

NT

City of Flagstaff

TYPICAL STORM DRAIN TRENCH

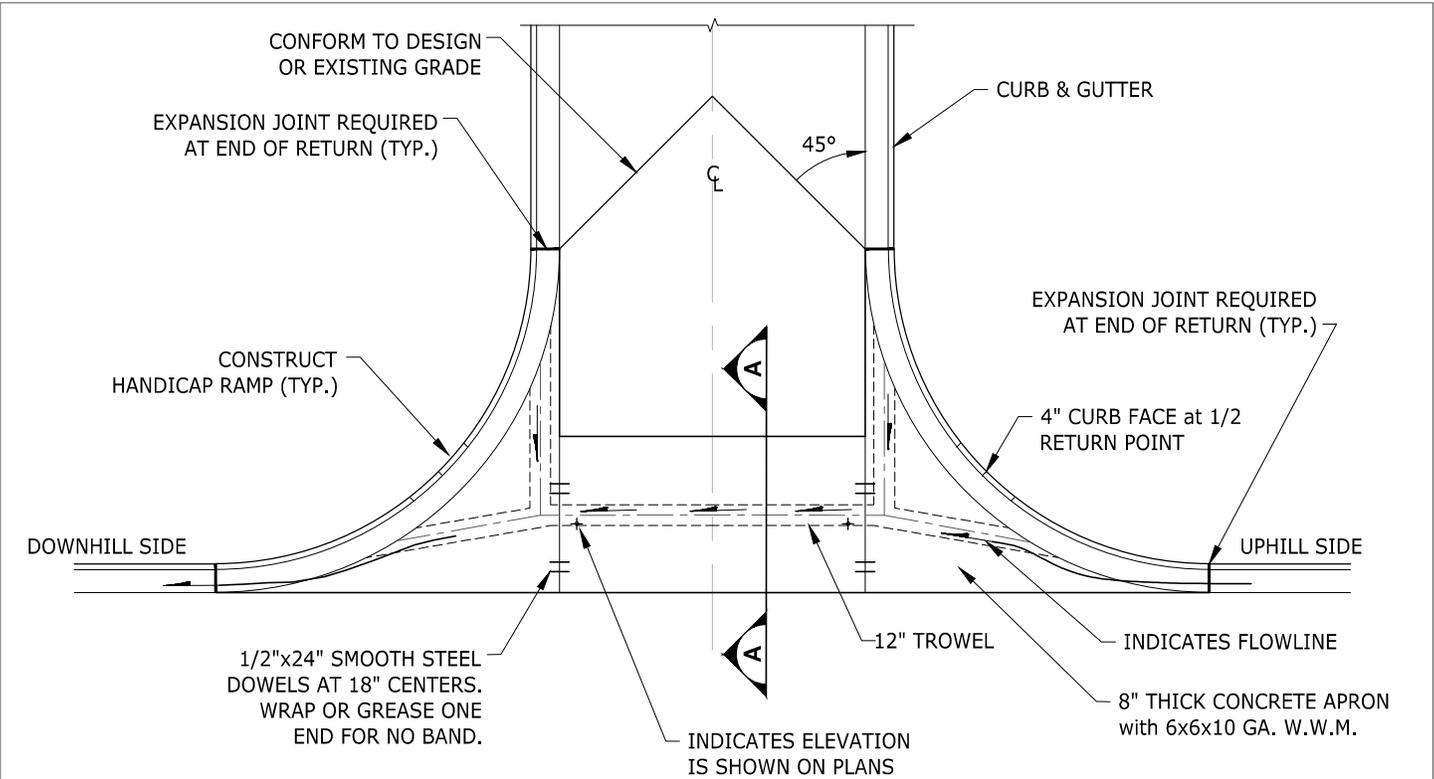


ENGINEERING
DETAIL

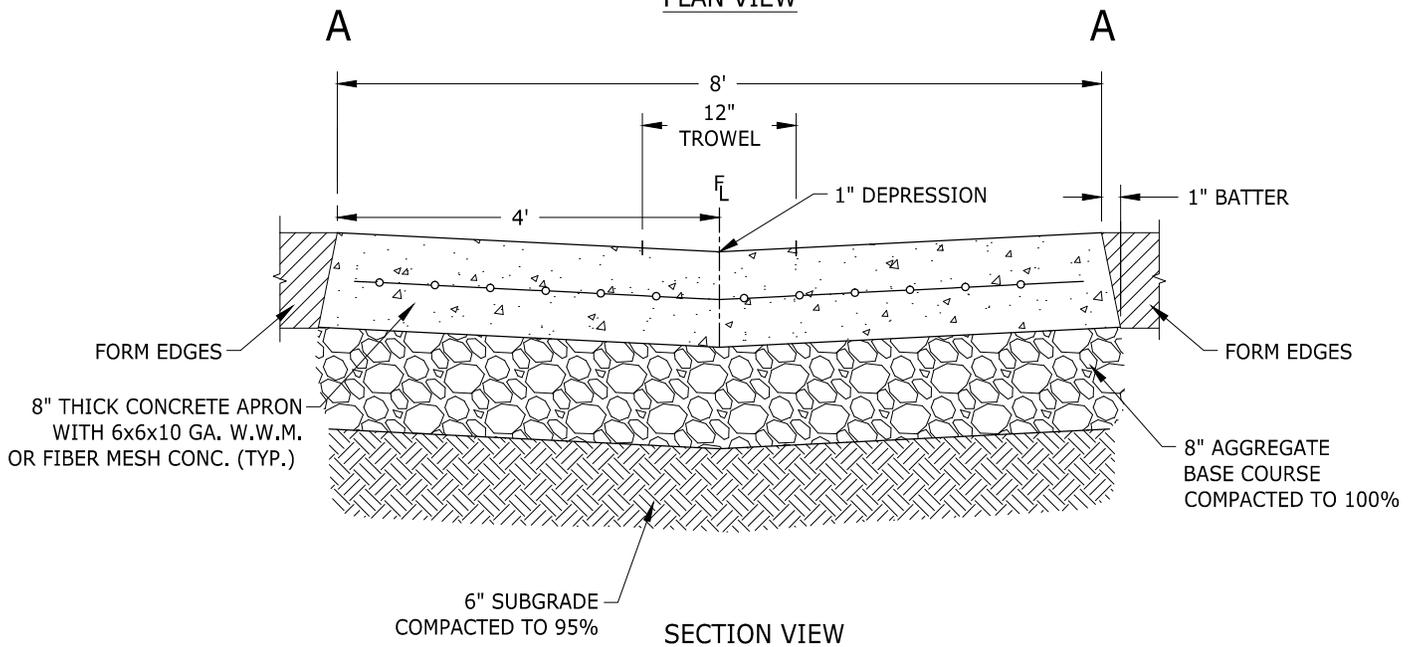
DETAIL NO.
8-02-010

REVISION DATE: 11/22/16

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PLAN VIEW

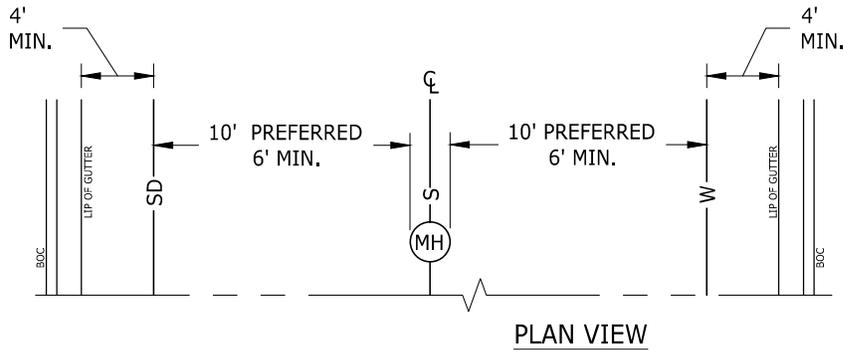


SECTION VIEW

1. CONCRETE SHALL BE CLASS "AA" (WITH 5-7% ENTRAINED AIR)
2. NO CONCRETE SHALL BE PLACED PRIOR TO FORM INSPECTION BY THE CITY ENGINEER OR HIS REPRESENTATIVE.
3. ASPHALTIC CONCRETE SHALL BE HELD 1/4" HIGH AT EDGE OF CONCRETE.

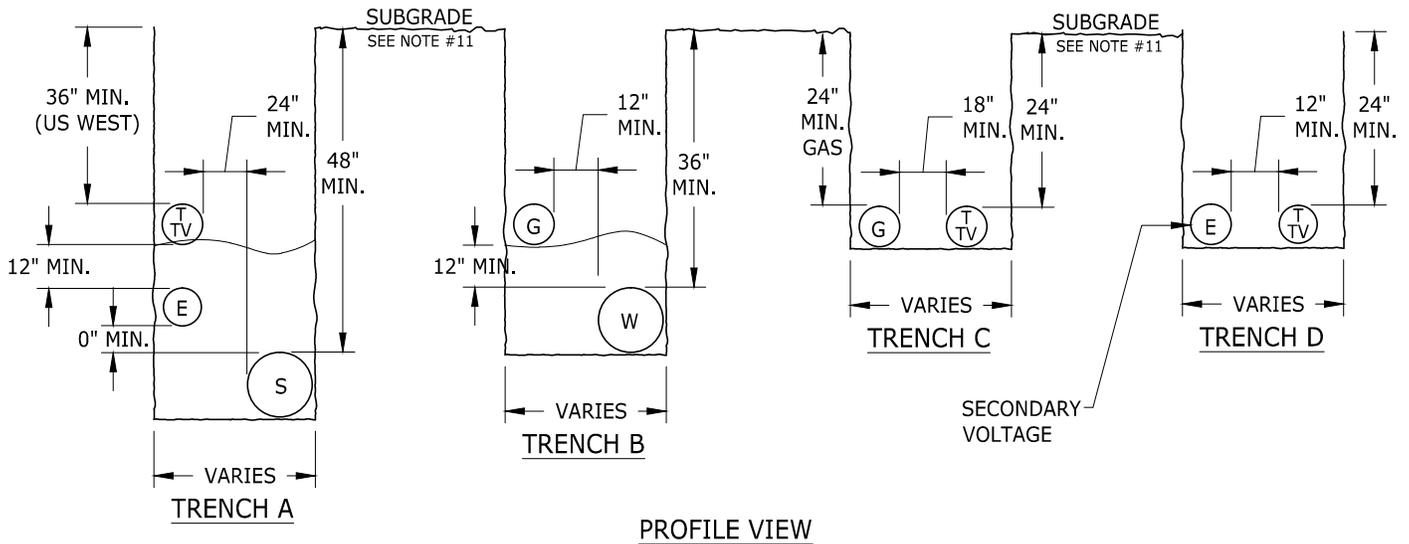
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 <p>City of Flagstaff ENGINEERING DETAIL</p>	STANDARD VALLEY GUTTER		
	DETAIL NO. 8-06-010	REVISION DATE: 11/22/16	1 1



NOTES:

1. WHERE POSSIBLE SEWER SHOULD BE LOCATED AT THE CENTERLINE.
2. WATER SHOULD BE 10' NORTH OR EAST OF CENTERLINE (MIN. 6' SEPARATION FROM SEWER.)
3. STORMDRAIN SHOULD BE 10' FROM SEWER (MIN. 6') ON THE OPPOSITE SIDE OF WHERE WATER IS LOCATED.
4. NO UTILITY SHALL BE LESS THAN 4' FROM LIP OF GUTTER.

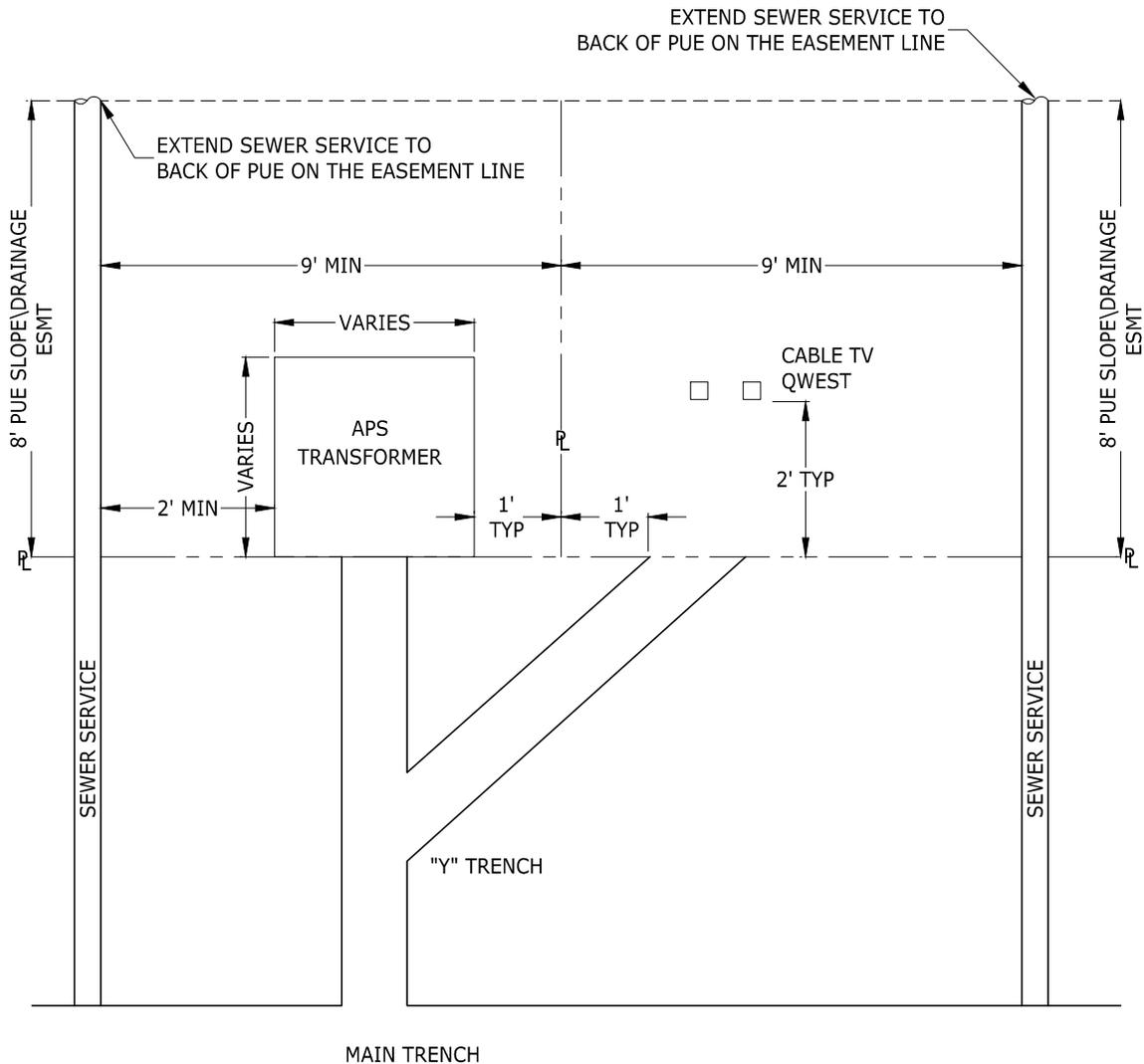


NOTES:

1. THE DIMENSIONS GIVEN IN THESE TRENCH DETAILS ARE MINIMUM. DEPENDING ON THE NUMBER AND SIZE OF UTILITIES IN A TRENCH, ADDITIONAL COVER AND/OR CLEARANCES MAY BE REQUIRED.
2. MINIMUM COVER SHALL BE MEASURED FROM THE TOP OF THE PIPE TO THE SUBGRADE UNDER EXISTING OR PROPOSED PAVEMENT. IN AREAS THAT ARE NOT TO BE PAVED, MINIMUM COVER SHALL BE MEASURED FROM FINISHED GRADE.
3. MINIMUM HORIZONTAL DISTANCE BETWEEN WATER AND SEWER PIPS IS 6 FEET.
4. WHEN SEWER AND WATER LINES CROSS, REFER TO ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (A.D.E.Q.) GUIDELINES, AND OTHER CITY STANDARDS.
5. WHILE POWER AND COMMUNICATION CABLES MAY BE INSTALLED IN SANITARY SEWER TRENCHES, A SEPARATE TRENCH MAY BE REQUIRED WHEN DEEMED NECESSARY BY UTILITY COMPANIES.
6. WATER AND ELECTRIC POWER LINES ARE NOT ALLOWED IN THE SAME TRENCH.
7. GAS AND SEWER LINES ARE NOT ALLOWED IN THE SAME TRENCH
8. TWO WORKING DAYS BEFORE YOU DIG, CALL FOR THE BLUE STAKES 1-800-STAKE-IT
9. TRACER WIRES SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD 9-01-020.
10. WHEN POWER AND COMMUNICATION CABLES ARE NOT IN THE SAME TRENCH, THEY SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 36" FROM WATER LINES AND 24" FROM SEWER LINES, AND SHALL MAINTAIN A MINIMUM OF 24" ABOVE SEWER LINES. WHEN GAS LINES ARE NOT IN THE SAME TRENCH, A MINIMUM HORIZONTAL SEPARATION OF 36" FROM SEWER LINES AND 18" FROM WATER LINES SHALL BE MAINTAINED; GAS LINES SHALL ALSO BE A MINIMUM OF 18" ABOVE WATER LINES. ALL MEASUREMENTS SHALL BE MADE FROM THE OUTSIDE EDGE OF PIPE OR CABLE.
11. MINIMUM DEPTHS FOR POWER, GAS, TELEVISION, AND COMMUNICATION ARE MEASURED FROM FINISHED GRADE.
12. ALL WATERLINE (FIRE HYDRANT LEAD LINES, FIRE LINES AND SERVICE LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 3')

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 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>UNDERGROUND UTILITES IN STREETS TYPICAL LOCATION AND TRENCH DETAIL</p>		
	<p>DETAIL NO. 9-01-010</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

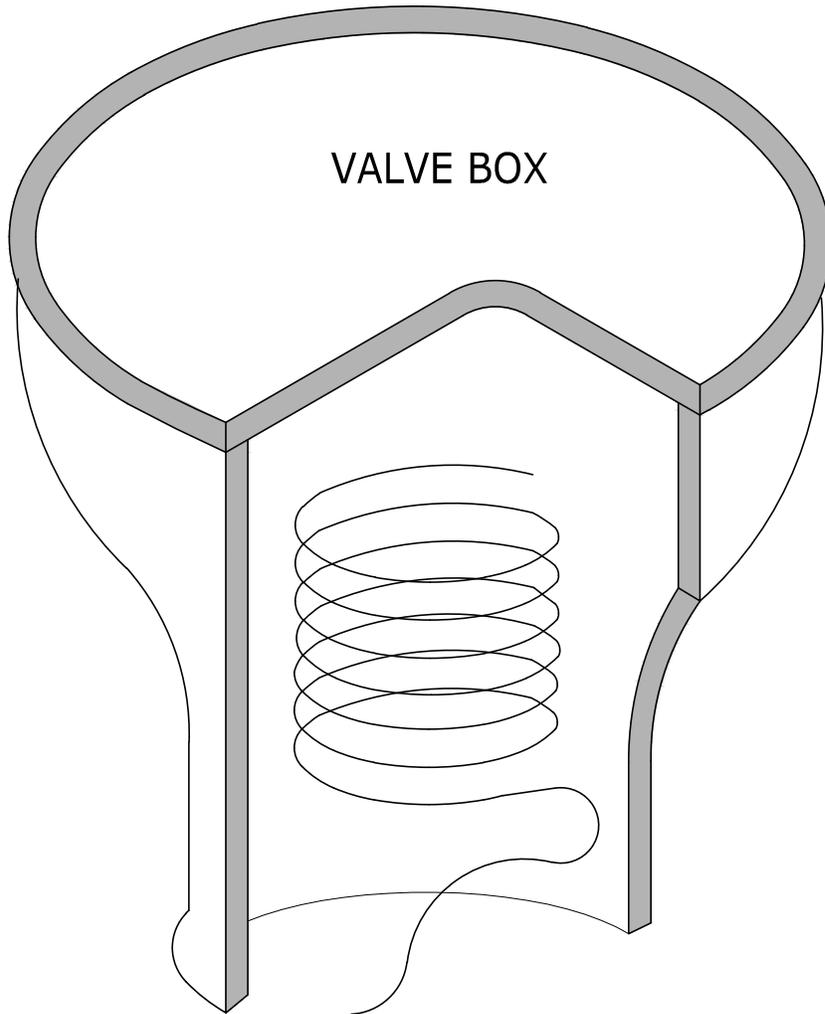


NOTES:

1. LARGE TRANSFORMER AND SWITCHING CABINETS SHALL BE LOCATED SO THAT THEY DO NOT INTRUDE INTO THE CLEAR VIEW ZONES OF ADJACENT INTERSECTIONS AND DRIVEWAYS.
2. DUE TO SAFETY CONSIDERATIONS, E.G. DIGGING AROUND TRANSFORMER, AND TO PRECLUDE DAMAGE TO CABLES BY OTHERS, CABLE TELEVISION REQUIRES SEPARATING AWAY FROM THE APS TRANSFORMER LOCATION. IT IS SUGGESTED THAT TRENCHING SIMILAR TO THE "Y" TRENCH AS SHOWN BE PROVIDED, ALTHOUGH ANY ALTERNATIVE THAT PROVIDES SIMILAR SEPARATION WILL BE CONSIDERED. PLEASE CHECK WITH OTHER UTILITIES FOR THEIR SPECIFIC REQUIREMENTS.
3. WATER AND GAS SERVICES SHALL BE CENTERED ON THE OPPOSITE PROPERTY LINE FROM THE SEWER SERVICE PER SPECIFICATION 13-09-003-0007.H

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 <p>City of Flagstaff</p>	<h2 style="margin: 0;">SERVICE LOCATION</h2>		
<p>ENGINEERING DETAIL</p>	<p>DETAIL NO. 09-01-011</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

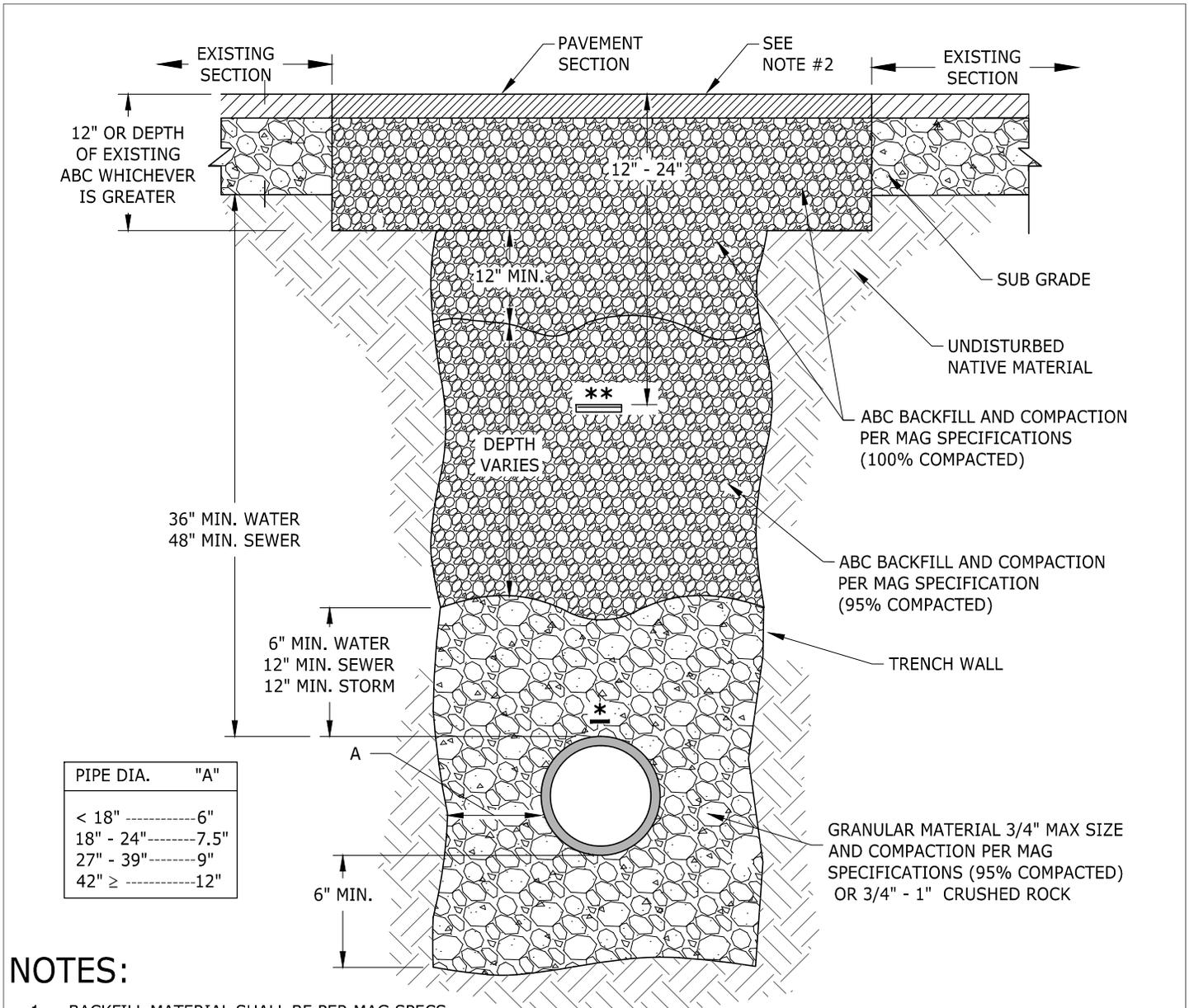


NOTES:

1. THE UF-600 TRACER WIRE SHALL BE A MINIMUM 8 FOOT OUTSIDE OF BOX WHEN EXTENDED, IN A CAST IRON VALVE BOX WITHOUT A VALVE.
2. THE TRACER WIRE EXTENDS FROM THE MAIN ON THE FIRE HYDRANT OR METER SERVICE RUNS. THE END COIL MUST BE SET IN A SEPARATE VALVE BOX.
3. COVER SHALL BE LABELED WATER, SEWER OR RECLAIM WASTEWATER.
4. LOCATE VALVE BOX 1 FOOT BEHIND SIDEWALK WITHIN RIGHT OF WAY.

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 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	TRACER WIRE		
	DETAIL NO. 09-01-020	REVISION DATE: 11/22/16	1 1



NOTES:

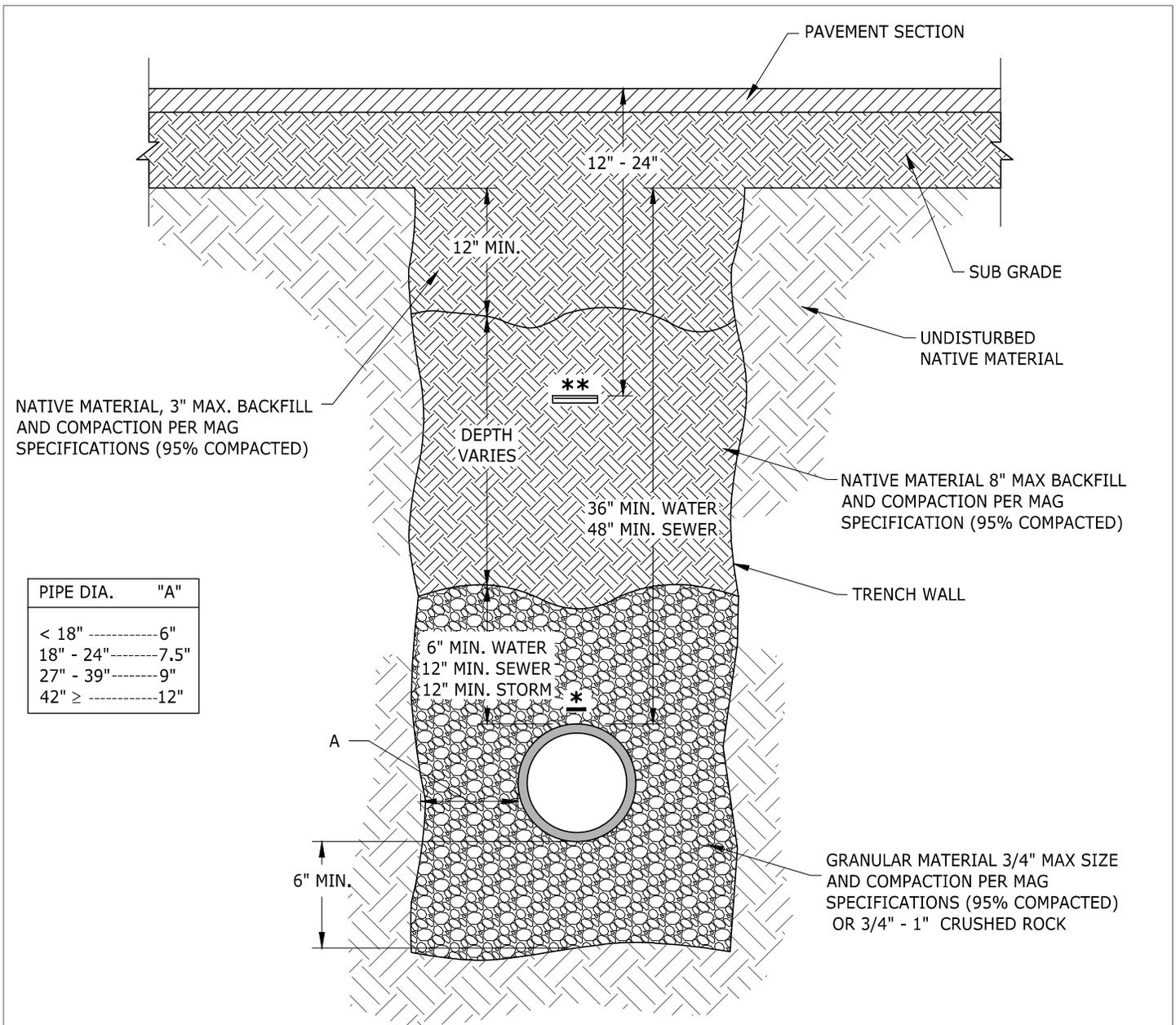
- BACKFILL MATERIAL SHALL BE PER MAG SPECS.
- THE DEPTH OF THE AC SHALL MATCH EXISTING OR TYPICAL MIN. PAVEMENT DEPTH FOR THE TYPE OF ROADWAY, WHICHEVER IS GREATER. THE TYPICAL MINIMUM PAVEMENT DEPTHS ARE AS FOLLOWS: ARTERIAL = 5", COLLECTOR = 4", LOCAL = 3"
- NON-SHRINK BACKFILL IN ACCORDANCE WITH COF STD. 9-6-030 AND MAY BE USED FOR BACKFILL UP TO EXISTING SUBGRADE. THE NON-SHRINK BACKFILL SHALL BE PROPORTIONED AS FOLLOWS: 2600 LBS OF 3/8" MINUS AGGREGATE, 800 LBS SAND, 94 LBS CEMENT AND 11 GALLONS WATER.
- A MIN. 2" OF UPM™ MAY BE USED FOR TEMPORARY TRENCH PAVING IF HOT MIX IS NOT AVAILABLE. UPM™ TEMPORARY PAVEMENT SHALL NOT REMAIN IN PLACE LONGER THAN 5 WORKING DAYS OR UNTIL HOT MIX ASPHALT IS AVAILABLE. AFTER 5 WORKING DAYS, THE CITY MAY PERFORM THE PERMANENT TRENCH PAVING AT THE CONTRACTORS EXPENSE. IN LIEU OF PLACING UPM™ THOUGH STILL TEMPORARY, THE CONTRACTOR MAY ELECT TO COMPLETELY BACKFILL THE TRENCH TO WITHIN 2" OF THE FINISH TRENCH GRADE WITH NON-SHRINK BACKFILL; THE FINAL 2" SHALL BE MAG CLASS "C" CONCRETE

* TRACER WIRE TAPED TO TOP CENTER OF MAIN WITH 10MIL PVC TAPE ON 4' CENTERS, SEE COF STD 9-01-020.

** WARNING TAPE

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>'TRENCHING & BACKFILL' EXISTING PAVED STREET/PAVED PARKING LOT or EASEMENT</p>		
	<p>DETAIL NO. 9-01-030</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



NATIVE MATERIAL, 3" MAX. BACKFILL AND COMPACTION PER MAG SPECIFICATIONS (95% COMPACTED)

PIPE DIA.	"A"
< 18"	6"
18" - 24"	7.5"
27" - 39"	9"
42" ≥	12"

A
6" MIN.

NATIVE MATERIAL 8" MAX BACKFILL AND COMPACTION PER MAG SPECIFICATION (95% COMPACTED)

GRANULAR MATERIAL 3/4" MAX SIZE AND COMPACTION PER MAG SPECIFICATIONS (95% COMPACTED) OR 3/4" - 1" CRUSHED ROCK

NOTES:

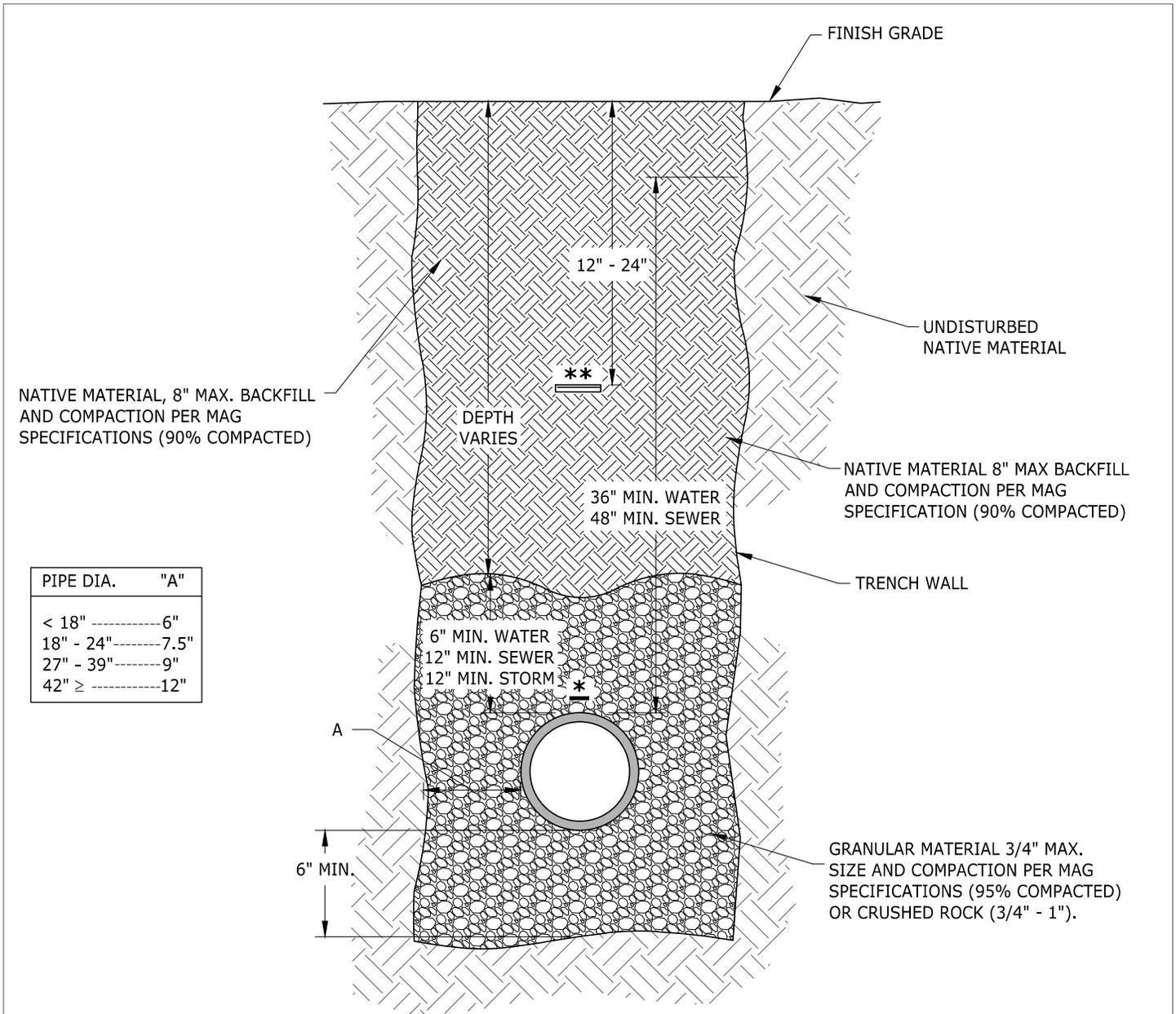
1. NATIVE BACKFILL SHALL BE PER MAG SPECS AND MAY BE SELECTED FROM THE EXCAVATION MATERIAL OR FROM A SOURCE SELECTED BY THE CONTRACTOR AND APPROVED BY THE CITY ENGINEER.
2. NON-SHRINK BACKFILL IN ACCORDANCE WITH COF STD. 9-6-030 AND MAY BE USED FOR BACKFILL UP TO EXISTING SUBGRADE. THE NON-SHRINK BACKFILL SHALL BE PROPORTIONED AS FOLLOWS: 2600 LBS OF 3/8" MINUS AGGREGATE, 800 LBS SAND, 94 LBS CEMENT AND 11 GALLONS WATER

* TRACER WIRE TAPED TO TOP CENTER OF MAIN WITH 10MIL PVC TAPE ON 4' CENTERS, SEE COF STD 9-01-020.

** WARNING TAPE

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>TRENCHING AND BACKFILL NEW PAVED STREET</p>		
	<p>DETAIL NO. 9-01-031</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



PIPE DIA.	"A"
< 18"	6"
18" - 24"	7.5"
27" - 39"	9"
42" ≥	12"

NOTES:

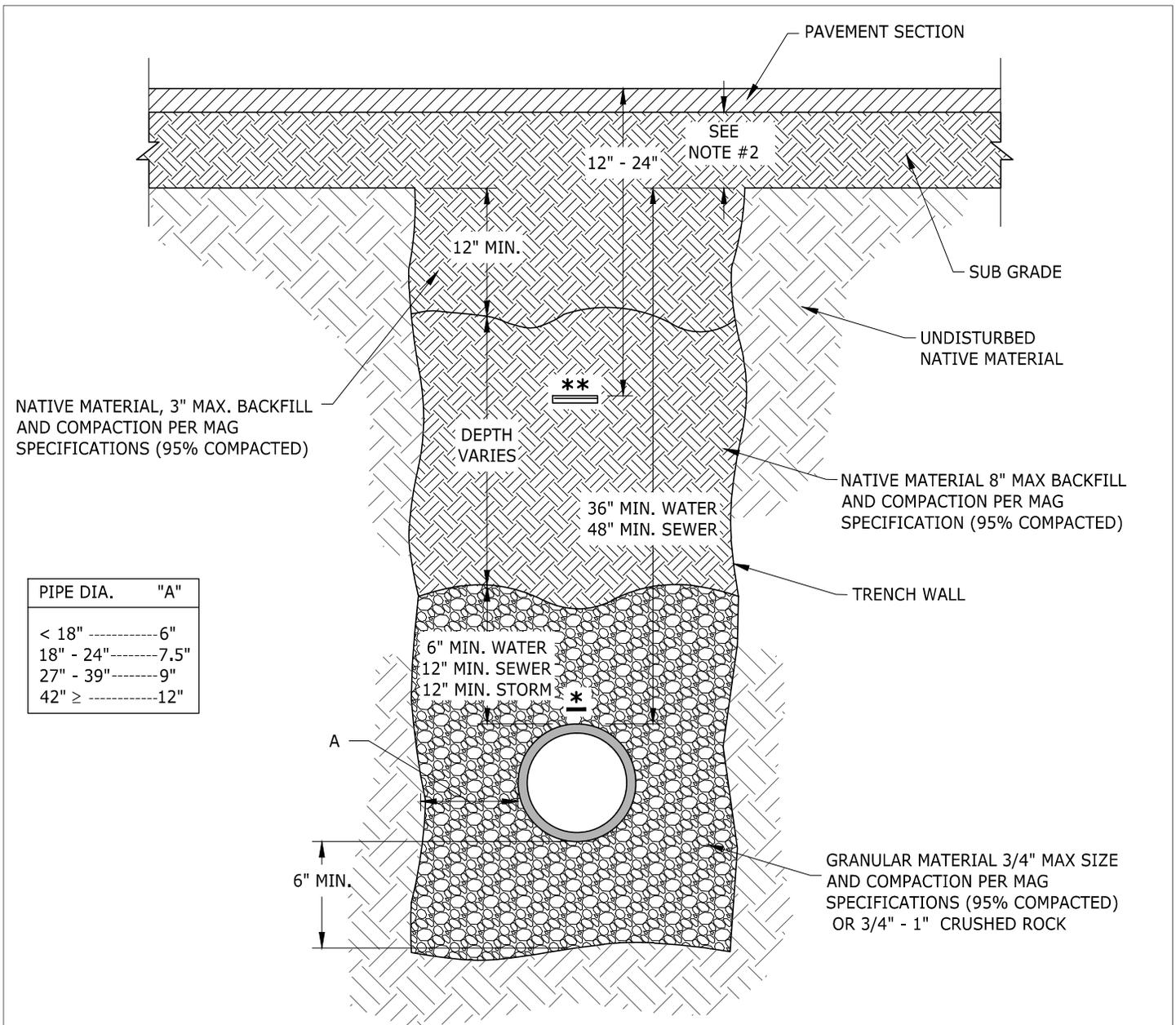
1. NATIVE BACKFILL SHALL BE PER MAG SPECS AND MAY BE SELECTED FROM THE EXCAVATION MATERIAL OR FROM A SOURCE SELECTED BY THE CONTRACTOR AND APPROVED BY THE CITY ENGINEER.
2. IF THE UNPAVED STREET HAS A SURFACE MATERIAL (ABC, CINDERS, ETC) OTHER THAN NATIVE, THE SURFACE MATERIAL SHALL BE REPLACED TO ITS EXISTING DEPTH.
3. NON-SHRINK BACKFILL IN ACCORDANCE WITH COF STD. 9-6-030 AND MAY BE USED FOR BACKFILL UP TO 6" BELOW FINISH GRADE. THE FINAL 6" SHALL BE NATIVE MATERIAL 8" MAX. THE NON-SHRINK BACKFILL SHALL BE PROPORTIONED AS FOLLOWS: 2600 LBS OF 3/8" MINUS AGGREGATE, 800 LBS SAND, 94 LBS CEMENT AND 11 GALLONS WATER

* TRACER WIRE TAPED TO TOP CENTER OF MAIN WITH 10MIL PVC TAPE ON 4' CENTERS, SEE COF STD 9-01-020.

** WARNING TAPE

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>TRENCHING AND BACKFILL UNPAVED EASEMENT OR STREET</p>		
	<p>DETAIL NO. 9-01-032</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



NATIVE MATERIAL, 3" MAX. BACKFILL AND COMPACTION PER MAG SPECIFICATIONS (95% COMPACTED)

PIPE DIA.	"A"
< 18"	6"
18" - 24"	7.5"
27" - 39"	9"
42" ≥	12"

A
6" MIN.

NATIVE MATERIAL 8" MAX BACKFILL AND COMPACTION PER MAG SPECIFICATION (95% COMPACTED)

TRENCH WALL

GRANULAR MATERIAL 3/4" MAX SIZE AND COMPACTION PER MAG SPECIFICATIONS (95% COMPACTED) OR 3/4" - 1" CRUSHED ROCK

NOTES:

1. NATIVE BACKFILL SHALL BE PER MAG SPECS AND MAY BE SELECTED FROM THE EXCAVATION MATERIAL OR FROM A SOURCE SELECTED BY THE CONTRACTOR AND APPROVED BY THE CITY ENGINEER.
2. NEW PAVEMENT SHALL BE 2 1/2" AC OVER 4" ABC, OR 4" PORTLAND CEMENT CONCRETE, OR DEPTH OF EXISTING PAVEMENT, WHICHEVER IS GREATER.
3. NON-SHRINK BACKFILL IN ACCORDANCE WITH COF STD. 9-6-030 AND MAY BE USED FOR BACKFILL UP TO EXISTING SUBGRADE. THE NON-SHRINK BACKFILL SHALL BE PROPORTIONED AS FOLLOWS: 2600 LBS OF 3/8" MINUS AGGREGATE, 800 LBS SAND, 94 LBS CEMENT AND 11 GALLONS WATER

* TRACER WIRE TAPED TO TOP CENTER OF MAIN WITH 10MIL PVC TAPE ON 4' CENTERS, SEE COF STD 9-01-020.

** WARNING TAPE

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>TRENCHING AND BACKFILL EXISTING PAVED PARKING LOT</p>		
	<p>DETAIL NO. 9-01-033</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

CLASS "B" CONCRETE

12"
6"

45°

TO HOUSE

NO GLUE CAP

R/W OR
BACK OF EASEMENT

WYE

BRICK

FINISH GRADE

12" MIN.
GALVANIZED OR
COPPER WIRE

36"-42"
OR PER PLAN

TO HOUSE

PLAN

45° BEND

BRACE PIPE WHILE
BACKFILLING TRENCH

SLOPE VARIES FROM 45°
HORIZONTAL TO VERTICAL FOR
ROCK AREAS

PROFILE

WHEN THIS DISTANCE IS 10' OR OVER,
USE DEEP SERVICE UNLESS OTHERWISE DIRECTED.

CLASS "B" CONCRETE

18"
4"

45° BEND

BEDDING

NTS

City of Flagstaff

DEEP SEWER SERVICE

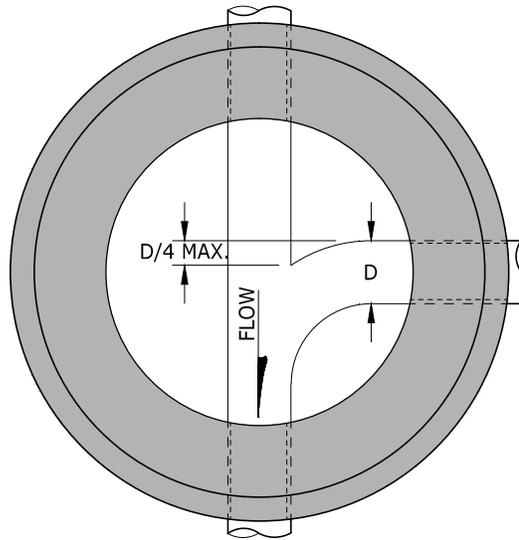


ENGINEERING
DETAIL

DETAIL NO.
9-02-080

REVISION DATE: 11/22/16

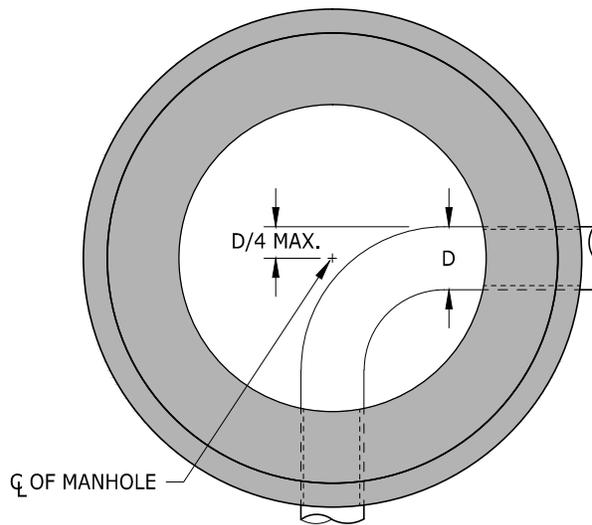
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3 or 4 LEG INTERSECTION

NOTES:

1. PIPE SIZE AND ELEVATION AS SHOWN ON PLANS
2. MIN. FLOW LINE RADIUS ON 8" PIPE IS 2 FEET



2 LEG INTERSECTION

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City of Flagstaff

MANHOLE BASE GEOMETRY DETAIL

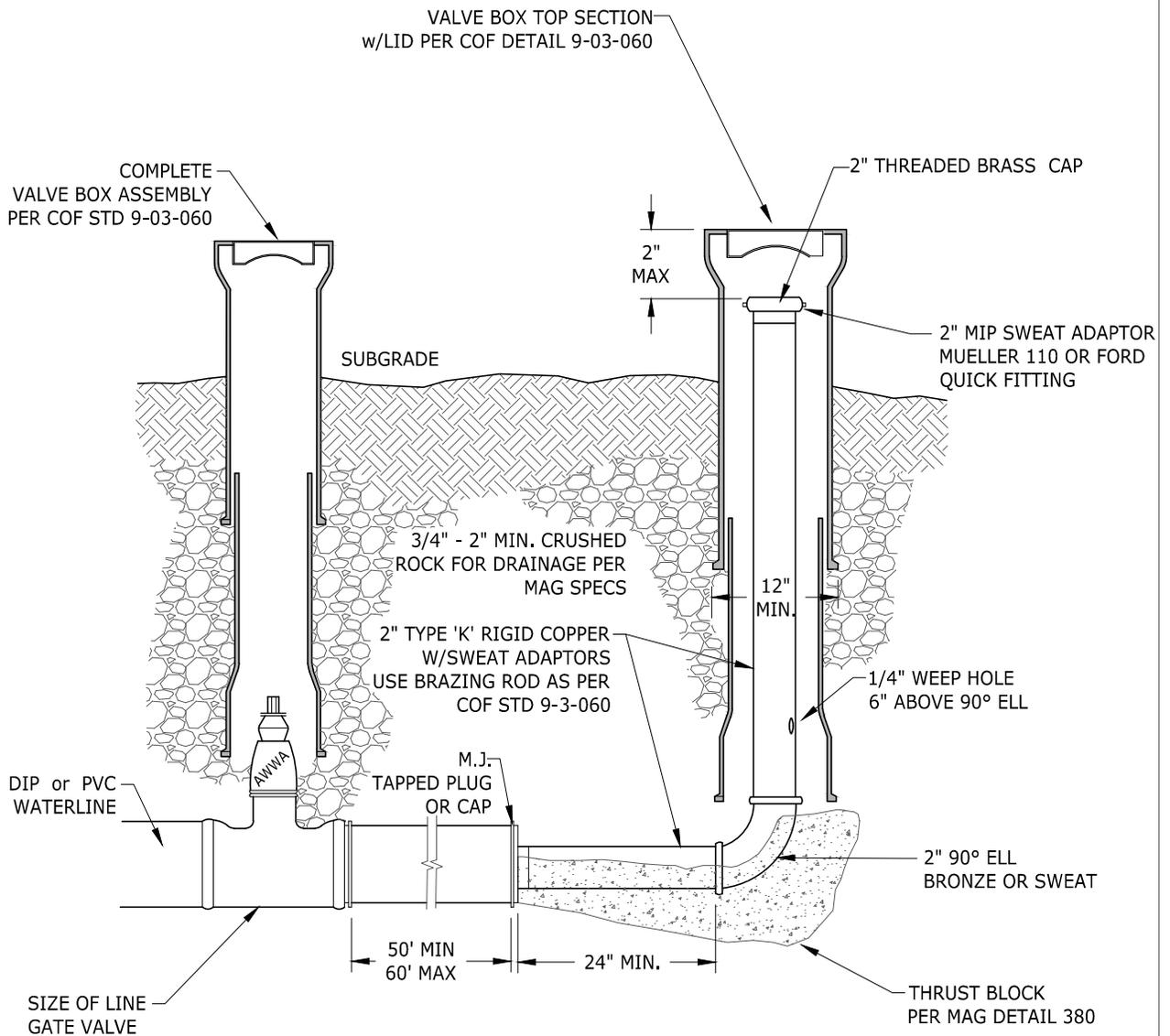


ENGINEERING
DETAIL

DETAIL NO.
9-02-092

REVISION DATE: 11/22/16

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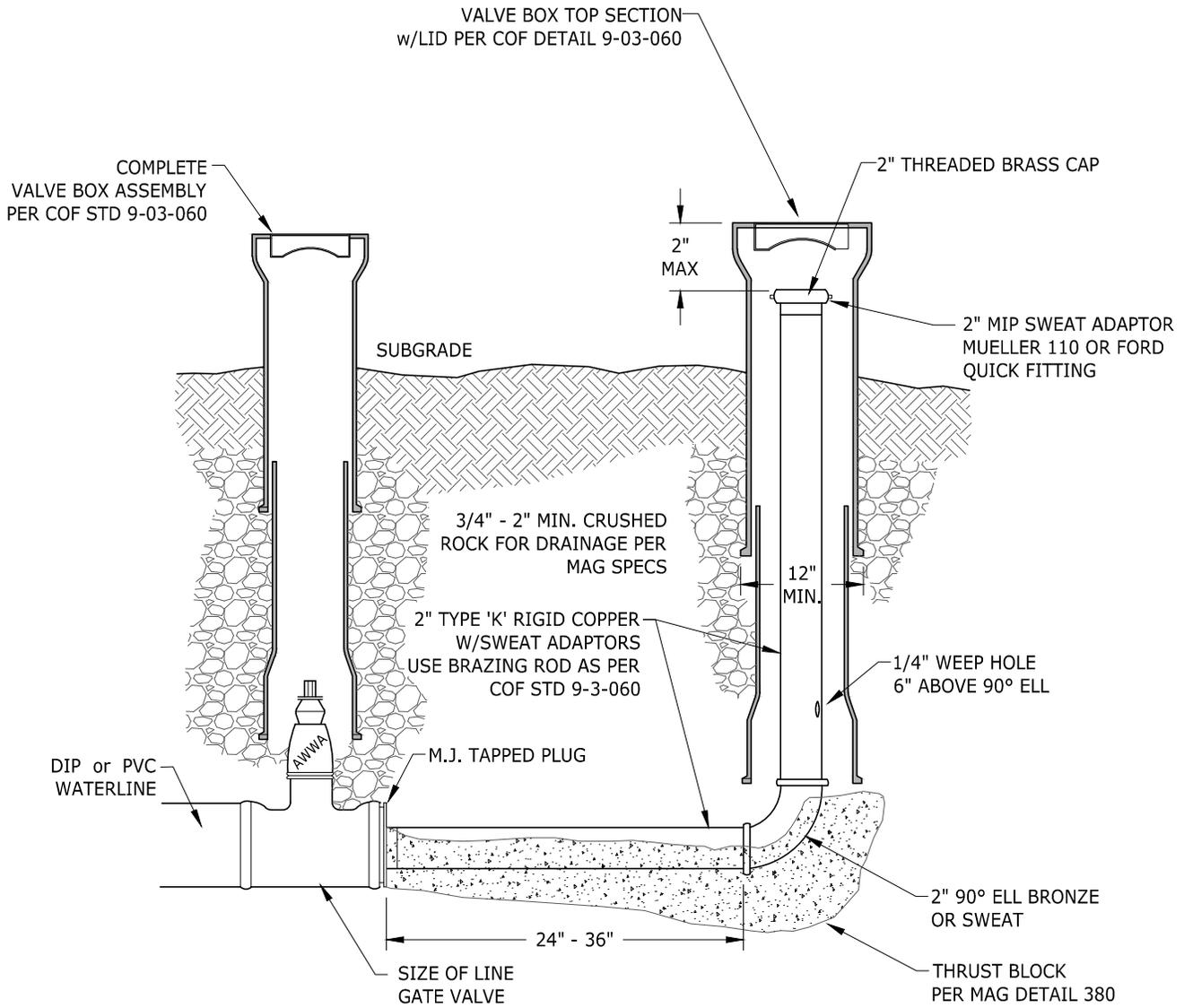


NOTES:

1. PIPE FITTINGS BEDDED IN GRANULAR MATERIAL 3/4" MAX. AND COMPACTION PER MAG SPEC (95% COMPACTION) WHERE DRAINAGE GRAVEL NOT REQUIRED.
2. ALL MATERIAL COMPACTIONED TO 95% UNDER VALVE BOXES.

NTS

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<h2 style="margin: 0;">END-OF-LINE TEMPORARY BLOW-OFF</h2>		
	<p>DETAIL NO.</p> <h1 style="margin: 0;">9-03-053</h1>	<p>REVISION DATE:</p> <p style="font-size: 1.2em;">11/22/16</p>	<p style="font-size: 2em; margin: 0;">1</p> <hr style="width: 100%;"/> <p style="font-size: 2em; margin: 0;">1</p>

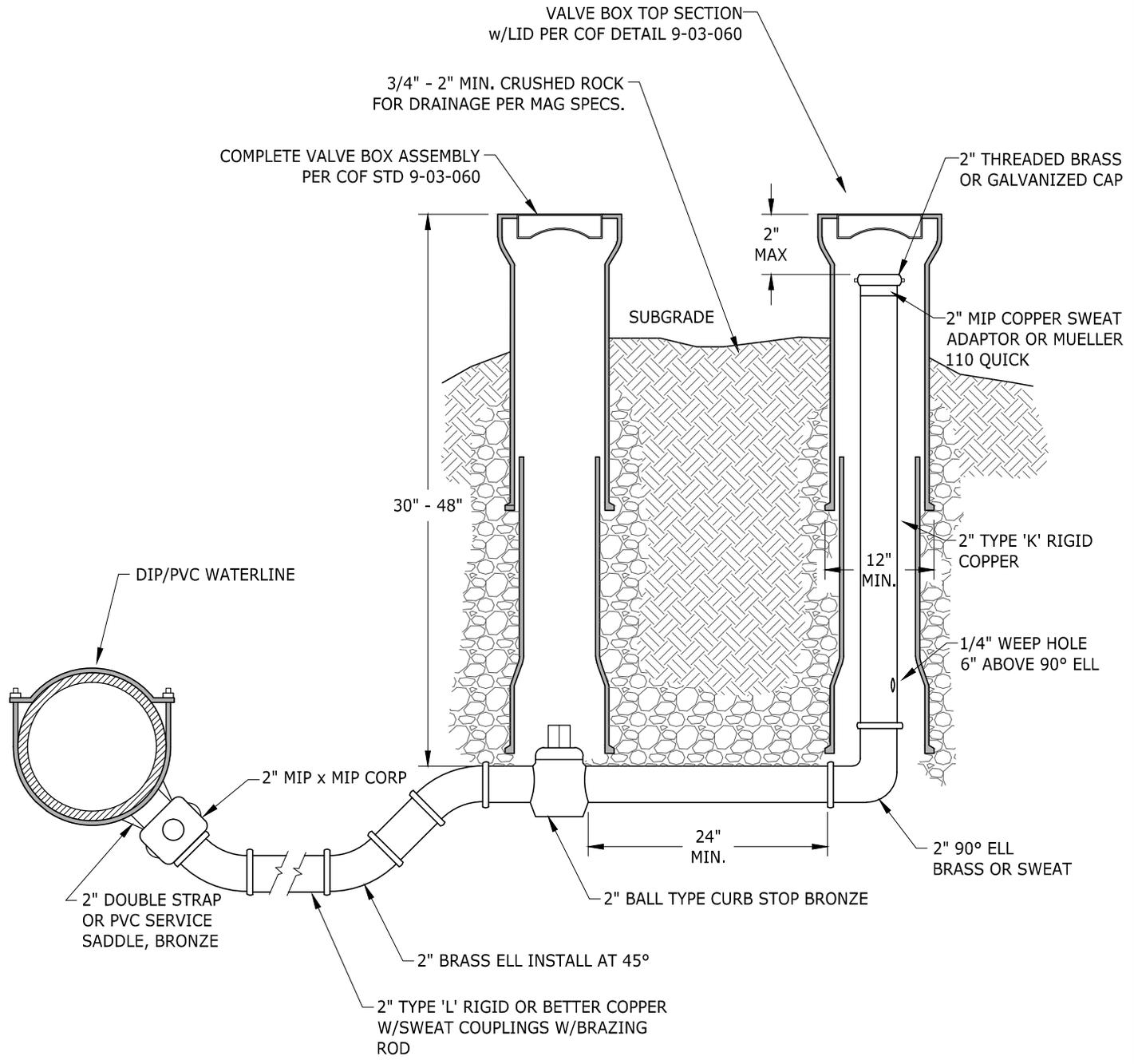


NOTES:

1. PIPE FITTINGS BEDDED IN GRANULAR MATERIAL 3/4" MAX. AND COMPACTION PER MAG SPEC (95% COMPACTION) WHERE DRAINAGE GRAVEL NOT REQUIRED.
2. ALL MATERIAL COMPACTED TO 95% UNDER VALVE BOXES.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>END-OF-LINE PERMANENT BLOW-OFF</h2>		
	<p>DETAIL NO. 9-03-054</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

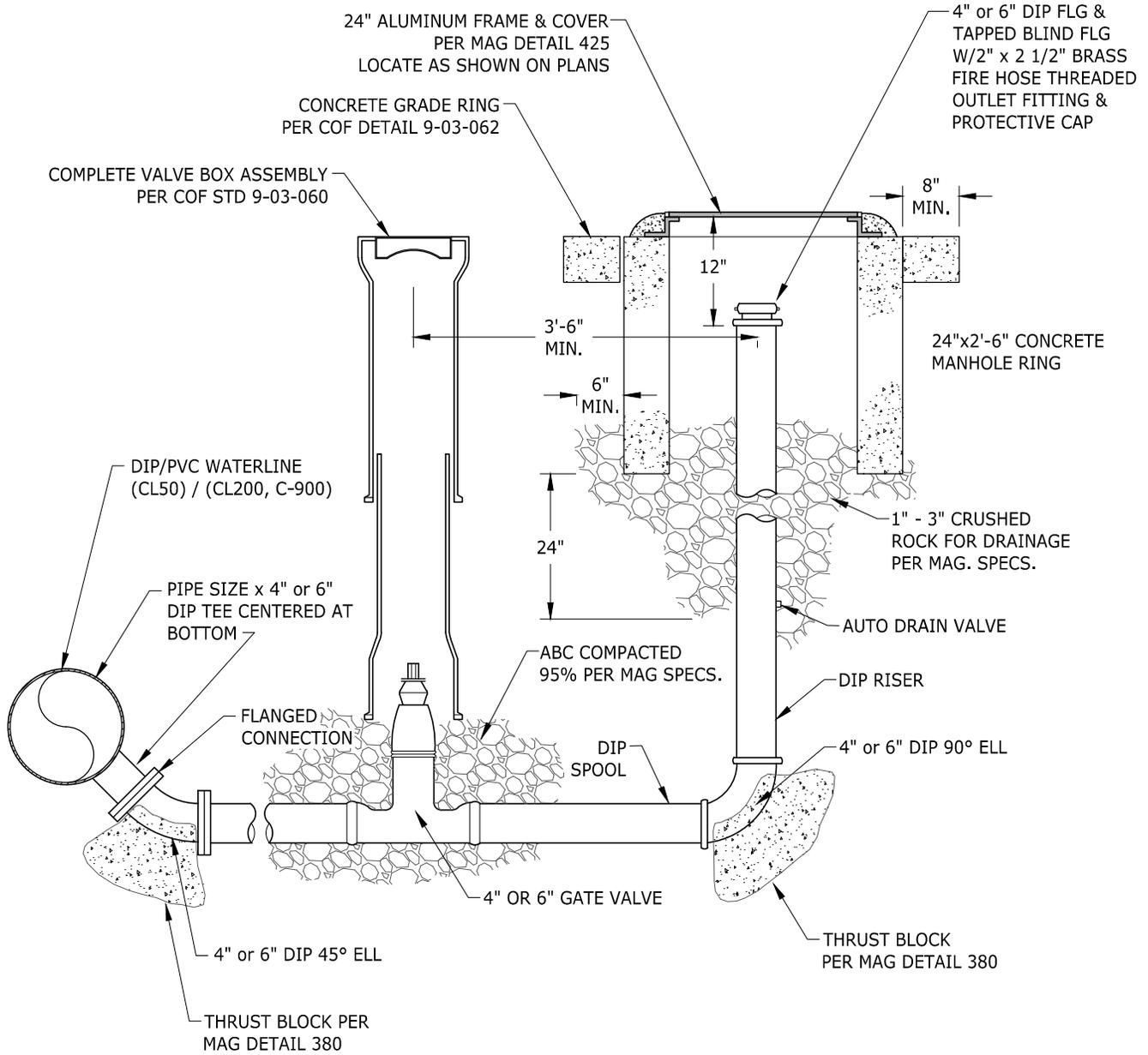


NOTES:

1. ALL SWEAT FITTINGS PER COF DETAIL 9-3-070
2. PIPE FITTINGS BEDDED IN GRANULAR MATERIAL 3/4" MAX AND COMPACTION PER MAG SPECS. (95% COMPACTION) WHERE DRAINAGE GRAVEL NOT REQUIRED
3. ALL MATERIALS COMPACTED TO 95% UNDER VALVE BOXES.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	IN-LINE BLOW-OFF ON WATER LINE 12" and SMALLER		
	DETAIL NO. 9-03-055	REVISION DATE: 11/22/16	1 1



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City of Flagstaff



ENGINEERING
DETAIL

IN-LINE BLOW-OFF ON WATER LINE LARGER THAN 12"

DETAIL NO.
9-03-056

REVISION DATE: 11/22/16

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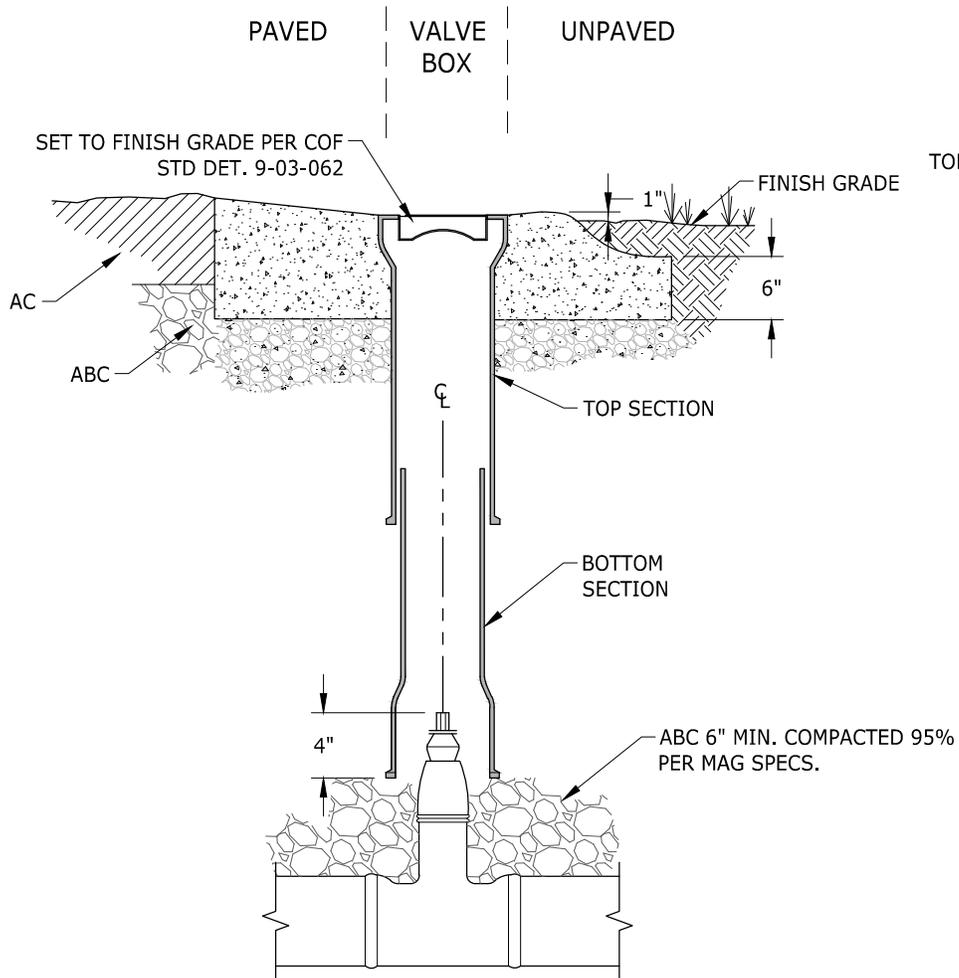


FIGURE A

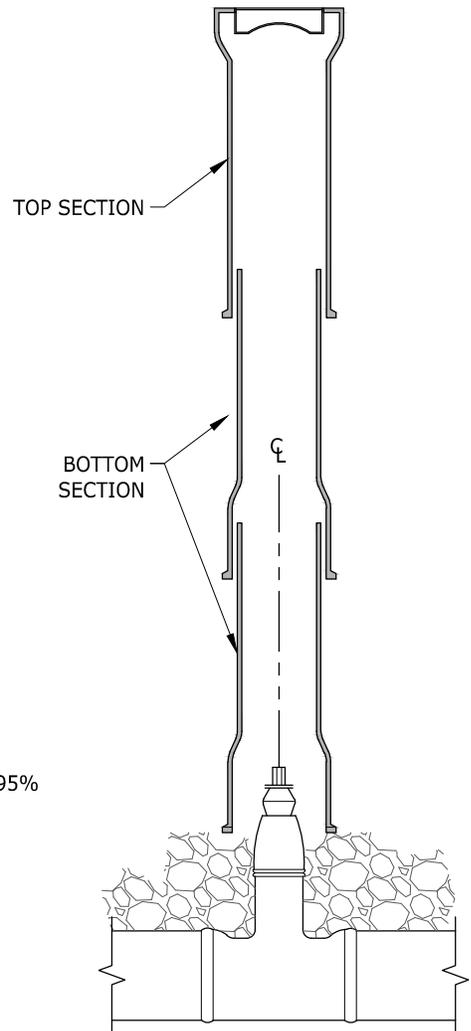


FIGURE B

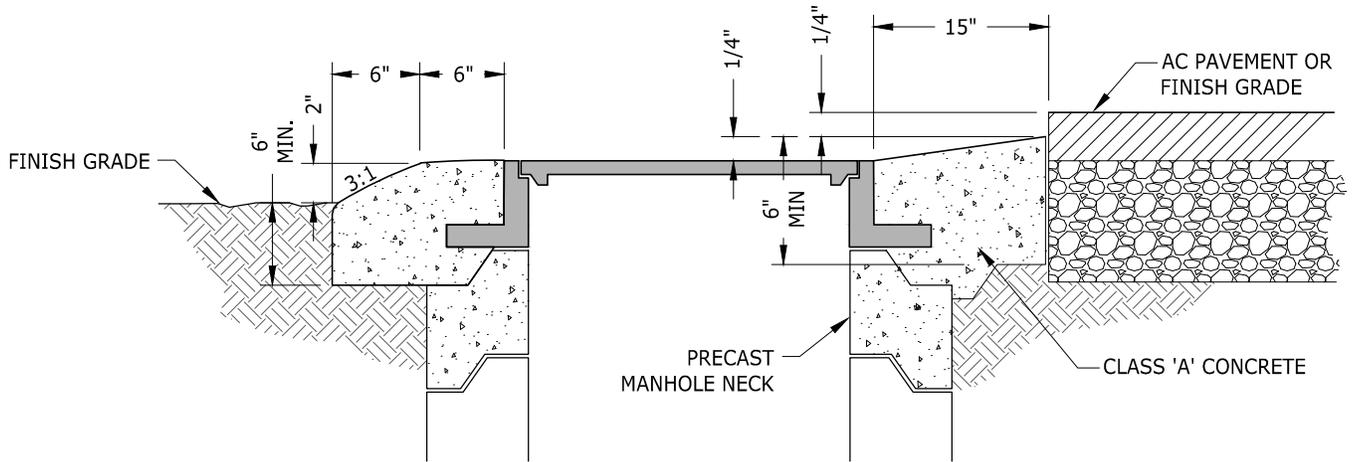
NOTES:

1. SEE COF STD. DETAIL 9-03-062 FOR NOTES RELATING TO THIS DETAIL

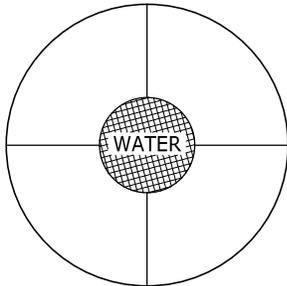
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 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>VALVE BOX ADJUSTMENT</h2>		
	<p>DETAIL NO. 9-03-060</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

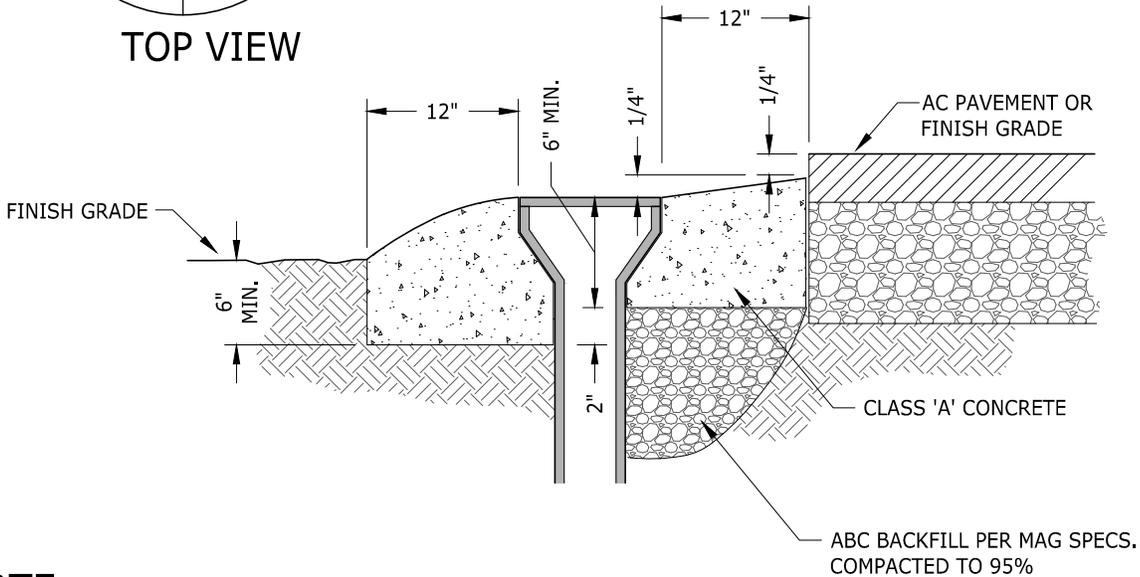
UNPAVED MANHOLE PAVED



WATER VALVES, BLOWOFFS AND SURVEY HANDHOLES



TOP VIEW



NOTE:

1. TOP OF VALVE BOX AND CONCRETE RING MUST BE 1/4" BELOW FINISHED GRADE.
2. CONCRETE RING FOR VALVES AND MANHOLES SHALL HAVE FOUR (4) STRESS JOINTS AT 90° ANGLES.
3. DEPTH OF CONCRETE SHALL BE A MIN. 6" OR SAME AS AC AND ABC SECTION, NOT TO EXCEED 8".
4. VALVES AND MANHOLES LOCATED UNDER CONCRETE PAVING SHALL HAVE A COLD JOINT OR EXPANSION JOINT CONCRETE COLLAR.

