Section 15.03.020. General Development Standards.

. . .

(3) Provo City adopts and incorporates by reference into this section:

(a) the following nationally recognized, industry standards:

(i) Manual of Standard Specifications, 2017, American Public Works Association;

(ii) Manual of Standard Plans, 2017, American Public Works Association;

(iii) Manual on Uniform Traffic Control Devices for Streets and Highways (the "MUTCD"), 2009 Edition, Federal Highway Administration;

(iv) A Policy on Geometric Design of Highways and Streets, 6th Edition, American Association of State Highway and Transportation Officials;

(v) Trip Generation Manual, 10th Edition, Institute of Transportation Engineers; and

(b) the following local standards, which supersede those standards adopted by subsection (a) to the extent there is any conflict:

(i) 2020 Provo Standard Drawing Details~~, 2019~~;

(ii) 2020 Provo City Public Works Department Development ~~Guidelines and~~ Design Standards~~, 2019.~~;

(iii) Utah Manual on Uniform Traffic Control Devices, For Streets and Highways, (FHWA's MUTCD 2009 Edition as amended for use in Utah), 2011, Utah Department of Transportation;

(iv) 2017 Standard Specifications for Road and Bridge Construction, 2017, Utah Department of Transportation;~~ and~~

(v) 2017 Standard Drawings for Road and Bridge Construction, 2017, Utah Department of Transportation~~.~~; and

(vi) Utah Administrative Code, Titles R305-R317.

SECTION 32 12 05M
BITUMINOUS CONCRETE

This Section modifies portions of Section 32 12 05 entitled "Bituminous Concrete" (APWA 2017 as outlined below.

Delete Article 1.4, paragraph D.7 and replace with the following:

7. Binder target percentage, dust to binder ratio, and the following as applicable.
   a. For Marshall mix design provide (1) tensile strength ratio (moisture sensitivity), (2) voids in the mineral aggregate (VMA), (3) stability, (4) flow, (5) voids in the bituminous mix, (6) voids filled with bituminous binder (VFA), (7) virgin binder replacement, (8) RAP asphalt content, and (9) effective asphalt content.

   b. For Superpave mix design provide (1) voids in the mineral aggregate (VMA), (2) voids filled with bituminous binder (VFA), and (3) Hamburg Wheel Tracker results.

Add to Article 2.1 the following:

2.5 Binder

A. Asphalt Cement (AC)

1. Performance graded asphalt binder (PGAB) may be substituted for asphalt cement as follows.

Asphalt Cement	Substitute
AC-10	PG 58-22 or PG 58-28
AC-20	PG 64-22

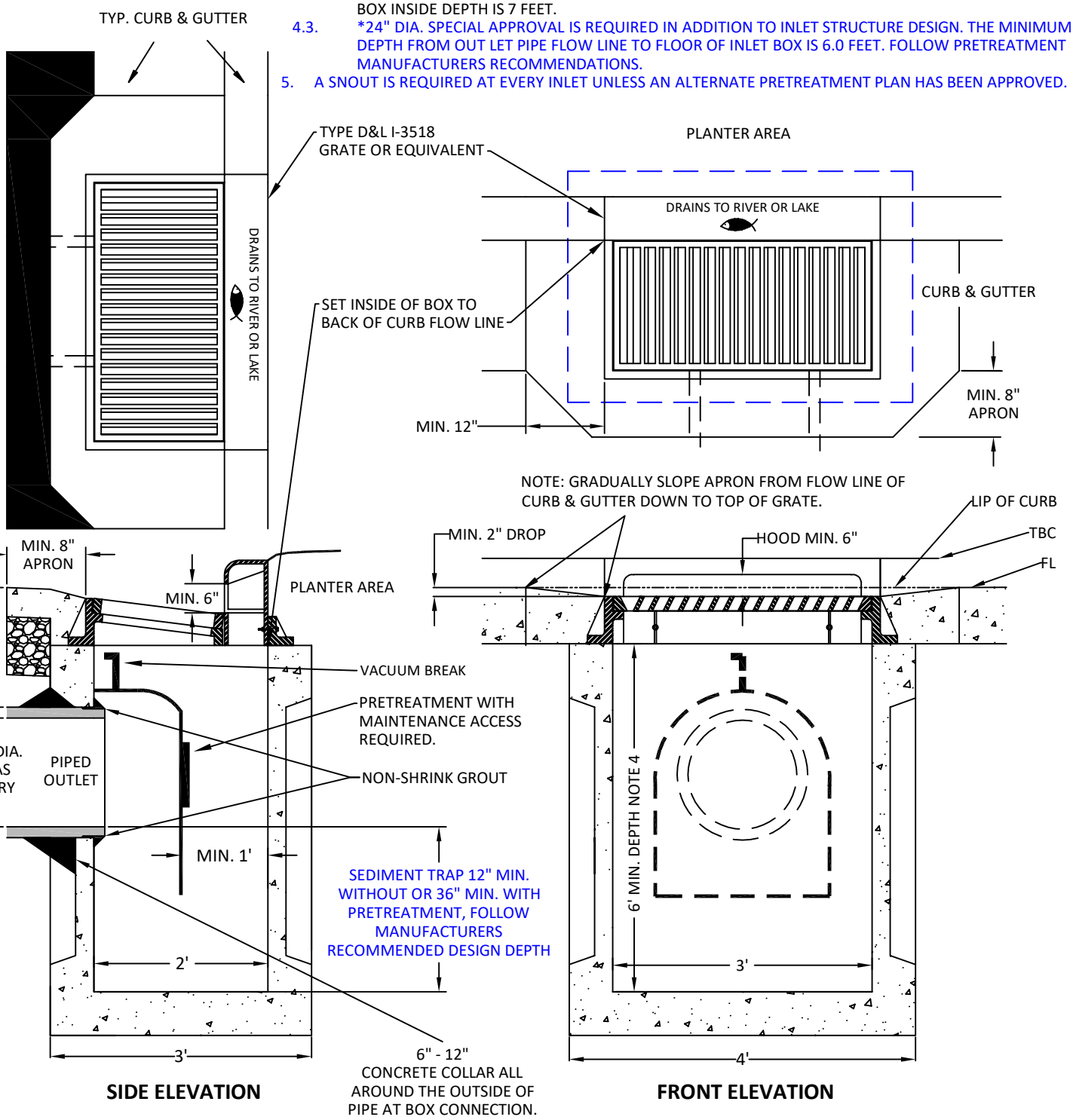
Delete Article 2.3, paragraph D and replace with the following:

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

1. Allowed up to 15 percent by weight of RAP or binder, whichever is lesser, with no change in specified binder grade.
2. Allowed from 15 to 25 percent by weight of RAP or binder, whichever is lesser, if the binder grade is adjusted according to AASHTO M323 to meet the specified binder grade.

NOTE:

1. FOR GRATE & FRAME DETAILS SEE D.&L. SUPPLY CATALOG #I-3518 OR EQUIVALENT.
2. REQUIRED STAMPED HOOD, "DRAINS TO RIVER OR LAKE" WITH FISH LOGO.
3. ALL BOXES AND FRAMES MUST SUPPORT A HS-20 LOADING.
4. REFER TO THE APPROVED PROJECT PLANS FOR PIPE SIZE, LOCATION, SEDIMENT DEPTH, PRETREATMENT AND OTHER STRUCTURE DESIGN REQUIREMENTS.
   - 4.1. 15" DIA. PIPE LATERAL, MINIMUM DEPTH FROM OUTLET OF PIPE FLOW LINE TO FLOOR OF INLET BOX IS 3.75 FEET OR DEEPER. FOLLOW PRETREATMENT MANUFACTURERS RECOMMENDATIONS. MIN. BOX INSIDE DEPTH IS 6 FEET.
   - 4.2. 18" DIA. PIPE AS NECESSARY, MINIMUM DEPTH FROM OUTLET OF PIPE FLOW LINE TO FLOOR OF INLET BOX IS 4.5 FEET OR DEEPER. FOLLOW PRETREATMENT MANUFACTURERS RECOMMENDATIONS. MIN. BOX INSIDE DEPTH IS 7 FEET.
   - 4.3. *24" DIA. SPECIAL APPROVAL IS REQUIRED IN ADDITION TO INLET STRUCTURE DESIGN. THE MINIMUM DEPTH FROM OUT LET PIPE FLOW LINE TO FLOOR OF INLET BOX IS 6.0 FEET. FOLLOW PRETREATMENT MANUFACTURERS RECOMMENDATIONS.
5. A SNOUT IS REQUIRED AT EVERY INLET UNLESS AN ALTERNATE PRETREATMENT PLAN HAS BEEN APPROVED.



SHEET 1 OF 1

PUBLIC WORKS

PRE-CAST CURB FACE AND INLET BOX

STANDARD DETAIL

P-315a

NOT TO SCALE

REVISED DATE: 10/07/19

NOTE:

1. FOR GRATE & FRAME DETAILS SEE D.&L. SUPPLY CATALOG #I-3518 OR EQUIVALENT.
2. REQUIRED STAMPED HOOD, "DRAINS TO RIVER OR LAKE" WITH FISH LOGO.
3. ALL BOXES AND FRAMES MUST SUPPORT A HS-20 LOADING.
4. REFER TO THE APPROVED PROJECT PLANS FOR PIPE SIZE, LOCATION, SEDIMENT DEPTH, PRETREATMENT AND OTHER STRUCTURE DESIGN REQUIREMENTS.
   - 4.1. 15" DIA. PIPE LATERAL MIN. BOX INSIDE DEPTH IS 6 FEET AND FOLLOWS PRETREATMENT MANUFACTURERS RECOMMENDATIONS.
   - 4.2. 18" DIA. PIPE AS NECESSARY. BOX INSIDE DEPTH IS 7 FEET AND FOLLOWS PRETREATMENT MANUFACTURERS RECOMMENDATIONS.
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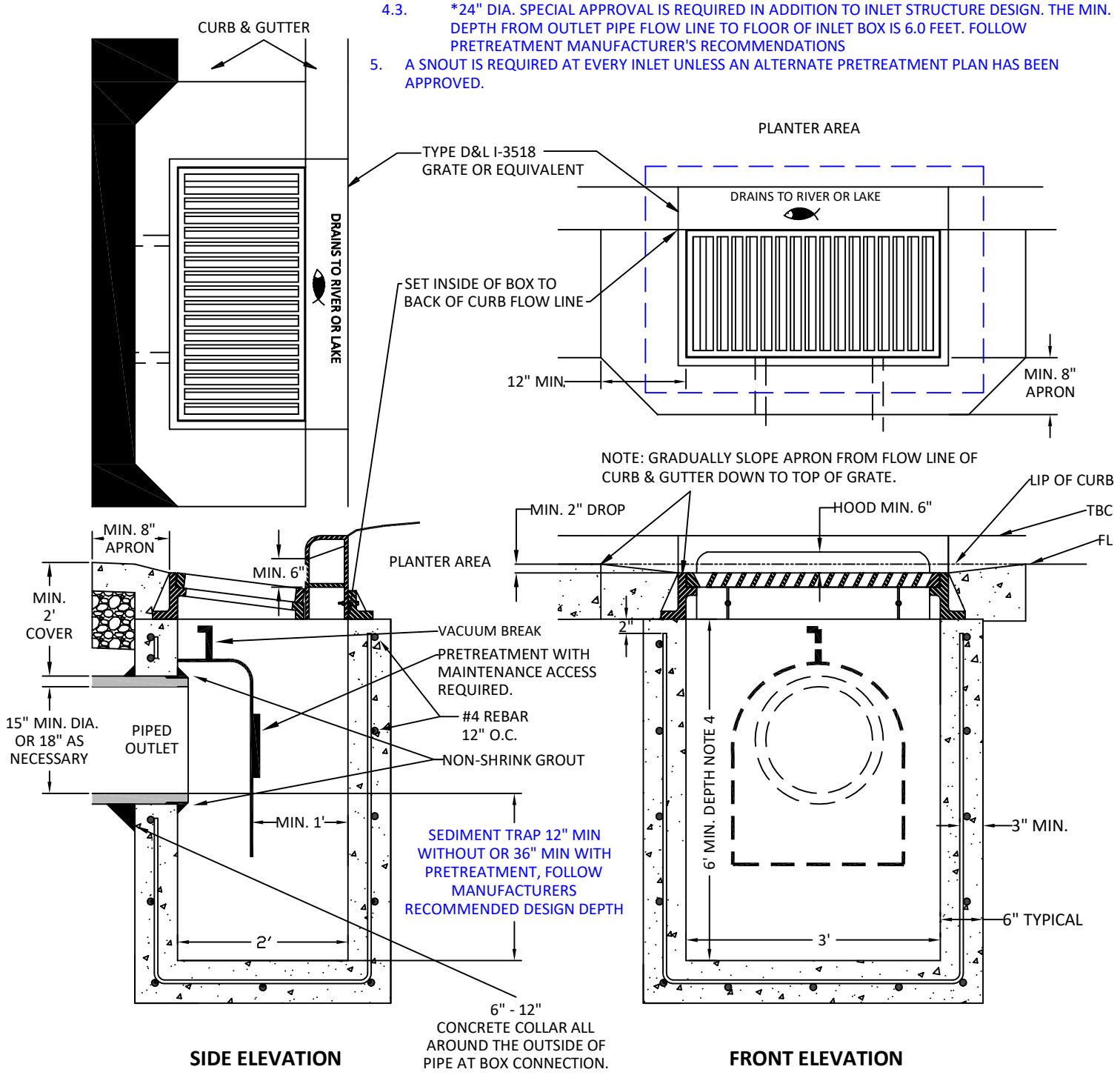

SHEET 1 OF 1

PUBLIC WORKS

CAST-IN-PLACE CURB FACE AND INLET BOX

STANDARD DETAIL

P-315b

NOT TO SCALE

REVISED DATE: 09/26/19

provo
PUBLIC WORKS

DOUBLE PRE-CAST CURB FACE AND INLET BOX

STANDARD DETAIL
P-315c
NOT TO SCALE
REVISED DATE: 09/26/19

SHEET 1 OF 1

NOTE:
1. FOR GRATE & FRAME DETAILS SEE D.&L. SUPPLY CATALOG #I-3518 OR EQUIVALENT.
2. REQUIRED STAMPED HOOD, "DRAINS TO RIVER OR LAKE" WITH FISH LOGO.
3. ALL BOXES AND FRAMES MUST SUPPORT A HS-20 LOADING.
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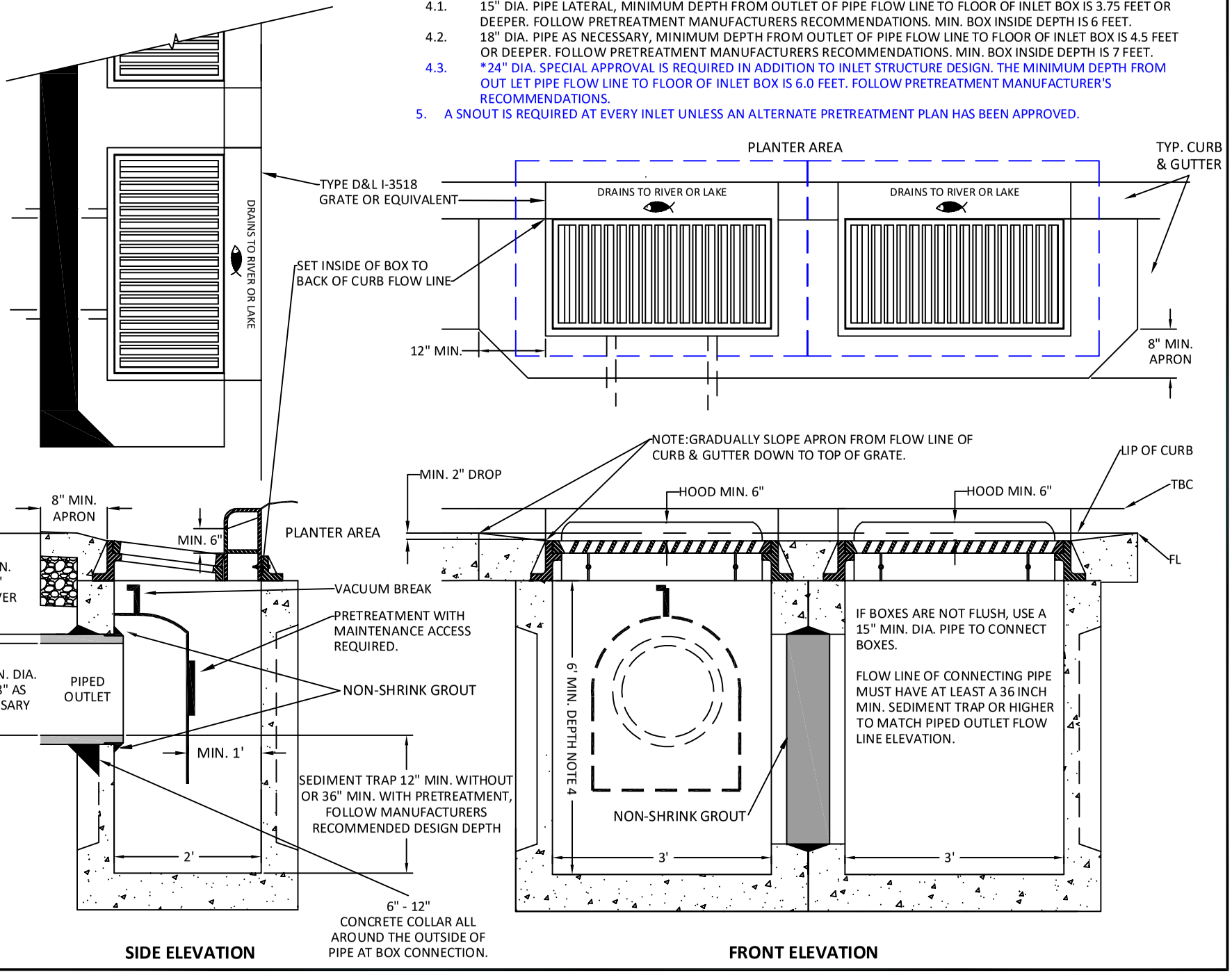

provo PUBLIC WORKS

DOUBLE CAST-IN-PLACE CURB FACE AND INLET BOX

STANDARD DETAIL

P-315d

NOT TO SCALE

REVISED DATE: 09/26/19

SHEET 1 OF 1

NOTE:

