Drainage Design Standards

See Appendix A

~~6.01~~7.02 Low Impact Development

See Appendix A.

~~6.02~~7.03 ~~98~~80th Percentile Storm Retention

See Appendix A.

~~SECTION 7~~SECTION 8 CONSTRUCTION STANDARDS

~~7.01~~8.01 General Policies

A. General Conditions

1. Permit/License: When the work is in progress, Contractor shall have at the work site a copy of the permit and his contractor's license number.

2. Private access: Temporary ~~all-weather~~all-weather roadways, driveways, walks, and ~~right-of-ways~~rights-of-way for vehicles and pedestrians shall be constructed and continuously maintained where required.

3. Street excavation in winter: Excavation of City streets during the winter months (herein defined as November 15 to April 1) will be allowed only if the work is a new service connection, required maintenance or emergency, or otherwise approved by the Public Works Department. Permanent patching of City streets excavated in the winter may be delayed until April 1 with the following provisions: Within five (5) working days from the completion of the excavation, the permittee provides/maintains a 1-1/2" thick temporary winter asphalt surface until such time as the permanent asphalt surface is installed; the permittee shall provide/maintain a temporary untreated base course surface until such time as the temporary winter asphalt surface is installed. These provisions apply regardless of whether the permittee or City crews are performing the permanent resurfacing.

4. Existing utilities: The contractor shall use extreme caution to avoid a conflict, contact, or damage to existing utilities, such as power lines, sewer lines, storm drains, street lights, telephone lines, cable television lines, water lines, gas lines, utility poles, or other appurtenances during the course of construction of this project. Any such conflict, contact, or damage shall be immediately communicated to said utility company and the Public Works Department. All projects shall be “Blue Staked” prior to construction.

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

B. Licensing

1. Contractor (including all sub-contractors) must be licensed with the State of Utah: It is the policy of Pleasant View City that contractors desiring to perform work in the City's public way shall be properly licensed in the State of Utah. The acceptable licenses shall be in accordance with UAC R156-55a-201.

2. Exceptions: A license shall not be required by the City when the permittee is a public utility company. (Subcontractors for utility companies shall have a valid contractor's license.)

C. Permits – Developer/Contractor is responsible for obtaining all necessary permits for the construction of the Improvements prior to commencement of said Improvements. Agencies/permits required may include, but are not limited to:

~~1. Developer/Contractor is responsible for obtaining all necessary permits for the construction of the Improvements prior to commencement of said Improvements. Agencies/permits required may include, but are not limited to:~~

~~2.~~1. Encroachment (City)

a. Pleasant View City's Department of Public Works issues permits to control any excavation and construction operations in the public right-of-way. All contractors, sub-contractors, and utility companies proposing to construct, repair, or replace any facility within the public right-of-way shall contact the Pleasant View City ~~Building~~ Public Works Department and complete all permit requirements prior to commencing proposed work.

b. Work performed by utility companies and contractors in constructing facilities in new subdivision streets must first ~~be approved by the Public Works Department~~have DRC-approved construction drawings. Said companies and contractors shall be required to obtain a ~~"No Fee Public~~ Right-of-Way Permit~~"~~ and will be subject to City inspection and must comply ~~compliance~~ with all requirements.

c. Emergency Work

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

(ii) In the event that emergency work is commenced on or within any public right-of-way of the City, the Public Works Department shall be notified within ~~one-half hour when~~ 30 minutes of the work commencinges or as soon as practicable if circumstances do not allow for more immediate notification. ~~possible from the time the work is commenced.~~ Contact shall be made to the City's "on call" personnel. If emergency work is commenced during off business hours, the Public Works Department will be notified within one (1) hour of the start of work on the first regular business day of which City offices are open after such work commences, and, at the discretion of the Public Works Department, a permit may be issued which shall be retroactive to the date when the work was begun. Before commencing the emergency work, all necessary safety

precautions for the protection of the public and the direction and control of traffic shall be taken. None of the provisions of these regulations are waived for emergency situations except for the prior permit requirement.

d. Enforcement: Violators of these regulations of working within the ~~P~~public ~~R~~right-of-w~~W~~ay shall be subject to the provisions of the applicable Pleasant View City Ordinances.

~~3.~~2. USACE/DWRi Stream Alteration – Stream Alteration

~~4.~~3. UPDES

~~5.~~4. Dam Safety (DWRi)

~~6.~~5. UPRR Railroad Encroachment

~~7.~~6. UTA Encroachment

~~8.~~7. UDOT

~~9.~~8. Weber County Surveyor's Monument

D. Excavation Operations

1. Blue Stakes: Before commencing excavation operations, the permittee shall call "Blue Stakes" at 1-800-662-4111 or 811.
2. Traffic control devices: Traffic control devices such as construction signs, barricades, and cones must be in place before excavation begins.
3. Protection of paved surfaces outside of excavation area: In order to avoid unnecessary damage to paved surfaces, backhoes, outriggers, tracked equipment, or any other construction equipment that may prove damaging to asphalt shall use rubber cleats or paving pads when operating on or crossing said surfaces.
4. Open trench limits: Open trenches will be limited to one block at a time or 660 feet, whichever is less.
5. In the event of a planned road closure, Contractor shall notify the City, Fire Department, emergency services dispatch, US Postal Service, Weber School District, and Utah Transit Authority (UTA) a minimum of ~~24 hours~~three (3) business days prior to the closure. In the case of an emergency, the above listed agencies ~~will soon~~shall be notified at the soonest possible time.
6. Environmental Controls
    a. Dust and debris: The permittee or contractor shall keep dust and debris controlled at the work site at all times. If necessary, a container shall be provided for debris and dusty areas shall be wet down. The permittee or contractor shall be responsible for the cleanup of mud or debris from public ~~road~~streets deposited by

vehicles or construction equipment exiting the work site. The City Engineer reserves the right to shut down the work or issue a citation if dust is not controlled.

b. Noise: The permittee or contractor shall keep neighborhood free of noise nuisance in accordance with the Noise Ordinance.

7. Cleanup: The permittee or contractor shall remove all equipment, material, barricades, and similar items from the right-of-way. Areas used for storage of excavated material will be smoothed and returned to their original contour. Vacuum sweeping or hand sweeping shall be required when the Building Department determines cleaning equipment is ineffective.

8. Storm Water: All Contractors working within the boundaries of Pleasant View City shall conform to all requirements and regulations as outlined by the Pleasant View City Storm Water Management Plan. Copies of the plan are available in the Pleasant View City Offices and on the City's website.

~~7.02~~8.02 Pre-Construction Conference

A. For subdivision and development projects, ~~T~~the preconstruction conference shall not be held until the ~~City Engineer~~Development Review Committee has approved and signed the construction plans.

B. A preconstruction conference shall be held before any excavation or other work is begun in the subdivision or Project. The meeting will include:

1. City Engineer
2. Developer or Project Manager
3. Subdivision or Project Engineer
4. All contractors and subcontractors involved with installing the subdivision or project improvements
5. Representatives of affected Pleasant View City Departments
6. Representatives of local utility companies as may be required by Pleasant View City.

C. Items pertaining to the construction and inspection of the subdivision or Project improvements will be discussed.

~~7.03~~8.03 Construction

A. Specifications

1. Contractor shall be responsible for constructing all improvements in accordance with the Technical Specifications, per Section ~~5~~9 of this document.
2. Deviations from such shall be reviewed and authorized by the City Engineer on a case-by-case basis.

B. Plans and Details

1. Contractor shall be responsible for constructing all improvements in accordance with the approved construction drawings and the Drawings, Plans, and Details, per Section ~~6~~ 10 of this document.

2. Deviations from such shall be reviewed and authorized by the City Engineer on a case-by-case basis.

C. Sequence/Timing

1. All underground utility work shall be completed prior to placement and compaction of the roadway base course. Utilities, including service lines, not installed prior to roadway construction shall be bored as approved by the Public Works Director.

2. All concrete collars shall be installed within fourteen (14) days of asphalt placement.

~~2.~~3. Gravity pipelines shall generally be installed starting at the lowest point of connection or discharge.

D. Inspection

1. All construction work involving the installation of improvements in the subdivision or project shall be subject to inspection by the City. It shall be the responsibility of the person responsible for construction to ~~insure~~ensure that inspections take place where and when required. Certain types of construction shall have continuous inspection, while others may have only periodic inspections.

2. Excavations for fire hydrants, water, storm water and sewer mains and laterals shall not be covered over or backfilled until such installation shall have been approved by the Public Works Director or his designee. If any such installation is covered before being inspected and approved, it shall be uncovered after notice to uncover has been issued to the applicant(s) or responsible party by the Public Works Director.

~~1.~~3. Televiewing Lines: Prior to approval and acceptance by the city, applicant shall inspect all sanitary sewer and storm water pipes by means of remote televiewing equipment and shall record the entire televiewing inspection on video tape or other acceptable reproduction means for review by city representatives.

E. Requests for Inspections

1. Requests for inspections shall be made to the Public Works Department by the person responsible for the construction.

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

3. Notice shall also be given one (1) day in advance of the starting of work requiring periodic inspection, unless specific approval is given otherwise by the ~~City Engineer~~Public Works Director~~,~~ or his ~~duly authorized representatives~~designee.

F. Continuous inspection

1. May be required on (but not limited to) the following types of work:
    a. Laying of street surfacing
    b. Placing of concrete for curb and gutter, sidewalks, and other structures
    c. Laying of sewer pipe, irrigation pipe, drainage pipe, water mains, water service laterals and testing.
2. On construction requiring continuous inspection, no work shall be done except in the presence or by permission of the ~~City Engineer or authorized city representative~~Public Works Director or his designee.

G. Periodic inspections

1. Shall be required on (but not limited to) the following types of work:
    a. Street grading and gravel base
    b. Excavations for curb and gutter and sidewalks
    c. Excavations for structures
    d. Trenches for laying pipe
    e. Forms for curb and gutter, sidewalks and structures

H. Substantial and Final Completion Inspections

1. A substantial completion inspection shall be requested by the Contractor and made by the City Engineer or authorized representative after all construction work is completed. Any faulty or defective work shall be corrected by the persons responsible for the work within a period of thirty (30) days of the date of the City Engineer's or authorized representative's Punchlist defining the faulty or defective work.
2. A final completion inspection shall be requested by the Contractor and made by the City Engineer or authorized representative after all faulty and defective work has been corrected.

I. Materials and Compaction Testing

1. Development Projects
    a. Developer/Contractor shall ~~select~~ retain a qualified, licensed testing firm ~~off of the City's pool of testing firms~~.
    b. Developer/Contractor shall be responsible for coordinating all testing in accordance with the Technical Specifications per Section ~~5~~9 of this document.
    c. Testing reports shall be submitted to City weekly for review. Areas with failed tests shall be corrected and retested.

d. Failure to have improvements tested as they are constructed may be cause for work stoppage or rejection by City.

2. City Projects

a. Contractor shall ~~select~~ retain a qualified, licensed testing firm ~~off of the City's pool of testing firms~~.

b. Contractor shall be responsible for coordinating all testing in accordance with the Technical Specifications per Section ~~5~~9 of this document.

c. Testing reports shall be submitted to City weekly for review. Areas with failed tests shall be corrected and retested. Contractor ~~may be required to~~shall pay for retesting.

d. Failure to have improvements tested as they are constructed may be cause for work stoppage or rejection by City.

J. Safety

1. Contractor is solely responsible for jobsite safety.

2. Contractor shall comply with all local, state, and federal rules and regulations regarding jobsite safety.

3. City and/or its authorized representatives shall have the authority to shut down a job when ~~unsafe working conditions are found~~a there is an eminent threat to human life.

~~SECTION 8~~SECTION 9 TECHNICAL SPECIFICATIONS

~~8.01~~9.01 Technical Specifications for Pleasant View City

A. Adoption of Divisions 01 through 34 of the Manual of Standard Specifications, as published by Utah LTAP Center, Utah State University, Logan, Utah, current edition, with all published amendments.

B. Modifications and Additions to Manual of Standard Specifications (see Appendix C)

~~8.02~~9.02 Order of Precedence

A. Approved project-specific specifications (when applicable)

B. Modifications and Additions to Manual of Standard Specifications

C. Manual of Standard Specifications, current edition, with all published amendments

~~SECTION 9~~SECTION 10 STANDARD DRAWINGS, PLANS, AND DETAILS

~~9.01~~10.01 Standard Drawings, Plans, and Details for Pleasant View City

A. Pleasant View City Standard Drawings, current edition (See Appendix D)

B. Adoption of Manual of Standard Plans, published by Utah LTAP Center, Utah State University, Logan, Utah, current edition, with all published amendments.

~~9.02~~10.02 Order of Precedence

A. Approved project-specific drawings and details (when applicable)

B. Pleasant View City Standard Drawings, current edition

C. Manual of Standard Plans, current edition, with all published amendments, when not covered by one of the aforementioned items

APPENDIX A – DESIGN GUIDELINES – STORM DRAIN AND DRAINAGE

APPENDIX A

DESIGN STANDARDS – STORM DRAIN AND DRAINAGE ~~DESIGN STANDARDS~~

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EXHIBITS

A1. General Provisions

~~A. Pleasant View faces unique storm water challenges because the City is surrounded on two sides by mountains and has the potential to receive a large amount of runoff in a short time. Pleasant View has tremendous opportunities for growth in residential, commercial, and industrial areas thus increasing the amount of impervious surfaces leading to increased runoff.~~

A. This document represents the reporting, design, and construction standards for private and public design and construction as it relates to storm drainage within the City. ~~All efforts have been made for this policy to conform to the requirements of the Clean Water Act, Phase II; and the Storm Water Management Plan of the City.~~

B. A Storm Water Report is required for all new development and redevelopment projects.

~~B.~~C. Implementation of LID measures and 80th percentile storm retention does not ~~reduce or~~ eliminate the requirement for detention/retention as contained in this document.

A2. Definitions and Acronyms

The following terms shall be defined as follows in this document relating to storm water:

A. 80th Percentile Storm – The rainfall event whose precipitation total is greater than or equal to 80 percent of all storm events over a given period of record. In Pleasant View City, the 80th percentile storm has been determined to be 0.48 inches of depth.

B. Best Management Practices (BMPs) – Construction practices and control measures necessary to protect against pollution generated by construction sites.

C. Common Plan of Development – "Common plan of development or sale" means one plan for development or sale, separate parts of which are related by any announcement, piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, plat, blueprint, contract, permit application, zoning request, computer design, etc.), physical demarcation (including contracts) that identify the scope of the project. A plan may still be a common plan of development or sale even if it is taking place in separate stages or phases, is planned in combination with other construction activities, or is implemented by different owners or operators.[1] Common plans of development may be residential, commercial, or industrial in nature.

~~C.~~D. Detention Basin ~~– Detention Basin – An open~~ A water storage pond designed to store a volume of water that reduces the post-development peak runoff of a storm to ~~the pre-development runoff~~a lesser rate ~~or other rate~~ as defined by the governing body. This is accomplished by the use of an outlet ~~control~~ which controls the rate of flow out of the pond into the receiving storm drain or water body. Detention ponds contain an inlet, outlet, and spillway; the inlet and outlet may be the one and the same. The detention basin is intended

[1] General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s); State of Utah Department of Environmental Quality, Division of Water Quality; November 20, 2016

to drain the storm water within a period of time to make the volume available for the next storm event.

E. Development – Any man-made change to land, including but not limited to site preparation, excavation, filling, grading, paving, and construction of buildings or other structures.

F. Disturb – To alter the physical condition, natural terrain or vegetation of land by clearing, grubbing, grading, excavating, filling, building or other construction activity.

G. Drain Inlet – A point of entry into a sump, storm water basin, or storm drain system.

H. Drinking Water Source Protection Zone – Zones determined by geo-hydrology designed to protect groundwater aquifers of a well in a culinary water system.

I. Freeboard – The vertical distance between the emergency spillway and the top of the basin embankment.

J. General Permit for discharges from MS4 (Permit) – Authorization for a municipal separate storm sewer system to discharge storm water into waters of the United States.

K. Hardscape – Generally impervious areas, typically streets, sidewalks, driveways, parking areas, and roofs.

L. Infiltration – The movement of water through the soil surface and into the soil;[2] the movement of water downward from the ground surface through the upper soil.[3]

M. Infiltration Rate – The rate at which water actually enters the soils during a storm.[2]

N. Infiltration System (storm water) – A system which is designed to return storm water runoff into an underground aquifer.