NTS



City of Flagstaff

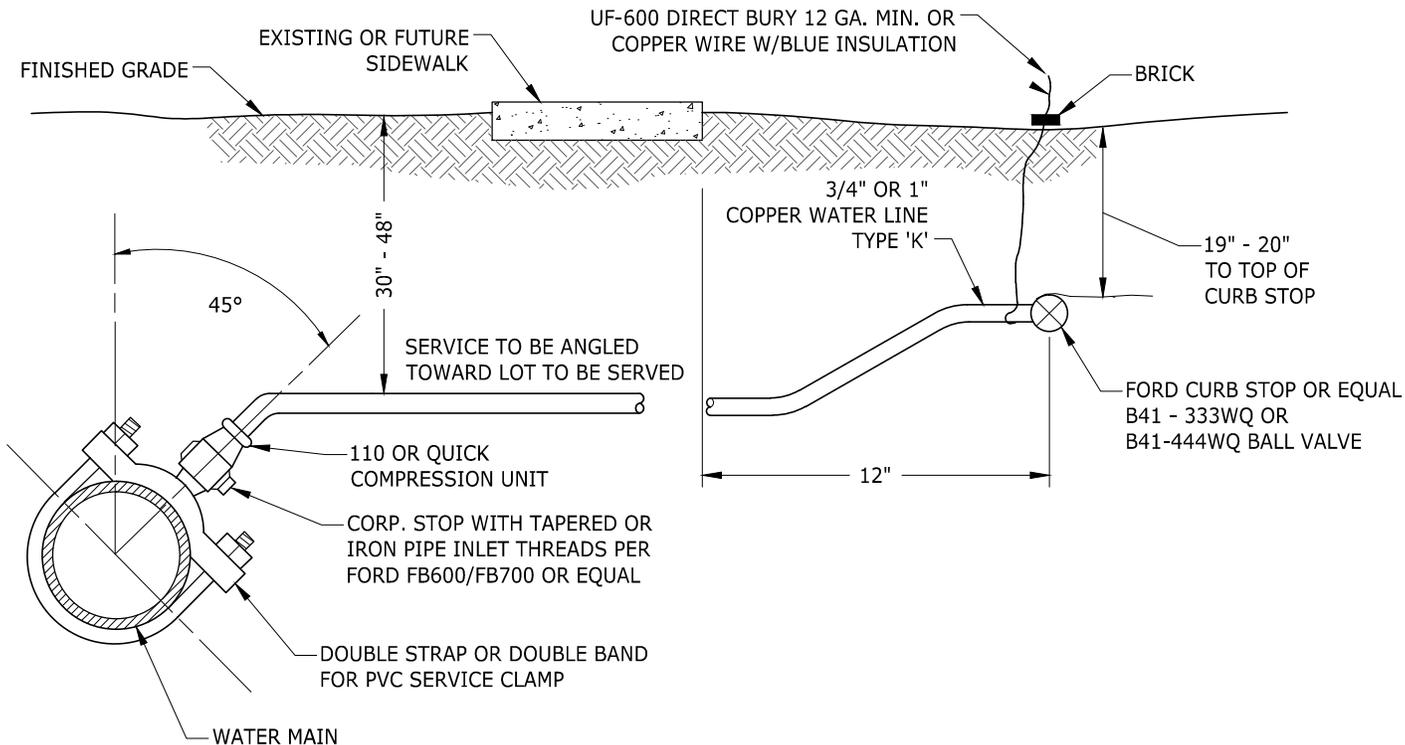
ENGINEERING
DETAIL

RING, FRAME OR COVER
INSTALLATION

DETAIL NO.
09-03-062

REVISION DATE: 11/22/16

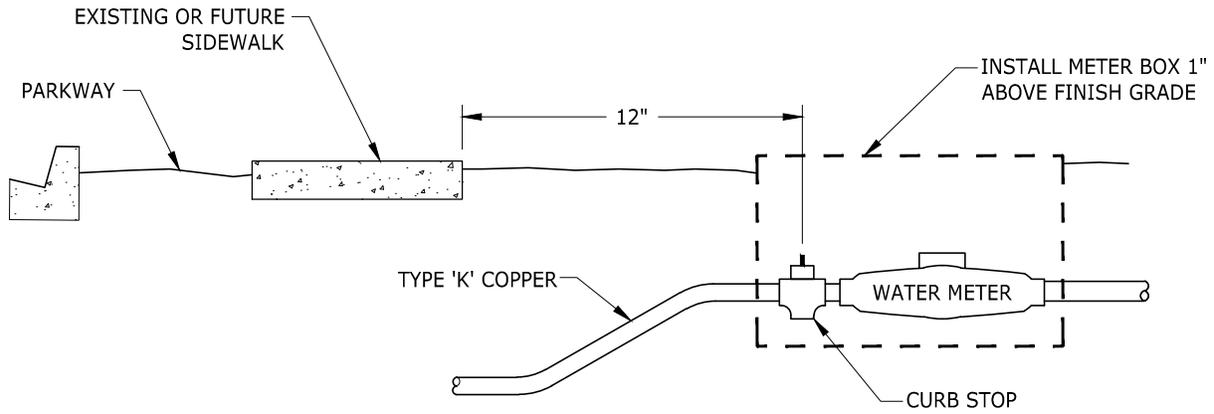
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SEE SECTION 13-09-003-0007 FOR NOTES RELATING TO THIS DETAIL.

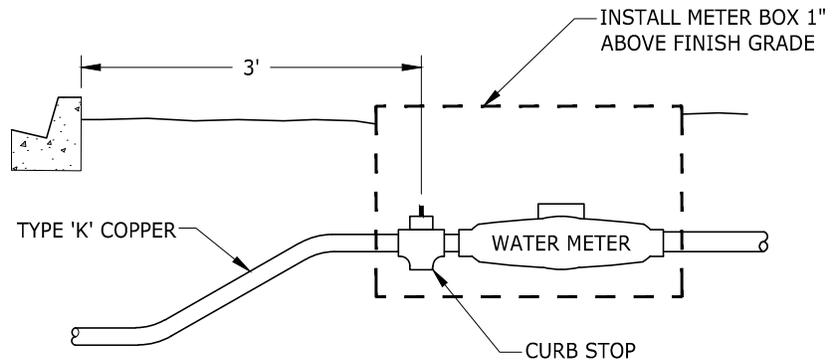
NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2 style="margin: 0;">3/4" and 1"</h2> <h1 style="margin: 0;">WATER SERVICE CONNECTION</h1>		
	<p>DETAIL NO. 09-03-070</p>	<p>REVISION DATE: 11/22/16</p>	<p style="font-size: 2em; margin: 0;">1 2</p>



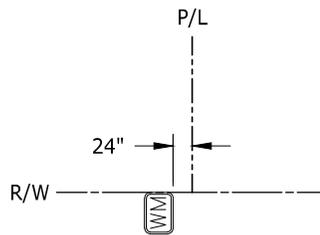
TYPE 'A'

IN AREAS WHERE SIDEWALK IS TO BE INSTALLED WITH OR WITHOUT PARKWAY, USE THIS CONFIGURATION



TYPE 'B'

IN AREAS WHERE NO SIDEWALK IS REQUIRED, USE THIS CONFIGURATION

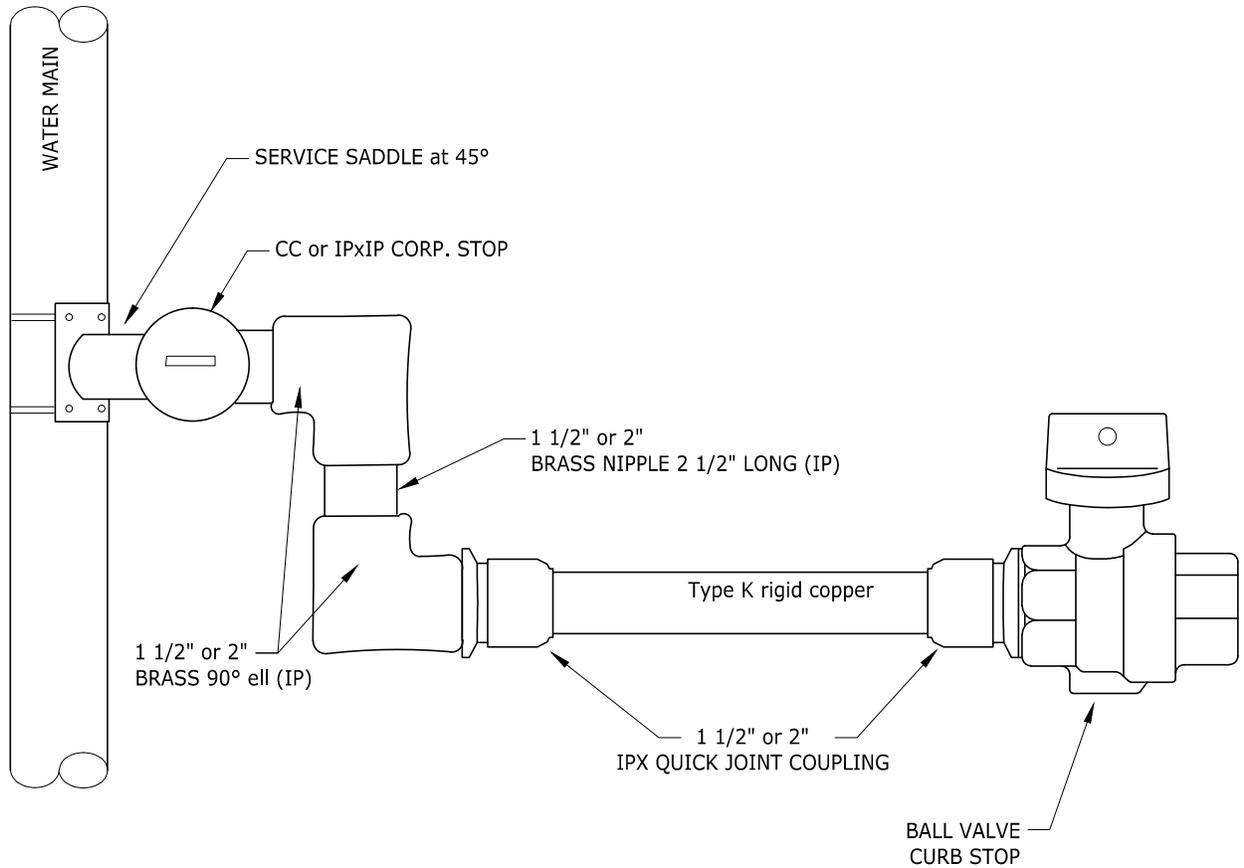


TYPE 'C'

IN AREAS WHERE NO CURB, GUTTER OR SIDEWALK IS REQUIRED THE FOLLOWING REQUIREMENTS SHALL BE MET:

1. METER BOX SHALL BE SET ON FRONT PROPERTY LINE.
2. 3/4" AND 1" CURB STOP SHALL BE 24" OUTSIDE PROPERTY LINE.
3. 1 1/2" AND 2" CURB STOP SHALL BE 36" OUTSIDE PROPERTY LINE.
4. CURB STOP SHALL BE 2" FROM INSIDE OF BOX TO ALLOW FOR EASY ACCESS TO BOTH COUPLINGS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>3/4" and 1" WATER SERVICE CONNECTION</p>		
	<p>DETAIL NO. 09-03-070</p>	<p>REVISION DATE: 11/22/16</p>	<p>2 2</p>

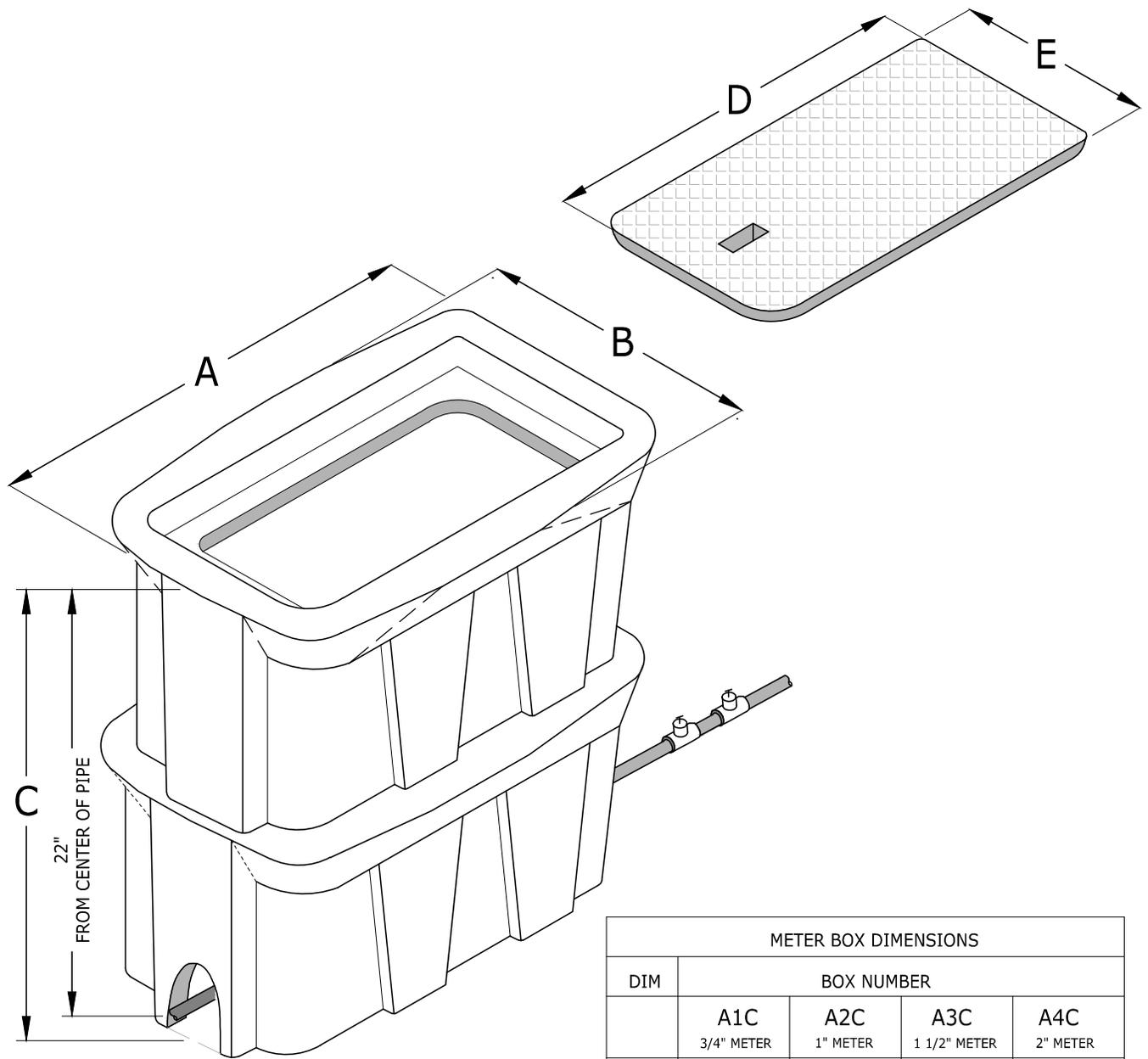


NOTE:

1. ALL FITTINGS USED IN CONNECTIONS WITH 1 1/2" AND 2" TYPE K RIGID COPPER SHALL BE NEW MUELLER OR FORD QUICK JOINT COUPLINGS PER SECTION 9-3-070.1
2. ALL 1 1/2" AND 2" SHALL ENTAIL A SWING TYPE CONNECTION CONSISTING OF TWO 90 DEGREE ELLS AND ONE 1 1/2" x 2 1/2" OR 2" x 2 1/2" BRASS NIPPLE BETWEEN THE 90 DEGREE ELLS.
3. ALL 1 1/2" AND 2" METER VALVE CONNECTIONS SHALL BE IPxIP BALL VALVE TYPE THAT ARE EQUAL OR EXCEED THOSE MANUFACTURED FORD, B11-666; OR JONES J-1900.
4. THE CURB STOP SHALL BE INSTALLED 19-20" BELOW FINISHED GRADE.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	WATER SERVICE CONNECTION		
	1 1/2 INCH AND 2 INCH		
09-03-071	REVISION DATE:	11/22/16	1
			1



METER BOX DIMENSIONS				
DIM	BOX NUMBER			
	A1C 3/4" METER	A2C 1" METER	A3C 1 1/2" METER	A4C 2" METER
A	19 1/4"	25 1/8"	29 9/16"	33 7/8"
B	12 1/2"	17 5/8"	18 13/16"	23 3/8"
C	12" / 14"	12" / 14"	12" / 14"	12" / 14"
D	14"	19 7/8"	23 1/2"	28 1/4"
E	7 1/4"	12 1/8"	12 5/8"	17 3/4"

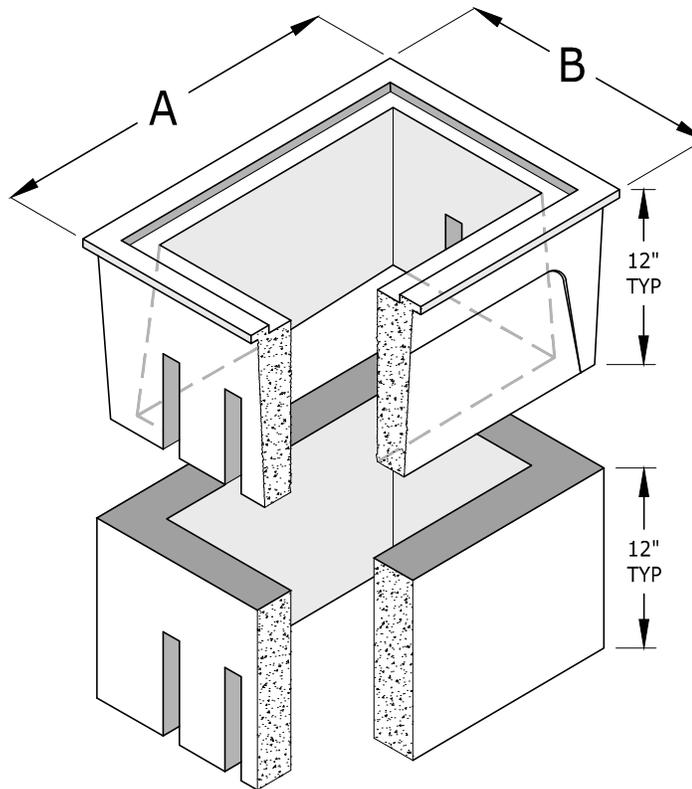
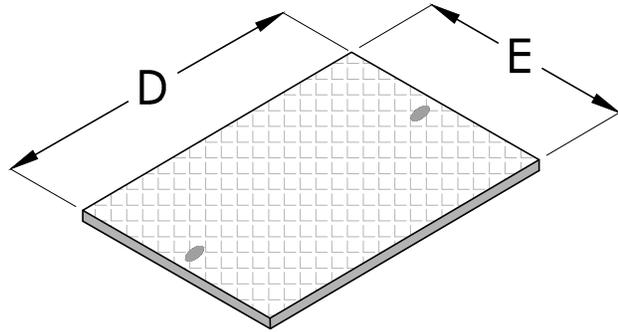
NOTES:

1. THE METER BOXES SHALL CONFORM TO THE DIMENSIONS AS SHOWN AND SHALL BE MADE OF LLDPE POLYMER.
2. MINIMUM 3/8" WALL THICKNESS.
3. THE METER BOXES SHALL BE BLACK EXCEPT FOR THE LID THROUGHOUT USING POLYETHYLENE MATERIALS AND SHALL NOT HAVE FOAMING OR BLOWING AGENTS.
4. LIDS SHALL BE OF THE LOCATABLE TYPE, COLORED AS FOLLOWS: BLUE (POTABLE WATER USE)
PURPLE (RECLAIM WATER USE)
5. BOXES & LIDS SHALL BE MADE IN THE U.S.A. BY DFW OR APPROVED EQUAL.

NTS

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<p>POLYMER WATER METER BOXES</p>		
	<p>DETAIL NO. 9-03-080</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

METER BOX DIMENSIONS			
DIM	BOX NUMBER		
	B1017	B1324	B1730
	3/4" METER	1" METER	1-1/2" & 2" METER
A	22 1/4"	29 1/2"	26 3/4"
B	15 5/8"	18 3/4"	23 3/4"
C	12" TYP	12" TYP	12" TYP
D	20"	27"	33 1/4"
E	13 3/8"	16 1/4"	20 1/4"
WEIGHT	130 LBS	166 LBS	268 LBS



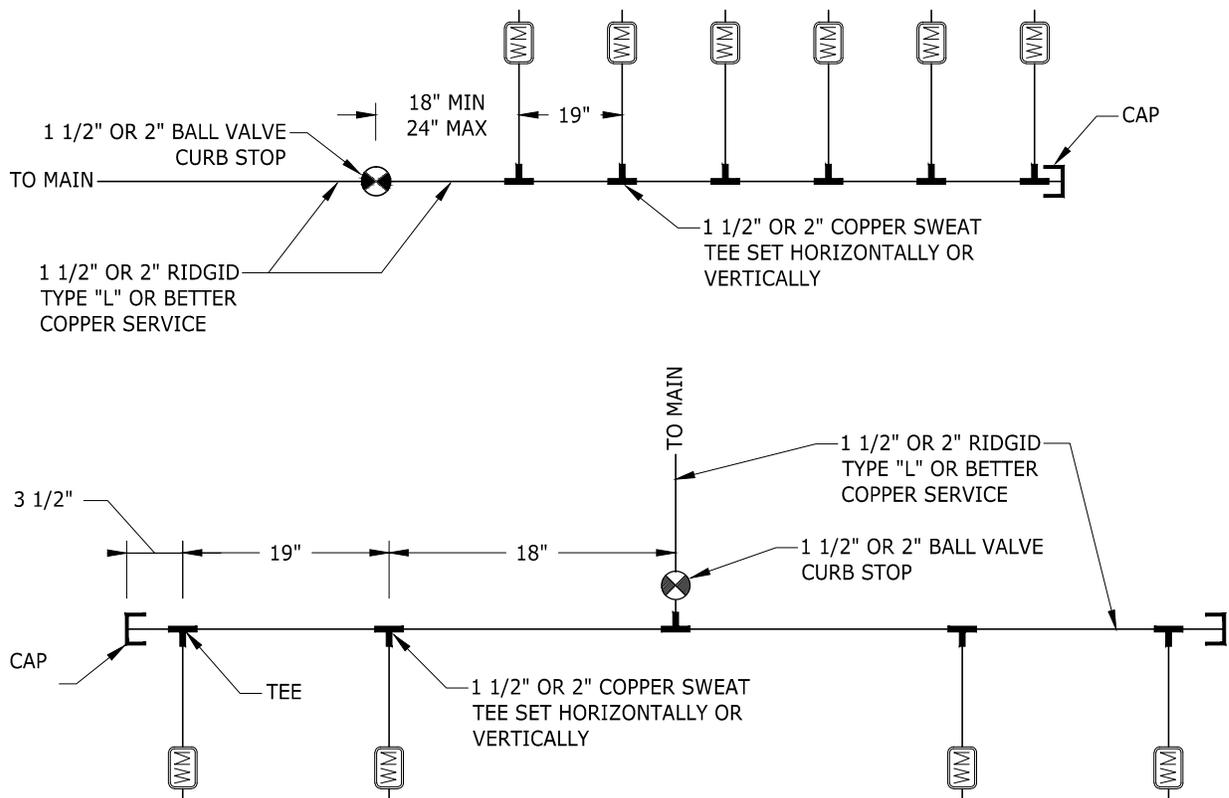
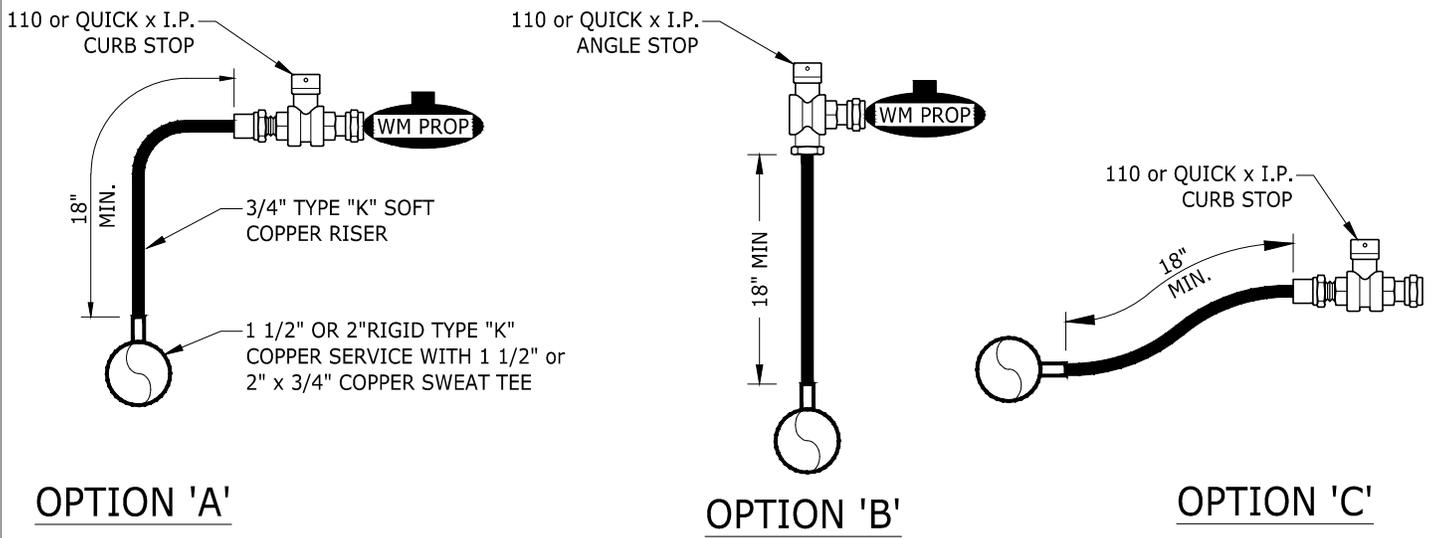
NOTES:

1. THE METER BOXES SHALL CONFORM TO THE DIMENSIONS AS SHOWN AND SHALL BE MADE OF HIGH DENSITY REINFORCED CONCRETE.
2. BOXES & LIDS SHALL BE MADE IN THE U.S.A. BY OLDCASTLE PRECAST OR APPROVED EQUAL.

NTS

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<p>TRAFFIC RATED BOXES</p>	
	<p>DETAIL NO.</p> <p>9-03-080A</p>	<p>REVISION DATE:</p> <p>11/22/16</p>

1
1



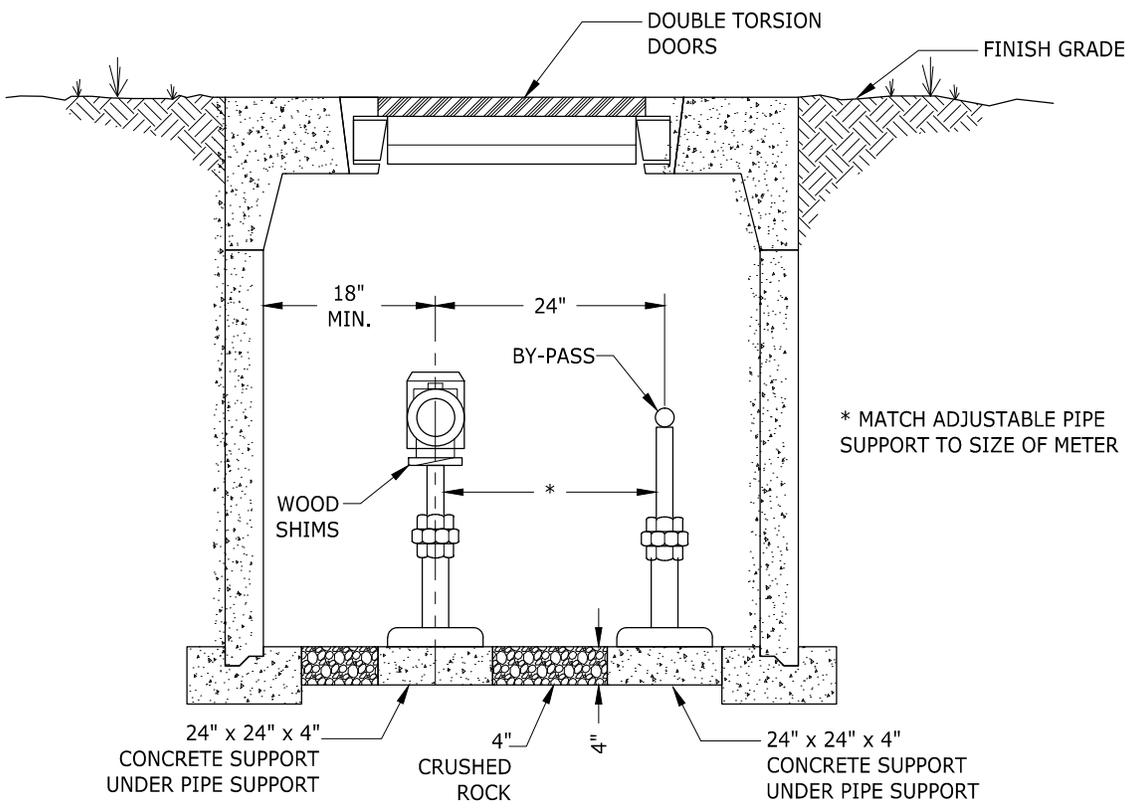
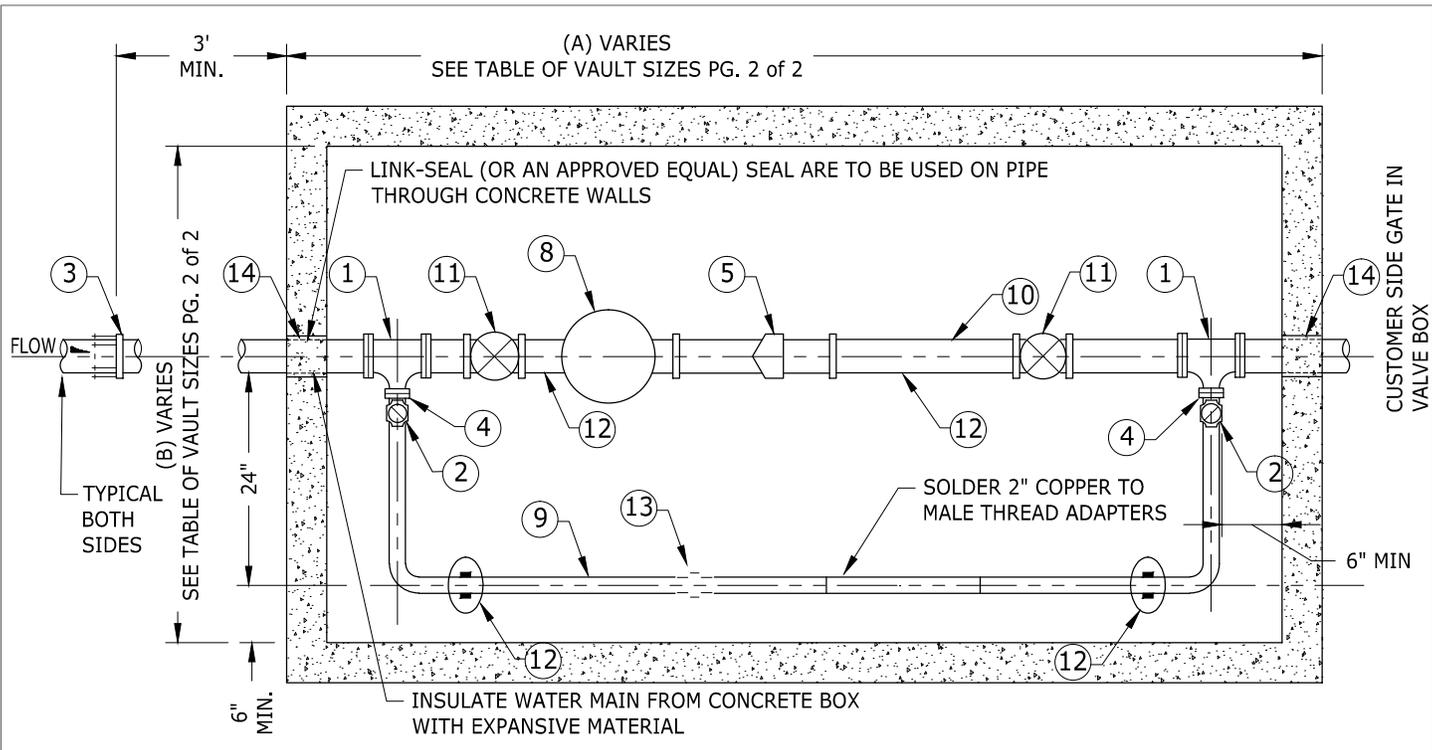
PLAN VIEWS

NOTE:

1. MULTIPLE WATER METER MANIFOLDS DESIGN CONFIGURATION MAY VARY
2. ALL MULTIPLE WATER METER MANIFOLDS DESIGNS MUST BE APPROVED BY THE WATER DISTRIBUTION DIVISION OF THE UTILITIES DEPARTMENT
3. USE COPPER BRAZING ALLOY PER ASTM

NTS

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<p>MULTIPLE METER MANIFOLDS</p>		
	<p>DETAIL NO.</p> <p>09-03-081</p>	<p>REVISION DATE:</p> <p>11/22/16</p>	<p>1</p> <p>1</p>



NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>COMPOUND METER</h2> <h3>3", 4", 6"</h3>		<p>1 2</p>
	<p>DETAIL NO. 09-03-082</p>	<p>REVISION DATE: 11/22/16</p>	

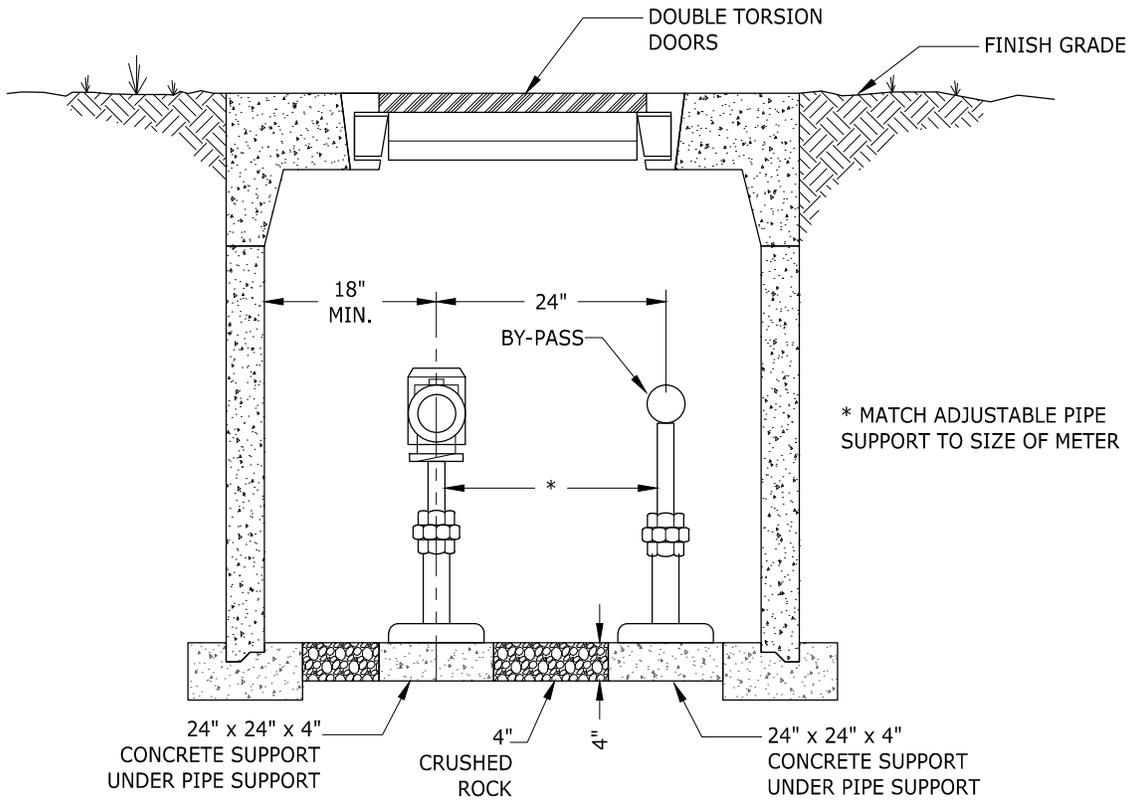
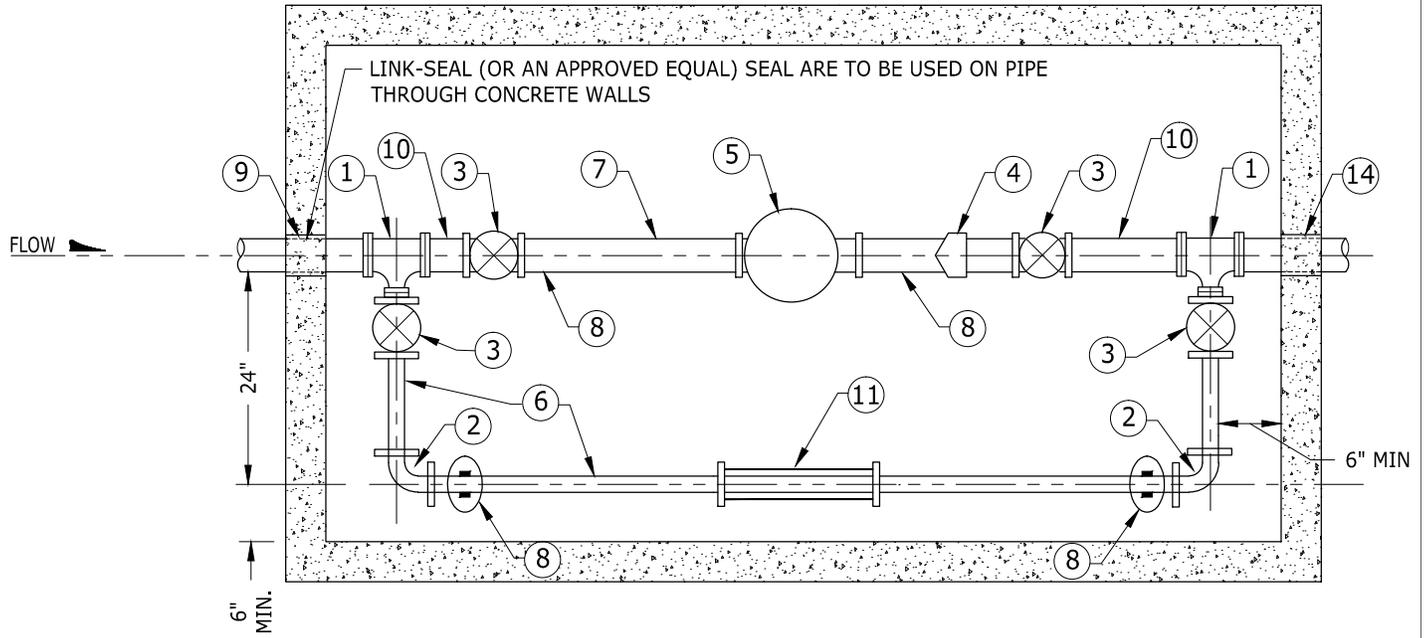
KEYNOTE:

- ① FLANGED TEE FOR BY-PASS
- ② CURBSTOP 2" BALL TYPE
- ③ ADAPTER, FLANGED TO MECH JOINT FOR ACP
- ④ GATE VALVE, FLANGED WITH HAND WHEEL OPEN LEFT WITH PIPE SUPPORT
- ⑤ COMPOUND METER (CONTACT COF UTILITIES FOR CURRENT STYLE AND LAY LENGTH)
- ⑥ FLANGED SWING CHECK VALVE WITH EXTERNAL LEVER AND WEIGHT
- ⑦ 2" BRONZE CHECK VALVE
- ⑧ FLANGED SPOOL 12" MIN. LENGTH
- ⑨ STRAINER 3", 4", 6" MANUFACTURER APPROVED FOR THE METER INSTALLED
- ⑩ FLANGED SPOOL (3 PIPE DIAMETERS IN LENGTH)
- ⑪ 2" TYPE "K" RIGID COPPER BY-PASS (USE SILVER FLOW BRAZING ALLOY FOR JOINTS)
- ⑫ COMPANION FLANGED WITH 2" TAP FOR BY-PASS
- ⑬ 2" ADJUSTABLE PIPE SUPPORT (2 MIN.)
- ⑭ 2" BRASS UNION
- ⑮ FORM AND FILL PIPE OPENING WITH CLASS "B" CONCRETE AFTER PIPE IS INSTALLED

NOTE:

1. FOR LARGER METERS SPECIAL VAULT DESIGN IS REQUIRED.
2. USE OF REMOTE READING DEVICE AT OPTION OF UTILITY.
3. PRECAST CONCRETE VAULTS - WITH DOUBLE TORSION DOORS - SPRING ASSISTED. (CONTACT COF UTILITIES FOR APPROVED VAULT BEFORE INSTALLATION).
4. INLET AND OUTLET PIPES MUST BE JOINT RESTRAINED TO PERMIT REMOVAL OF FITTINGS OR METER.
5. WATER METER VAULT MUST BE A UTILITY VAULT CO./COF SPEC. VAULT
(4484-WA)
(5106-WA)
(612-WA)
6. 8" & LONGER CONTACT OCOF UTILITIES FOR SPECIAL APPLICATION

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h1>COMPOUND METER</h1> <h2>3", 4", 6"</h2>			
	DETAIL NO. <h1>09-03-082</h1>	REVISION DATE: 11/22/16	<table border="1" style="width: 100px; height: 100px;"> <tr> <td style="text-align: center; vertical-align: middle;">2</td> <td style="text-align: center; vertical-align: middle;">2</td> </tr> </table>	2
2	2			



City of Flagstaff



ENGINEERING
DETAIL

FIRE SERVICE METER

6" , 8" 10"

DETAIL NO.

09-03-083

REVISION DATE:

11/22/16

1

2

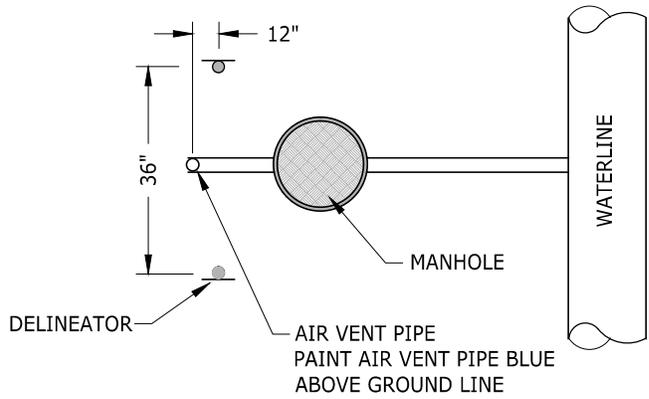
KEYNOTE:

- ① FLANGED TEE FOR BY-PASS - SAME SIZE AS THE FIRE SERVICE METER.
- ② FLANGED 90° BENDS SAME SIZE AS THE FIRE SERVICE METER
- ③ GATE VALVE, FLANGED WITH HAND WHEEL OPEN LEFT WITH PIPE SUPPORT SAME SIZE AS THE FIRE SERVICE METER
- ④ FIRE SERVICE METER (CONTACT COF UTILITIES FOR CURRENT STYLE AND LAY LENGTH)
- ⑤ STRAINER, MANUFACTURER APPROVED FOR THE METER ASSEMBLY UL/FM APPROVED
- ⑥ BY-PASS MUST MATCH THE SIZE OF THE FIRE SERVICE METER (FLANGED DIP)
- ⑦ FLANGED SPOOL (3 PIPE DIAMETERS IN LENGTH)
- ⑧ ADJUSTABLE PIPE SUPPORT MATCH PIPE SUPPORT TO SIZE OF METER
- ⑨ LINKSEAL (OR APPROVED EQUAL) ARE TO BE USED IN PIPE THROUGH CONCRETE WALLS
- ⑩ FLANGED SPOOL
- ⑪ DUCTILE IRON MECHANICAL JOINT SOLID SLEEVE - RESTRAINED

NOTE:

1. USE OF REMOTE READING DEVICE AT OPTION OF UTILITY.
2. PRECAST CONCRETE VAULTS - WITH DOUBLE TORSION DOORS - SPRING ASSISTED. (CONTACT COF UTILITIES FOR APPROVED VAULT BEFORE INSTALLATION).
3. INLET AND OUTLET PIPES MUST BE JOINT RESTRAINED TO PERMIT REMOVAL OF FITTINGS OR METER.
4. WATER METER VAULT MUST BE A UTILITY VAULT CO./COF SPEC. VAULT
6": (612-WA) 8" & LARGER CONTACT COF UTILITIES FOR SPECIAL APPLICATION

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h1>FIRE SERVICE METER</h1> <h2>6", 8", 10"</h2>		
	DETAIL NO. <h1>09-03-083</h1>	REVISION DATE: 11/22/16	<div style="display: flex; align-items: center; justify-content: center;"> 2 2 </div>

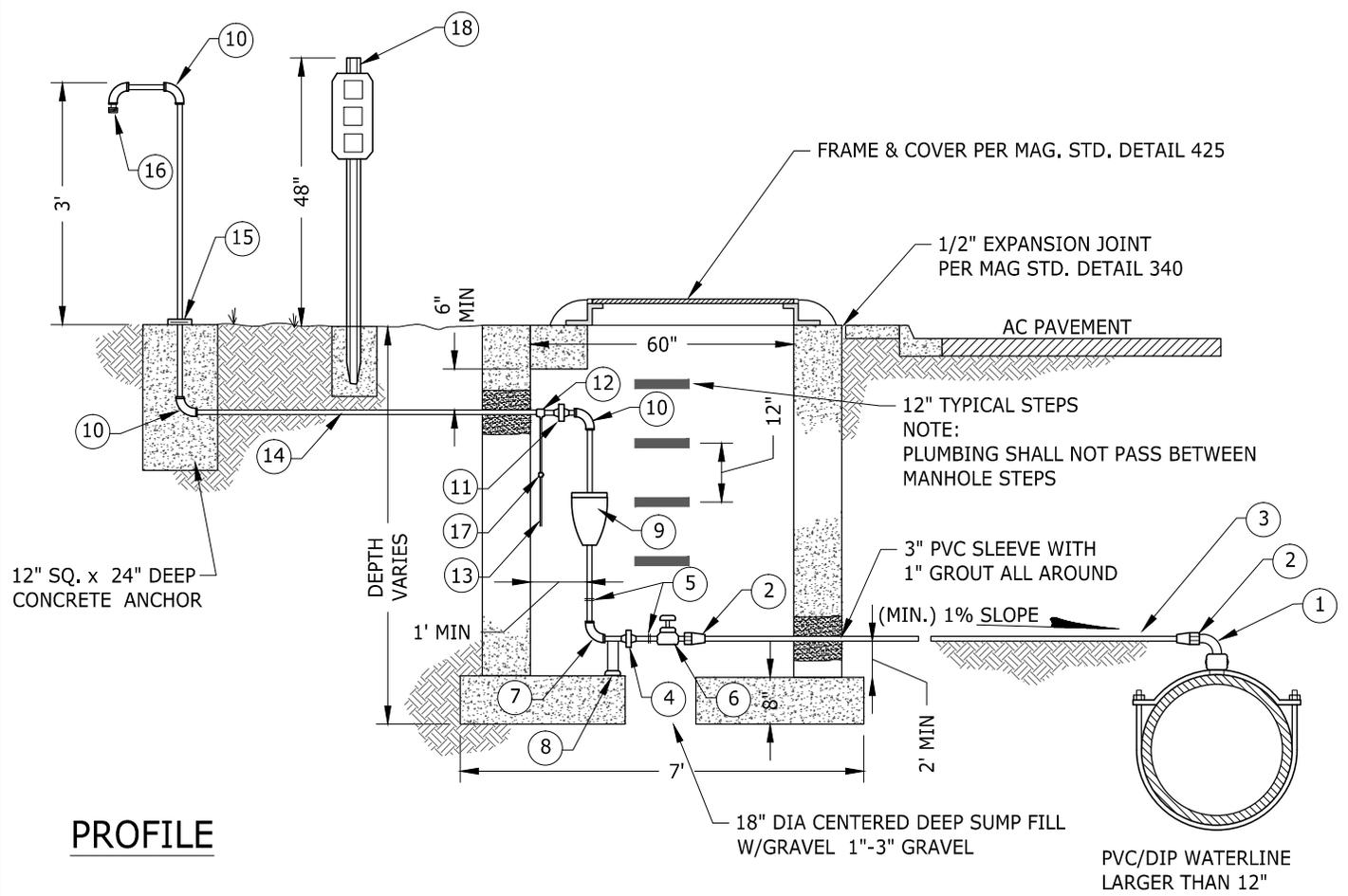


60" BARREL
60" TOP

30" ALUMINUM RING & COVER ADJUST TO GRADE
W/3" CONCRETE ADJUSTING RINGS

DELINEATOR LOCATION

PLAN



PROFILE

NTS

City of Flagstaff



ENGINEERING
DETAIL

<h2>2" COMBINATION AIR RELEASE VALVE</h2>	
DETAIL NO. 09-03-100	REVISION DATE: 11/22/16
1	2

KEYNOTE:

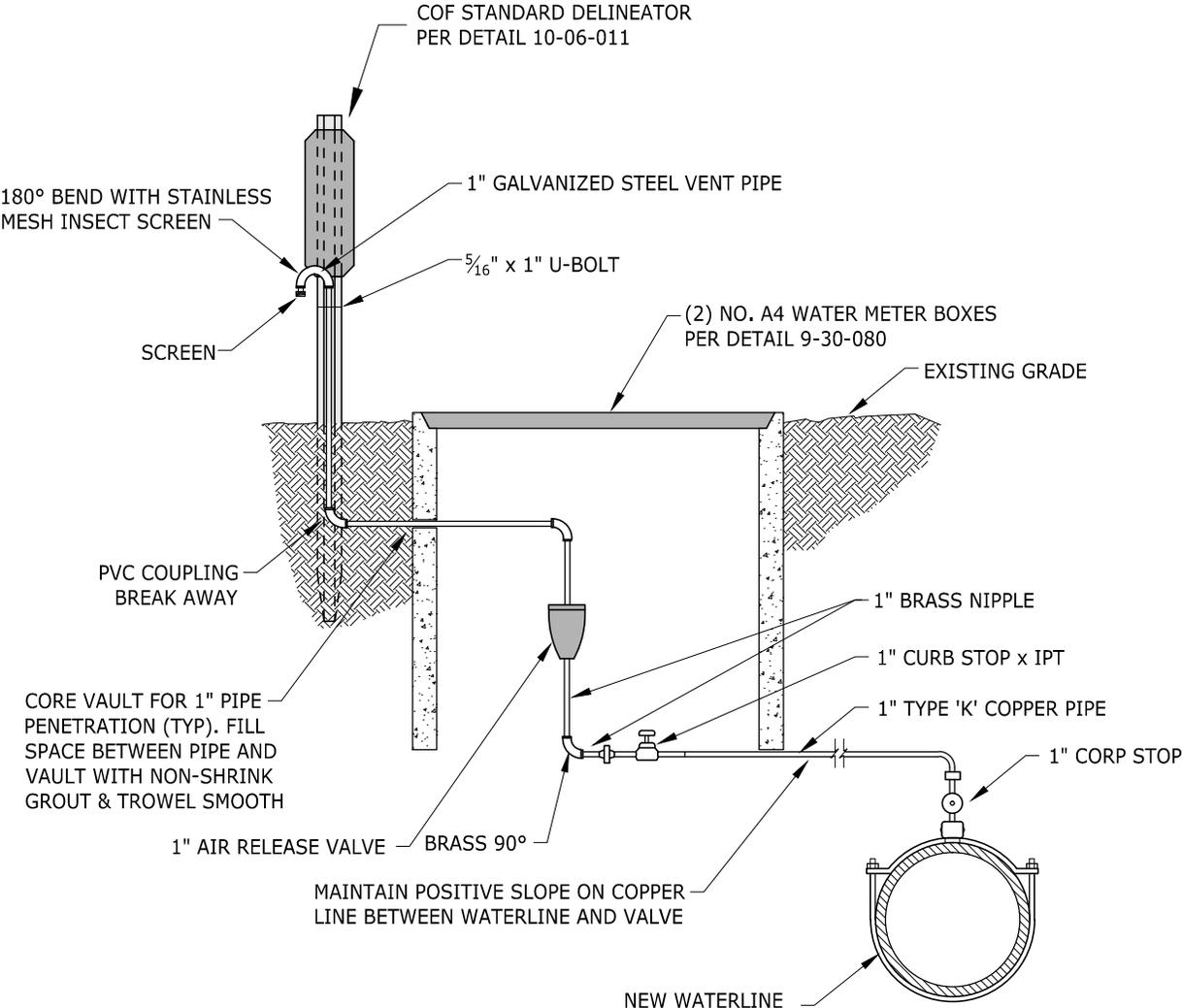
- ① SWING JOINT ASSEMBLY:
 SERVICE SADDLE, DOUBLE STRAP:
 2" CORP (1) IP x IP
 2" 90° BRASS ELLS (2)
 2" BRASS NIPPLE, 2 1/2" TO 6" LONG
- ② 2" IP x SWEAT COPPER ADAPTOR IP THREADS, SWEAT WITH BRAZING ROD AS PER COF STD FOR SWEAT FITTINGS, 110 or QUICK
- ③ 2" TYPE "L" RIGID COPPER
- ④ 2" BRASS UNION
- ⑤ 2" BRASS NIPPLE
- ⑥ 2" BALL CURB STOP, LOCATE CURB STOP ON IT'S SIDE SO THAT IT IS ACCESSIBLE FROM MH OPENING
- ⑦ 2" BRASS 90° ELL
- ⑧ ADJUSTABLE PIPE SUPPORT - - - ELCEN NO. 48, 50 AND 268 FLOOR FLANGE BOLT TO SLAB WITH WEDGE ANCHOR BOLTS
- ⑨ 2" COMBINATION AIR RELEASE VALVE
- ⑩ 2" 90° ELL - - - GALVANIZED STEEL STANDARD WEIGHT
- ⑪ 2" GALVANIZED UNION
- ⑫ 2" x 1/2" GALVANIZED TEE
- ⑬ 1/2" GALVANIZED DRAIN TUBE
- ⑭ 2" SCHEDULE 40 GALVANIZED STEEL PIPE
- ⑮ 2" AWWA CLASS "B" FLANGES (THREADED) WITH MINIMUM 2 THREADED BOLTS
- ⑯ 2" AWWA CLASS "B" FLANGES (THREADED) W/NO. 18 STAINLESS STEEL WIRE MESH BETWEEN FLANGES
- ⑰ 1/2" CHECK VALVE
- ⑱ STANDARD DELINEATOR PER COF STD DETAIL 10-06-011 SET IN A 12" x 24" BASE FACING ONCOMING TRAFFIC (2 EA)

NOTE:

- 1. ALL BELOW GROUND PIPE & FITTINGS SHALL BE WRAPPED W/2 LAYERS (50% LAP EACH) OF 10 MIL PVC TAPE W/PRIMER PER MANUFACTURER'S RECOMMENDATIONS.
- 2. ALL COPPER FITTINGS OUTSIDE OF MANHOLE TO BE BEDDED IN FINE CINDERS.