1. FOR GRATE & FRAME DETAILS SEE D.&L. SUPPLY CATALOG #I-3518 OR EQUIVALENT.
2. REQUIRED STAMPED HOOD, "DRAINS TO RIVER OR LAKE" WITH FISH LOGO.
3. ALL BOXES AND FRAMES MUST SUPPORT A HS-20 LOADING.
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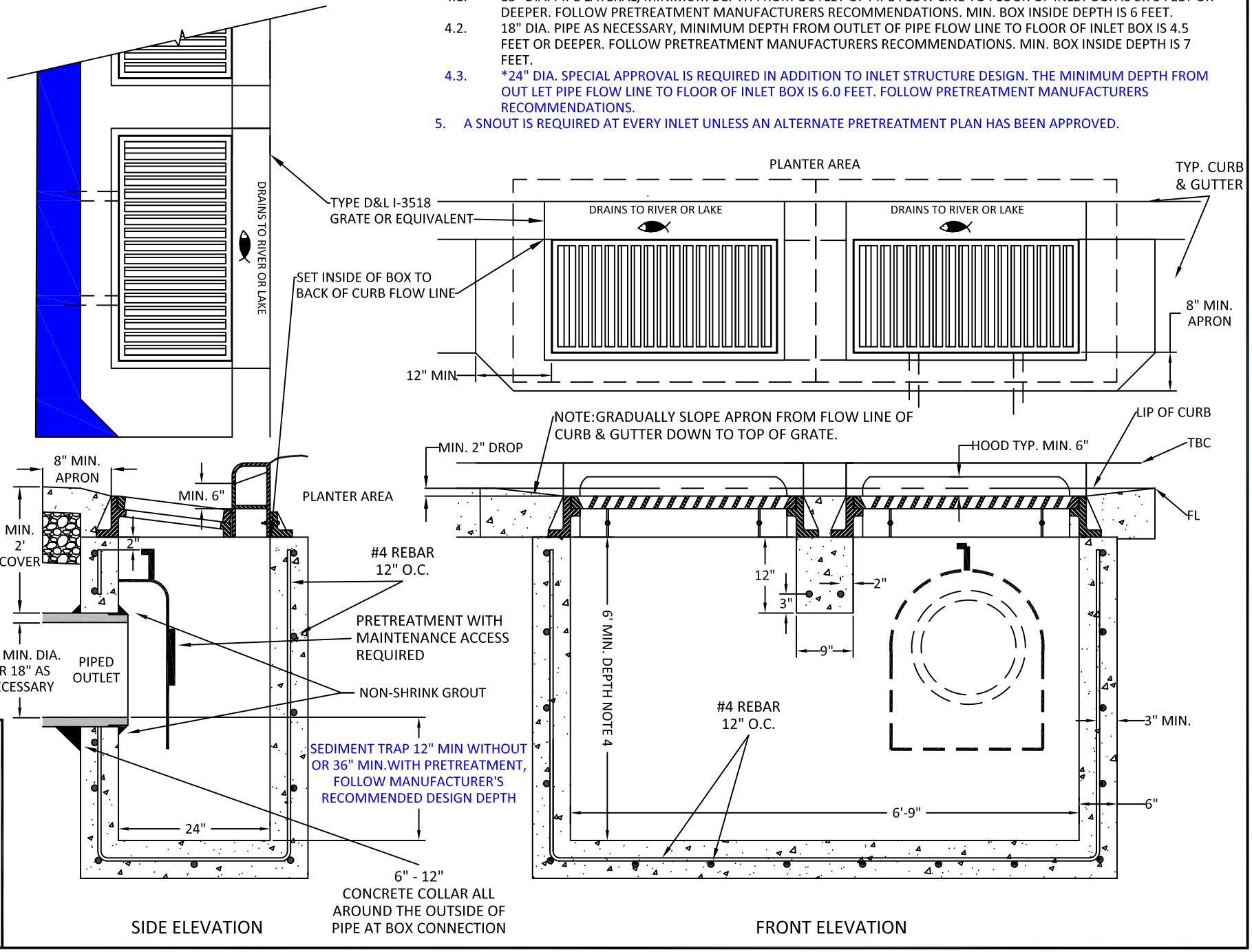
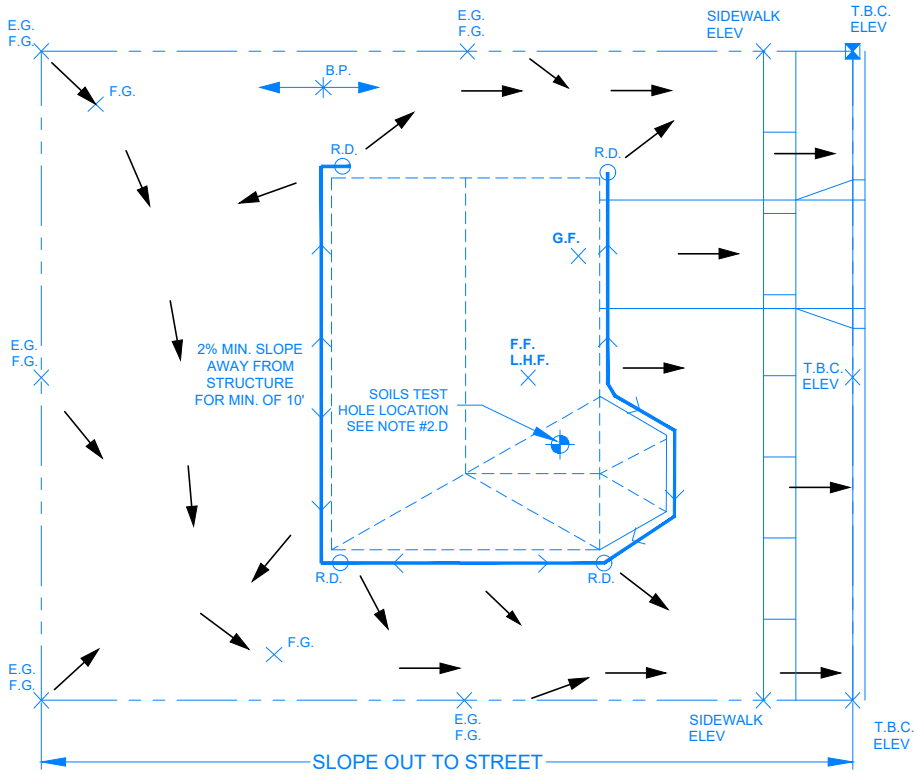
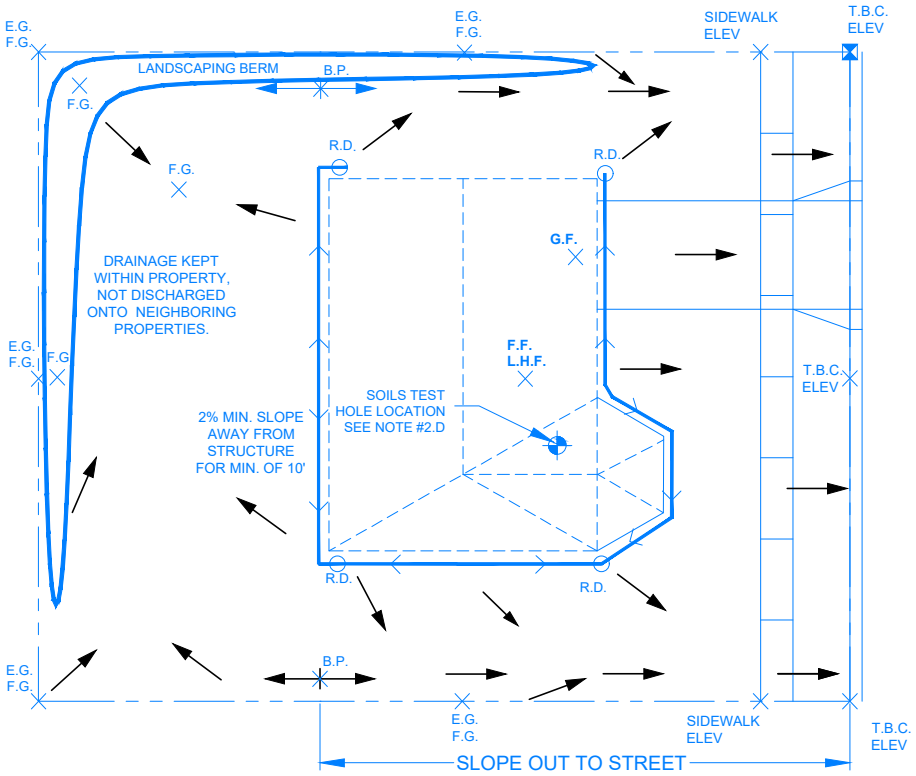


TYPE 1 LOT



TYPE 2 LOT



LEGEND
- B.P. - BREAK POINT
- T.B.C. - TOP BACK OF CURB
- G.F.- GARAGE FLOOR
- L.H.F.- LOWEST HABITABLE FLOOR
- F.F. - FINISH FLOOR
- F.G. - FINISH GRADE
- E.G. - EXISTING OR PRE-CONSTRUCTION GRADE
- FLOW DIRECTION
- BENCH MARK (T.B.C. OR PERMANENT FEATURE)
- R.D. - ROOF DRAIN (DISCHARGE BEYOND FOOTING)

REFER TO SHEET P-390 2 OF 2 FOR ADDITIONAL NOTES

REFER TO SHEET P-391 FOR LOT GRADING PROFILES

provo PUBLIC WORKS

LOT GRADING PLAN

STANDARD DETAIL
P-390
NOT TO SCALE
REVISED DATE: 10/8/2019

Lot grading plan notes

1. GENERAL

A. Per Section 18.03.080, Provo City Code, it shall be the responsibility of the property owner to ensure that the private drainage generated within the private property is adequately handled and does not create a nuisance on neighboring properties. Provide a site grading plan with existing and final elevation information.

2. EXECUTION

A. Drain as much surface flows, especially hard (impervious) surfaces, as possible out to the street fronting the lot. This includes the following; all front of building, as much roof as possible, drive way, walks, and so forth. Any areas unable to be sloped to the street shall be addressed within own lot boundaries and not discharged into any neighboring properties.

B. Garage floor (G.F.) shall follow the requirements detailed in Provo standard drawing P-394.

C. Identify existing spot elevations for at least 5-6 different locations, especially along the property boundary to ensure adequate tie-in to neighboring properties. Provide final grade elevations for same spots, significant grade changes, and other locations necessary to show intended grading design.

D. Any time there is a lower level in a structure a soils engineer letter may be requested to determine the ground water elevations relative to the basement floor. Refer to the Storm Drainage Systems Design and Management Manual for requirements for lowest habitable floor elevations in relation to groundwater. Identify all test hole locations and depths relative to the benchmark (i.e. top of curb at property corner, or other permanent feature).

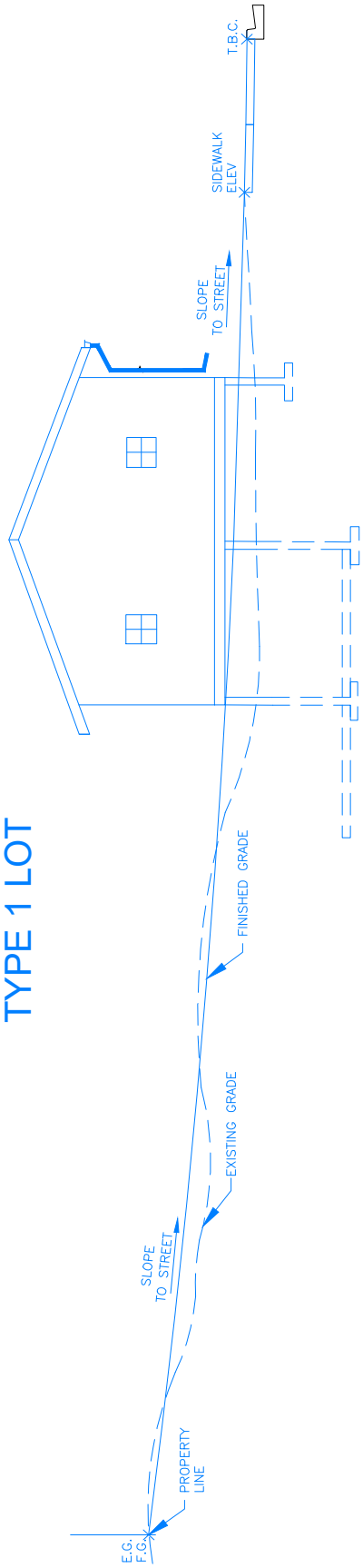
provo PUBLIC WORKS

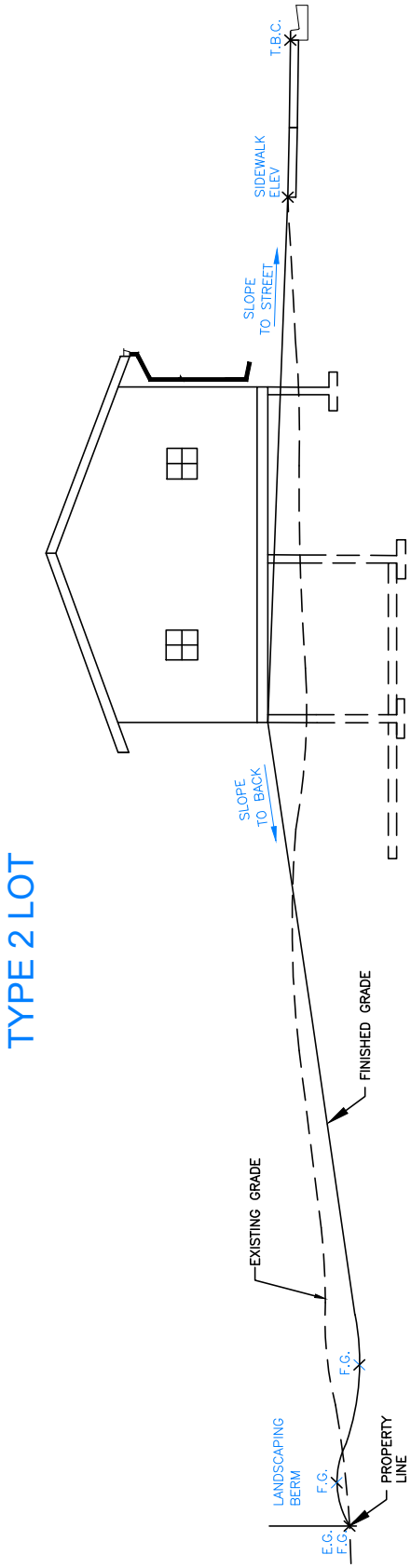
LOT GRADING PLAN NOTES

STANDARD DETAIL
P-390

NOT TO SCALE

REVISED DATE: 10/8/19





PLAN REQUIREMENTS

1. EXISTING AND PROPOSED GRADES (LABEL AND EXTEND PAST PROPERTY LINES).
2. ELEVATIONS ON KEY STRUCTURAL POINTS, WALLS, SLABS, DRIVEWAYS, GARAGE, ETC.
3. RETAINING WALL LOCATIONS, AND ENGINEERED DESIGN IF REQUIRED.
4. OTHER REQUIREMENTS AS PER GEOTECHNICAL INVESTIGATION REPORTS IF REQUIRED.