1. Bioretention facilities, rain gardens, and tree boxes that are designed to slow down and hold storm water runoff for biological treatment and use by vegetative uptake are not considered to be infiltration systems if they are isolated from groundwater. Groundwater isolation may be achieved with impermeable liners or an underdrain that does not discharge into a dug, bored, drilled or driven well, improved sinkhole or other subsurface fluid distribution system.

2. The discharge of storm water piping below grade for the purpose of infiltration is considered a Class V injection well facility.

O. Injection Well, Class V – As defined in Utah Administrative Code R317-7-2:

1. A bored, drilled, or driven shaft whose depth is greater than its largest surface dimension, OR

2. A dug hole whose depth is greater than its largest surface dimension, OR

[2] Linsley/Franzini/Freyberg/Tchobanglous. (1992). *Water Resources Engineering and Environmental Engineering.* New York: McGraw-Hill Inc.

[3] Lindeburg. (2003). *Civil Engineering Reference Manual.* Belmont, CA: Professional Publications, Inc.

3. An improved sinkhole, OR
4. A subsurface fluid distribution system.

P. Internal Overflow – See Overflow.

Q. Low Impact Development (LID) – An approach to land development (or re-development) that works with nature to more closely mimic pre-development hydrologic functions, reduces or minimizes the quantity of storm water runoff, and protects or improves water quality in receiving water bodies.

R. LID Analysis and Report – A written analysis of a development or redevelopment site that (1) identifies appropriate methods to reduce storm water runoff, (2) identifies the pollutants to target for each drainage area, and (3) selects appropriate structural controls to implement on the site.

S. Municipal Separate Storm Sewer System (MS4) – The storm water conveyance system owned by the City which includes streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains. For a full definition, see UAC 317-8.

T. Outlet – The discharge mechanism of a detention basin, typically a pipe containing a head gate or orifice to control the release of water out of the basin.

U. Overflow – A storm drain basin feature that allows excess water to leave the basin through discharge piping which is set at an elevation below the emergency spillway.

V. Percolation – The movement of water through the subsurface soil layers, usually continuing downward to the groundwater table,[3] measured by a Standard Percolation Test in units of minutes per inch.

W. Pollutant – Chemicals, sediment, trash, disease-carrying organisms, and other contaminants picked up by storm water which is conveyed into rivers, streams, and other water bodies.

X. Redevelopment – Alteration of a property that changes the footprint of a site or building.

Y. Retention Basin (in lieu of detention) – A water storage pond designed to store the runoff volume of a storm and dispose of water through percolation, infiltration, and evaporation within a period of time to make the volume available for the next storm event. A retention basin contains an inlet and spillway, but no structural outlet. An open retention basin is not a Cl. V injection well.

~~D.~~Z. Retention Basin (LID) – A water storage pond, or part thereof, designed to dispose of water through percolation, infiltration, and evaporation. An open retention basin is not a Cl. V injection well.

AA. Softscape – Generally pervious areas, such as native vegetation and landscaped areas.

BB. Spillway, Emergency – A storm drain basin feature that controls and guides storm water as it spills over the basin's embankment.

CC. Storm Drain System – The system of conveyances (including but not limited to catch basins, detention basins, retention basins, infiltration galleries, curbs, gutters, ditches, cross drains, roads, man-made channels, streams, sumps, pipes, etc.) owned and operated ~~publically~~publicly or privately, which is designed and used for collecting and/or conveying storm water.

DD. Storm Water Pollution Prevention Plan (SWPPP) – A written plan that evaluates and minimizes the impact of pollutants on storm water through the use of control measures and activities that target pollution sources. A SWPPP template can be found on the UDEQ Water Quality website.

EE. Storm Water Report – A written analysis of a development or redevelopment site that estimates the volume and rate of storm water runoff generated by the proposed improvements. The report details rationale and calculations for establishing the sizes of storm water piping and storage facilities in compliance with this document. ~~optionally~~

FF. Storm Water Runoff – Precipitation that is not intercepted or otherwise captured at a site which eventually enters into natural water bodies such as rivers, streams, and lakes.

GG. Storm Water Quality Report – A written analysis of a development or redevelopment site that shows 1) the determination of the volume of the 80th percentile storm event and 2) the selection of BMPs to manage and/or infiltration the rainfall on-site or the rationale to the technical infeasibility to do so.

HH. Subsurface Fluid Distribution System – An assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground. (i.e. infiltration galleries, underground retention)

II. Sump – An open-bottomed storm water catch basin located at a low point that collects and infiltrates storm water and contains no outlet.

JJ. UAC – Acronym for Utah Administrative Code.

KK. UDEQ – Acronym for Utah Department of Environmental Quality.

~~A2.~~A3. ~~Rainfall~~ Hydraulics and Hydrology

A. All storm drain system components shall be designed to ~~carry~~ accommodate the 100-year storm event, unless otherwise stated.

B. ~~Storm~~ Hydraulics Specifications

1. Local storm drain piping shall be designed for the ~~10~~25-year storm, where the street ~~road~~ or other above-ground conveyance will carry the difference to the 100-year storm.

~~1.~~2. Storm drain piping connecting two (2) streets through private property shall be designed for the 100-yr storm.

~~2.~~3. ~~All~~Local detention basins, including all piping into the basin from the nearest point of entry, ~~regardless of local or regional, or retention or detention,~~ shall be designed to accommodate the~~a 100~~25-year storm event.~~, including all piping into the basin.~~

4. Local retention basins (in lieu of detention), including all piping into the basin from the nearest point of entry, shall be designed to accommodate ~~Volume shall be based upon~~ the 100-year, 3 hour storm. ~~See Exhibits 1 and 2 for rainfall data.~~

5. Regional detention basins, including all piping into the basin from the nearest point of entry, shall be designed to accommodate the 100-year storm event.

6. See Exhibits 1 and 2 for rainfall data.

7. The storm duration used for the sizing of basins shall be based upon the ~~worst case~~worst-case scenario of inflow versus outflow and not the time of concentration~~.~~; however, ~~–~~the time of concentration shall be calculated and shown.

8. Detention discharge shall not exceed the rate determined by using the standard rate of 0.1 cubic feet per second per total acre (show all calculations or provide spreadsheet and/or program file containing said calculations).

9. Calculations shall be based on the total acreage of the development.

10. Pass-through of offsite drainage through the development must be considered and will be allowed.

~~3.~~11. Oil/sediment separators, including but not limited to hydrodynamic separators, baffle wall boxes, and pipe hoods, shall be sized to treat the 2-yr, 6-hr storm event, and pass the 25-yr storm event for which detention is designed.

C. ~~Calculation Basis~~Hydrologic Methodology

1. Parameters

a. For residential subdivisions:

i. Hardscape – Proposed streets and sidewalk areas plus the percentage of lot area hardscape as shown below.

Zone	Percentage of Lot Area Hardscape
RE-15, RE-20, R-1	40%
A-2	25%
A-5	12%
R-5, LSFR	65%
RE-5, Other	Consult City Engineer

i. Softscape – The remaining area of the subdivision not hardscape.

b. For commercial subdivisions:

i. Hardscape – Proposed street and sidewalk area plus 85% of lot area

ii. Softscape – 15% of lot area

c. For commercial site plans with no local detention ~~(original plat recordation prior to 2019)~~:

i. Hardscape – 85% of lot area

ii. Softscape – 15% of lot area

2. ~~– For d~~Developments less than 20 acres

a. ~~, t~~The Rational Method may be used. ~~For developments larger than 20 acres, a City Engineer-approved computer model shall be used.~~A computer model may also be used. See paragraph 3 for more information.

~~a. Volume in pipes, ditches, or roadside swales shall not be considered in the volume calculation for detention and retention basins.~~

b. Rainfall Intensity – When using the Rational Method, use the rainfall intensity table ~~included as~~provided in Exhibit 1 ~~to~~of this document.

c. Runoff Coefficients – The following C-values shall be used when using the Rational Method:

i. Hardscape (roofs, pavements, compacted gravel/UTBC) – 0.90

ii. Softscape (open space, landscaping) – 0.25 ~~(or lower, depending on soil and slope)~~

~~i.~~iii. Other values from published sources may be used when pre-approved by the City Engineer.

3. Developments larger than 20 acres

a. A City Engineer-approved computer model shall be used.

~~b.a. Calculation Basis – For developments less than 20 acres, the Rational Method may be used. For developments larger than 20 acres, a City Engineer-approved computer model shall be used.~~

~~c.~~ Rainfall Pattern and Depth – ~~For the use of computer models,~~ T~~t~~he following rainfall pattern shall be used. This pattern is based on the Farmer-Fletcher Distribution. This pattern is for a 1-inch unit storm and must be multiplied by rainfall depth for storms of other magnitudes, as provided in Exhibit 2.

b.

Farmer-Fletcher Distribution

Unit Storm

Time (Min.)	Depth (inches)	Time (Min.)	Depth (inches)	Time (Min.)	Depth (inches)	Time (Min.)	Depth (inches)	Time (Min.)	Depth (inches)	Time (Min.)	Depth (inches)
1	0	11	0.004	21	0.033	31	0.052	41	0.012	51	0.005
2	0	12	0.005	22	0.034	32	0.045	42	0.011	52	0.005
3	0.002	13	0.008	23	0.035	33	0.04	43	0.01	53	0.004
4	0.002	14	0.009	24	0.038	34	0.035	44	0.009	54	0.004
5	0.002	15	0.009	25	0.039	35	0.03	45	0.009	55	0.004
6	0.002	16	0.013	26	0.045	36	0.022	46	0.008	56	0.003
7	0.002	17	0.017	27	0.052	37	0.02	47	0.006	57	0.003
8	0.002	18	0.02	28	0.054	38	0.018	48	0.006	58	0.002
9	0.003	19	0.024	29	0.054	39	0.016	49	0.005	59	0.002
10	0.003	20	0.029	30	0.054	40	0.014	50	0.005	60	0.001

~~A3.~~A4. Storm Drain System

A. Independent System

1. Storm waters shall not be conveyed in irrigation ditches.
2. Irrigation waters shall not be conveyed in storm drain systems.

B. ~~Groundwater~~Land Drains

New land drain systems are not allowed.

~~Where adverse groundwater conditions exist, the City may allow the installation of a subsurface land drain system. Laterals may be installed to each lot for clear groundwater only (discharge of surface water to the storm drain system shall only be permitted upon approval from the City Engineer). Subsurface lines shall be installed with a slope adequate for proper drainage. A backflow control device may be required at the confluence of the land drain system and storm drain system, as determined by the City Engineer.~~

C. Piping

1. All ~~S~~storm drain lines considered part of the City's storm drain system shall be reinforced concrete pipe (RCP), of appropriate class.
2. Minimum size for storm ~~sewer~~drain mains shall be 15-inch diameter.
3. Public storm drain pipes shall not be curved.
4. Pipe specifications are included in Section 9 of the Development, Design, and Construction Standards.

~~3.~~5. ~~.Pipe specifications are included in the Section 5 of the Development, Design, and Construction Standards.~~ Pioneering Agreement – Where determined by the City Engineer and/or the Storm Drain Capital Facilities Plan, larger drain lines shall be installed to accommodate future development. The cost to provide adequate storm drainage ~~to~~ for a development shall be paid for by the Developer. Upsizing will be coordinated at the time of development. The cost of upsizing will be the responsibility of the City unless otherwise defined in an agreement.

D. Structures

1. ~~Access –~~ Storm drain lines shall have cleanout boxes, inlets, or manholes installed at all changes in grade , ~~or~~ alignment, or pipe size, with a maximum distance of 400 feet between ~~accesses~~structures.
2. To minimize backwater effects on the upstream pipe, the elevation of the pipe soffits shall be matched when the downstream pipe is larger than the upstream pipe. (Not applicable to upstream pipes from a single catch basin.)
3. Channel Contouring.
    a. Structures shall contain contoured flow channels when one or more of the following conditions exist:
        i. The velocity of an incoming pipe is 15 fps or greater at 50% capacity.
        ii. Structure is an intersection of three (3) or more pipes (excluding pipes connected to single catch basins).
        iii. Structure contains a change of direction.
    b. Channel Height. Channel contouring shall be constructed with fill concrete to the top of the highest soffit of the highest top of pipe entering or exiting the manhole (excluding pipes connected to single catch basins). The shaping shall match the pipe section below pipe springline and consist of vertical walls above pipe springline.
    c. Channel Slope. The channel shall be constructed with a slope between the upstream and downstream pipes. The slope shall be the average of the upstream and downstream pipe slopes, or as approved by the City Engineer.
4. Drops.
    a. Structures shall not contain drops greater than 1-ft.
    b. Drops greater than 1-foot are permissible when the drop involves a pipe from a single catch basin.
    c. Drops greater than 1-foot that are necessary to avoid a utility conflict, reduce the slope of the downstream pipe, or to account for the energy losses in the manhole will be evaluated on a case-by-case basis, and may require additional analysis. At a minimum, channel contouring is required.

~~4.~~5. Structures shall be installed in accordance with the ~~s~~Technical ~~tandard s~~Specifications and ~~s~~Standard ~~d~~Drawings.

E. Sumps

1. Sumps ~~Drains~~ are not allowed in the City's storm drain system, except as approved by the City Engineer on a case-by-case basis.

2. Sumps shall not be permitted within zones 1 or 2 of any Drinking Water Source Protection Zone of any drinking water source.

~~5.~~3. When approved, Class V Injection Well~~Proper~~ permitting is required.

F. Grates

1. A flared end section with trash rack is required on the inlet of an entrance to the storm drain system.

2. A flared end section with trash rack is required on the inlet end of culverts 50-ft and greater.

~~6.~~3. When end sections and/or track racks are required, sloped end treatments shall be installed when located parallel to traffic and in the clear zone.

~~A4.~~A5. Detention and Retention Basins

A. When Required

1. Storm drainage basins are required for all development; however, residential developments less than one (1) acre are not required to have detention or retention, except ~~when~~ as determined by the City Engineer.

~~1.~~2. In lieu of providing onsite detention within a proposed development, if the development is located within another detention basin's drainage subbasin, Developer may propose to modify and upgrade an existing detention basin. If the development is located within 1,500-ft of a regional detention basin, within the basin's drainage subbasin, and the storm drain system has the adequate capacity, Developer may propose to participate in the modification of the regional facility. Consult with City Engineer and Public Works Director for feasibility.

B. Public Basins (Local)

1. When Used – For all developments serving multiple lots and/or containing public roadways, a public basin is required, unless otherwise as described in subsection C.

2. Ownership and Maintenance – Public basins shall be owned and maintained by the City.

3. Property – Public basins shall be located on a separate parcel dedicated to the City. Parcel shall have street frontage of at least 50-ft.

4. Access – Access shall be provided to within 10-ft of all structures. Access and turnaround area shall be a 12-ft wide all-weather, drivable surface.

5. Developer Responsibility – When required for development, public basins shall be constructed by the developer. Following conditional acceptance of the construction, the operation and maintenance shall be conveyed to the City.

C. Private Basins (Local)

1. When Used

a. Single Lots – For drainage from non-single family residential lots not already accounted for in an existing basin and for residential lots described in A5.A.1 above.

b. Multiple Lots – For mixed-use, multi-family, and commercial PUDs, a private basin may be utilized.

2. Property, Ownership, and Maintenance

a. Single Lots – Private basins shall be located within the lot on private property and owned and maintained by the property owner.

b. Multiple Lots – Private basins serving multiple lots shall be located on a separate parcel or within common area, owned and maintained by a Homeowners' or Property Owners' Association.

c. Actual ownership and responsibility shall be specifically defined in the Owner's Dedication, Certificates, Development Agreements, or by Deed.

3. Access

a. Easement

i. Single Lots – The City shall be provided an easement to, around, and across the basin for inspection, emergency access, operation, and/or repair.

ii. Multiple Lots – An easement to, around, and across the basin dedicated to the City shall be shown on the plat or recorded by separate instrument for inspection, emergency access, operation, and/or repair.

b. Access shall be provided to within 10-ft of all structures. Access and turnaround area shall be a 12-ft wide all-weather, drivable surface.

c. Access may be provided from a private street provided an access easement is granted to the City providing access to/from the basin from a public street. Minimum width of an access easement is 20-ft.