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>2" COMBINATION AIR RELEASE VALVE</h2>		
	DETAIL NO. <h1>09-03-100</h1>	REVISION DATE: 11/22/16	<div style="font-size: 2em; margin: 0;">2</div> <div style="font-size: 2em; margin: 0;">2</div>

MUELLER 110 or FORD QUICK
JOINT COMPRESSION WILL
BE ACCEPTED



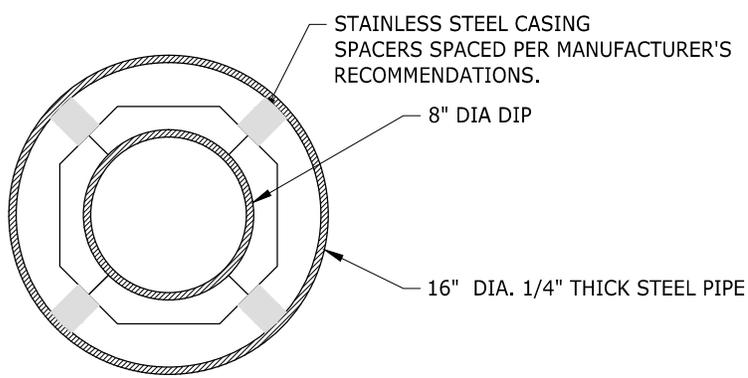
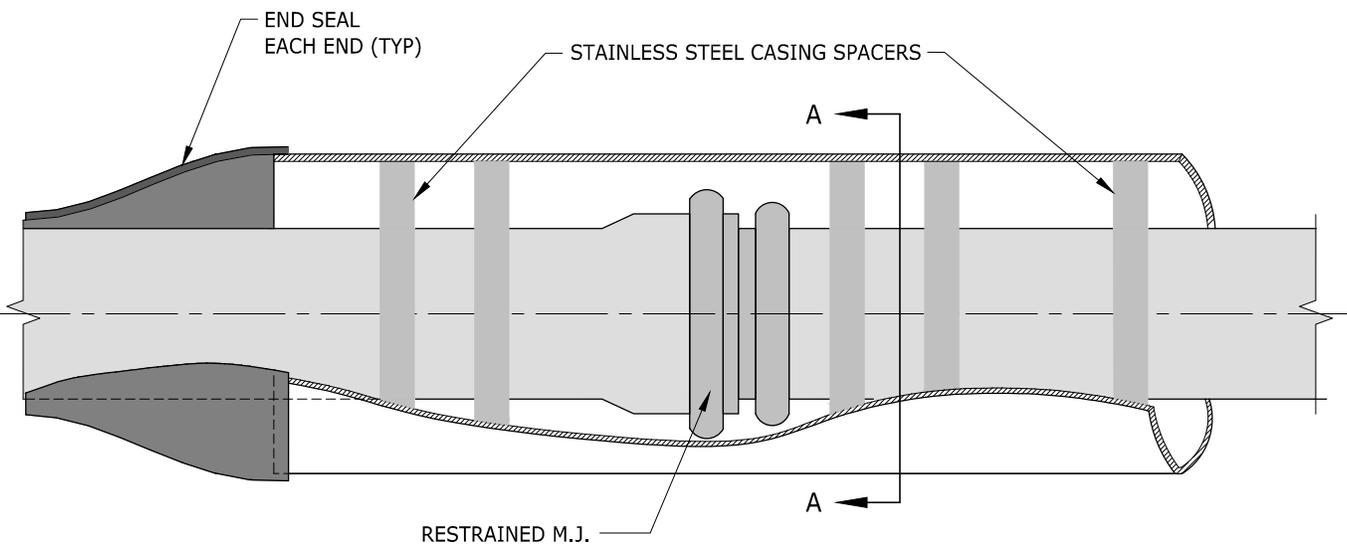
*CALL OUT MODEL/MAKE OF
THE APPROVED ARV

NOTE:

1. SHOP DRAWINGS REQUIRED ON ALL COMPONENTS OF AIR RELEASE VALVE ASSEMBLY VAULT.
2. SERVICE SADDLE AND CORP STOP PER COF STANDARD DETAIL 9-03-070-1

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h1>1" AIR RELEASE VALVE</h1>		
	<p>DETAIL NO. 09-03-101</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



SECTION A - A

PIPE SIZE	SLEEVE SIZE (MIN)
10"	20"
12"	24"

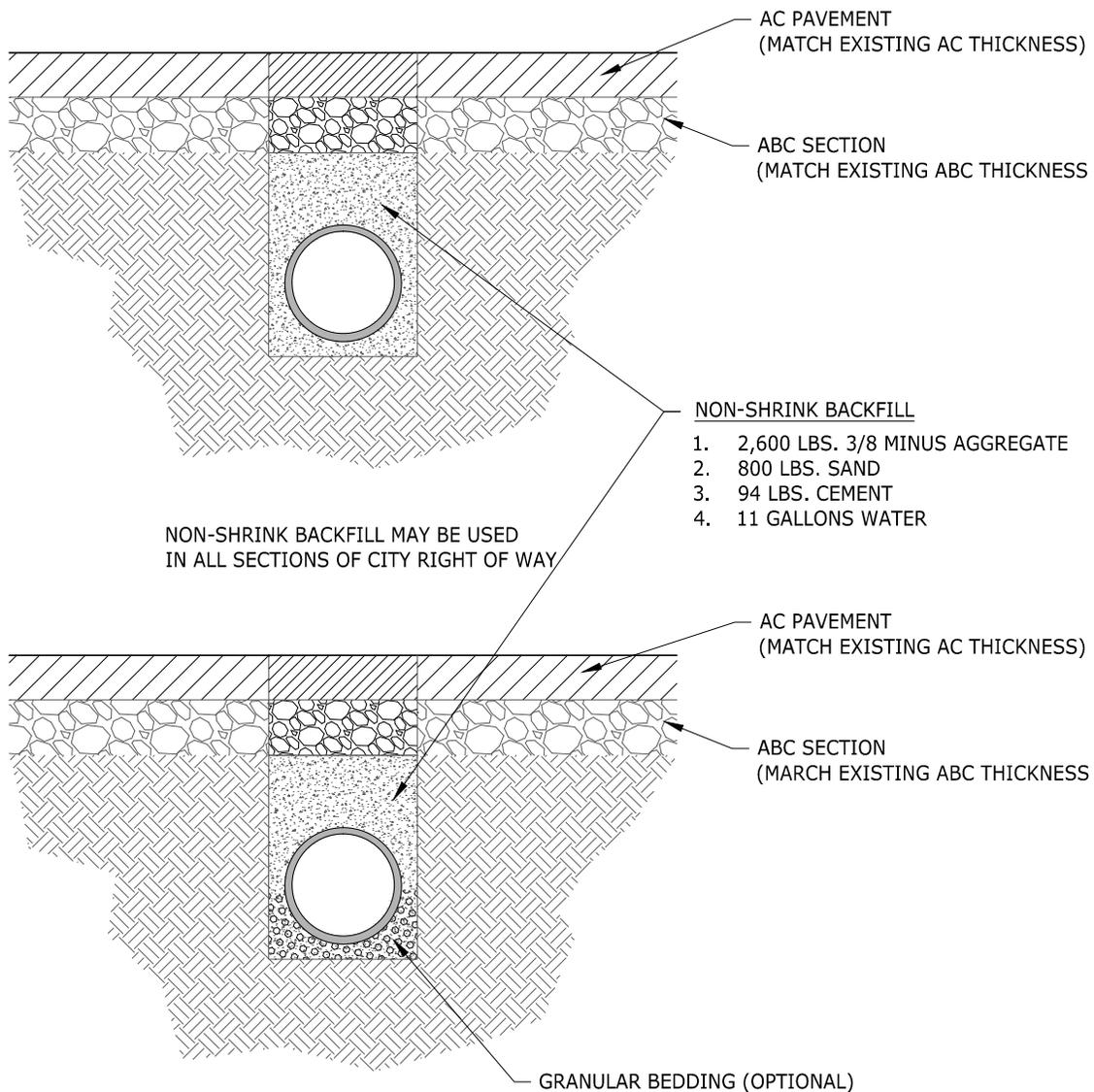
SEE SPECIFICATION 13-09-006-0001.B.5

NOTES:

1. THE END OF THE DIP PIPE IS RESTRAINED MECHANICALLY JOINT AND NOT TO REST ON THE CASING.
2. ALL CASING SPACERS SHALL RUN THE LENGTH OF THE MJ DIP PIPE.
3. CASING SPACERS TO BE BY ADVANCE PRODUCTS & SYSTEMS, INC. OR APPROVED EQUAL.
4. SEAL ENDS OF CASING W/END SEALS BY ADVANCE PRODUCTS & SYSTEM, INC. OR APPROVED EQUAL

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	WATER/SEWER LINE CASING		
	DETAIL NO. 09-06-010	REVISION DATE: 11/22/16	1 1

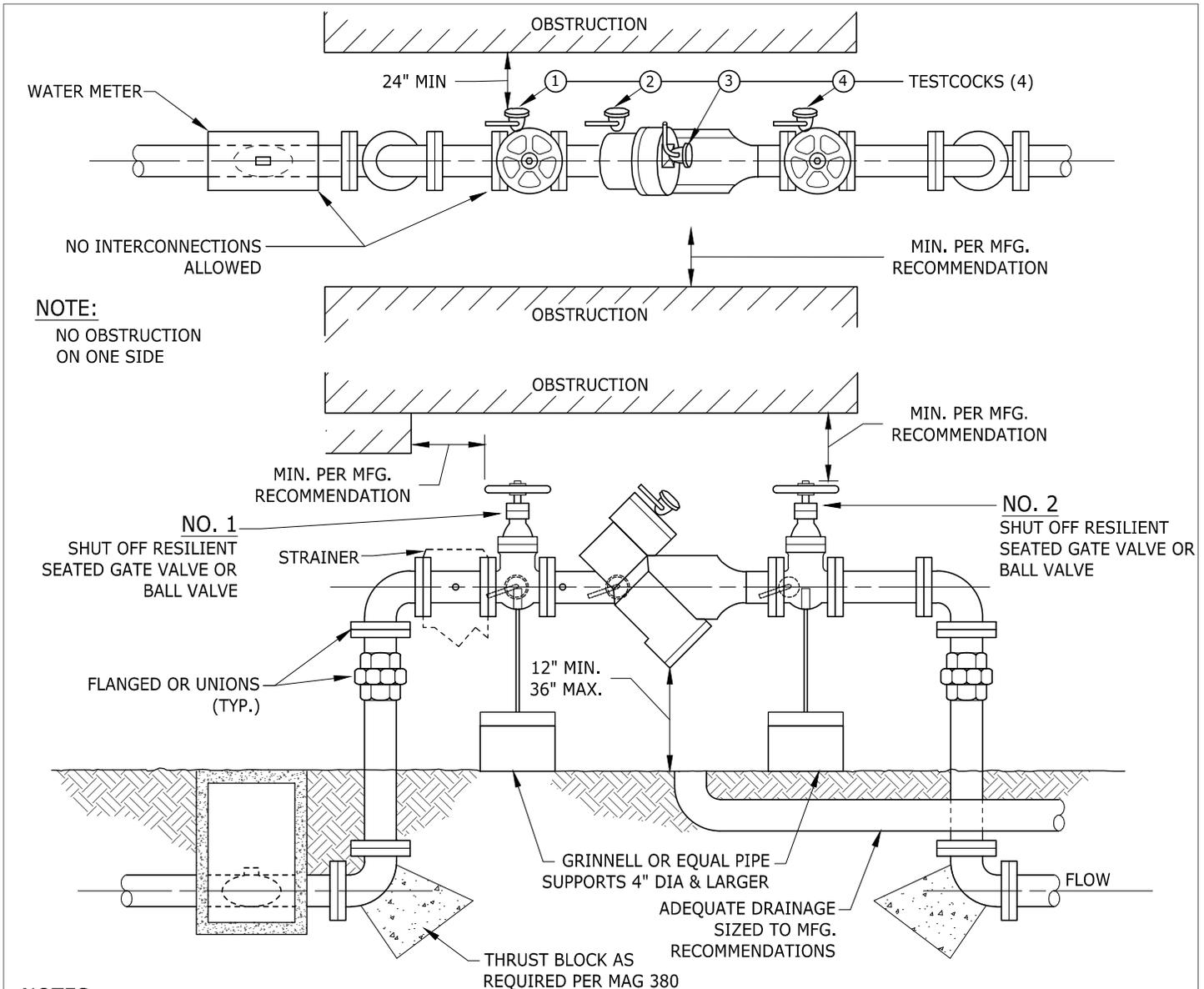


NOTES:

1. COLD MIX ASPHALT MAY BE USED FOR TEMPORARY PATCH IF HOT MIX ASPHALT IS NOT AVAILABLE.
2. A MINIMUM OF 2" OF UPM™ MAY BE USED FOR TEMPORARY TRENCH PAVING IF HOT MIX IS NOT AVAILABLE. UPM™ TEMPORARY PAVEMENT SHALL NOT REMAIN IN PLACE LONGER THAN 5 WORKING DAYS OR UNTIL HOT ASPHALT IS AVAILABLE. AFTER 5 WORKING DAYS, THE CITY MAY PERFORM THE PERMANENT TRENCH PAVEMENT AT THE CONTRACTOR'S EXPENSE. IN LIEU OF PLACING UPM™ THOUGH STILL TEMPORARY, THE CONTRACTOR MAY ELECT TO COMPLETELY BACKFILL THE TRENCH TO WITHIN 2" OF THE FINISHED TRENCH GRADE WITH NON-SHRINK BACKFILL, THE FINAL 2" SHALL BE MAG CLASS "C" CONCRETE.
3. WHEN PIPE IS ENCASED IN NON-SHRINK BACKFILL, THE PIPE SHALL BE WRAPPED PER MAG SPECIFICATION 610.6.2

NTS

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<h2>NON-SHRINK SLURRY BACKFILL</h2>		
	<p>DETAIL NO.</p> <h1>09-06-030</h1>	<p>REVISION DATE:</p> <p>11/22/16</p>	<p>1</p> <p>1</p>



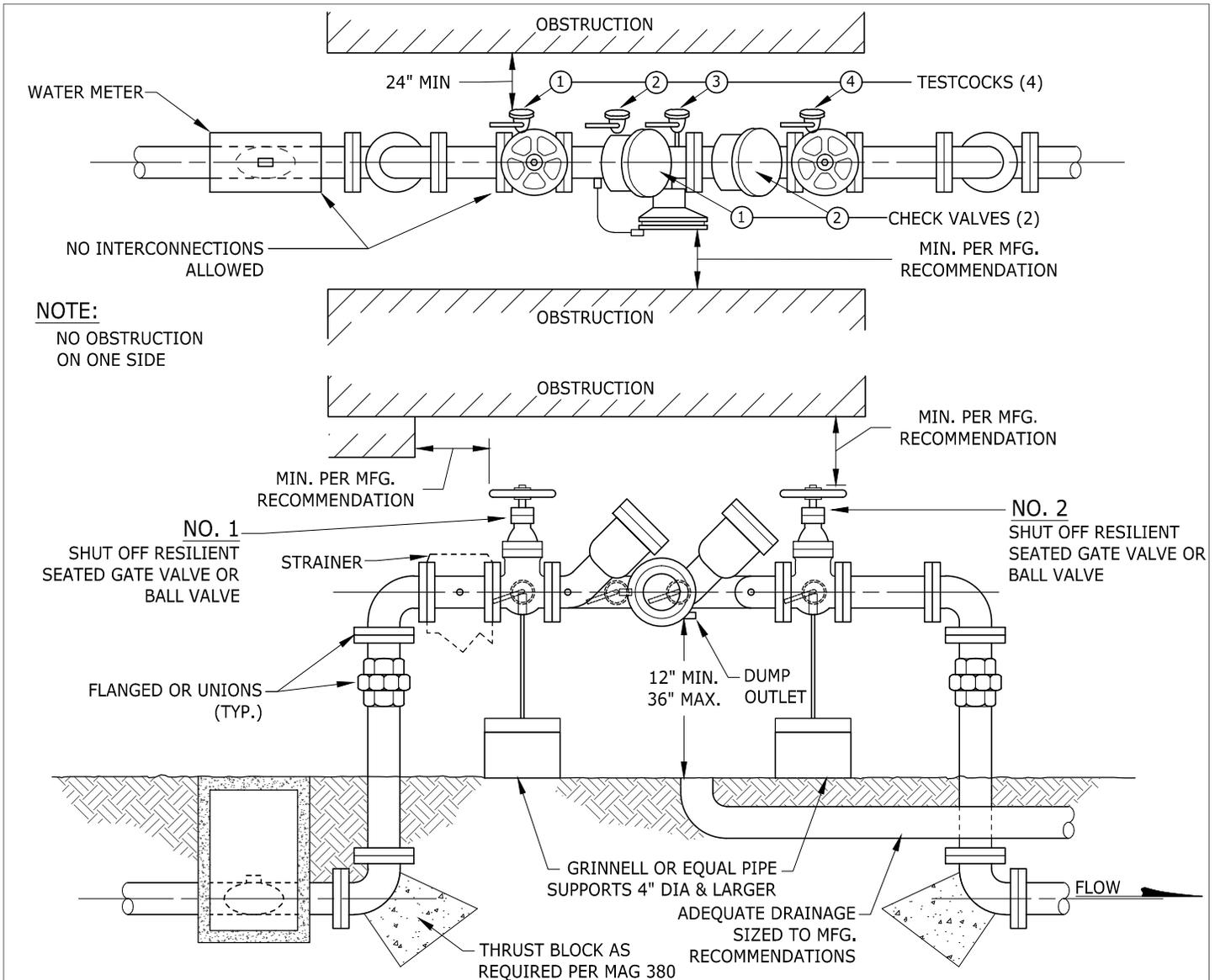
NOTE:
NO OBSTRUCTION
ON ONE SIDE

NOTES:

1. A CORRECT REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) INSTALLATION IS SHOWN ABOVE. THERE MUST NOT BE ANY CONNECTIONS ON THE SERVICE LINE BETWEEN THE RPA AND THE WATER METER.
2. PROTECTIVE CAGES ARE OPTIONAL, AND WHEN INSTALLED MUST MEET CLEARANCE REQUIREMENTS IN ADDITION TO PROVIDING SIDE AND TOP ACCESS.
3. CAGES MUST NOT RETAIN WATER.
4. THE ASSEMBLY MUST BE ACCESSIBLE AT ALL TIMES.
5. THE RPA MUST BE INSTALLED ABOVE GROUND AND AS CLOSE TO THE WATER METER AS POSSIBLE.
6. THE ASSEMBLY MUST BE PROTECTED FROM FREEZING.
7. DISTANCE FROM THE BOTTOM OF PRESSURE RELIEF VALVE TO THE DRAIN OPENING MUST BE A MINIMUM OF TWICE THE DIAMETER OF THE ASSEMBLY PIPING.
8. INSTALLATION MUST MEET UNIFORM PLUMBING CODES IN ADDITION TO FLAGSTAFF WATER STANDARD DETAILS.
9. INSTALLATION MUST BE LEFT EXPOSED UNTIL INSPECTED AND APPROVED BY FLAGSTAFF CITY UTILITIES.
10. IN CASES WHERE WATER SUPPLY MAY NOT BE INTERRUPTED DURING NORMAL WORKING HOURS, TWO ASSEMBLIES INSTALLED IN PARALLEL ARE REQUIRED.
11. THE ASSEMBLY MUST BE APPROVED BY THE CITY UTILITIES PRIOR TO INSTALLATION.
12. FOR AN UPDATED LIST OF APPROVED ASSEMBLIES OR ADDITIONAL QUESTIONS CONTACT THE CITY UTILITIES DEPARTMENT AT (928) 213-2117

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2 style="margin: 0;">DOUBLE CHECK VALVE ASSEMBLY INSTALLATION</h2>		
	<p>DETAIL NO. 09-06-071</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

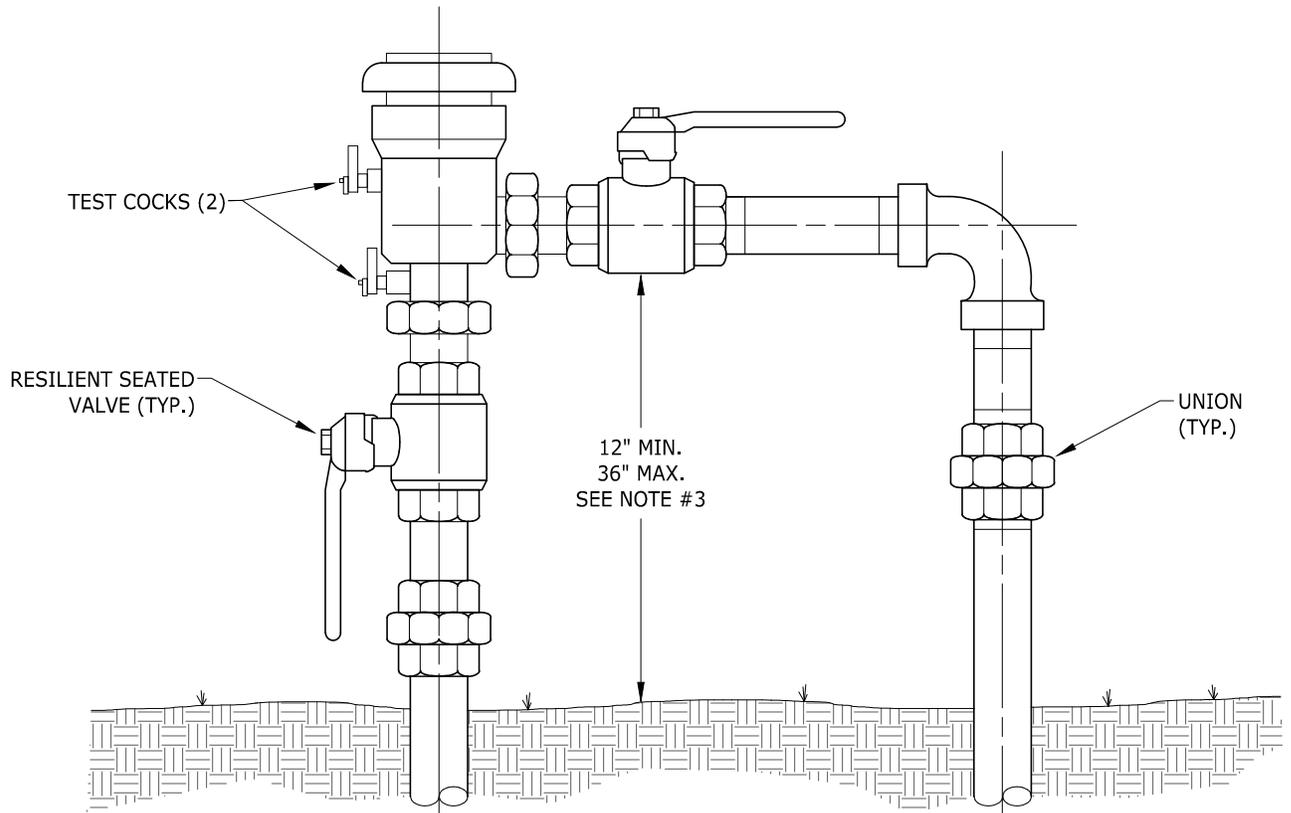


NOTE:
NO OBSTRUCTION
ON ONE SIDE

NOTES:

1. A CORRECT REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) INSTALLATION IS SHOWN ABOVE. THERE MUST NOT BE ANY CONNECTIONS ON THE SERVICE LINE BETWEEN THE RPA AND THE WATER METER.
2. PROTECTIVE CAGES ARE OPTIONAL, AND WHEN INSTALLED MUST MEET CLEARANCE REQUIREMENTS IN ADDITION TO PROVIDING SIDE AND TOP ACCESS.
3. CAGES MUST NOT RETAIN WATER.
4. THE ASSEMBLY MUST BE ACCESSIBLE AT ALL TIMES.
5. THE RPA MUST BE INSTALLED ABOVE GROUND AND AS CLOSE TO THE WATER METER AS POSSIBLE.
6. THE ASSEMBLY MUST BE PROTECTED FROM FREEZING.
7. DISTANCE FROM THE BOTTOM OF PRESSURE RELIEF VALVE TO THE DRAIN OPENING MUST BE A MINIMUM OF TWICE THE DIAMETER OF THE ASSEMBLY PIPING.
8. INSTALLATION MUST MEET UNIFORM PLUMBING CODES IN ADDITION TO FLAGSTAFF WATER STANDARD DETAILS.
9. INSTALLATION MUST BE LEFT EXPOSED UNTIL INSPECTED AND APPROVED BY FLAGSTAFF CITY UTILITIES.
10. IN CASES WHERE WATER SUPPLY MAY NOT BE INTERRUPTED DURING NORMAL WORKING HOURS, TWO ASSEMBLIES INSTALLED IN PARALLEL ARE REQUIRED.
11. THE ASSEMBLY MUST BE APPROVED BY THE CITY UTILITIES PRIOR TO INSTALLATION.
12. FOR AN UPDATED LIST OF APPROVED ASSEMBLIES OR ADDITIONAL QUESTIONS CONTACT THE CITY UTILITIES DEPARTMENT AT (928) 213-2117
13. THREE SETS OF PLANS SHALL BE SUBMITTED TO CITY UTILITIES DEPARTMENT FOR APPROVAL BY SIGNATURE PRIOR TO INSTALLATION

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>REDUCED PRESSURE ASSEMBLY (RPA)</p> <p>INSTALLATION</p>		NTS
	<p>DETAIL NO.</p> <p>09-06-072</p>	<p>REVISION DATE:</p> <p>11/22/16</p>	<p>1</p> <hr style="width: 50%; margin: 0 auto;"/> <p>1</p>



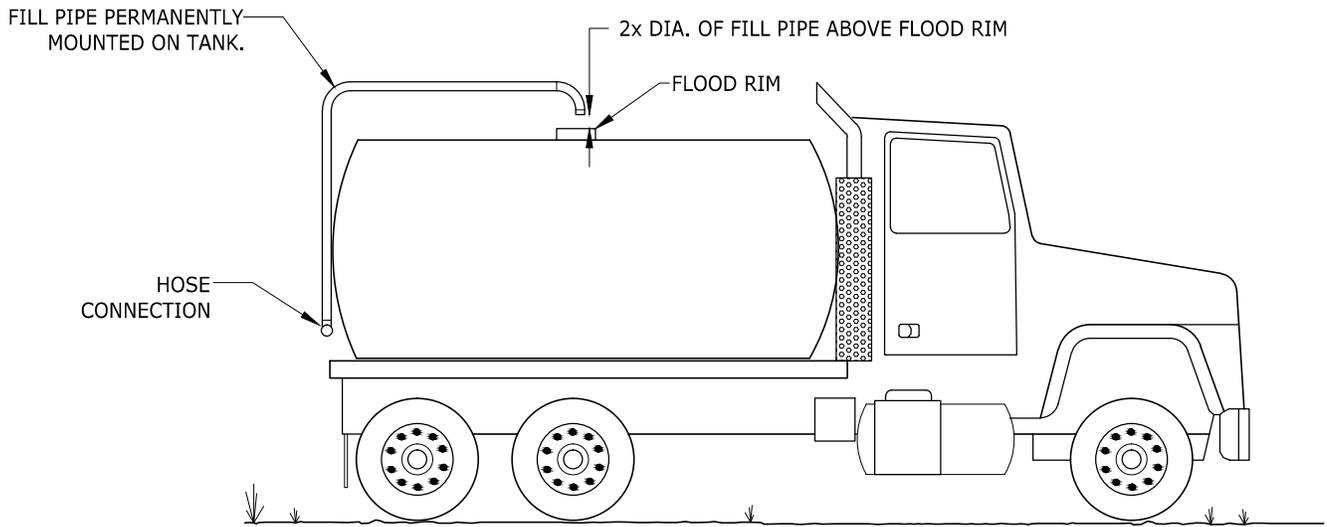
NOTES:

1. CONTACT CITY OF FLAGSTAFF UTILITIES DEPARTMENT FOR LATEST APPROVED LIST OF BACKFLOW PREVENTOR ASSEMBLIES.
2. TWO TEST COCKS SHALL BE INSTALLED PER U.S.C.*
3. ASSEMBLY MUST BE INSTALLED 12 INCHES ABOVE THE HIGHEST OUTLET ON THE SYSTEM. IF THIS DISTANCE EXCEEDS 36 INCHES A REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY MUST BE UTILIZED.
4. ASSEMBLY MUST BE PROTECTED FROM FREEZING.
5. 3 SETS OF PLANS SHALL BE SUBMITTED TO THE CITY UTILITIES DEPARTMENT FOR APPROVAL BY SIGNATURE PRIOR TO INSTALLATION.
6. ALL SHUT OFF VALVES MUST BE RESILIENT SEATED.
7. FLANGES OR UNIONS TO BE AS CLOSE TO THE ASSEMBLY AS POSSIBLE.
8. DEVICE MAY BE REMOVED FOR WINTER THEN REINSTALLED AND TESTED IN THE SPRING.

* U.S.C. IS UNIVERSITY OF SOUTHERN CALIFORNIA (FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH).

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>PRESSURE VACUUM BREAKER ASSEMBLY (PVBA) INSTALLATION</p>		<p>1 1</p>
	<p>DETAIL NO. 09-06-073</p>	<p>REVISION DATE: 11/22/16</p>	



WATER TRUCK/TANK

NTS

City of Flagstaff



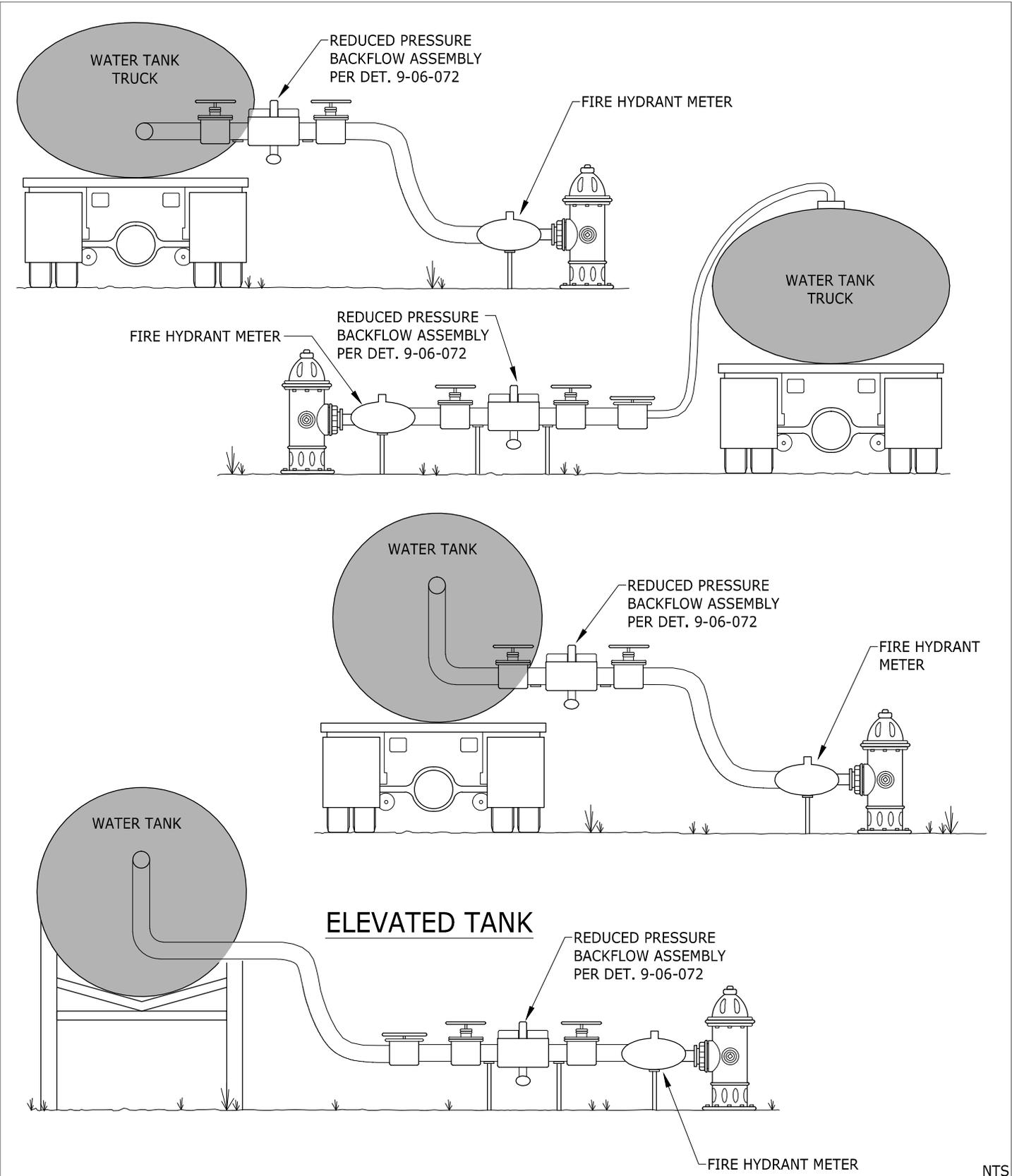
ENGINEERING
DETAIL

AIR GAP BACKFLOW PROTECTION
FOR WATER TANKS

DETAIL NO.
09-06-074

REVISION DATE: 11/22/16

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NTS

City of Flagstaff



ENGINEERING
DETAIL

FIRE HYDRANT METER BACK FLOW PROTECTION

DETAIL NO.

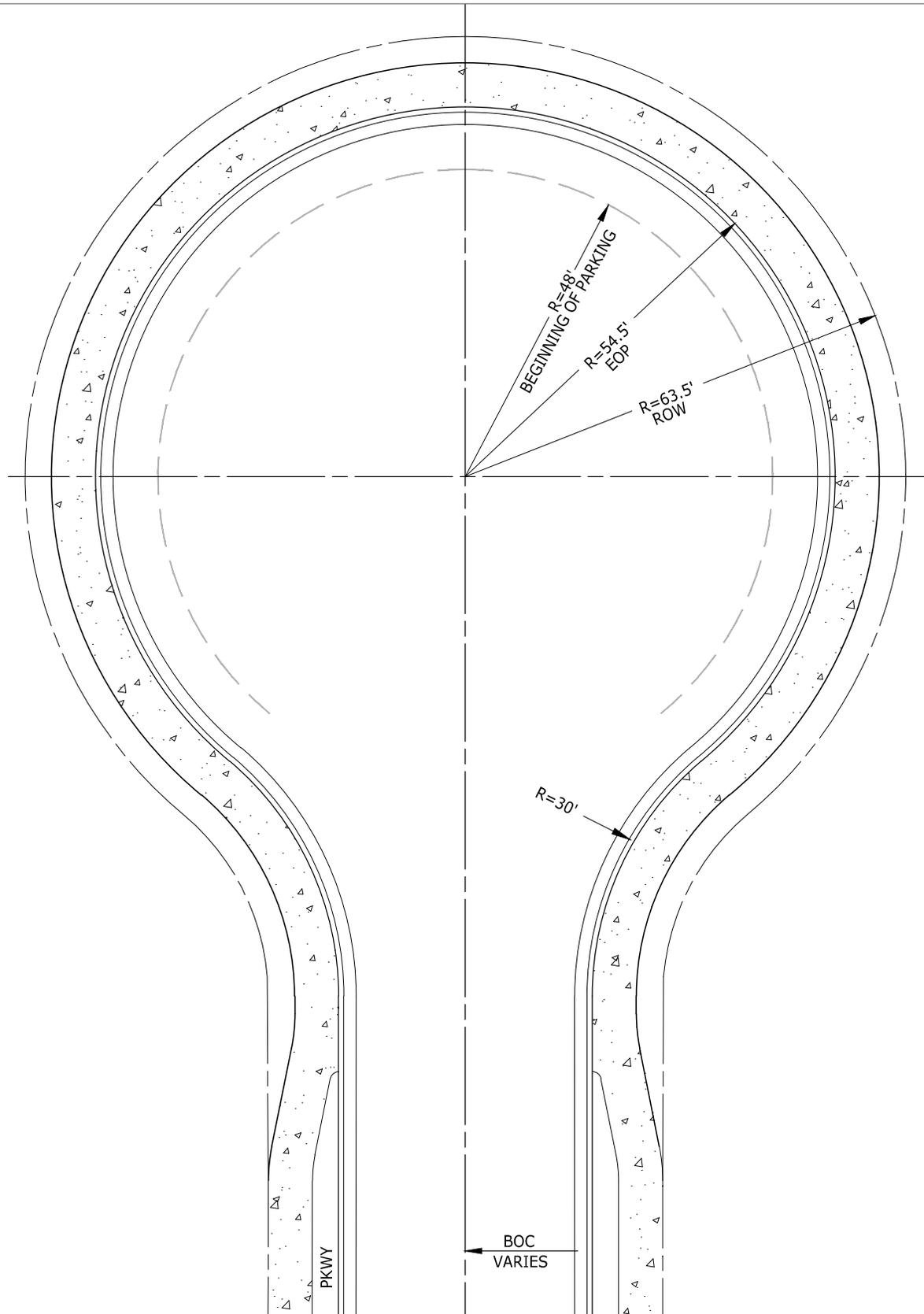
09-06-075

REVISION DATE:

11/22/16

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City of Flagstaff

URBAN CUL-DE-SAC



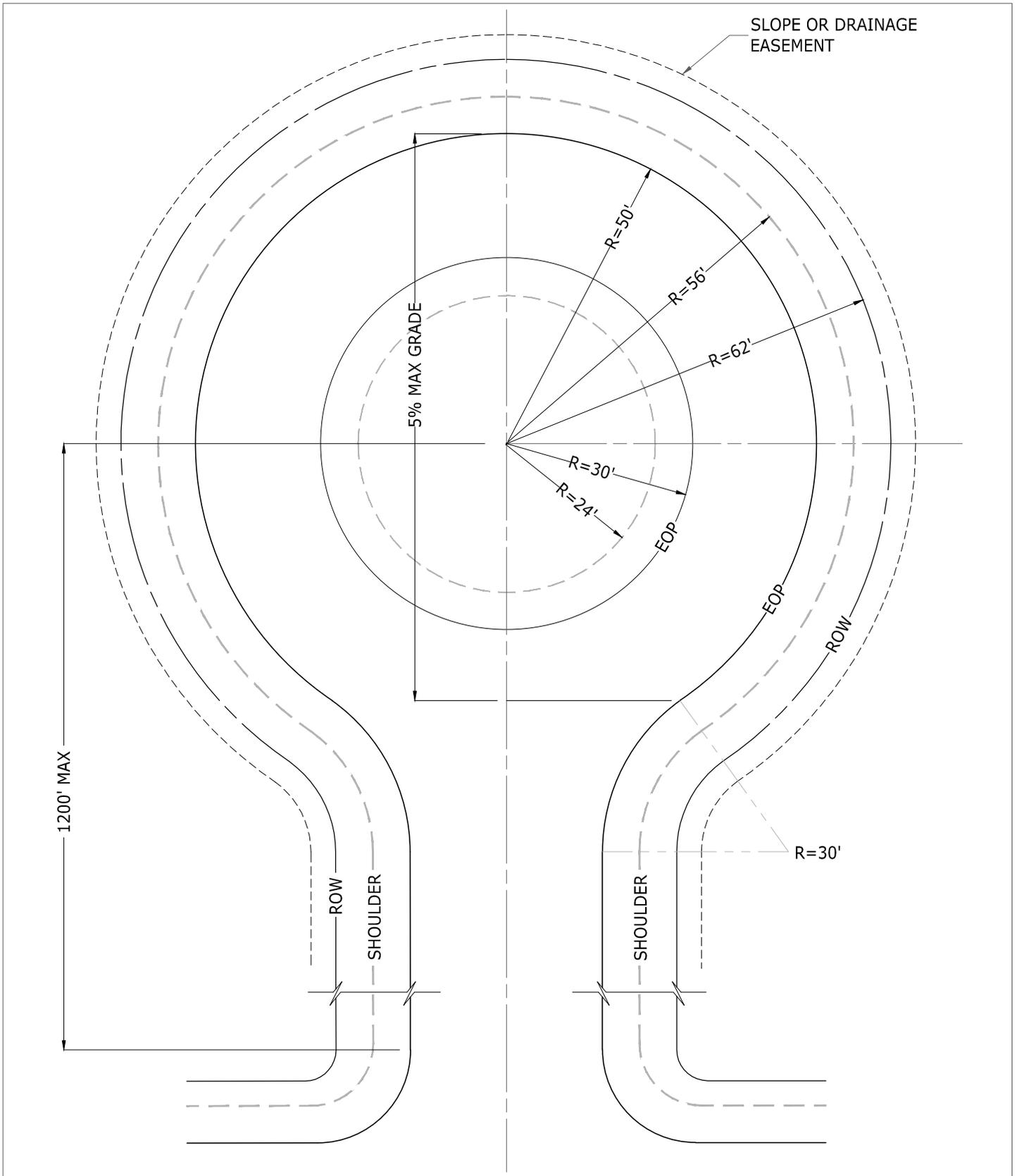
ENGINEERING
DETAIL

DETAIL NO.
10-04-010

REVISION DATE: 11/22/16

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City of Flagstaff

RURAL CUL-DE-SAC

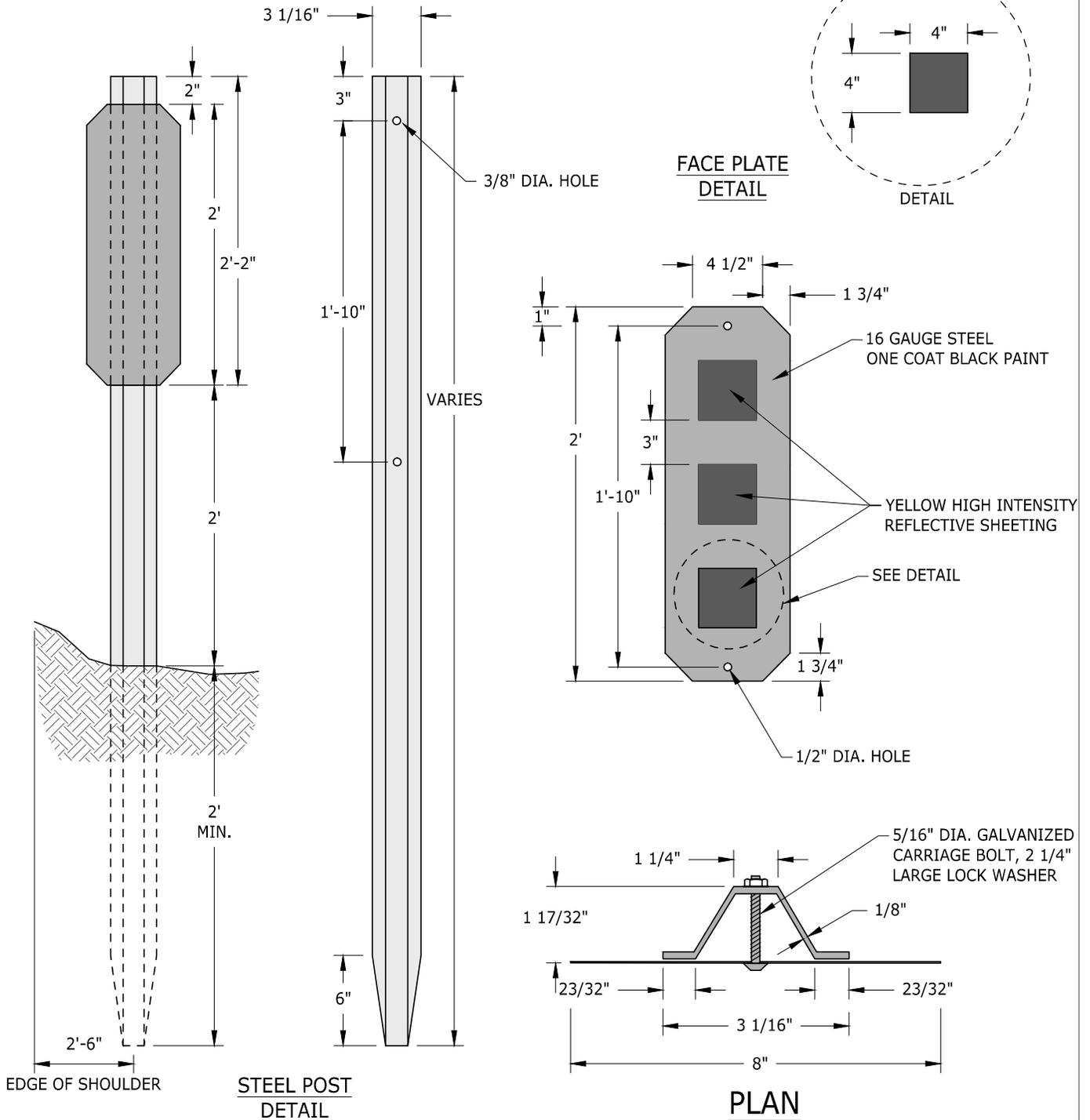


ENGINEERING
DETAIL

DETAIL NO.
10-04-011

REVISION DATE: 11/22/16

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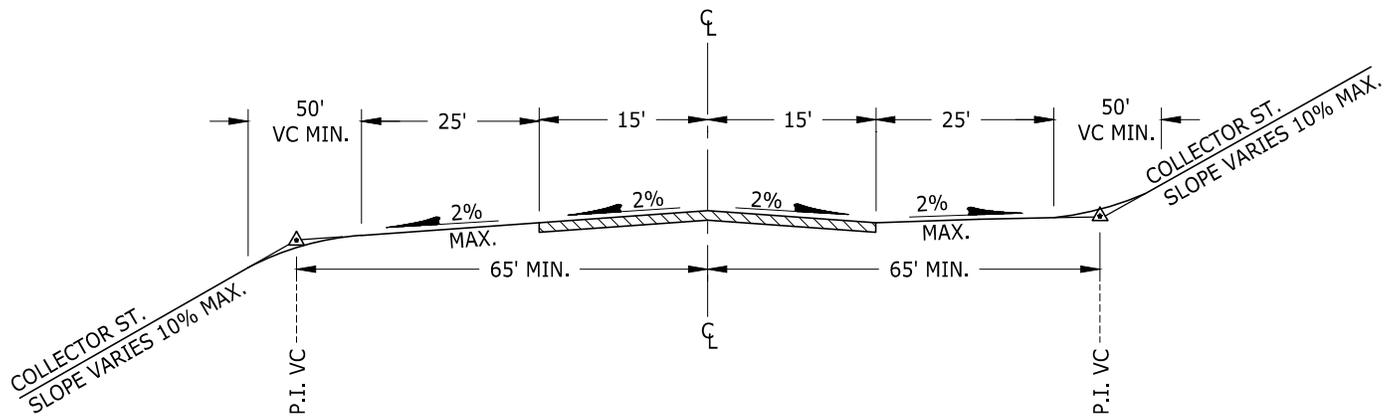


NOTES:

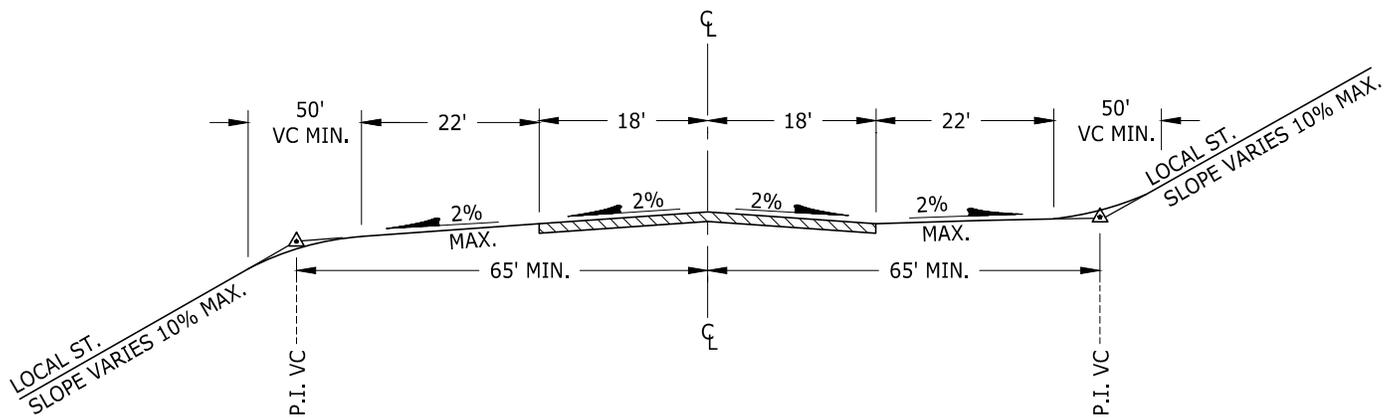
1. ROADSIDE DELINEATOR SHALL BE PLACED AT THE DIRECTION OF THE TRAFFIC ENGINEER OR IN ACCORDANCE WITH THE GUIDELINES PRESENTED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
2. ON DEAD END STREET, DELINEATORS SHALL BE PLACED AT THE END OF PAVING ON PAVED STREET AND AT THE END OF THE TRAVELED WAY ON UNPAVED STREETS. USE MAG STD 130 TYPE 'A' or 'B' ON TEMPORARY DEAD ENDS.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	STANDARD DELINEATOR		
	<p>DETAIL NO. 10-06-011</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



COLLECTOR STREET



LOCAL STREET

NOTES:

1. THIS STANDARD SHALL BE APPLIED TO EACH MINOR LEG OF AN INTERSECTION AS DETERMINED BY THE CITY ENGINEER.
2. GRADES SHOWN ARE AT MINOR STREET CENTERLINE. INDIVIDUAL CONSIDERATION SHALL BE GIVEN AT THE CURB LINE TO INSURE POSITIVE DRAINAGE AT THE VALLEY GUTTER. SUITABLE MEASURES SHALL BE TAKEN WHERE NECESSARY TO INSURE THAT PROPER DRAINAGE PATTERN IS OBTAINED AT THE INTERSECTION. LARGER SCALE INTERSECTION DETAILS MAY BE REQUIRED.

NTS

City of Flagstaff



ENGINEERING
DETAIL

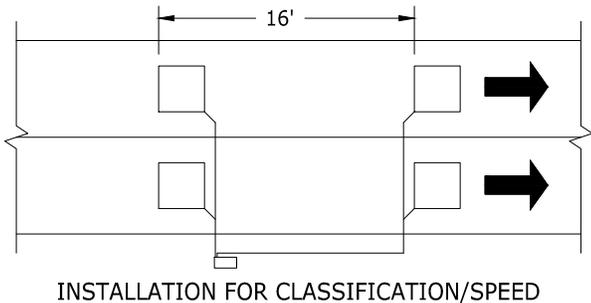
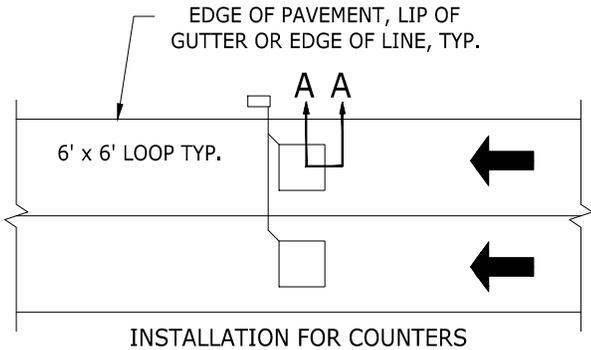
STOP RAMP PARAMETERS

DETAIL NO.
10-06-012

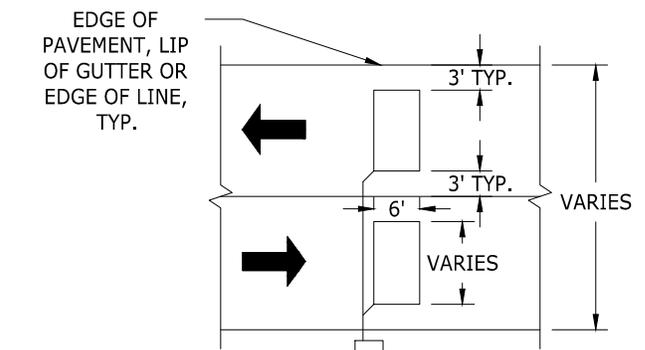
REVISION DATE: 11/22/16

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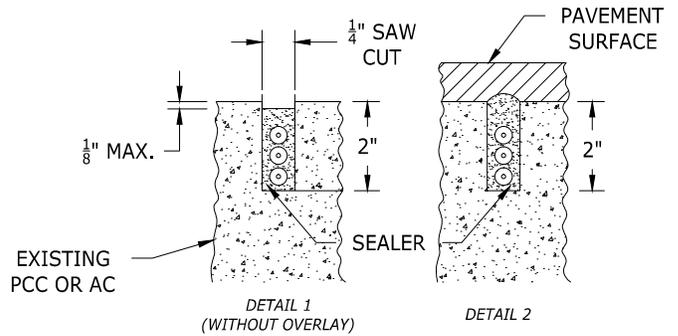
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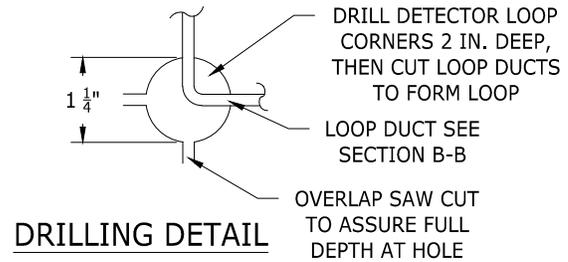
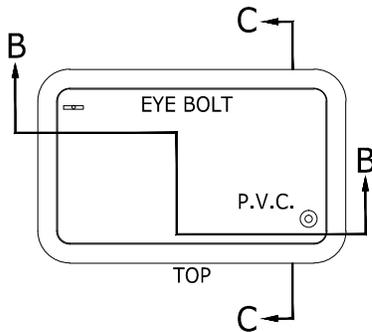
**LOOP INSTALLATION
IN MULTI-LANE ROADWAY**



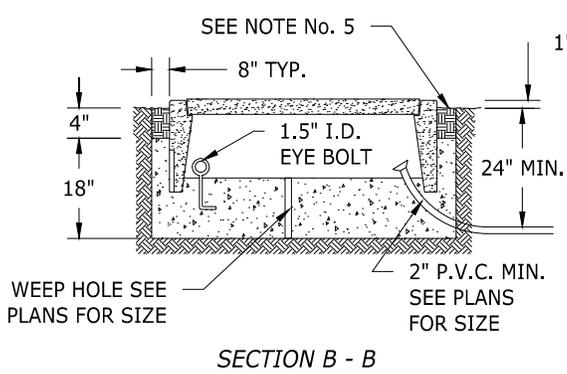
**LOOP INSTALLATION
IN 2-LANE ROADWAY**



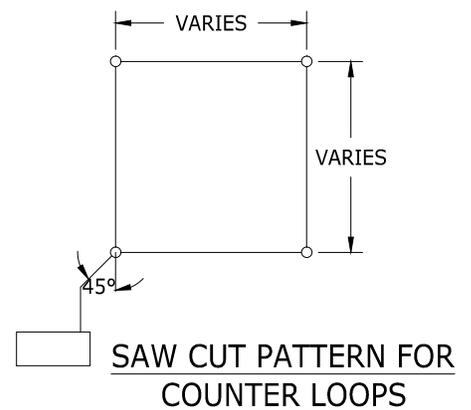
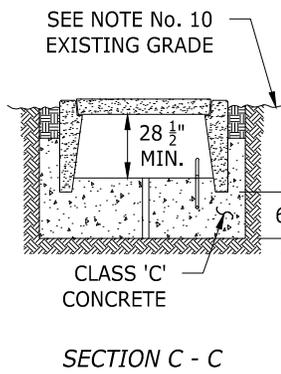
SECTION A - A



DRILLING DETAIL



**TYPICAL NO. 7 PULL BOX
INSTALLATION FOR TRAFFIC COUNTER**



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City of Flagstaff



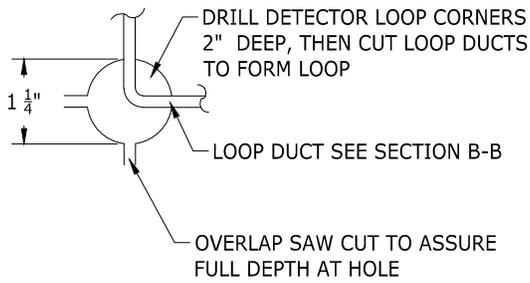
ENGINEERING
DETAIL

**DETECTOR LOOPS
FOR TRAFFIC COUNTERS**

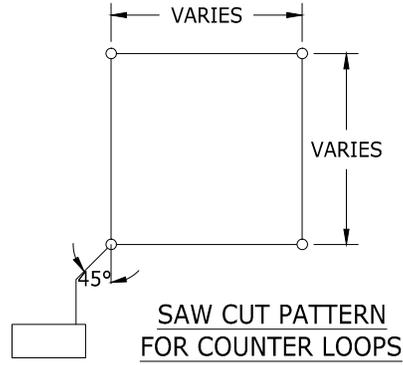
DETAIL NO.
10-06-013

REVISION DATE: 11/22/16

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2



DRILLING DETAIL



NOTES:

1. ONE DETECTOR LOOP PER LANE SHALL BE INSTALLED AND CENTERED IN THE TRAVEL LANE.
2. SPEED MONITORING AND VEHICLE CLASSIFICATION SYSTEMS REQUIRE 2 LOOPS PER LANE, CENTERED IN THE LANE, WITH 16 FEET FROM LEADING EDGE TO LEADING EDGE. THE LEADING EDGE OF BOTH LOOPS MUST BE PARALLEL TO EACH OTHER WITH NO MORE THAN 1 INCH OF VARIATION ACROSS THE FACE OF THE LOOPS.
3. LOOPS OF 6 FT. X 6 FT. ARE STANDARD FOR LANES UP TO 12 FEET WIDE. FOR WIDER LANES, ADJUST THE WIDTH OF THE LOOP TO MAINTAIN 3 FEET FROM THE CENTER STRIPE AND 3 FEET FROM THE EDGE OF PAVEMENT, EDGE LINE, OR THE LIP OF GUTTER. FOR LANES NARROWER THAN 12 FEET, ADJUST THE WIDTH TO MAINTAIN 3 FEET FROM THE CENTER STRIPE AND AT LEAST 1 FT. FROM EDGE OF PAVEMENT, EDGE LINE, OR THE LIP OF GUTTER WHILE MAINTAINING 6 FT. LENGTH OF LOOP.
4. THREE TURNS OF SHEATHES, THHN STRANDED 14 AWG SINGLE CONDUCTOR COPPER WIRE (IN PVC TUBING) IS THE STANDARD FOR COUNTER AND CLASSIFICATION / SPEED LOOPS.
5. BACKFILL PULL BOX WITH EXCAVATED MATERIAL AND THOROUGHLY TAMP.
6. PULL BOXES INSTALLED IN CONCRETE AREAS SHALL USE $\frac{1}{2}$ INCH FELT AS AN EXPANSION JOINT.
7. ALL UNUSED EXCAVATION MATERIAL SHALL BE PROPERLY DISPOSED.
8. SAW CUTS SHALL BE SEALED WITH AN APPROVED SEALER AS PER THE CURRENT ARIZONA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION.
9. EMULSIFIED CRACK FILLER (CRF OR APPROVED EQUAL) AND SILICA SAND MIXTURE ARE TO BE USED ON ALL INSTALLATIONS IN ASPHALTIC CONCRETE, WITH OR WITHOUT AN OVERLAY.
10. WHEN A PULL BOX IS INSTALLED IN SIDEWALK, INSTALL PULL BOX FLUSH WITH THE TOP OF SIDEWALK.

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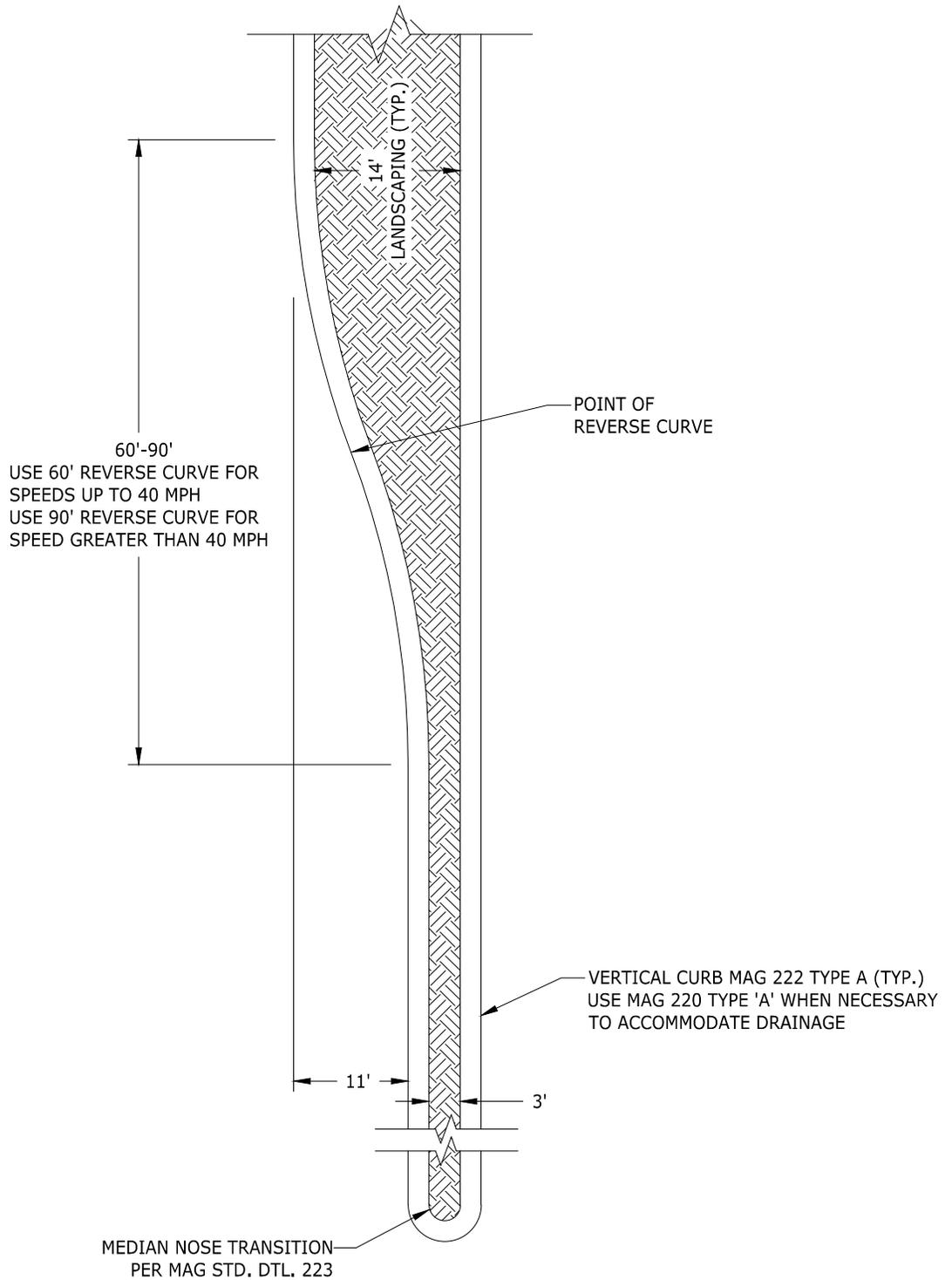
ENGINEERING
DETAIL

**DETECTOR LOOPS
FOR TRAFFIC COUNTERS**

DETAIL NO.
10-06-013

REVISION DATE: 11/22/16

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City of Flagstaff

MEDIAN WITH 90' or 60' TAPER



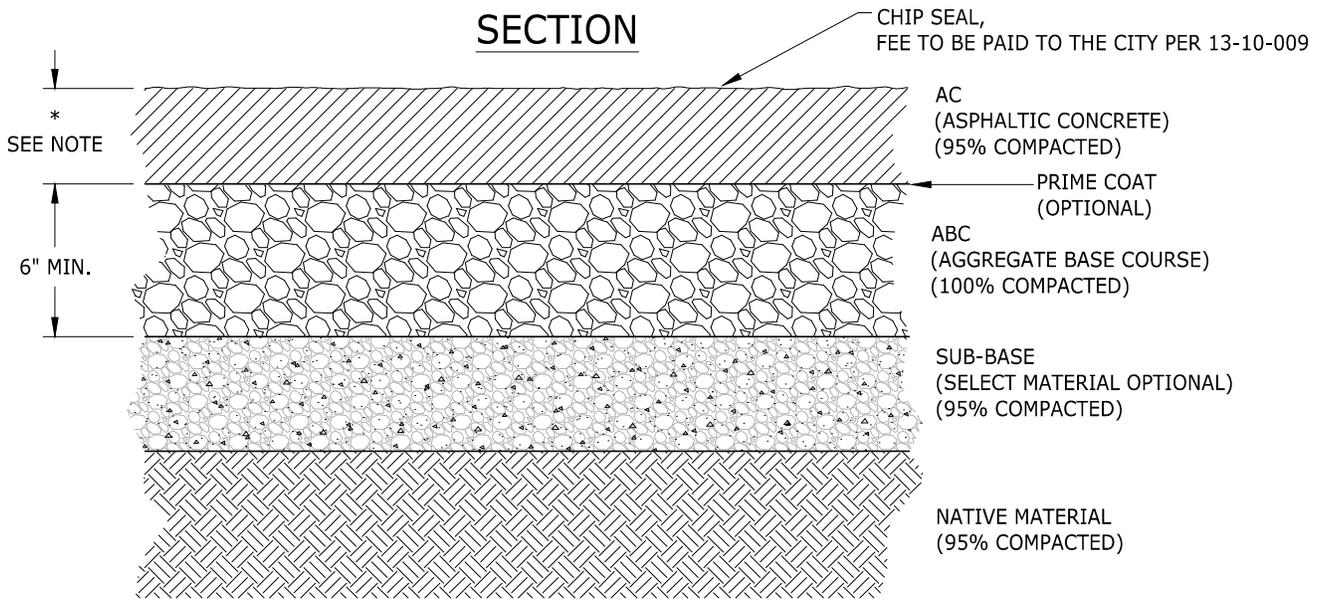
ENGINEERING
DETAIL

DETAIL NO.
10-06-014

REVISION DATE: 11/22/16

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SECTION



* THE MINIMUM DEPTH OF THE AC VARIES, DEPENDING ON THE TYPE OF ROADWAY. THE TYPICAL MINIMUM PAVEMENT DEPTHS ARE AS FOLLOWS, OR MATCH EXISTING, WHICHEVER IS GREATER.

ARTERIALS = 5"
COLLECTORS = 4"
LOCALS & ALLEYS = 3"

OFF-STREET PARKING MINIMUM DEPTH OF AC IS 2 1/2"
PARKING LOTS MAY BE PAVED WITH 4" PORTLAND CEMENT CONCRETE UPON COMPACTED SUBGRADE.

ALTERNATIVE SECTIONS:

1. FOR PARKING LOTS, ALTERNATIVE SECTIONS OF PAVEMENT WILL BE CONSIDERED (i.e. PAVERS, POROUS ASPHALT AND CONCRETE, GRASS CRETE, GRAVEL PAVE, ETC.)