provo PUBLIC WORKS

LOT GRADING PROFILES

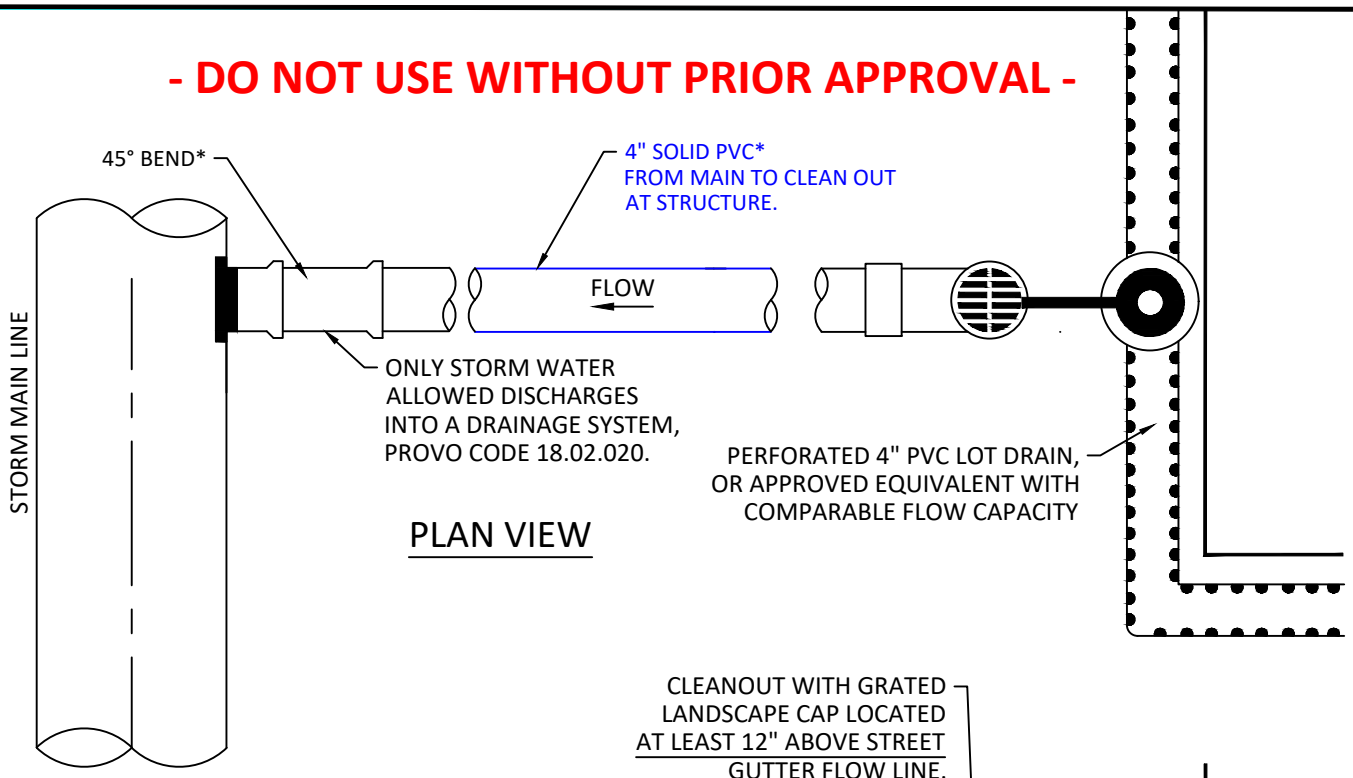
SHEET 1 OF 1

STANDARD DETAIL
P-391

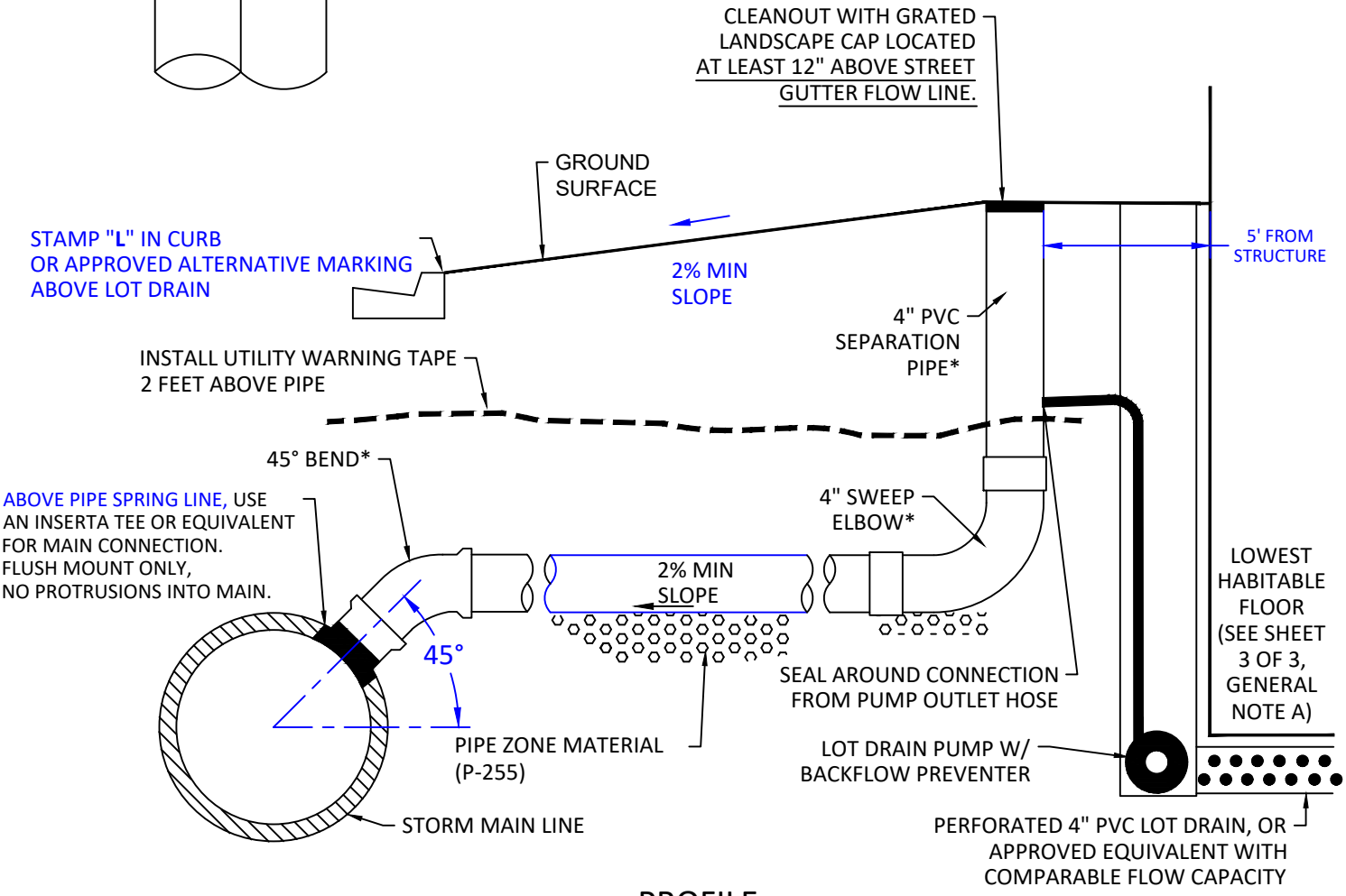
NOT TO SCALE

REVISED DATE: 10/8/19

- DO NOT USE WITHOUT PRIOR APPROVAL -



PLAN VIEW



PROFILE

* USE TYPE SDR 35 PVC AND THE COLOR
WHITE FOR ALL LOT DRAIN LATERAL PIPING

provo PUBLIC WORKS

LOT DRAIN LATERAL WITH DRAIN PUMP

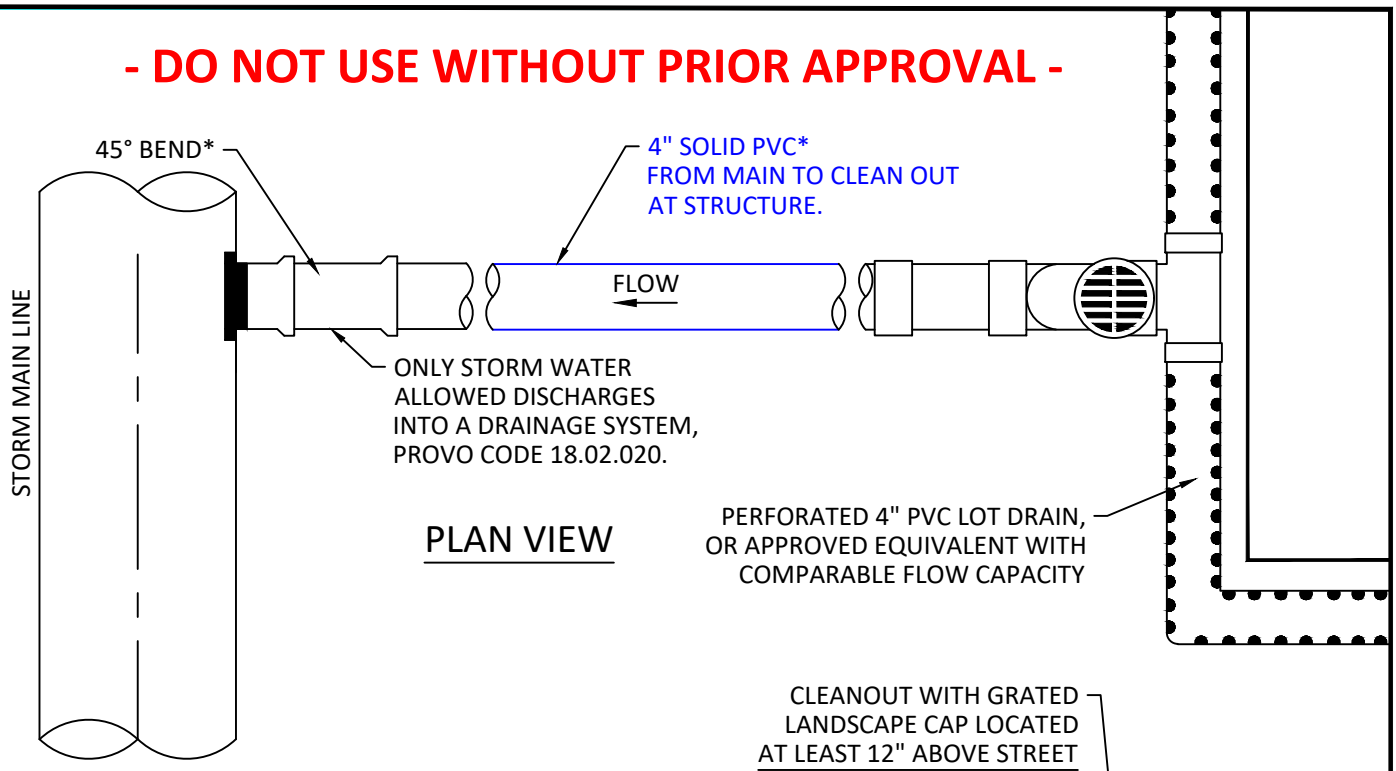
SHEET 1 OF 3

STANDARD DETAIL
P-392a

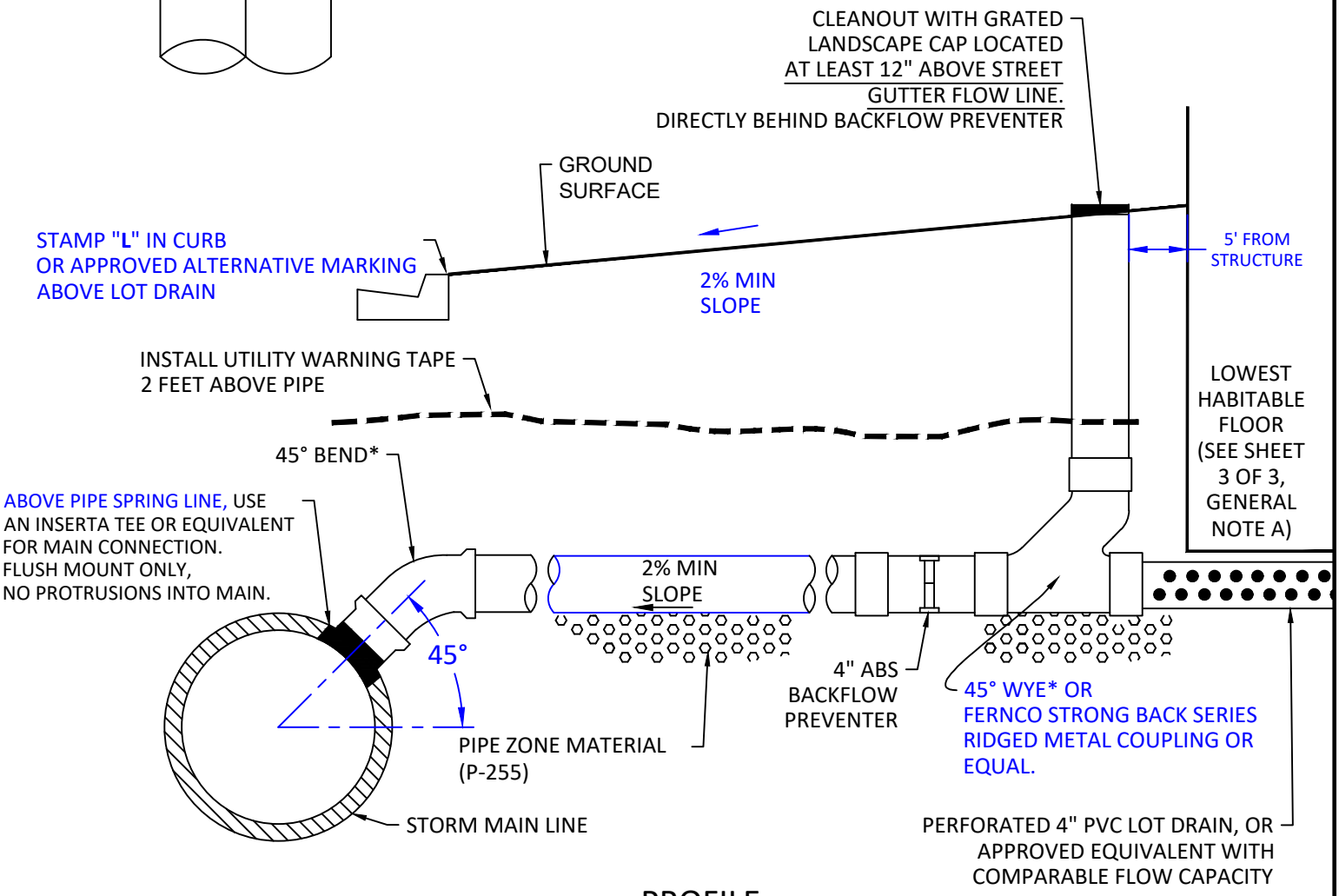
NOT TO SCALE

DATE: 10/07/2019

- DO NOT USE WITHOUT PRIOR APPROVAL -



PLAN VIEW



PROFILE

* USE TYPE SDR 35 PVC AND THE COLOR **WHITE** FOR ALL LOT DRAIN LATERAL PIPING

provo PUBLIC WORKS

LOT DRAIN LATERAL WITH GRAVITY FLOW

SHEET 2 OF 3

STANDARD DETAIL

P-392b

NOT TO SCALE

DATE: 10/07/2019

Lot Drain Lateral

1. GENERAL

A. Standard Drawings P-392a and P-392b may be used under the following conditions:

A.A. Lot drains are sometimes required by the IBC to drain backfilled areas around buildings in areas with tight native soils . Lot drains are not intended to drain high groundwater. The lowest habitable floor is recommended to be a minimum of 4 feet above groundwater elevation. Provo City may require a site specific geotechnical report identifying groundwater elevations and minimum FF elevations, to be reviewed and approved by the City Engineer or their designee.

A.B. Standard Drawing P-392a - The top of the landscape grate on the separation pipe shall be a minimum of 12 inches above the gutter flow line.

A.C. Standard Drawing P-392b - This drawing can only be used if (a) the storm drain main is designed to convey the City design storm with the HGL below top of pipe, AND (b) the lowest habitable floor is a minimum of 2 feet above the top of storm drain main at the lot drain connection. Otherwise, P-392a must be used.

B. It is unlawful for any person to cause or allow the discharge into a water body or storm drainage system, either directly or indirectly, of any substance not comprised entirely of storm water, refer to Provo City code 18.02.020 for prohibited discharges.

C. Minimum distance between lot drain connections to the storm main shall be 4 feet.

D. Minimum required grade of lot drain is 2%.

E. Clean-outs on lateral shall be installed at a minimum every 100 feet and wherever there is a change in slope, direction or bend in pipe and within 5 feet from structure.

F. If building construction is not imminent, terminate at a clean-out a minimum of 12 feet inside the property line. Cap and mark white for future connection.

2. PRODUCTS

A. Lot drains shall use type SDR 35 PVC. The color of the pipe and fittings shall be white.

B. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.

C. Backfill: Common fill, PROVO Section 31 05 13M. Maximum particle size 2-inches.

D. Pipe zone: Gravel, Provo Section 31 05 13M.

E. Lot drain mainline connections: 45 degree bend and Inserta Tee or equivalent.

3. EXECUTION

A. Before installation, secure acceptance by ENGINEER for all pipe, fittings, and couplings to be used.

B. Core and remove plug from storm main. Do not break into storm main for connection.

C. Use an Inserta Tee or equivalent for a water tight connection at storm main. Protrusion into storm main pipe past inner wall is not allowed.

D. CONTRACTOR shall have ALL connections inspected and surveyed by Provo City before backfilling.

E. Provide backfill and surface restoration per Plan P-255.

provo PUBLIC WORKS

LOT DRAIN LATERAL AND CLEAN-OUT

STANDARD DETAIL
P-392c

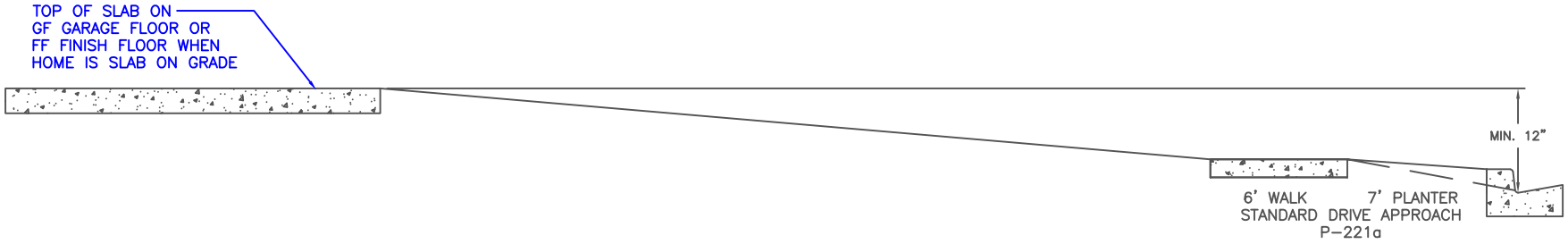
NOT TO SCALE

DATE: 10/07/2019

provo PUBLIC WORKS

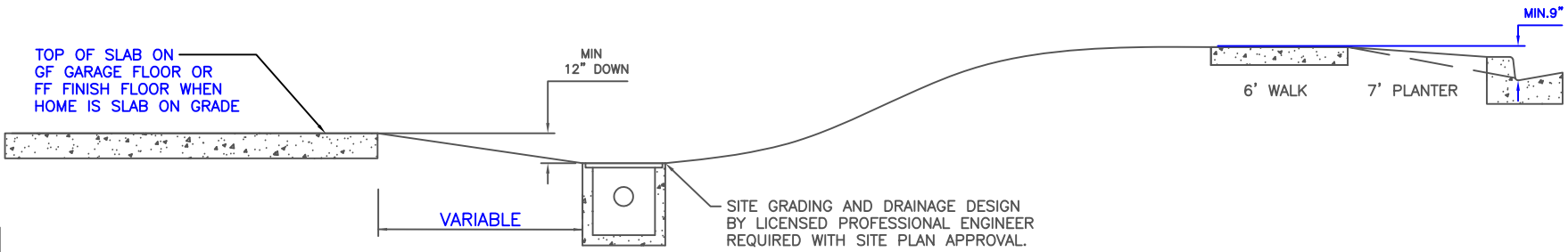
SITE DRAINAGE PROFILES

OPTION 1
(STANDARD)



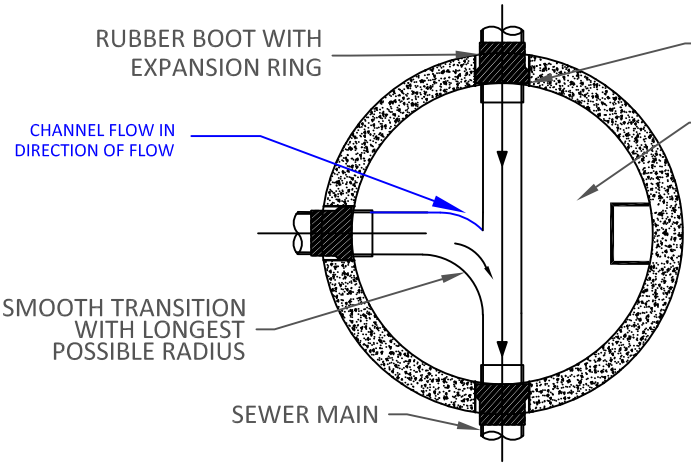
FOR EXISTING DRIVE APPROACH TYPES, REFER TO THE APPROPRIATE PROVO CITY P-221 SERIES FOR DETAILS AND NOTES.

OPTION 2
(ONLY FOR USE WHEN APPROVED BY CITY ENGINEER OR THEIR DESIGNEE WITH A SITE PLAN APPROVAL.)



STANDARD DETAIL
P-394
NOT TO SCALE
REVISED DATE: 10/07/19

SHEET 1 OF 1

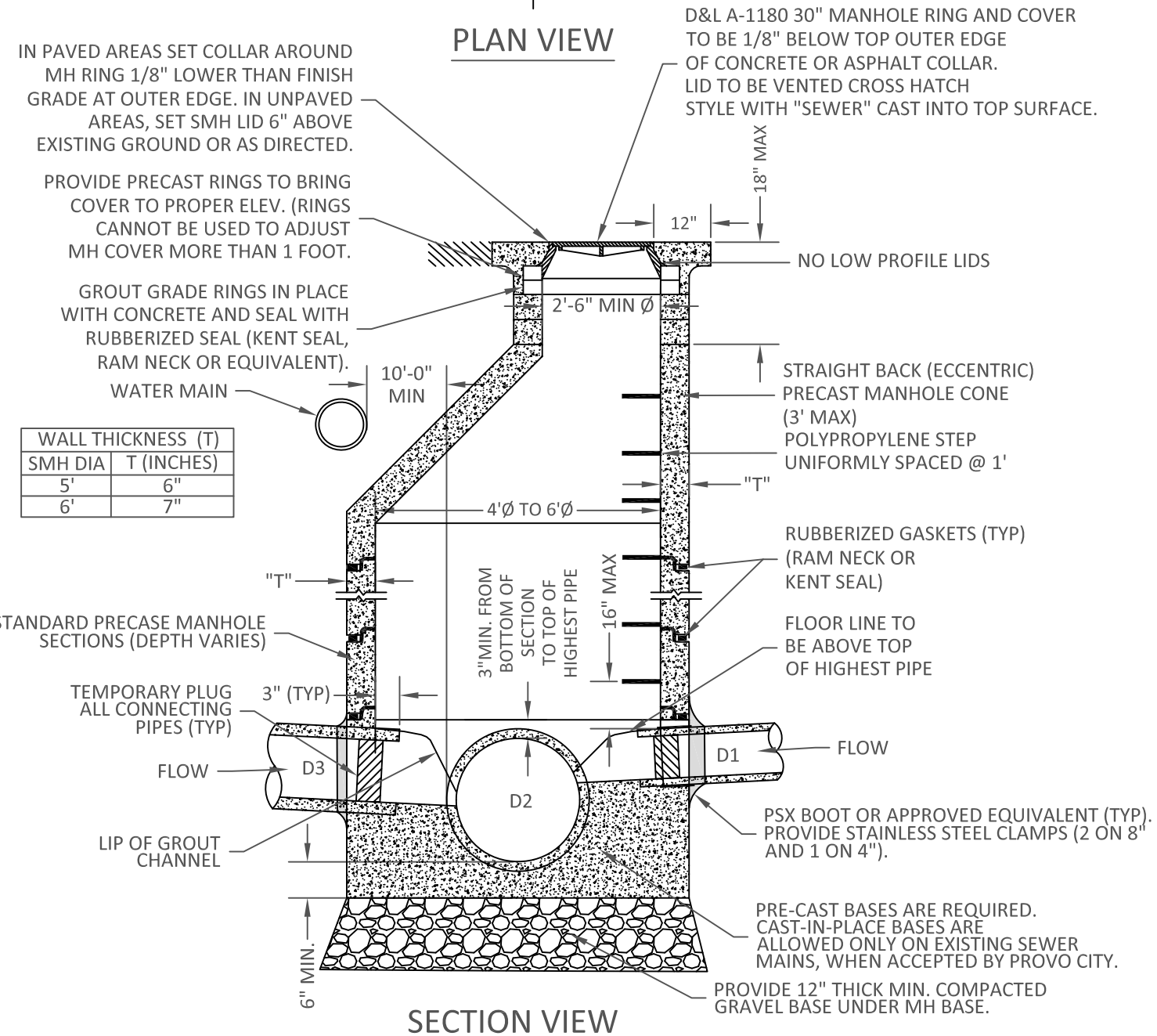


PLAN VIEW

DEFLECTION ANGLE 0° - 75°= 0.1'

DROP DEFLECTION ANGLE 75° - 90°= 0.2'

DROP DEFLECTION ANGLE > 90° = 0.3 DROP



WALL THICKNESS (T)	
SMH DIA	T (INCHES)
5'	6"
6'	7"

SECTION VIEW

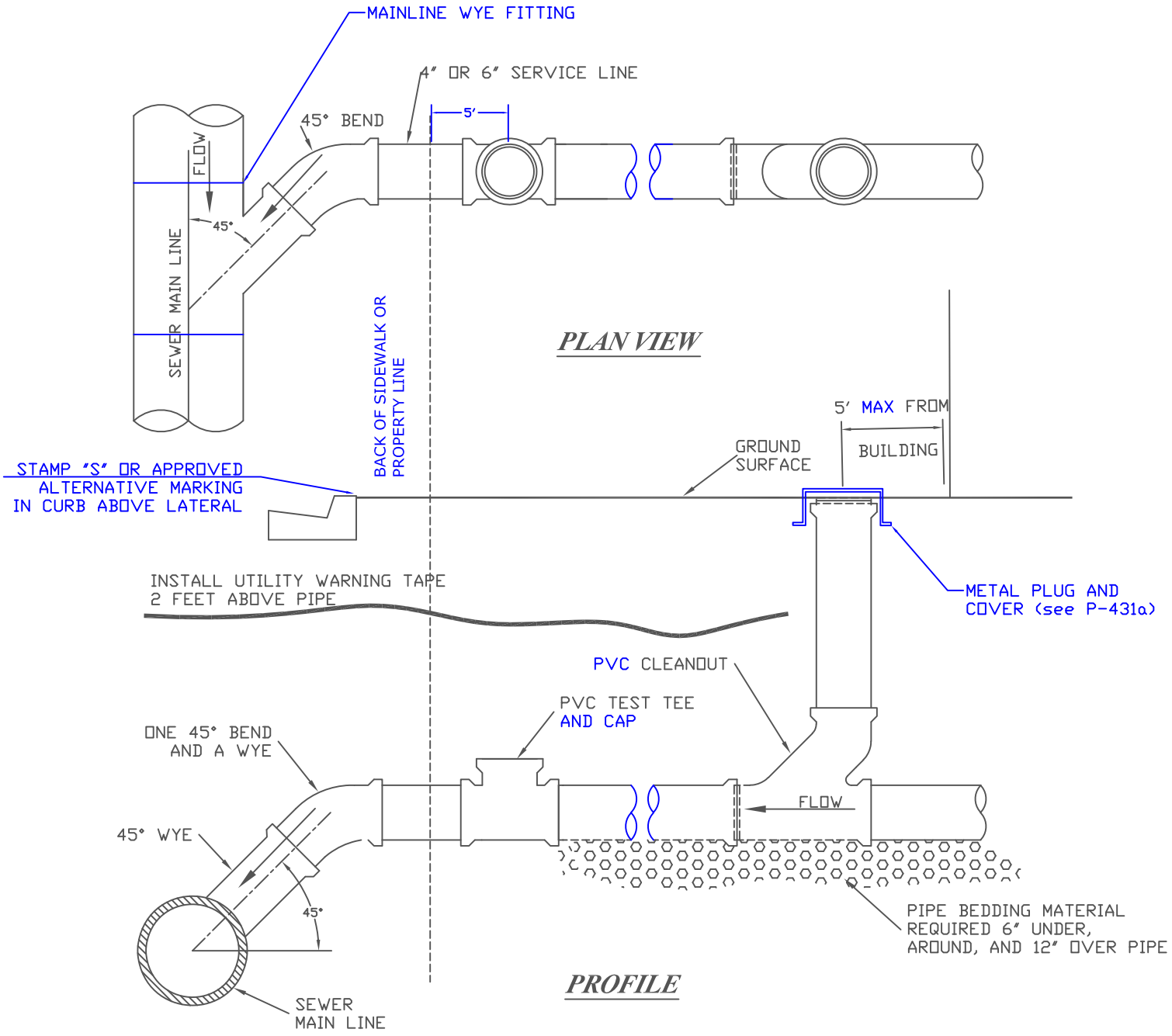
provo PUBLIC WORKS

STANDARD MANHOLE

STANDARD DETAIL
P-411

NOT TO SCALE

REVISED DATE: 09/26/2019



provo PUBLIC WORKS

STANDARD SEWER SERVICE CONNECTION AND CLEAN-OUT

STANDARD DETAIL

P-431

NOT TO SCALE

APPROVAL DATE: 09/26/2019

Sewer lateral connection

1. GENERAL

A. Laterals shall be 4-inch diameter minimum. A 6-inch or larger lateral is required for buildings with more than five equivalent residential units.