4. For all private basins, Developer is required to enter into a Long-Term Storm Water Management Agreement with the City.

5. Developer Responsibility – When required for development, private basins shall be constructed by the developer.

D. Regional Basins

1. Regional Basins – Regional basins shall be owned and maintained by the City, constructed according to the criteria herein, and approved of the City Engineer.
2. Access – Each basin shall be constructed with sufficient, all-weather, drivable access to all structures from a public street. A turnaround area shall be provided at the termination of the access road.

E. Basin Volume

1. All basin designs and calculations shall be included in the Storm Water Report and submitted to and reviewed by the City Engineer for approval.
2. Volume shall be measured to the 25-year overflow elevation.
3. Volume in pipes, ditches, or roadside swales shall not be considered in the volume calculation for detention and retention basins.
4. Storage of water shall not be allowed in above-ground parking lots.

F. Allowable Discharge Design

1. See Section A3.B for Hydraulics Specifications.
2. Public Basins shall have a city standard control structure with movable, screw-type headgates set at the calculated opening height. Developer/engineer shall determine the opening height of the gate to provide an area equivalent to that of the calculated orifice area. This height shall be noted in the improvement plans.
3. Private Basins shall have a calculated fixed orifice plate mounted in the control structure.

~~B. 2. the rate determined by using the standard rate of 0.1 cubic feet per second per total acre (show all calculations or provide spreadsheet and/or program file containing said calculations). or provide spreadsheet or program file.Location – Detention basins shall be located with convenient access for maintenance and repair by maintenance personnel. This generally means that the basin property has frontage along a public roadway.~~

~~C. Parking lots – Storage of water shall not be allowed in parking lots.~~

~~D. Underground Storage – Underground storage will be considered for private basins only.~~

~~E. All detention basin designs and calculations shall be reviewed by the City Engineer for approval.~~

~~F. Maintenance and Ownership~~

~~1. Private Basins – When approved, private detention basins shall be owned and maintained by the property owner.~~

~~2. Local Public Basins – Local detention basins shall be constructed by the developer. Following acceptance of the construction, the ownership, operation, and maintenance shall be conveyed to the City.~~

~~3. Regional Detention Basins – Regional basins shall be owned and maintained by the City, constructed according to the criteria herein, and approved of the City Engineer. Actual ownership and responsibility shall be specifically defined in the Owner's Dedication Certificates, Development Agreements, or by Deed.~~

~~G. Basin Easement and Access~~

~~1. Public Basins – The developer shall provide the City permanent access to any public basin.~~

~~2. Private Basin – The City shall be provided an easement for emergency access, operation, and/or repair for a private basin.~~

~~3. Access – Each basin shall be constructed with sufficient drivable access, outside of the basin, to any structure from a city street.~~

~~H.~~G. Detention and Retention Basin Elements

1. Side ~~S~~slopes – Side slopes shall not be steeper than 4:1 (horizontal to vertical). Retaining walls in lieu of side slopes may be proposed for private basins. No matter the heights, walls shall be designed by a qualified engineer and account for soil saturation, empty and full pond, rapid water drawdown, etc.
2. Bottom Slope – The basin floor shall be designed so as to prevent the permanent ponding of water. The slope of the floor of the basin shall not be less than 1% to provide drainage of water to the outlet grate~~ and prevent prolonged wet, soggy, or unstable soil conditions~~. The preferred minimum slope is 2%.
3. Freeboard – At least one (1) foot of freeboard is required between the top of berm and the spillway elevations. ~~(berm above the 100-year high-water mark).~~
4. Overflow (internal) – The control structure shall contain an internal overflow designed to carry the 100-year storm flow minus the 25-year storm flow, which is handled by the controlled outlet and storage.
~~4.~~5. Spillways
    a. The spillway shall be designed to carry the 200-year storm flow minus the 100-year storm flow, which is handled by the overflow in the outlet control structure~~, if said structure has an internal overflow system (see CS-19 for details)~~.
    b. For large detention basins (greater than 1 acre-ft), concrete spillways shall be required.
    c. For small detention basins (less than or equal to 1 acre-ft), if the control structure is located in the street, the catch basin may serve as the spillway subject to the top of grate being at the required elevation. Otherwise, a concrete spillway is required.
    ~~b.~~d. Spillways shall introduce flows back into the pipe, road, or stream downstream of the outlet control.

~~c.~~e. Spillways shall include a maintained swale and drainage easement to a safe location.

~~d.~~f. The spillway shall be designed to prevent erosion.

g. All spillways shall be designed to protect adjacent embankments, nearby structures, and surrounding properties.

h. For all detention/retention basins, the following information shall be clearly labeled on the construction plans:

i. Detention and/or retention volume (required and provided)

ii. Allowable discharge

iii. Orifice size or canal gate and opening size with required opening height for allowable discharge

iv. Elevations:

a) lowest point in pond

b) flowline of pond inlet/outlet

c) orifice or canal gate opening flowline

d) overflow (internal)

e) spillway

~~a)~~f) lowest point top of bank

6. Ground Covers~~—~~

a. Public Basins (Local) – The surface area of the basin and property shall be as shown in the Standard Drawings and generally consists of decorative rockscaping and waterwise plants with a drip irrigation system. ~~sodded. A minimum of 4 inches of top soil must be installed prior to sod placement. The basin shall be provided with an automated sprinkler system approved by the City Engineer.~~

~~e.~~b. Private Basins (Local) – The surface area of the basin and surrounding property shall be rockscaped/xeriscaped or vegetated. If rockscaped, it shall consist of decorative rockscaping and waterwise plants with a drip irrigation system. If vegetated, either hydro-seed, hydro-mulch, or sod is acceptable. A minimum of four (4) inches of top soil must be installed prior to hydro-seed, hydro-mulch, or sod placement. Vegetated basins must contain a pressurized sprinkler irrigation system. Use one of the seed mixtures found in Section 32 93 13 M. Developer/contractor is responsible for establishing vegetation.

~~5.~~7. Embankment (Fill) Construction – If a raised embankment is constructed for a basin (constructed with granular materials), it shall be provided with a minimum of 6-inches of clay cover on the inside of the berm to prevent water passage through the soil. Refer to the project's geotechnical report for recommendations.

~~6.~~8. Excavation (Cut) Construction – If the basin is constructed primarily by excavation, ~~then~~ it may be necessary to provide an impermeable liner (for detention basins) and ~~land~~ drain system ~~(~~when constructed in the proximity of basements or other below-~~-~~grade structures~~)~~. Refer to the project's geotechnical report for recommendations. ~~In either case, the specific recommendations found in as determined by a geotechnical evaluation shall be followed.~~

9. Multi-Use Basins – Basins may be designed as multi-use facilities when appropriate precautions are incorporated into the design. If amenities such as pavilions, playground equipment, ~~volleyball~~ sports courts, etc. are to be constructed within the water detention area of a basin, they shall be designed appropriately. Structures shall be designed for saturated soil conditions and bearing capacities are to be reduced accordingly. ~~Restrooms~~ Buildings shall not be located in areas of inundation. Inlet and outlet structures should be located as far as possible from all facilities. No wood chips or floatable objects may be used in the area that will be inundated.

10. Groundwater

    a. Historical high groundwater level at the location of the basin shall be determined by the geotechnical engineer and included in the Geotechnical Report for the project.

    b. The bottom of any detention or retention pond shall be at least 2-ft above the determined high groundwater level.

    c. If 2-ft of separation cannot be met:

        i. Retention is not permitted, and

        ii. Detention basin shall be lined with an impermeable HDPE liner before the ground cover is installed.

11. Fencing

    a. Fencing shall be provided on all sides except along the road frontage.

    b. Fencing shall be a minimum of 6-ft tall, with material in accordance with these Public Works Standards and City Zoning Requirements.

~~I.~~ Basins whose depth exceed five (5) feet as measured from its lowest point to the spillway shall be completely fenced and secured from trespassing, unless otherwise approved by the City Engineer and Public Works Director.

c.

~~J.~~H. Detention Basins – Other

1. ~~Percolation~~ Infiltration – No reduction due to ~~percolation~~ infiltration for detention basins volumes shall be permitted.

~~2. Outlet Control – Private detention basins may have a calculated fixed orifice plate mounted on the outlet of the basin. Public detention basins shall have movable, screw-~~

~~type head gates set at the calculated opening height with a stop block required to carry the maximum allowable discharge.~~

2. Low Flow Piping – If ~~T~~the inlet and outlet structures ~~may~~ are ~~be~~ located in different areas of the basin, ~~requiring~~ a buried pipe system to convey any base flows that enter and exit the basin is required. (Cross gutters and surface flows are prohibited.) The minimum pipe size and material for the low flow pipe shall be 15-inch RCP or as otherwise specified by the City Engineer.
3. Underground storage meeting the requirements of section A7.F.3 paragraphs e-h is permitted.
4. Oil/Sediment Separators
    a. An approved oil/sediment separator shall be installed upstream of the control structure for all basins. For public basins, a City-approved hydrodynamic separator is required (see Section A7). For private basins, other separator types shall be approved by the City Engineer.
    b. Sizing and design of oil/sediment separators shall be reviewed and approved by the City Engineer.
        i. Manufacturer's recommendations for sizing must be followed with calculations submitted to the City.
        ii. Consideration must be given to frequency and ease of maintenance of the structure.
        iii. Separator should be installed upstream of detention basin and appropriately sized for such location.
        iv. See Section A3.B for sizing requirements.
    c. Any site dealing with large parking lots or particularly dirty parking lots such as auto repair and maintenance is required to have an oil separator.
    d. On an annual basis, private basins with separators shall be required to be cleaned and provide documentation to the City per the Long-Term Storm Water Management Agreement.
    ~~a.~~e. See also Section A7 – Low Impact Development.

~~K.~~l. Retention Basins (in lieu of detention) ~~(excludes 90th Percentile Storm Retention; see Section A7)~~ (see Section A6 for Retention Basins – LID)

1. Retention basins must be specifically approved by the City Engineer.
2. Retention basins shall not be permitted within zones 1 or~~,~~ 2~~, or 3~~ of any Drinking Water Source Protection Zone of any drinking water source.

3. ~~An approved oil/sediment separator~~A hydrodynamic separator shall be installed upstream of a retention basin. See Section A3.B for sizing requirements.

~~4.1. Volume shall be based upon the 100-year, 3-hour storm. See Exhibits 1 and 2 for rainfall data.~~

~~5.~~4. Retention Basin Criteria – Retention basin~~s~~ in lieu of detention basin may be permitted ~~in lieu of detention basins~~ if the following conditions apply:

a. The distance between the nearest City storm ~~drain~~ drain system component and the boundary of the development is greater than:

i. For residential subdivisions~~development~~: 500 feet or 50 feet multiplied by the number of lots in the entire development (whichever is greater)~~for subdivisions or 10 lots or less~~;

~~i.~~ii. For commercial subdivisions: 500 feet or 100 feet multiplied by the number of lots in the entire development (whichever is greater); or

~~ii.~~iii. For commercial site development: 20 feet multiplied by the number of parking stalls on the site.~~;1,000 feet for subdivisions greater than 10 lots.~~

b. The basin is not located within a Hazardous Area (such as a steep slope) or some other sensitive area (such as a Drinking Water Source Protection Zone).

~~b.~~c. The basin is designed to completely drain within 48 hours of the primary storm event.

~~c.~~d. Recommendation by the City Engineer.

~~6.~~5. ~~Percolation~~ Infiltration Rate for Retention Basins

a. An infiltration ~~percolation~~ test shall be performed by a ~~licensed tester~~geotechnical engineer. The ~~percolation~~ infiltration test shall be performed at the location and elevation of the proposed grade of the bottom of the retention basin.

b. Due to degradation of soils ability to ~~percolate~~ infiltration over time, only ~~8~~70% of the ~~percolation~~ infiltration rate shall be used in the calculations for the retention basins.

~~b.~~c. Infiltration rates shall be between 0.25 in/hr and 6.0 in/hr for retention.

~~7. Retention basins shall be designed to completely drain within 48 hours of the primary storm event.~~

~~L. Subsurface Fluid Distribution Systems~~

~~1. Subsurface Fluid Distribution Systems are allowed for private basins only.~~

~~2. See Paragraph I for requirements related to Percolation Rate for Retention Basins.~~

~~3. A Class V injection well permit is required.~~

4. An approved oil/sediment separator shall be installed upstream of subsurface fluid distribution system.

Subsurface Fluid Distribution Systems are not allowed for storm water disposal if located in Zone 1 or 2 of a drinking water source. They may be allowed in Zone 3 or 4 of a drinking water source if they are equipped with appropriate pretreatment and approved by the City Engineer. **Discharge**

Allowable Discharge Design

5. **Calculations shall be based on the 100-year storm event.**
6. **Calculations shall be based on the total acreage of the development draining to the basin.**
7. **Pass-through of offsite drainage through the development will be allowed.**
8. **Discharge shall not exceed pre-development runoff with pre-development meaning the condition of the land prior to settlement.**
9. **Alternatively, a standard discharge rate of 0.1 cubic feet per second per total acre may be used.**
10. **Controlled discharge will be established as described in A4.H.5 of this document.**

~~A5.~~A6. Water Quality

A. Long-term Best Management Practices (BMPs) shall be used to maintain, to the maximum extent practical, the quality of the water to the pre-developed condition.

B. Construction BMPs shall be implemented per the City's Storm Water Management Plan.

A7. Low Impact Development

A. All new development and redevelopment projects that disturb land greater than or equal to one (1) acre, including projects that are part of a larger common plan of development or sale which collectively disturbs land greater than or equal to one (1) acre, shall be required to evaluate and implement Low Impact Development (LID) approaches to infiltrate, evapotranspire, and/or harvest and use storm water from the site to protect water quality.[4] See Exhibit 3 for General Applicability Flowchart.

B. Developer shall complete and submit the State's *Storm Water Quality Report Template* found on the DWQ website.

1. All calculations shall be provided (Project Impervious Area, Runoff Coefficient, Volume, etc.).
2. Calculation of Predevelopment Hydrologic Condition is optional.
3. See Section A3.C for information on impervious (hardscape) areas.

C. LID/retention should be addressed in Geotech report. Infiltration rate should be tested and provided to determine suitability for retention/infiltration at the proposed location and depth, if applicable. If retention is deemed technically infeasible, water quality measures must be implemented.

D. 80th Percentile Storm Retention

1. All new development and redevelopment projects that disturb land greater than or equal to one (1) acre, including projects that are part of a larger common plan of development or sale which collectively disturbs land greater than or equal to one (1) acre, shall be required to manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 80th percentile rainfall (storm) event. This objective must be accomplished by the use of practices that are designed, constructed, and maintained to infiltrate, evapotranspire, and/or harvest and reuse rainwater. If meeting this retention standard is technically infeasible, a rationale shall be provided on a case-by-case basis for the use of alternative design criteria. The project must document and quantify that infiltration, evapotranspiration, and rainwater harvesting have been used to the maximum extent technically feasible and that full employment of these controls are infeasible due to site constraints.[4]

[4] Adapted from General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s); State of Utah Department of Environmental Quality, Division of Water Quality; effective March 11, 2025.

2. The intent is to manage water as close as possible to the point at which it falls.
3. In Pleasant View City, the 80th percentile storm has been determined to be 0.48 inches of depth.
4. Calculations and implementation rationale must be contained in the Storm Water Quality Report.
5. LID measures should be implemented to meet the 80th Percentile Storm requirements.
6. If an LID approach cannot be utilized, the Applicant must document an explanation of the reasons preventing this approach and the rationale for the *chosen alternative controls* on a case-by-case basis for each project.[3]
7. Implementation of LID measures does not eliminate the requirement for detention/retention basins as described in Section A5 but may be included within the designed detention/retention volumes calculated.