NOTES:

1. ALTERNATIVE SECTIONS SHALL BE LIMITED TO THE PARKING AREAS AND DRIVE AISLES THAT DO NOT SERVE AS FIRE ACCESS AISLES.
2. THE PROFESSIONAL ENGINEER MAY RECOMMEND PAVEMENT STRUCTURAL SECTION THAT ARE EQUIVALENT TO THE MINIMUM SECTIONS ABOVE.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>PAVEMENT STRUCTURAL SECTIONS for STREETS & OFF-STREET PARKING LOTS</p>		
	<p>DETAIL NO. 10-09-010</p>	<p>REVISION DATE: 11/22/16</p>	<p>1</p>

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City of Flagstaff

ENGINEERING
DETAIL

ARTERIAL (MAJOR or MINOR)

DETAIL NO.

10-09-032

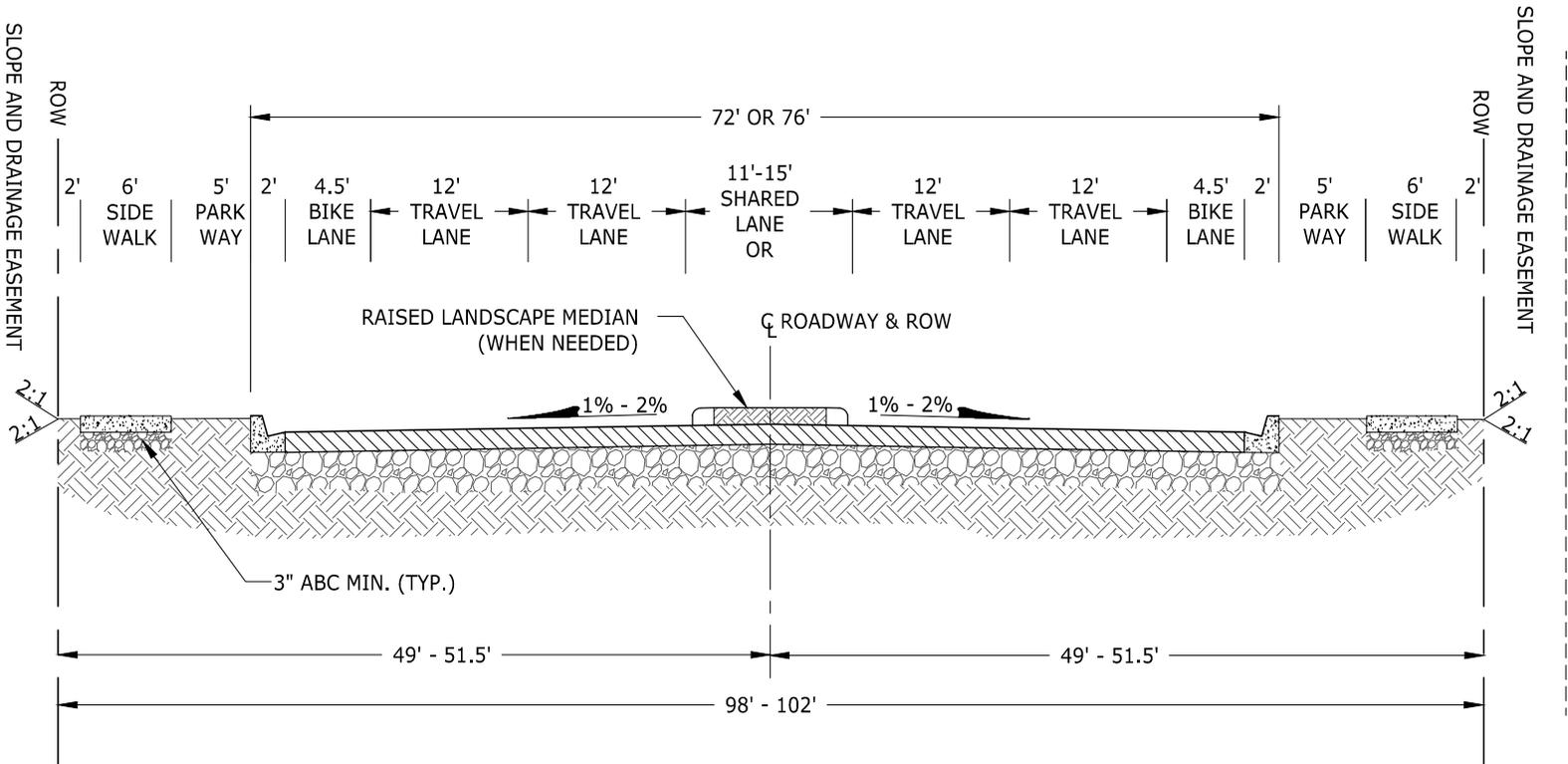
REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

MAJOR COLLECTORS

DETAIL NO.

10-09-034

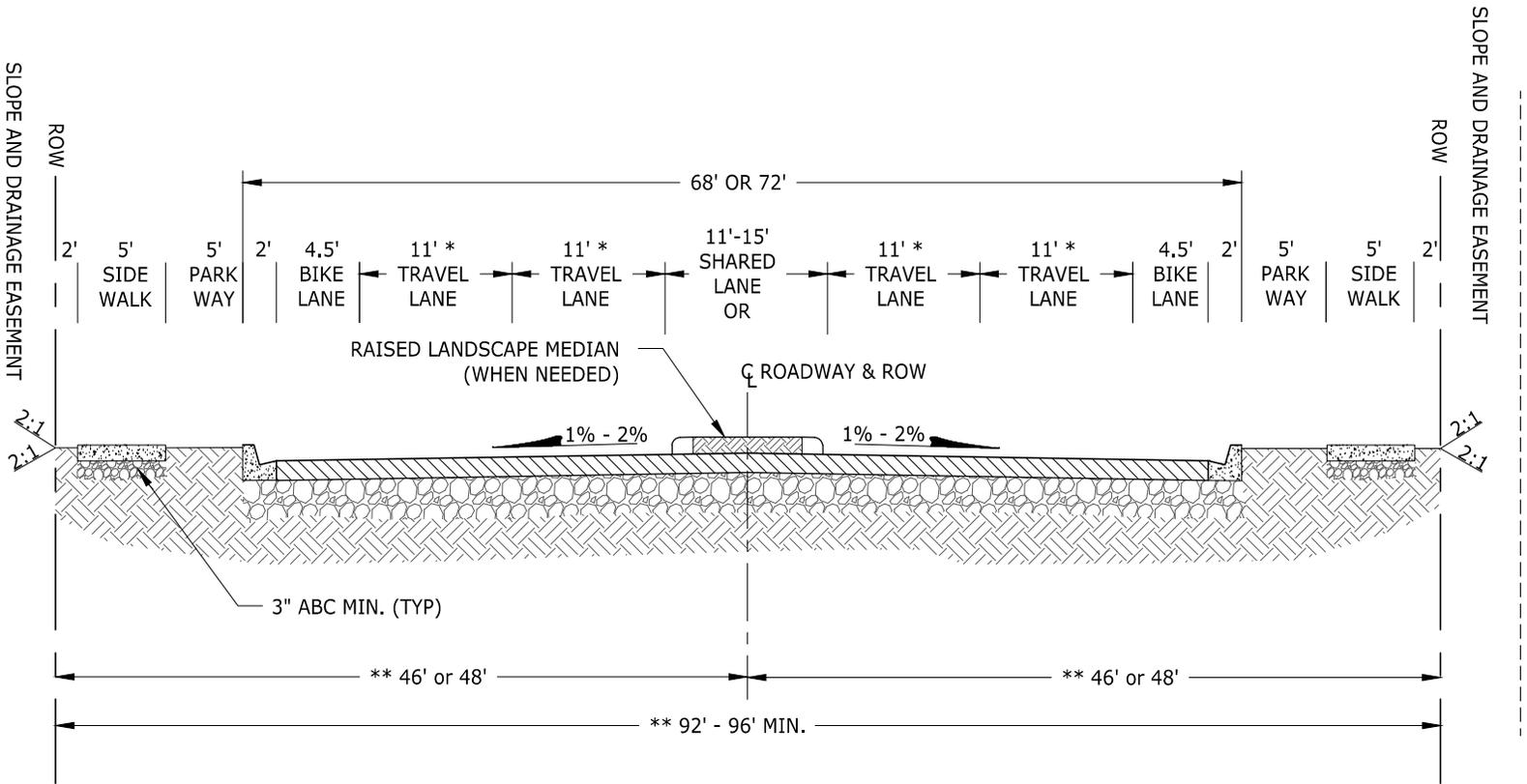
REVISION DATE:

11/22/16

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NOTES:

- * MINIMUM TRAVEL LANE WIDTH = 12' FOR ALL TRUCK ROUTES OR WHEN DESIGN SPEED IS 40 MPH or GREATER
- ** INCREASE THESE DIMENSIONS WHEN TRAVEL LANES ARE 12'



City of Flagstaff

ENGINEERING
DETAIL

MINOR COLLECTOR

NTS

DETAIL NO.

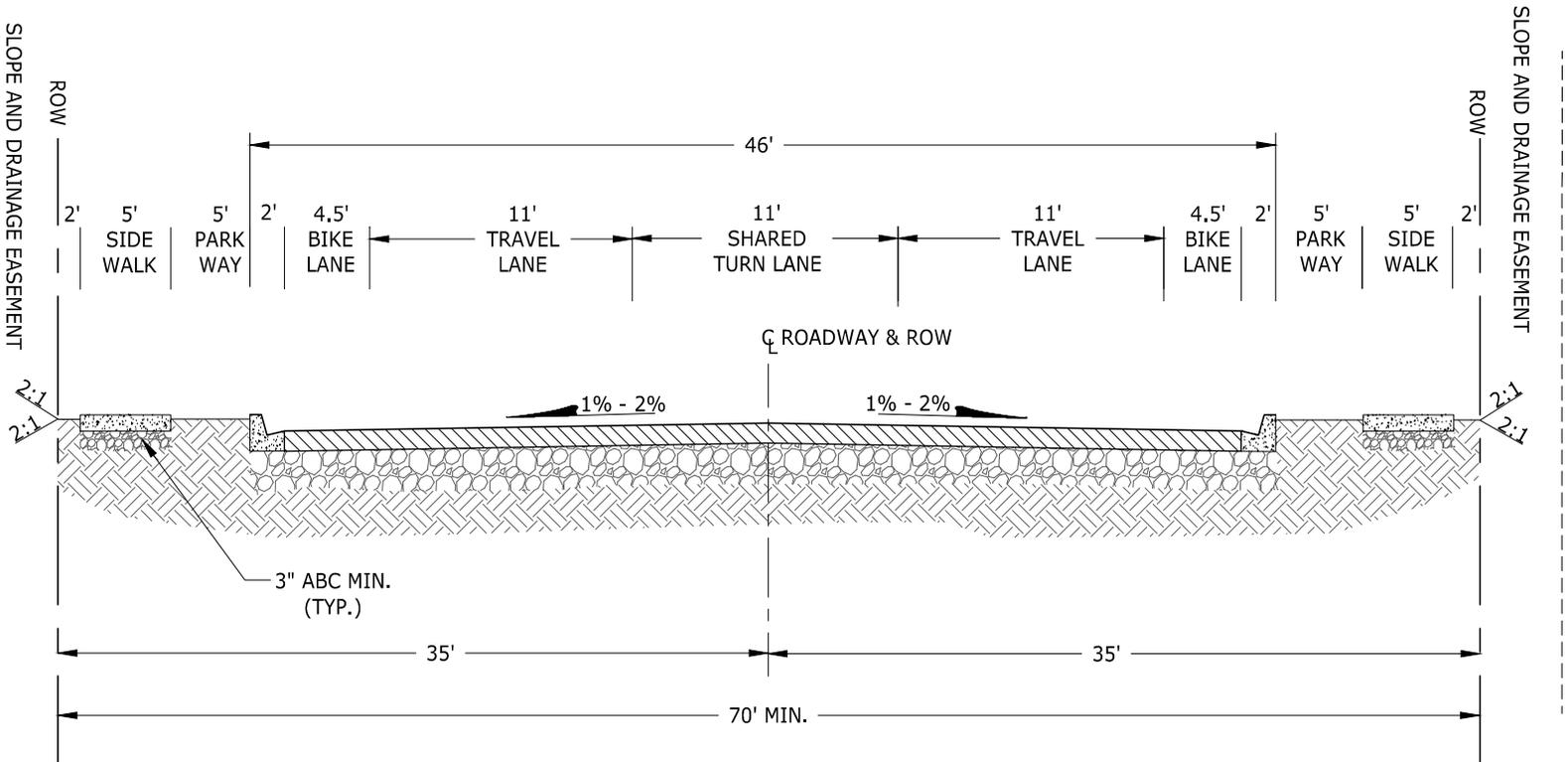
10-09-035

REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

COMMERCIAL LOCAL

NTS

DETAIL NO.

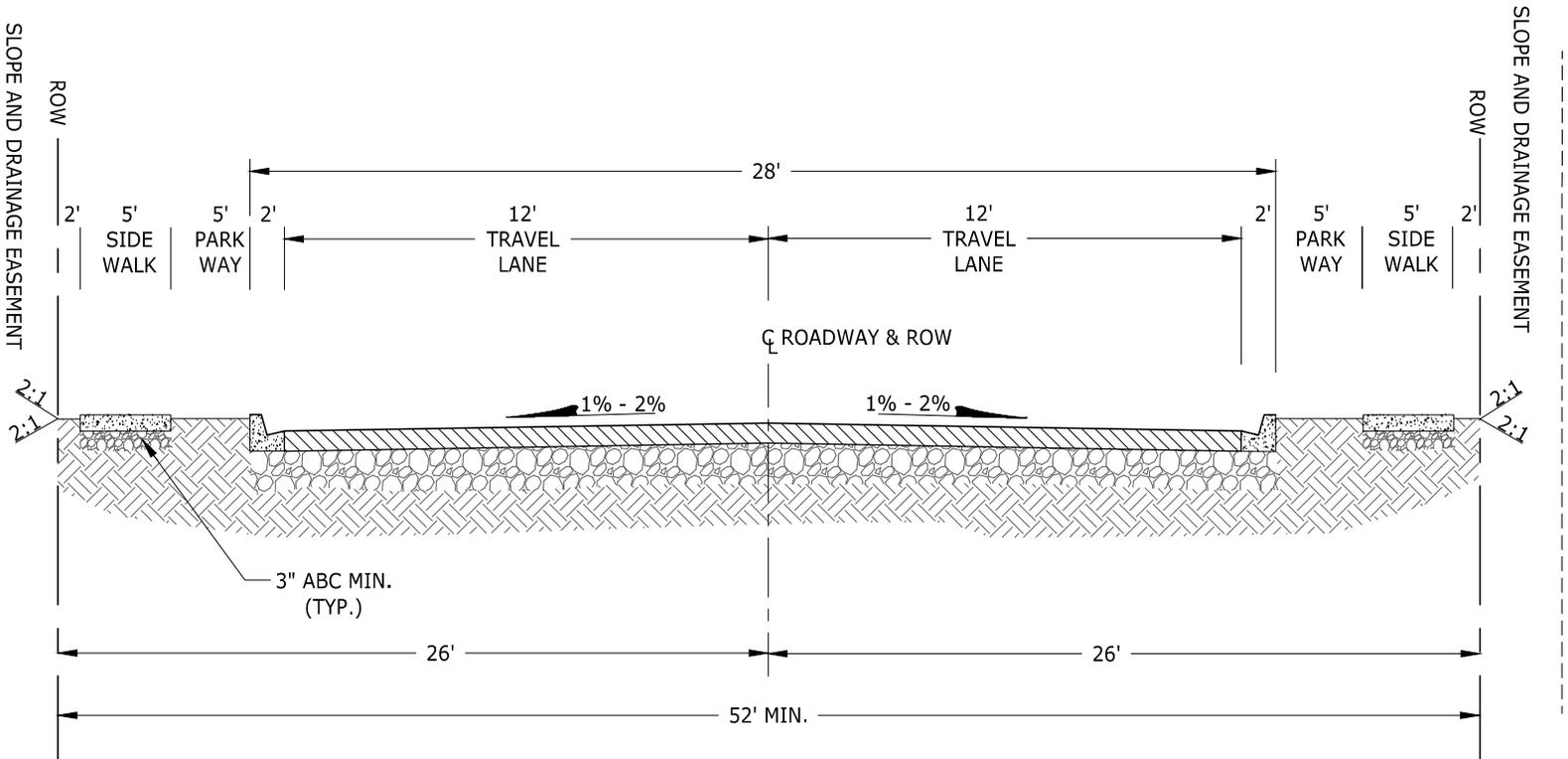
10-09-036

REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

RESIDENTIAL LOCAL "WIDE"

DETAIL NO.

10-09-037

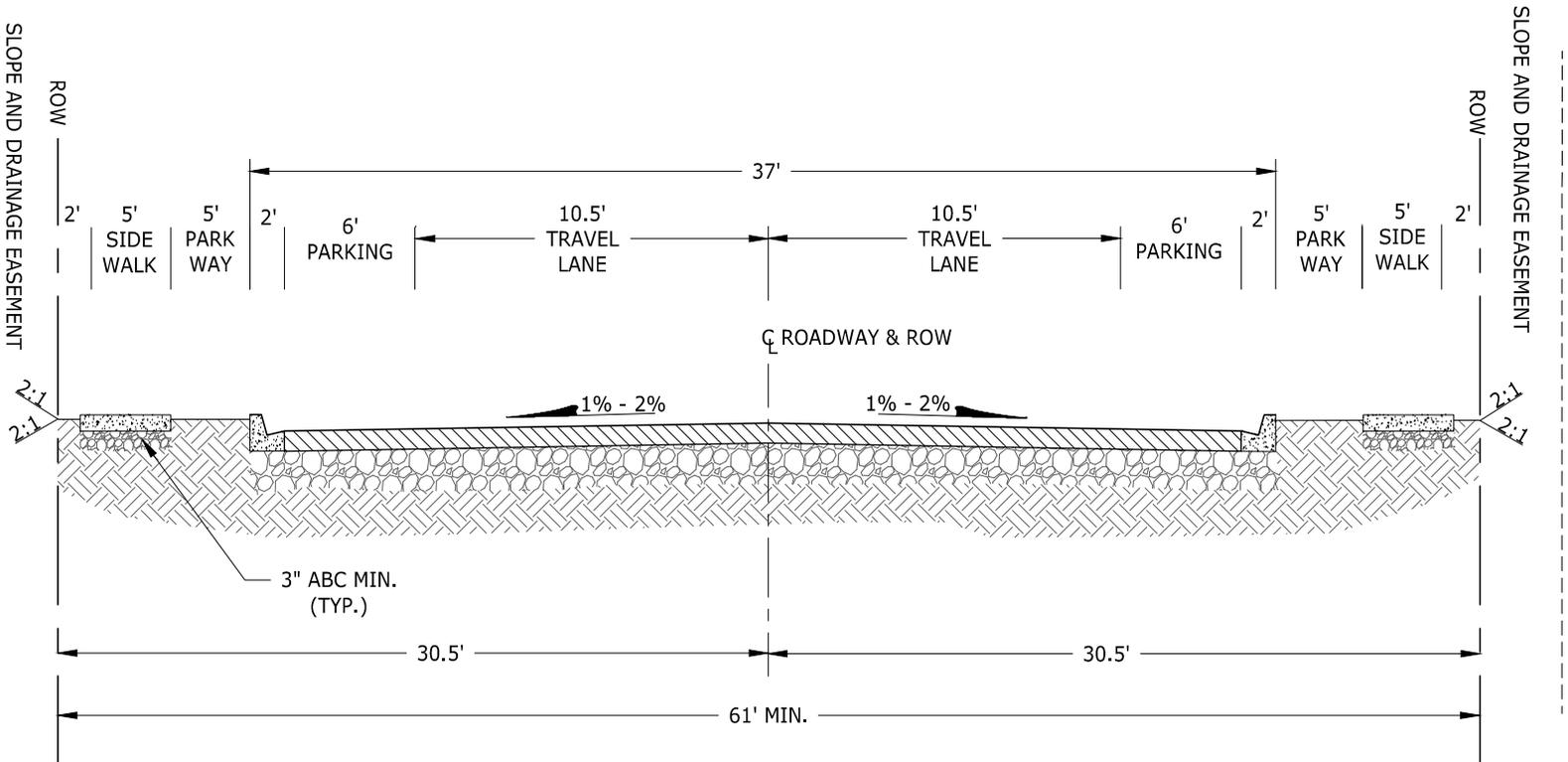
REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

RESIDENTIAL LOCAL

NTS

DETAIL NO.

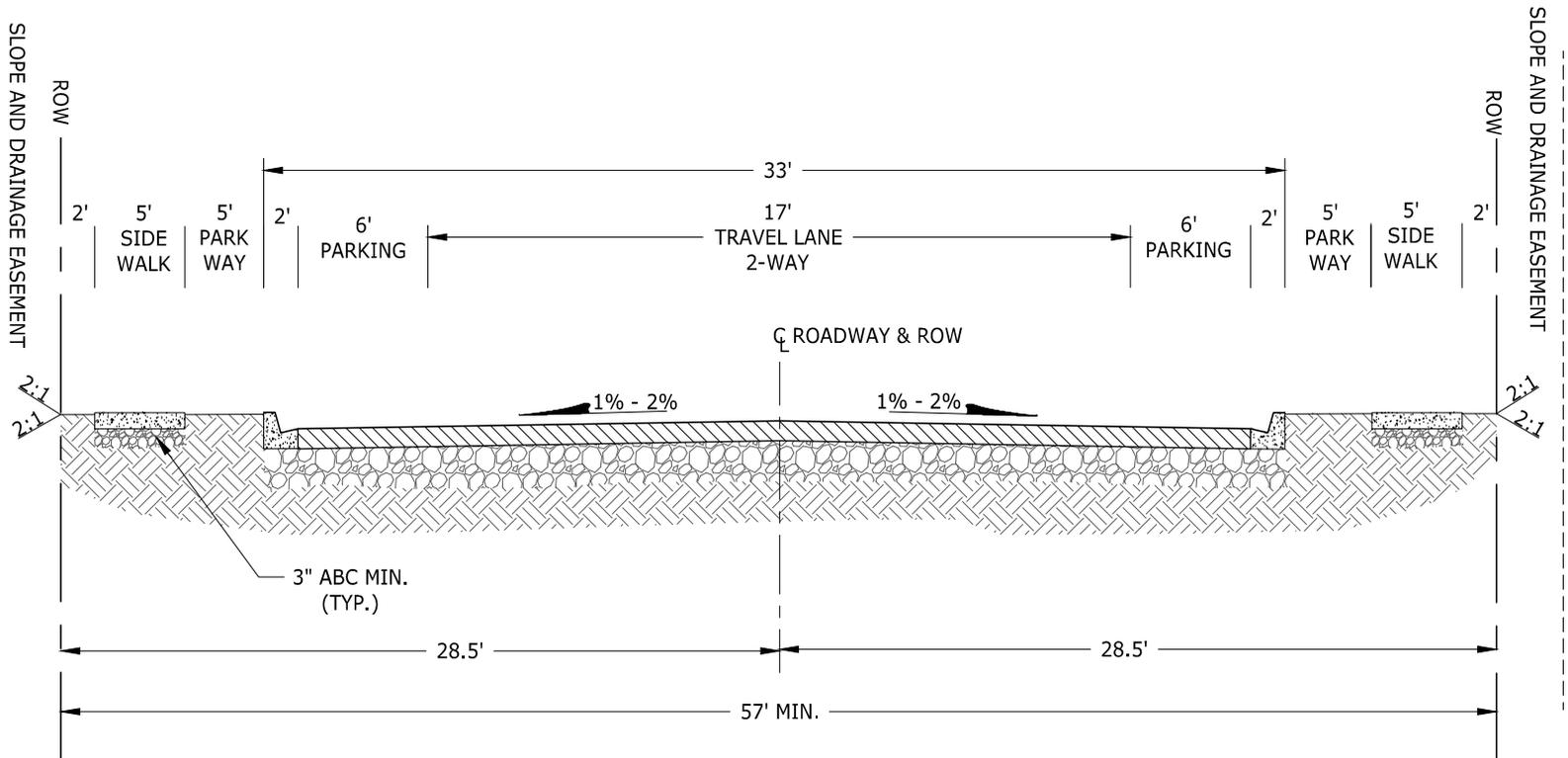
10-09-038

REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

RESIDENTIAL LOCAL "NARROW"

DETAIL NO.

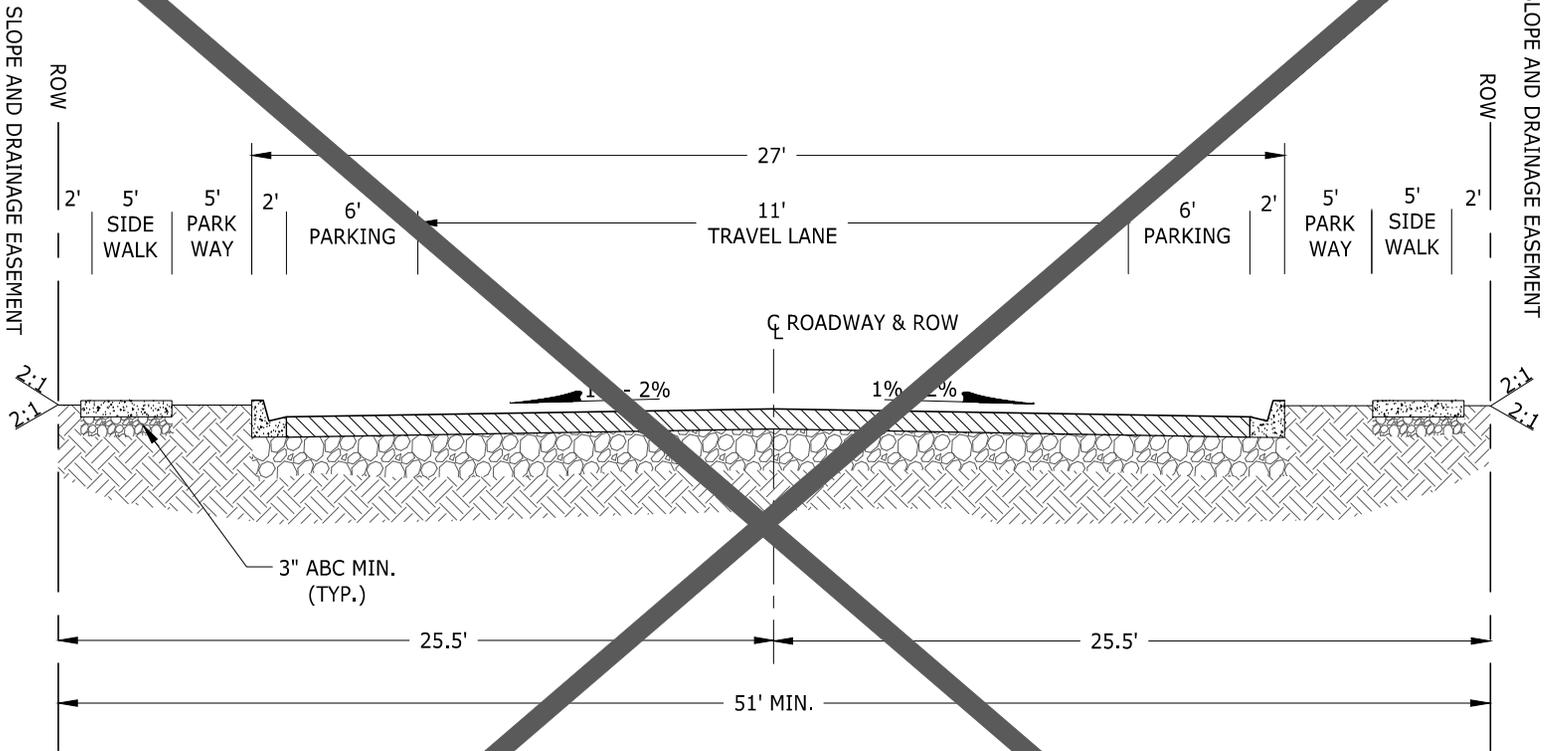
10-09-039

REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

MAJOR ARTERIAL "COMMERCIAL CENTER"

DETAIL NO.

10-09-040

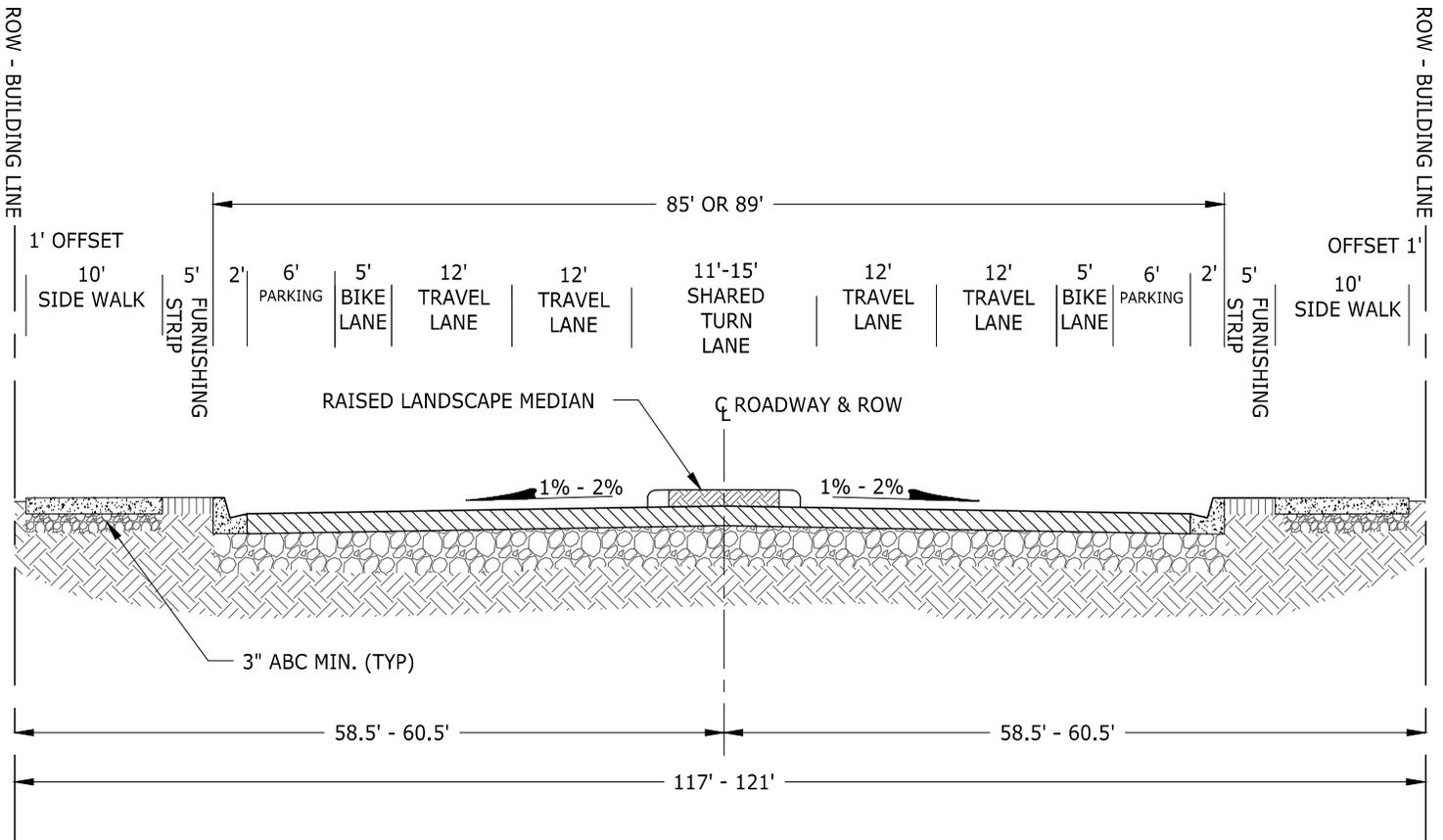
REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

MINOR ARTERIAL "COMMERCIAL CENTER"

DETAIL NO.

10-09-041

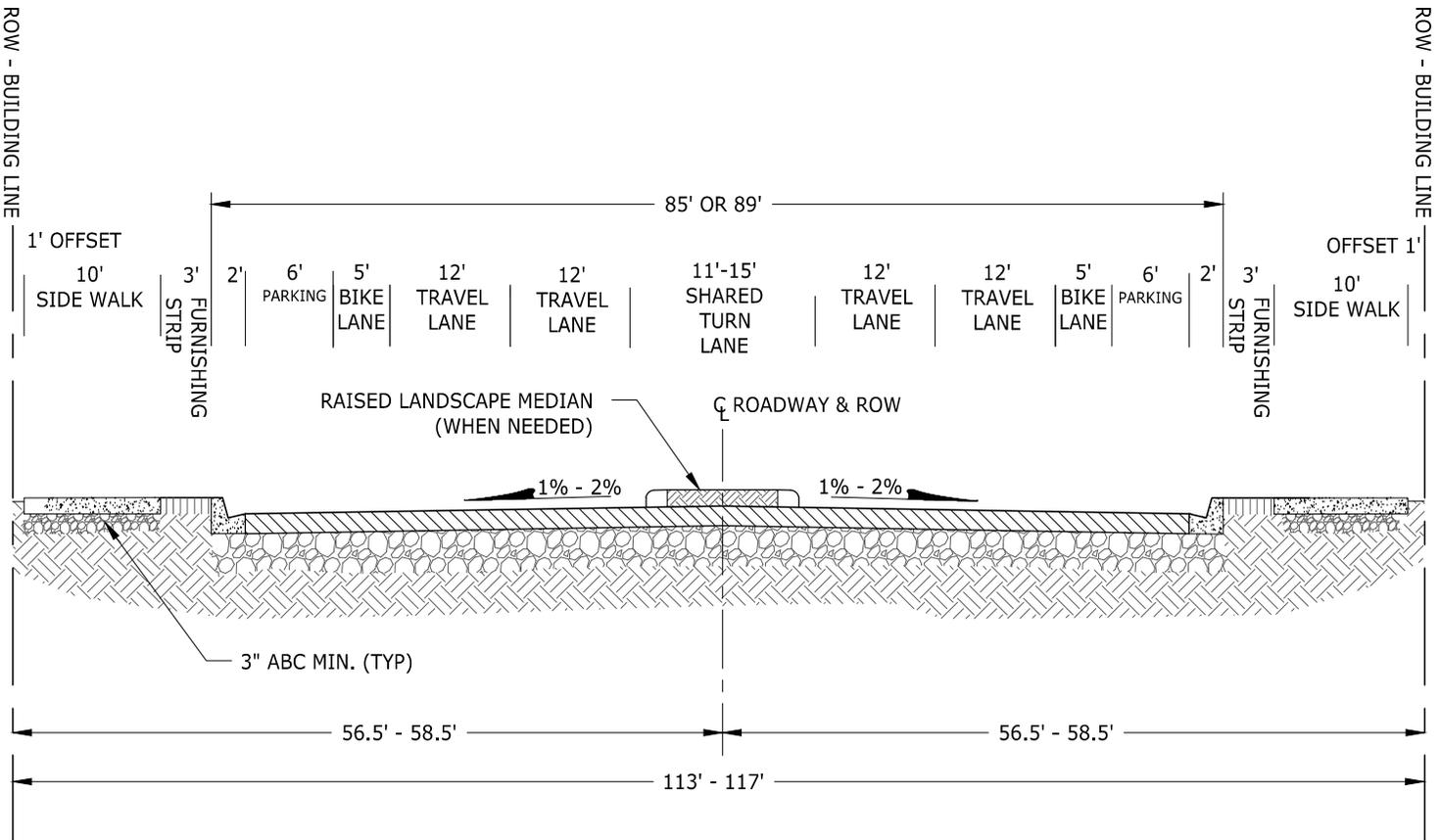
REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

MAJOR COLLECTOR "COMMERCIAL CENTER"

DETAIL NO.

10-09-042

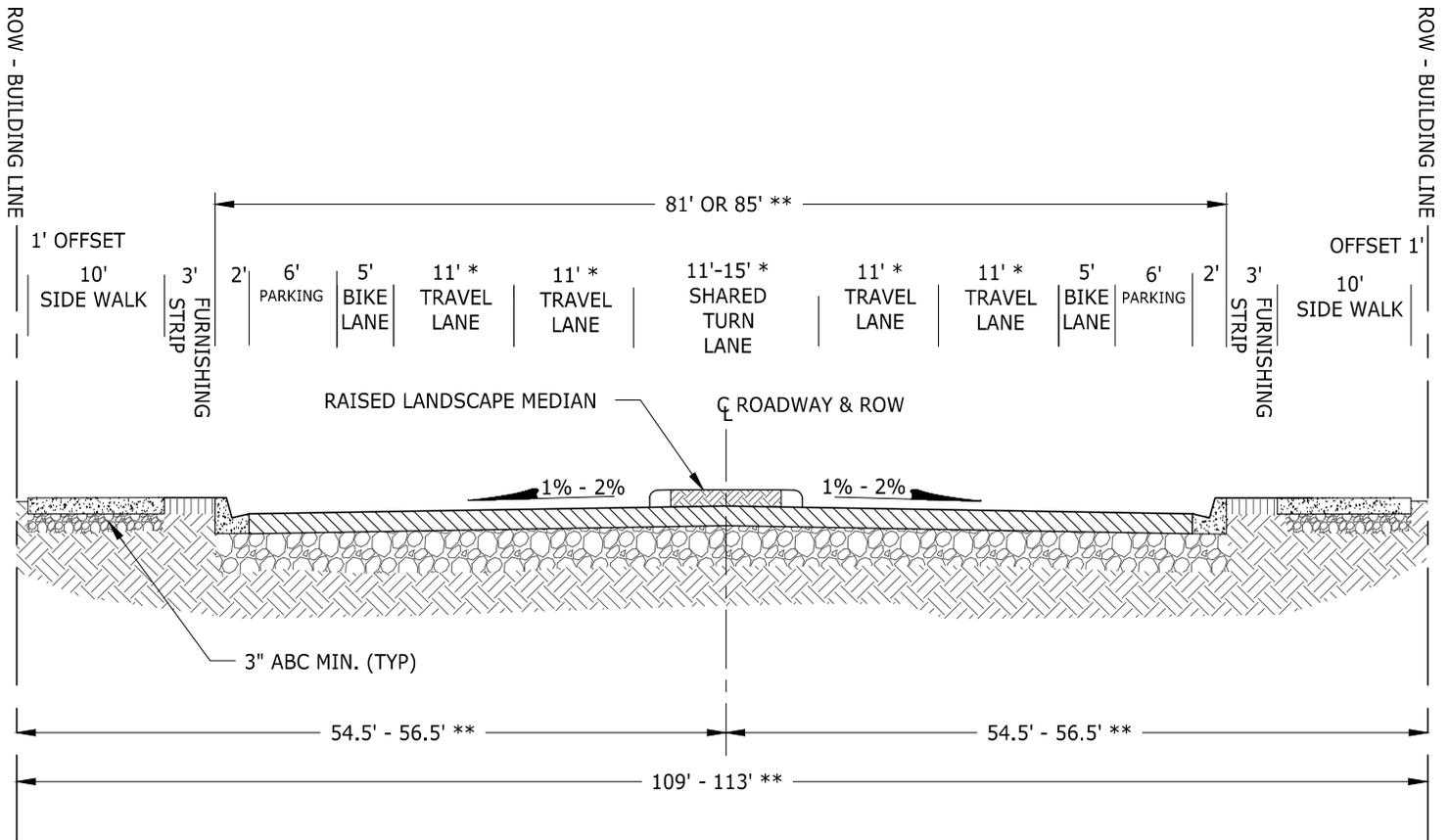
REVISION DATE:

11/22/16

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NTS



NOTES:

- * TRAVEL LANES SHALL BE 12' ALONG TRUCK ROUTES OR WHEN DESIGN SPEED IS 40 MPH OR GREATER
- ** WHEN TRUCK LANES ARE USED THESE DIMENSIONS WILL INCREASE ACCORDINGLY.



City of Flagstaff

ENGINEERING
DETAIL

MINOR COLLECTOR "COMMERCIAL CENTER"

DETAIL NO.

10-09-043

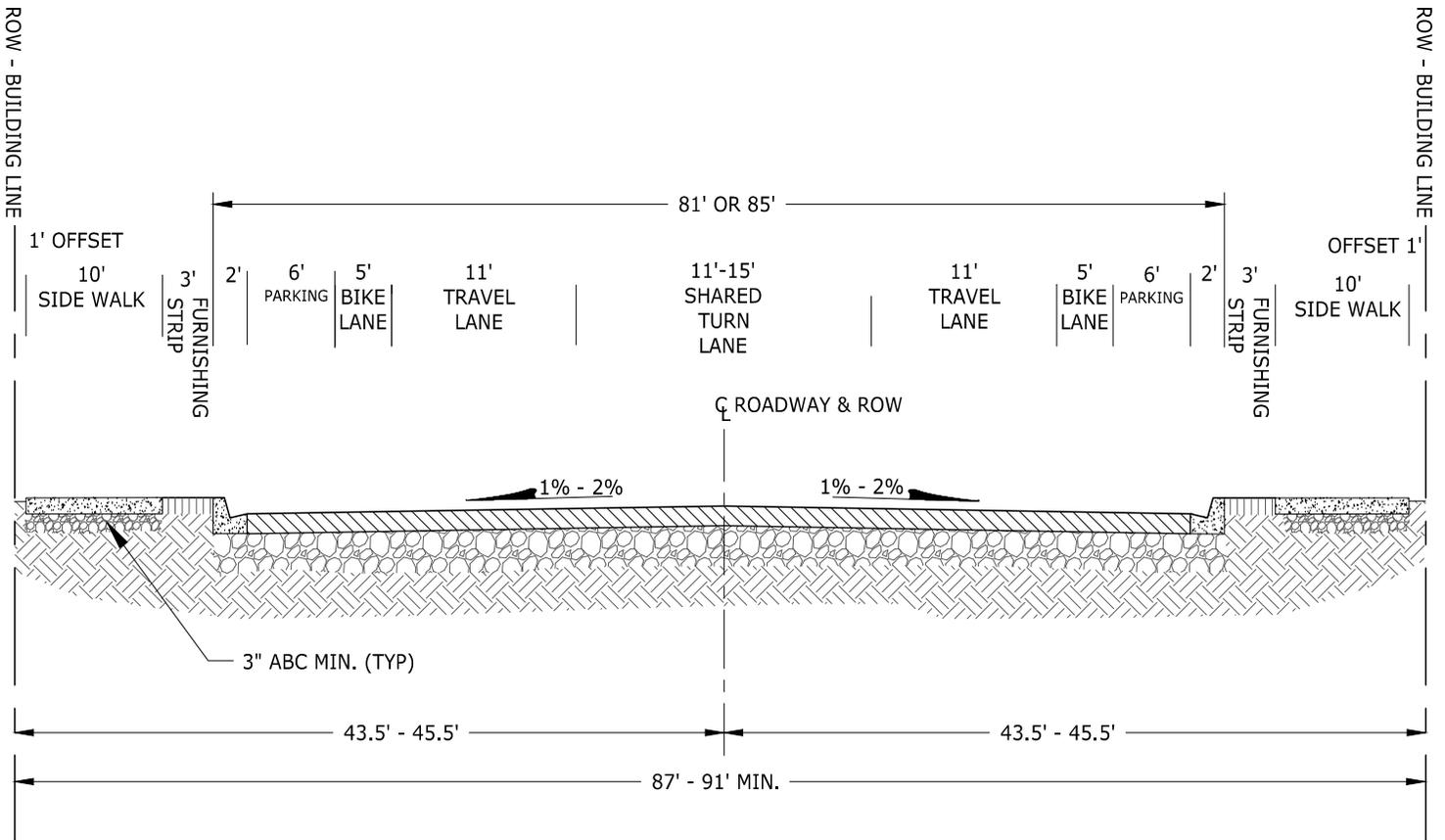
REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

COMMERCIAL LOCAL "COMMERCIAL CENTER"

DETAIL NO.

10-09-044

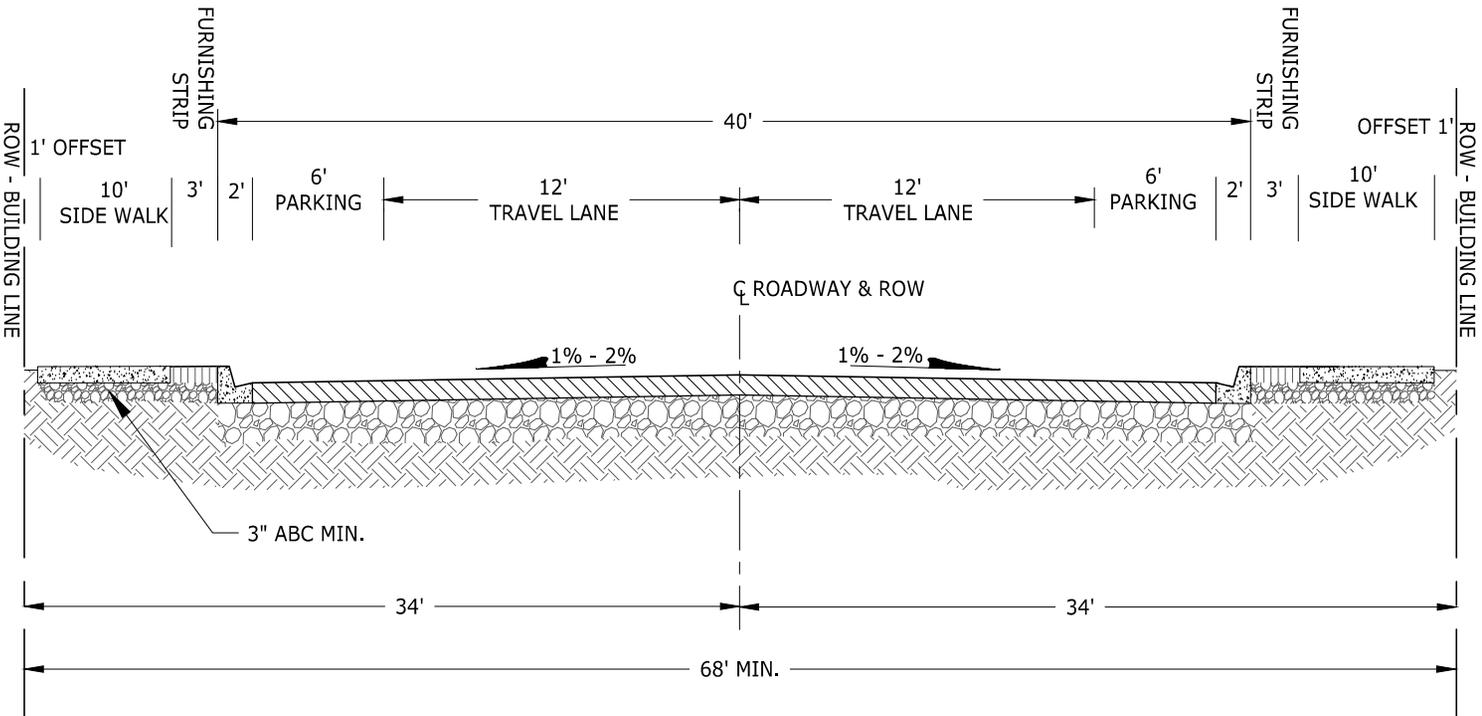
REVISION DATE:

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City of Flagstaff

ENGINEERING
DETAIL

RURAL ARTERIAL

NTS

10-09-045

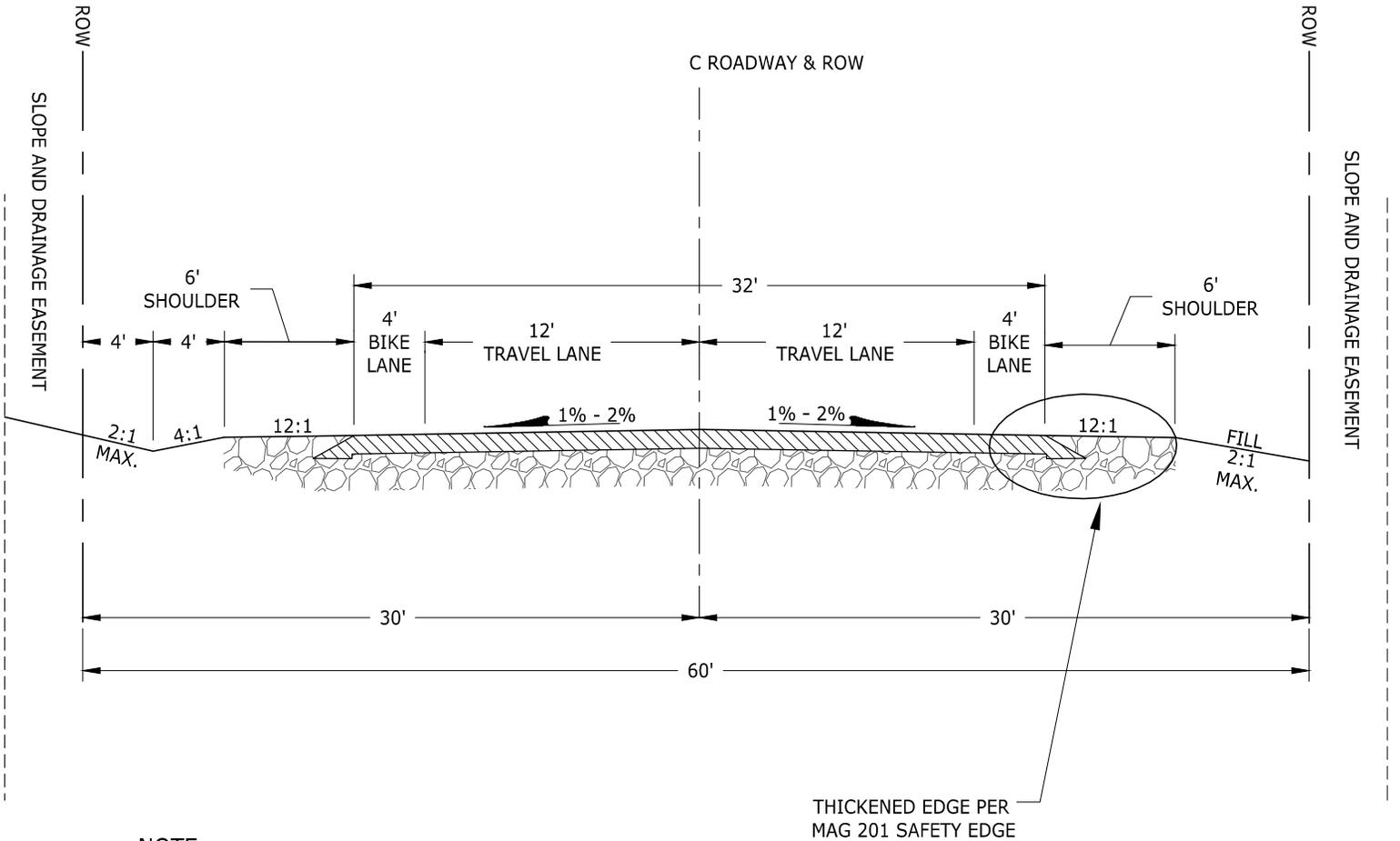
DETAIL NO.

REVISION DATE:

11/22/16

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NOTE:
CURB, GUTTER, AND SIDEWALK ARE OPTIONAL

THICKENED EDGE PER
MAG 201 SAFETY EDGE



City of Flagstaff

ENGINEERING
DETAIL

RURAL COLLECTOR

NTS

10-09-046

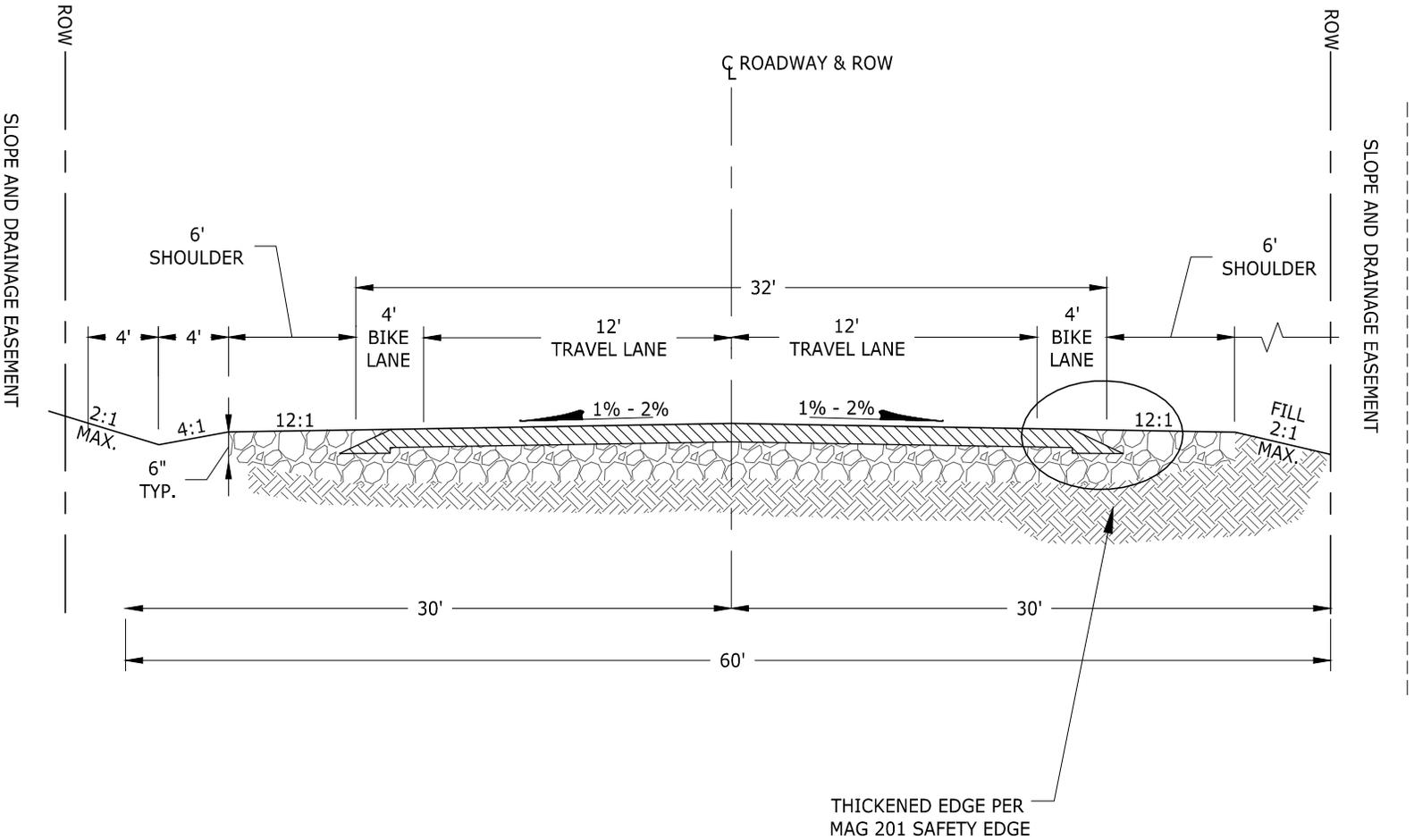
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REVISION DATE:

11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

RURAL LOCAL

NTS

DETAIL NO.

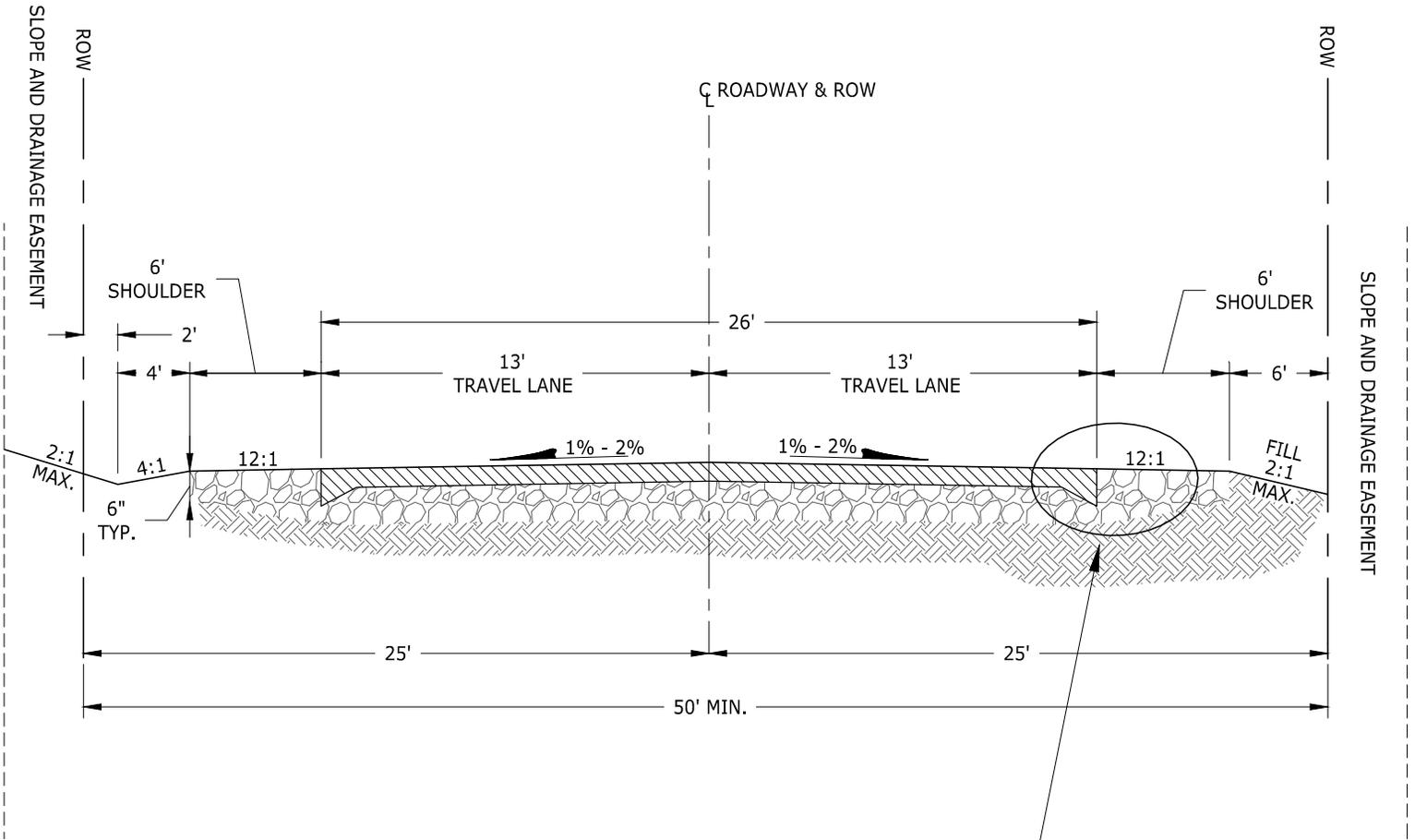
10-09-047

REVISION DATE:

11/22/16

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NOTE:
CURB, GUTTER, AND SIDEWALK ARE OPTIONAL



City of Flagstaff

ENGINEERING
DETAIL

RURAL LOCAL "NARROW"

NTS

10-09-048

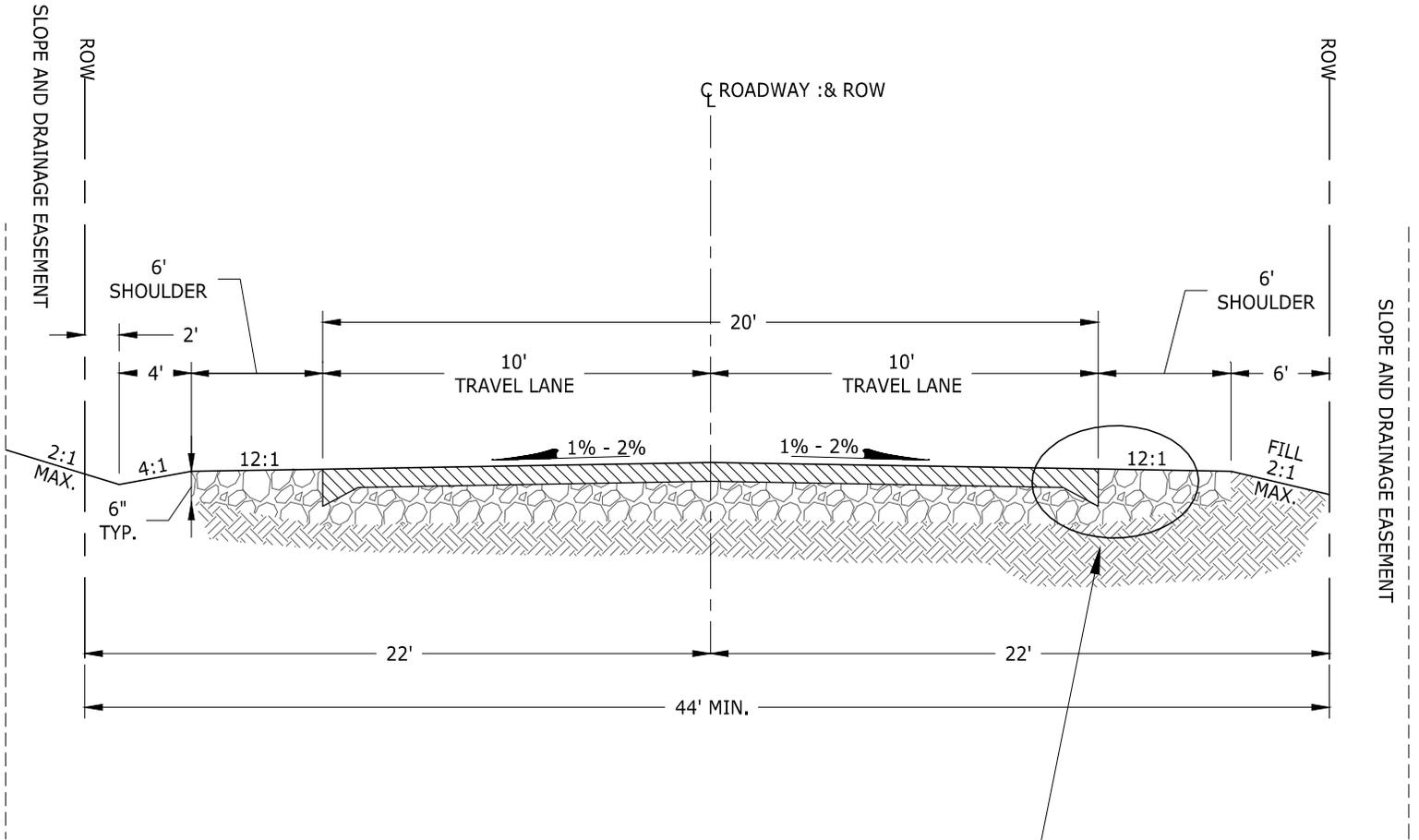
DETAIL NO.

REVISION DATE:

11/22/16

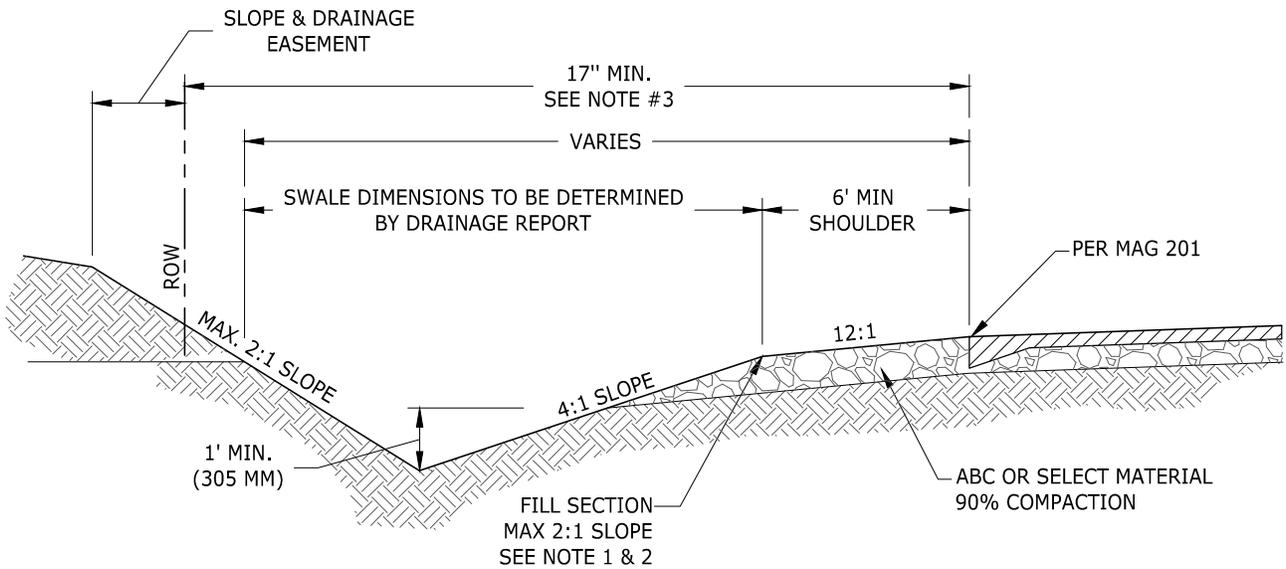
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NOTE:
CURB, GUTTER, AND SIDEWALK ARE OPTIONAL

THICKENED EDGE PER
MAG 201 TYPE A



RURAL

NOTES:

1. ON FILL SECTIONS WHERE COLLECTION AND TRANSPORTATION OF SURFACE RUNOFF IS NOT REQUIRED, THE MAXIMUM SLOPE IS 2:1
2. IN RURAL SHOULDER SECTIONS, GUARD RAILS OR OTHER PROTECTIONS WILL BE REQUIRED ON FILL SECTIONS OF SLOPES GREATER THAN 4:1, OR PER AASHTO REQUIREMENTS.
3. DRAINAGE CALCULATIONS MAY SHOW SUCH INCREASED DRAINAGE AS TO REQUIRE ADDITIONAL RIGHT-OF-WAY.
4. RIGHT-OF-WAY TOTAL VARIES WITH COMBINATIONS OF STREET AND SHOULDER SECTIONS.
5. SLOPE EASEMENTS WILL BE REQUIRED WHERE SLOPES ARE OUT OF THE RIGHT-OF-WAY.