B. Provide separate laterals for each unit. Provo City approval required for all combined sewer laterals.

C. Minimum distance between 4 inch lateral connections shall be 4 feet.

D. Required grade of sewer laterals is 2%. Where it is impractical to run the sewer laterals at 2% due to the depth of the sewer main, a 6 inch or larger sewer lateral may be run at 1% grade when approved by Provo City.

E. Clean-outs shall be installed every 100 feet, and where there is a change in slope or direction of the lateral and within 5' of the building.

F. Laterals must connect to sewer main line. Discharge into a manhole is not permitted.

2. PRODUCTS

A. Sewer laterals shall be green or black in color. Do not use white.

B. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.

C. Backfill: Common fill, PROVO Section 31 05 13M. Maximum particle size 2-inches.

D. Pipe Zone: Gravel, PROVO Section 31 05 13M.

E. Cast Iron: Strong back RC series by Fernco with four stainless steel clamps or equal required for all plain end pipe connections.

F. Lateral mainline connections: All connections to the main must be constructed with one 45 degree bend and Wye unless specific approval is given allowing an alternative connection.

G. Manhole mainline connections: All 6 inch and larger laterals on commercial or multi-family laterals require a manhole at the connection to the public main.

3. EXECUTION

A. Before installation, secure acceptance by ENGINEER for all pipe, fittings, and couplings to be used.

B. Tape wrap pipe as required by soil conditions.

C. When allowed, core and remove plug from sewer main. Do not break into sewer main to make connection.

D. CONTRACTOR shall have all connections inspected and surveyed by Provo City before backfilling.

E. CONTRACTOR shall perform water test for lateral as directed by Provo City Inspector.

F. Provide backfill and surface restoration per Plan P-255.

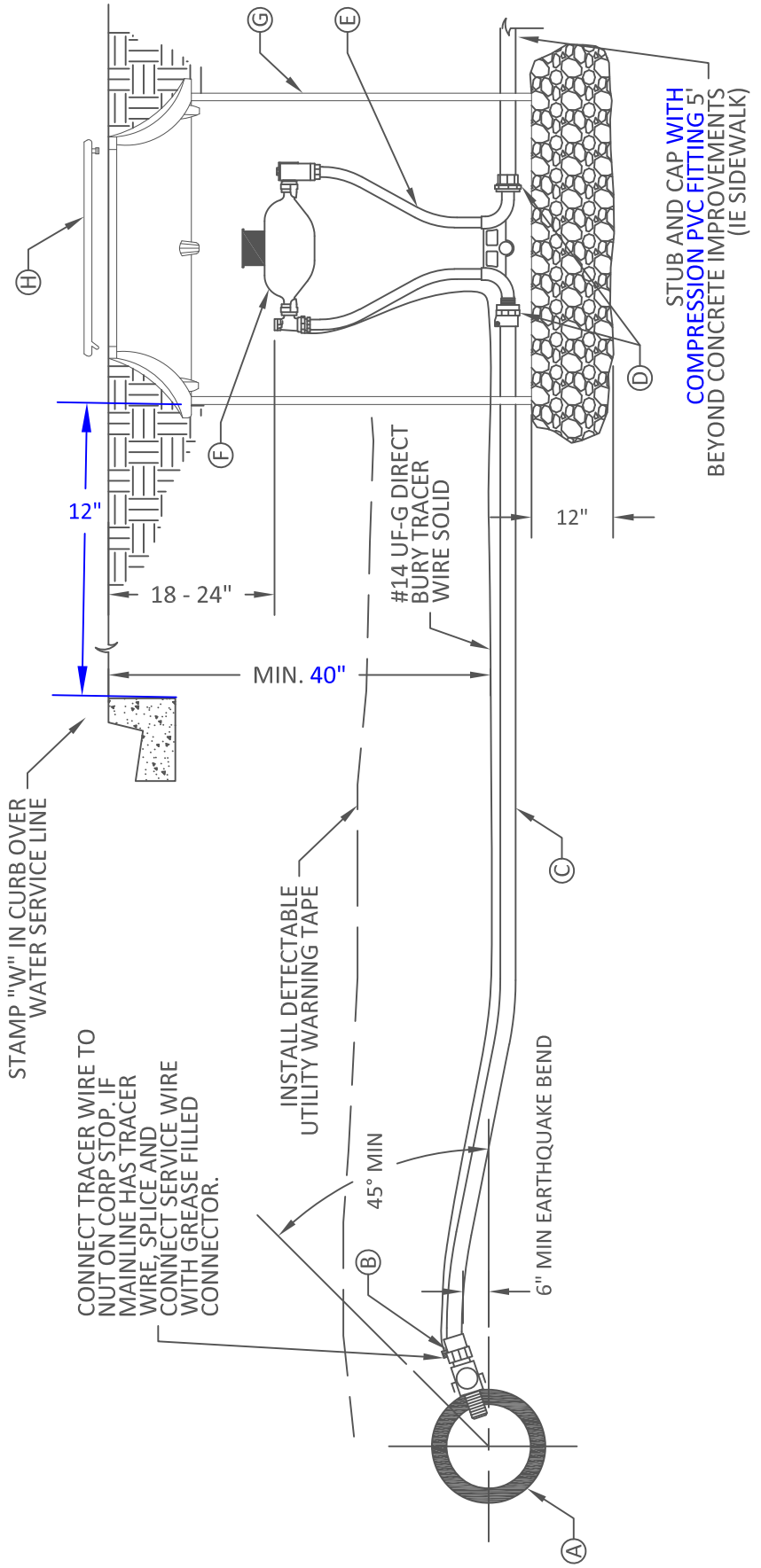
provo PUBLIC WORKS

STANDARD SEWER SERVICE CONNECTION AND CLEAN-OUT

STANDARD DETAIL
P-431

NOT TO SCALE

REVISED DATE: 09/26/2019



LEGEND

No.	ITEM	DESCRIPTION
A	CONNECTION TO MAIN	DIRECT TAP DUCTILE IRON / USE DOUBLE STRAP SADDLE ON PVC (PVC ALLOWED BY SPECIAL PERMISSION ONLY)
B	CORPORATION STOP	BRASS WITH TRACER WIRE NUT (MUELLER OR FORD CC x COMPRESSION DIRECT TAP IN DUCTILE IRON) (IRON PIPE THREAD x COMPRESSION IN PVC SADDLE)
C	PIPE	1-inch COPPER - TYPE "K" SOFT OR BLUE PC 200, DR9 POLYETHYLENE TUBING MEETING AWWA C901 & NSF 61 WITH #14 TRACER WIRE AND METAL INSERTS. NO SPLICES ALLOWED!
D	ADAPTER	BRASS - MALE x COMPRESSION
E	METER YOKE	1-inch COPPER - EQUIP WITH INLET VALVE, VERTICAL DUAL CHECK VALVE, STABILIZER BARS PERPENDICULAR TO SETTER, & SOLID BAR BETWEEN INLET & OUTLET AT BASE AND HALFWAY UP METER YOKE
F	METER	NEPTUNE AMI SMART METER WITH ANTENNA TO BE INSTALLED BY CITY. PROTECT FROM DAMAGE
G	METER BOX	CMP, OR WHITE HDPE (21" DIA x 30" HEIGHT (MIN))
H	RING AND LID	D&L FOUNDRY AND SUPPLY L-2244 RING WITH UNIVERSAL COVER FOR NEPTUNE R450 RADIO ANTENNA; D-6018-09 IN DRIVEWAYS AND CONCRETE

provo PUBLIC WORKS

3/4" AND 1" METER

SHEET 1 OF 2

STANDARD DETAIL

P-521

NOT TO SCALE

REVISED DATE: 09/26/2019

3/4" and 1" meter

1. GENERAL

A. Do not install meter in driveways, sidewalks or curb and gutter without express written permission from Provo City.

B. In new subdivisions, stake lot corners prior to installation of water meters.

C. In street surfaces or other vehicular traffic areas (like driveway approaches), Install the same type of meter box as required for 1 1/2" and 2" service meters. See Plan P-522.

D. Above ground reduced pressure backflow prevention valve (RP) may be required in some applications. For more information, contact Provo City Cross Connection Program Coordinator at (801) 852-6788.

E. To get access to water, contact Provo City at (801) 852-6780 for water meter to be installed. Access to water will be downstream and outside of the meter box. No jumpers allowed.

F. Maintain at least 2 feet between 1 inch and ¾ inch service line taps. Maintain 4 feet between any connection that is larger than 1 inch and any other connection.

2. PRODUCTS

A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.

B. Backfill: Common fill, PROVO Section 31 05 13M. Maximum particle size 2-inches.

C. Castings: Grey iron class 35 minimum per ASTM A 48, coated with asphalt based paint or better.

D. Fittings: Use compression fittings (no flare). Mueller or Ford only.

E. Teflon tape and pipe dope to be used on all threaded pipe fittings.

3. EXECUTION

A. Meter Placement:

1) Install the meter box 1 foot behind curb and gutter (if there is no curb, install within 7' of the property line) and within the public right-of-way and in the center of the lot.

2) Do not install meters under driveway approaches, sidewalks, or curb and gutter.

B. Bed service line in one foot of sand all directions.

C. Meter Box: Set box so grade of the frame and cover matches the finish grade of the surrounding surface.

D. Lid must be to grade before meter will be installed.

E. Pipe Outside of Right-of-Way: Coordinate with utility agency or adjacent property owner for type of pipe to be used outside of right-of-way.

F. Inspection: Before backfilling around meter box, secure inspection of installation by ENGINEER.

G. Provide backfill and surface restoration per Plan P-255.

H. Operation of Valves: Provo City water valves to be operated only by Provo City Water Resources employees, even in emergencies. For assistance call (801) 852-6780.

provo PUBLIC WORKS

3/4" AND 1" METER

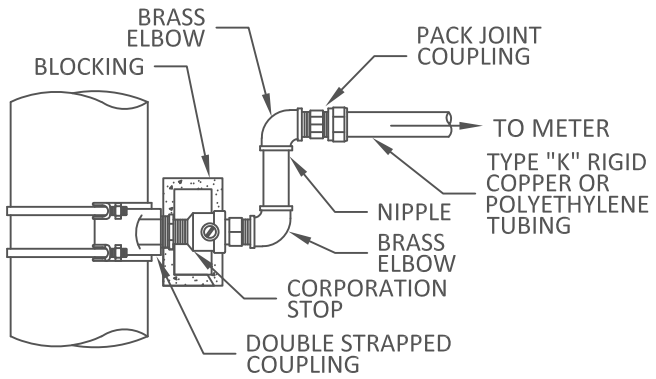
STANDARD DETAIL
P-521

NOT TO SCALE

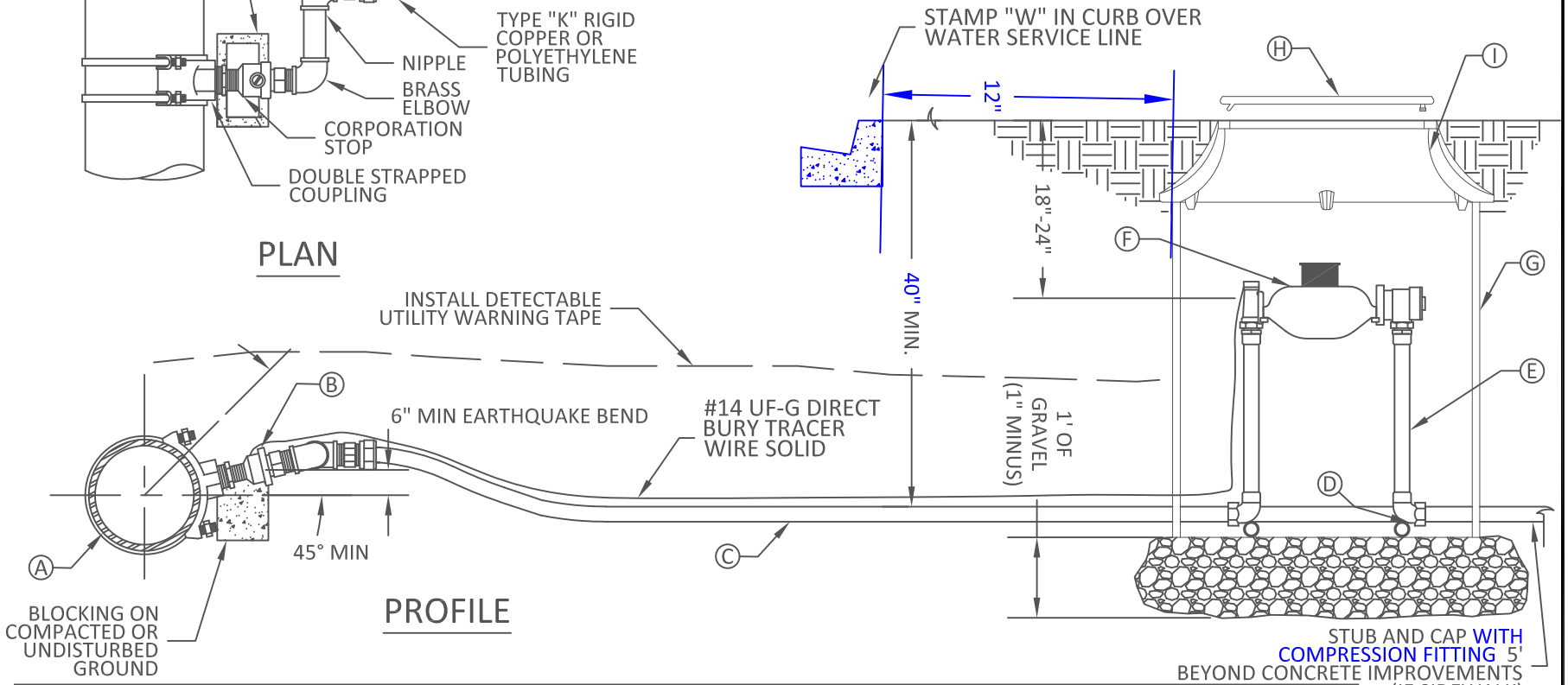
REVISED DATE: 10/06/2010

provo PUBLIC WORKS

WATER SERVICE LATERAL LAYOUT 1.5" & 2"



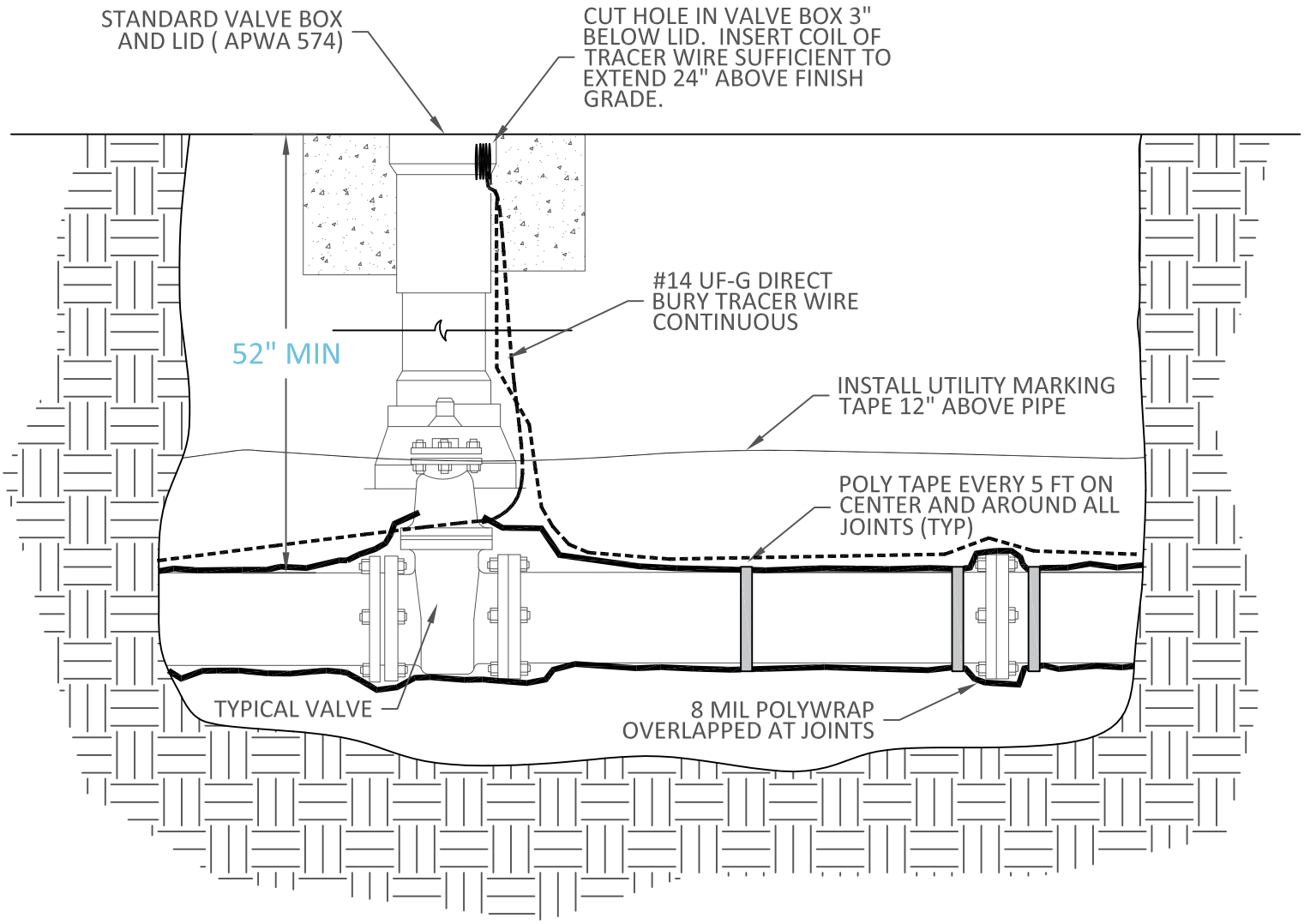
PLAN



PROFILE

LEGEND		
No.	ITEM	DESCRIPTION
Ⓐ	CONNECTION TO MAIN	USE DOUBLE STRAP BRASS SADDLE IN ALL CASES AND DOUBLE SWING WHEN USING RIGID COPPER TUBE
Ⓑ	CORPORATION STOP	BRASS - IRON PIPE THREAD WITH TRACER WIRE NUT
Ⓒ	PIPE	RIGID COPPER - OR PC 160, DR9 POLYETHYLENE TUBING MEETING AWWA C901 AND NSF61 WITH #14 TYPE UFTRACER WIRE AND METAL INSERTS. NO SPLICES ALLOWED!
Ⓓ	ADAPTER	BRASS - MALE x COMPRESSION
Ⓔ	METER YOKE	COPPER - EQUIP WITH INLET VALVE, VERTICAL DUAL CHECK VALVE, STABILIZER BARS PERPENDICULAR TO SETTER, & SOLID BAR BETWEEN INLET & OUTLET AT BASE AND HALFWAY UP METER YOKE. INCLUDE BYPASS.
Ⓕ	METER	NEPTUNE AMI SMART METER WITH ANTENNA TO BE INSTALLED BY CITY. PROTECT FROM DAMAGE
Ⓖ	METER BOX	CMP, CONCRETE, OR HDPE (30" DIA x 30" HEIGHT (MIN))
Ⓗ	RING AND LID	D&L FOUNDRY AND SUPPLY L-2244 RING WITH L-2240-24 COVER AND L-2336 30" ADAPTOR RING IN LANDSCAPE AREAS; B-5343 RING OR A-1180 WITH A-1180 COVER & RECESSED NEPTUNE R450 UNIVERSAL HOLE IN CONCRETE AREAS