E. See Exhibit 4 for a Summary of Allowable LID BMPs.

F. Special Provisions

1. Retention Basin (LID)
   a. Pretreatment is required prior to the retention basin. Approved pretreatment measures are hydrodynamic separators and vegetated forebays. See Section A3.B for sizing requirements.
   b. See Paragraph A5.I.5 for requirements related to Infiltration Rate for Retention Basins.
   c. The bottom of the retention basin shall be at least 2-ft above the determined high groundwater level.
2. Dry Wells
   a. Pretreatment, such as a pipe hood, is required prior to the dry well. See Section A3.B for sizing requirements.
   b. Dry wells are not allowed for storm water disposal if located in Zone 1 or 2 of a drinking water source.
   c. See Paragraph A5.I.5 for requirements related to Infiltration Rate for Retention Basins.
   d. The bottom of the dry well shall be at least 2-ft above the determined high groundwater level.
   e. A Class V injection well permit is required. (refer to DWQ UIC Program)
3. Underground Infiltration Gallery/Subsurface Fluid Distribution Systems

a. Underground Infiltration Galleries are not allowed for storm water disposal if located in Zone 1 or 2 of a drinking water source.

b. See Paragraph A5.I.5 for requirements related to Infiltration Rate for Retention Basins.

c. The bottom of the underground infiltration gallery shall be at least 2-ft above the determined high groundwater level.

d. A Class V injection well permit is required. (refer to DWQ UIC Program)

e. An approved hydrodynamic separator shall be installed upstream of the control structure serving an underground infiltration gallery. See Section A3.B for sizing requirements.

f. Approved manufacturer/models for public underground infiltration galleries are:

i. ADS StormTech® systems

ii. Contech DuroMaxx and ChamberMaxx systems; and

iii. Perforated pipe infiltration galleries (design/layout as approved by City Engineer)

g. Access manholes shall be placed on both ends of the isolator row, and at the inlet side of each other row. Inspection ports shall be placed at the other ends of each row other than the isolator row.

h. Manufacturer's representative shall oversee construction and provide a certification that installation is as shown on the approved drawings. Certification shall be received prior to issuance of substantial completion or conditional acceptance.

4. Hydrodynamic Separators

a. See Section A3.B for sizing requirements.

b. Approved models are:

i. ADS: Barracuda, Arcadia

ii. Contech: Cascade Separator, CDS, Stormceptor

iii. Oldcastle Infrastructure: Dual-Vortex Separator (DVS)

iv. Others may be approved on a case-by-case basis by City Engineer and Public Works Director.

c. Manufacturer's representative shall oversee construction and provide a certification that installation is as shown on the approved drawings. Certification shall be received prior to issuance of substantial completion or conditional acceptance.

G. Owner-executed Long-Term Storm Water Management Agreement is required for all detention/retention/LID measures prior to acceptance of improvement plans.

EXHIBIT 1 – NOAA POINT PRECIPITATION FREQUENCY ESTIMATES – INTENSITY

NOAA Atlas 14, Volume 1, Version 5
Location name: Ogden, Utah, USA*
Latitude: 41.3198°, Longitude: -111.9888°
Elevation: 4467 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**1.67** (1.45-1.92)	**2.10** (1.86-2.44)	**2.87** (2.52-3.30)	**3.56** (3.11-4.12)	**4.70** (4.01-5.47)	**5.76** (4.75-6.78)	**7.02** (5.60-8.35)	**8.52** (6.54-10.3)	**11.0** (7.93-13.7)	**13.2** (9.11-17.0)
10-min	**1.27** (1.11-1.46)	**1.60** (1.42-1.85)	**2.18** (1.91-2.51)	**2.72** (2.36-3.13)	**3.58** (3.05-4.16)	**4.39** (3.62-5.16)	**5.35** (4.27-6.36)	**6.48** (4.98-7.87)	**8.33** (6.04-10.4)	**10.1** (6.94-12.9)
15-min	**1.05** (0.916-1.21)	**1.32** (1.17-1.53)	**1.80** (1.58-2.08)	**2.24** (1.96-2.59)	**2.96** (2.52-3.44)	**3.62** (2.99-4.26)	**4.42** (3.52-5.26)	**5.36** (4.12-6.51)	**6.89** (4.99-8.63)	**8.31** (5.73-10.7)
30-min	**0.706** (0.618-0.814)	**0.890** (0.788-1.03)	**1.21** (1.06-1.40)	**1.51** (1.32-1.74)	**1.99** (1.70-2.32)	**2.44** (2.01-2.87)	**2.98** (2.37-3.54)	**3.61** (2.77-4.38)	**4.64** (3.36-5.81)	**5.60** (3.86-7.19)
60-min	**0.437** (0.382-0.504)	**0.551** (0.488-0.636)	**0.750** (0.658-0.864)	**0.935** (0.814-1.08)	**1.23** (1.05-1.43)	**1.51** (1.24-1.78)	**1.84** (1.47-2.19)	**2.23** (1.72-2.71)	**2.87** (2.08-3.60)	**3.46** (2.39-4.45)
2-hr	**0.282** (0.251-0.321)	**0.353** (0.314-0.402)	**0.456** (0.403-0.518)	**0.553** (0.484-0.631)	**0.715** (0.612-0.822)	**0.863** (0.721-1.00)	**1.04** (0.840-1.22)	**1.25** (0.972-1.50)	**1.58** (1.16-1.97)	**1.90** (1.33-2.42)
3-hr	**0.218** (0.196-0.244)	**0.269** (0.243-0.302)	**0.335** (0.301-0.376)	**0.399** (0.355-0.448)	**0.500** (0.436-0.567)	**0.595** (0.509-0.682)	**0.711** (0.593-0.827)	**0.848** (0.684-1.01)	**1.07** (0.822-1.32)	**1.28** (0.941-1.63)
6-hr	**0.149** (0.136-0.163)	**0.182** (0.166-0.201)	**0.220** (0.200-0.242)	**0.254** (0.229-0.282)	**0.306** (0.273-0.342)	**0.350** (0.308-0.393)	**0.400** (0.345-0.455)	**0.456** (0.385-0.526)	**0.569** (0.464-0.672)	**0.671** (0.532-0.821)
12-hr	**0.095** (0.087-0.104)	**0.116** (0.107-0.128)	**0.140** (0.128-0.154)	**0.162** (0.147-0.178)	**0.194** (0.174-0.215)	**0.220** (0.195-0.246)	**0.248** (0.216-0.281)	**0.279** (0.237-0.320)	**0.325** (0.269-0.383)	**0.363** (0.293-0.436)
24-hr	**0.061** (0.056-0.068)	**0.075** (0.068-0.083)	**0.090** (0.082-0.099)	**0.102** (0.093-0.113)	**0.119** (0.108-0.131)	**0.133** (0.119-0.146)	**0.146** (0.131-0.161)	**0.160** (0.142-0.176)	**0.178** (0.158-0.197)	**0.192** (0.169-0.221)
2-day	**0.036** (0.033-0.040)	**0.044** (0.040-0.049)	**0.053** (0.048-0.058)	**0.060** (0.054-0.066)	**0.069** (0.063-0.076)	**0.076** (0.069-0.084)	**0.084** (0.076-0.092)	**0.091** (0.082-0.100)	**0.101** (0.090-0.111)	**0.108** (0.096-0.120)
3-day	**0.026** (0.024-0.029)	**0.032** (0.030-0.036)	**0.039** (0.035-0.043)	**0.044** (0.040-0.048)	**0.051** (0.047-0.056)	**0.057** (0.052-0.063)	**0.063** (0.056-0.069)	**0.068** (0.061-0.075)	**0.076** (0.068-0.084)	**0.082** (0.072-0.091)
4-day	**0.022** (0.020-0.024)	**0.027** (0.024-0.029)	**0.032** (0.029-0.035)	**0.036** (0.033-0.040)	**0.042** (0.039-0.047)	**0.047** (0.043-0.052)	**0.052** (0.047-0.057)	**0.057** (0.051-0.063)	**0.064** (0.056-0.070)	**0.069** (0.060-0.076)
7-day	**0.015** (0.013-0.016)	**0.018** (0.017-0.020)	**0.022** (0.020-0.024)	**0.025** (0.023-0.028)	**0.029** (0.026-0.032)	**0.032** (0.029-0.036)	**0.036** (0.032-0.039)	**0.039** (0.035-0.043)	**0.043** (0.038-0.048)	**0.046** (0.041-0.052)
10-day	**0.012** (0.011-0.013)	**0.014** (0.013-0.016)	**0.017** (0.016-0.019)	**0.020** (0.018-0.022)	**0.023** (0.021-0.025)	**0.025** (0.023-0.027)	**0.027** (0.024-0.030)	**0.029** (0.026-0.032)	**0.032** (0.029-0.036)	**0.034** (0.030-0.038)
20-day	**0.007** (0.007-0.008)	**0.009** (0.008-0.010)	**0.011** (0.010-0.012)	**0.013** (0.011-0.014)	**0.014** (0.013-0.016)	**0.016** (0.014-0.017)	**0.017** (0.015-0.018)	**0.018** (0.016-0.020)	**0.019** (0.017-0.021)	**0.020** (0.018-0.022)
30-day	**0.006** (0.005-0.007)	**0.007** (0.007-0.008)	**0.009** (0.008-0.010)	**0.010** (0.009-0.011)	**0.011** (0.010-0.012)	**0.012** (0.011-0.013)	**0.013** (0.012-0.015)	**0.014** (0.013-0.016)	**0.015** (0.014-0.017)	**0.016** (0.014-0.018)
45-day	**0.005** (0.004-0.005)	**0.006** (0.006-0.007)	**0.007** (0.007-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.010)	**0.010** (0.009-0.011)	**0.011** (0.010-0.012)	**0.012** (0.010-0.013)	**0.012** (0.011-0.014)	**0.013** (0.012-0.014)
60-day	**0.004** (0.004-0.005)	**0.005** (0.005-0.006)	**0.006** (0.006-0.007)	**0.007** (0.006-0.008)	**0.008** (0.007-0.009)	**0.009** (0.008-0.009)	**0.009** (0.009-0.010)	**0.010** (0.009-0.011)	**0.011** (0.010-0.012)	**0.011** (0.010-0.012)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

EXHIBIT 2 – NOAA POINT PRECIPITATION FREQUENCY ESTIMATES – DEPTH

NOAA Atlas 14, Volume 1, Version 5
Location name: Ogden, Utah, USA*
Latitude: 41.3198°, Longitude: -111.9888°
Elevation: 4467 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.139** (0.121-0.160)	**0.175** (0.155-0.203)	**0.239** (0.210-0.275)	**0.297** (0.259-0.343)	**0.392** (0.334-0.456)	**0.480** (0.396-0.565)	**0.585** (0.467-0.696)	**0.710** (0.545-0.862)	**0.913** (0.661-1.14)	**1.10** (0.759-1.41)
10-min	**0.212** (0.185-0.244)	**0.267** (0.236-0.308)	**0.363** (0.319-0.419)	**0.453** (0.394-0.522)	**0.597** (0.508-0.694)	**0.731** (0.603-0.860)	**0.891** (0.711-1.06)	**1.08** (0.830-1.31)	**1.39** (1.01-1.74)	**1.68** (1.16-2.15)
15-min	**0.262** (0.229-0.302)	**0.330** (0.293-0.382)	**0.450** (0.395-0.519)	**0.561** (0.489-0.648)	**0.740** (0.630-0.860)	**0.906** (0.747-1.06)	**1.10** (0.881-1.31)	**1.34** (1.03-1.63)	**1.72** (1.25-2.16)	**2.08** (1.43-2.67)
30-min	**0.353** (0.309-0.407)	**0.445** (0.394-0.514)	**0.606** (0.532-0.698)	**0.755** (0.658-0.872)	**0.997** (0.848-1.16)	**1.22** (1.01-1.44)	**1.49** (1.19-1.77)	**1.80** (1.39-2.19)	**2.32** (1.68-2.90)	**2.80** (1.93-3.59)
60-min	**0.437** (0.382-0.504)	**0.551** (0.488-0.636)	**0.750** (0.658-0.864)	**0.935** (0.814-1.08)	**1.23** (1.05-1.43)	**1.51** (1.24-1.78)	**1.84** (1.47-2.19)	**2.23** (1.72-2.71)	**2.87** (2.08-3.60)	**3.46** (2.39-4.45)
2-hr	**0.565** (0.502-0.642)	**0.706** (0.628-0.804)	**0.912** (0.806-1.04)	**1.11** (0.968-1.26)	**1.43** (1.22-1.64)	**1.73** (1.44-2.00)	**2.08** (1.68-2.45)	**2.50** (1.94-3.01)	**3.17** (2.32-3.94)	**3.79** (2.66-4.84)
3-hr	**0.655** (0.590-0.734)	**0.808** (0.730-0.908)	**1.01** (0.904-1.13)	**1.20** (1.07-1.35)	**1.50** (1.31-1.70)	**1.79** (1.53-2.05)	**2.14** (1.78-2.49)	**2.55** (2.06-3.03)	**3.22** (2.47-3.98)	**3.84** (2.83-4.88)
6-hr	**0.893** (0.820-0.982)	**1.09** (0.997-1.20)	**1.32** (1.20-1.45)	**1.53** (1.38-1.69)	**1.84** (1.64-2.05)	**2.10** (1.84-2.36)	**2.40** (2.07-2.73)	**2.73** (2.31-3.16)	**3.41** (2.78-4.02)	**4.02** (3.19-4.92)
12-hr	**1.15** (1.06-1.26)	**1.41** (1.30-1.55)	**1.70** (1.55-1.87)	**1.95** (1.77-2.15)	**2.34** (2.10-2.60)	**2.66** (2.35-2.97)	**3.00** (2.61-3.40)	**3.36** (2.87-3.87)	**3.92** (3.25-4.62)	**4.38** (3.53-5.26)
24-hr	**1.48** (1.35-1.63)	**1.82** (1.65-2.00)	**2.18** (1.98-2.39)	**2.47** (2.24-2.72)	**2.88** (2.60-3.16)	**3.19** (2.88-3.51)	**3.52** (3.16-3.87)	**3.84** (3.43-4.23)	**4.28** (3.79-4.74)	**4.62** (4.06-5.32)
2-day	**1.75** (1.60-1.92)	**2.14** (1.96-2.36)	**2.55** (2.33-2.80)	**2.89** (2.64-3.17)	**3.35** (3.05-3.67)	**3.70** (3.35-4.06)	**4.05** (3.66-4.45)	**4.41** (3.96-4.85)	**4.88** (4.36-5.38)	**5.23** (4.64-5.77)
3-day	**1.93** (1.76-2.12)	**2.37** (2.16-2.60)	**2.83** (2.59-3.11)	**3.22** (2.93-3.52)	**3.74** (3.40-4.09)	**4.14** (3.75-4.54)	**4.55** (4.10-4.99)	**4.96** (4.45-5.46)	**5.52** (4.91-6.09)	**5.94** (5.24-6.58)
4-day	**2.12** (1.94-2.33)	**2.60** (2.37-2.85)	**3.11** (2.84-3.41)	**3.54** (3.23-3.88)	**4.12** (3.74-4.51)	**4.58** (4.14-5.02)	**5.05** (4.54-5.54)	**5.52** (4.94-6.08)	**6.16** (5.46-6.81)	**6.65** (5.85-7.38)
7-day	**2.58** (2.34-2.85)	**3.16** (2.88-3.49)	**3.78** (3.44-4.17)	**4.29** (3.90-4.73)	**4.99** (4.52-5.49)	**5.52** (4.98-6.08)	**6.06** (5.45-6.69)	**6.61** (5.91-7.31)	**7.32** (6.50-8.15)	**7.87** (6.95-8.79)
10-day	**2.93** (2.66-3.23)	**3.60** (3.28-3.97)	**4.29** (3.90-4.72)	**4.84** (4.40-5.32)	**5.56** (5.05-6.11)	**6.10** (5.52-6.71)	**6.63** (5.99-7.31)	**7.15** (6.44-7.90)	**7.82** (7.00-8.67)	**8.31** (7.40-9.24)
20-day	**3.84** (3.49-4.21)	**4.71** (4.29-5.17)	**5.58** (5.08-6.12)	**6.24** (5.69-6.84)	**7.09** (6.45-7.76)	**7.70** (7.00-8.43)	**8.30** (7.51-9.08)	**8.85** (7.99-9.70)	**9.53** (8.58-10.5)	**10.0** (8.98-11.0)
30-day	**4.66** (4.28-5.10)	**5.72** (5.24-6.25)	**6.74** (6.18-7.36)	**7.52** (6.88-8.20)	**8.52** (7.79-9.29)	**9.23** (8.43-10.1)	**9.92** (9.04-10.8)	**10.6** (9.60-11.6)	**11.4** (10.3-12.5)	**11.9** (10.8-13.2)
45-day	**5.81** (5.32-6.34)	**7.11** (6.52-7.75)	**8.35** (7.66-9.08)	**9.31** (8.53-10.1)	**10.5** (9.64-11.4)	**11.4** (10.4-12.4)	**12.2** (11.2-13.3)	**13.0** (11.8-14.2)	**14.0** (12.7-15.3)	**14.6** (13.2-16.0)
60-day	**6.81** (6.25-7.40)	**8.34** (7.65-9.06)	**9.78** (8.98-10.6)	**10.9** (9.99-11.8)	**12.3** (11.2-13.3)	**13.3** (12.1-14.4)	**14.2** (13.0-15.4)	**15.1** (13.7-16.4)	**16.1** (14.7-17.5)	**16.8** (15.3-18.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