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City of Flagstaff



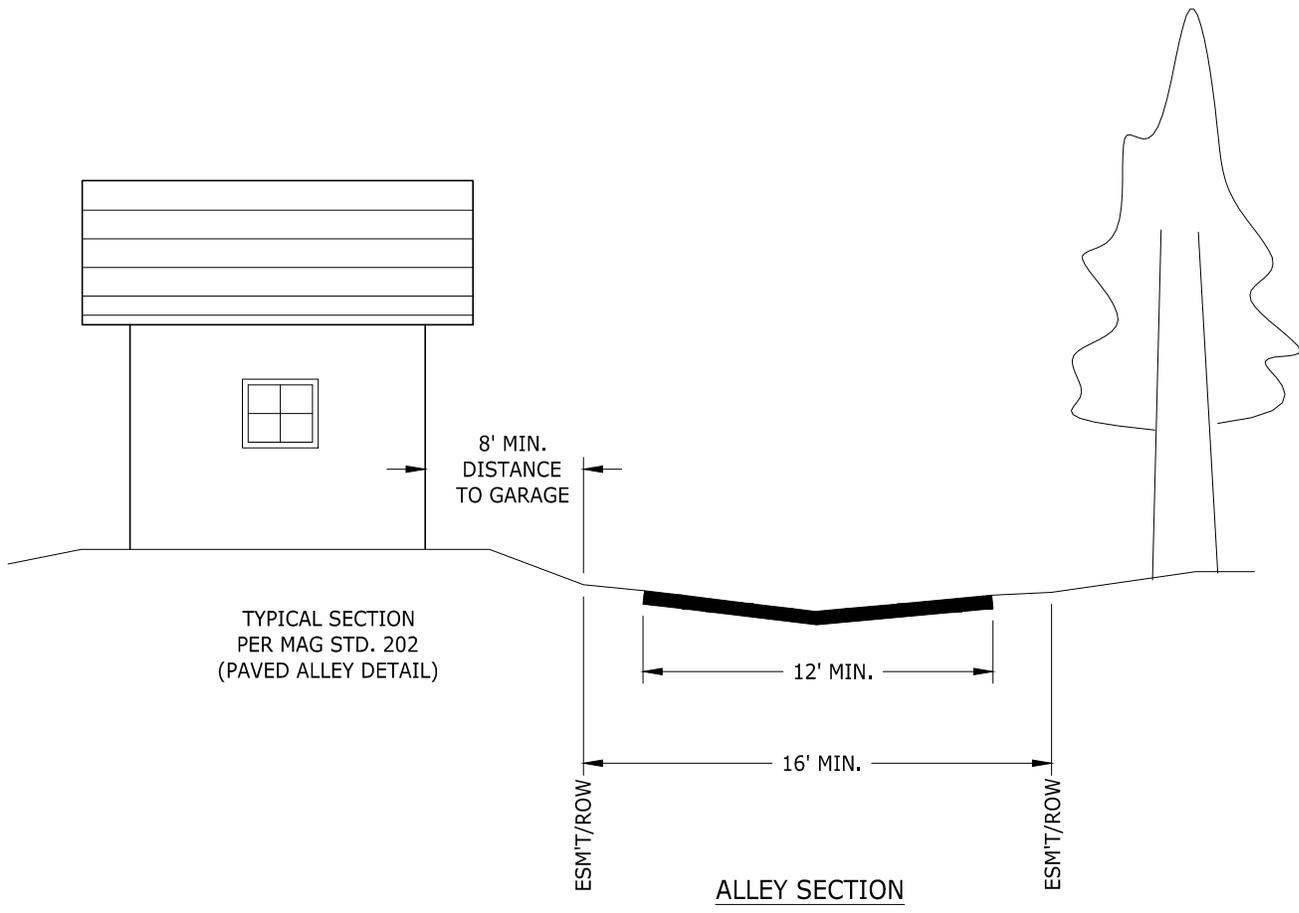
ENGINEERING
DETAIL

SHOULDER SECTION

DETAIL NO.
10-09-049

REVISION DATE: 11/22/16

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City of Flagstaff



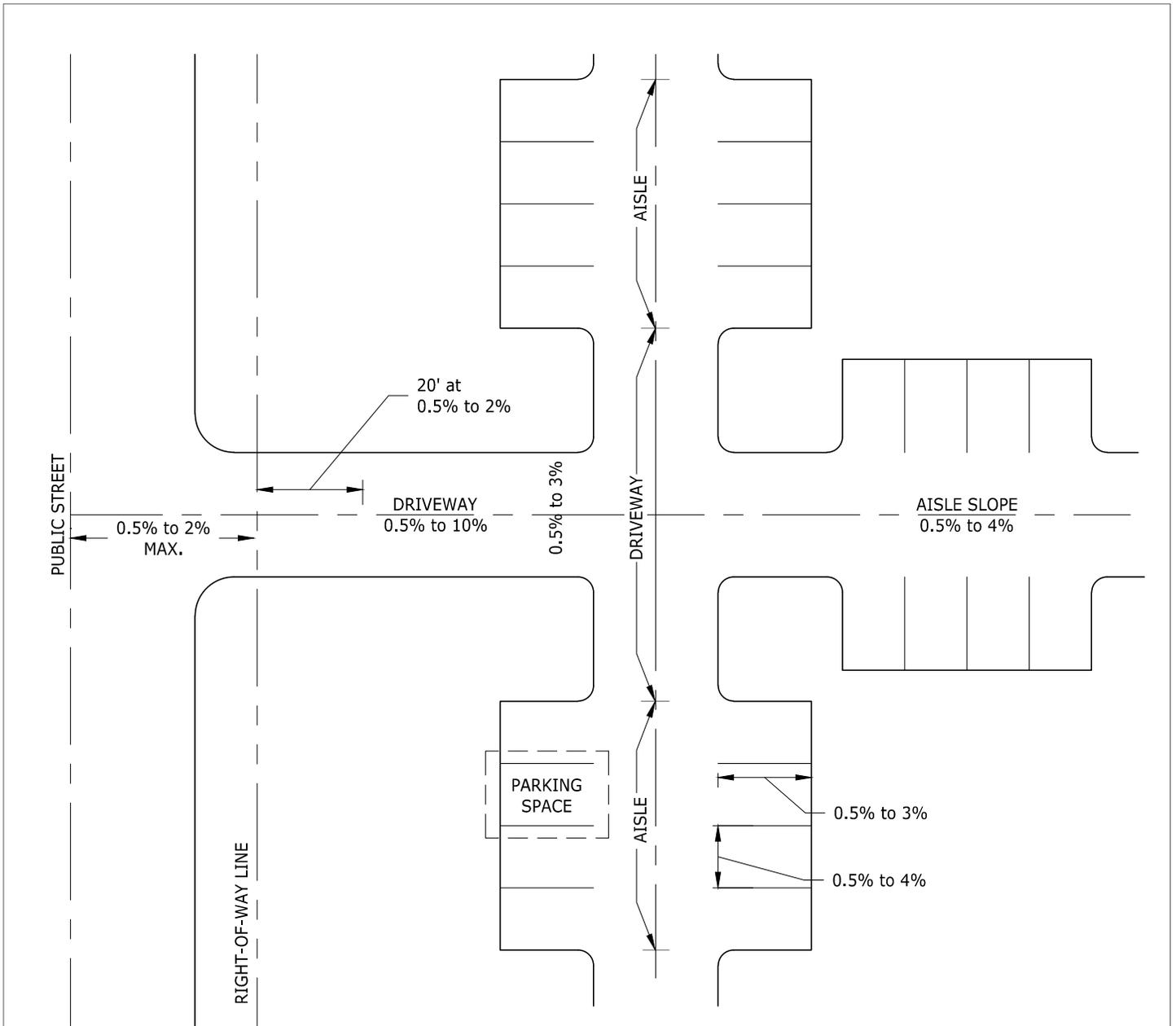
ENGINEERING
DETAIL

RESIDENTIAL ALLEY CROSS-SECTION

DETAIL NO.
10-09-050

REVISION DATE: 11/22/16

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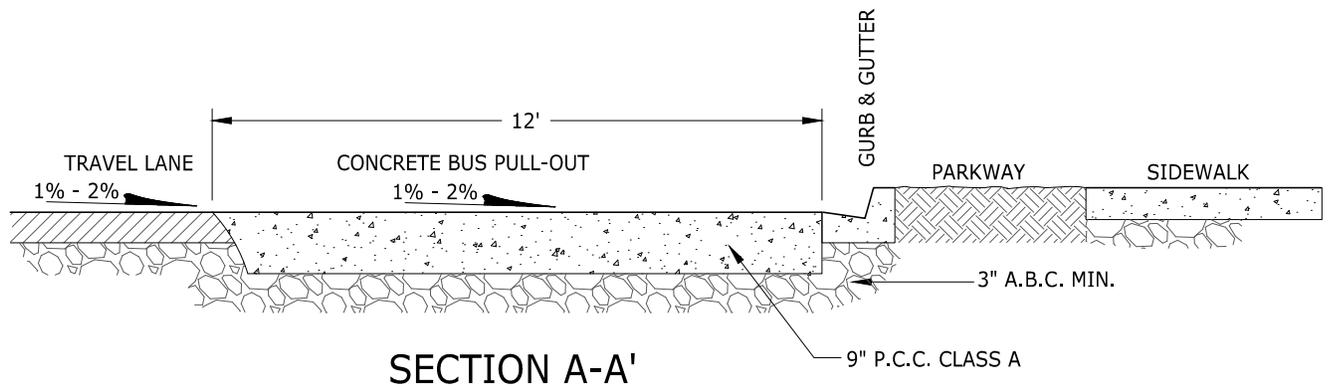
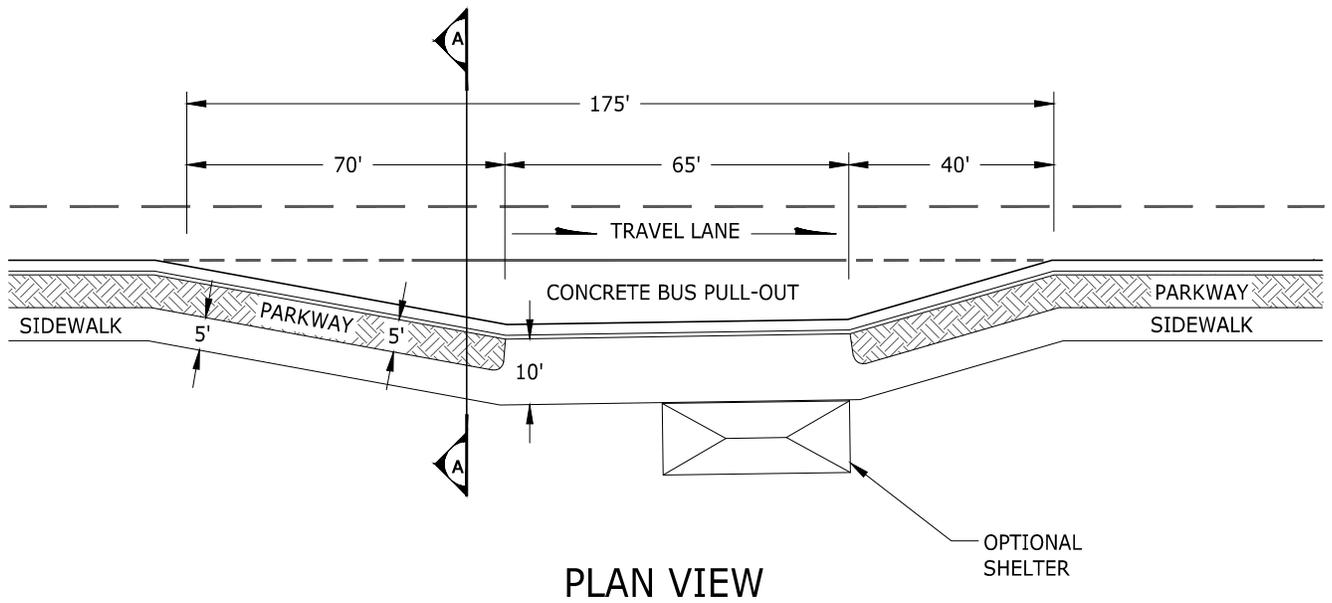


NOTES:

1. DRIVEWAY - NO DIRECT PARKING ACCESS.
2. AISLE - DIRECT PARKING ACCESS.
3. THIS DETAIL DOES NOT APPLY FOR SINGLE FAMILY RESIDENCE.
4. PARKING - THE MAXIMUM SLOPES SHOWN FOR AISLES AND SPACES MAY BE EXCEEDED FOR UP TO 30% OF THE TOTAL NUMBER OF SPACES FOR A SINGLE PROJECT. THIS 30% SHOULD BE IN 3 OR MORE LOCATIONS AROUND THE PROJECT AND SHOULD BE IN OUTLYING AREAS THAT WILL BE USED LEAST. IN THE 30% AREAS, THE AISLES SLOPES SHALL NOT EXCEED 8%, THE SPACES SLOPE SHALL NOT EXCEED 6% LONGITUDINALLY OR 8% LATERALLY.
5. ACCORDING TO THE FEDERAL REGISTER/VVOL. 56, NO. 144/FRIDAY, JULY 26, 1991/RULES AND REGULATIONS: HANDICAPPED PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 1:50 (2%) IN ALL DIRECTIONS.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>PARKING, DRIVEWAY & AISLE SLOPE PARAMETERS</p>		
	<p>DETAIL NO. 10-10-010</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



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City of Flagstaff

BUS PULLOUT



ENGINEERING
DETAIL

DETAIL NO.
10-10-019

REVISION DATE: 11/22/16

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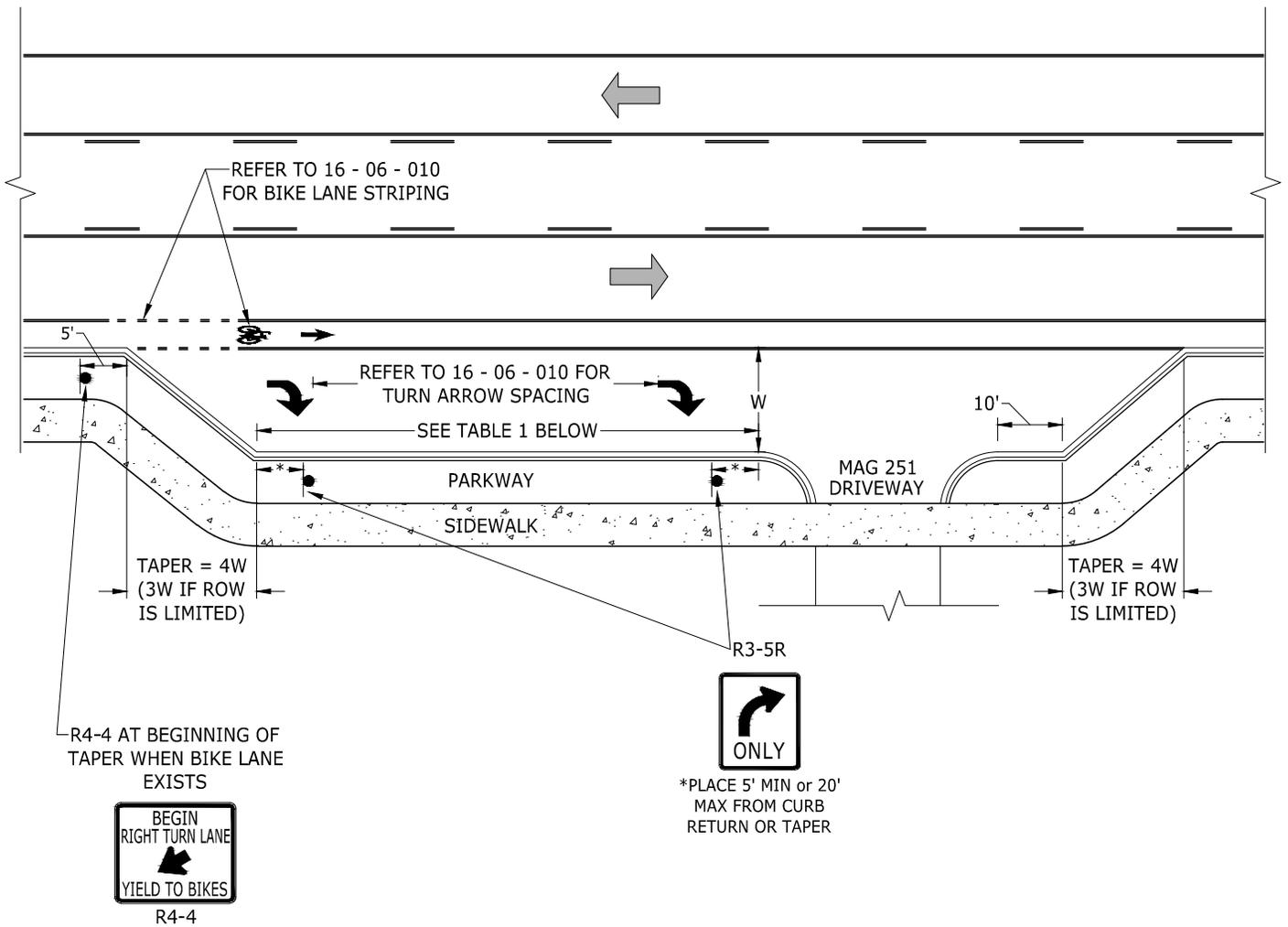


TABLE 1

DESIGN SPEED (MPH)	DECCELERATION LANE LENGTH, L (ft)
30	90
35	120

Per 2010 AASHTO:
Stopping Sight Distance on Level Roadways

NOTES:

1. REFER TO 16-06-010 FOR PAVEMENT MARKING DETAILS.
2. THIS DETAIL APPLIES ONLY WITH SPEEDS OF 35 MPH OR LESS.
3. WHERE THE SPEED LIMIT EXCEEDS 35 MPH, REFER TO ADOT STANDARDS FOR TURN LANE DETAIL (THE DESIGN SPEED IS THE GREATER OF THE POSTED SPEED OR THE 85TH PERCENTILE SPEED).

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City of Flagstaff



ENGINEERING
DETAIL

LOW SPEED RIGHT
TURN LANE DRIVEWAY

DETAIL NO.
10-10-020

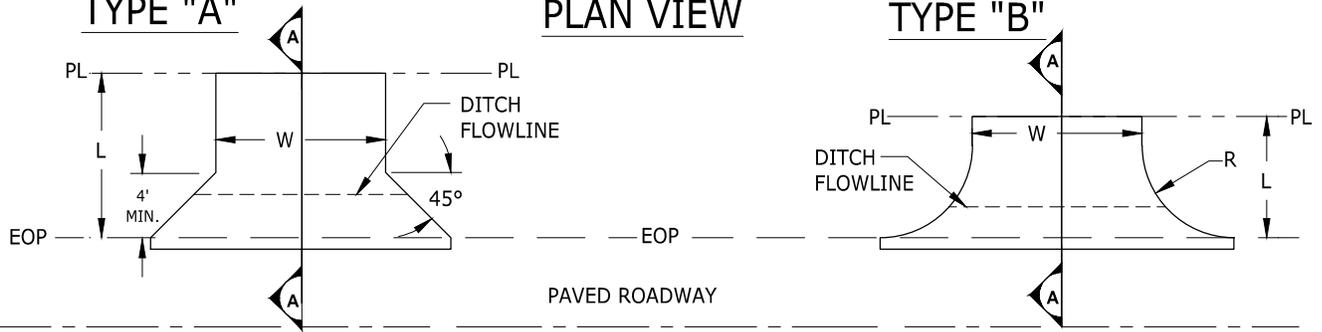
REVISION DATE: 11/22/16

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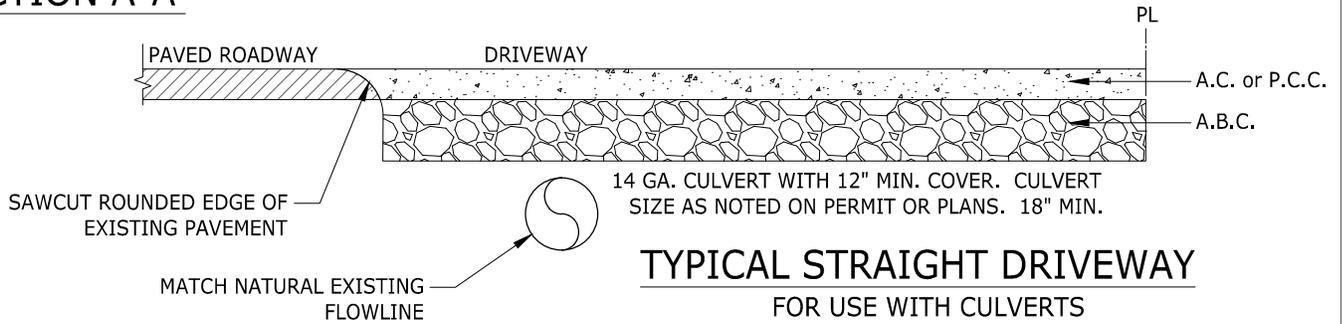
TYPE "A"

PLAN VIEW

TYPE "B"

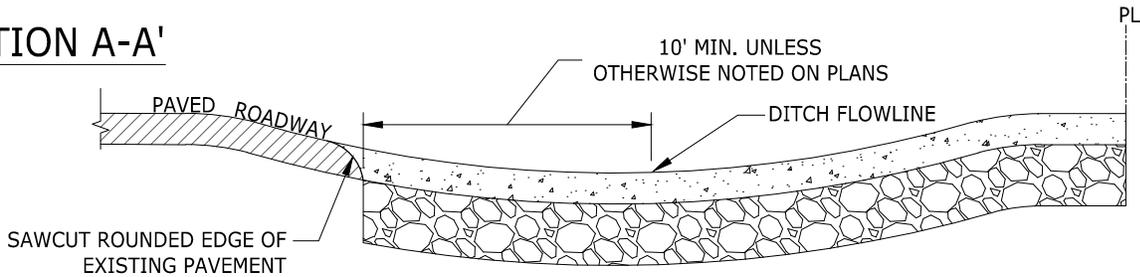


SECTION A-A'



**TYPICAL STRAIGHT DRIVEWAY
FOR USE WITH CULVERTS**

SECTION A-A'



**TYPICAL VALLEY GUTTER DRIVEWAY
DRIVEWAY WITHOUT CULVERT**

NOTES:

1. W - INDICATES WIDTH OF PAVED SURFACE OF DRIVEWAY
L - INDICATES LENGTH OF PAVED SURFACE DRIVEWAY P.L. TO E.P.
R - RADIUS 10' MIN., 20' DESIRABLE
EOP - EDGE OF EXISTING PAVEMENT
PL - PROPERTY LINE
2. SIZE AND TYPE OF DRIVEWAY SHALL BE NOTED ON PLANS
3. DRIVEWAYS SHALL BE PERPENDICULAR TO THE STREET WITHIN THE RIGHT OF WAY
4. A.C. AND BASE MATERIAL THICKNESS FOR DRIVEWAYS SHALL BE
2.5" A.C. 4" A.B.C. OR 6" CLASS "A" P.C.C. ON 3" A.B.C. FOR RESIDENTIAL AND 8" CLASS "A" P.C.C. ON 3" A.B.C. FOR COMMERCIAL
5. DRIVEWAYS ARE TO BE PLACED WHERE SHOWN ON PLANS OR AS DIRECTED BY THE CITY ENGINEER
6. DRAINAGE STRUCTURES SHALL BE PROVIDED UNDER DRIVEWAYS WHERE NECESSARY 12" MIN. COVER TO FINISH GRADE REQUIRED UNLESS OTHERWISE NOTED ON PLANS

NTS

City of Flagstaff

PAVED TURNOUTS



ENGINEERING
DETAIL

DETAIL NO.

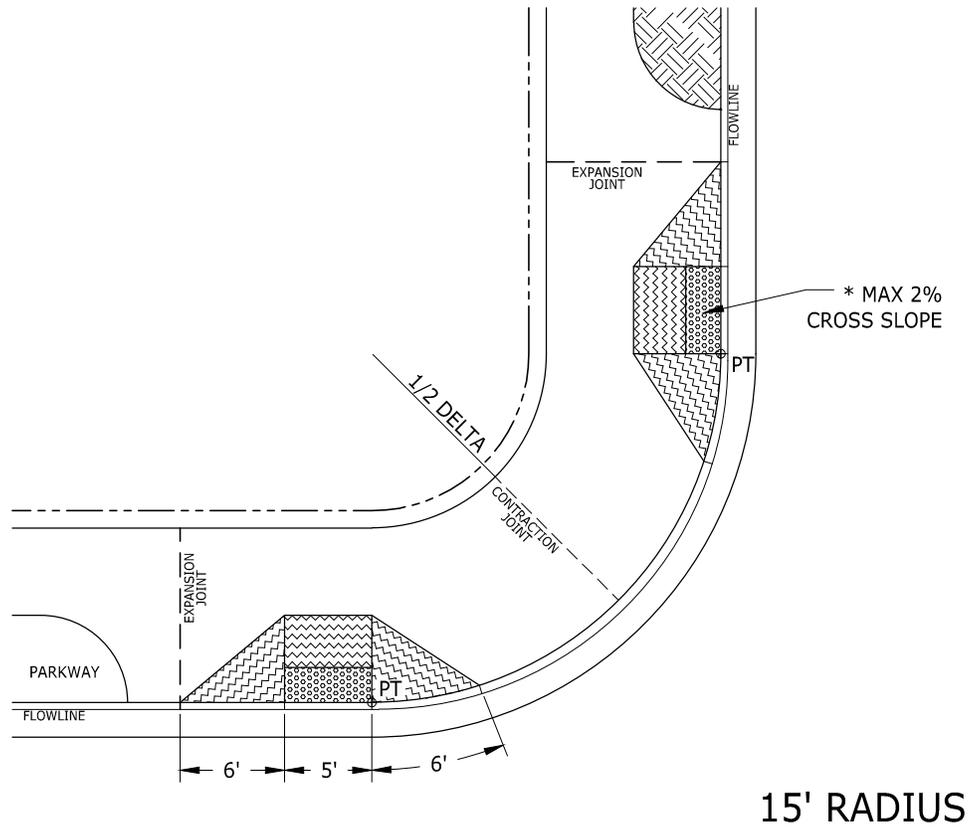
10-10-031

REVISION DATE:

11/22/16

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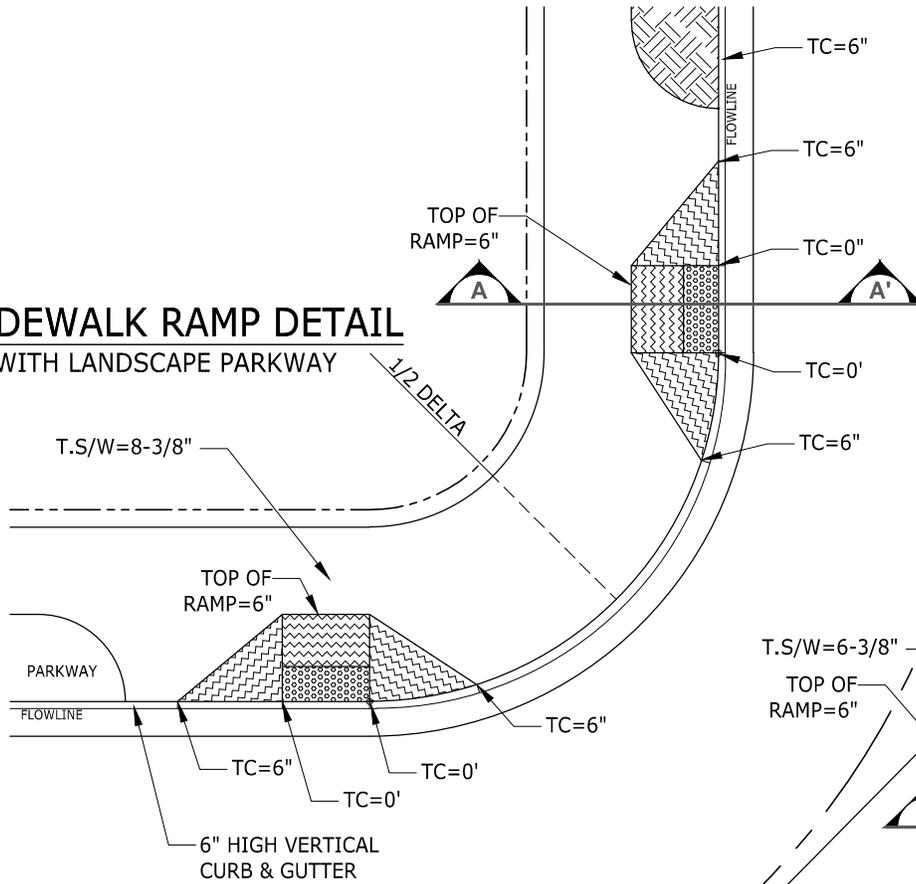
NOTES:

1. CONTROL ELEVATIONS SHOWN ARE IN RELATION TO THE GUTTER AND ARE LOCATED RADIALLY. GUTTER ELEVATION = 0'
2. RAMP CURBS MAY BE POURED MONOLITHIC WITH A CONSTRUCTION JOINT. CLASS "A" CONCRETE TO BE USED AS PER SECTION 725
3. EXPANSION JOINT FILLERS SHALL BE PREFORMED 1/2" BITUMINOUS TYPE PER A.S.T.M. D-1751
4. THE MAXIMUM CROSS SLOPE MAY BE GREATER THAN 2% WHEN THE TOPOGRAPHY IS EXTREME
5. SEE 10-10-043 FOR DETECTABLE WARNING DETAIL

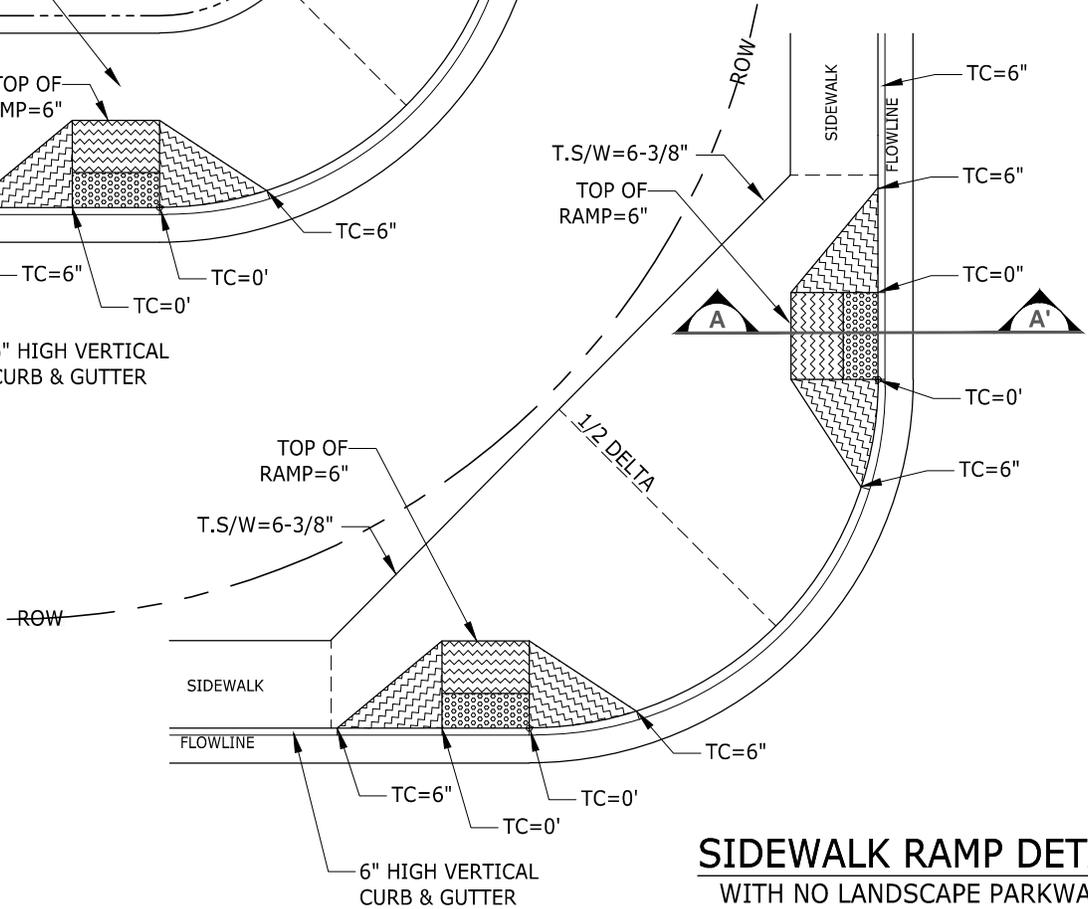
NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>SIDEWALK RAMP DETAIL 15' RADIUS CURB RETURN</p>		
	<p>DETAIL NO. 10-10-034</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 2</p>

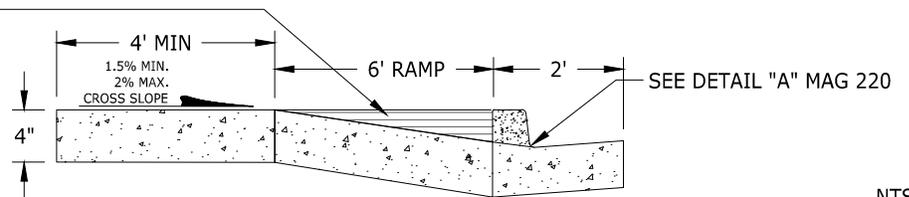
SIDEWALK RAMP DETAIL
WITH LANDSCAPE PARKWAY



SIDEWALK RAMP DETAIL
WITH NO LANDSCAPE PARKWAY



GROOVE SLOPING RAMP FACE PER MAG
SEE MAG 234 (DETAILS)



SECTION A-A'



City of Flagstaff
ENGINEERING
DETAIL

SIDEWALK RAMP DETAIL
15' RADIUS CURB RETURN

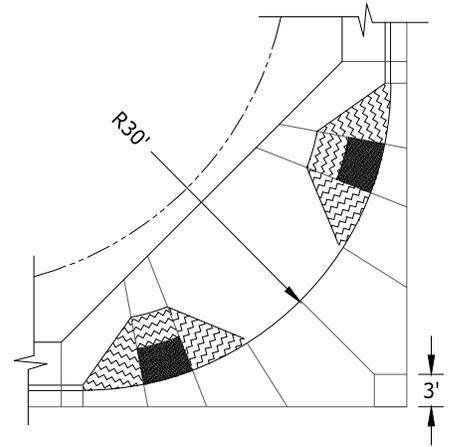
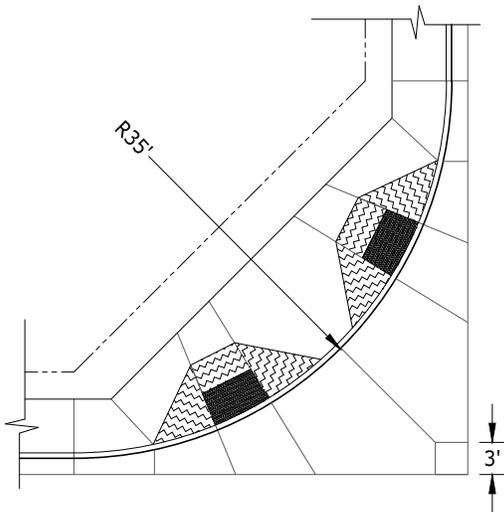
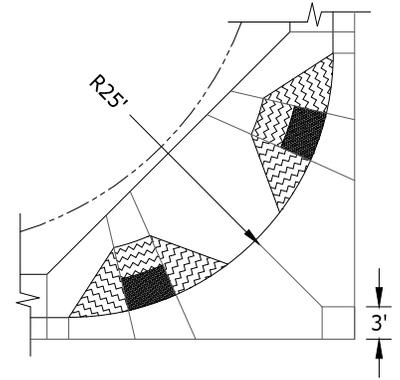
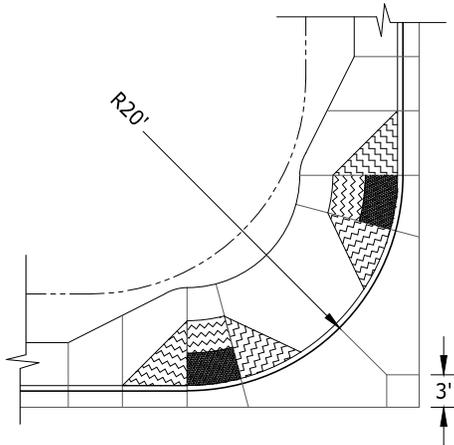
DETAIL NO.
10-10-034

REVISION DATE: 11/22/16

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NOTES:

1. CONSTRUCT THE CONTRACTION JOINTS AS SHOWN ON CONCRETE APRON FOR THE RADIUS REQUIRED.
2. WHEN PLANS CALL FOR A CLASS "A" CONCRETE VALLEY GUTTER THE CONTRACTION JOINTS SHALL BE SPACED SYMMETRICAL WITH AT LEAST ONE JOINT EVERY 10 FEET.
3. WHEN PLANS CALL FOR A 7' VALLEY GUTTER, MAKE A 7' SQUARE INSTEAD OF A 3' SQUARE

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City of Flagstaff

APRON JOINTS



ENGINEERING
DETAIL

DETAIL NO.
10-10-038

REVISION DATE: 11/22/16

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City of Flagstaff

ENGINEERING
DETAIL

**DRIVEWAY-PEDESTRIAN RAMP COMBINATION
(FOR USE AT T TYPE INTERSECTION)**

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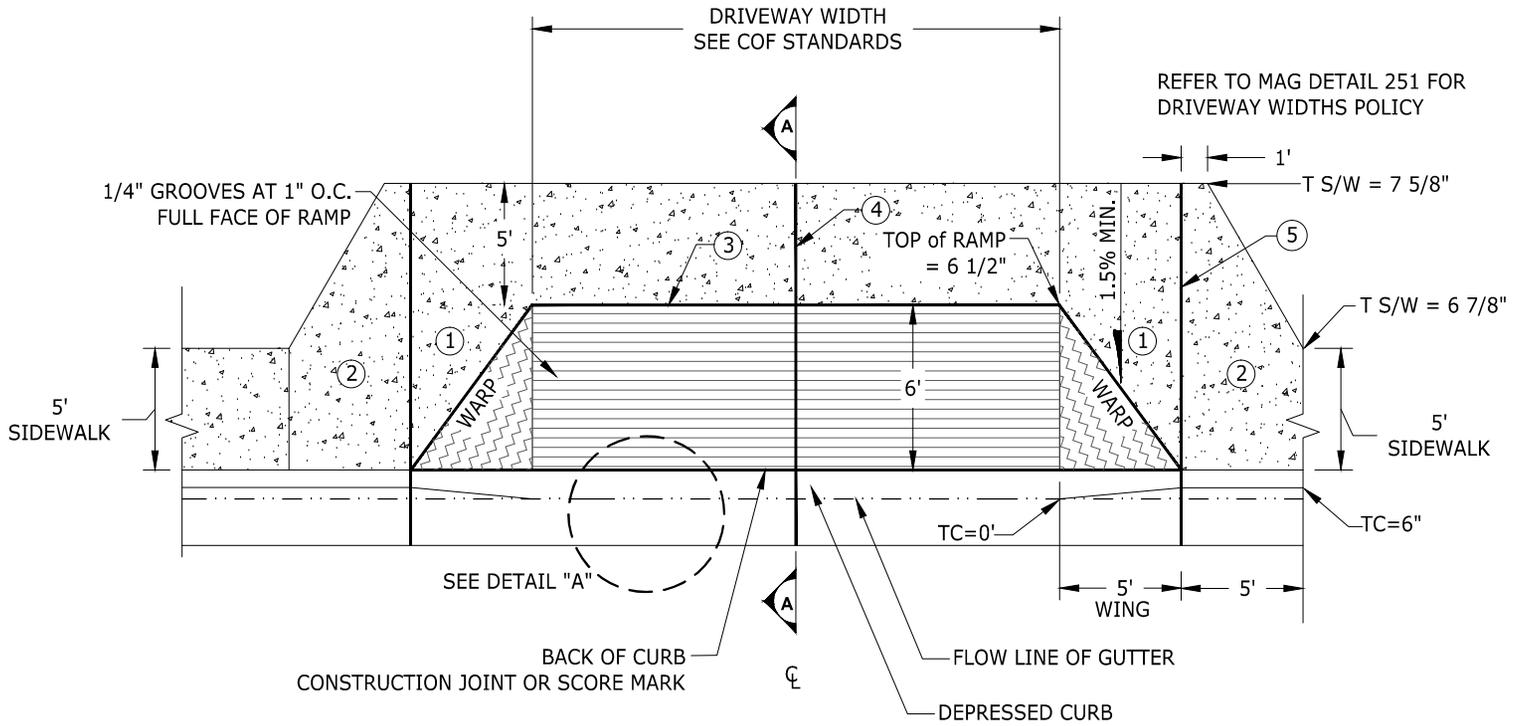
10-10-039

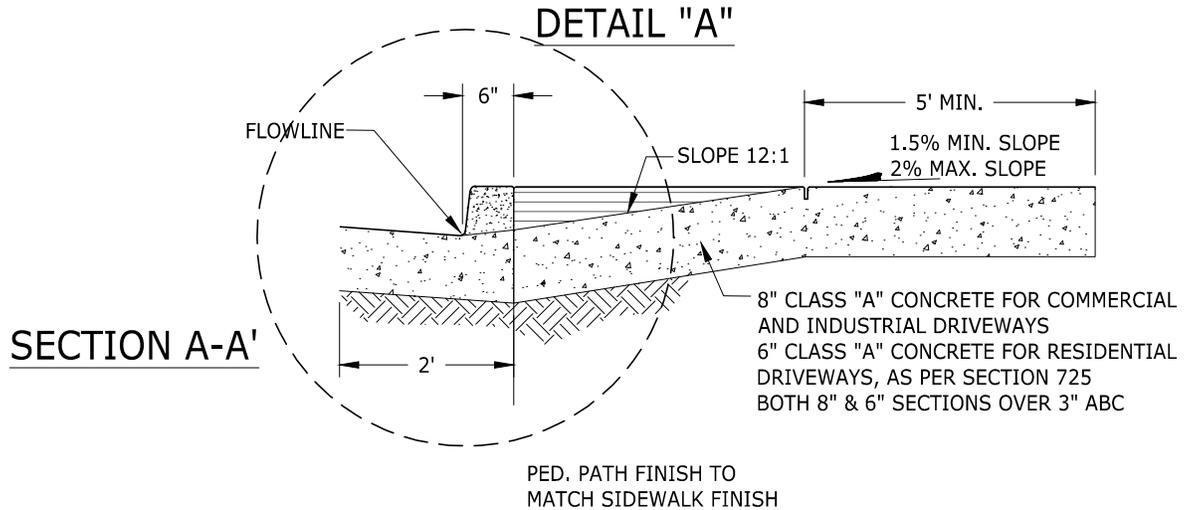
DETAIL NO.

REVISION DATE: 11/22/16

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KEYNOTES:

- ① ROUGH BROOM FINISH - USE A RIPPLE SURFACE PATTERN
- ② SIDEWALK MAG DETAIL 230
- ③ CONTRACTION JOINT
- ④ WHEN WIDTH EXCEEDS 22' PROVIDE A CONTRACTION JOINT ON DRIVEWAY CENTERLINE
- ⑤ FULL DEPTH EXPANSION JOINT THROUGH DRIVEWAY, CURB & GUTTER. EXPANSION JOINT FILLER SHALL BE 1/2" BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER A.S.T.M. D-1751

NOTES:

1. DEPRESSED CURB SHALL BE PAID FOR AS COMBINED CURB & GUTTER.
2. EXPANSION JOINT MATERIAL SHALL BE SECURED IN PLACE PRIOR TO POURING CONCRETE AND SHALL COMPLETELY SEPARATE THE DRIVEWAY SLAB FROM THE SIDEWALK, EXTENDING FROM THE SURFACE TO THE SUBGRADE.
3. CONTROL ELEVATIONS SHOWN ARE IN RELATION TO GUTTER. GUTTER ELEVATION = 0'

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	DRIVEWAY-PEDESTRIAN RAMP COMBINATION (FOR USE AT T TYPE INTERSECTION)		
	DETAIL NO. 10-10-039	REVISION DATE: 11/22/16	<div style="display: flex; align-items: center; justify-content: center;"> 2 2 </div>



City of Flagstaff

ENGINEERING
DETAIL

DRIVEWAY-PEDESTRIAN RAMP COMBINATION
(FOR USE AT T TYPE INTERSECTION)

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10-10-040

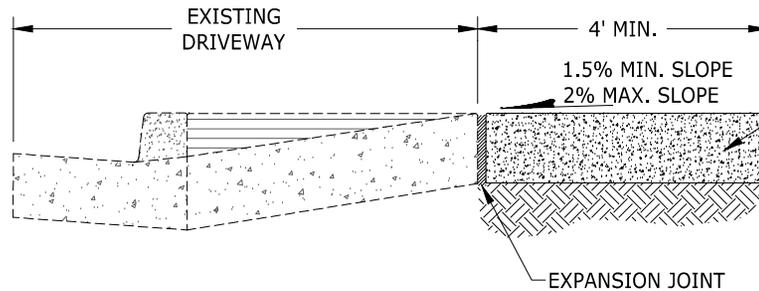
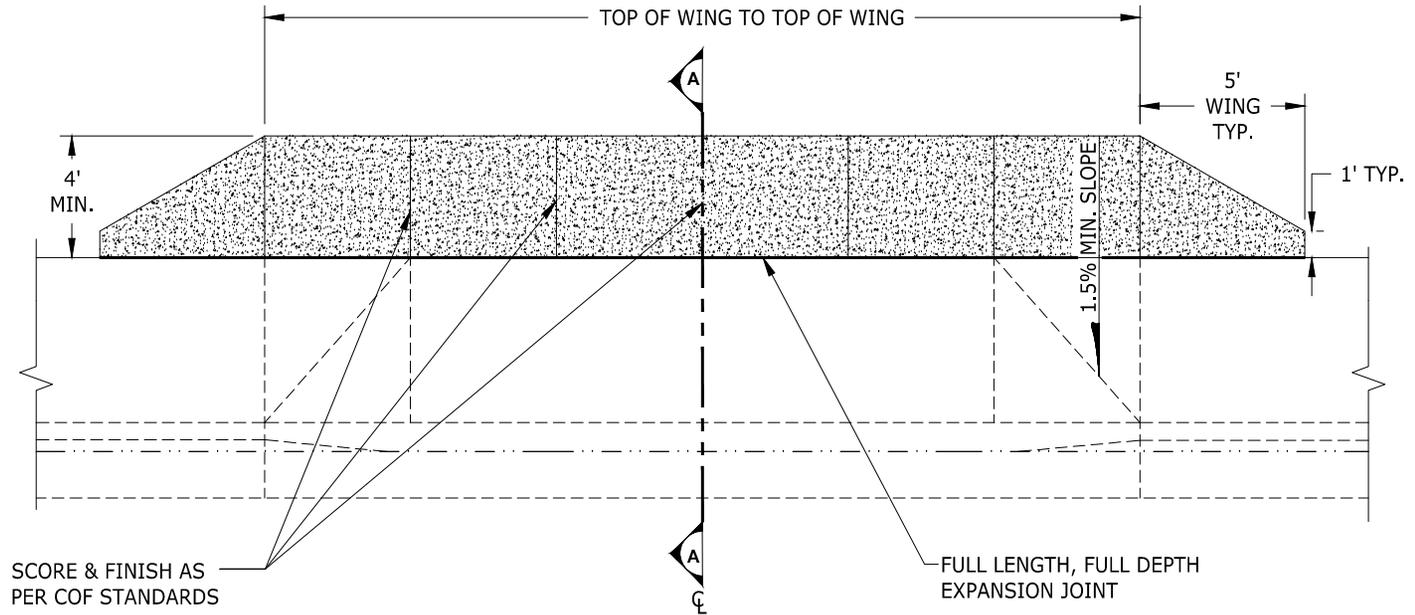
DETAIL NO.

REVISION DATE:

11/22/16

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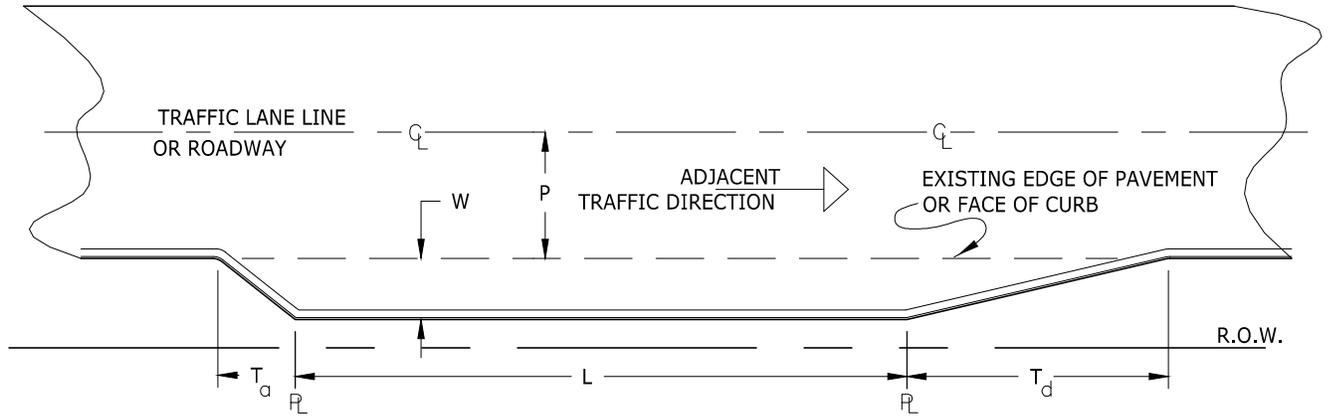
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SECTION A-A'

NOTES:

1. EXPANSION JOINT FILLER SHALL BE 1/2" BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, ASTM D-1751
2. CONTROL & EXPANSION JOINTS SHALL ALIGN WITH EXISTING JOINTS IN DRIVEWAY
3. EXPANSION JOINT MATERIAL SHALL BE SECURED IN PLACE PRIOR TO POURING CONCRETE AND SHALL COMPLETELY SEPARATE THE DRIVEWAY SLAB FROM THE SIDEWALK, EXTENDING FROM THE SURFACE TO THE SUBGRADE.
4. EXPANSION JOINT MATERIAL SHALL BE USED WHEN NEW POURING IS ADJACENT TO EXISTING DRIVEWAY AREA.



T_a = LENGTH OF APPROACH TAPER
 T_d = LENGTH OF DEPARTURE TAPER

W = WIDTH OF PAVEMENT WIDENING, TO FACE OF CURB (FT.)
L = LENGTH OF PAVEMENT WIDENING (FT.)
S = SPEED OF TRAFFIC (M.P.H.)
P = WIDTH OF ADJACENT TRAFFIC LANE TO EDGE OF EXISTING PAVEMENT (FT.)

	CASE 1	CASE 2	CASE 3
CONDITION	$W+P \geq 26'$ $L \geq 250'$	$W \geq 8'$ $L \leq 250'$	$W < 8'$
T_a	$\frac{WS^2}{120} \left(\frac{WS^2}{310} \right)$	4W	4W
T_d (NOTE 3)	$\frac{WS^2}{60} \left(\frac{WS^2}{155} \right)$	10W	4W

NOTES:

1. IF A PAVEMENT EDGE TAPER OVERLAPS THE TAPER FROM ANOTHER WIDENING, OR EXTENDS INTO A STREET INTERSECTION, THEN THE NEW PAVEMENT EDGE SHALL BE CONSTRUCTED TO MATCH THE FULL WIDTH OF THE WIDENING, OR TO MATCH THE CURB RETURN OF THE INTERSECTION.
2. TAPERS ARE CONSTRUCTED OFF THE FRONTAGE OF THE DEVELOPING PARCEL UNLESS ADEQUATE RIGHT-OF-WAY IS NOT AVAILABLE.
3. WIDENING AND DEPARTURE TAPER FOR CASE 1 MAY REQUIRE LANE MARKINGS AND WARNING SIGNS. ALL CURBED DEPARTURE TAPERS REQUIRE TYPE 2 OBJECT MARKERS (TRIPLE VERTICAL).
4. SAWCUT MAYBE REQUIRED.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>PAVEMENT EDGE TAPERS FOR ISOLATED STREET WIDENINGS</h2>		<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-right: 1px solid black; padding-right: 5px;">1</div> <div style="padding-left: 5px;">2</div> </div>
	<p>DETAIL NO. 10-10-042</p>	<p>REVISION DATE: 11/22/16</p>	

IN THE CASE OF WIDENING WITHOUT A CURB THE DIMENSION 'W' IS TO THE NEW EDGE OF PAVEMENT. IN THE CASE OF WIDENING AN ALREADY CURBED SECTION THE TAPER LENGTHS ARE THE SAME BUT THE EDGE OF THE TAPER IS THE EXTENSION OF A TYPE 'A' CURB.

CASE 1

$W+P \geq 26'$

$L \geq 250'$

THE WIDENING IS LONG ENOUGH AND WIDE ENOUGH THAT IT CREATES or APPEARS TO BE AN ADDITIONAL TRAFFIC LANE WHICH COULD BE USED BY THROUGH TRAFFIC FOR DECELERATION, OR PASSING. THE SPEED OF THE TRAFFIC IS A CRITICAL FACTOR AND SAFE TAPER LENGTHS ARE DERIVED FROM THE MUTCD AND AASHTO FOR THE DIVERGING AND MERGING MANEUVERS AT EACH END.

CASE 2

$W \geq 8'$

$L \geq 250'$

THE WIDENED AREA IS NOT A FULL ADDITIONAL TRAFFIC LANE, BUT CAN SERVE FOR PASSING AT REDUCED SPEED, MANEUVERING INTO ON-STREET PARKING OR IN AND OUT OF DRIVEWAYS ALONG THE WIDENED SECTION. TAPERS SERVE TO PROTECT THE EDGE OF PAVEMENT BEYOND THE WIDENING. THE DEPARTURE TAPER IS LONG ENOUGH TO ACCOMMODATE SWEEPING TURNS OUT OF DRIVEWAYS.

CASE 3

$W < 8'$

THE WIDENED AREA IS NOT USED BY TRAFFIC EXCEPT TO ENTER AND EXIT DRIVEWAYS ALONG THE WIDENED SECTIONS. THE TAPERS PROTECT THE EDGE OF THE PAVEMENT.

NOTES:

1. COVERS THE COMMON SITUATION WHERE A WIDENING IS NEAR BY NOT ADJACENT TO ANOTHER WIDENING OR AN INTERSECTION RETURN. THE MATCH ACROSS THE INTERVENING PROPERTY ELIMINATES THE RAGGED/RANDOM APPEARANCE OF THE EDGE OF PAVEMENT AND MAKES PLOWING AND SWEEPING MUCH EASIER.
2. CLARIFIES AND STANDARDIZES THE CITY RESPONSE TO THE QUESTION OF HOW MUCH WIDENING IS NECESSARY. IT ALSO PRECLUDES THE CASES WE HAVE HAD IN THE PAST WHERE THE TAPER IS ACCOMPLISHED WITHIN THE WIDENING USING EDGE LINE STRIPING AND DELINEATORS INSTALLED IN THE PAVEMENT.
3. REQUIRES TRAFFIC CONTROL DEVICES TO WARN DRIVERS AND MAINTENANCE OPERATORS IN CASES WHERE THE DEPARTURE TAPES COULD BE A HAZARD TO TRAFFIC OR CURBED TAPERS COULD BE DAMAGED DURING PLOWING.
4. THIS STANDARD DOES NOT COVER THE SITUATIONS WHERE THERE IS NOT ENOUGH RIGHT OF WAY IN FRONT OF THE PROPERTIES NEXT TO THE DEVELOPMENT TO ACCOMMODATE THE REQUIRED TAPER. THESE AND OTHER UNUSUAL CONDITIONS NEED TO BE REVIEWED ON A CASE BY CASE BASIS.

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City of Flagstaff



ENGINEERING
DETAIL

**PAVEMENT EDGE TAPERS
FOR ISOLATED STREET WIDENINGS**

DETAIL NO.

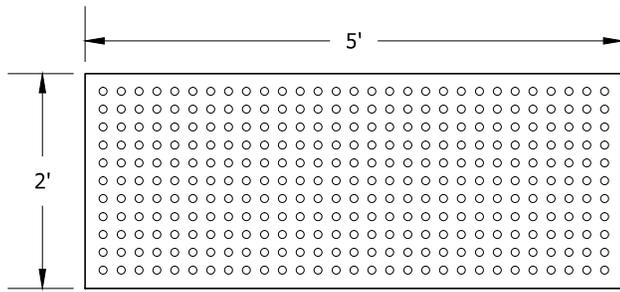
10-10-042

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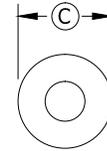
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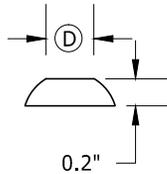
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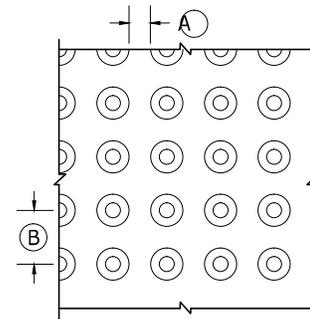
DETECTABLE WARNING STRIP DETAIL PLAN



TRUNCATED DOME DETAIL



TRUNCATED DOME ELEVATION



TEXTURE PATTERN DETAIL

NOTES:

1. DETECTABLE WARNING STRIPS SHALL BE USED ON ALL NEW AND RETRO-FIT RAMPS, PEDESTRIAN REFUGES AND OTHER LOCATIONS AS OUTLINED IN THE CURRENT ACCESS BOARD GUIDELINES FOR RIGHT OF WAY DEVELOPMENT.
2. DETECTABLE WARNING STRIPS SHALL BE MECHANICALLY ATTACHED FOR NEW RAMP INSTALLATIONS.
3. DIMENSIONS ARE SUBJECT TO SITE CONDITIONS AND ADA REGULATIONS.

KEYNOTES:

- (A) 11/16" MINIMUM (TYP.) (0.65" MINIMUM ADA ACTUAL)
- (B) 1-5/8" to 2-3/8" (TYP.) (1.6" to 2.4" ADA ACTUAL)
- (C) 7/8" to 1-3/8" (TYP.) (0.9" to 1.4" ADA ACTUAL)
- (D) 50% to 65% OF 'C'

MATERIALS:

CAST GRAY IRON CONFORMING TO ASTM A-48 CLASS 30A MINIMUM

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City of Flagstaff

ENGINEERING
DETAIL

DETECTABLE WARNING STRIP DETAIL

DETAIL NO.

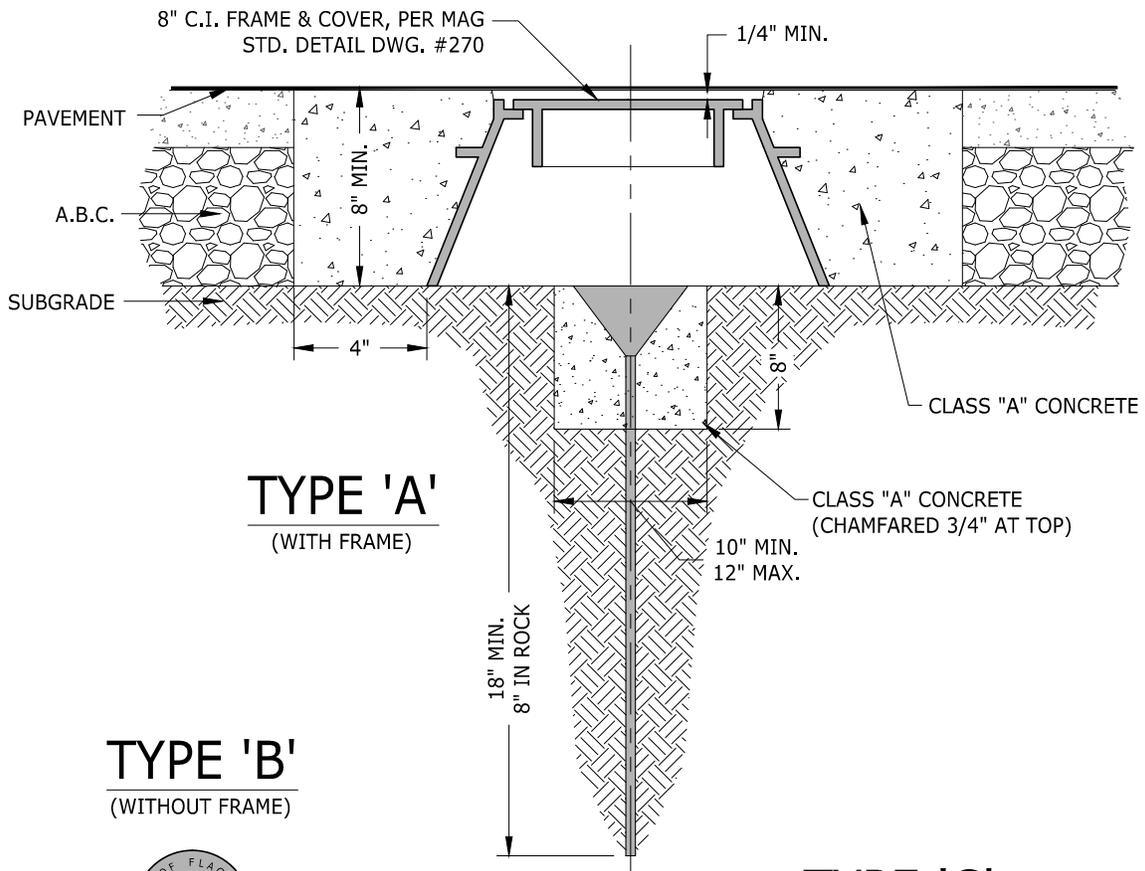
11-10-043

REVISION DATE:

11/22/16

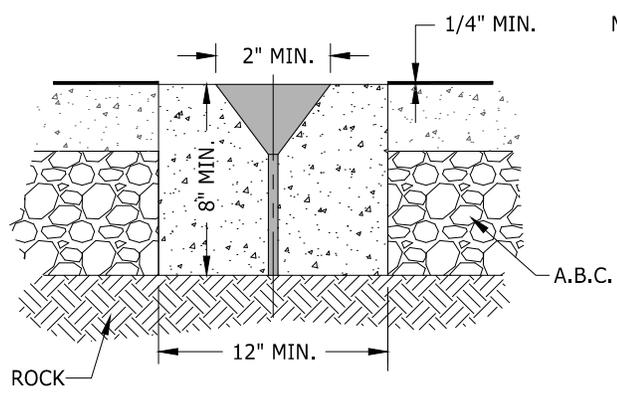
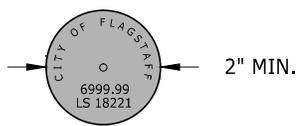
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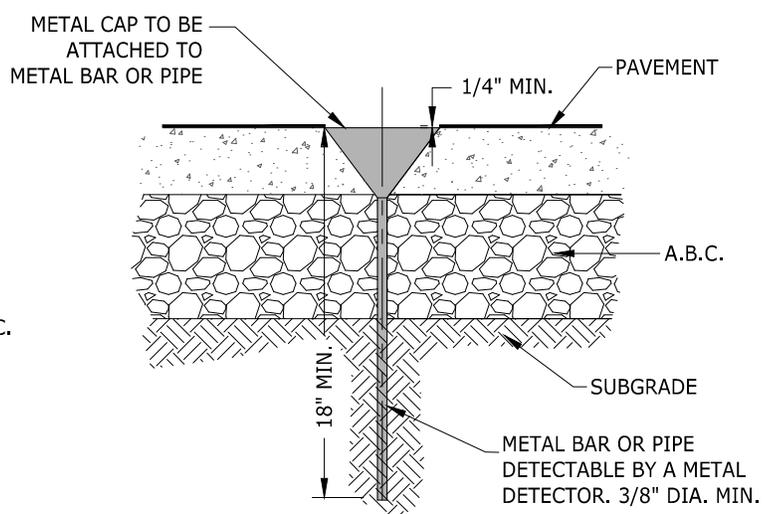


TYPE 'A'
(WITH FRAME)

TYPE 'B'
(WITHOUT FRAME)



TYPE 'C'



NOTES:

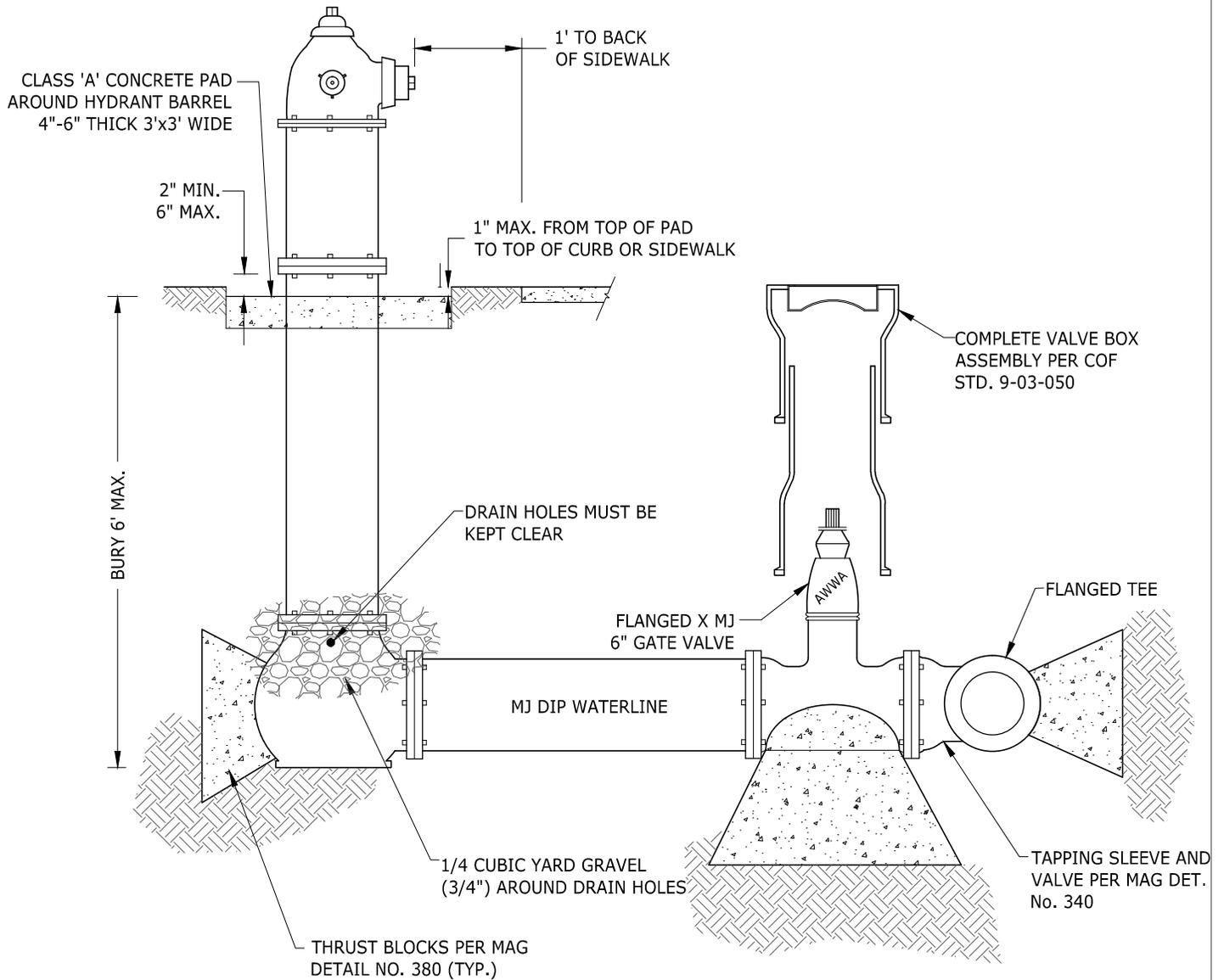
1. RIGHT-OF-WAY CONTROL MONUMENT SHALL BE FACTORY STAMPED "CITY OF FLAGSTAFF" AND BEAR THE REGISTRATION NUMBER OF THE LAND SURVEYOR RESPONSIBLE FOR THE WORK.
2. A MONUMENT EXAMPLE ACCEPTABLE TO THE CITY: 2" LIETZ BRASS CAP PRESS-FITTED ON TO AN I.P.
3. USE TYPE C UNLESS SPECIFIED OTHERWISE ON THE PLANS, SEE SPECIFICATION 13-11-001-0002.A.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	INSTALLATION OF SURVEY MONUMENT		
	DETAIL NO. 11-01-010	REVISION DATE: 11/22/16	1 1

SEE DETAIL NO. 13-03-012 FOR PROTECTION POST INSTALLATION

NOTE: MIN. 3' CLEAR LEVEL AREA AROUND HYDRANT



FOR SPECIFICATIONS, INSTALLATION, AND TESTING REFER TO CHAPTER 9-06-060 (FIRE HYDRANTS) AND 13-03-010 (FIRE SAFETY).