STANDARD DETAIL
P-522
NOT TO SCALE
REVISED DATE: 09/26/2019



provo PUBLIC WORKS

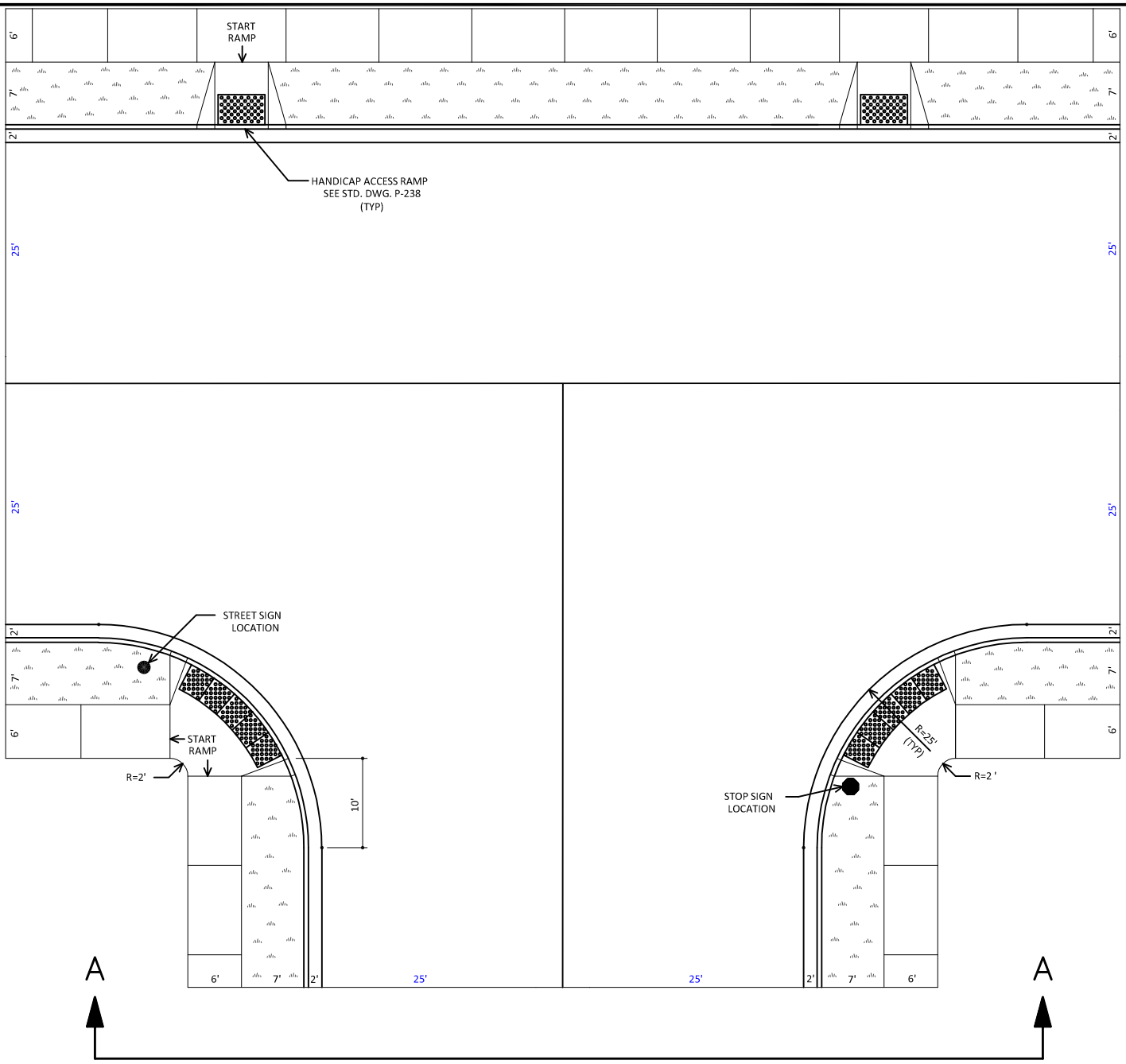
WATER MAINLINE, POLYWRAP & TRACER WIRE

STANDARD DETAIL

P-594

NOT TO SCALE

REVISED DATE: 09/26/2019



SECTION A-A

COLLECTOR STREET TO COLLECTOR STREET

NOTE: HANDICAP ACCESSIBLE RAMPS SHALL BE PROVIDED AT ALL CROSSING LOCATIONS.

provo PUBLIC WORKS

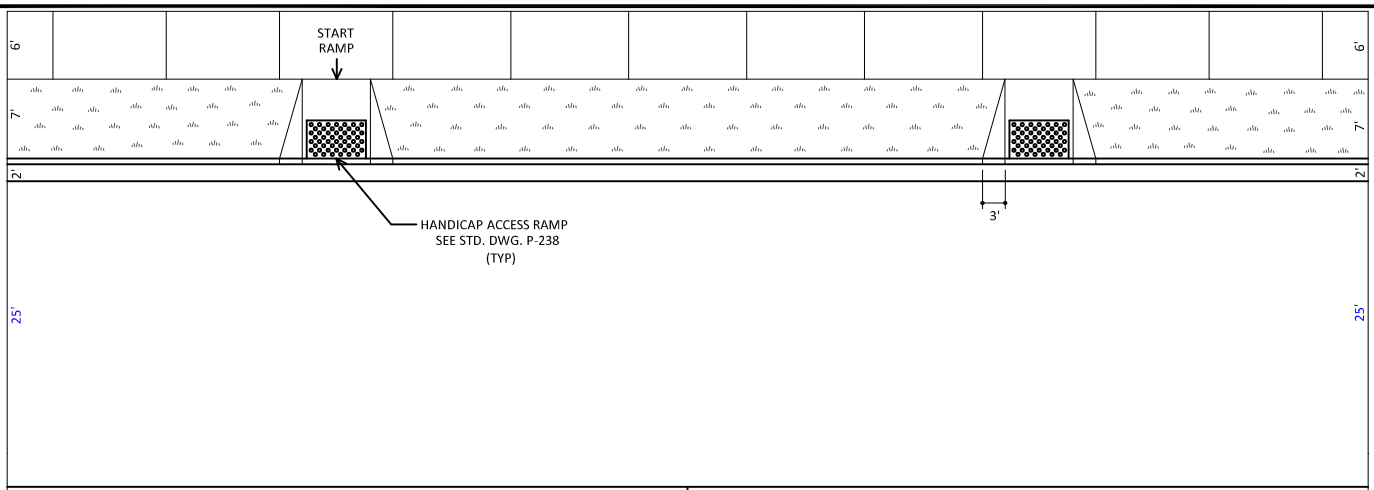
TYPICAL COLLECTOR STREET T-INTERSECTION

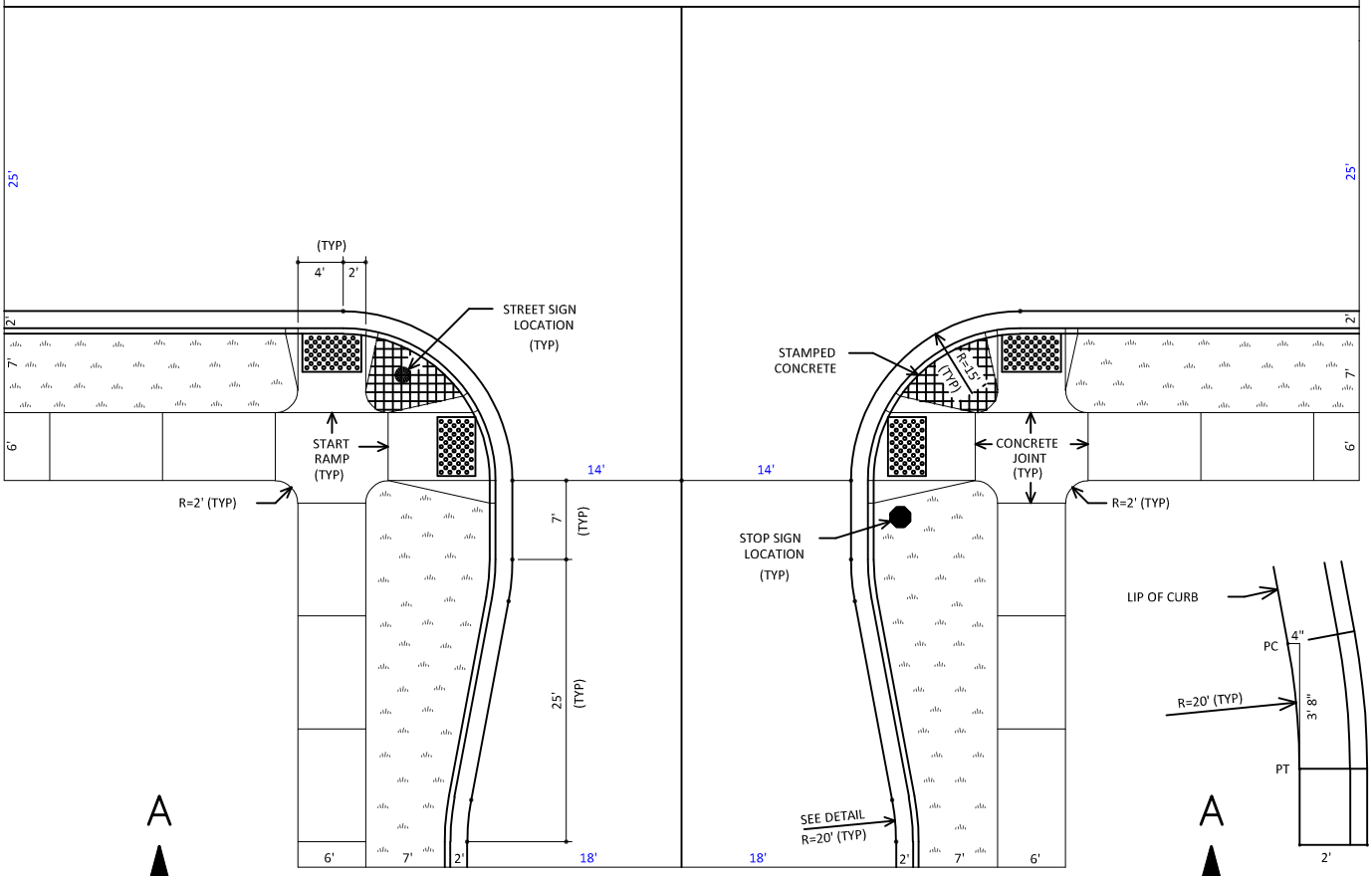
SHEET 1 OF 1

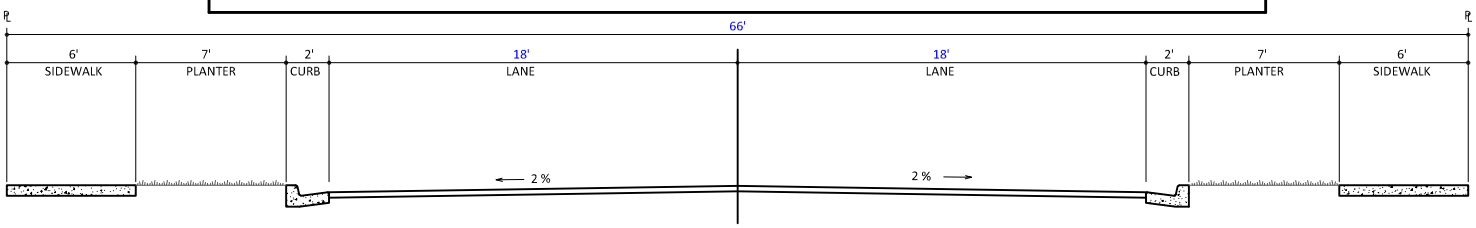
STANDARD DETAIL
P-903

NOT TO SCALE

REVISED DATE: 10/14/19







SECTION A-A

LOCAL STREET TO COLLECTOR STREET

NOTE: HANDICAP ACCESSIBLE RAMPS SHALL BE PROVIDED AT ALL CROSSING LOCATIONS.

SHEET 1 OF 1

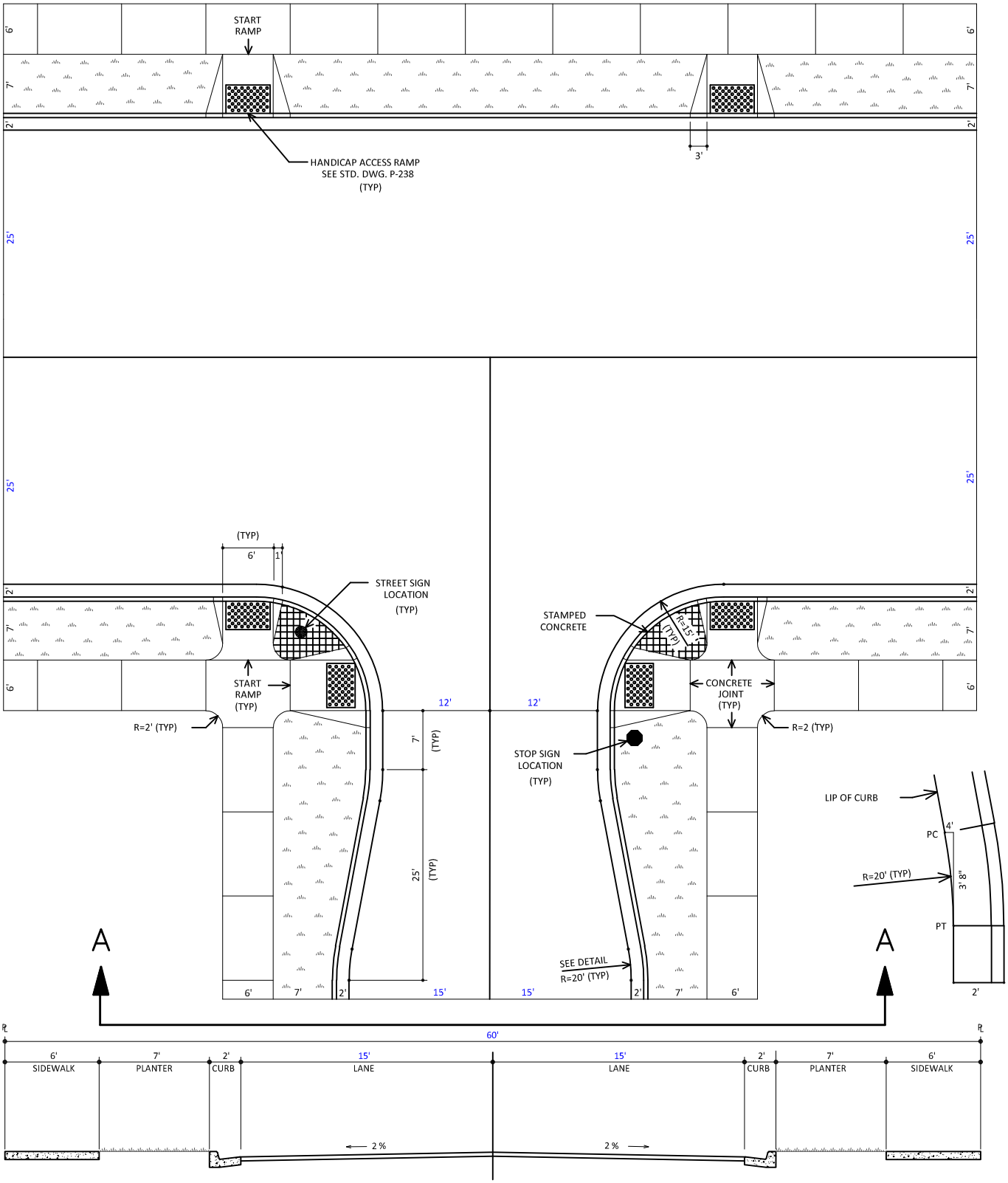
provo PUBLIC WORKS

TYPICAL LOCAL STREET T-INTERSECTION

STANDARD DETAIL
P-904

NOT TO SCALE

REVISED DATE: 10/14/19



SECTION A-A

LOCAL STREET TO COLLECTOR STREET

NOTE: HANDICAP ACCESSIBLE RAMPS SHALL BE PROVIDED AT ALL CROSSING LOCATIONS.