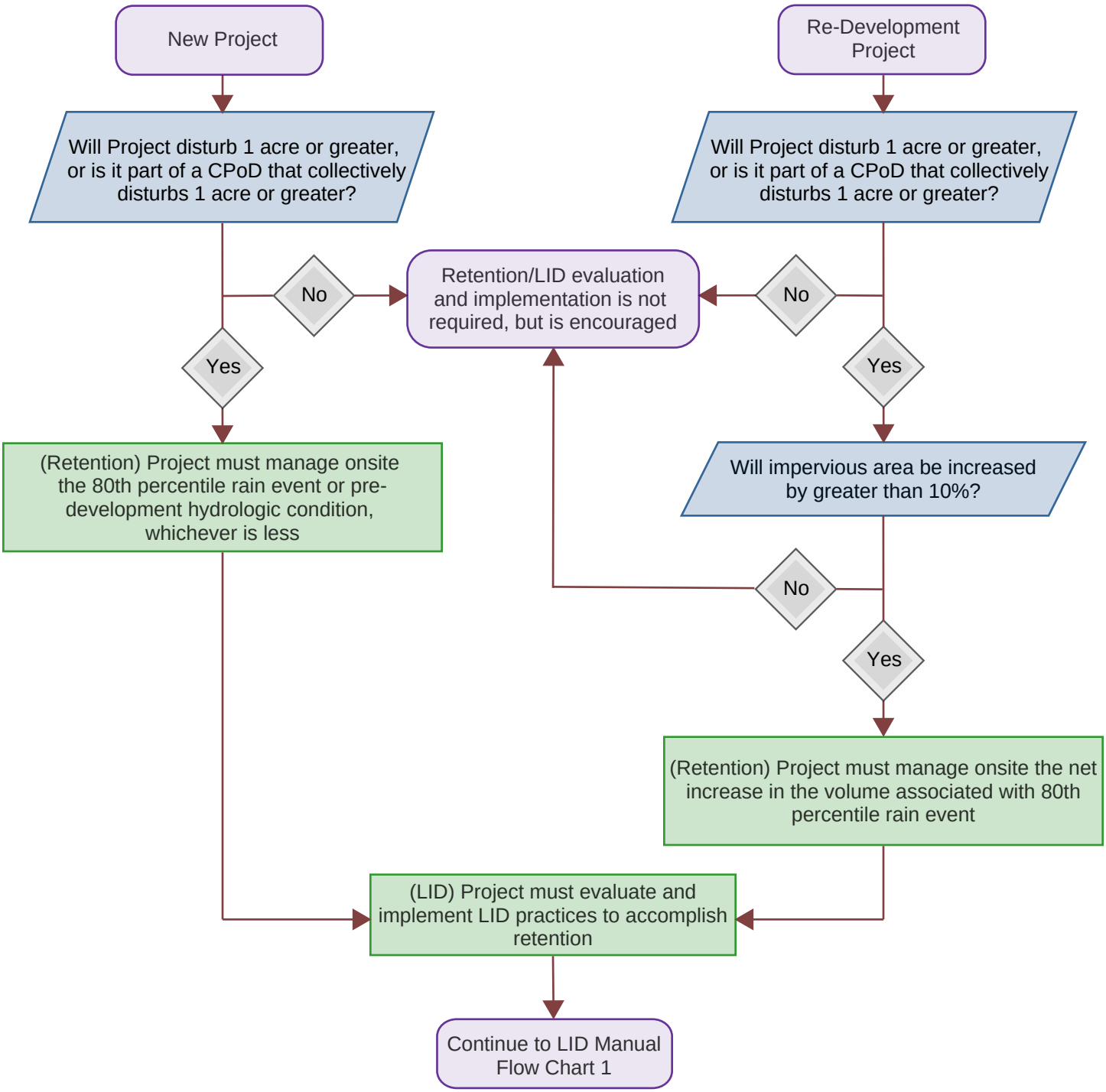
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

EXHIBIT 3 – GENERAL RETENTION/LID APPLICABILITY FLOWCHART

Pleasant View City

Retention/LID Project Applicability Flowchart



LID = Low Impact Development
CPoD = Common Plan of Development or Sale

EXHIBIT 4 – SUMMARY OF ALLOWABLE LID BMPs

Summary of Allowable LID BMPs
from *A Guide to Low Impact Development within Utah*

https://deq.utah.gov/water-quality/low-impact-development

LID BMP Category	LID BMP Type	Fact Sheet ID	Volume Retention	Where Permitted				
				Residential - Public Roads	Residential - Private Roads	Residential - Multi-family	Commercial	Industrial
Bioretention	Rain Garden	BR-1	yes	yes	yes	yes	yes	yes
	Bioretention Cell	BR-2	yes	yes	yes	yes	yes	yes
	Bioswale	BR-3	some	yes	yes	yes	yes	yes
	Vegetated Strip	BR-4	some	yes	yes	yes	yes	yes
	Tree Box Filter	BR-5	varies	no	yes	yes	yes	yes
	Green Roof	BR-6	yes	no[2]	no[2]	no[2]	yes	yes
Pervious Surfaces	Pervious Surfaces	PS-1	yes	no[2]	no[2]	yes	yes	yes
Infiltration Devices[5]	Infiltration Basin[3]	ID-1	yes	yes	yes	yes	yes	yes
	Infiltration Trench	ID-2	yes	no	yes	yes	yes	yes
	Dry Well[3,4]	ID-3	yes	yes	yes	yes	yes	no
	Underground Infiltration Gallery[3,4]	ID-4	yes	yes	yes	yes	yes	yes
Harvest and Reuse	Harvest and Reuse	HR-1	yes	no[2]	no[2]	no[2]	yes	yes

Notes

[2] Individual homes are encouraged to utilitize BMP, but it will not count towards LID and retention requirement for development.

[3] Requires pre-treatment

[4] Requires UIC Class V injection well permit from State of Utah

[5] Other factors (e.g. drinking water source protection zone, groundwater, etc.) may limit use.

APPENDIX B – GEOTECHNICAL INVESTIGATION REPORT MINIMUM REQUIREMENTS

APPENDIX B ~~(NEW)~~

GEOTECHNICAL INVESTIGATION REPORT MINIMUM REQUIREMENTS

B1. General Provisions

A. All reports shall include the Minimum Testing Requirements and use the Design Parameters as detailed below.

B. All reports shall be signed and sealed by a registered Professional Engineer licensed in Utah.

B2. Report Contents

A. Geotechnical Investigation Report submitted to Pleasant View City shall generally include the following contents, as applicable.

CONTENTS

6.5 Roadway and Embankments Fill
6.6 Structural Fill
6.7 Utility Trenches
6.8 Re-use of Excavated Soil Materials
7.0 Foundations
7.1 Foundation Recommendations
7.2 Installation Requirements
7.3 Estimated Settlement
7.4 Lateral Resistance
8.0 Static and Seismic Lateral Earth Pressures (Active, Moderately Yielding, At-Rest, and Passive Conditions)
9.0 Floor Slabs
10.0 Drainage Recommendations
10.1 Surface
10.2 Subsurface
10.3 Foundation Drains/Subdrains
11.0 Pavement Section
11.1 (See Section B4)
11.2 Exterior Concrete Flatwork
12.0 Retaining Walls (Required for all retaining walls taller than 4 feet, when used)
12.1 Surface and Subsurface Drainage
12.2 Internal and Global Stability (Static and Seismic Loading)
12.3 Dimensions and Elevations
12.4 Settlements
12.5 Construction Inspection
13.0 Slope Stability (Required for slopes greater than 25%)
14.0 References
Tables
Figures
A. Project Location/Site Map
B. Boring/Test Pit Locations
C. Boring/Test Pit Logs
D. Key to Symbols for Boring/Test Pit Logs
Appendices, as needed

B3. Minimum Testing Requirements

A. Borings (B) and Test Pits (TP), either known as a "hole"
1. Total: Minimum 1 hole per 2 acres, rounded up
a. Example: 5.5 acre site: 5.5÷2 = 2.75, round up to 3 holes
2. Roadway: 1 hole + 1 hole per 500 lf of roadway (rounded up, along centerline alignment) (counts towards Total)
a. Example: 10.5 acre subdivision with 1,850 lf of roadway centerline

i. Roadway: 1 + (1,850÷500) = 4.7, round up to 5 holes
ii. Total, minimum: 10.5÷2 = 5.25, round up to 6 holes
iii. Therefore, 6 total holes are required for subdivision, with 5 of the holes being along the roadway alignment.

3. Commercial sites: 1 hole + 1 hole per 5,000 square feet (rounded up) for buildings
   a. Example: 13,500 sf building: 1 + (13,500÷5,000) = 3.7, round up to 4 holes
4. Additional borings or test pits as may be required for a representative sampling of the site, as determined by the geotechnical engineer.

B. When retention/infiltration is proposed:
1. Test Pit or Boring: A test pit or boring shall be performed at the location of the proposed retention/infiltration measure. The test pit or boring shall be to a depth of at least 3-ft below the depth of the retention/infiltration measure.
2. Infiltration Test: An infiltration test shall be performed at the location and depth of the proposed feature.
3. Maximum (high) groundwater table shall be determined following ~~4.~~ UAC R317-4-4.(1)(e)(i)(C).

B4. Minimum Design Parameters for Pavement

A. Local/Residential
1. 75,000 ESALs~~S~~ (205 ESALs/day)
2. 20-yr design life
3. 3% growth factor

B. Cul-de-Sac
1. 50,000 ESALs~~S~~ (137 ESALs/day)
2. 20-yr design life
3. 3% growth factor

C. Minor Collector (as shown on the City's Master Street Map)
1. 300,000 ESALs~~S~~ (822 ESALs/day)
2. 20-yr design life
3. 3% growth factor

D. Major Collector / Minor Arterial
1. Contact City for traffic requirements

APPENDIX C - MODIFICATIONS AND ADDITIONS TO MANUAL OF STANDARD SPECIFICATIONS

APPENDIX C

MODIFICATIONS AND ADDITIONS TO THE

~~2017~~ *MANUAL OF STANDARD SPECIFICATIONS*

as published by:
Utah LTAP Center
Utah State University
Logan Utah
~~2017~~

TABLE OF CONTENTS

SECTION 03 20 00 M
CONCRETE REINFORCING (MODIFIED)

PART 3 EXECUTION

3.1 **PLACING**

Add paragraphs F and G as follows:

F. No steel shall extend from or be visible on any finished surface

G. All steel shall have a minimum of 1.5-inches of concrete cover.

SECTION 03 30 04 M
CONCRETE (Modified)

PART 2 PRODUCTS

2.4 ADDITIVES

Add paragraph F as follows:

F. Fiber Reinforcement: A minimum of 1.0 pounds per cubic yard of polyolefin micro-fiber reinforcement shall be evenly distributed into the mix. Mixing shall be as recommended by the manufacturer/ supplier such that the fibers do not ball up. Polyolefin micro-fibers shall meet the requirements of ASTM C1116 and ASTM D7508.

2.5 MIX DESIGN

Replace Paragraph A with the following:

A. **Class:** : When not specified in the plans or project specification, use the following table to select the class of concrete required for the application:

Class	Application
5,000	Above-ground applications, ~~R~~reinforced ~~S~~structural ~~C~~concrete
4,000	Surface (at ground level) application, including ~~S~~sidewalks, curb, gutter, cross gutters, waterways, pavements, and unreinforced footings and foundations
3,000 or 4000	Thrust blocks, anchors, mass concrete
~~2,000~~	~~Anchors, mass concrete~~

SECTION 03 30 10 M
CONCRETE PLACEMENT (Modified)

PART 3 EXECUTION

3.2 PREPARATION

Add paragraph F as follows:

F. No concrete shall be placed until the surfaces have been inspected and approved by the City Engineer or City Inspector.

SECTION 26 56 19 M
ROADWAY LIGHTING (MODIFIED)

PART 1 GENERAL

1.1 SECTION INCLUDES

Replace paragraph B with the following:

B. Testing, restoration, salvage.

Add the following paragraph C:

C. Responsibility of DEVELOPER/CONTRACTOR and OWNER

1.2 REFERENCES

Replace paragraph A with the following:

A. Pleasant View City Public Works Standard Drawings.

Add the following paragraphs F and G:

F. International Building Code, Structural Requirements, as adopted by OWNER.

G. Rocky Mountain Power Standards.

1.3 SUBMITTALS

Add paragraph D:

D. The following shall be submitted and approved by the OWNER:

1. Prior to Installation: Roadway Lighting Plan, showing wiring location, wiring type, voltage, power source location, conduit size and location, junction boxes, and light types. Specifications for cable, conduit, fuse kits, splice kits, junction boxes, and connectors.
2. After Installation, but Prior to Connection to Power: Electronic copy of the Roadway Lighting Plan redlines showing the same items as listed above.
3. Record Drawings: Exact location of the conduit shall be shown and dimensioned or shot in with GPS for future OWNER Blue Staking.

PART 2 PRODUCTS

Replace Section 2.2 with the following:

2.2 CONDUCTORS/WIRES

A. Materials:

1. Conductors: Okonite-FMR Type TC-Cable #112-10-4054, Okonite X-Olene Okoseal #112-31-3747, or Anixter VNTC #3H-0603 copper only.

2. Insulation: RHH-RHW-USE grade cross link polyethylene.
3. Wire: No aluminum wire allowed.
    a. #6 AWG-RHW-2 copper lines from power source to boxes.
    b. From pole base or (hand hole) to the fixture head #10 or #12 THHN copper will only be allowed.
    c. Wire to be black, white, green or phased taped at both ends.
    d. Multiple Pole Installation: Wire size shall be designed by an electrical engineer with no more than a 3% drop in the nominal voltage at the base of each pole. The minimum wire size shall be a #6 AWG RHW copper wire suitable for wet conditions.
    e. Wire must extend 18-inches above grade to splice in ground box.

B. Fuse Holders: In-line, watertight LEC-AA.

C. GFCI Outlets: Wired to come on and off with the light.

D. Splicing:
1. Compatible with cable insulation and water seal for underground use. Comply with UL code.
2. Located a minimum of 3-feet and a maximum of 10-feet from Rocky Mountain Power transformer or secondary box, leave pigtail 8-feet long to secondary box.

E. Conduit:
1. Size and Type:
    a. 2” minimum schedule 40 gray non-conductive PVC unless otherwise specified.
    b. Approved cap or duct seal on ends to prevent debris from entering conduit during construction.
    c. Stronger conduit material, larger conduit size, or larger sweeps may be required for long runs or where more than three (3) bends are needed.
2. Cover:
    a. Conduit bury depth: See OWNER Standard Drawings
3. Pull Line:
    a. Flat pull line capable of withstanding 1000 lbs of tension
    b. 72-inches of extra line capable of extending from each end of conduit.
    c. Secure inside the ends of the conduit and both ends capped.
4. Sweeps and Bends: 90-degree sweeps/bends shall have a minimum of 18-inch radius and a maximum of 24-inch radius.
5. Marker Tape: Minimum 6-inch wide plastic marker tape along the entire length of run 12-inches below grade.

Delete 2.3 in its entirety and replace with the following:

2.3 **LIGHTING ASSEMBLY**

A. Base, pole, luminaire support, and luminaire per OWNER Residential (LP-1), Corridor (LP-2), and Intersection (LP-3) shown in Pleasant View City Public Works Standard Drawings.