NTS

City of Flagstaff

FIRE HYDRANT ASSEMBLY

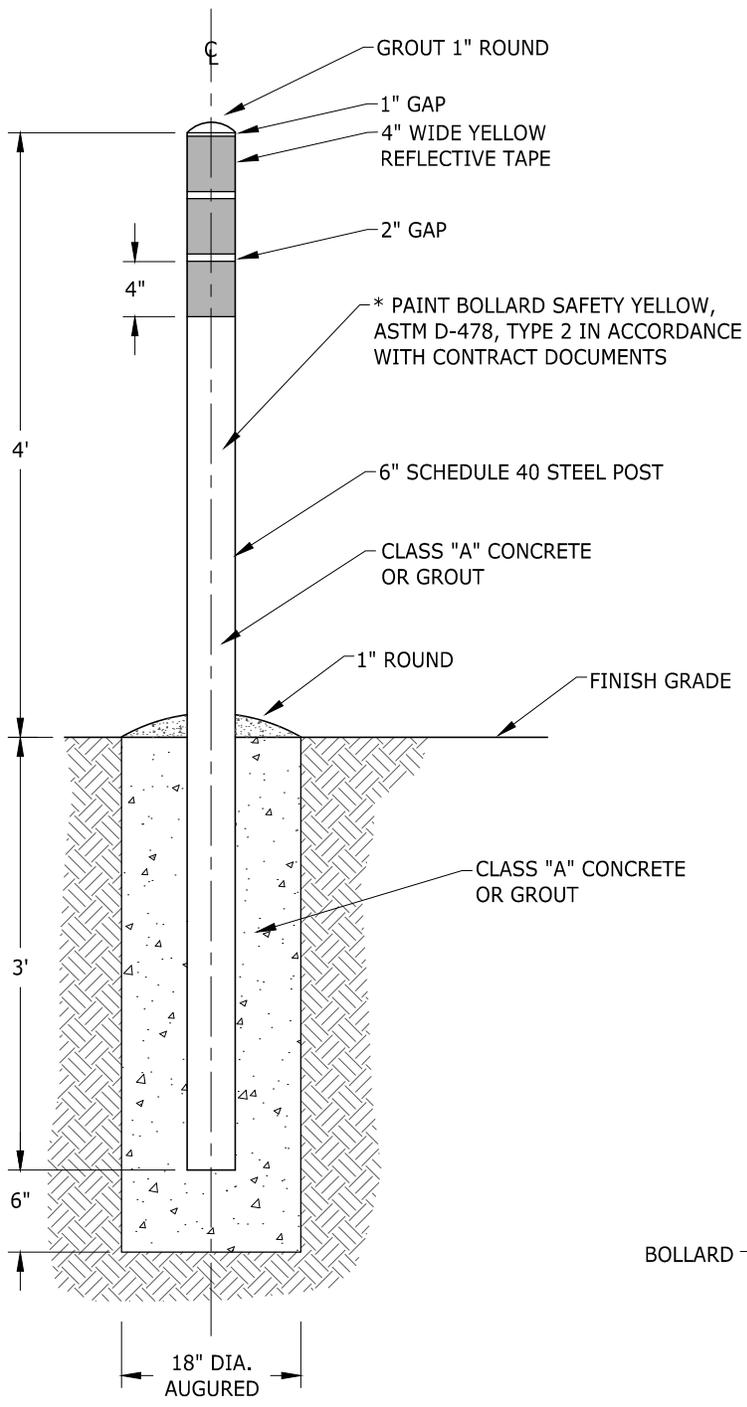


ENGINEERING
DETAIL

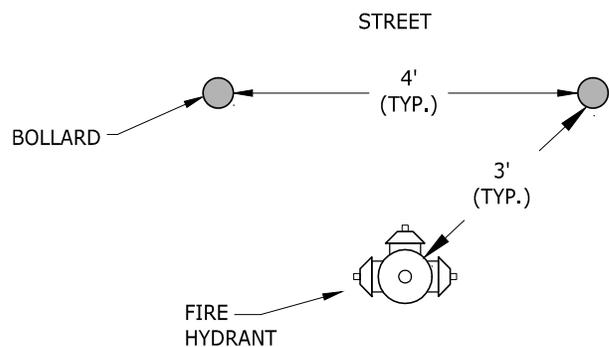
DETAIL NO.
13-03-011

REVISION DATE: 11/22/16

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PLAN VIEW



NOTES:

1. GROUT SHALL CONFORM TO MAG SECTION 776
2. * COLOR SHALL BE OSHA SAFETY YELLOW (WITH YELLOW REFLECTIVE TAPE) WHEN SPECIFIED ON THE PLANS

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City of Flagstaff

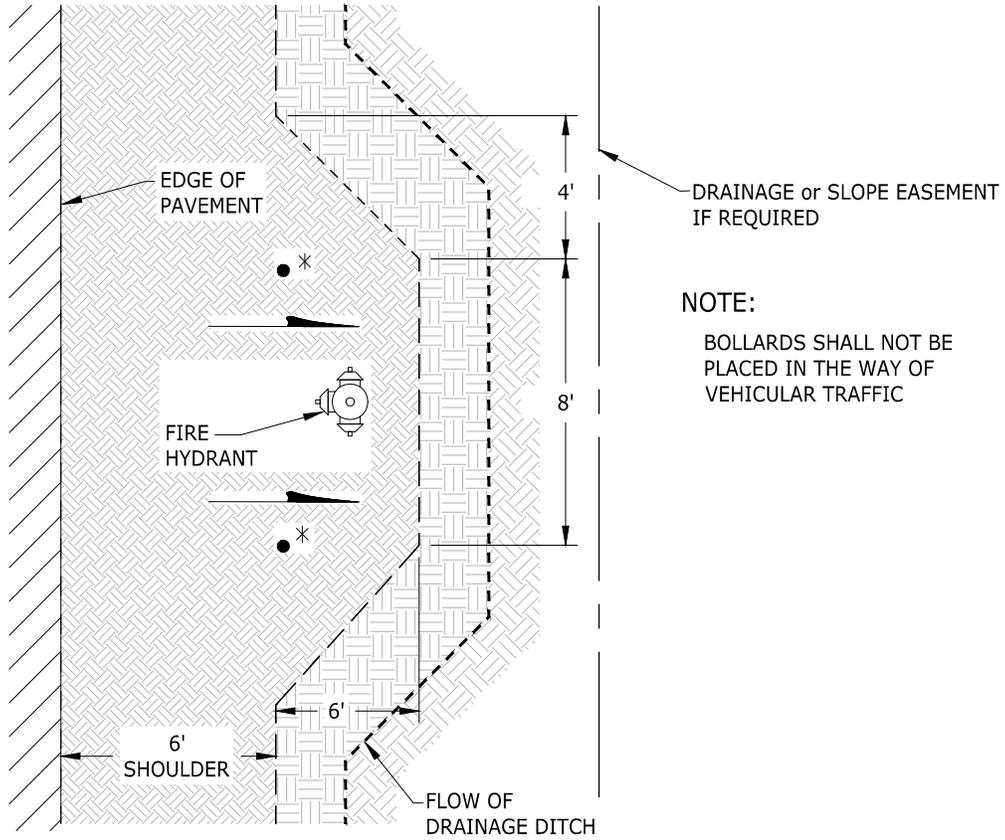
ENGINEERING
DETAIL

FIRE HYDRANT PROTECTION POST DETAIL IN PAVED OR CONCRETE SURFACE

DETAIL NO.
13-03-012

REVISION DATE: 11/22/16

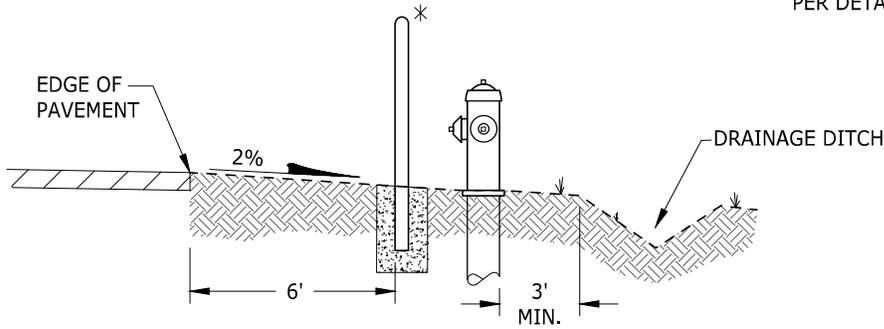
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NOTE:
 BOLLARDS SHALL NOT BE
 PLACED IN THE WAY OF
 VEHICULAR TRAFFIC

PLAN VIEW

* FIRE HYDRANT PROTECTION POST
 PER DETAIL 13-03-012



PROFILE

NTS



City of Flagstaff

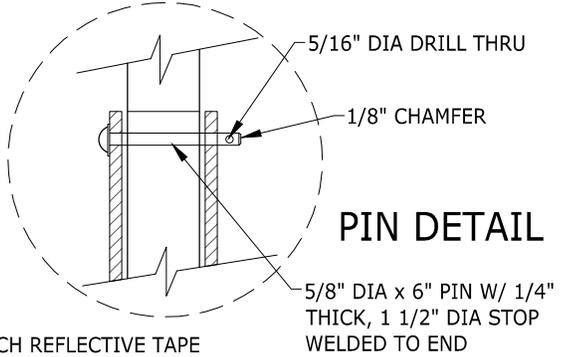
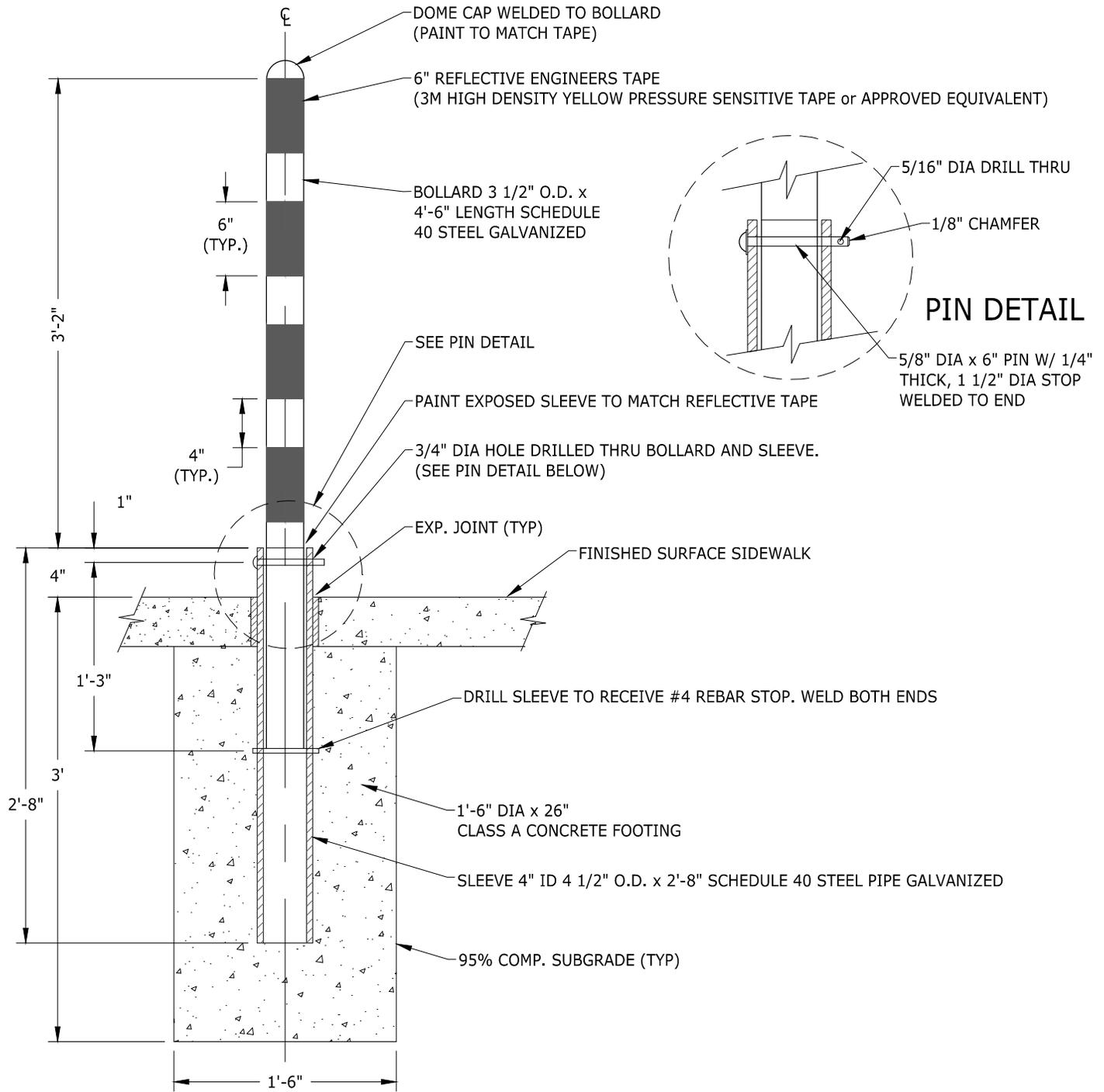
ENGINEERING
 DETAIL

**SHOULDER WIDENING AT FIRE HYDRANTS
 FOR UNCURBED ROADS**

DETAIL NO.
13-03-013

REVISION DATE: 11/22/16

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NOTES:

1. BOLLARD IS TO BE PAINTED AS FOLLOWS:
 - 1.1. PRIMER: TWO (2) COATS - COMPONENT ETCHING WASH PRIMER
 - 1.2. INTERMEDIATE: TWO (2) COATS - COMPONENT EPOXY PRIMER
 - 1.3. FINISH: ONE (1) COAT - "FRAZEE - 7636N LUSH VERANDA" HEAVY DUTY ENAMEL (ALKYD BASED) OR EQUAL
2. FOOTINGS AND BOLLARDS TO BE INSTALLED PRIOR TO POURING CONCRETE
3. BOLLARDS SHALL NOT BE IN THE WAY OF VEHICULAR TRAFFIC

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City of Flagstaff



ENGINEERING
DETAIL

REMOVABLE BOLLARD

DETAIL NO.

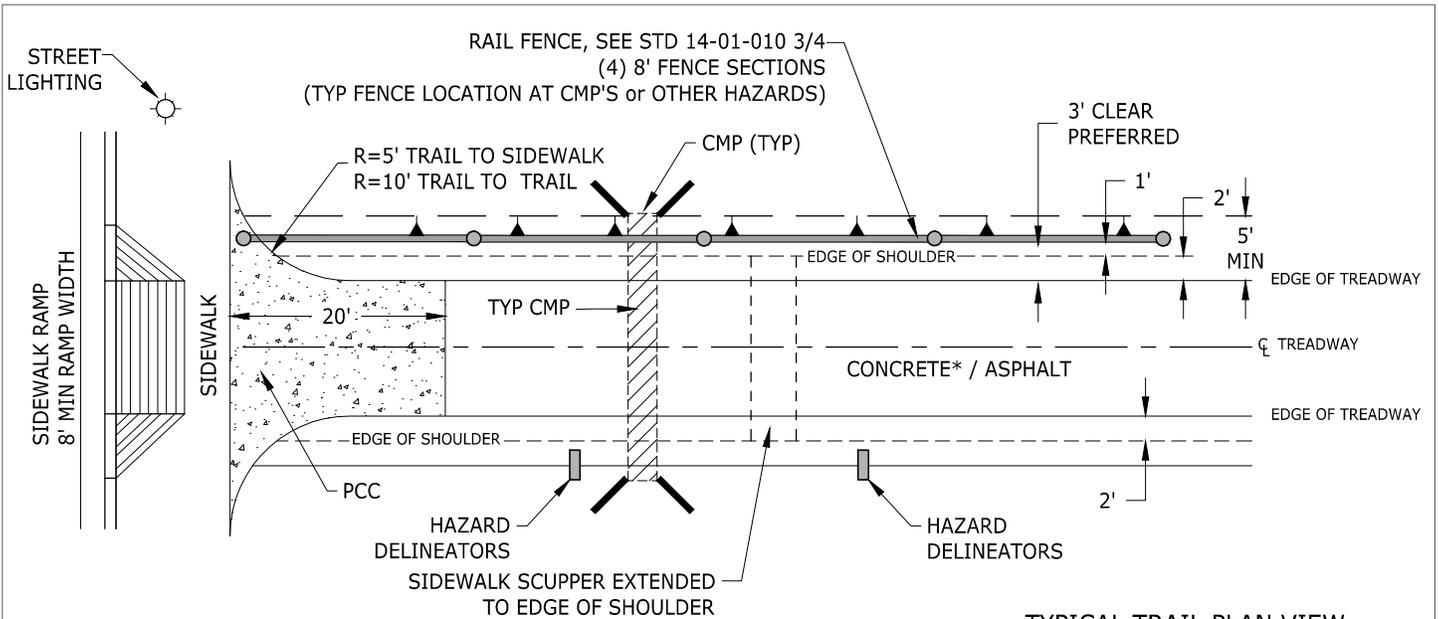
13-03-014

REVISION DATE:

11/22/16

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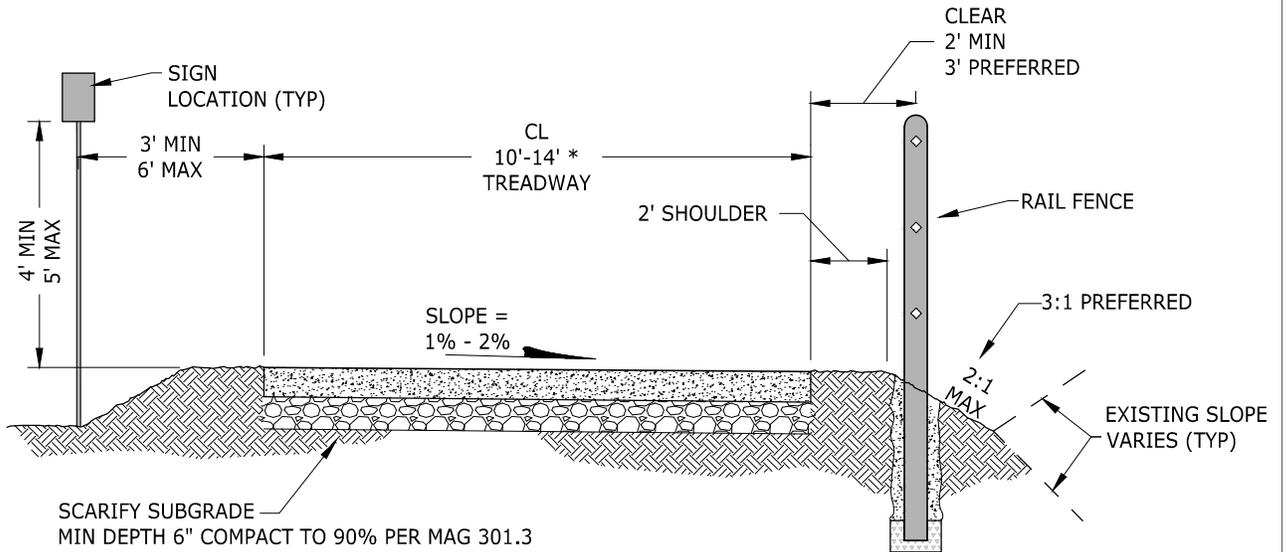


TYPICAL TRAIL PLAN VIEW

NOTES:

1. 50' MAX DISTANCE BETWEEN EXPANSION JOINTS per ADOT DETAIL C-07.01 (E JOINT)
2. 10' MAX DISTANCE BETWEEN CONTRACTION JOINT (SAWCUT TO 1 1/2" DEPTH AND FILL JOINT per ADOT DETAIL C-07.01)

* PER ANTICIPATED MIX USES, AREA TYPE AND ENVIRONMENT, LANE STRIPING WILL BE REQUIRED ON 14 FT WIDTHS AND MAY BE REQUIRED ON 10' AND 12' WIDTHS TO INDICATE CENTERLINE OR USER SEPARATION. IF IT IS DETERMINED THAT THE CITY WILL UTILIZE THE FUTS TRAIL AS ACCESS FOR MAINTENANCE VEHICLES, THE DESIGN ENGINEER MAY BE REQUIRED TO DESIGN A THICKER PAVEMENT SECTION THAT WILL SUPPORT MAINTENANCE VEHICLES THAT ARE ANTICIPATED TO USE THE FUTS FOR ACCESS. WHEN A FUTS TRAIL IS CONSTRUCTED ADJACENT TO A PUBLIC STREET (IN LIEU OF A SIDEWALK) IT SHALL BE CONSTRUCTED OF PCC

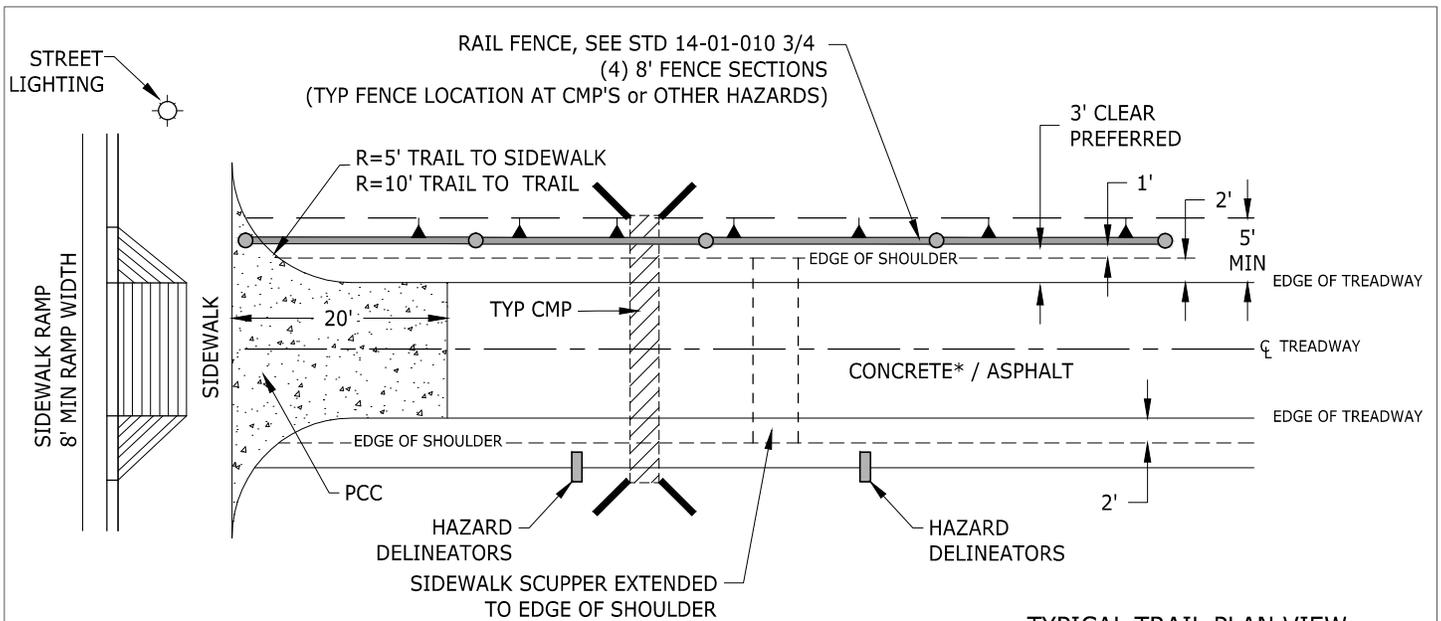


TYPICAL TRAIL CROSS SECTION

NOTES:

- 6" CLASS "A" PCC OVER 4" ABC WITH MAG STD 201 "A" TURN DOWN AT THE END OF THE TRAIL OR
- 3" AC OVER 6" ABC WITH MAG STD 201 TYPE "A" TURN DOWN WHEN APPROVED BY CITY ENGINEER.
- VEHICLE CROSSINGS TO MEET COF DRIVEWAY STDS WHEN TRAIL IS USED FOR VEHICLE TRAFFIC, A GREATER SECTION MAY BE REQUIRED.

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>FLAGSTAFF URBAN TRAILS SYSTEM</p> <p>DETAILS PAVED SECTION</p>		NTS
	<p>DETAIL NO.</p> <p>14-01-010</p>	<p>REVISION DATE:</p> <p>11/22/16</p>	<p>1</p> <p>4</p>

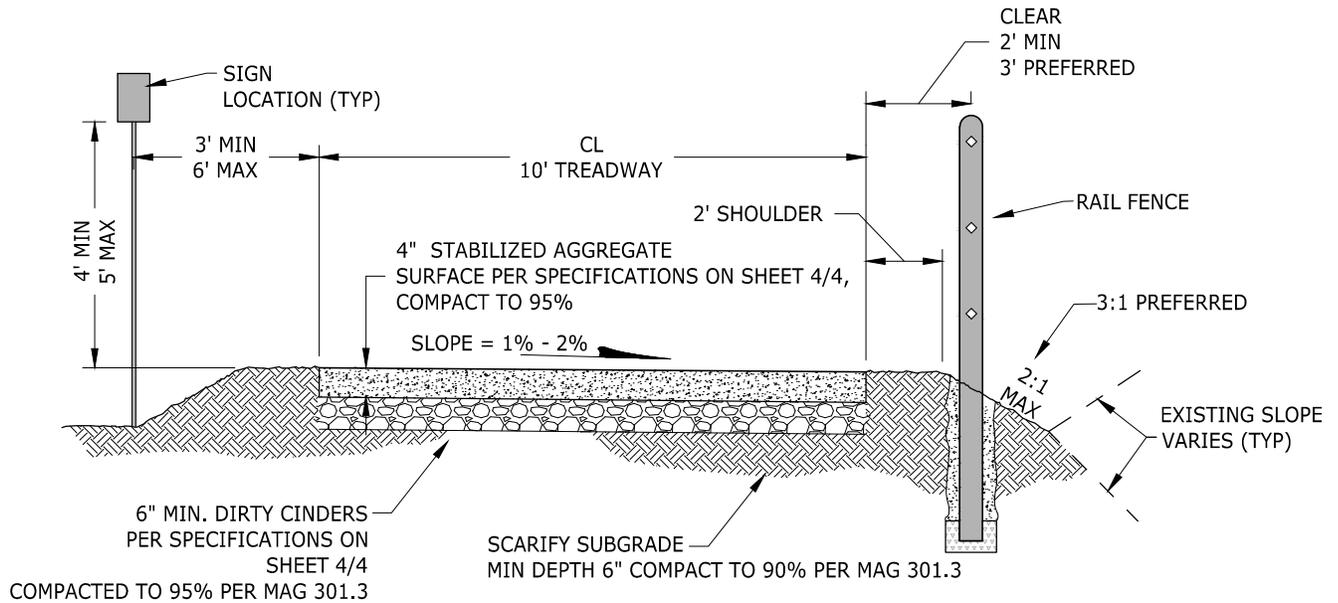


TYPICAL TRAIL PLAN VIEW

NOTES:

1. 50' MAX DISTANCE BETWEEN EXPANSION JOINTS per ADOT DETAIL C-07.01 (E JOINT)
2. 10' MAX DISTANCE BETWEEN CONTRACTION JOINT (SAWCUT TO 1 1/2" DEPTH AND FILL JOINT per ADOT DETAIL C-07.01)

* PER ANTICIPATED MIX USES, AREA TYPE AND ENVIRONMENT, LANE STRIPING WILL BE REQUIRED ON 14 FT WIDTHS AND MAY BE REQUIRED ON 10' AND 12' WIDTHS TO INDICATE CENTERLINE OR USER SEPARATION. IF IT IS DETERMINED THAT THE CITY WILL UTILIZE THE FUTS TRAIL AS ACCESS FOR MAINTENANCE VEHICLES, THE DESIGN ENGINEER MAY BE REQUIRED TO DESIGN A THICKER PAVEMENT SECTION THAT WILL SUPPORT MAINTENANCE VEHICLES THAT ARE ANTICIPATED TO USE THE FUTS FOR ACCESS. WHEN A FUTS TRAIL IS CONSTRUCTED ADJACENT TO A PUBLIC STREET (IN LIEU OF A SIDEWALK) IT SHALL BE CONSTRUCTED OF PCC

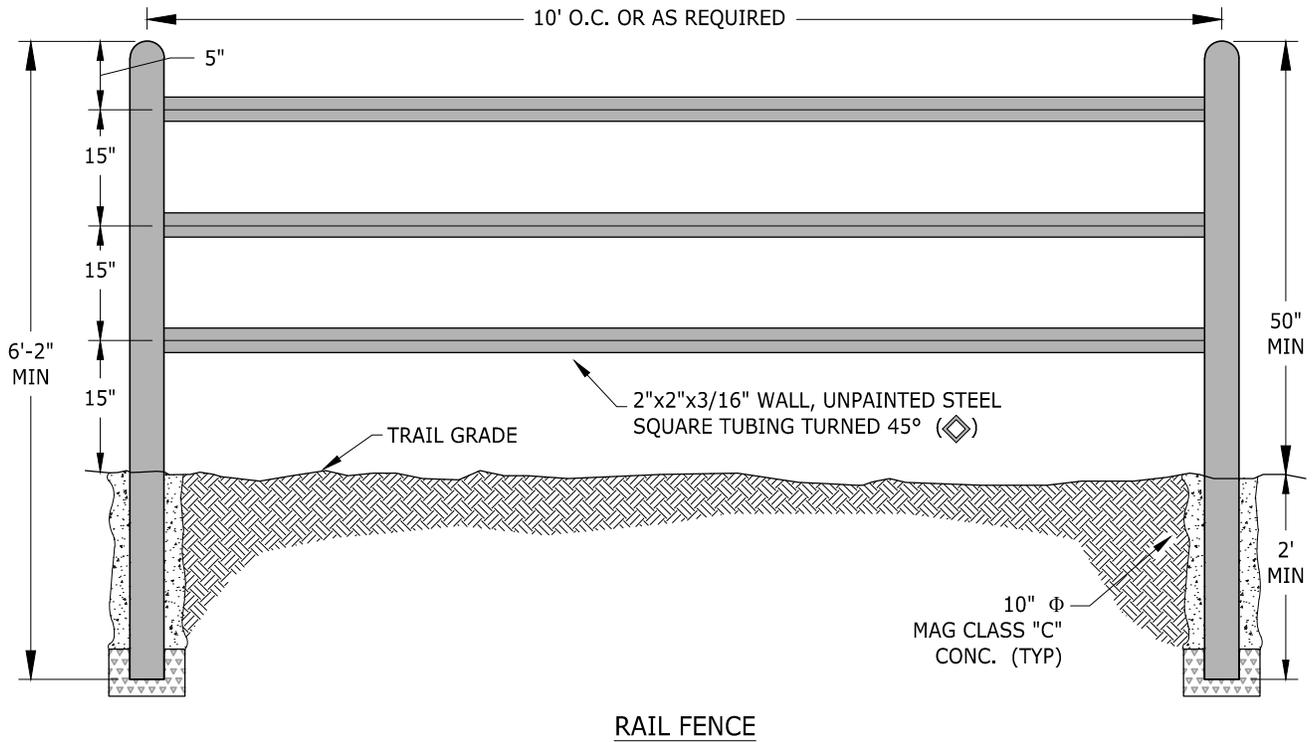


TYPICAL TRAIL CROSS SECTION

NOTES:

1. WHERE THE SLOPE OF THE TRAIL EXCEEDS 10% THE STRUCTURAL SECTION SHALL BE PCC OR AC PER SHEET 1/4

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>FLAGSTAFF URBAN TRAILS SYSTEM DETAILS UNPAVED SECTION</p>		NTS
	<p>DETAIL NO. 14-01-010</p>	<p>REVISION DATE: 11/22/16</p>	<p>2 4</p>



NOTES:

1. USE ONE OR TWO SECTIONS OF 5"x5" POSTS AND 3"x3" RAILS FOR ENTRY FEATURES.
2. USE 56.5" POSTS AND 4" RAILS IN HIGH HAZARD AREAS
3. SET POST 3' DEEP ON SLOPES GREATER THAN 2:1

4"x4"x44.5" ABOVE GRADE, 3/16" UNPAINTED STEEL SQUARE TUBING, PEAKED CAP TO DRAIN

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>FLAGSTAFF URBAN TRAILS SYSTEM DETAILS</p>		
	<p>DETAIL NO. 14-01-010</p>	<p>REVISION DATE: 11/22/16</p>	<p>3 4</p>

AGGREGATE SURFACE MATERIAL (FOR UNPAVED SECTION):

1. HERBICIDE SHALL BE SURFLAN® OR EQUAL FOR PRE-EMERGENT CONTROL AND ROUNDUP® FOR POST EMERGENT CONTROL.
2. AGGREGATE SURFACE MATERIAL SHALL BE A COLOR COMPATIBLE WITH NATURAL SURROUNDINGS AND ACCEPTABLE TO THE CITY OR COUNTY. WHITE, LIGHT GREY OR OTHER VISUALLY INCOMPATIBLE COLORED AGGREGATES WILL NOT BE ACCEPTED.
3. AGGREGATE SURFACE MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF MAG SECTION 702, EXCEPT THAT THE GRADATION SHALL BE AS FOLLOWS:

SIEVE SIZE (SQUARE OPENINGS)	PERCENT BY WEIGHT PASSING SIEVE
1"	100
3/4"	96-100
1/2"	85-99
3/8"	79-98
No. 4	68-87
No. 8	52-74
No. 30	27-50
No. 100	16-33
No. 200	13-27

4. HERBICIDES SHALL BE MIXED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS FOR NON-CROP LAND USE. PRE-EMERGENT HERBICIDE SHALL BE APPLIED TO THE SUBGRADE SURFACE AT A RATIO OF 1.5 GALLONS TO 100 GALLONS OF WATER PER ACRE. CARE SHALL BE GIVEN TO CONTAINING THE HERBICIDES TO THE FUTS TRAIL LIMITS ONLY. THE AGGREGATE SURFACE MATERIAL SHALL BE TREATED WITH LIGNIN SULFONATE IN ACCORDANCE WITH MAG SPECIFICATION 792.2
5. HERBICIDES SHALL BE MIXED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS FOR NON-CROP LAND USE. POST EMERGENT HERBICIDES SHALL BE APPLIED TO FUTS TRAIL AFTER THE SUBGRADE HAS BEEN SCARIFIED AND BEFORE SHAPING AND COMPACTING THE BASE. THE POST EMERGENT HERBICIDE SHALL BE APPLIED AT A RATIO OF 1.5 GALLONS OF WATER PER ACRE. CARE SHALL BE GIVEN TO CONTAINING HERBICIDES TO THE FUTS TRAIL LIMITS ONLY.
6. LIGNIN SULFONATE SHALL BE DELIVERED TO THE CONTRACTOR IN A CONCENTRATED FORM WITH 50% SPENT SUFLIDE LIQUOR (SSL). THE CONTRACTOR SHALL FUTHER DILUTE THE LIGNIN SULFONATE WITH AN EQUAL PART OF WATER PRIOR TO SPREADING.
7. PLACEMENT OF AGGREGATE SURFACE MATERIAL WITH DILUTED LIGNIN SULFONATE SHALL BE AN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS IN OTHER APPROVED METHODS, INCLUDING APPLICATION OF WATER TO THE SUBGRADE AS REQUIRED BY THE MANUFACTURER. THE FUTS TRAIL SHALL RECIEVE A TOTAL APPLICATION OF 0.7 GALLONS PER SQUARE YARD OF 50% SSL AND SHALL BE APPLIED IN THE FOLLOWING MANNER:
 - a. THE AGGREGATE SURFACE MATERIAL SHALL BE THOROUGHLY MIXED WITH DILUTED LIGNIN SULFONATE AT A RATE OF 0.5 TO 0.6 GALLONS PER SQUARE YARD OF TRAIL.
 - b. THE CONTRACTOR SHALL APPLY A "TOP SHOT" TO THE FINISHED TRAIL SURFACE BY SURFACE SPRAYING 0.1 TO 0.2 GALLONS OF DILUTED LIGNIN SULFONATE PER SQUARE YARD OF TRAIL NO SOONER THAN 2 DAYS AND NO LATER THAN 3 DAYS AFTER THE PLACEMENT OF THE TREATED AGGREGATE SURFACE COURSE.

DIRTY CINDER GRADATION SPECIFICATION

SIEVE SIZE (SQUARE OPENINGS)	PERCENT BY WEIGHT PASSING SIEVE
3/4"	90-100
No. 4	58-78
No. 8	37-67
No. 30	13-35
No. 100	4-15
No. 200	0-12

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>FLAGSTAFF URBAN TRAILS SYSTEM DETAILS</p>		
	<p>DETAIL NO. 14-01-010</p>	<p>REVISION DATE: 11/22/16</p>	<p>4 4</p>

WIDTH OF UNDERPASS SHOULD BE INFLUENCED IN PART BY LENGTH. FOR TUNNEL STRUCTURES UP TO 50' LONG, THE WIDTH SHOULD BE EITHER:

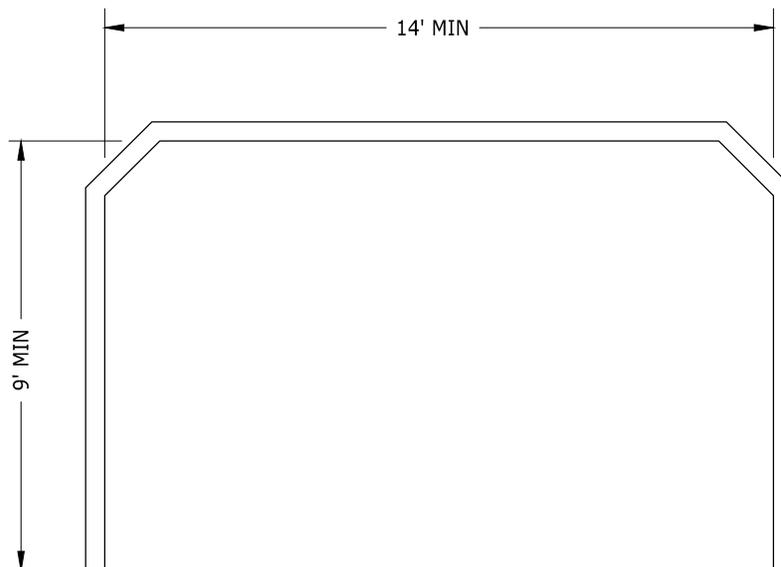
a) 14' or

b) THE WIDTH OF THE APPROACH PATHWAY PLUS A 24" "SHY ZONE" ON EITHER SIDE (i.e., $10'+2'+2'=14'$),

WHICHEVER IS GREATER.

FOR TUNNEL STRUCTURES LONGER THAN 50', THE WIDTH SHOULD BE INCREASED BY ONE FOOT (1') FOR ANY PORTION OF EACH 10' BEYOND 50'. (FOR 51' TO 60' USE 15' WIDTH; FOR 61' TO 70' USE 16"; AND SO FORTH)

THE HEIGHT/CLEARANCE OF THE UNDERPASS SHOULD BE A MINIMUM OF 9' WITH THE PREFERED HEIGHT OF 10' (ESPECIALLY FOR LONGER UNDERPASSES)



NTS

City of Flagstaff



ENGINEERING
DETAIL

PEDESTRIAN & SHARED USED PATH UNDERPASS DIMENSIONS

DETAIL NO.

14-01-011

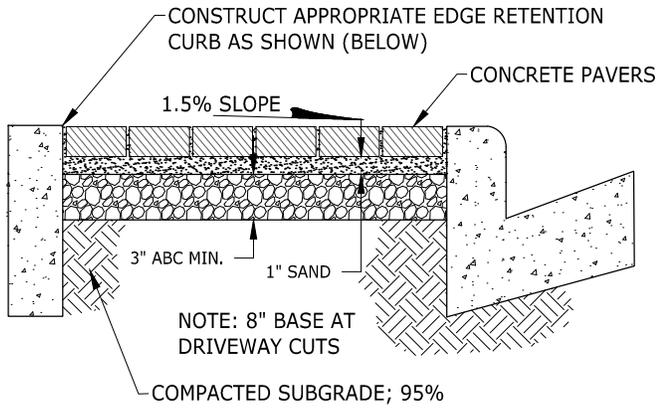
REVISION DATE:

11/22/16

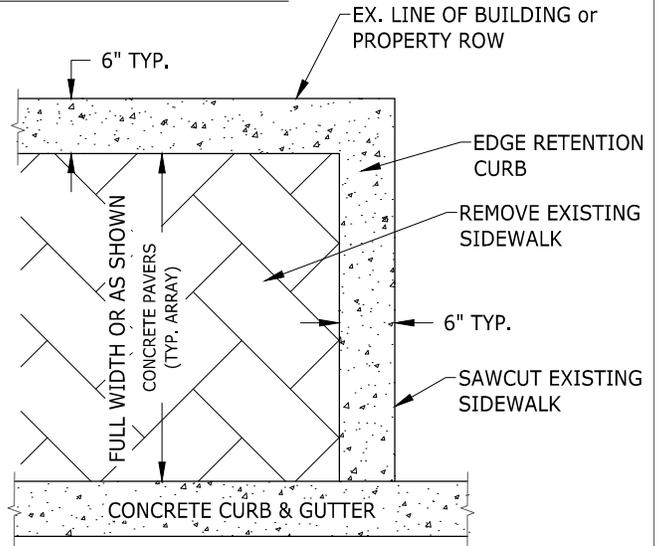
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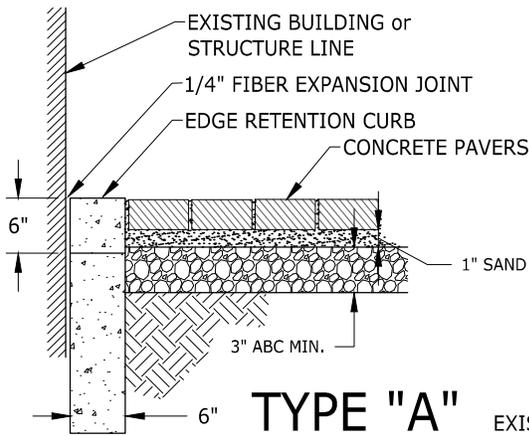
TYPICAL CROSS SECTION



TYPICAL LAYOUT

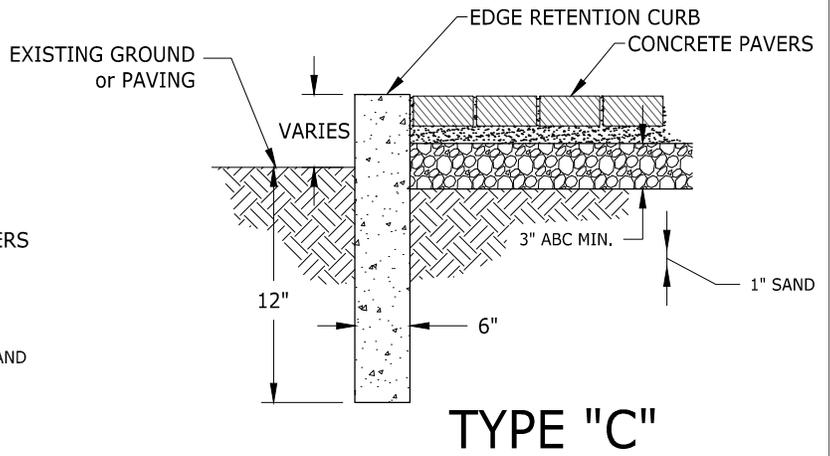
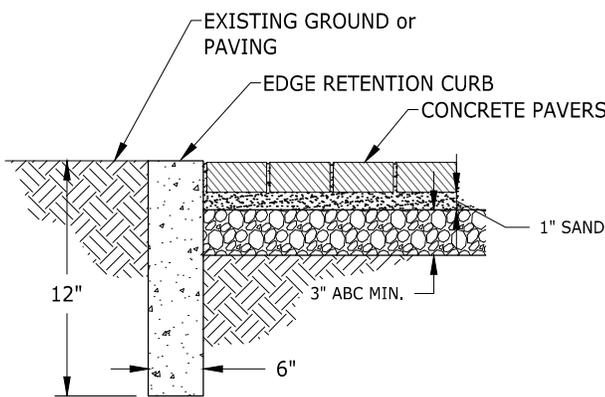


EDGE RETENTION CURB DETAILS



NOTE:

- 1/2" RADIUS ALL EXPOSED EDGES
- CONTRACTION JOINTS IN ALL CURBS, 10' MAX SPACING
- THIS WORK SHALL MEET ALL REQUIREMENTS OF M.A.G. SECTION 342 "DECORATIVE PAVEMENT CONCRETE PAVING STONE or BRICK"



NTS

City of Flagstaff



ENGINEERING
DETAIL

CONCRETE PAVING STONE or
BRICK SIDEWALK

DETAIL NO.

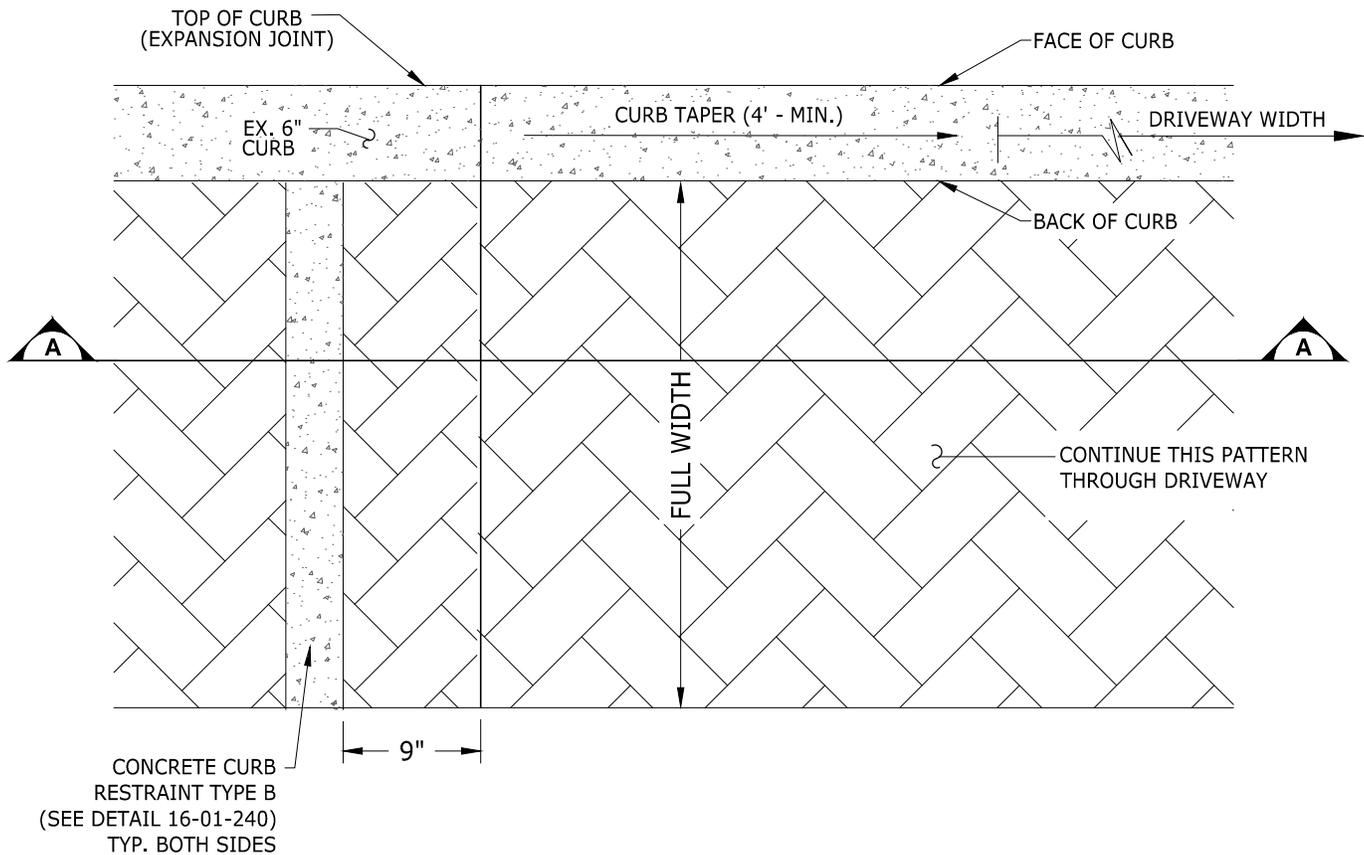
16-01-240

REVISION DATE:

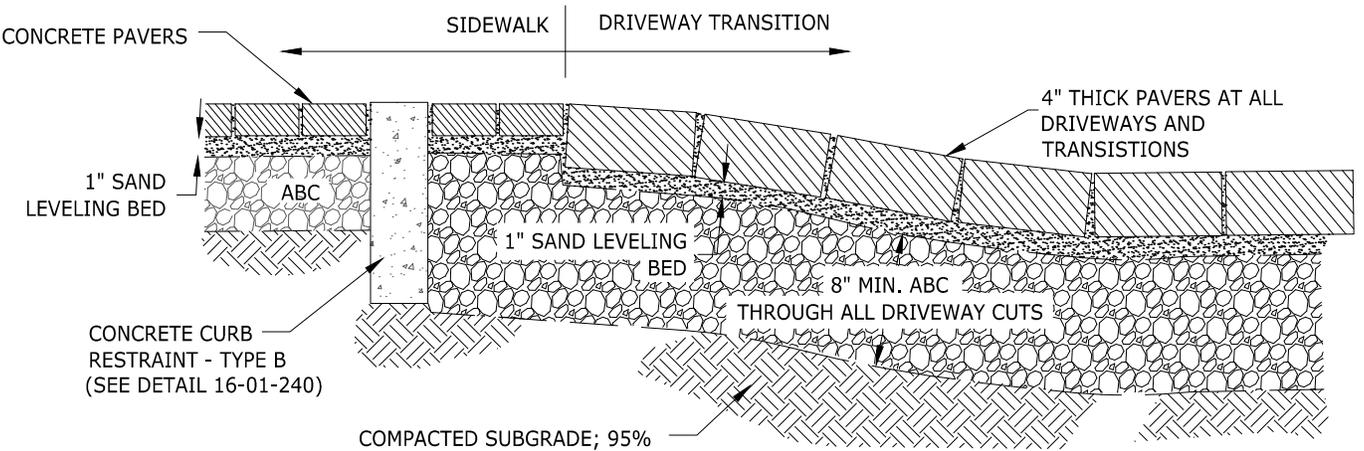
11/22/16

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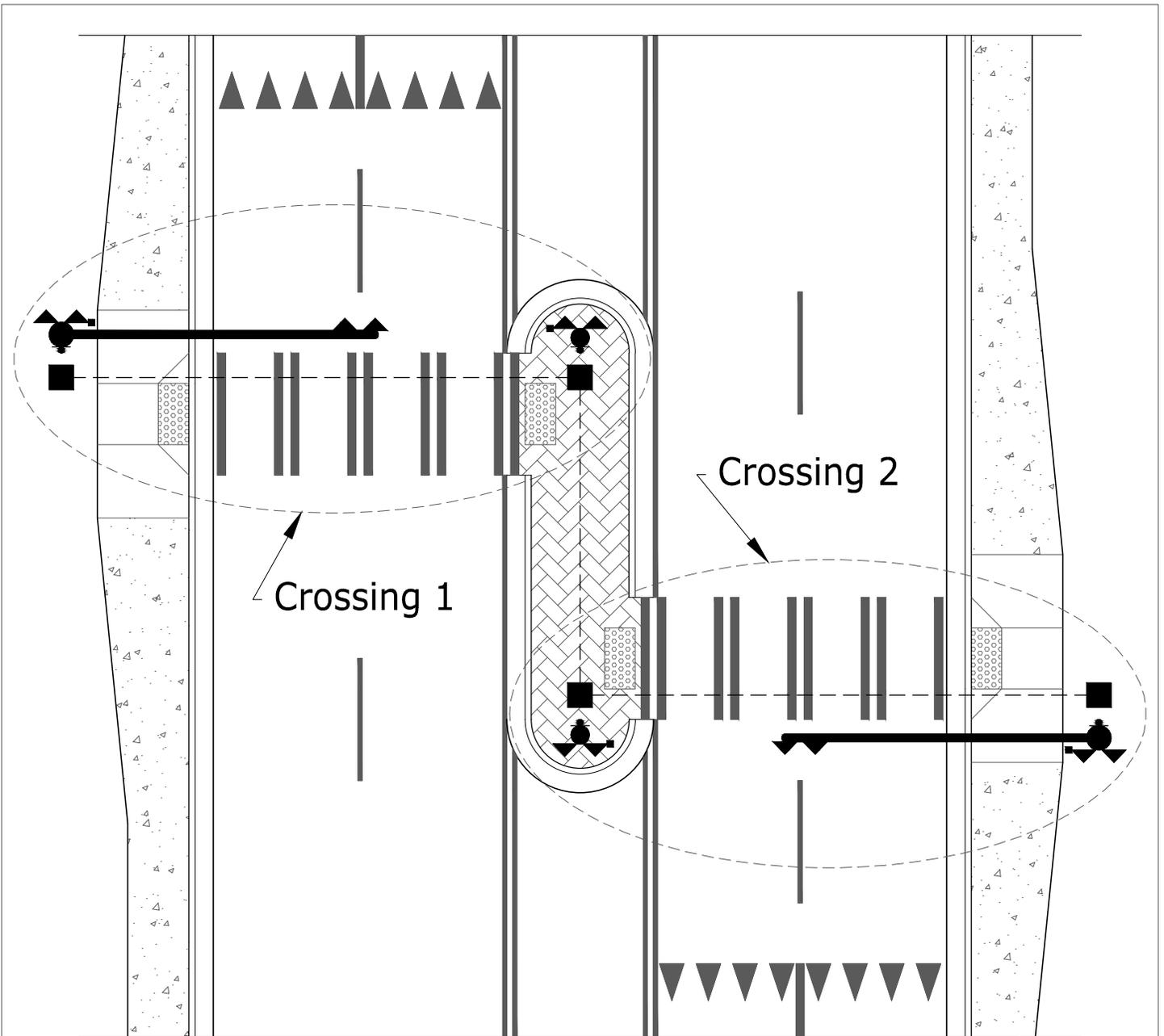
CONCRETE CURB
RESTRAINT TYPE B
(SEE DETAIL 16-01-240)
TYP. BOTH SIDES



SECTION A - A

NOTE: THIS WORK SHALL MEET ALL REQUIREMENTS OF MAG SECTION 342 "DECORATIVE PAVEMENT CONCRETE PAVING STONE OR BRICK".

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>CONCRETE PAVING STONE or BRICK DRIVEWAY</p>		NTS
	<p>DETAIL NO. 16-01-241</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



LEGEND:

-  - TWO (2) CIRCULAR RAPID FLASHING BEACONS (CRFB)
-  - POLE WITH MAST ARM (MORE INFORMATION ON PAGE 3/3)
-  - FIFTEEN (15) FOOT POLE (MORE INFORMATION ON PAGE 2/3)
-  - PULL BOX
-  - LED INDICATOR LIGHT
-  - PUSH BUTTON

NOTES:

1. EACH LOCATION (CROSSING 1 AND CROSSING 2) IS AN INDEPENDENT CROSSING AND SHALL HAVE ITS OWN ACTUATED CONTROLLER.
2. EACH CROSSING SHALL HAVE TWO (2) PUSH BUTTONS, SIX (6) 12" LED CIRCULAR RAPID FLASHING BEACON SIGNAL HEADS, AND TWO (2) LED INDICATOR LIGHTS.
3. ALL INDICATORS AND DETECTORS ARE TO BE HARDWIRED TO THE CONTROLLERS.

NTS

City of Flagstaff



ENGINEERING
DETAIL

**TYPICAL LAYOUT
OF PEDESTRIAN CRFB**

DETAIL NO.

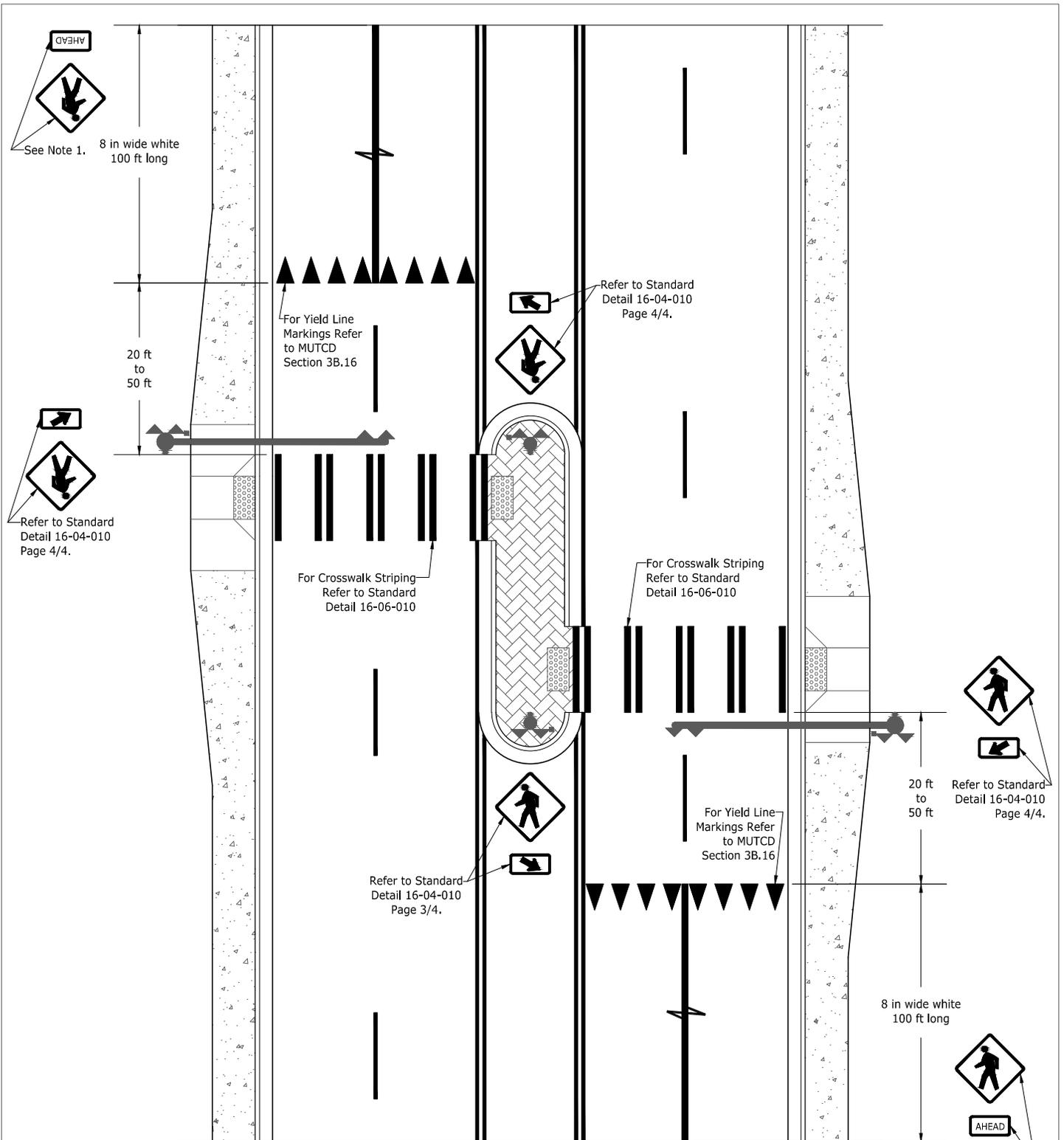
16-04-010

REVISION DATE:

11/22/16

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NOTES:

1. ADVANCED WARNING SIGNS (MUTCD W11-2 AND W16-9P) ARE TO BE PLACED IN ACCORDANCE WITH SECTION 2C.05 OF THE MUTCD.

NTS



City of Flagstaff

ENGINEERING
DETAIL

**TYPICAL SIGNING & STRIPING DETAIL
OF PEDESTRIAN CRFB**

DETAIL NO.