SHEET 1 OF 1

provo PUBLIC WORKS

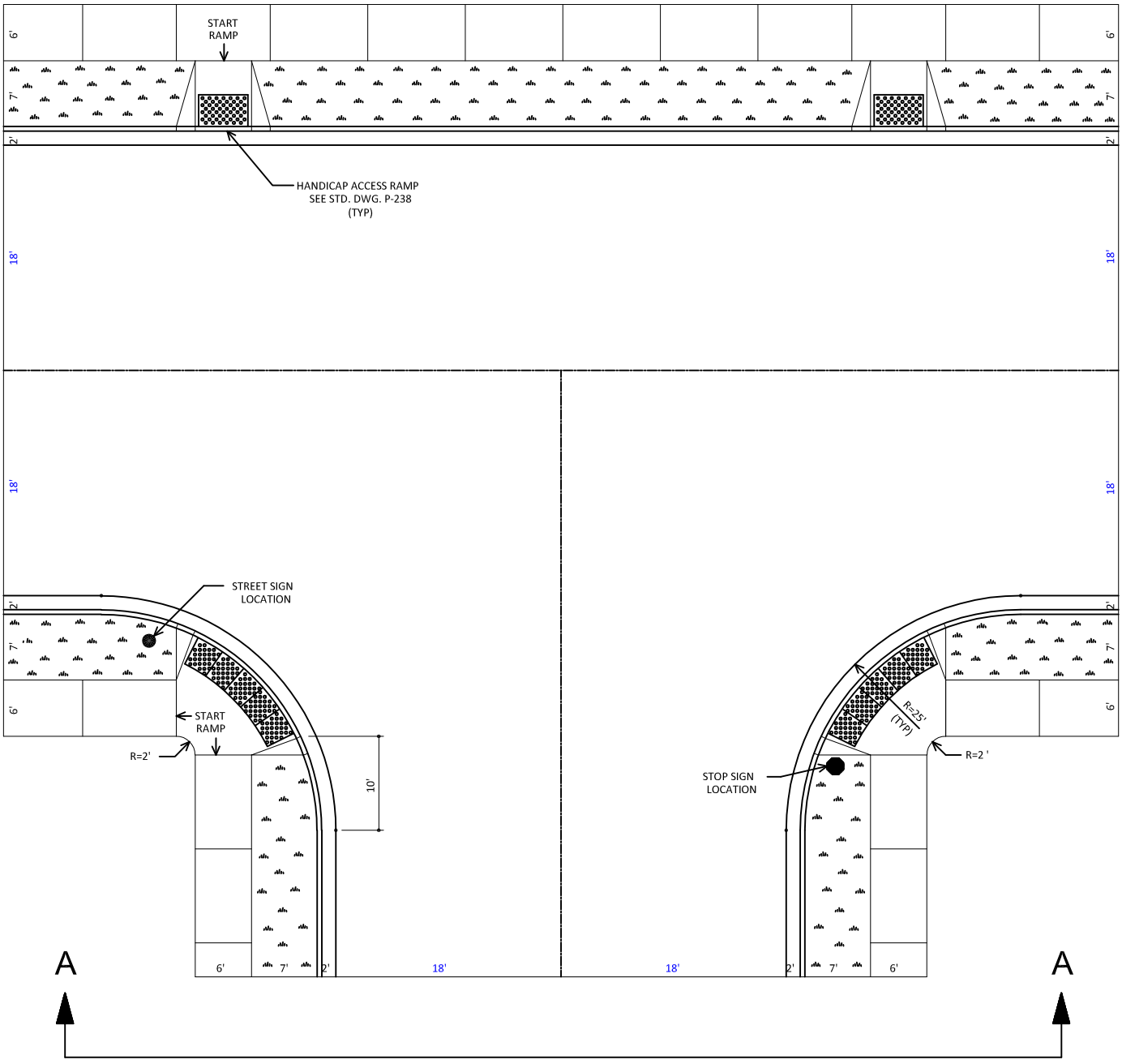
TYPICAL LOCAL STREET T-INTERSECTION

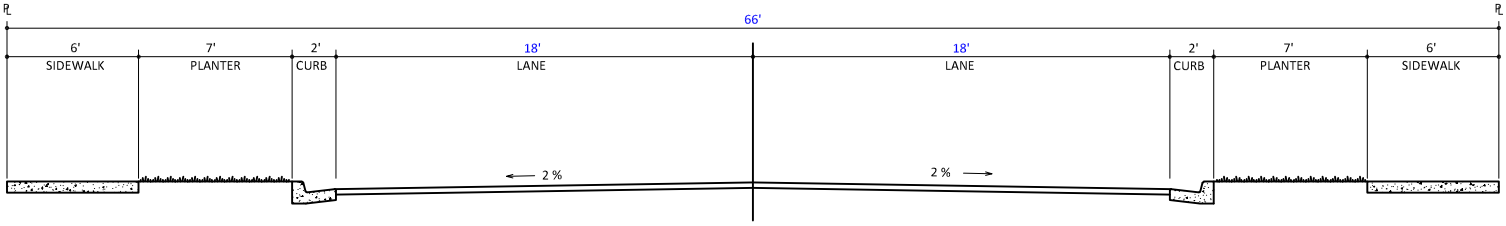
STANDARD DETAIL

P-905

NOT TO SCALE

REVISED DATE: 10/14/19





SECTION A-A

LOCAL STREET TO LOCAL STREET

*REQUIRES CITY ENGINEER APPROVAL

NOTE: HANDICAP ACCESSIBLE RAMPS SHALL BE PROVIDED AT ALL CROSSING LOCATIONS.

provo PUBLIC WORKS

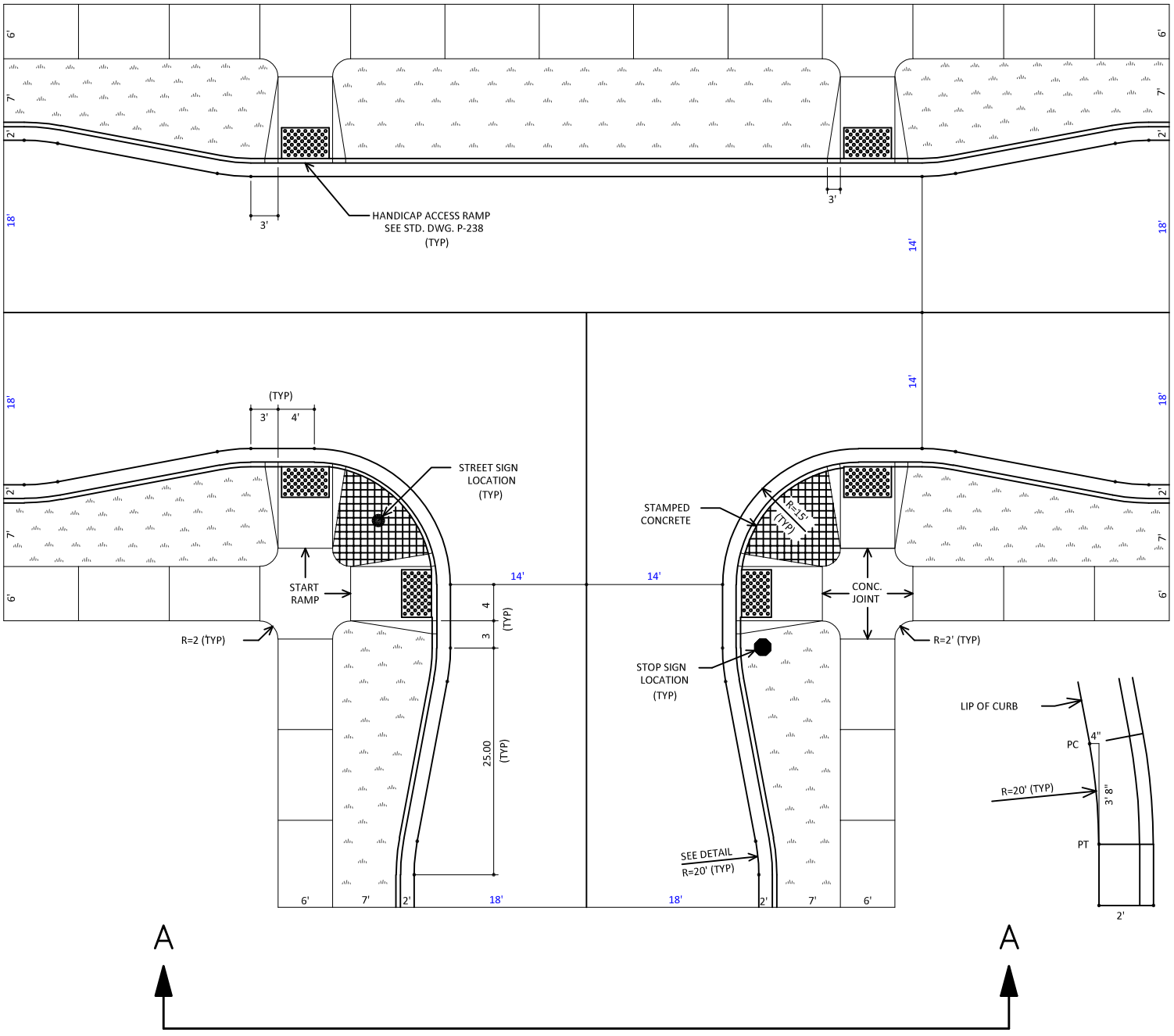
TYPICAL LOCAL STREET T-INTERSECTION

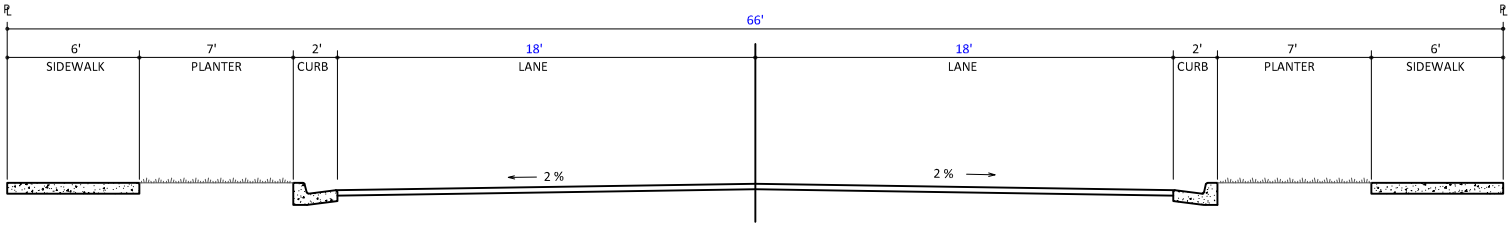
SHEET 1 OF 1

STANDARD DETAIL
P-906

NOT TO SCALE

REVISED DATE: 10/14/19





SECTION A-A

LOCAL STREET TO LOCAL STREET

NOTE: HANDICAP ACCESSIBLE RAMPS SHALL BE PROVIDED AT ALL CROSSING LOCATIONS.

provo PUBLIC WORKS

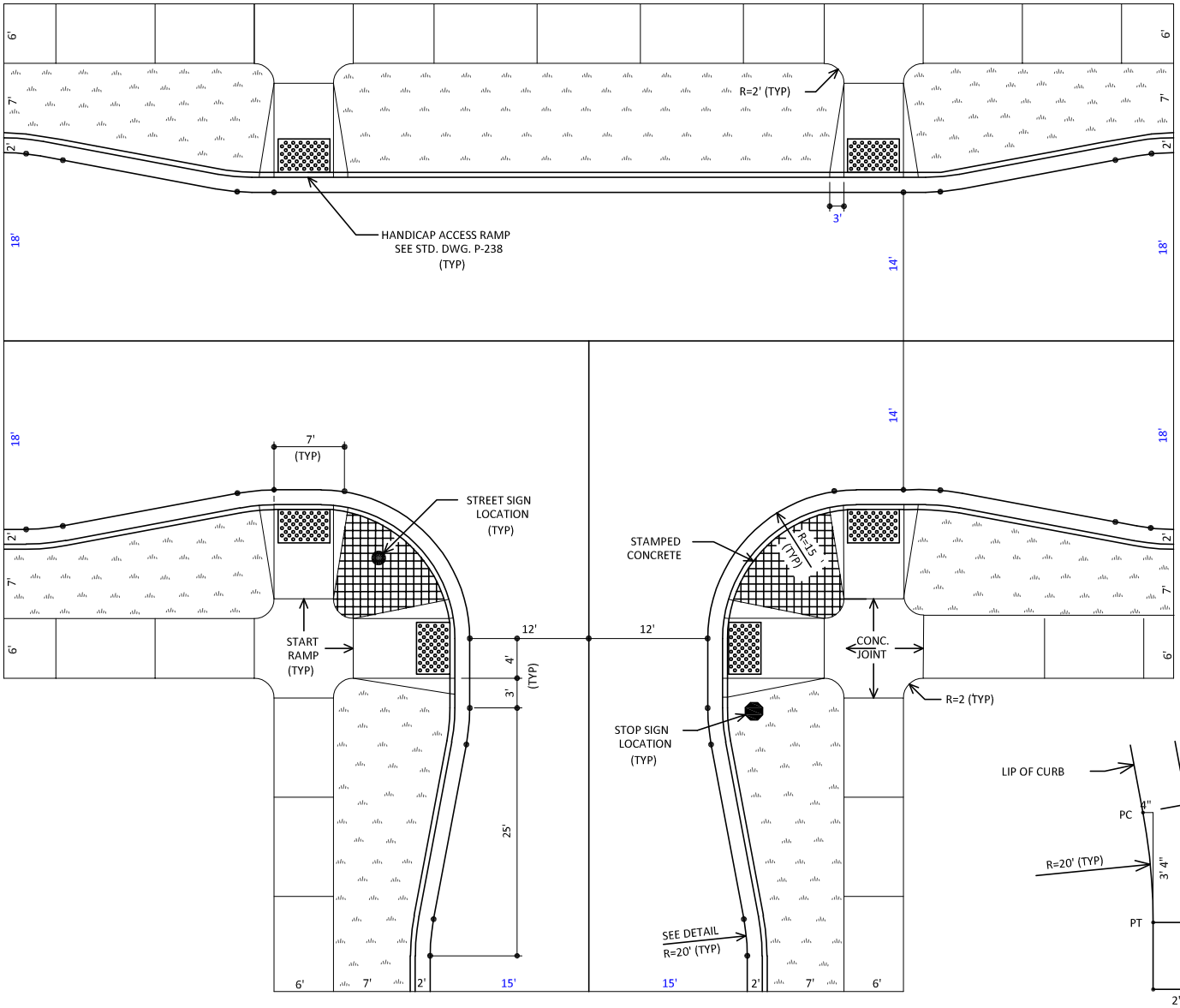
TYPICAL LOCAL STREET T-INTERSECTION

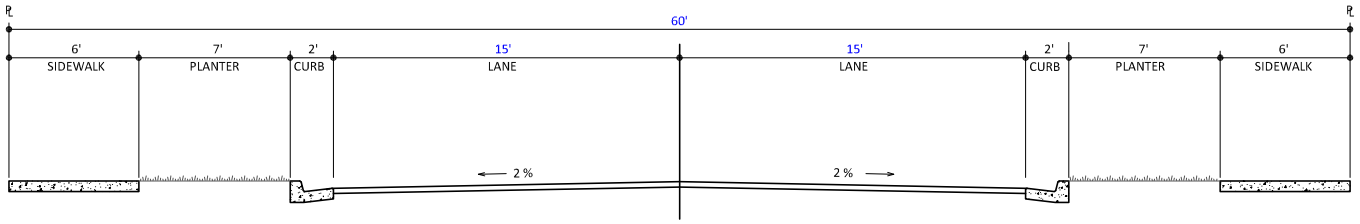
SHEET 1 OF 1

STANDARD DETAIL
P-907

NOT TO SCALE

REVISED DATE: 10/14/19





SECTION A-A

LOCAL STREET TO LOCAL STREET

NOTE: HANDICAP ACCESSIBLE RAMPS SHALL BE PROVIDED AT ALL CROSSING LOCATIONS.

provo PUBLIC WORKS

TYPICAL LOCAL STREET T-INTERSECTION

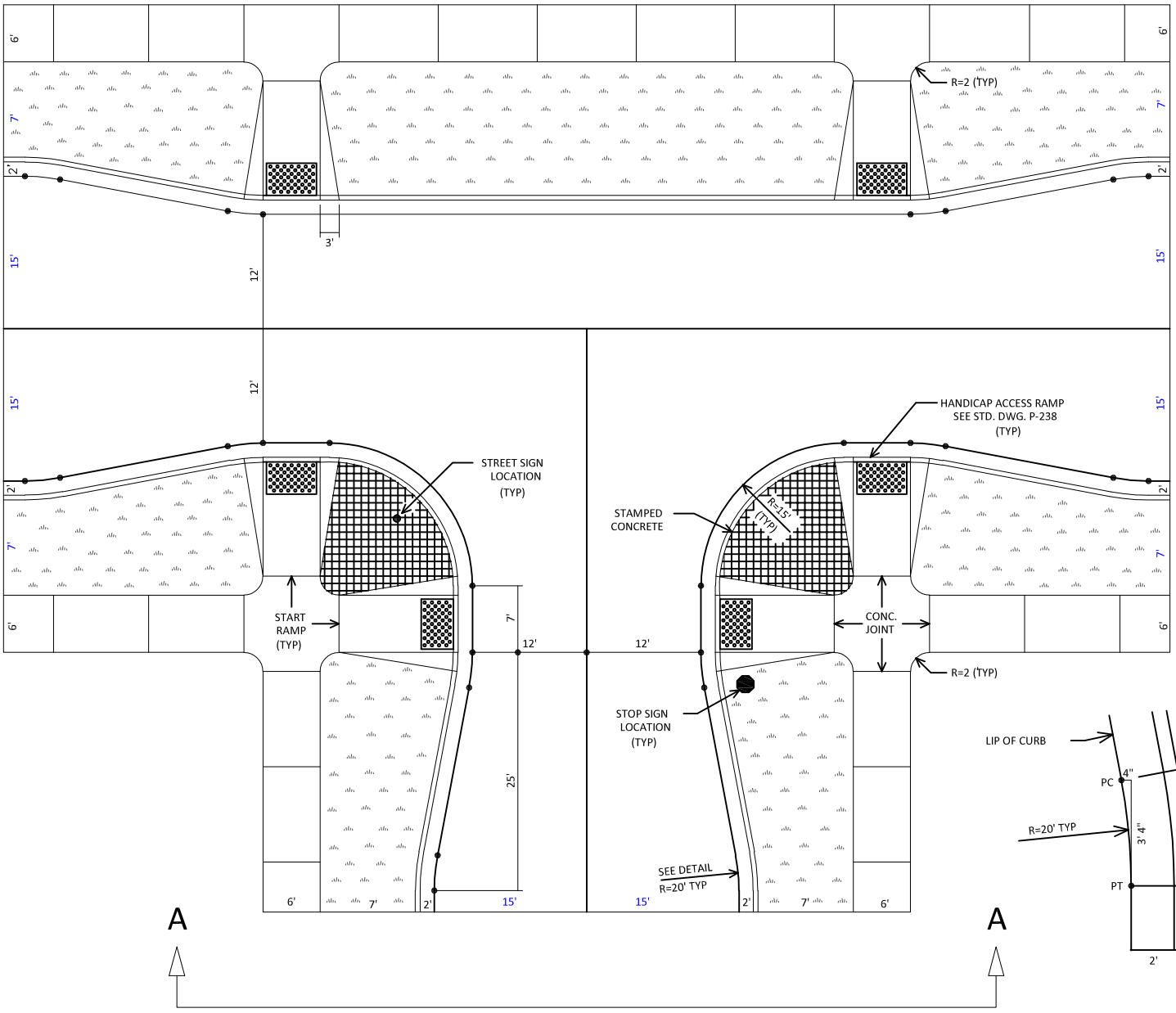
SHEET 1 OF 1

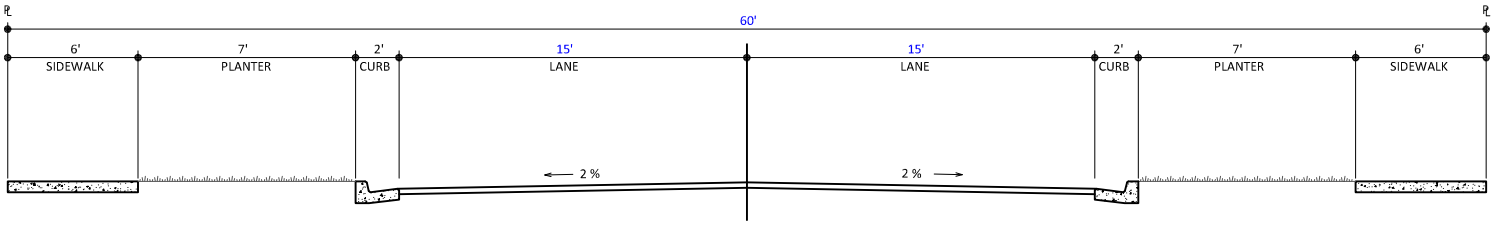
STANDARD DETAIL

P-908

NOT TO SCALE

REVISED DATE: 10/14/19





SECTION A-A

LOCAL STREET TO LOCAL STREET

NOTE: HANDICAP ACCESSIBLE RAMPS SHALL BE PROVIDED AT ALL CROSSING LOCATIONS.