2.4 **JUNCTION BOXES**

Add item 3 to paragraph A:

Shall include:

a. Fuse hot wires in junction boxes.

b. Supply waterproof splice kit for neutral cable.

Add paragraph C:

C. Connection to light may also serve as a point of disconnect if located within 10-feet of power source.

Replace Section 2.6 in its entirety and replace it with the following:

2.6 **CONNECTIONS**

A. Wire nuts will be allowed in the pole base only.

B. A Littlefuse LEBJJ fuse holder (or equivalent) with weatherproof rubber boots, mechanical connection, 600 volt rated and 65 AMP rated.

C. Fuse shall be 10 AMP BLF, 20 AMP BLN and 65 AMP BLN or equivalent one time fuse.

D. Fuse holder shall be placed on all hot leads.

E. No crimp connections allowed.

Revise Section 2.8 as follows:

2.8 **POLYSULFIDE BASE, SINGLE COMPONENT SEALANT** [Not Used]

PART 3 EXECUTION

3.1 **PREPARATION**

Replace item F with the following:

F. Compact excavated trench material; see Section 33 05 20.

3.2 POLE FOUNDATION

Replace paragraph B, item 3c with the following:

B. Locations:
   3.
      c. As shown on Pleasant View City Public Works Standard Drawings

Add subparagraph d:

      d. For mid-block installations, locate on or near side lot line or extension thereof.

3.8 PAINTING

Add paragraph D:

D. Damage to pole and/or base coating shall be repaired based on manufacturer's recommendations.

3.9 FIELD QUALITY CONTROL

Add paragraph E :

E. OWNER shall conduct Inspections as follows:

   1. Underground infrastructure shall remain unburied until it has been approved by the Inspector.
   2. Foundation shall be inspected before streetlight assembly installation.
   3. Streetlight assembly installation.

3.11 RESTORATION

Replace paragraph B with the following:

B. Restore paved surfaces in compliance with OWNER's standard asphalt patching requirements.

Add paragraph D:

D. Repair or replace damaged sprinklers and lines.

Add the following Part 4:

PART 4 RESPONSIBILITY

4.1 PAYMENT

A. DEVELOPER of a new subdivision shall be responsible for all **costs** associated with the installation and electrical service to new streetlights, including but not limited to:

1. Electrical service to the development from ROCKY MOUNTAIN POWER
    a. Drawings
    b. Approval
    c. Plat (where applicable)
    d. Connection to existing power
    e. Mainline conduit and cable, transformers, secondary boxes, service to all lots
    f. Work order
2. Conduit from power source (transformer or secondary box) to streetlight location.
3. Location of as-built conduit locations (survey-grade GPS).
4. Junction box near power source.
5. Splice box or interim junction boxes.
6. Junction box near streetlight.
7. Sonotube for streetlight foundation.
8. Rebar cage for streetlight foundation.
9. Concrete streetlight foundation.
10. Streetlight bolt pattern / assembly in foundation.
11. Streetlight and fixture assembly (complete).
12. Wire cable from power source to streetlight.
13. Power source connection for streetlight.

4.2 INSTALLATION AND COORDINATION

A. DEVELOPER of a new subdivision shall be responsible for the installation and coordination of the following:

1. Power service to the development from ROCKY MOUNTAIN POWER
    a. Drawings
    b. Approval
    c. Plat (where applicable)
    d. Connection to existing power
    e. Mainline conduit and cable, transformers, secondary boxes, service to all lots

f. Work order

2. Conduit from power source (transformer or secondary box) to streetlight location with approved OWNER location marker (see drawings).
3. Junction box near power source.
4. Splice box or interim junction boxes.
5. Junction box near streetlight.
6. Sonotube for streetlight foundation
7. Rebar cage for streetlight foundation
8. Concrete streetlight foundation
9. Streetlight bolt pattern / assembly in foundation
10. Streetlight and fixture assembly (complete)
11. Wire cable and accessory connections from power source to streetlight
12. Grounding rod

B. OWNER shall be responsible for the installation and coordination of the following:

1. Work order with ROCKY MOUNTAIN POWER for electrical service to streetlights
2. Location of as-built conduit locations (survey-grade GPS)
3. ROCKY MOUNTAIN POWER connection of the power source to the streetlight.

END OF SECTION

SECTION 31 23 16 M
EXCAVATION (Modified)

PART 3 EXECUTION

3.3 GENERAL EXCAVATION REQUIREMENT

Add paragraph I as follows:

I. Excavation for pipelines under existing curb and gutter, concrete slabs, or sidewalks shall be open cut. In no case shall tunneling be allowed. At the option of the City Engineer, jacking under permanent facilities may be allowed based on his/her direction.

Add Section 31 23 20 Fill

SECTION 31 23 20
FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-structural fill materials.

B. Non-structural placement and compaction.

1.2 REFERENCES

A. **ASTM Standards**

D 698	Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
D 1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
D 2922	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. When requested by ENGINEER, submit laboratory dry density and optimum laboratory moisture content for each type of fill to be used.

1.4 QUALITY ASSURANCE

A. Do not change material sources without ENGINEER's knowledge.

B. Reject material that does not comply with the requirements specified in this Section.

1.5 STORAGE

A. Safely stockpile materials.

B. Separate differing fill materials, prevent mixing, and maintain optimum moisture content of materials.

1.6 SITE CONDITIONS

A. Do not place, spread, or roll any fill material over material that is damaged by water. Remove and replace damaged material at no additional cost to OWNER.

B. Control erosion. Keep area free of trash and debris. Repair settled, eroded, and rutted areas.

C. Reshape and compact damaged structural section to required density.

1.7 ACCEPTANCE

A. General: Native material may be wasted if there is no additional cost to substitute material acceptable to ENGINEER.

B. Lift thickness: One test per Lot.

C. Compaction: One test per Lot. Verify density using nuclear tests, ASTM D 2922. Compaction and Lot sizes as follows:

1. Compact to 92% Standard Proctor
2. One Lot = 1500 square feet per lift

1.8 **WARRANTY**

A. Repair settlement damage at no additional cost to OWNER.

PART 2 PRODUCTS

2.1 **FILL MATERIALS**

A. Material shall be free from sod, grass, trash, rocks larger than four (4) inches in diameter, and all other material unsuitable for construction of compacted fills.

2.2 **WATER**

A. Make arrangements for sources of water during construction and make arrangements for delivery of water to site.

B. Comply with local Laws and Regulations at no additional cost to OWNER when securing water from water utility company.

PART 3 EXECUTION

3.1 **PREPARATION**

A. Implement the traffic control plan requirements, Section 01 55 26.

B. Verify material meets maximum size requirements.

C. If ground water is in the intended fill zone, dewater.

3.2 **PROTECTION**

A. Protect existing trees, shrubs, lawns, structures, fences, roads, sidewalks, paving, curb and gutter and other features.

B. Protect above or below grade utilities. Contact utility companies to repair utility damage. Pay all cost of repairs.

C. Avoid displacement of and damage to existing installations while compacting or operating equipment.

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

E. Restore any damaged structure to its original strength and condition.

3.3 **LAYOUT**

A. Identify required line, levels, contours, and datum.

B. Stake and flag locations of underground utilities.

C. Upon discovery of unknown utility or concealed conditions, notify ENGINEER.

D. Maintain all benchmarks, control monuments and stakes, whether newly established by surveyor or previously existing. Protect from damage and dislocation.

E. If discrepancy is found between Contract Documents and site, ENGINEER shall make such minor adjustments in the Work as necessary to accomplish the intent of Contract Documents without increasing the Cost of the Work to CONTRACTOR or OWNER.

3.4 **SUBGRADE**

A. Protect Subgrade from desiccation, flooding, and freezing.

B. Before placing fill over Subgrade, get ENGINEER's inspection of subgrade surface preparations.

C. If Subgrade is not readily compactable get ENGINEER’s permission to stabilize the subgrade.

3.5 **TOLERANCES**

A. Compaction: Ninety-two (92) percent minimum relative to a standard proctor density, Section 31 23 26.

B. Lift Thickness (before compaction):

1. Eight (8) inches when using riding compaction equipment.

2. Six (6) inches when using hand held compaction equipment.

3.6 **CLEANING**

A. Remove stockpiles from site. Grade site surface to prevent free standing surface water.

B. Leave borrow areas clean and neat.

END OF SECTION

SECTION 31 37 00
RIPRAP OR ROCK LINING

This specification replaces APWA Standard Specification Section 31 37 00.

PART 1 GENERAL

1.1 GENERAL

This section covers furnishing and placing the granular filter and loose riprap materials in accordance with these specifications and in conformity with the lines, grades, and dimensions shown on the drawings or as directed by the ENGINEER.

1.2 REFERENCES

A. The latest edition of the following publications form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

B. American Society for Testing and Materials (ASTM)

ASTM C-127 Specific Gravity and Absorption of Coarse Aggregate.

ASTM C-535 Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

1.3 RELATED SECTIONS

Section 31 05 19, Geotextile Fabric

1.4 SUBMITTALS

A. The following shall be submitted:

1. Certification from a certified independent laboratory that the riprap meets the material properties of this specification.

2. A sample of the riprap to be used for construction.

1.5 STORAGE OF MATERIALS

Materials shall be arranged and used in a manner to avoid excessive segregation and to prevent contamination with other materials.

PART 2 PRODUCTS

2.1 GRANULAR FILTER

A. Granular filter sources shall be approved by the ENGINEER prior to use.

B. Concrete masonry or concrete pavement may not be used for granular filter.

C. Granular Filter shall be well graded with additional gradation requirements as follows:

TABLE 1 – GRANULAR FILTER GRADATIONS

% Smaller Than Given Size By Weight	Size (Inches)
90-100	3
35-90	¾
0-30	No. 4
0-15	No. 16
0-3	No. 200

** D_{50} = Nominal particle size

D. The CONTRACTOR shall be responsible for obtaining (by selective mining, crushing, screening, or some other method) drainage rock will meet the specified material requirements.

2.2 LOOSE RIPRAP

A. Riprap shall consist of quarry stone which is sound and durable against disintegration under conditions to be met in handling and placing, and is hard and tenacious and otherwise of suitable quality to ensure permanency in the specified kind of work.

B. Riprap sources shall be approved by the ENGINEER prior to use. Concrete masonry or concrete pavement may not be used for riprap. Riprap shall be well graded with additional gradation requirements for riprap as follows:

(continued on next page)

TABLE 2 – LOOSE RIPRAP GRADATIONS

Riprap Designation	%Smaller Than Given Size By Weight	(Inches)	D_{50}** (Inches)
Class I	70-100	12	6
	50-70	9	
	35-50	6	
	2-10	3	
Class II	70-100	15	9
	50-70	12	
	35-50	9	
	2-10	3	
Class III	70-100	20	12
	50-70	16	
	35-50	12	
	2-10	4	
Class IV	70-100	25	15
	50-70	20	
	35-50	15	
	2-10	5	
Class V	70-100	30	18
	50-70	24	
	35-50	18	
	2-10	6	
Class VI	70-100	35	21
	50-70	28	
	35-50	21	
	2-10	7	
Class VII	70-100	40	24
	50-70	32	
	35-50	24	
	2-10	8	

** D_{50} = Nominal particle size

C. All stones shall be angular (no rounded rock will be permitted), each piece having its greatest dimensions not greater than three times its least dimensions. All stone shall conform to the following test requirements of the American Society for Testing and Materials Standards:

	Requirements	ASTM Standard
Specific Gravity, minimum	2.60	C-127
Los Angeles Abrasion, maximum	40%	C-535

D. The CONTRACTOR shall be responsible for obtaining (by selective mining, crushing, screening, or some other method) loose riprap that will meet the specified material requirements.

PART 3 EXECUTION

3.1 PREPARATION

A. Remove all brush, trees, stumps, and other objectionable materials and dress area to a smooth surface. Make Excavation to provide a firm foundation and protect against undercutting. Secure approval before backfilling.

B. Install required granular filter in accordance with this Section, or geotextile in accordance with Section 31 05 19, as applicable.

3.2 GRANULAR FILTER

A. Prior to placement of granular filter, the subgrades to the granular filter shall be compacted and graded to the lines and grades shown on the drawings.

B. Granular filter shall generally be placed starting at the lowest elevations and working upward. The surface shall be leveled as necessary, to produce a reasonably uniform appearance and the required thickness.

3.3 LOOSE RIPRAP

A. Prior to placement of loose riprap, the granular filter shall be placed and graded to the lines and grades shown on the drawings.

B. Riprap shall generally be placed starting at the lowest elevations and working upward. Riprap shall be placed to the minimum thickness designated on the drawings and shall be positioned in such a manner that will provide uniform distribution of the various sizes of stone and produce a well-keyed mass of rock with the least practical amount of void space. The surface shall be leveled as necessary, to produce a reasonably uniform appearance and the required thickness.

END OF SECTION

SECTION 31 41 00 M
SHORING (Modified)

PART 1 GENERAL

~~1.2 PRICE – MEASUREMENT AND PAYMENT~~

~~A. In Trenching, Shoring:~~

~~*Revise subparagraph 1 to read as follows:*~~

~~1. A two (2) part Protective System is required if each Side of the Trench is to be shored. The use of a Trench Box shall be classified as one Protective System.~~

1.4 **DESIGN OF PROTECTIVE SYSTEMS**

Add paragraphs C and D as follows:

C. Trenches five (5) feet deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than five (5) feet deep, a competent person may determine that a protective system is not required.

D. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 29 CFR 1926.652(b) and (c).

1.5 **SUBMITTALS**

Revise paragraph A to read as follows:

A. Submit a Protective System plan:

1. When excavation is over twenty (20) feet deep, or
2. When requested by ENGINEER.

Add Article 1.6 as follows:

1.6 **REFERENCES**

A. 29 CFR Part 1910 – Occupational Safety and Health Standards

B. 29 CFR Part 1926 Subpart P – Excavations

PART 3 EXECUTION

3.4 INSPECTIONS

Add paragraph C as follows:

C. OWNER and/or ENGINEER may order an immediate work stoppage if working conditions are thought to be unsafe. Work may resume only after proper safety precautions are implemented.

SECTION 32 01 06 M
STREET NAME SIGNS (Modified)

PART 1 GENERAL

1.2 **REFERENCES**

Add paragraph C as follows:

C. **Pleasant View City Public Works Standard Drawings**

SECTION 32 01 13.64 M
CHIP SEAL (Modified)

PART 1 GENERAL

1.2 **REFERENCES**

A. **ASTM Standards:**

Add the following to paragraph A:

C 29 Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate

C 330 Standard Specification for Lightweight Aggregates for Structural Concrete

Rename Article 1.5 as follows:

1.5 **WEATHER AND CONDITIONS**

A. Temperature

Add subparagraph 4 as follows:

4. Do not place if forecasted temperature is expected to drop below 40 deg F within 72 hours of placement.

B. Moisture and Wind:

Add subparagraph 1 as follows:

1. Do not place chip seal coat if surface moisture is present.

PART 2 PRODUCTS

2.1 ~~**ASPHALT**~~ **BINDER**

Revise paragraph B as follows:

B. Emulsified Asphalt: CRS-2P or LMCRS, Section 32 12 03. Use any of the following additives to match aggregate particle charge, weather conditions, and mix design:

(Subparagraphs 1-5 remain unchanged.)

2.2 **COVER AGGREGATE**

A. Material:

~~*Revise*~~ *Add subparagraph 12* ~~*to read*~~ *as follows:*

1. Lightweight Aggregate: 100% Crusher processed rotary kiln lightweight expanded shale chips (Utelite or approved equal).