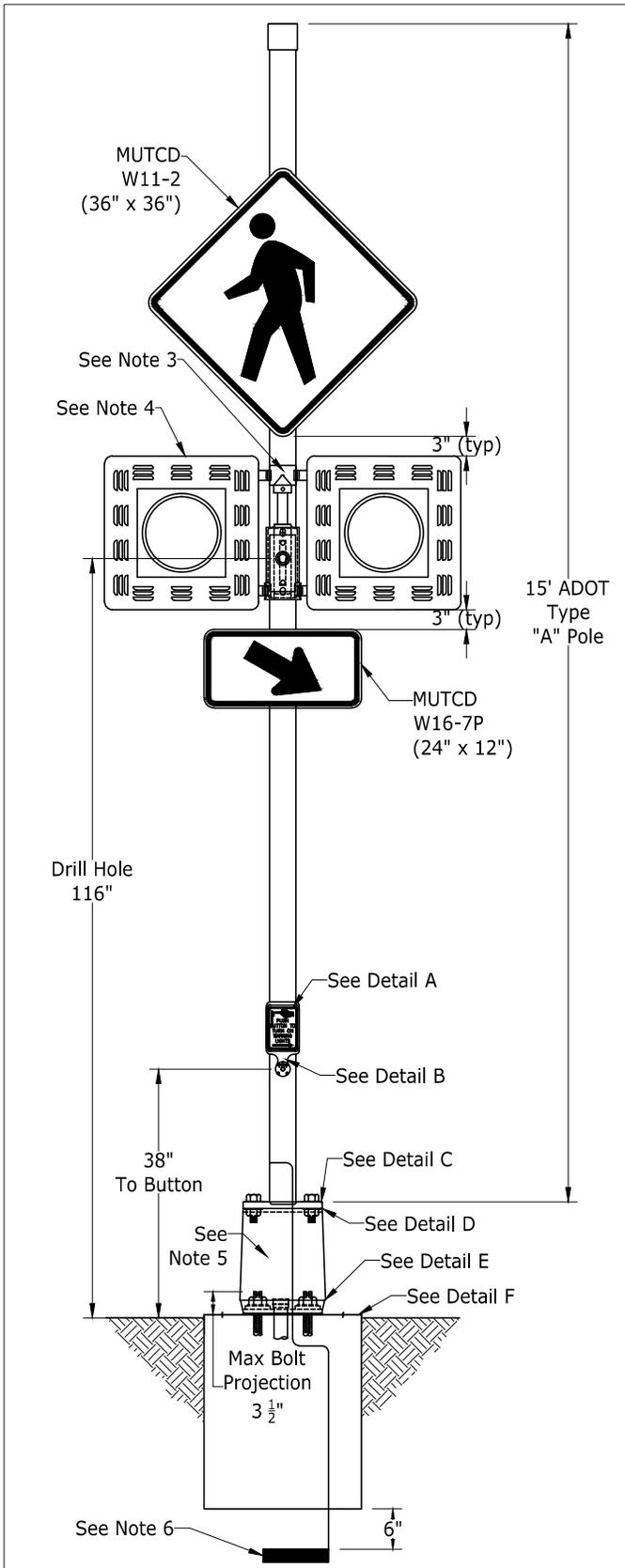
16-04-010

REVISION DATE:

11/22/16

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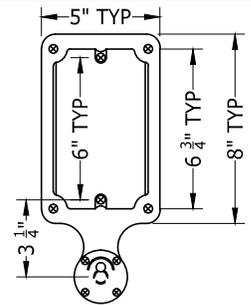


NOTES:

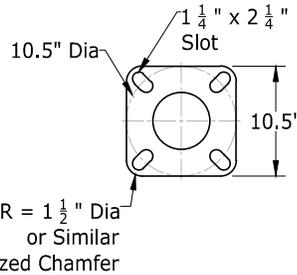
1. FOR ALL TRAFFIC SIGNAL CONSTRUCTION WORK REFER TO SECTION 13-16-004-0004.
2. FOR POLE, FOUNDATION, AND BOLTS REFER TO ADOT STANDARD DRAWINGS T.S. 4-1 AND 4-23 AND ADOT STANDARD SPECIFICATIONS SECTION 731-1.
3. FOR MOUNTING ASSEMBLY REFER TO ADOT TYPE VII MOUNTING ASSEMBLY STANDARD DRAWING.
4. FOR SIGNAL FACE REFER TO ADOT FLASHING BEACON SIGNAL FACE ASSEMBLY; TYPE "D" STANDARD DRAWING; ALSO INCLUDE 2" FLUORESCENT YELLOW PRISMATIC RETROREFLECTIVE BORDER AROUND THE ENTIRE PERIMETER OF THE BACKPLATE.
5. FOR BREAKAWAY BASE REFER TO ADOT TYPE 2 BREAKAWAY BASE STANDARD DRAWINGS.
6. A 25' COIL OF #4 AWG BARE COPPER CONDUCTOR OR 14" SQUARE COPPER GROUND PLATE SHALL BE INSTALLED BEFORE THE CONCRETE IS POURED AND CONNECTED TO POLE GROUNDING LUG IN THE HAND HOLE. THE GROUND OR COIL SHALL BE COVERED WITH 6" OF FILL.



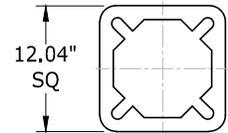
DETAIL A
MUTCD R10-25
(modified to include directional arrow)



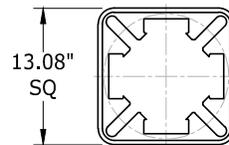
DETAIL B
Typical Pedestrian Push Button



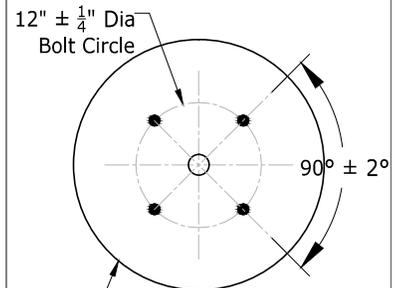
DETAIL C
Base Plate



DETAIL D
Top View of Break Away Base



DETAIL E
Bottom View of Break Away Base



DETAIL F
Foundation Section

City of Flagstaff



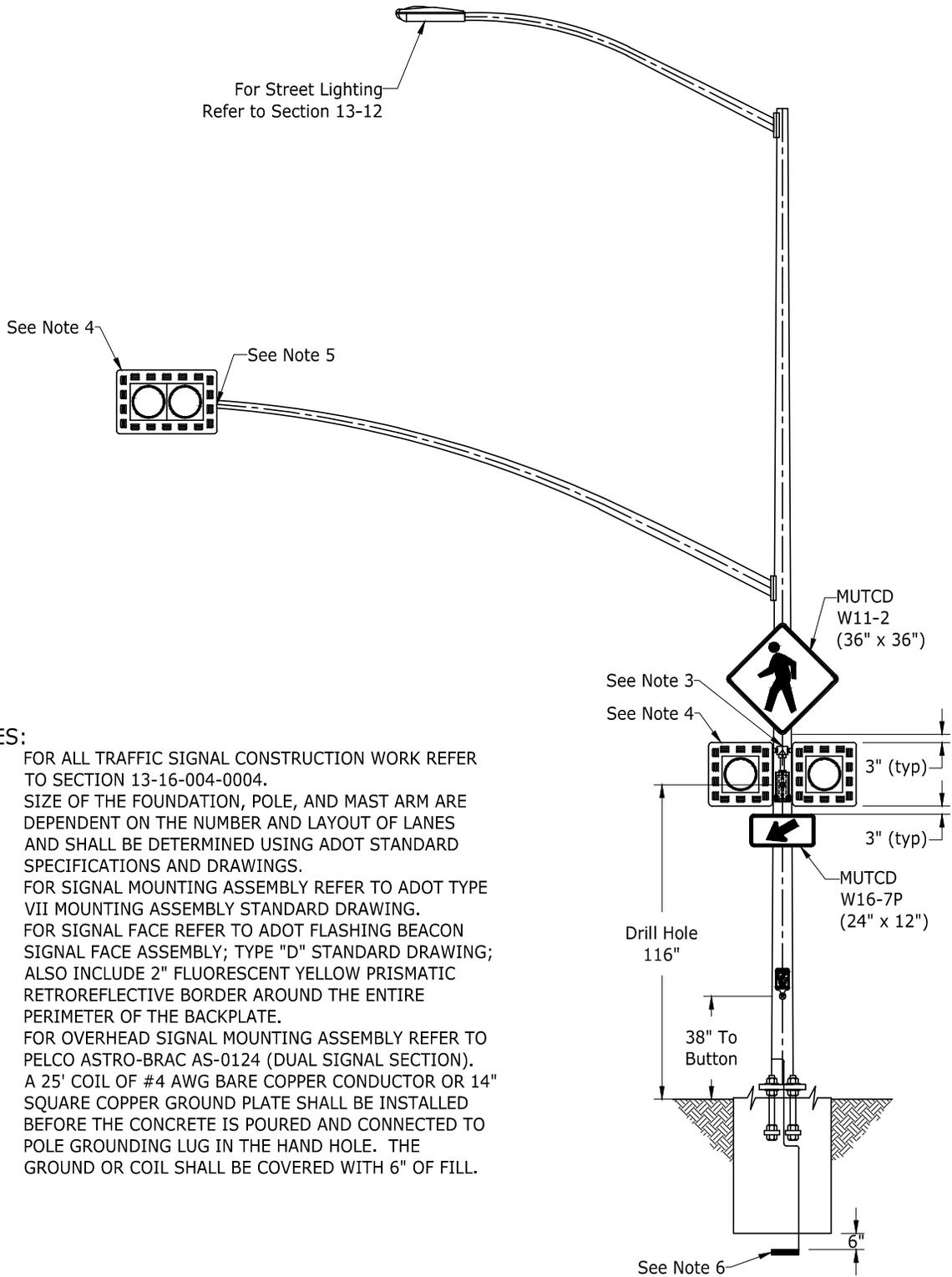
ENGINEERING
DETAIL

**TYPICAL POLE DETAIL
OF PEDESTRIAN CRFB**

DETAIL NO.
16-04-010

REVISION DATE: 11/22/16

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4



NOTES:

1. FOR ALL TRAFFIC SIGNAL CONSTRUCTION WORK REFER TO SECTION 13-16-004-0004.
2. SIZE OF THE FOUNDATION, POLE, AND MAST ARM ARE DEPENDENT ON THE NUMBER AND LAYOUT OF LANES AND SHALL BE DETERMINED USING ADOT STANDARD SPECIFICATIONS AND DRAWINGS.
3. FOR SIGNAL MOUNTING ASSEMBLY REFER TO ADOT TYPE VII MOUNTING ASSEMBLY STANDARD DRAWING.
4. FOR SIGNAL FACE REFER TO ADOT FLASHING BEACON SIGNAL FACE ASSEMBLY; TYPE "D" STANDARD DRAWING; ALSO INCLUDE 2" FLUORESCENT YELLOW PRISMATIC RETROREFLECTIVE BORDER AROUND THE ENTIRE PERIMETER OF THE BACKPLATE.
5. FOR OVERHEAD SIGNAL MOUNTING ASSEMBLY REFER TO PELCO ASTRO-BRAC AS-0124 (DUAL SIGNAL SECTION).
6. A 25' COIL OF #4 AWG BARE COPPER CONDUCTOR OR 14" SQUARE COPPER GROUND PLATE SHALL BE INSTALLED BEFORE THE CONCRETE IS POURED AND CONNECTED TO POLE GROUNDING LUG IN THE HAND HOLE. THE GROUND OR COIL SHALL BE COVERED WITH 6" OF FILL.

City of Flagstaff



ENGINEERING
DETAIL

**TYPICAL MAST ARM DETAIL
OF PEDESTRIAN CRFB**

DETAIL NO. 16-04-010	REVISION DATE: 11/22/16	4
		4



DETAIL A: STREET NAME SIGN FOR SPEEDS OF 40 MPH OR LESS



DETAIL B: STREET NAME SIGN FOR SPEEDS GREATER THAN 40 MPH

NOTES:

1. FOR PUBLIC ROADWAYS SIGNS ARE TO BE A GREEN BACKGROUND WITH WHITE RETRO-REFLECTIVE (TYPE XI SHEETING) LETTERS.
2. FOR PRIVATE ROADWAYS SIGNS ARE TO BE A BLUE BACKGROUND WITH WHITE RETRO-REFLECTIVE (TYPE XI SHEETING) LETTERS.
3. THE ARROW SHALL POINT IN THE DIRECTION OF INCREASING ADDRESSES FOR A GIVEN STREET.
4. SIGNS SHALL MEET 2009 MUTCD SECTION 2D.43.
5. LETTER FONT SHALL BE HIGHWAY C.
6. FOR POST DESIGN, REFER TO SECTION 13-16-005-0002.

NTS

City of Flagstaff



ENGINEERING
DETAIL

STREET NAME SIGNS

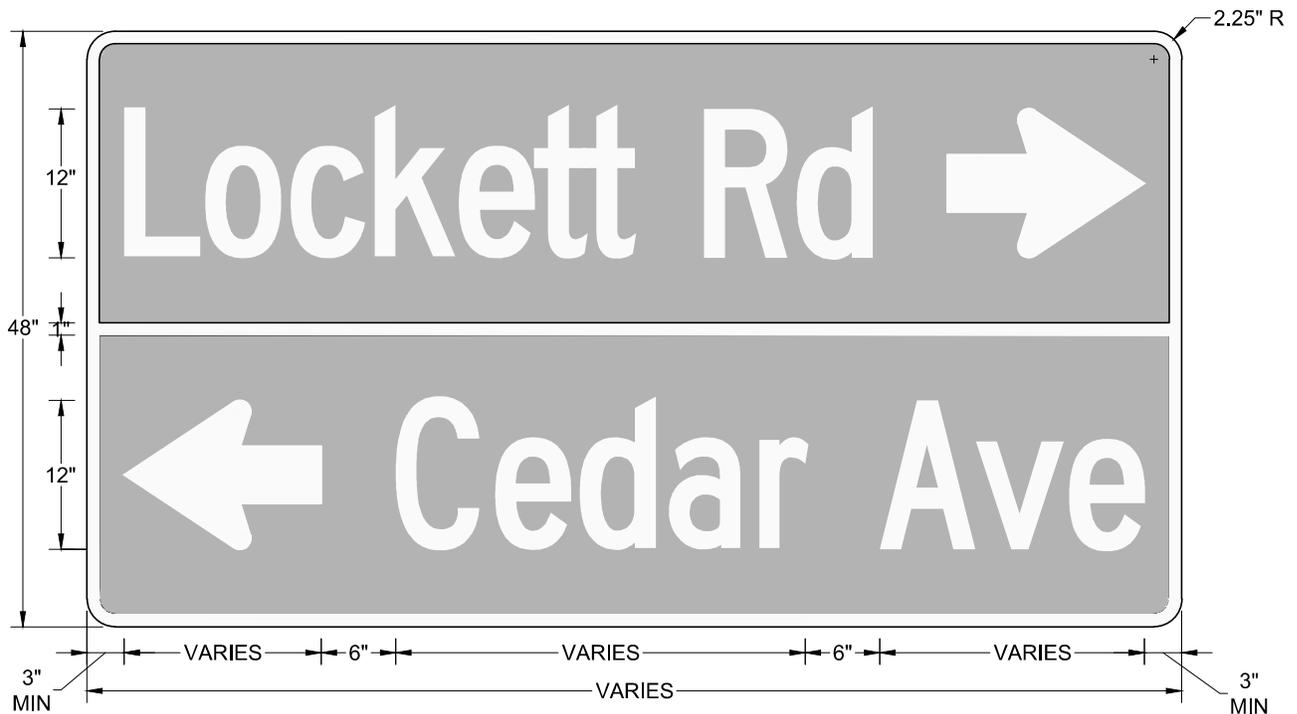
DETAIL NO.
16-05-010

REVISION DATE: 11/22/16

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DETAIL C: TRAFFIC SIGNAL STREET NAME SIGN



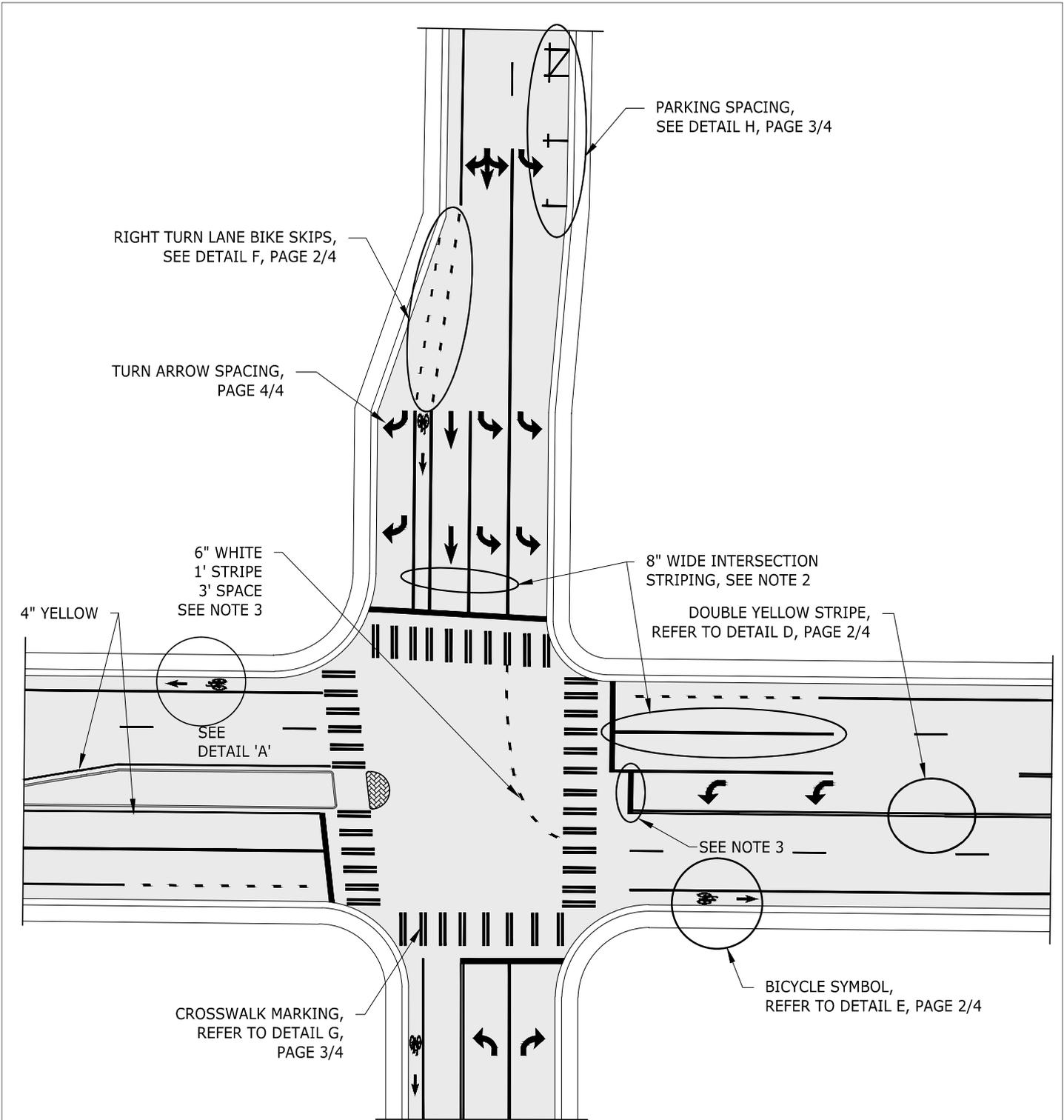
DETAIL D: TRAFFIC SIGNAL STREET NAME SIGN
(where name changes)

NOTES:

1. FOR PUBLIC ROADWAYS SIGNS ARE TO BE A GREEN BACKGROUND WITH WHITE RETRO-REFLECTIVE (TYPE XI SHEETING) LETTERS.
2. FOR PRIVATE ROADWAYS SIGNS ARE TO BE A BLUE BACKGROUND WITH WHITE RETRO-REFLECTIVE (TYPE XI SHEETING) LETTERS.
3. SIGNS SHALL MEET 2009 MUTCD SECTION 2D.43.
4. LETTER FONT SHALL BE HIGHWAY C.
5. TRAFFIC SIGNAL STREET NAME SIGNS SHALL BE INSTALLED ON TRAFFIC SIGNAL POLES WITH A MINIMUM OF 3 STEEL CLAMP BRACKETS WITH PREFORATED SQUARE TUBING, AS SHOWN ON ADOT STANDARD DRAWINGS.

NTS

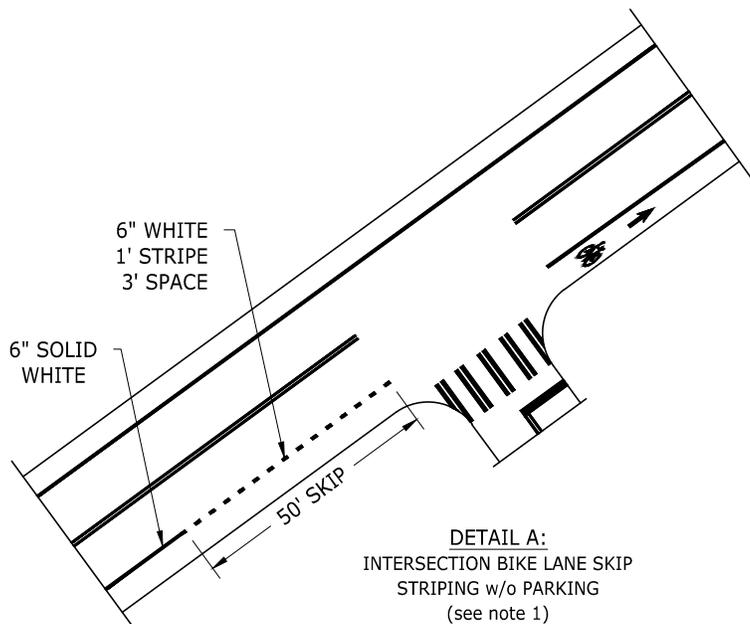
 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<p>TRAFFIC SIGNAL STREET NAME SIGNS</p>		
	<p>DETAIL NO. 16-05-020</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



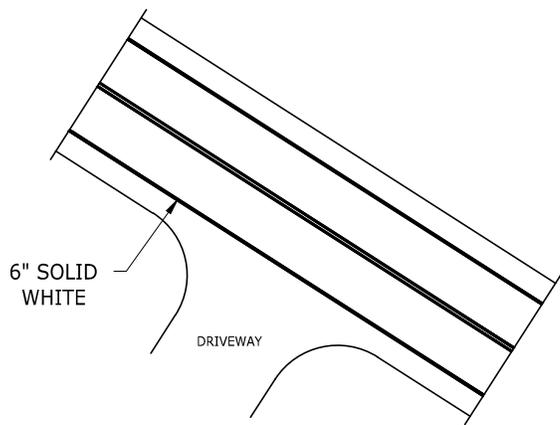
- NOTES:
1. FOR PAVEMENT MARKING MATERIAL TYPES, SEE CHAPTER 13-16-006.
 2. 8" WIDE STRIPING IS TO BE A MINIMUM LENGTH OF 100 FEET, OR MATCH EXISTING TURN LANE.
 3. LAYOUT OF MINI SKIPS THROUGH INTERSECTION AND SETBACK OF LEFT TURN LANE STOP BAR SHALL BE APPROVED BY TRANSPORTATION ENGINEERING STAFF.

NTS

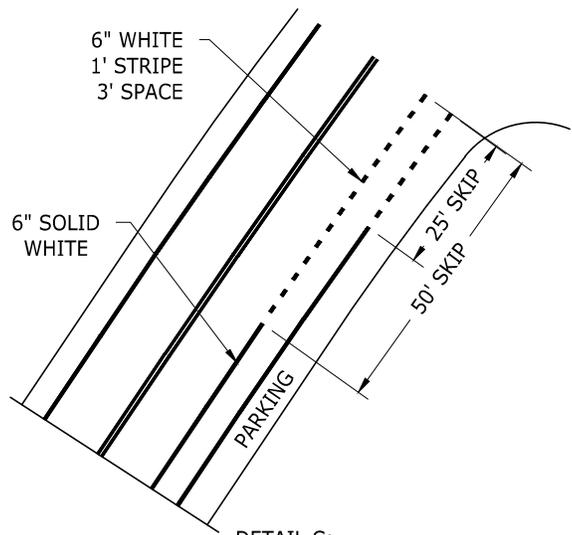
 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>INTERSECTION STRIPING</h2>			
	DETAIL NO. <h1>16-06-010</h1>	REVISION DATE: 11/22/16	<div style="font-size: 2em; font-weight: bold;">1</div> <div style="font-size: 2em; font-weight: bold;">4</div>	



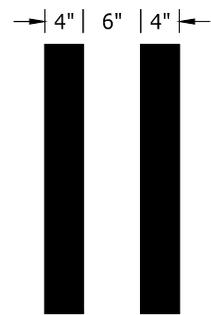
DETAIL A:
INTERSECTION BIKE LANE SKIP
STRIPING w/o PARKING
(see note 1)



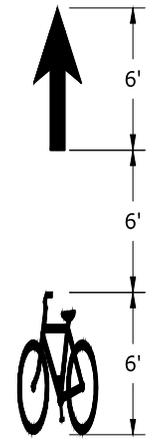
DETAIL B:
DRIVEWAY BIKE LANE STRIPING
(see note 2)



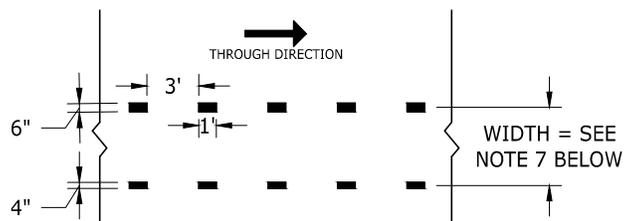
DETAIL C:
INTERSECTION BIKE LANE
STRIPING w/ PARKING
(see note 3)



DETAIL D:
DOUBLE YELLOW STRIPE
(see note 4)



DETAIL E:
BIKE SYMBOL
(per MUTCD 9C-3A)
(see note 5 & 6)



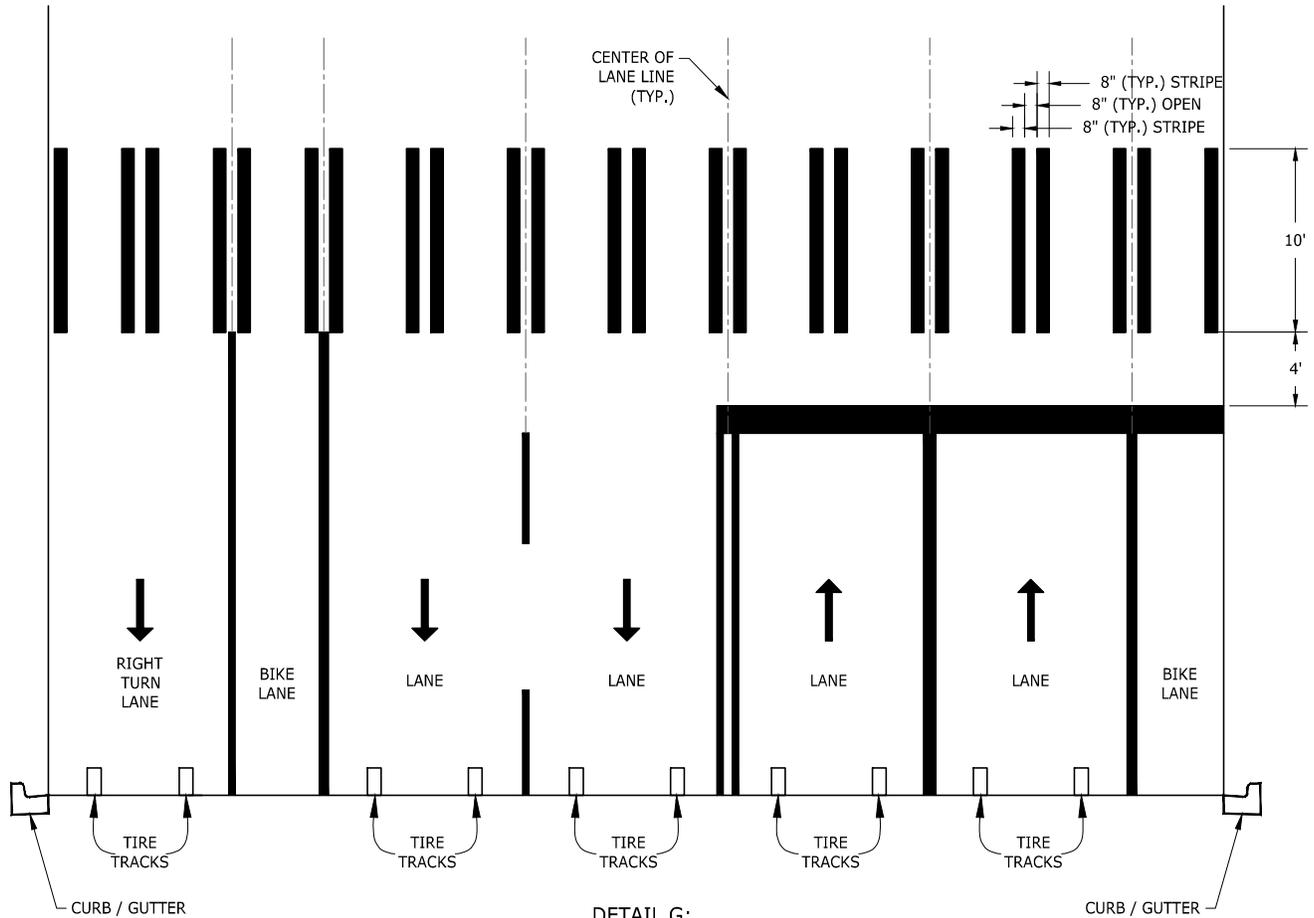
DETAIL F:
RIGHT TURN LANE BIKE SKIPS
(see note 7)

NOTES:

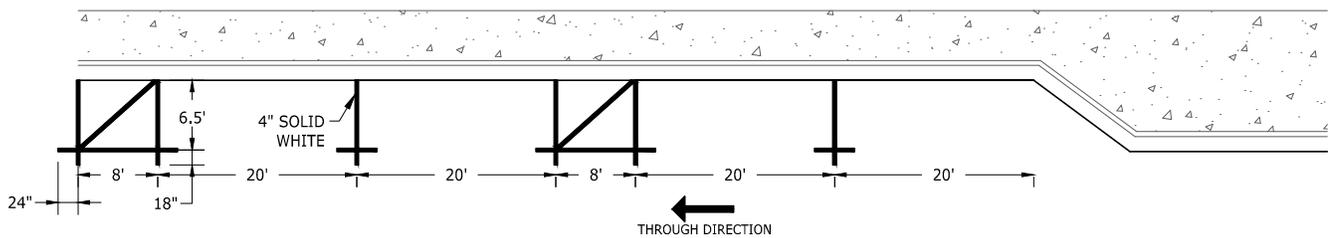
1. USED WHEN A BIKE LANE APPROACHES AN INTERSECTION, STRIPE A SKIP SECTION OF 50 FEET ENDING AT CURB RETURN.
2. SOLID BIKE STRIPING SHALL CONTINUE ACROSS DRIVEWAYS.
3. WHEN PARKING APPROACHES AN INTERSECTION, STRIPE A SKIP SECTION OF 50 FEET ON THE TRAVEL LANE SIDE OF THE BIKE LANE AND A 25 FOOT SECTION ON THE PARKING SIDE OF THE BIKE LANE.
4. DOUBLE YELLOW STRIPING SHALL BE A 4" WIDE STRIPE, A 6" WIDE GAP, AND A 4" WIDE STRIPE.
5. BIKE LANE SYMBOLS SHALL BE 15 FEET FROM THE CURB RETURN ON THE DOWNSTREAM LEG OF ALL INTERSECTIONS.
6. THE GAPS BETWEEN BIKE SYMBOLS SHALL BE RELATIVELY STANDARD SPACING OF NO MORE THAN 1/2 MILE LONG.
7. TYPICAL BIKE LANE WIDTH = 4.5', EXCEPT WHEN ADJACENT TO ON-STREET PARKING AND/OR WHEN BIKE LANE TRAVERSES BETWEEN TURN LANES, THEN WIDTH = 5'.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	STRIPING DETAILS		
	<p>DETAIL NO. 16-06-010</p>	<p>REVISION DATE: 11/22/16</p>	<p>2 4</p>



DETAIL G:
CROSSWALK MARKING
(see note 1 & 2)



DETAIL H:
PARALLEL PARKING MARKINGS
(see note 3)

NOTES:

1. FOR ROADWAYS WITH MORE OR LESS LANES, SAME CONFIGURATION APPLIES. KEEP CROSSWALK BARS CENTERED ON LANE LINES, IN CENTER OF TRAVELED PORTION OF LANE TO MINIMIZE WEAR ON CROSSWALK STRIPES, AND PARALLEL TO WHEEL PATHS. DETAIL IS INTENDED TO BE REPRESENTATIVE ONLY. FINAL LAYOUT OF PAVEMENT MARKINGS IS DEPENDENT ON SPECIFIC LANE CONFIGURATION OF STREET.
2. CITY INSPECTOR SHALL INVOLVE TRAFFIC ENGINEERING SECTION FOR REVIEWING NONSTANDARD LAYOUTS PRIOR TO INSTALLING MARKINGS, FOR WHICH AT LEAST 24-HOURS NOTICE IS REQUIRED.
3. FOR MORE THAN TWO (2) 20 FOOT PARALLEL PARKING STALLS, ONE (1) PARKING MANEUVERING BOX IS REQUIRED BETWEEN THE SECOND AND THIRD STALL.

NTS

City of Flagstaff



ENGINEERING
DETAIL

**STRIPING
DETAILS**

DETAIL NO.
16-06-010

REVISION DATE: 11/22/16

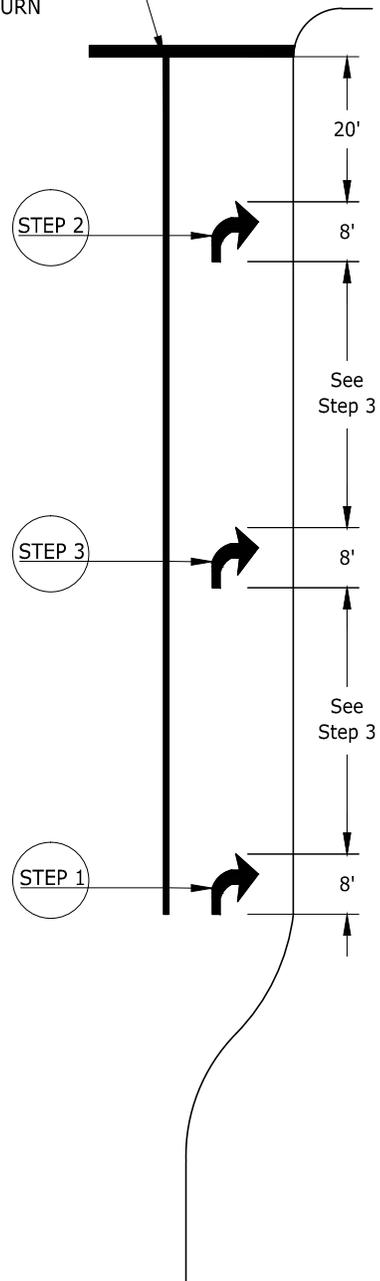
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TURN LANE LINE STARTS AT STOP BAR, BUT IF STOP BAR DOES NOT EXIST, THEN START AT CURB RETURN

STEP 1:
PLACE FIRST ARROW FLUSH WITH THE END OF THE TURN LANE LINE, AS SHOWN

STEP 2:
WHEN STORAGE LENGTH IS 76' OR GREATER, PLACE ANOTHER ARROW 20' FROM THE STOP BAR, OR IF NO STOP BAR EXISTS 20' FROM BEGINNING OF THE TURN LANE LINE

STEP 3:
PLACE SUPPLEMENTAL ARROW CENTERED FOR STORAGE LENGTHS OF 200' OR GREATER.



NOTES:

1. FOR STORAGE LENGTHS OF 400' OR GREATER, ADD A 4TH ARROW EQUALLY SPACED.
2. ARROWS SHALL BE EVEN WITH ADJACENT TURN LANE ARROWS WHEN APPLICABLE.

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City of Flagstaff

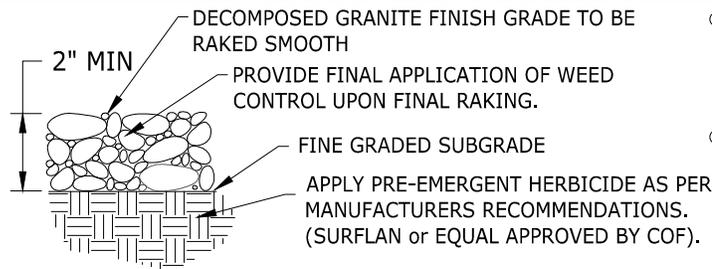
ENGINEERING
DETAIL

TURN LANE PAVEMENT
MARKINGS

DETAIL NO.
16-06-010

REVISION DATE: 11/22/16

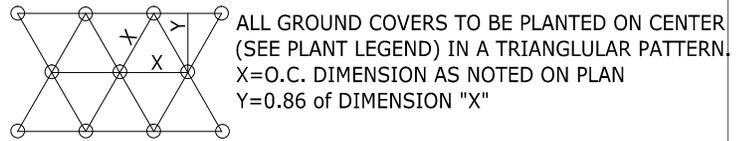
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DECOMPOSED GRANITE

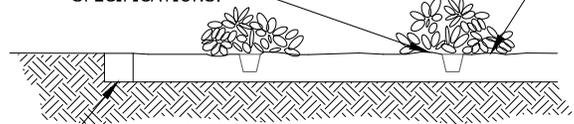
NOTES:

Refer to COS Detail 2210 for finish grade height of decomposed granite in relation to top of curbs & sidewalks.



MULCH SOIL TO A DEPTH OF 2" 1' IN DIAMETER. KEEP MULCH 2" AWAY FROM PLANT BASE.

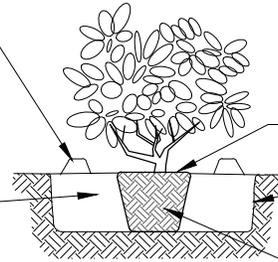
BACKFILL WITH NATIVE SOIL. APPLY SLOW-RELEASE FERTILIZER TO SURFACE AWAY FROM TRUNK PER MANUFACTURER'S SPECIFICATIONS.



GROUNDCOVERS

PREPARE SOIL PER SEPCIFICATIONS AND ROTOTILL TO A DEPTH OF 6" PRIOR TO ANY SPRINKLER WORK.

FORM TEMPORARY IRRIGATION BORDER JUST OUTSIDE OF ROOT BALL. USE WATER TO SETTLE BACKFILL. DO NOT PACK BACKFILL.



SET TOP OF ROOT BALL AT SOIL SURFACE

BACKFILL WITH NATIVE SOIL (NO ROCKS GREATER THAN 1") APPLY SLOW-RELEASE FERTILIZER TO SURFACE AWAY FROM TRUNK PER MANUFACTURER'S SPECIFICATIONS.

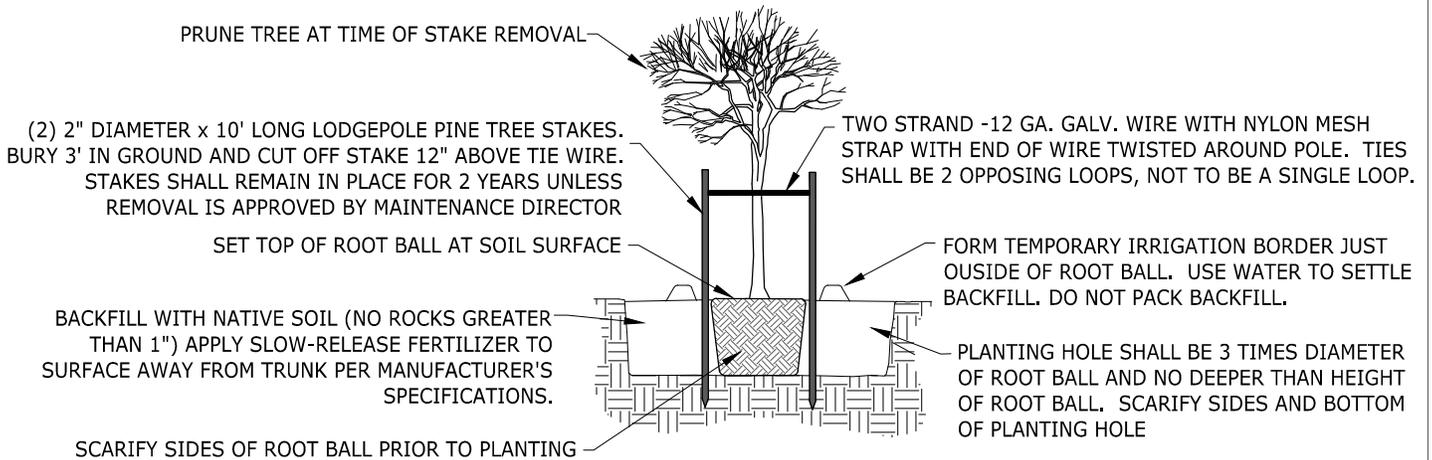
PLANTING HOLE SHALL BE 2-2 1/2 TIMES DIAMETER OF ROOT BALL AND NO DEEPER THAN HEIGHT OF ROOT BALL. SCARIFY SIDES AND BOTTOM OF PLANTING HOLE

SCARIFY SIDES OF ROOT BALL PRIOR TO PLANTING

SHRUB PLANTING

NOTES:

1. SUFFICIENT CLEARANCE SHALL BE MAINTAINED BETWEEN SHRUBS AND UTILITY FACILITIES SO AS TO NOT HINDER USE OF THESE FACILITIES.
2. PLANT PIT BASINS WITHIN SLOPED PLANTING AREAS SHALL BE CONSTRUCTED WITH A MAX. 2:1 SLOPE. PROVIDE SMOOTH TRANSITION TO SURROUNDING FINISH GRADE.



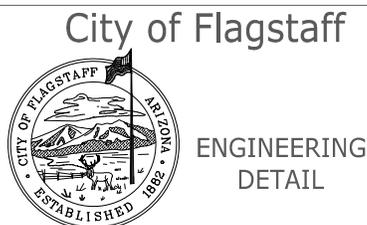
TREE PLANTING AND STAKING

≤ 36" BOX or 2" CALIPER

NOTES:

1. SUFFICIENT CLEARANCE SHALL BE MAINTAINED BETWEEN SHRUBS AND UTILITY FACILITIES SO AS TO NOT HINDER USE OF THESE FACILITIES.
2. PLANT PIT BASINS WITHIN SLOPED PLANTING AREAS SHALL BE CONSTRUCTED WITH A MAX. 2:1 SLOPE. PROVIDE SMOOTH TRANSITION TO SURROUNDING FINISH GRADE.
3. SEE DETAIL 18-04-050 FOR CONIFER TREE PLANTING.

NTS



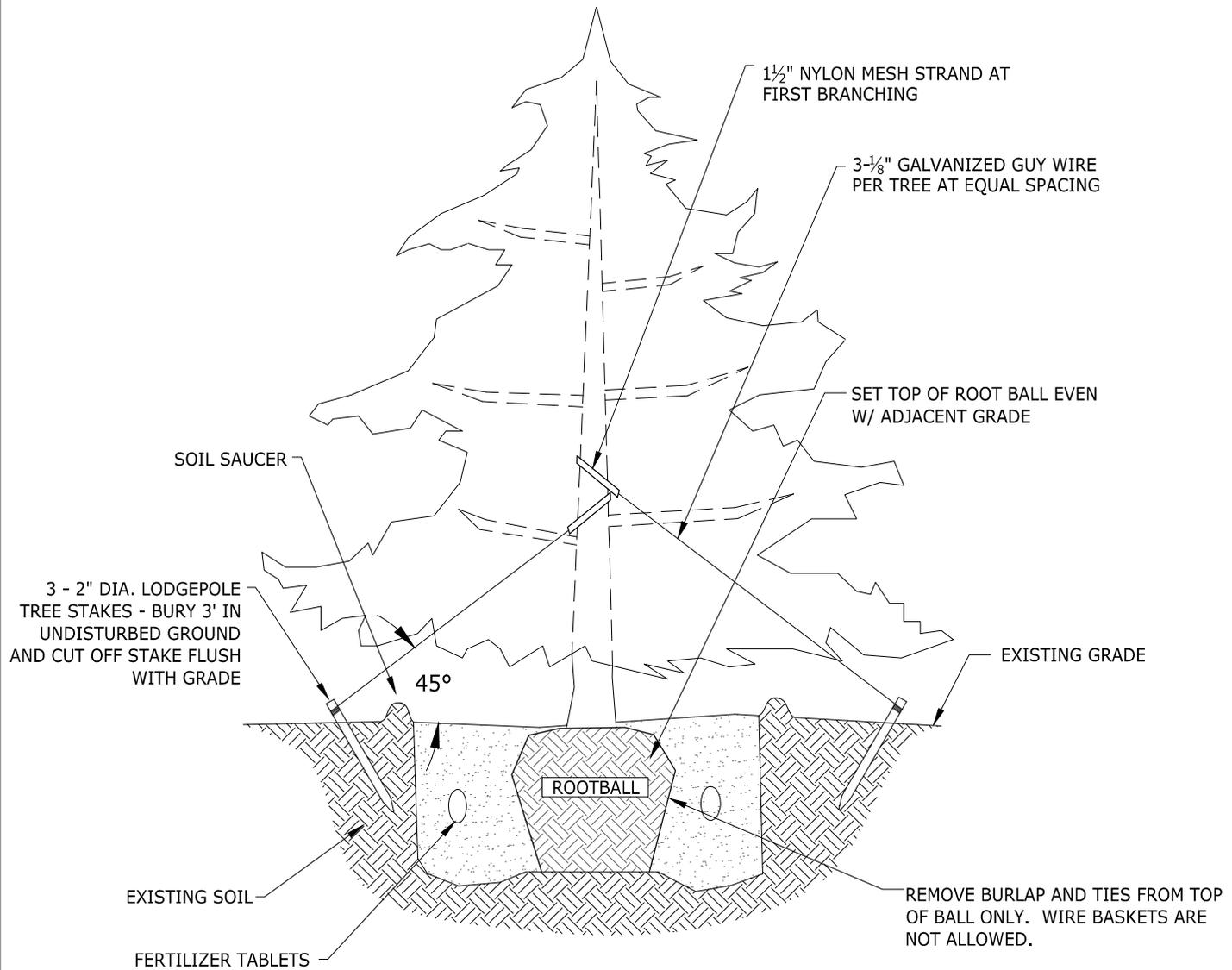
ENGINEERING
DETAIL

LANDSCAPE DETAILS

DETAIL NO.
18-03-050

REVISION DATE: 11/22/16

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NTS

City of Flagstaff

CONIFER TREE PLANTING

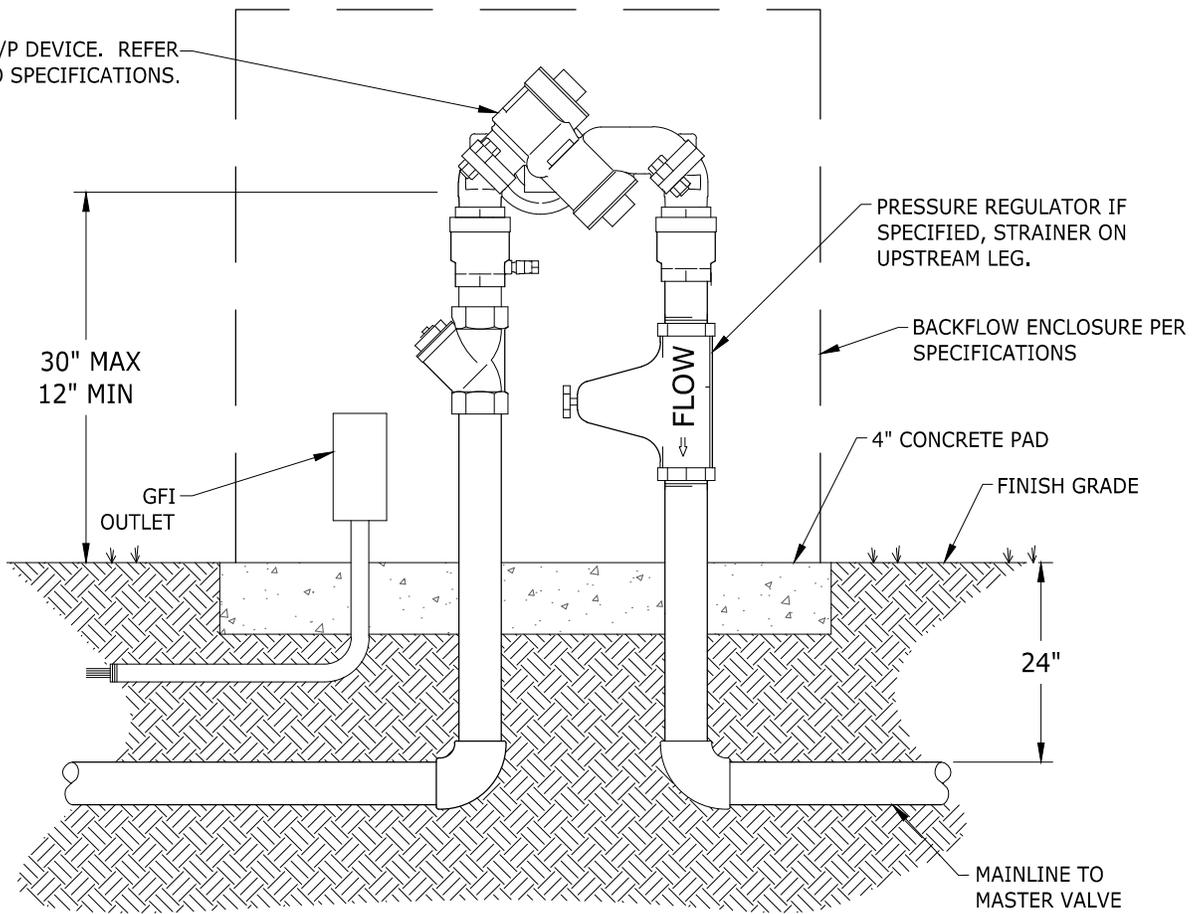


ENGINEERING
DETAIL

DETAIL NO.
18-04-050

REVISION DATE: 11/22/16

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FEBCO MODEL 825YA

REDUCED PRESSURE ASSEMBLY
STANDARD CONFIGURATION
OUTSIDE INSTALLATION

NOTES

1. IF WYE STRAINER OR PRESSURE REGULATOR IS SPECIFIED, INSTALL ON EITHER THE HORIZONTAL PIPING OR ON THE DOWNSTREAM LEG AS SPACE PERMITS.
2. ALL PIPE & FITTINGS TO BE TYPE "L" COPPER.
3. ASSEMBLY SHALL BE APPROVED BY U.S.C. FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH.
4. INSTALL BACKFLOW PREVENTION ASSEMBLY W/ RELIEF PORT FACING TOWARD THE GROUND.
5. BACKFLOW PREVENTION ASSEMBLY MUST BE LEVEL AND INSTALLED A MIN. OF 12" FROM RELIEF PORT TO GRADE.
6. TEST COCKS (4) SHALL BE FITTED W/ BRASS PLUGS AND INSTALLED W/ TEFLON TAPE.
7. SHUTOFF CALCS TO BE RESILIENT BALL TYPE W/ REMOVABLE HANDLES.
8. COMPRESSION TYPE FITTINGS ARE NOT ALLOWED.
9. STAKE LOCATION OF ASSEMBLY FOR APPROVAL BY THE ENGINEER BEFORE INSTALLATION BEGINS.
10. ALL PIPES AND FITTINGS SHALL BE COPPER.
11. PROVIDE TEST CERTIFICATE FROM CITY APPROVED TESTING COMPANY PRIOR TO APPROVAL.
12. COPPER FITTINGS SHALL BE INSTALLED W/ LEAD FREE SOLDER JOINTS.

NTS



City of Flagstaff

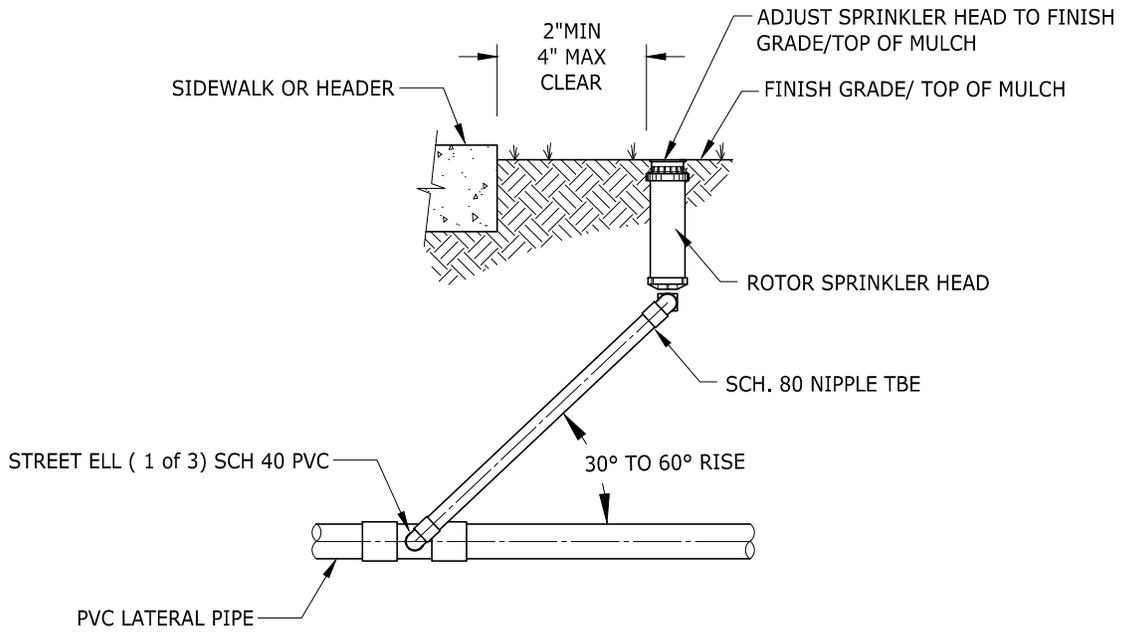
ENGINEERING
DETAIL

FEBCO BACKFLOW ASSEMBLY

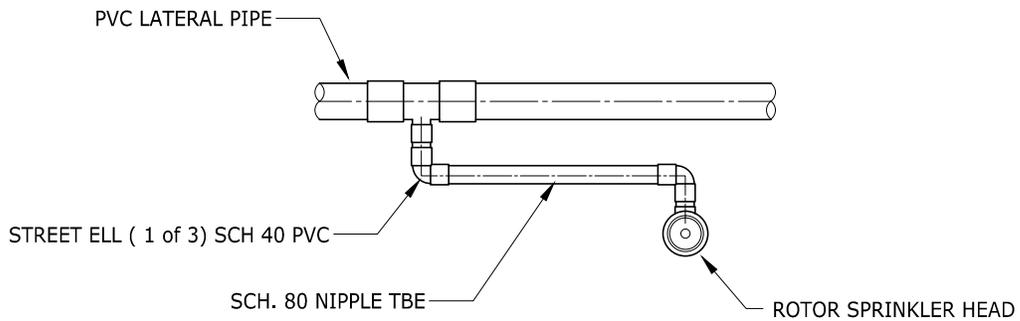
DETAIL NO.
19-01-020

REVISION DATE: 11/22/16

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SWING JOINT ASSEMBLY ELEVATION



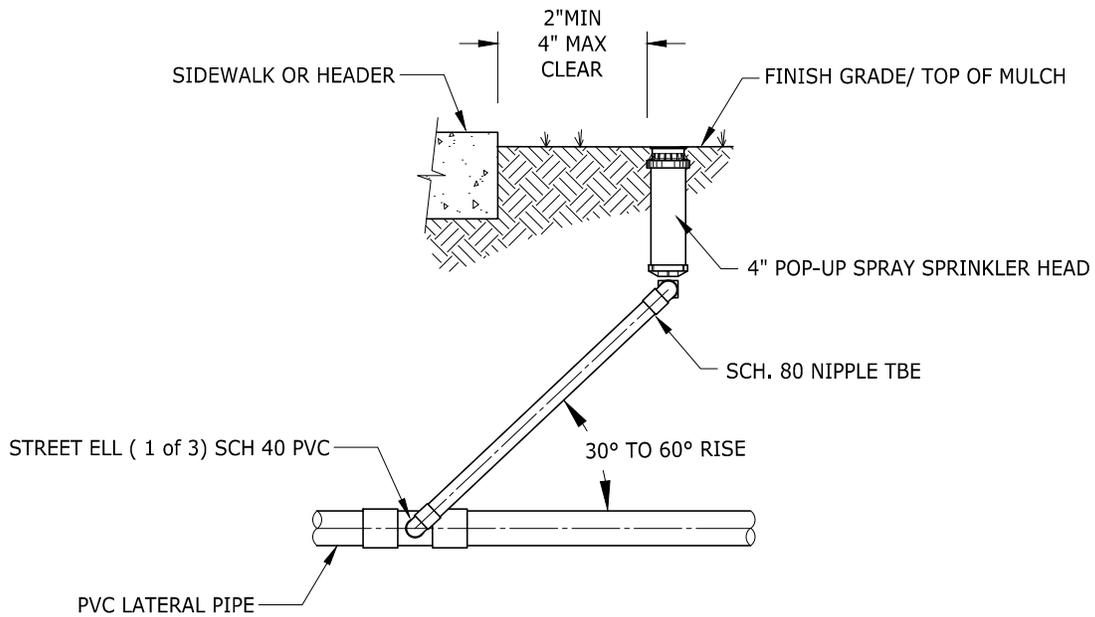
SWING JOINT ASSEMBLY PLAN

NOTES:

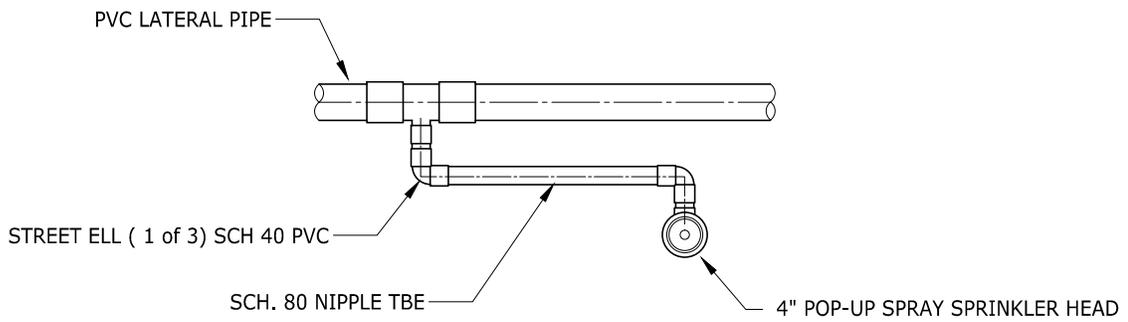
1. SWING JOINT TO BE THE SAME SIZE AS SPRINKLER HEAD INLET.
2. NO PRE-FAB SWING JOINTS.
3. NO MARLEX FITTINGS.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h1>ROTOR SPRINKLER ASSEMBLY</h1>		
	<p>DETAIL NO. 19-02-001</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



SWING JOINT ASSEMBLY ELEVATION



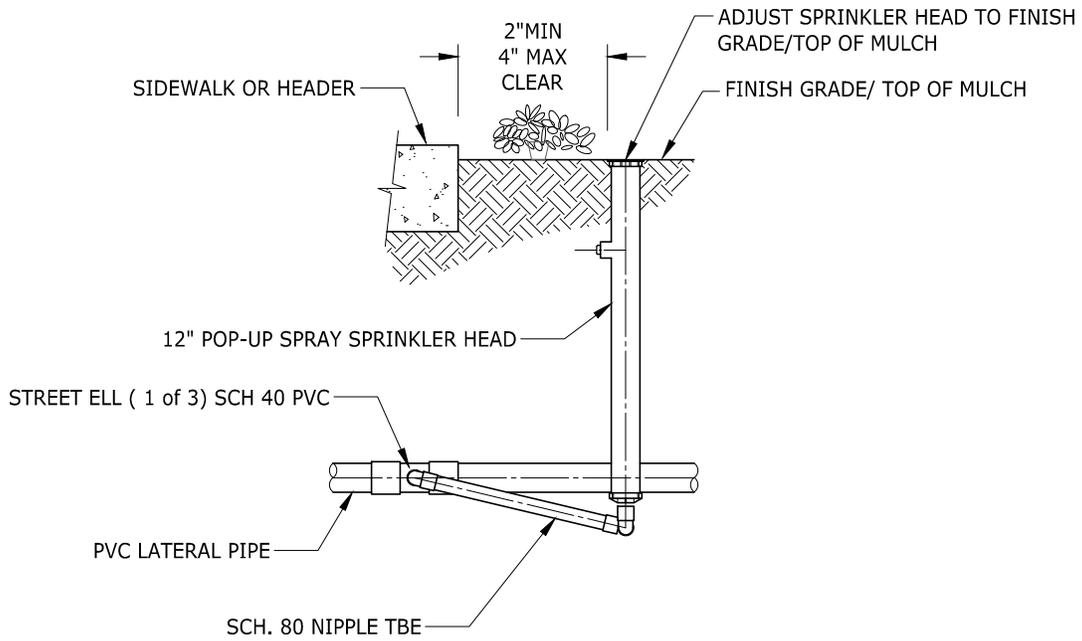
SWING JOINT ASSEMBLY PLAN

NOTES:

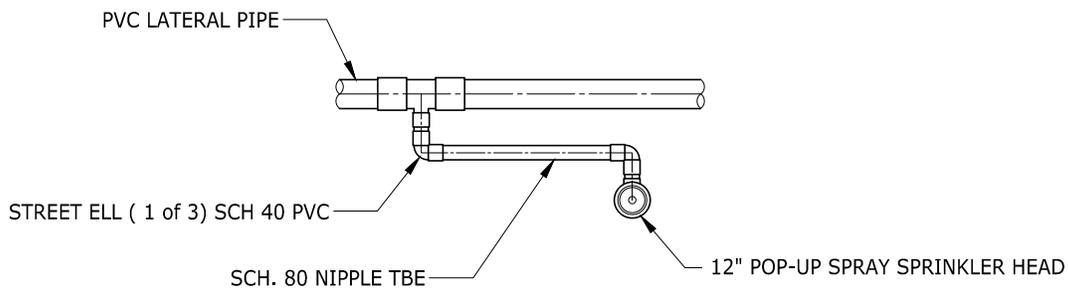
1. SWING JOINT TO BE THE SAME SIZE AS SPRINKLER HEAD INLET.
2. NO PRE-FAB SWING JOINTS.
3. NO MARLEX FITTINGS.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>POP-UP SPRINKLER ASSEMBLY</p>		<p>1 1</p>
	<p>DETAIL NO. 19-02-002</p>	<p>REVISION DATE: 11/22/16</p>	



SWING JOINT ASSEMBLY ELEVATION



SWING JOINT ASSEMBLY PLAN

NOTES:

1. SWING JOINT TO BE THE SAME SIZE AS SPRINKLER HEAD INLET.
2. SWING JOINT SHALL BE CONNECTED TO BOTTOM OUTLET.
3. NO PRE-FAB SWING JOINTS.
4. NO MARLEX FITTINGS.

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City of Flagstaff

ENGINEERING
DETAIL

SHRUB POP-UP SPRINKLER ASSEMBLY

DETAIL NO.
19-02-003

REVISION DATE: 11/22/16

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CARSON/BROOKS VALVE BOX WITH LOCKING "T" STYLE COVER (SUPPLY WITH STAINLESS STEEL BOLTS). INSTALL H-20 TRAFFIC RATED BOX IN HIGH TRAFFIC AREAS AS DETERMINED BY THE COS.

INLINE WYE FILTER W/200 MESH STAINLESS STEEL SCREEN AND FLUSHING CAP. PROVIDE ROOM FOR SCREEN REMOVAL. AGRICULTURAL PRODUCTS INC. "SPIN CLEAN" MODEL OR APPROVED EQUAL

SCH. 40 PVC FEMALE ADAPTER (SLIP x THREAD)

SCH. 40 PVC DRIP LATERAL LINE FROM CONTROL VALVE, CLASS 315 FOR 1/2" LINE

FINISH GRADE

PRESET SENNIGER PRESSURE REGULATOR

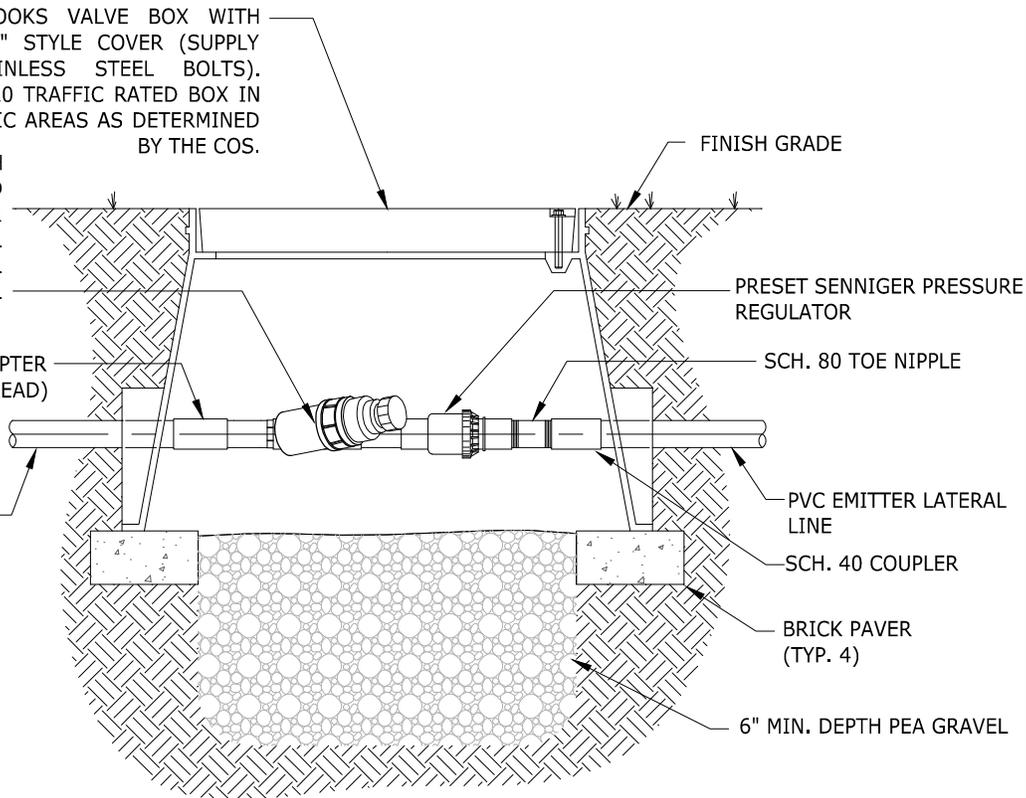
SCH. 80 TOE NIPPLE

PVC EMITTER LATERAL LINE

SCH. 40 COUPLER

BRICK PAVER (TYP. 4)

6" MIN. DEPTH PEA GRAVEL



NTS

City of Flagstaff



ENGINEERING
DETAIL

DRIP FILTER & PRESSURE REGULATOR

DETAIL NO.