provo PUBLIC WORKS

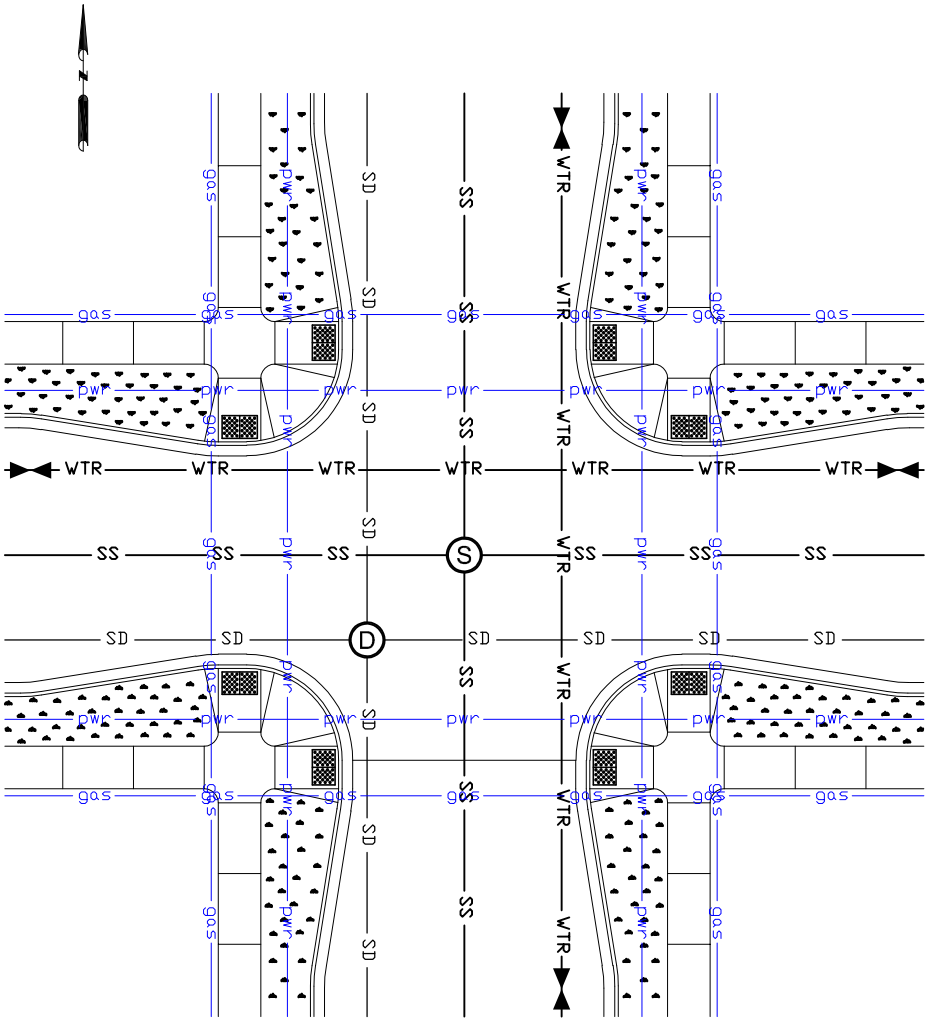
TYPICAL LOCAL STREET T-INTERSECTION

SHEET 1 OF 1

STANDARD DETAIL
P-909

NOT TO SCALE

REVISED DATE: 10/14/19



PLAN VIEW

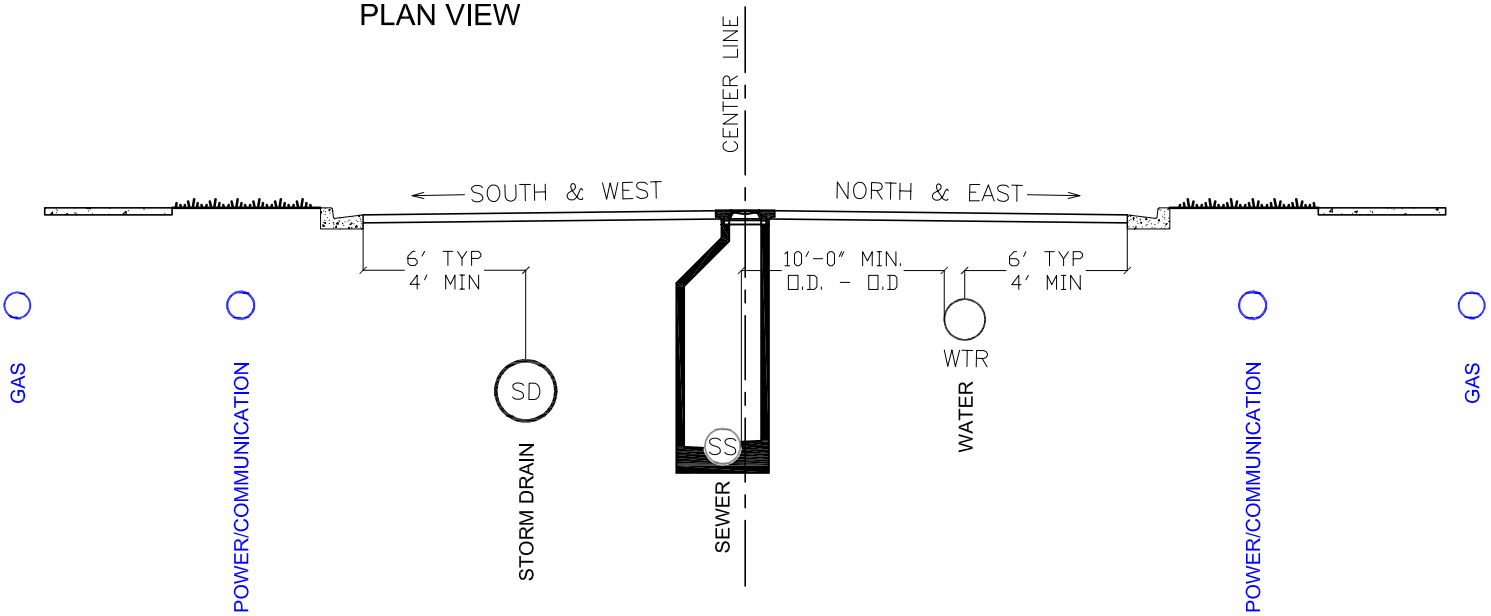
NOTES:

WATER LINES: TYPICALLY 6' FROM THE LIP OF CURB ON THE NORTH AND EAST SIDES OF THE ROAD.

SEWER LINES: TYPICALLY ON CENTER LINE OF ROAD.

STORM DRAIN: TYPICALLY 6' FROM THE LIP OF CURB ON THE SOUTH AND WEST SIDES OF THE ROAD.

DETAIL DOES NOT APPLY TO 24' ASPHALT WIDTH ROADS.



CROSS SECTION

SHEET 1 OF 1

provo PUBLIC WORKS

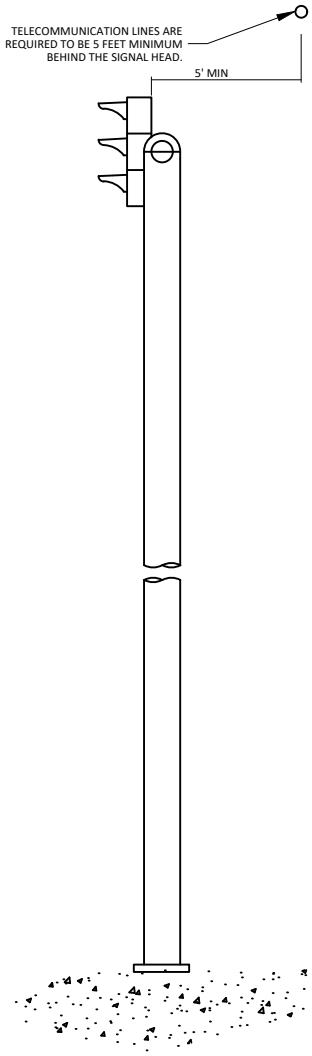
UTILITY LOCATION IN CITY R.O.W.

STANDARD DETAIL

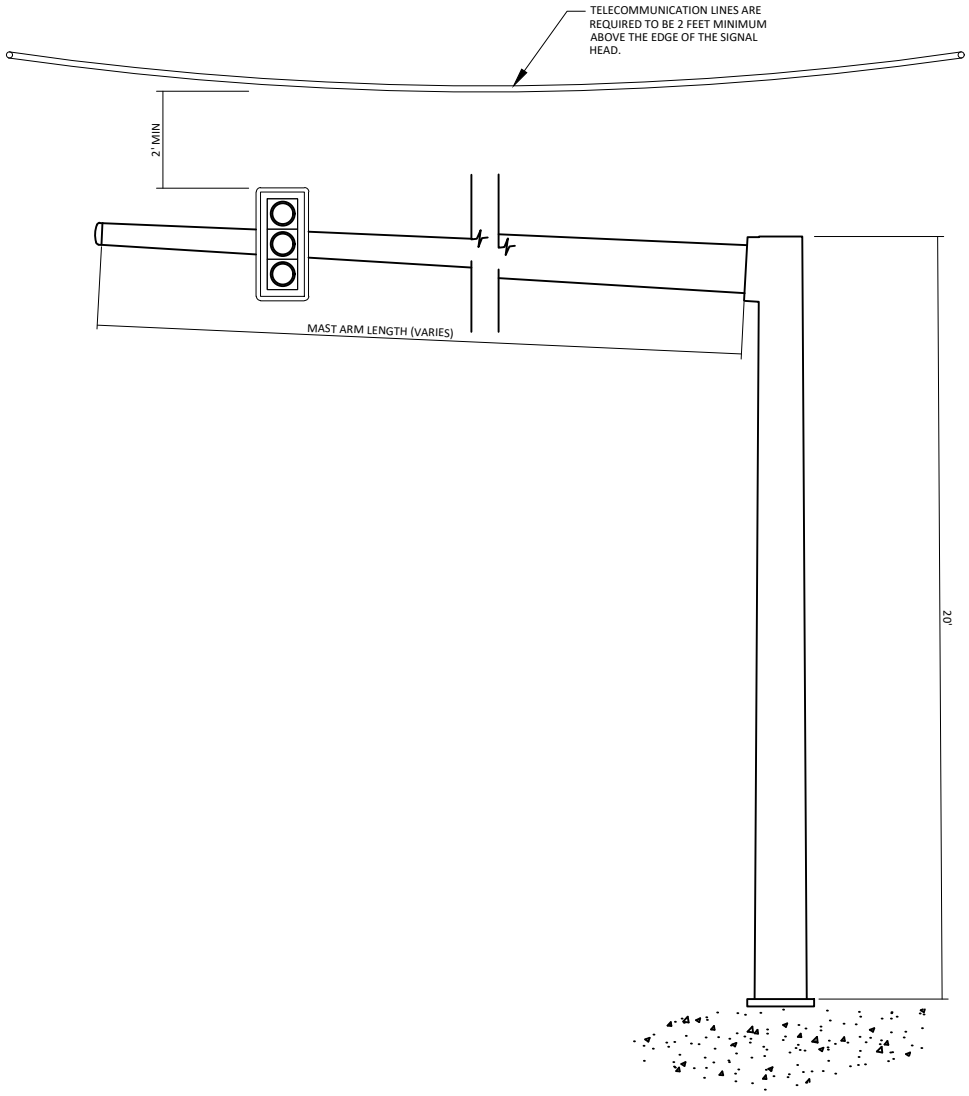
P-914

NOT TO SCALE

REVISED DATE: 10/14/19



SIDE VIEW



FRONT VIEW

NOTE:
THIS STANDARD IS TO BE FOLLOWED AT ALL CURRENT AND FUTURE SIGNALIZED INTERSECTIONS.

provo PUBLIC WORKS 2020

OVERHEAD UTILITY LOCATION

STANDARD DETAIL
P-915

NOT TO SCALE

REVISED DATE: 10/14/2019

CULINARY WATER SYSTEMS

1. WATER MAIN LINE UPSIZING OR EXTENSIONS
    A. The developer of a project which requires the extension or upsizing of water main lines shall pay the cost of such work.
    B. All subdivisions shall have a complete water distribution system installed before such subdivisions are accepted by the City.
        a. The design and construction of such a water distribution system shall meet all applicable standards and be approved prior to installation.
        b. The developer shall install the water distribution system at the developer's own expense for all water mains which are necessary to provide all required water per State and City design standards. Minimum static pressure at the point of use shall be 50 psi. Maximum shall be 120 psi.
        c. The system shall include a properly looped feed from the nearest adequately supplied locations in the City water distribution system. Provo City will use a hydraulic model where required by State Code to verify that the capacity for fire flow and water demand as specified in the project plans are available. The proposed system shall be modified to comply with the model findings.
        d. If the Director requires increased capacity above that required for the project, the developer may be eligible for reimbursement for the difference in material cost between the main required for the development and the larger diameter main actually installed.
    C. When any street is to be paved from curb to curb with a permanent type of pavement, an eight (8) inch or larger water main shall be installed in that street prior to the paving of the street. The cost of installation of such water main shall be borne by the developer.
    D. If a person installs a water main line extension to serve a parcel, said main line extension shall extend completely across the parcel of property being developed.
    E. A developer who pays the cost of an off-site water main line extension may have the right of reimbursement described in Provo City Code Chapter 10.02.050.

2. CULINARY WATER MAIN STANDARDS
    A. All water system installation and design must conform to Provo City's Water System Master Plan and all applicable state administrative rules, particularly R309-550.
        a. Minimum allowable water main diameter shall be eight inches (8") in low and medium density residential areas.

b. Minimum allowable water main diameter shall be twelve inches (12") in all other areas.
c. Main lines larger than the minimums shown above may be required if necessary for fire flow or pressure. Developer shall be responsible for an upsize based on providing sufficient capacity for the development.
d. If the Master Plan requires a larger pipe size than described in paragraphs (a) and (b), City may require the developer to install the larger size. ~~Reimbursement may be granted according to paragraph 1.D. of this section.~~

B. Waterline shall be Ductile Iron with polywrap, grease on bolts and #14 copper tracer wire per Provo Standard Drawing P-594 and installed per AWWA Standard C600-10.~~.~~ PVC, HDPE, Steel, or other pipe material are not allowed unless expressly permitted by the Public Works Division of Water Resources. All construction and installation shall conform to standards referenced in R309-550-8 of the Utah Administrative Code.

C. Waterline should typically be installed within the street section in the location shown on Provo Standard Drawing P-914.

D. Provide a minimum of ten (10) feet horizontal clearance between a water and sewer edge to edge per Utah Administrative Code R317-3-2 and R309-550-7.

a. Where a water main and a sewer line must cross, the water main shall be at least 18 inches above the sewer line. Separation distances shall be measured edge-to-edge (i.e. from the nearest edges of the facilities).

b. Water mains and sewer lines shall not be installed in the same trench.

c. Where local conditions make it impossible to install water or sewer lines at separation distances required by subsection (a), the sewer pipes are in good condition, and there is not high groundwater in the area, it may be acceptable if the design includes a minimum horizontal separation of 6 feet and a minimum vertical clearance of 18 inches with the waterline being above. In order to determine whether the design is acceptable, the following information shall be submitted as part of the plans for review.

i. reason for not meeting the minimum separation standard;

ii. location where the water and sewer line separation is not being met;

iii. horizontal and vertical clearance that will be achieved;

iv. sewer line information including pipe material, condition, size, age, type of joints, thickness or pressure class, whether the pipe is pressurized or not, etc.;

v. water line information including pipe material, condition, size, age, type of joints, thickness or pressure class, etc.;

vi. ground water and soil conditions; and,

vii. any mitigation efforts.

~~D.~~E.

F. Minimum cover required shall be 48 inches (48").

G. All new water infrastructure shall be pressure tested by maintaining 200 psi for two hours.

H. All materials that may come in contact with drinking water, including pipes, gaskets, lubricants and O-Rings, shall be ANSI-certified as meeting the requirements of ANSI/NSF Standard 61, Drinking Water System Components - Health Effects. To permit field-verification of this certification, all components shall be appropriately stamped with the NSF logo.

~~E.~~I. Pipe, joints, fittings, valves, and fire hydrants shall conform to ANSI/NSF Standard 61, and applicable sections of AWWA Standards C104-A21.4-08 through C550-05 and C900-07 through C950-07.

3. VALVES
   A. Valves shall be provided in all intersections and shall equal number of legs.
   B. Valves shall be located a minimum of three feet (3') off a tee or cross.
   C. All valves larger than 12 inch (12") shall be butterfly design.
   D. Provide concrete collars on valve boxes at ¼" below finished asphalt.
   E. Place valves at intersections per Provo Standard Drawing P-914.

4. WATER SERVICES
   A. No service line connections shall be made to Provo City's water distribution system or to main water lines on private property without authorization. The party making the connection shall be required to obtain a permit for the same and to pay the fees associated with that permit as shown on the Consolidated Fee Schedule.
   B. Water taps on public or private mains shall be installed by a qualified and licensed plumber or a pre-qualified utility contractor and inspected by the City.
   C. Minimum size shall be one inch (1") diameter for service lines and meter yokes.
   D. Engineering calculations shall be required to show that meter size is adequate to meet demand for any uses other than detached single family residential or townhomes.

E. No common use water services shall be allowed unless approved by the Water Resources Director.
   a. Service lines must be so arranged that the supply to each separate house or premises are controlled by a separate valve, placed within and near the line of the street curb.
   b. Common use water services shall be eliminated as redevelopment of the site occurs, or if repair or replacement is needed. The construction or repair cost will be the responsibility of the Owner.
   c. Master meter(s) or combined building meters may be allowed for private developments if approved by the Water Resources Director. All lines within the private development shall be private including those from the private mainline to the meter. The developer shall provide the City with an agreement defining who is responsible for maintenance and show the lines as private on the plat and utility plans. Individual shutoffs located near the curb are required for each unit.
   d. Legal and physical access shall be provided to all meters.
   ~~d.~~e. All service lines shall be capped downstream of the meter box until connected for service.

5. ABANDONDED SERVICE LINES
   A. Whenever a water service line is abandoned in favor of a different service line, the old service line shall be disconnected from the main line and the old service tap shall be plugged at the main line. The cost of all such work shall be the responsibility of the owner of the property being serviced by the new water service line. Any work described in this Section shall be inspected by Provo City before backfilling.

6. FIRE HYDRANTS
   A. Provide minimum fire flow required by the Uniform Fire Code for proposed structures and fire flow calculations at all hydrant locations. Unless project specific information is provided, the following will be assumed:

Provo City Minimum Operational and Performance Criteria for Planning and Design

Component	Criteria
Fire Flow Requirements (flow [gpm] @ duration [hours]) [a]	
Single-Family Residential	1,500 gpm @ 2 hrs
Multi-Family Residential	2,500 gpm @ 2 hrs
Commercial	3,000 gpm @ 3 hrs (with approved automatic sprinkler system)
Institutional (schools, hospitals, etc.)	4,000 gpm @ 4 hrs (with approved automatic sprinkler system
Industrial/Business Park	4,000 gpm @ 4 hrs (with approved automatic sprinkler system)

Water Transmission Line Sizing (16-in in diameter or greater)	
Max day plus Fire Flow or Peak Hour Demand Condition	
Minimum Pressure, psi	35 psi (20 psi for fire flow)
Maximum Head Loss, ft per 1000 ft of pipe (ft/k	7 ft/kft
Maximum Velocity, ft per second (fps)	7 fps
Water Distribution Line Sizing (Less than 16-in in diameter)	
Max day plus Fire Flow or Peak Hour Demand Condition	
Minimum Pressure, psi	35 psi (20 psi for fire flow)
Maximum Head Loss, ft/k ft	10 ft/kft
Maximum Velocity, ft/sec	5 fps

[a] Typical minimum flow will be verified by City on a case by case basis

B. Install fire hydrants per Provo Standard Drawing P-511.
   a. Hydrants shall be connected to a minimum eight-inch (8") main using a minimum six-inch (6") diameter pipe.
   b. No bends are allowed on fire hydrant laterals.
   c. No services shall be allowed on fire hydrant laterals.

C. Replace fire hydrant if the hydrant is to be moved.

D. Fire Hydrant spacing:
   a. Shall not exceed three hundred feet (300') in areas of multi-family dwellings, commercial and manufacturing uses.
   b. In single family dwelling use areas hydrant spacing shall not exceed five hundred feet (500 ft).
   c. Major roads shall have fire hydrants placed on both sides of the roadway to provide for Fire Department access to such hydrants.

E. Place fire hydrant within 100 feet (100') of the fire department connection (FDC).

F. Provide fire hydrants at the end of dead-end lines for flushing purposes.

G. Private fire service lines designed to provide fire protection to a building or buildings shall be constructed according to Provo City Standards at the expense of the owner of the building being serviced according to the following requirements:
   a. Maintenance associated with such fire service lines shall also be at the expense of said owner.
   b. Water service lines and meters may be connected to fire service lines when approved by the Director if the fire line is looped and said fire lines are intended to provide water to the building being serviced by the fire service line. In this case, the fire lines and service lines will be private and only appurtenances inside the meter box will be maintained by the City.
   c. Provide a valve on the mainline. Fire line after the valve shall be private.
   d. Fire suppression system and hydrants are not allowed on the same line unless the fire line is looped.
   e. Provide approved backflow prevention.