~~*Replace*~~ *Add Table 1A* ~~*with the*~~*as follows*~~*ing*~~*:*

Table 1A – Physical Properties of Lightweight Aggregate (ASTM C330)			
Property	**ASTM**	**Min.**	**Max.**
Clay Lumps and Friable Particles, percent	C142	-	2
Bulk Density Dry Loose Condition, lb/ft^3	C29	-	55

B. Gradation: Analyzed on a dry weight and percent passing basis.

~~*Replace* *Add* *Table 2A* ~~*with the*~~*as* *follow*~~*sing*~~*:*

Table 2A – Master Grading Band for Lightweight Aggregate		
Sieve	**ASTM**	**C330 Requirement**
1/2”	C136	100
3/8”		80-100
No. 4		5-40
No. 8		0-20
No 16		0-10
No. 200	C117	0-10

Replace Article 2.3 with the following:

2.3 **FOG SEAL/FLUSH COAT**

A. Material: Use cationic emulsified asphalt grade CSS-1h, Section 32 12 03.

Add Article 2.4 as follows:

2.4 **MIX DESIGN**

A. Select Type and grade of emulsified asphalt, ASTM D 3628.

B. Use the following application rates, or submit mix design for approval by Engineer.

1. Emulsion: Use Table 3.

Table 3 – Emulsion Application Rate	
Emulsion	Application Rate (gal/sy)
CRS-2P	0.32 – 0.35
LMCRS-2	0.32 – 0.35

2. Cover Material: Use Table 4.

Table 4 – Cover Material Application Rate	
Emulsion	Application Rate (lbs/sy)
CRS-2P	10.0 – 12.0
LMCRS-2	10.0 – 12.0

3. Fog Seal/Flush Coat: Use 0.10 – 0.12 gal/sy at a 2:1 dilution rate.

PART 3 EXECUTION

3.2 PREPARATION

Add paragraph F as follows:

F. Cover manholes, valves boxes, storm drain inlets, and other service utility features before placing any chip seal coat.

3.4 APPLICATION

Revise paragraph A to read as follows:

A. Asphalt Emulsion: Keep viscosity between 50 and 100 centistokes during application, ASTM D 2170. Keep temperature to a minimum of 145 deg F.

Revise Article 3.6 to read as follows:

3.6 FOG SEAL/FLUSH COAT

A. Apply asphalt seal over the chips within 24 hours of placing chips.

B. Keep viscosity between 50 and 100 centistokes, during application, ASTM D 2170.

SECTION 32 12 05 M
BITUMINOUS CONCRETE (MODIFIED)

2.3 ADDITIVES

Revise paragraph D to read as follows:

D. RAP: Free of detrimental quantities of deleterious materials.

1. Use RAP Content as requirements of Table 2, but RAP Content shall not exceed 30%.
2. Determine RAP binder content by chemical extraction.

SECTION 32 16 13 M
DRIVEWAY, SIDEWALK, CURB, GUTTER (Modified)

PART 3 EXECUTION

3.4 CONTRACTION JOINTS

D. Curb, Gutter, Waterway:

Revise subparagraph 1 to read as follows:

1. Place joints at intervals not exceeding 10 feet.

3.5 EXPANSION JOINTS

B. Sidewalks:

Add subparagraph 5 as follows:

5. ~~Expansion joints are to be placed at 48-foot intervals (minimum) or~~ Place expansion joints wherever new sidewalk adjoins existing sidewalks, driveways, or aprons.

C. Curb, Gutter, Waterway:

Add subparagraph 4 as follows:

1. Place expansion joint where new curb and gutter adjoins existing curb and gutter.

SECTION 32 31 13 M
CHAIN LINK FENCES AND GATES (Modified)

PART 2 PRODUCTS

2.6 POSTS, CAPS, RAILS, COUPLINGS

A. Posts, Frames, Stiffeners, Rails: ASTM F 1043:

Revise applicable rows of Table 1 to read as follows:

Top Rail	1-5/8” pipe

PART 3 EXECUTION

3.6 INSTALLATION OF FENCE FABRIC

Revise paragraph A to read as follows:

A. Place fence fabric on roadway side of posts unless otherwise specified. Place fabric approximately 1 inch above the grounds. Maintain a straight grade between posts by excavating ground high points and filling depressions with soil.

SECTION 32 31 16 M
WELDED WIRE FENCES AND GATES (Modified)

PART 1 GENERAL

1.2 **REFERENCES**

Add paragraph D as follows:

D. UDOT Standard Drawing

FG 2A Right of Way Fence and Gates (Metal Post)

FG 2B Right of Way Fence and Gates (Metal Post)

PART 3 EXECUTION

3.2 **INSTALLATION**

Add paragraph N as follows:

N. Install per UDOT Standard Drawings FG 2A and FG 2B.

Add Section 32 31 23 Poly(Vinyl Chloride)(PVC) Fences and Gates

SECTION 32 31 23
POLY(VINYL CHLORIDE)(PVC) FENCES AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. PVC fencing, posts, gates, and appurtenances.

1.2 REFERENCES

A. **ASTM Standards:**

D 1784	Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
F 626	Fence Fittings
F 964	Rigid Poly(Vinyl Chloride)(PVC) Exterior Profiles Used for Fencing and Railing
F 1999	Installation of Rigid Poly(Vinyl Chloride)(PVC) Fence Systems

1.3 SUBMITTALS

A. Drawings: Indicate plan layout, grid, size and spacing of components, accessories, fittings, anchorage, and post section.

B. Data: Submit manufacturer's installation instructions and procedures, including details of fence and gate installation.

C. Submit sample of fence fabric and typical accessories.

PART 2 PRODUCTS

2.1 GENERAL

A. Products from other qualified manufacturers having a minimum of 5 years' experience manufacturing PVC fencing will be acceptable by the architect as equal, if approved in writing, ten days prior to bidding, and if they meet the following specifications for design, size, and fabrication. PVC Profiles, lineals, and extrusions used as components must "meet or exceed" the minimum performance guidelines laid out in ASTM 964.

2.2 PVC FENCE

A. Pickets, rails, and posts fabricated from PVC extrusion. The PVC extrusions shall comply with ASTM D 1784, Class 14344B and have the following characteristics:

Specific Gravity (+/- 0.02)	1.4
Using 0.125 specimen Izod impact ft. lbs./in. notch	23.0
Tensile strength, PSI	6,910
Tensile modulus, PSI	336,000
Flexural yield strength, PSI	10,104
Flexural modulus, PSI	385,000
DTUL at 264 PSI	67˚C

B. All fence parts made from PVC shall have a minimum thickness of 0.17 in except where specified otherwise.

2.3 **POST CAPS**

A. Molded, one piece.

B. Cross Section: Match post or gate upright cross section.

C. Thickness: 0.095" minimum.

D. Configuration: Flat or four-sided as required for installation to top of posts and gate.

2.4 **ACCESSORIES**

A. Standard gate brace, screw caps, rail end reinforcers, and other accessories as required.

2.5 **MISCELLANEOUS MATERIALS**

A. Stiffener Chemicals: Galvanized steel structural channel. Configure channels for concealed installation within PVC rails with pre-drilled holes for drainage. Aluminum extruded channel available upon request.

1. Cross Section: 3.00" x 3.00" x 1.500" hourglass shape to grip picket.

2. Thickness: 0.040 Gauge (minimum)

B. Fasteners and Anchorage: Stainless Steel. All fasteners to be concealed or colored heads to match. Provide sizes as recommended by fence manufacturer.

C. PVC Cement: As recommended by fence manufacturer.

2.6 **GATE HARDWARE AND ACCESSORIES**

A. General: Provide hardware and accessories for each gate according to the following requirements.

B. Hinges: Size and material to suit gate size, non-lift-off type, self-closing, glass filled nylon with stainless steel adjuster plate, offset to permit 120 degree gate opening. Provide one pair of hinges for each gate.

1. Stainless Steel, painted with carbo zinc base.

2. Finish: Pre-painted, 2 coats "Polane."

3. Color: Black Gravity Latch or dual access gravity latch.

C. Latch: Manufacturers' standard self-latching, thumb latch, pre-finished steel, or stainless steel gravity latch. Provide one latch per gate.

1. Finish: Match gate hinge finish.

D. Hardware: Stainless Steel. Provide sizes as recommended by fence manufacturer.

1. Finish: Match gate hinge finish.

2.7 **CONCRETE**

A. Use Class 3000 concrete. Section 03 30 04.

2.8 **REINFORCING FOR FILLED POSTS**

A. Steel Reinforcing:

1. Steel Reinforcing Bars: ASTM A 615. Grade 60. Deformed (#4 or ½").

2. Install 2 bars for each corner or gate post as specified in the drawings.

PART 3 EXECUTION

3.1 **PREPARATION**

A. Locate and preserve utilities, Section 31 23 16.

B. Excavation, Section 31 23 16.

C. Review to ASTM F 567 and CLFMI products manual for chain link fence installation.

D. Protect roots and branches of trees and plants to remain.

E. Limit amount of clearing and grading along fence line to permit proper installation.

3.2 **LAYOUT OF WORK**

A. Accurately locate and stake locations and points necessary for installation of fence and gates.

B. General arrangements and location of fence and gates are indicated. Install except for minor changes required by unforeseen conflicts with work of other trades.

3.3 **INSTALLATION – GENERAL**

A. Install fence in compliance with manufacturer's written instructions.

B. PVC components shall be carefully handled and stored to avoid contact with abrasive surfaces.

C. Install components in sequence as recommended by fence manufacturer.

D. Install fencing as indicated on the drawings provided.

E. Variations from the installation indicated must be approved.

F. Variations from the fence and gate installation indicated and all costs for removal and replacement will be the responsibility of the CONTRACTOR.

3.4 INSTALLATION OF POSTS

A. Excavation

1. Drill or hand-excavate (using post hole digger) holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
2. If not indicated on drawings, excavate holes for each post to a minimum diameter of 12 inches.
3. Unless otherwise indicated, excavate hole depths not less than 30 inches or to frost line.

B. Posts

1. Install posts in one piece, plumb and in line. Space as noted in the drawings. Enlarge excavation as required to provide clearance indicated between post and side of excavation.
2. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations.
    a. Unless otherwise indicated, terminate top of concrete footings 3 inches below adjacent grade and trowel to a crown to shed water.
    b. Secure posts in position for manufacturer's recommendations until concrete sets.
    c. After installation of rails and unless otherwise indicated, install reinforcing in posts in opposing corners of post as shown and fill end and gate posts with concrete to level as indicated. Concrete fill shall completely cover the reinforcing steel and gate hardware fasteners. Consolidate the concrete by striking the post face with a rubber mallet, carefully tamping around the exposed post bottom.
    d. Install post caps. Use #8 screws, nylon washers and snap caps.
    e. Remove concrete splatters from PVC fence materials with care to avoid scratching.

3.5 INSTALLATION OF RAILS

A. Top and Bottom Rails

1. Install rails in one piece into routed hole fabricated into posts to receive top and bottom rails, and middle where necessary. Except at sloping terrain, install rails level.
    a. Prior to installation of rails into posts, insert concealed steel channel stiffeners in top rail, where necessary. Bottom rails shall include minimum 2-¼" drainage holes.
    b. At posts to receive concrete fill, tape rail ends to prevent seepage when filling post with concrete.

B. Middle Rails:

1. Where necessary, install middle rails in one piece into routed hole in posts with larger holes facing down. Except at sloping terrain, install middle rails level. Secure mid rail to pickets with 2-#8 x 1-1/2" screws evenly spaced.
    a. At posts to receive concrete fill, tape rail ends to prevent seepage when filling post with concrete.

3.6 **INSTALLATION OF FENCE FABRIC/PICKETS**

A. Pickets: Install pickets in one piece as per manufacturer recommendations. Install pickets plumb.

3.7 **INSTALLATION ON SLOPING TERRAIN**

A. At sloping terrain rails may be racked (sloped) or stepped to comply with manufacturer's recommendations.

3.8 **INSTALLATION OF GATES**

A. Prior to installation of rails into posts, apply PVC cement into sockets per manufacturer's recommendations. Bottom rail shall include minimum 2-¼" drainage holes.

B. Assemble gate prior to fence installation to accurately locate hinge and latch post. Align gate horizontal rails with fence horizontal rails.

C. Install gates plumb, level, and secure for full opening without interference according to manufacturer's instructions.

D. Gate Latch Installation. Install gate latch according to manufacturer's instructions.

E. Allow minimum 72 hours to let concrete set-up before opening gates.

END OF SECTION

SECTION 32 92 00 M
TURF AND GRASS (Modified)

PART 1 GENERAL

1.3 **SUBMITTALS**

Add paragraph ~~C~~ D as follows:

D. Submit seed mix from Supplier.~~.~~

PART 2 PRODUCTS

Replace Article 2.2 with the following:

2.2 **~~SEED~~NATIVE GRASSES AND WILDFLOWERS**

~~*Add paragraph D as follows:*~~

A. Provide one of the following mixtures:~~Seed Mix:~~

1. Native Grasses and Wildflowers

SEED #	BOTANICAL NAME	COMMON NAME	% by Weight
1	Festuca ovina duriuscula	Hard Fescue	77%
Plus equal proportioned quantities of the following wildflower seeds:			23%
2	Aster alpinus	Alpine Aster	
3	Campanual carpatica 'Jacqueline'	Bluebells	
4	Coreopsis grandiflora 'Sunray'	Dwarf Coreopsis	
5	Eschschlzia californica	California Poppy	
6	Linum Lewisii	Blue Flax	
7	Primula	While Primrose	
8	Tagetes	Marigold	
9	Viguiera Multiflora	Showy golden eye	

~~1.~~2. Native Grasses

SEED #	BOTANICAL NAME	COMMON NAME	% by Weight
1	Agropyron cristatum 'Fairway'	Fairway Crested Wheatgrass	15%
2	Agropyron riparium 'Sodar'	Streambank Wheatgrass	20%
3	Bromus inermis 'Manchar'	Smooth Brome	32%
4	Fescue rubra 'Fortress'	Red Fescue	25%
5	Poa compressa 'Reuben's'	Reuben's Canadian Bluegrass	6%
6	Trifolium repens	White Dutch Clover	2%

B. Purity of all seed types: 90 percent.

C. Germination of all seed types: 90 percent.

PART 3 EXECUTION

3.4 ~~SEEDING~~INSTALLATION

Revise paragraph ~~A~~ C to read as follows:

C. Seeding: Apply seed at a rate of eight (8) pounds per 1,000 square feet evenly in two (2) intersecting directions. Rake in lightly and top-dress all seeded areas with 1/4 inch topsoil. Do not let seed installation be subject to damage by climatic conditions.

Add Section 33 05 12 Conductive Tracer Wire for Pipe Installation

SECTION 33 05 12
CONDUCTIVE TRACER WIRE FOR PIPE INSTALLATION

PART 1 GENERAL

1.1 SUMMARY

This section covers the requirements for installation of a conductive tracer wire with underground pipe.

1.2 SYSTEM DESCRIPTION

Install electrically continuous tracer wire with access points as described herein to be used for locating pipe with an electronic pipe locator after installation.

PART 2 PRODUCTS

2.1 Tracer wire shall be twelve (12) gauge minimum solid copper with thermoplastic insulation recommended for direct burial. Wire connectors shall be 3M DBR, or approved equal, and shall be watertight and provide electrical continuity.

PART 3 EXECUTION

3.1 ERECTION / INSTALLATION / APPLICATION AND/OR CONSTRUCTION

A. General: Tracer wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be secured to the pipe as required to ensure that the wire remains adjacent to the pipe. The tracer wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all new water valve boxes, water meter boxes, fire hydrants, sewer manholes, and sewer cleanouts as applicable to the utility line being installed.

B. Manholes: The wire shall be installed from the exterior of the manhole to the interior by installing the wire underneath the manhole frame.

3.2 TESTING

CONTRACTOR shall perform a continuity test on all tracer wire in the presence of ENGINEER or ENGINEER's representative. Testing shall be performed prior to road construction.

3.3 REPAIR / RESTORATION

If the tracer wire is found to be not continuous after testing, CONTRACTOR shall repair or replace the failed segment of the wire.

END OF SECTION

SECTION 33 05 25 M
PAVEMENT RESTORATION (Modified)

PART 1 GENERAL

1.2 REFERENCES

Replace paragraph A to read as follows:

A. **Pleasant View City Public Works Standard Drawings**

PART 2 PRODUCTS

2.2 ASPHALT PAVEMENT

Revise paragraph A to read as follows:

A. Permanent Warm Weather Asphalt Concrete: Section 32 12 05 M unless indicated otherwise.

Revise paragraph C to read as follows:

C. Pavement Sealing:

1. Crack Seal: Section 32 01 17
2. Chip Seal: Section 32 01 13.64 and 32 01 13.64 M.
3. Fog Seal: Section 32 01 13.50.

PART 3 EXECUTION

3.5 ASPHALT PAVEMENT RESTORATION

Revise paragraphs A and B to read as follows:

A. Follow Pleasant View City Public Works Standard Drawings.

B. Match existing pavement thickness or 4-inches minimum, whichever is greater.

SECTION 33 08 00 M
COMMISSIONING OF WATER UTILITIES (Modified)

PART 3 EXECUTION

3.5 **INFILTRATION TEST**

Revise paragraph A to read as follows:

A. General: 150 gallons per inch diameter per mile per day. If the ground water table is less than two (2) feet above the crown of the pipe, the infiltration test is not required.

Revise Article 3.6 in its entirety to read as follows:

3.6 **EXFILTRATION TEST**

A. Non-Pressurized System:

1. General: Air test or hydrostatic test is CONTRACTOR's choice.
2. Air Test:
   a. Plastic Pipe: ASTM F 1417.
      (i) For pipe up to 30 inches diameter, pressure drop is 0.5 psi.
      (ii) For pipe larger than 30 inches diameter, isolated joint test is 3.5 psi maximum pressure drop is 1.0 psi in 5 seconds.
   b. Concrete Pipe:
      (i) ASTM C 1214 for concrete pipe 4" to 24" diameter.
      (ii) ASTM C 1103 for concrete pipe 27" and larger.
3. Hydrostatic Test: Provide air release taps at pipeline's highest elevations and expel all air before the test. Insert permanent plugs after test has been completed.
   a. Plastic Pipe: ASTM F 2497.
   b. Concrete Pipe: ASTM C 497. Abide by Section 3 and Section 16 in the ASTM standard and applicable recommendations of manufacturer.

B. Pressurized System:

1. Pressure Test: All newly laid pipe segments and their valves, unless otherwise specified, shall be subjected to a hydrostatic pressure test of 225 psi or 50 psi above working pressure, whichever is higher. The hydrostatic pressure test shall be conducted after the pipe segments have been partially backfilled.
2. Duration of Pressure Test: The duration of each hydrostatic pressure test shall be at least two (2) hours.
3. Test Procedure: Each pipe segment shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a satisfactory manner. Testing against closed valves will be allowed. The pump, pipe connection, and all necessary apparatus including gauges

and meters shall be furnished by the CONTRACTOR. CONTRACTOR shall provide all labor and equipment necessary to perform the test.

4. Expelling Air Before Test: Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, air release mechanisms shall be installed, if necessary, at points of highest elevation, and afterwards tightly capped.

5. Examination Under Pressure: All pipes, fittings, valves, hydrants, joints, and other hardware will be subject to examination under pressure during the hydrostatic test. Any defective pipes, fittings, hydrants, valves, or other hardware discovered in consequence of this pressure test shall be removed and replaced by the CONTRACTOR with sound material, at no expense to the OWNER, and the test shall be repeated until the ENGINEER is satisfied.

6. No piping installation will be acceptable until the leakage is less than the amount allowed by industry standards for the type of pipe material being tested. Or, if no standard prevails, than the number of gallons per hour is determined by the formula:

$$Q = \frac{LD\sqrt{P}}{148{,}000}$$

Where: Q = allowable leakage, gallons per hour

L = length of pipe under test, feet

D = diameter of pipe, inches

P = average test pressure, psig

3.9 COMMISSIONING TEST SCHEDULE

Revise Table 3 as follows:

	Alignment	Grade	Joint	Infiltration	Exfiltration	Distortion	Obstruction	Disinfection	Tracer Wire
Potable Water					●	●	●	●	●

SECTION 33 11 00 M
WATER DISTRIBUTION AND TRANSMISSION (Modified)

PART 1 GENERAL

1.2 REFERENCES

Revise paragraph B to read as follows:

B. **Pleasant View City Public Works Standard Drawings**

Add the following to paragraph C. AWWA Standards:

C105	Polyethylene Encasement for Ductile Iron Pipe Systems
C110	Ductile-Iron and Gray-Iron Fittings
C111	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
C223	Fabricated Steel and Stainless Steel Tapping Sleeves
M14	AWWA Recommended Practice for Backflow Prevention and Cross-Connection Control

Add paragraph ~~F~~ G as follows:

G. ANSI/NSF Standards:

61	Drinking Water System Components – Health Effects

1.3 PERFORMANCE REQUIREMENTS

Replace paragraph A with the following:

A. Depth of Cover:

1. Minimum as indicated on the drawings. If minimum cannot be achieved, contact ENGINEER.
2. Maximum of 72 inches unless indicated on the plans or approved by ENGINEER.

1.5 SITE CONDITIONS

Revise paragraph D to read as follows:

D. Do not operate <u>any</u> water valve until its owner and water company's permission is secured.

PART 2 PRODUCTS

2.1 PIPES AND FITTINGS

Revise paragraph A to read as follows:

A. Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, and capacities indicated. Use only NSF 61 approved products in drinking water systems. All such products shall be appropriately stamped with the NSF logo.

Add paragraphs E and F as follows:

E. Mechanical Joint Fittings: Ductile iron, Class 250

F. Flanged Fittings: Ductile iron, Class 250

2.3 VALVE BOX

Revise paragraph A to read as follows:

A. Buried Valves in Traffic Areas: Cast iron two (2) piece slip sleeve type, 5-1/4 inch shaft, with a drop lid, rated for HS-20 loading.

Revise paragraph C to read as follows:

C. Markings: Potable water main line valves box covers shall contain the wording "PLEASANT VIEW WATER~~.~~" unless otherwise directed by OWNER or ENGINEER.

Add Articles 2.9 and 2.10 as follows:

2.9 TAPPING SLEEVE AND VALVE

A. AWWA C223.

B. Sleeve shall be full circumferential seat with all stainless steel tapping sleeve.

C. Flanged outlet with flanged by MJ valve.

2.10 FIRE SPRINKLER/~~SUPRESSION~~SUPPRESSION LINES

A. Lines:

1. Ductile iron, Class 51, or as approved in writing by OWNER or ENGINEER.
2. Meet all specifications for main lines.

B. Valve:

1. All fire lines shall be equipped with an isolation gate valve located at the main line.

PART 3 EXECUTION

3.3 LAYOUT

Replace paragraph C with the following:

C. Obtain approval from the Utah Division of Drinking Water for an exception to the rules where a potable water line crosses under a sanitary sewer line.

~~3.3~~3.4 INSTALLATION – PIPE AND FITTING

A. General:

Add subparagraphs ~~34~~ through ~~78~~ as follows:

4. Encase all buried ductile iron valves, fitting, connections, and specialties in minimum 8 mil. polyethylene sheets in accordance with AWWA C105.
5. Waterline shall be laid and maintained to lines and grades established by the drawings, with fittings and valves at the required locations. Deviations as approved in writing by OWNER or ENGINEER.
6. Lay water lines on a continuous grade to avoid high points except as shown on the plans.
7. Cut edges and rough ends shall be ground smooth. Bevel end for push-on connections.
8. Do not drop pipe or fittings into trench.

Add paragraph I as follows:

I. Tie-Ins:

1. All tie-ins shall be made dry and not on a day proceeding a weekend or holiday.
2. OWNER requires 48-hours' notice for water turn-off.
3. At least 24 hours prior to a service disruption, CONTRACTOR shall notify all affected water users.
4. Where shutting down a line is not feasible as determined by OWNER or ENGINEER, CONTRACTOR shall make a wet tap using a tapping sleeve and valve.

3.5 INSTALLATION – CONCRETE THRUST BLOCK

Revise paragraph A to read as follows:

A. Pleasant View City Public Works Standard Drawings.

3.8 INSTALLATION – SERVICE TAPS

Revise paragraph A to read as follows:

A. Pleasant View City Public Works Standard Drawings.

3.9 **INSTALLATION – SERVICE LINE**

Revise paragraph A.1 to read as follows:

1. Install service line as shown in the Pleasant View City Public Works Standard Drawings. Follow AWWA C800, Utah drinking water Rules and Regulations and International Building Code requirements.

Revise paragraph C to read as follows:

C. Meter Box: Install as shown in the Pleasant View City Public Works Standard Drawings.

Add paragraph D as follows:

D. New Water Service Line

1. 1" Service

a. All laterals must be of one continuous ~~copper~~ tube between the corp stop and the meter box. No joints or ~~copper to copper~~ connectors are allowed.

2. 1.5" and 2" Services

a. When using copper tube, ~~A~~all solder joints shall be 95-5 solder or better, or Mueller compression fittings or approved equal.

~~3.9~~3.10 **INSTALLATION – WATERMAIN LOOP (SYPHON)**

Revise paragraph A to read as follows:

A. Install loops under obstructions as shown in the Pleasant View City Public Works Standard Drawings.

3.12 **BACKFILLING**

B. Trench~~es~~ and Pothole Backfill: Section 33 05 20:

Revise subparagraphs 1 and 2 to read as follows:

1. ~~Pipe zone backfill,~~ Pleasant View City Public Works Standard Drawings for the Pipe zone.
2. ~~Trench backfill,~~ Pleasant View City Public Works Standard Drawings for above the pipe zone.

3.14 **SURFACING ~~RESTORATION~~FINISHING**

A. Roadway Trenches and Patches: Section 33 05 25:

Revise subparagraphs 1 and 2 to read as follows:

1. Asphalt concrete patch, Pleasant View City Public Works Standard Drawings.
2. Concrete pavement patch, contact OWNER for instructions.

Add new Article 3.1~~4~~6 as follows:

3.16 **FIRE SPRINKLER/SUPPRESSION LINES**

A. Notify OWNER 48 hours prior to installation.

B. Unless written authorization is given by OWNER, no services shall be connected to the fire sprinkler/suppression lines.

C. Location: As approved by OWNER.

SECTION 33 12 16 M
WATER VALVES (Modified)

PART 1 GENERAL

1.2 REFERENCES

~~*Modify*~~ *Revise the fourth (4th) item in paragraph* ~~*A*~~*B to read as follows:*

C509 Resilient-Seated Gate Valves for Water Supply Service

Add paragraph ~~*B*~~*D as follows:*

D. **Pleasant View City Public Works Standard Drawings**

PART 2 PRODUCTS

2.1 VALVES – GENERAL

A. Underground:

Add subparagraph 3 as follows:

3. Valves over five (5) feet in depth shall have a valve nut extension stem.

2.2 GATE VALVES

Add paragraph D as follows:

D. Model: Mueller A-2361, Clow 2639, AFC Series 2500 RW NRS (Alpha x Alpha)

Add Article 2.10 as follows:

2.10 AIR/VACUUM RELIEF VALVES

A. Operation: Relieve air build-up and/or allow intrusion of air to prevent vacuum conditions within pipe.

B. Location: Valve and vent placement location as approved by OWNER or ENGINEER.

C. Connection: Service saddle.

PART 3 EXECUTION

3.1 INSTALLATION

Add paragraphs ~~*D,*~~ *E, F, and* ~~*F*~~*G as follows:*

E. Prior to installation, inspect valves for direction of opening, freedom of operation, tightness of pressure-containing bolting, and cleanliness of valve ports and seating surfaces.

F. Examine all valves for damage or defects immediately prior to installation.

G. Mark and hold defective materials for inspection by OWNER or ENGINEER. Replace rejected materials.

SECTION 33 12 19 M
HYDRANTS (Modified)

PART 1 GENERAL

1.2 REFERENCES

Revise paragraph A to read as follows:

A. **Pleasant View City Public Works Standard Drawings**

PART 2 PRODUCTS

2.1 DRY-BARREL FIRE HYDRANT

Add paragraph C as follows:

C. Model: Mueller Super Centurion, Clow Medallion, Waterus Classic Pacer.

2.3 VALVES

Revise paragraph A to read as follows:

C. Gate Valve: Section 33 12 16.

2.4 ACCESSORIES

Revise paragraph D to read as follows:

D. Valve Box, Valve Chamber: Section 33 11 00.

PART 3 EXECUTION

3.2 INSTALLATION

Revise paragraph A to read as follows:

A. Install hydrant according to Pleasant View City Public Works Standard Drawings and AWWA M17.

Revise paragraph H to read as follows:

H. Install thrust block according to Pleasant View City Public Works Standard Drawings.

SECTION 33 12 33 M
WATER METER (Modified)

PART 1 GENERAL

1.2 REFERENCES

Add paragraph ~~DB~~ as follows:

D. **Pleasant View City Public Works Standard Drawings.**

PART 2 PRODUCTS

2.2 METERS FOR SERVICE PIPING

Revise paragraph A to read as follows:

A. OWNER shall supply and set all 1" meters. All other meters supplied and set by CONTRACTOR.

2.3 SERVICE LINE, VALVES, AND FITTINGS

Revise paragraph A to read as follows:

A. Service Pipe: Smooth wall polyethylene, Section 33 05 06.

Revise paragraph B to read as follows:

B. Service Valves and Fittings:

1. AWWA C800.
2. 1-Inch Service Laterals – Brass corporation stops with CC thread.
3. 1.5-Inch and 2-Inch Service Laterals – Copper or brass screw-type fittings (ball valves, strainers, nipples, tees, bends, etc.).
4. 3-Inch and 4-Inch Service Laterals
   a. AWWA C-900 PVC or ~~D~~ductile iron pipe.
   b. Cast iron, flanged valves and fittings.
5. Greater than 4-Inch – Coordinate with and obtain approval from OWNER and ENGINEER.

Replace Article 2.4 with the following:

2.4 METER BOXES

A. See Pleasant View City Public Works Standard Drawings.

PART 3 EXECUTION

3.1 INSTALLATION

Revise paragraph D to read as follows:

D. OWNER Supplied Meters: Installed by OWNER unless indicated otherwise.

Add paragraphs ~~E~~F and ~~F~~G as follows:

F. Install one solid piece of ~~copper~~ pipe from main to meter.

G. Install service laterals with 48-inches of cover, minimum.

SECTION 33 13 00 M
DISINFECTION (Modified)

PART 1 GENERAL

1.2 REFERENCES

~~*Modify paragraph B to read as follows:*~~

~~C. Utah Administrative Code~~

~~R309 Drinking Water~~

Add paragraph C as follows:

~~D.~~C. NSF/ANSI Standards:

60 Drinking Water Treatment Chemicals – Health Effects

1.4 **SUBMITTALS**

Delete paragraphs B, C, and D in their entirety.

Add Article 1.8 as follows:

1.8 **WORK PERFORMED BY OWNER**

A. OWNER will perform bacteriological and high chlorine sampling and testing. CONTRACTOR shall provide all other work associated with this Section.

PART 2 PRODUCTS

2.1 **DISINFECTANT**

Add paragraph E as follows:

E. All products shall comply with NSF/ANSI 60.

PART 3 EXECUTION

3.1 **PREPARATION**

Add paragraphs ~~C~~D and ~~D~~E as follows:

D. Notify OWNER at least ~~72 hours~~three (3) business days prior to any flushing or disinfecting.

E. Install temporary connections for flushing water lines after disinfection. After the satisfactory completion of the flushing work, remove and plug the temporary connection.

3.2 **DISINFECTION OF WATER LINES**

Revise paragraph D to read as follows:

D. Coordinate with OWNER to collect a bacteriological water sample at end of line to be tested. If sample fails bacteriological test, flush system and retest. Continue flushing and retesting until sample passes test.

Revise paragraph G to read as follows:

G. After a passing bacteriological test sample is obtained, let the system relax for 24 hours. Flush and coordinate with OWNER to collect a subsequent bacteriological sample for testing. If the subsequent test passes, then water line is acceptable.

3.5 **FIELD QUALITY CONTROL**

B. Bacteriological Test:

Revise subparagraphs 1 and 2 to read as follows:

1. Coordinate with OWNER to collect samples for testing no sooner than 16 hours after system flushing.
2. OWNER will have water samples analyzed per State of Utah requirements.

Add Article 3.6 as follows:

3.6 **SPECIAL PROCEDURE FOR TAPPING SLEEVES**

D. Before a tapping sleeve is installed, the exterior of the main to be tapped shall be thoroughly cleaned, and the interior surface of the sleeve shall be lightly dusted with calcium hypochlorite powder.

APPENDIX D - PLEASANT VIEW CITY PUBLIC WORKS STANDARD DRAWINGS