7. WATER VAULTS/METER BOXES
    A. Whenever a new service line is installed connecting any premises to an unmetered private line which is supplied water from the water mains of Provo City, or whenever a service pipe is connected directly to the water system of said City, a water meter must be installed.
    B. All water meters shall be installed in easily accessible locations.
    C. No meter box shall be allowed in any street, driveway, driveway flare, or sidewalk without express written permission of Provo City.
    D. At the time of a significant remodel or new construction, existing services and meter sets must be brought up to current standard with dual check valves in meter yoke and new can. If the service line is damaged, deteriorated, or galvanized pipe, the OWNER shall replace the water service from the mainline to the meter. Splices between the mainline and meter yoke are not allowed so if a meter location is changed to be farther from the mainline, a new service line from the main to meter yoke is required.
    E. Water meters shall be furnished and installed by Provo City.
    F. Water meters shall not be installed until:
        a. Proper demolition of old water lines and services has been completed or a bond for such demolition has been received.
        b. Newly installed main lines have been pressure tested, disinfected, and approved and service lines, including meter boxes and appurtenances, have been inspected and approved.
        c. No meters shall be installed until all applicable fees have been paid including water connection fees, impact fees and main line extension fees as appropriate.

8. THRUST RESTRAINTS
    A. Concrete thrust blocks:
        a. Provide concrete thrust blocks at all taps, temporary dead ends and at the base of all hydrants.
        b. Place thrust blocks directly against undisturbed earth.
        c. Provide bond breakers on all thrust blocks.
        d. All other locations shall rely on restrained joints to handle thrust unless directed otherwise by City
    B. Joint Restraints:
        a. The number of joints that need to be restrained back from thrust producing fittings shall be determined by the design engineer and approved by the City.

9. BACKFLOW PREVENTION DEVICE

A. Install an approved backflow prevention device downstream of all meters larger than 2-inch and ahead of all outside irrigation systems. The backflow prevention device shall meet all requirements of Utah Administrative Rule R309-105 and the International Plumbing Code.
B. Comply with City Standard Drawings.
C. Contact cross connection coordinator at (801) 852-6788 for inspection of the backflow prevention devices other than dual check valves inside meter boxes.

10. WATER LINE LOOPING

A. Looping of water lines creates a vulnerability in the system; therefore, looping is highly discouraged. All other alternatives should be investigated prior to proposing looping, which should be the option of last resort.
B. If looping of water lines is approved by Provo, the Director may assess a fee for shutting down the existing line and to provide for future maintenance of the loop. The fee will vary based on the size of the line being looped.

11. EASEMENTS

A. Provide a minimum twenty feet wide (20') public utility easement for all public water mains installed outside of the street right of way or other City owned property. Unless otherwise approved, the water line should be installed in the center of the easement.

12. OTHER APPURTENANCES

A. Provide pressure reducing stations if required by Water Resources Director.
B. Air ~~vacuum breakers~~relief valves and blow-offs at high points may be required if other means of air release are not provided. If used, air relief valves and blow-offs shall comply with the following:

a. The open end of the air relief vent pipe from automatic valves shall be provided with a #14 mesh, non-corrodible screen and a downward elbow, and where possible, be extended to at least one foot above grade. Alternatively, the open end of the pipe may be extended to as little as one foot above the top of the pipe if the valve's chamber is not subject to flooding, or if it meets the requirements of (7) Chamber Drainage.

b. Blow-offs or air relief valves shall not be connected directly to a sewer.

c. Adequate number of hydrants or blow-offs shall be provided to allow periodic flushing and cleaning of water lines.

~~B.~~d. The air relief valve shall be installed in a manner to prevent it from freezing. A shut-off valve shall be provided to permit servicing of an air relief valve.

C. All booster proposed stations and storage tanks subject to Water Resources Director approval and shall meet all the following requirements:
   a. All booster stations and storage tanks shall be identified as part of the City's master plan and shall be designed to service large City areas and not individual developments. Private booster stations are not allowed.
   b. No booster stations shall be constructed without a storage tank of sufficient size to meet all sizing requirements of Utah Administrative Code R309-510. Said tank shall be located at an elevation sufficient to provide gravity flow to its service area and shall be designed to work cooperatively with all other components of the water source, storage and distribution system.
   c. The booster station shall be located on a main with sufficient size and pressure to provide the required flow without causing any part of the water system to fail to meet pressure requirements.

D. Chambers, pits, or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system, shall not be connected directly to a storm drain or sanitary sewer. Chambers shall be provided with a drain to daylight, if possible. Where this is not possible, underground gravel-filled absorption pits may be used if the site is not subject to flooding and conditions will assure adequate drainage. Sump pumps may also be considered if a drain to daylight or absorption pit is not feasible.

SANITARY SEWER SYSTEMS

All Sanitary Sewer installation and design shall comply with Provo City's Wastewater Collection System Master Plan.

1. SEWER MAIN LINE UPSIZING OR EXTENSIONS
    A. The developer of a project which requires the extension or upsizing of sewer main lines shall pay the cost of such work.
    B. All subdivisions shall have a complete sewer distribution system installed before such subdivisions are accepted by the City.
        a. The design and construction of such a sewer distribution system shall meet all applicable standards and be approved prior to installation.
        b. The developer shall install the sewer distribution system at the developer's own expense for all sewer mains which are necessary to provide all required sewer per State and City design standards.
            1. Design 8"-15" pipes to flow no more than Half Full at Peak Flow.
            2. Design 18" and Larger Pipes to flow no more than 75% Full at Peak Flow.
            3. Include inflow and infiltration in sizing calculations.
            4. Provo City may use a sewer model to verify sewer capacity is available for the proposed project as specified in the project plans. The proposed system shall be modified to comply with the model findings and offsite improvements may be required prior to development.
            5. Ensure that transmission pipes sizes are sufficient for future growth in the area per the most recent Provo City's Wastewater Collection System Master Plan. If the Master Plan requires a larger pipe than the development, City may pay for the difference in material cost between the size required for the development and the larger size.
    C. When any street is to be paved from curb to curb with a permanent type of pavement, an eight (8) inch or larger sewer main shall be installed in that street prior to the paving of the street. The cost of installation of such sewer main shall be borne by the developer.
    D. If a person installs a sewer main line extension to serve a parcel of property, said main line extension shall extend completely across the parcel of property being developed.
    E. A developer who pays the cost of an off-site sewer main line extension may have the right of reimbursement described in Provo City Code Chapter 10.03.040.
2. SEWER PIPE MAIN STANDARDS
    A. Minimum mainline size shall be 8" in diameter. Actual size of mainlines shall provide adequate flow for current and future development.
    B. Provide green PVC (polyvinyl Chloride) SDR 35 or approved equal.

C. Sewer mainlines and laterals shall be marked with a detectable green colored locator tape.

D. Minimum depth of the sewer mainlines shall be seven (7) feet below finish grade. In areas where basements are allowed, sewer mains shall be deep enough to service basements.

E. Sewer mainline grades are as follows:

Minimum Sewer Main Pipe Slope*	
8 inch sewer lines**	0.40%
10 inch sewer lines	0.28%
12 inch sewer lines	0.22%
15 inch sewer lines	0.15%
18 inch sewer line	0.12%
21 inch and larger sewer lines	0.10%
* Sewer mains may not be upsized only for the purpose of installing at a flatter slope unless information is provided by the engineer showing that there is adequate scour volume to keep the line clean without increased maintenance. ** The first segment(s) of 8 inch sewer mains may be required to be placed at 1% min slope if there is not sufficient flow to provide adequate scour volume.	

F. All sewers which are designed to flow at 10 feet per second or greater shall be reviewed by City for approval or alternate design consideration. Suitable thrust blocks, concrete anchors or equivalent restraints shall be provided per R317-3-2 of the Utah Code when pipe slopes are 10% or greater.

G. Horizontal clearance to any culinary water line shall be at least 10 feet (10') edge of pipe to edge of pipe per R309-550 and R317-3-2.
   a. Utilities crossing sewer mains shall cross as close to a right angle as possible.
   b. Provide a minimum vertical clearance of eighteen inches (18") between water and sewer with water main lines and service above the sewer measured from the outside of the pipes.

3. MANHOLE DESIGN STANDARDS
   A. Manholes shall conform to Provo Standard Drawing P-411.
   B. Depth transitions shall occur between manholes. Drop manholes are discouraged and may only be used with explicit written approval and shall conform to Provo Standard Drawing P-433.
   C. Sewer manholes shall be installed:
      a. At a maximum spacing of four hundred (400) feet.
      b. At all changes in grade, size or alignment, and at all intersections with other mainlines.
      c. At the end of main lines (no cleanouts allowed on mainlines).
      d. All six-inch (6") and larger laterals on commercial or multi-family laterals require a manhole at the connection to the public main.

D. Sewer manholes shall be sized based on the following:
   a. Five (5) foot Diameter manholes required at three-way manholes, 90° bends, over 15" and 18" pipes, manholes over 10' deep, and in manholes with over one ~~feet of~~ foot of drop ~~in~~ across manhole.
   b. Six (6) foot Diameter manholes required over pipes 24" and greater, and at three-way manholes where the deflection exceeds 90° and height of manhole exceeds 16'.

4. ABANDONMENT OF SEWER LATERALS
   A. Whenever an existing sewer lateral(s) is abandoned in favor of a new lateral, the Owner shall disconnect the existing sewer lateral from the main and plug the lateral tap into the main. All costs associated with labor and material for such work shall be the responsibility of the property owner causing the lateral to be abandoned. All work shall be inspected by Provo City before backfilling.

5. SEWER LATERAL DESIGN STANDARDS
   A. Sewer taps will be performed by the contractor and inspected by a City Inspector.
      a. Sewer taps into an existing eight (8) inch main shall not be greater than four (4) inches.
         1. Direct nose-on connections may only be used when connecting to an existing mainline. The installation must be inspected and a saddle used when warranted.
         2. Connections to new mains shall be with a wye and a forty-five degree (45º) bend.
      b. Minimum distance between connections shall be four feet.
      c. Sewer laterals ~~on end manholes and in cul-de-sacs may be allowed to tap into a manhole directly with approval by the City. Provide formed base to direct flow through manhole.~~ shall connect to sewer main lines and not discharge into manholes.
   B. At the time of new construction, significant remodel or change of use, reuse of existing laterals may be allowed for use only if the following conditions are met:
      a. The existing lateral is of sufficient size and slopes for the proposed use.
      b. The existing lateral is in good condition, free from damage, bellies, leaks, or deviations in slope.
      c. If the above criteria cannot be met the Owner shall abandon the existing later at the main and provide a new lateral that meets all current Provo Standards and Specifications.
   C. Allowable sanitary sewer lateral pipe material shall be as follows:
      a. ABS (Acrylonitrile-Butadiene-Styrene) schedule 40, black in color. For use in sewer laterals only.

b. PVC (Polyvinyl Chloride) SDR 35 or other approved wall thickness for laterals (green in color).

D. Minimum lateral size shall be as follows:
   a. Single family residential: four (4) inches in diameter with 2% minimum slope.
   b. Individual lateral serving five (5) or fewer residential equivalent units: four (4) inches in diameter with a minimum slope of 2%.
   c. All other uses: minimum six inches (6") diameter with a slope of 2%. A 1% minimum slope may be used if approved as part of the City review.
      1. The sewer lateral size shall be based on actual project flows, but in no case shall the lateral be less than six inches (6") in diameter.

E. The policy of the City regarding the number of separate service laterals for residential and commercial structures is as follows:
   a. Each separate lot, parcel, dwelling unit, building, house, business or premises shall be served by an individual lateral except as allowed in paragraph (c).
   b. For one- and two-family dwelling structures, a separate service lateral for each dwelling unit is required.
   c. For multiple-family dwelling structures, stacked dwelling units, or commercial structures separate service laterals for each unit shall be the general rule. However, where design dictates otherwise, a common lateral for multiple units (or fewer laterals than the number otherwise specified) may be permitted where the applicant provides adequate documentation, including signed and stamped engineering calculations, and guarantees to assure adequacy of sewer/wastewater collection and responsibility for payment and maintenance. Easements may also be necessary where common laterals cross property lines. In any such case, the Water Resources Director has sole discretion to permit or reject a reduction in the required number of service laterals accordingly.
   d. Common sewer laterals approved under paragraph (c) shall be have a minimum diameter of six (6) inches for all laterals serving more than five residential equivalent units.

F. Sewer laterals shall not be allowed to connect into any private sewer system without permission from the owner of said system.

G. Cleanouts shall be required at a minimum of every 100 feet (100') and at bends forty-five degrees (45°) or greater. All laterals shall have at least one cleanout.

6. PRETREATMENT

A. Pretreatment
   a. Pretreatment will generally be required for each use producing excessive grease, sand, oil or sewer load different from a standard residential unit.

b. All covered parking lots, car washes, restaurants, auto shops and interior floor drains that are subject to receipt of sand, silts, chemicals, petroleum products, or other contaminants must have a grease trap, sand/oil separator, or other appropriately designed system to pretreat all process waste water before it enters the collections system.
c. Grease Interceptors shall be sized according to the current manual of the Uniform Plumbing Code (UPC) with a minimum size of 750 gallons and be installed per Provo Standard Drawing P-441.
    1. All drainage fixtures in any food and beverage preparation area or any process which produces fats, oils, or greases (FOG) shall be routed through a grease interceptor.
    2. Food grinders or disposals are heavily discouraged.
    3. Restroom waste shall not be routed through grease interceptor.
d. Include note on plans to contact the Pretreatment Coordinator at 801-852-6793 regarding required pretreatment and grease interceptors.
e. The Interceptor shall have manhole rings and covers rated for traffic loading.
f. A sampling manhole shall be installed no more than 10 feet (10') downstream from any interceptor.
    1. The required vault will be a four-foot (4') manhole unless otherwise approved by the pretreatment coordinator.
    2. Sampling vault should be at flowline with no hydraulic jumps.
    3. A six inch (6") minimum clearance is required from the end of the inlet pipe to the bottom of the sampling manhole flowline.
    4. The bottom of the sampling manhole shall be formed to slope the water towards the outlet pipe.
    5. If the inlet is greater than six inches (6") a plan will need to be submitted and approved by the City.

7. EASEMENTS
    A. Provide a minimum twenty feet wide (20') public utility easement for all public sewer mains installed outside of the street right of way or other City owned property. Unless otherwise approved, the sewer line should be installed in the center of the easement.

8. LIFT STATIONS
    A. No temporary or private lift stations shall be allowed.

9. SHALLOW SEWER
    A. Provide the following note on the plat for sewer main line depths less than 10 feet (10'):

a. “Shallow Sewer Depths! Contractor shall verify sewer lateral depth and set foundation elevation to provide adequate fall into sewer lateral. Buildings with a basement may not have sewer service available for basement.”

B. Provide the following note on the plat for property on one side of the street is low enough to make providing sewer to the property from the street difficult:
   a. “Low Lots! Contractor shall verify sewer lateral depth and set foundation elevation to provide adequate fall into sewer lateral. Buildings with a basement may not have gravity sewer service available for basement.”

STORM DRAIN SYSTEM

1. OVERALL DRAINAGE ~~PLAN~~REQUIREMENTS
    A. All system installation and design must conform to Provo City's Storm Water Master Plan and Storm Drainage Systems Design and Management Manual~~.~~
    B. Surface drainage shall be designed ~~as~~ such that all drainage is addressed within own project boundaries and does not adversely affect other properties.
    C. Provide protection to the project from natural drainage ways such as Utah Lake, Provo River and canyon drainage flows.
    D. Identify all existing storm drain and irrigation features within and adjacent to the project boundaries.
    E. Projects that are within the high water table area, per Provo City Code 15.05.170 High Water Table and Wetland Area Development Standards, must meet and address those conditions as part of the project including, but not limited to the following;
        I. Retention basins are not allowed.
        II. Provide minimal building elevations adjacent to Utah Lake or Provo River.
        III. Provide the high ground water table elevation.
    F. Identify public and private drainage systems.
    G. Provide overall predevelopment and post development pervious and impervious surface area measurements.
2. HYDRAULIC DESIGN CRITERIA
    A. The design of a storm drainage system should have as its objective the design of a balance between the maximum allowable discharge rate and downstream receiving system's capacity. Refer to Provo City Storm Water Design manual for more detail of allowable discharge rates, storm frequency and intensity.
    B. Piped systems are to be designed using the ~~25~~10-year storm event.
        a. Provo City may use a hydraulic model to verify system demand as specified by the project plans. The proposed system may need to be modified to comply with model output.
    C. Basins
        I. Detention basins are to be designed using the ~~25~~10-year ~~24-hour~~ storm event. The maximum discharge rate is 0.2 cfs/ac or less where downstream capacities require additional restrictions. Refer to Provo City Storm Water Design manual for these areas.
        II. Retention basins are to be sized using a 100-year, 24-hour storm event.
        III. As part of the design consideration, a geotechnical study is required to determine infiltration rates and the highest ground water table elevation.

IV. The floor of a detention basin must be at least 1 foot above the highest elevation of the following; groundwater table, Utah Lake or Provo River (where applicable).

V. The maximum design depth for a basin shall be 3 feet with an additional 1 foot for free board to the top of the spillway.

VI. Provide a ~~minimum 10 foot wide~~ maintenance access ~~area to the hydraulic related features.~~as required in Chapter 12 of the Design Manual.

VII. Provide a ~~Storm Drainage System~~Private Utility Maintenance Agreement for all components of the proposed private drainage system.

a. The party responsible for executing the maintenance agreement, i.e., homeowners association, property owner, etc.
b. Extent of the maintenance activities to be performed.
c. Frequency of proposed recordkeeping and reporting of performed maintenance and inspection activities.
d. Provide easements to Provo City to access and inspect temporary and permanent Storm Water Controls.

3. STORM DRAIN PIPE SIZE AND TYPE
   A. The minimum public storm drain main pipeline diameter is 18 inch reinforce concrete and 15 inch for laterals.
   B. All public storm drain lines within public rights of way shall be reinforced concrete pipe.
   C. Provo standard manholes P-411 are required for accesses at all pipe transitions including changes in direction, elevation, slope and pipe sizes.
4. STORM DRAIN MANHOLES
   A. Provo standard manholes P-411 should be spaced every 400 feet and is required for accesses at all pipe transitions including direction, elevation, slope and at changes in pipe sizes.
5. STORM DRAIN INLETS
   A. ~~A minimum of 12 inches of separation from flow line of outlet pipe to floor of inlet box is required.~~ Inlets shall follow Provo City Standard Details P-315a-d.
   ~~B. Inlet boxes shall be the drop back hood type of inlet box, Provo Standard Drawings series P-315 a-c Curb Face and Inlet Box with stamped hood, drains to river or lake with the fish logo.~~
   ~~C.~~B. Inlet boxes should be placed at a distance of no more than four hundred (400) lineal feet of street curb and gutter and when gutter flows are =>3 cfs.
   ~~D.~~C. A double inlet type of boxes shall be installed at low points of vertical curves, downgrade cul-de-sacs or dead end streets and in areas with steep slopes. Additional inlets may be required to capture the 10-year design flow.
   ~~E.~~D. The use of combination inlet type of structures is discouraged and allowed in rare cases or where found necessary and as approved by the City Engineer.

6. PRIVATE LOT DRAIN CONNECTION
    A. Lot drains shall use type SDR 35 and the color white PVC for all piping.
    B. Lot drains shall be 4 inch diameter minimum.
    ~~C. Back flow prevention device may be required on lot drain line as determined by the City.~~
    ~~D.~~C. For further information, refer to Provo Standard detail P-392 a-c.

7. WATER QUALITY
    ~~A.~~ A pretreatment device is required prior to ~~all~~ any connections onto a ~~City~~public system, or into any underground detention or retention basin system, ~~which include~~ including class V injection wells or sumps.
    ~~I.~~ Pretreatment devices must meet the manufacturer's ~~design~~ requirements, and ~~the following criteria.~~be designed to remove floatable contaminants and filter or settle out sediment
        ~~c. Remove floatable contaminants.~~
    ~~d.~~A. ~~Filter sediment.~~.
    B. ~~Fill out and submit the~~All projects over 1 acre must submit a Storm Water Pollution Prevention Plan (SWPPP) using the UPDES Construction ~~Activity~~ General Permit ~~Templet~~Template.
    C. Single Family Residential Lots under 1 acre that meet the following criteria must submit a SWPPP using either the UPDES Common Plan Permit Template or the UPDES Construction General Permit Template.
        a. Lot is within a plat recorded 1992 or later.
        b. Proposed house construction is the first time a house has been constructed on lot since the plat was recorded.
    ~~A.~~D. Projects not requiring a full SWPPP submittal as defined above shall be required to sign Provo City's Acknowledgment of Prohibited Discharges prior to obtaining City permits for construction.