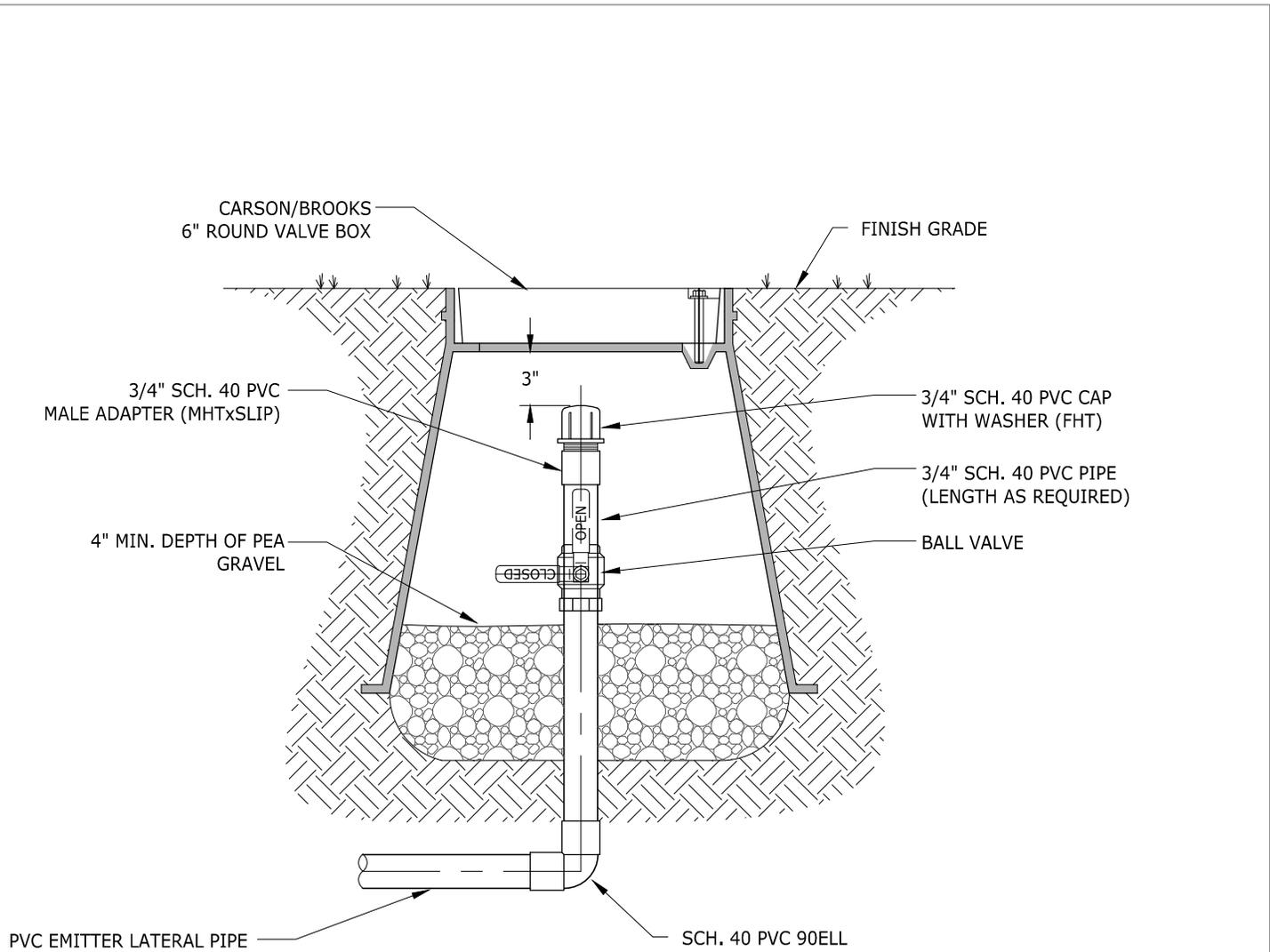
19-02-004

REVISION DATE:

11/22/16

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City of Flagstaff



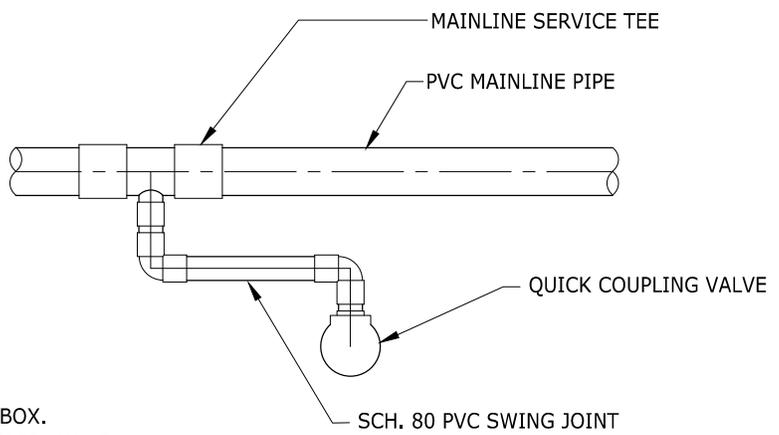
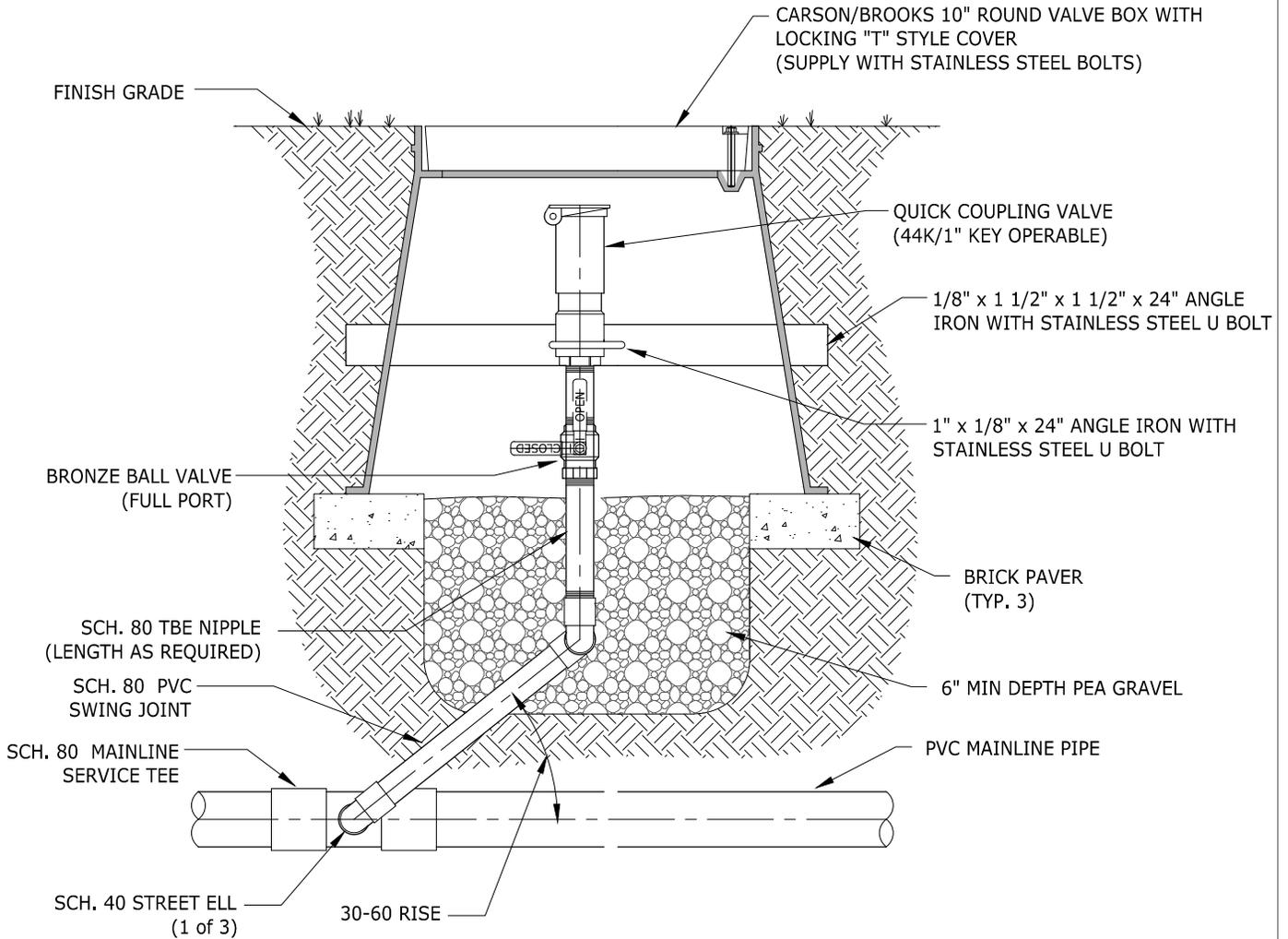
ENGINEERING
DETAIL

EMITTER FLUSH CAP ASSEMBLY

DETAIL NO.
19-02-005

REVISION DATE: 11/22/16

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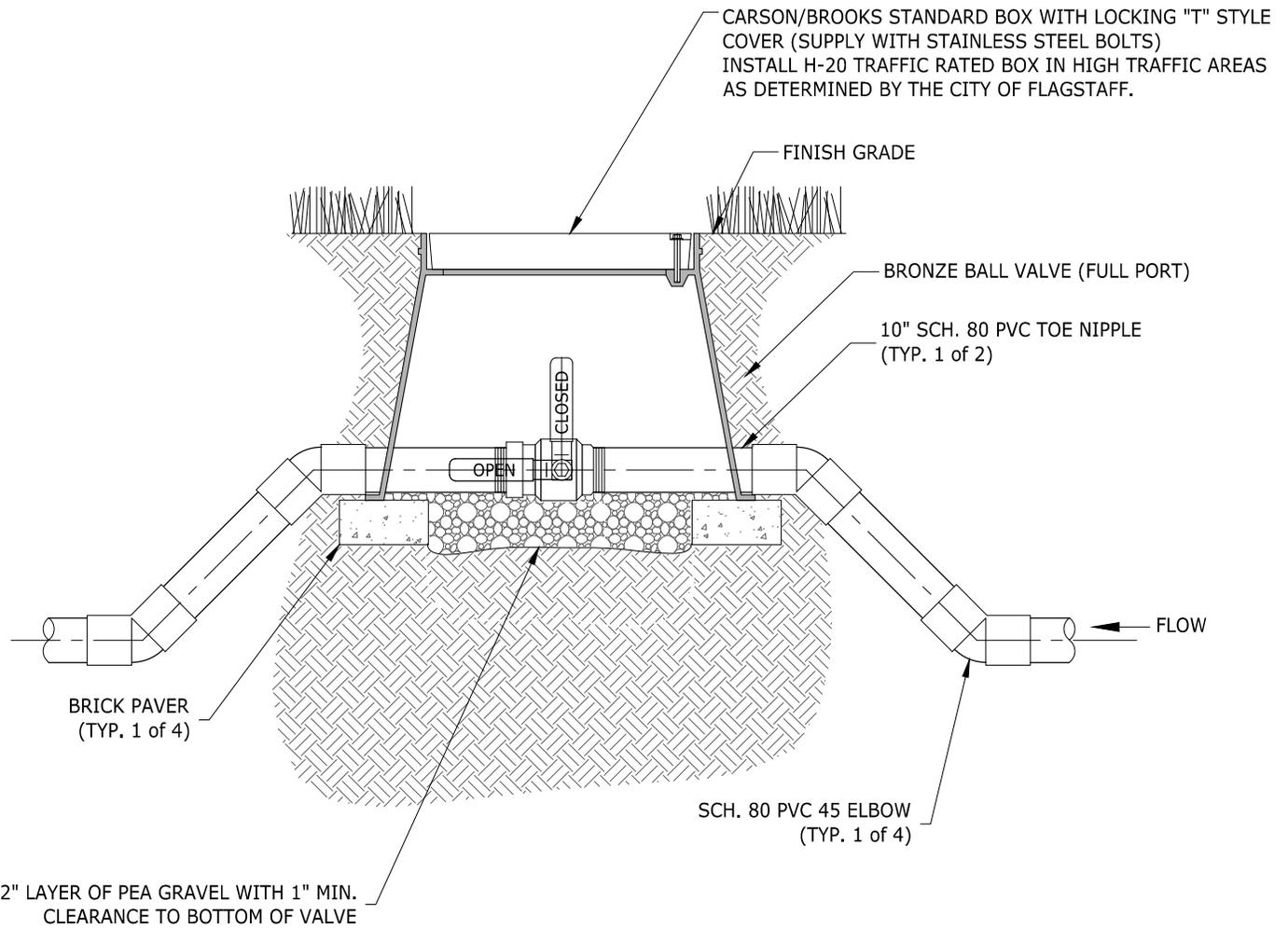


NOTE:

1. EACH QUICK COUPLER SHALL BE IN A SEPARATE VALVE BOX.
2. SWING JOINT SHALL BE THE SAME SIZE AS QUICK COUPLER VALVE.
3. NO PRE-FAB SWING JOINTS.
4. U-BOLT TO BE SECURED WITH LOCK WASHERS AND BACK-UP LOCKING NUT.
5. VALVE BOX LID EMBOSS WITH "QC" OR AS DIRECTED.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	QUICK COUPLER ASSEMBLY		
	DETAIL NO. 19-02-006	REVISION DATE: 11/22/16	<div style="display: flex; justify-content: center; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 5px;">1</div> <div style="border: 1px solid black; padding: 5px;">1</div> </div>

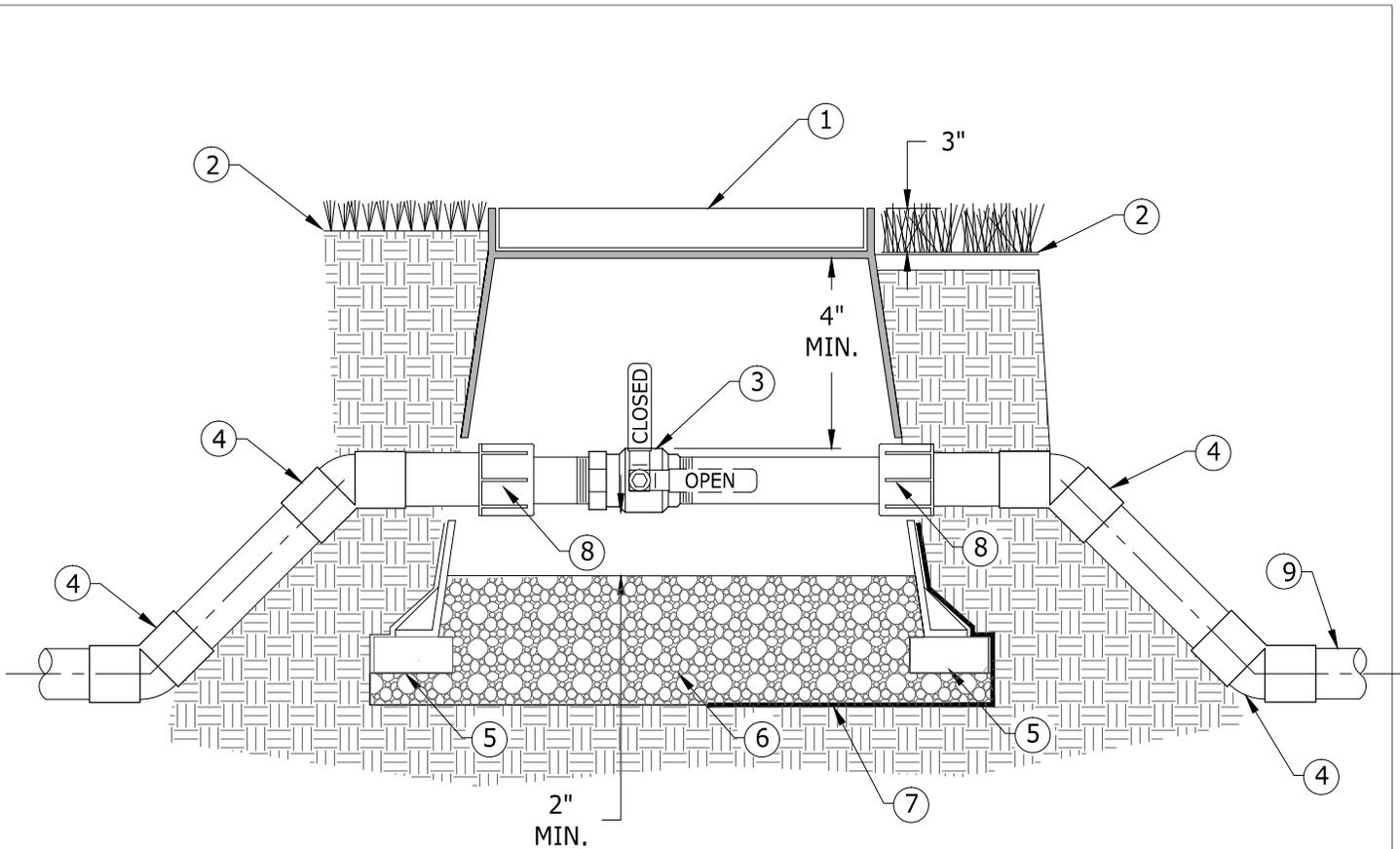


NOTE:

1. BALL VALVE SHALL MATCH NOMINAL SIZE OF MAINLINE PIPE.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>1-1/2" & SMALLER MAINLINE BALL VALVE</h2>		<p>1 1</p>
	<p>DETAIL NO. 19-02-007</p>	<p>REVISION DATE: 11/22/16</p>	



KEYNOTE:

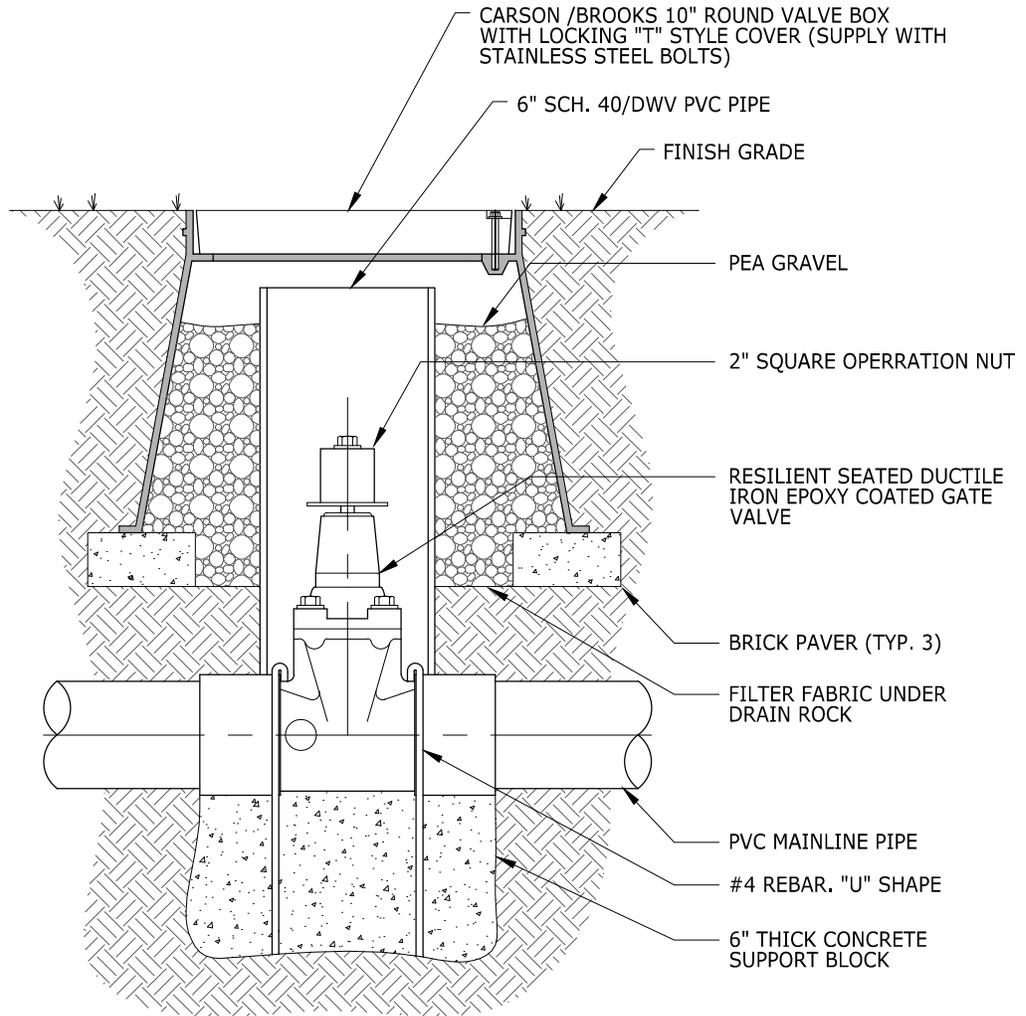
- ① CARSON/BROOKS STANDARD BOX WITH LOCKING "T" STYLE COVER. SUPPLY WITH STAINLESS STEEL BOLTS.
- ② FINISH GRADE
- ③ BRONZE FULL PORT BALL VALVE
- ④ SCH 80 PVC 45° ELBOW
- ⑤ BRICK PAVER
- ⑥ 2" LAYER OF PEA GRAVEL
- ⑦ LANDSCAPE FABRIC
- ⑧ MALE ADAPTER
- ⑨ PRESSURE SUPPLY LINE. DEPTH AS PER SPECS.

NOTE:

- 1. BALL VALVE SHALL MATCH NOMINAL SIZE OF MAINLINE PIPE.
- 2. BOX TO BE INSTALLED AS TO ALLOW FOR PROPER OPERATION OF BALL VALVE INSTALL AT RIGHT ANGLE TO HARDSCAPE EDGE, INSTALL VALVE OFF-CENTER IN BOX.
- 3. INSTALL VALVE BOX EXTENSIONS AS REQUIRED TO ACHIEVE PROPER VALVE INSTALLATION AT MAIN LINE DEPTH.
- 4. EMBOSS COVER WITH "IV" IN 1-INCH HIGH STENCIL LETTERS USING STYLUS TIP TORCH.

NTS

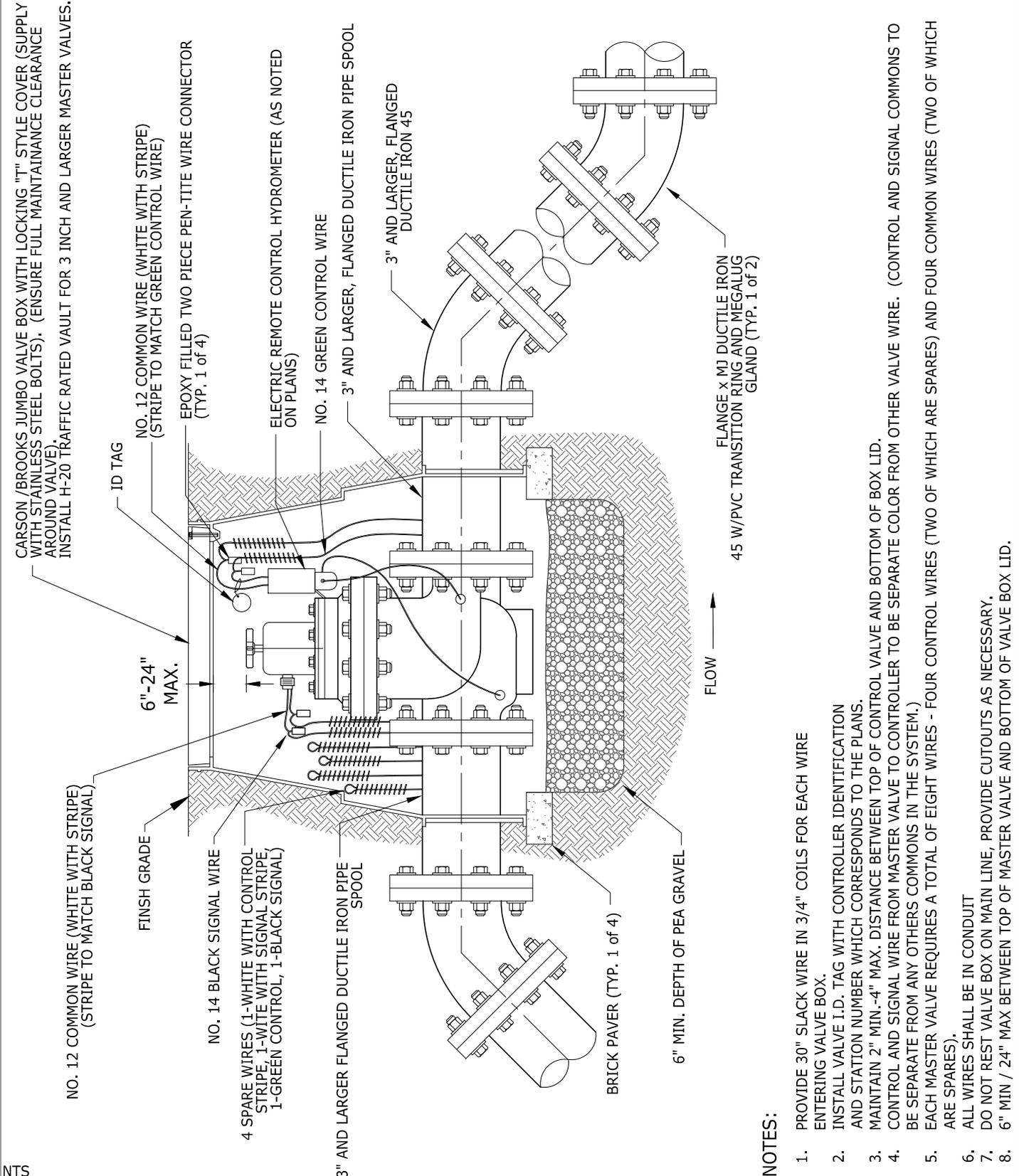
 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>BALL VALVE DETAIL</h2>		
	<p>DETAIL NO. 19-02-008</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



NOTE:

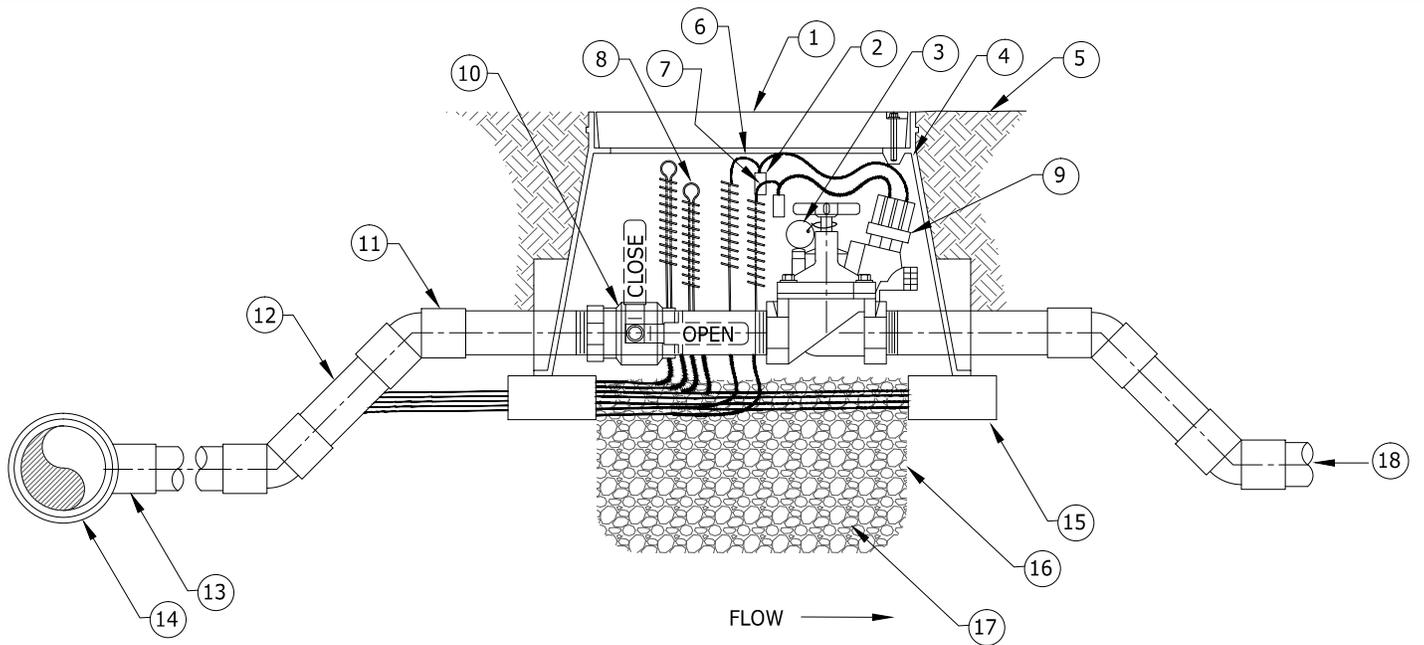
1. GATE VALVE SHALL MATCH NOMINAL SIZE OF MAINLINE PIPE.
2. PROTECT VALVE BODY WITH 10MIL PLASTIC PRIOR TO INSTALLATION OF REBAR & SUPPORT BLOCK.
3. RESILIENT WEDGE GATE VALVE MAY HAVE EITHER MECHANICAL JOINT, PUSH-ON ENDS, OR FLANGE ENDS. THE OPERATOR IS A WRENCH NUT
4. EMBOSS COVER WITH "I.V." IN 1" HIGH STENCIL LETTERS USING STYLUS TIP TORCH.
5. SET VALVE BOX FLUSH WITH FINISH GRADE IN NATIVE AREAS. 1/2 INCH ABOVE FINISH GRADE IN TURF AREAS.
6. SUPPLY 2" KEY HANDLE FOR VALVE OPERATION.

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<p>3" & LARGER</p> <p>MAINLINE ISOLATION GATE VALVE</p>		<p>1 1</p>
	<p>DETAIL NO.</p> <p>19-02-009</p>	<p>REVISION DATE:</p> <p>11/22/16</p>	



- NOTES:**
1. PROVIDE 30" SLACK WIRE IN 3/4" COILS FOR EACH WIRE ENTERING VALVE BOX.
 2. INSTALL VALVE I.D. TAG WITH CONTROLLER IDENTIFICATION AND STATION NUMBER WHICH CORRESPONDS TO THE PLANS.
 3. MAINTAIN 2" MIN.-4" MAX. DISTANCE BETWEEN TOP OF CONTROL VALVE AND BOTTOM OF BOX LID.
 4. CONTROL AND SIGNAL WIRE FROM MASTER VALVE TO CONTROLLER TO BE SEPARATE COLOR FROM OTHER VALVE WIRE. (CONTROL AND SIGNAL COMMONS TO BE SEPARATE FROM ANY OTHERS' COMMONS IN THE SYSTEM.)
 5. EACH MASTER VALVE REQUIRES A TOTAL OF EIGHT WIRES - FOUR CONTROL WIRES (TWO OF WHICH ARE SPARES) AND FOUR COMMON WIRES (TWO OF WHICH ARE SPARES).
 6. ALL WIRES SHALL BE IN CONDUIT
 7. DO NOT REST VALVE BOX ON MAIN LINE, PROVIDE CUTOUTS AS NECESSARY.
 8. 6" MIN / 24" MAX BETWEEN TOP OF MASTER VALVE AND BOTTOM OF VALVE BOX LID.

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2>3" & LARGER MASTER VALVE/FLOW METER</h2>	
	<p>DETAIL NO. 19-02-010</p>	<p>REVISION DATE: 11/22/16</p>



KEYNOTES

- ① CARSON /BROOKS VALVE BOX WITH LOCKING "T" STYLE COVER (SUPPLY WITH STAINLESS STEEL BOLTS). INSTALL H-20 TRAFFIC RATED BOX IN HIGH TRAFFIC AREAS AS DETERMINED BY THE COS.
- ② EPOXY FILLED TWO PIECE CYLINDER WIRE CONNECTOR (TYP. 1 of 2)
- ③ ID TAG
- ④ 3" MIN CLEARANCE BETWEEN BOTTOM OF LID AND VALVE FLOW STEM
- ⑤ FINISH GRADE
- ⑥ NO. 12 COMMON WIRE
- ⑦ NO. 12 CONTROL WIRE
- ⑧ NO. 12 SPARE WIRES LOOPED INTO EACH VALVE BOX (BLUEx2)
- ⑨ ELECTRIC REMOTE CONTROL VALVE
- ⑩ BRONZE BALL VALVE (FULL PORT) SAME SIZE AS CONTROL VALVE
- ⑪ SCH. 80 PVC 45 (SxS)(TYP 1 of 2)
- ⑫ SCH. 80 PVC PIPE SAME SIZE AS CONTROL VALVE
- ⑬ SCH. 80 PVC PIPE (SCH. 80 PVC TEE CONNECTION - SxSxS) SCH. 80 TOE NIPPLE (DUCTILE TEE CONNECTION)
- ⑭ PVC MAINLINE PIPE WITH SCH 80 PVC or DUCTILE IRON SERVICE TEE
- ⑮ BRICK PAVER (TYP 1 of 4)
- ⑯ 6" MIN DEPTH OF PEA GRAVEL (BELOW VALVE BODY)
- ⑰ 3" SCH. 80 PVC TBE NIPPLE (PLASTIC VALVE ONLY) 3" BRASS NIPPLE FOR BRASS VALVES
- ⑱ PVC LATERAL PIPE

NOTES

- 1. PROVIDE 30" SLACK WIRE IN 3/4" COILS FOR EACH WIRE ENTERING VALVE BOX.
- 2. INSTALL VALVE ID TAG WITH CONTROLLER IDENTIFICATION AND STATION NUMBER WHICH CORRESPONDS TO THE PLANS.
- 3. MAINTAIN 2" MIN - 4" MAX DISTANCE BETWEEN TOP OF CONTROL VALVE AND BOTTOM OF BOX LID.
- 4. INSTALL D.C. LATCHING SOLENOIDS W/ DC CONTROLLERS.
- 5. FOR BRASS CONTROL VALVES, INSTALL 3" BRASS TBE NIPPLE BETWEEN BALL VALVE AND CONTROL VALVE.
- 6. LOWER LATERAL PIPE TO PROPER DEPTH OUTSIDE OF VALVE BOX USING SCH 40 PVC 45° ELBOWS.
- 7. INSTALL WITHIN PURPLE VALVE BOX WITH LID MARKED "CAUTION - RECLAIMED WATER - DO NOT DRINK"

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>IRRIGATION REMOTE CONTROL VALVE</p>		
	<p>DETAIL NO. 19-02-011</p>	<p>REVISION DATE: 11/22/16</p>	<p>1</p>

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City of Flagstaff

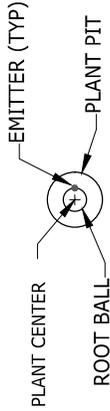
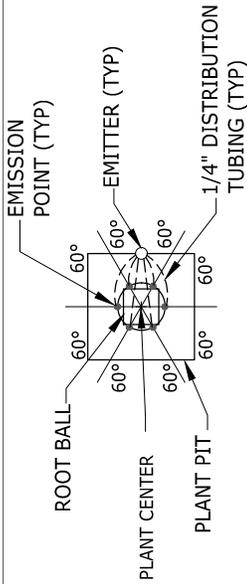
ENGINEERING
DETAIL

IRRIGATION EMITTER LAYOUT

DETAIL NO.
19-02-013

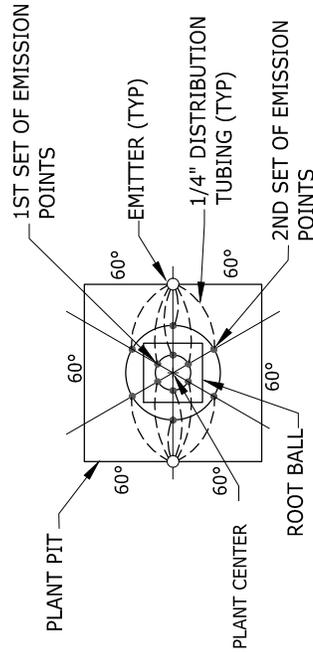
REVISION DATE: 11/22/16

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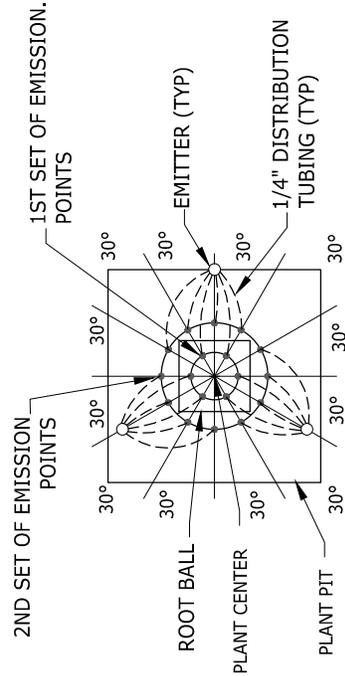


**SHRUB EMITTER
SINGLE OUTLET**

TREE EMITTER - MULTI OUTLET
15 GAL. TO 42" BOX TREES
(SEE EMITTER SCHEDULE)



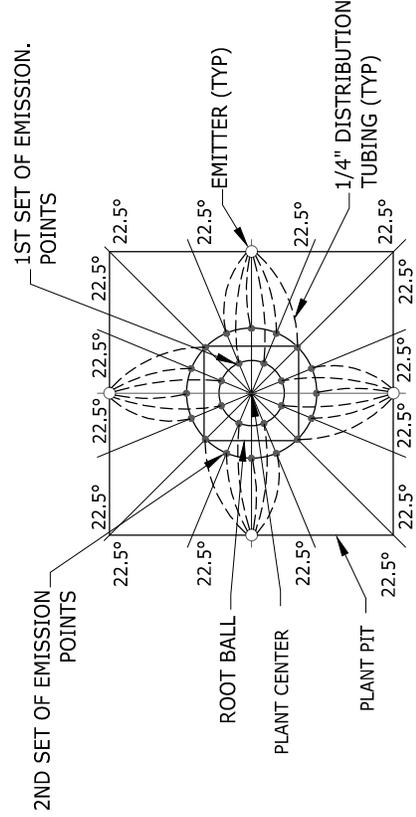
TREE EMITTER - MULTI OUTLET
48" BOX TO 60" BOX TREES
(SEE EMITTER SCHEDULE)



TREE EMITTER - MULTI OUTLET
66" BOX TO 84" BOX TREES
(SEE EMITTER SCHEDULE)

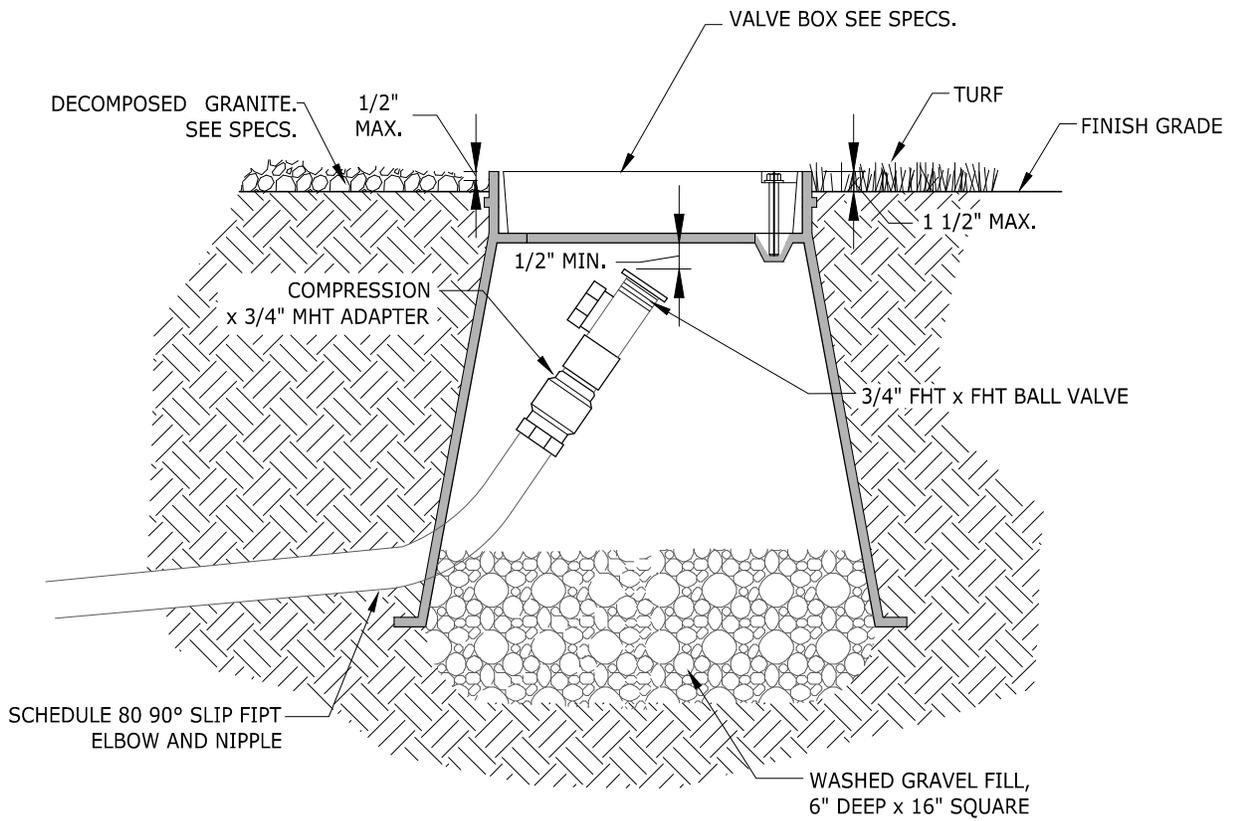
EMITTER SCHEDULE

TREE SIZE	NUMBER OF MULTI-OUTLET EMITTERS - OUTLET QUANTITY = EMITTER GPH TOTAL	DISTANCE FROM TRUNK	
		1ST SET OF EMISSION POINTS	2ND SET OF EMISSION POINTS
15 GAL.	1-1 GPH=6 GPH	3 @ 12"	
24" BOX	1-1 GPH=6 GPH	4 @ 18"	
30" BOX	1-1 GPH=6 GPH	6 @ 21"	
36" BOX	1-2 GPH=12 GPH	6 @ 24"	
42" BOX	1-2 GPH=12 GPH	6 @ 27"	
48" BOX	2-2 GPH=24 GPH	6 @ 12"	4 @ 42"
54" BOX	2-2 GPH=24 GPH	6 @ 15"	5 @ 45"
60" BOX	2-2 GPH=24 GPH	6 @ 18"	6 @ 48"
66" BOX	3-2 GPH=36 GPH	6 @ 24"	12 @ 54"
72" BOX			
78" BOX	3-2 GPH=36 GPH	6 @ 30"	12 @ 60"
84" BOX			
> 90" BOX	4-2 GPH=48 GPH	8 @ 33"	16 @ 66"



TREE EMITTER - MULTI OUTLET
96" BOX TREES
(SEE EMITTER SCHEDULE)

NTS



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City of Flagstaff

END LINE FLUSH



ENGINEERING
DETAIL

DETAIL NO.

19-02-014

REVISION DATE:

11/22/16

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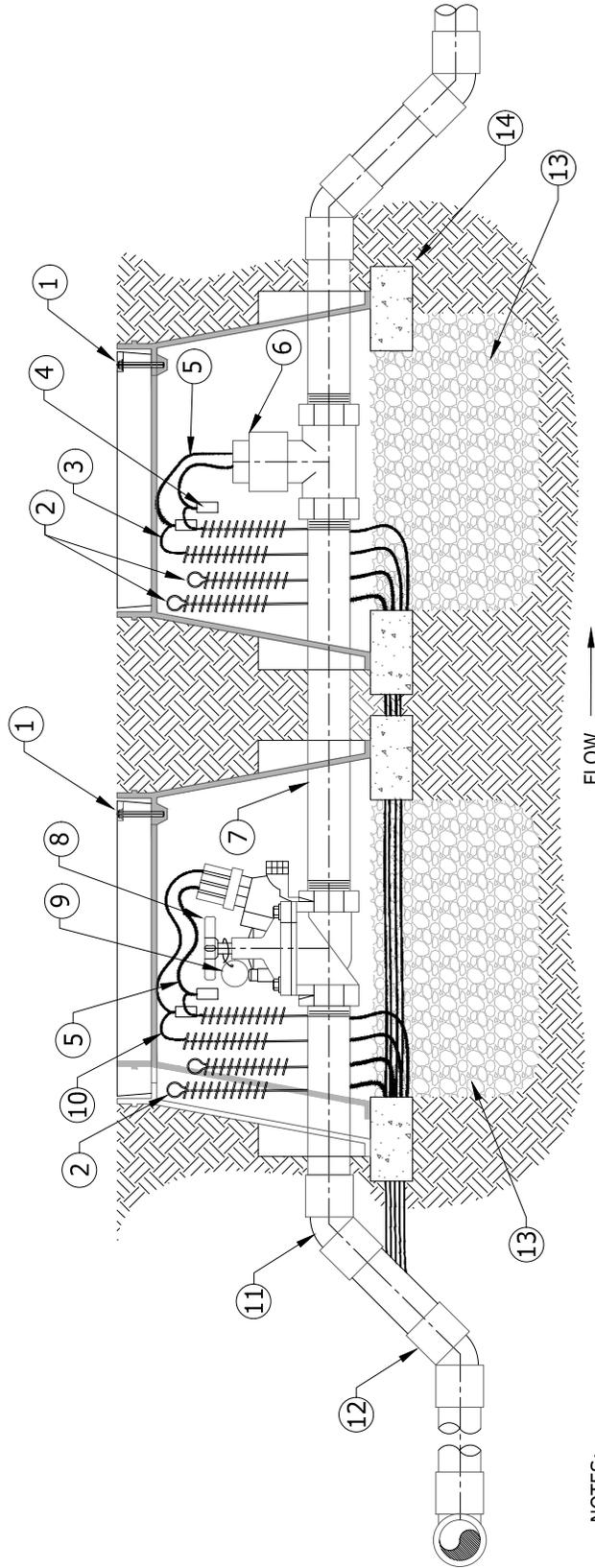
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KEYNOTES

- 1 VALVE BOX
- 2 2 SPARE WIRES (1-WHITE W/ SIGNAL COLOR STRIPE, 1-SIGNAL COLOR)
- 3 NO. 12 SIGNAL WIRE
- 4 EPOXY FILLED TWO PIECE PEN-TITE WIRE CONNECTOR (TYP. 1 OF 4)
- 5 NO. 12 COMMON WIRE (WHITE W/ SIGNAL COLOR STRIPE)
- 6 FLOW SENSOR
- 7 NIPPLE (MAINLINE SIZE X 24")
- 8 ELECTRIC REMOTE CONTROL VALVE (AS NOTED ON PLANS)
- 9 ID TAG
- 10 NO. 14 CONTROL WIRE
- 11 SCH 80 PVC 45° ELL (TYP. 1 OF 4)
- 12 SCH 80 PVC PIPE, SAME SIZE AS CONTROL VALVE
- 13 6" MIN. DEPTH PEA GRAVEL BELOW VALVE BODY
- 14 BRICK PAVER (TYP. 1 OF 8)

FLOW SENSOR DISTANCES SCHEDULE

PIPE SIZE	CLEAR DISTANCE	
	UP STREAM	DOWN STREAM
1"	10"	5"
1.25"	12.5"	6.25"
1.5"	15"	7.5"
2"	20"	10"
2.5"	25"	12.5"
3"	30"	15"
4"	40"	20"
6"	60"	30"
8"	80"	40"
10"	100"	50"
12"	120"	60"



NOTES:

- 1. PROVIDE 30" SLACK WIRE IN 3/4" COILS FOR EACH WIRE ENTERING VALVE BOX.
- 2. INSTALL VALVE I.D. TAG WITH CONTROLLER IDENTIFICATION AND STATION NUMBER WHICH CORRESPONDS TO THE PLANS.
- 3. MAINTAIN 2" MIN.-4" MAX. DISTANCE BETWEEN TOP OF CONTROL VALVE AND BOTTOM OF BOX LID.
- 4. CONTROL AND SIGNAL WIRE FROM MASTER VALVE TO CONTROLLER TO BE SEPARATE COLOR FROM OTHER VALVE WIRE. (CONTROL AND SIGNAL COMMONS TO BE SEPARATE FROM ANY OTHERS COMMONS IN THE SYSTEM.)
- 5. ALL WIRES SHALL BE IN CONDUIT.

NTS



City of Flagstaff

ENGINEERING
DETAIL

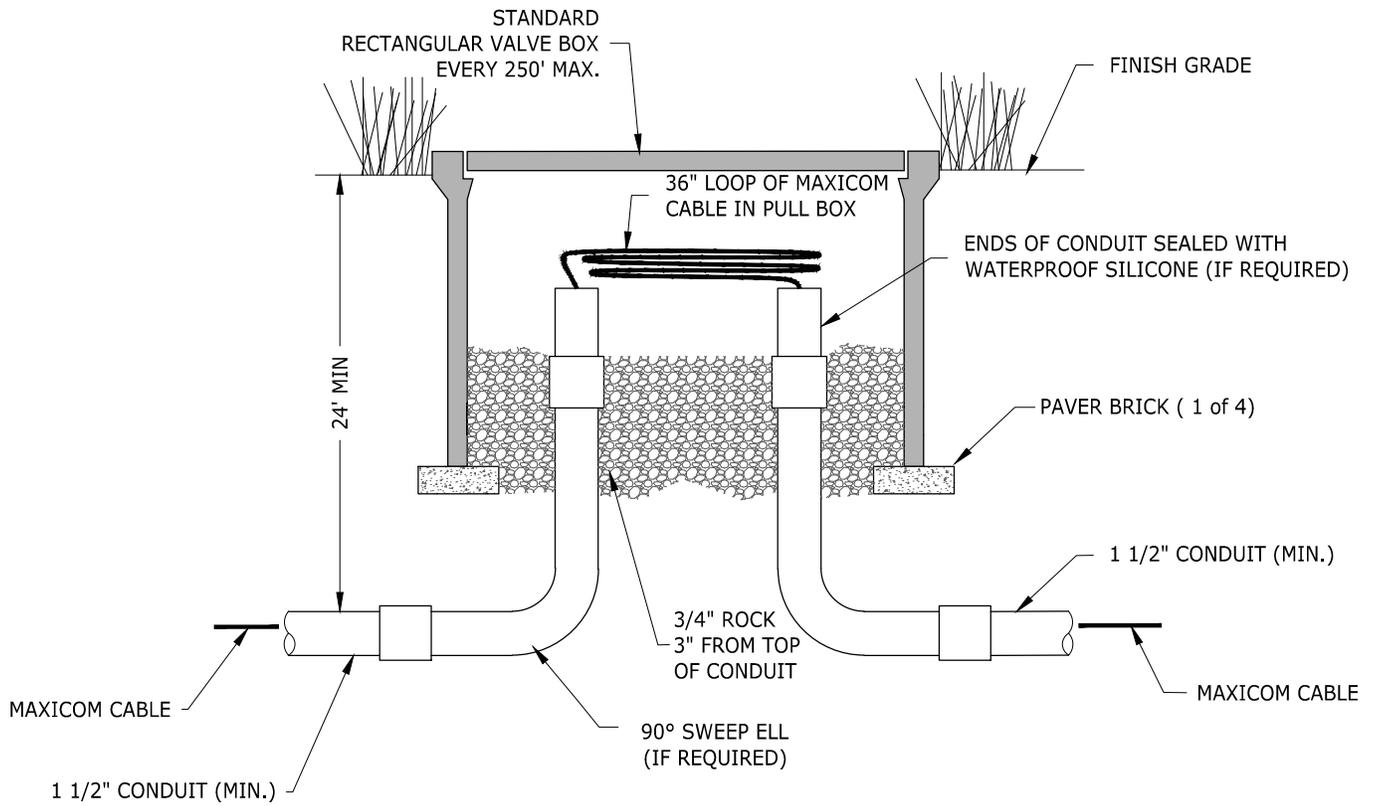
2" or SMALLER
MASTER VALVE/FLOW SENSOR ASSEMBLY

DETAIL NO.
19-02-015

REVISION DATE: 11/22/16

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NTS

City of Flagstaff



ENGINEERING
DETAIL

MAXICOM CABLE PULL BOX

DETAIL NO.

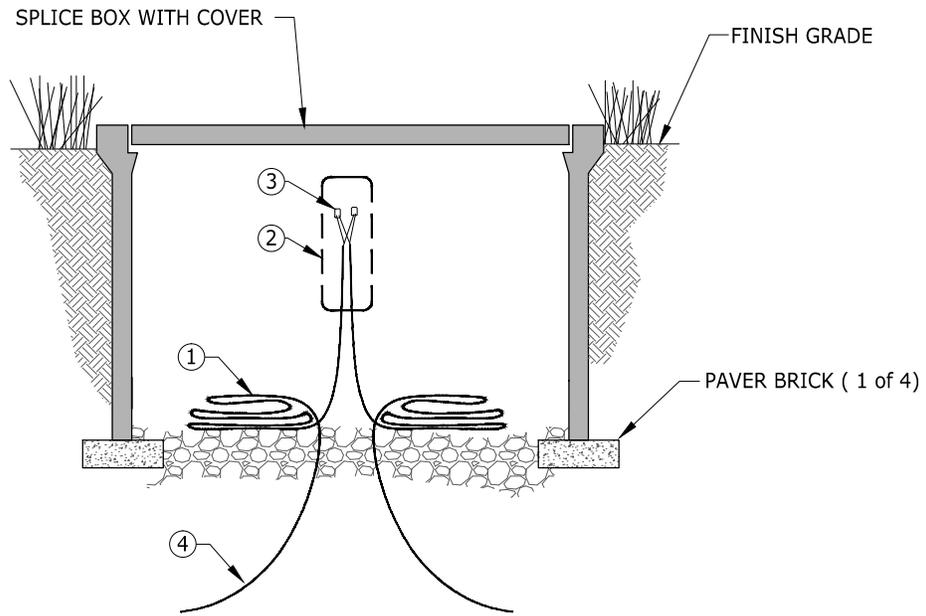
19-02-016

REVISION DATE:

11/22/16

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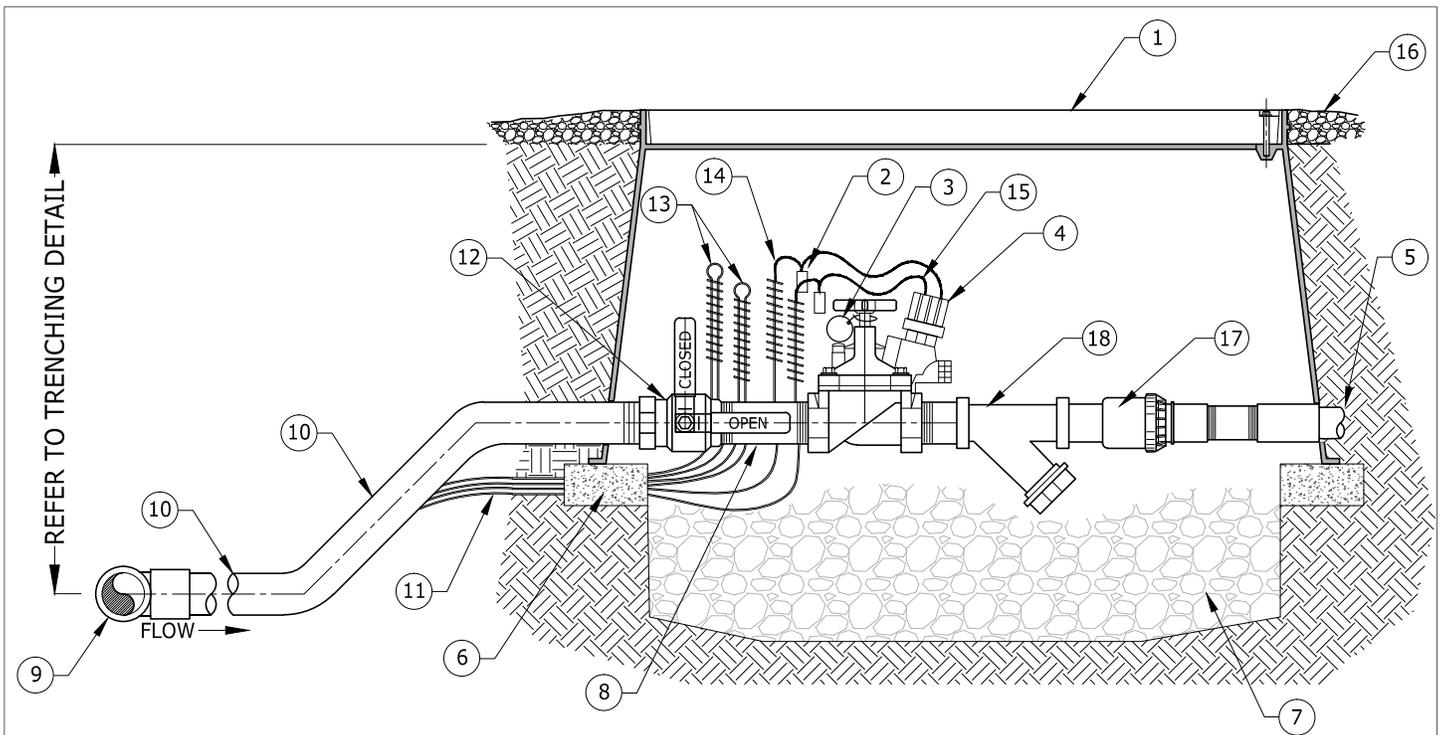


KEYNOTES

- ① PE-CABLE (36-INCH LOOP)
- ② PREFORMED SUPER SERVICEAL WATERPROOF WIRE SPLICE KIT
- ③ 3M UAL CONNECTIONS (SPLICE ALL WIRE PAIRS)
- ④ ALL WIRE MUST BE PLACED IN CONDUIT 3" ABOVE ¾" ROCK

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h1>QUICK COUPLER ASSEMBLY</h1>		
	<p>DETAIL NO. 19-02-017</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>



KEYNOTES

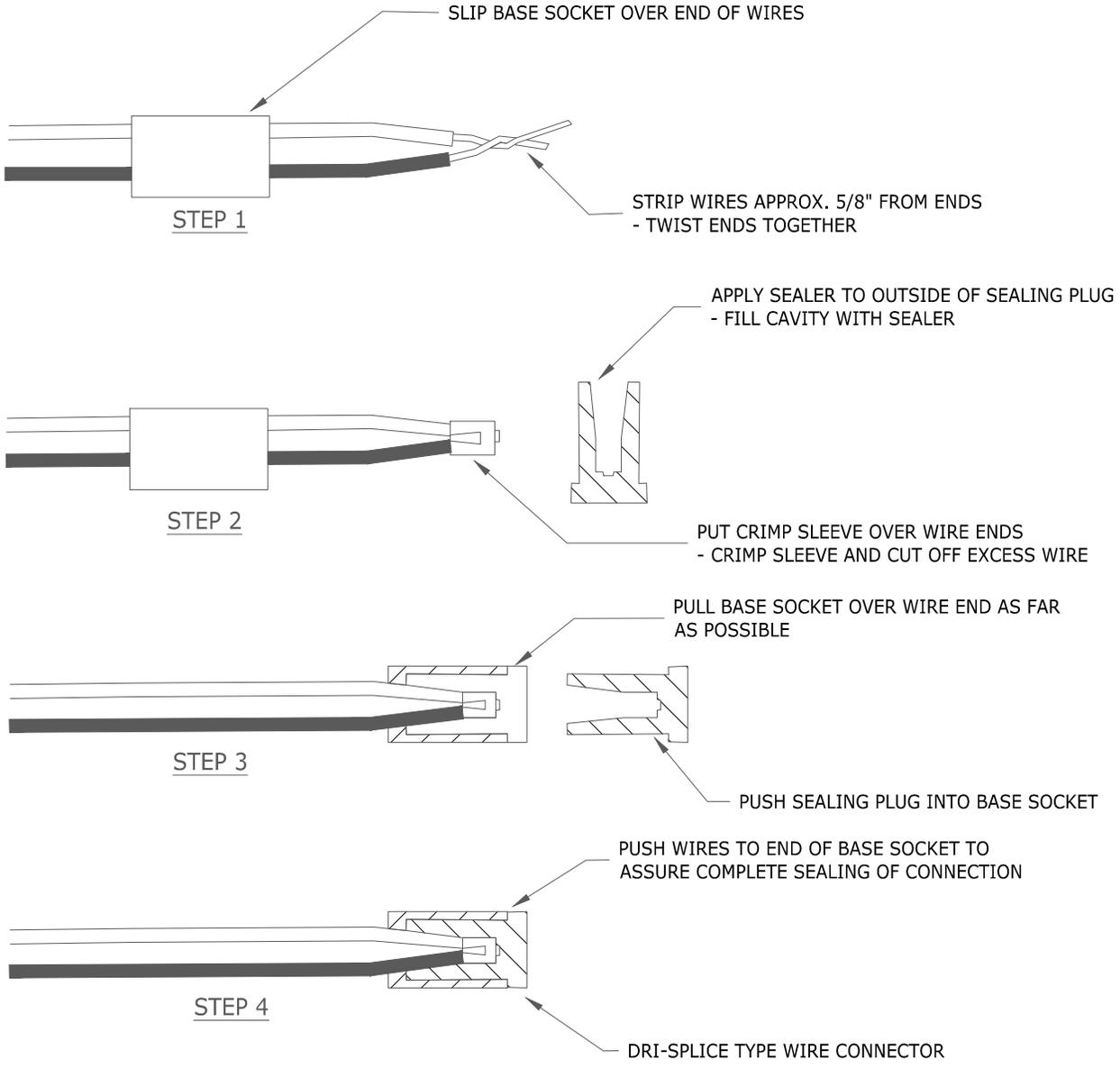
- ① VALVE BOX
- ② EBOXY FILLED TWO PIECE CYLINDER WIRE CONNECTOR
- ③ ID TAG
- ④ ELECTRIC REMOTE CONTROL VALVE AS NOTED ON PLANS.
- ⑤ SCH 80 PVC LATERAL
- ⑥ BRICK PAVER (TYP.)
- ⑦ 6" MIN. DEPTH PEA GRAVEL (BELOW VALVE BODY)
- ⑧ 3" SCH 80 PVC NIPPLE (PLASTIC VALVE ONLY).
- ⑨ SCH 80 PVC MAINLINE PIPE WITH HDPE SERVICE TEE
- ⑩ SCH 80 PVC PIPE SAME SIZE AS CONTROL VALVE
- ⑪ 24-VOLT WIRES FROM CONTROLLER
- ⑫ BRONZE BALL VALVE (FULL PORT). SAME SIZE AS
- ⑬ SPARE WIRES LOOPED INTO EACH VALVE BOX (BLUE) (2)
- ⑭ CONTROL WIRE
- ⑮ COMMON WIRE
- ⑯ FINISH GRADE
- ⑰ PRESET PRESSURE REGULATOR (AS NOTED ON PLANS)
- ⑱ WYE FILTER (AS NOTED ON PLANS)

NOTES

1. PROVIDE 30" SLACK WIRE IN 3/4" COILS FOR EACH WIRE ENTERING VALVE BOX.
2. INSTALL VALVE I.D. TAG WITH CONTROLLER IDENTIFICATION AND STATION NUMBER THAT CORRESPONDS TO THE PLANS.
3. MAINTAIN 2" MIN.-4" MAX. DISTANCE BETWEEN TOP OF CONTROL VALVE AND BOTTOM OF BOX LID.
4. INSTALL D.C. LATCHING SOLENOIDS W/ D.C. CONTROLLERS.
5. FOR BRASS CONTROL VALVES, INSTALL 3" BRASS TBE NIPPLE BETWEEN BALL VALVE AND CONTROL VALVE
6. INSTALL CONTROL VALVES A MINIMUM OF 1' APART IN SHRUB AREAS UNLESS OTHERWISE NOTED.
7. USE TEFLON TAPE ON ALL THREADED FITTINGS.
8. VALVE BOX SHALL BE SET PARALLEL W/ GRADE.

NTS

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	DRIP IRRIGATION REMOTE CONTROL VALVE ASSEMBLY		
	DETAIL NO. 19-02-019	REVISION DATE: 11/22/16	1 1



NOTES

1. FOR WIRE SIZES NO. 14, 12 AND 10, ALL CONNECTIONS IN VALVE BOXES ONLY.
2. INSTALL SPEARS DS-100 DRI-SPLICE CONNECTORS WITH DS-300 SEALANT.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2 style="margin: 0;">IRRIGATION WIRE CONNECTION</h2>		
	<p>DETAIL NO. 19-02-021</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 1</p>

**MAXIMUM NUMBER OF WIRES
TO BE INSTALLED IN A
SCHEDULE 40 PVC SLEEVE**

WIRE SIZE (AWG)	2"	2-1/2"	3"	WIRE SIZE (AWG)
14	25	40	56	14
12	20	33	50	12

NOTES

ALL WIRE SLEEVES TO BE SHC. 40 PVC AND SHALL BE INSTALLED WITH A MINIMUM OFFSET AT THE JOINTS TO PERMIT EASY INSTALLATION AND REMOVAL OF CONTROL AND COMMON WIRES. ALL WIRES SHALL BE INSTALLED IN SLEEVES UNDER THE PAVED AREAS. SLEEVES SHALL EXTEND AT LEAST 12" BEYOND THE EDGES OF THE PAVEMENT. SIZE OF SLEEVES SHALL BE AS SHOWN.

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City of Flagstaff



ENGINEERING
DETAIL

IRRIGATION WIRE SLEEVING CHART

DETAIL NO.

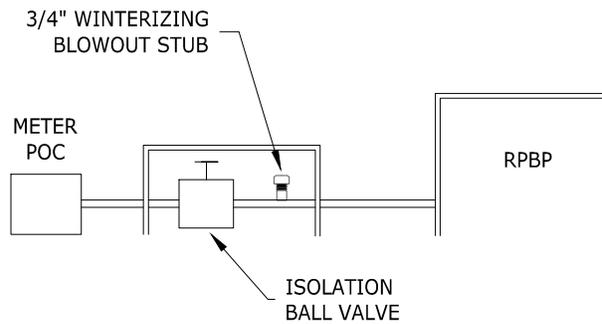
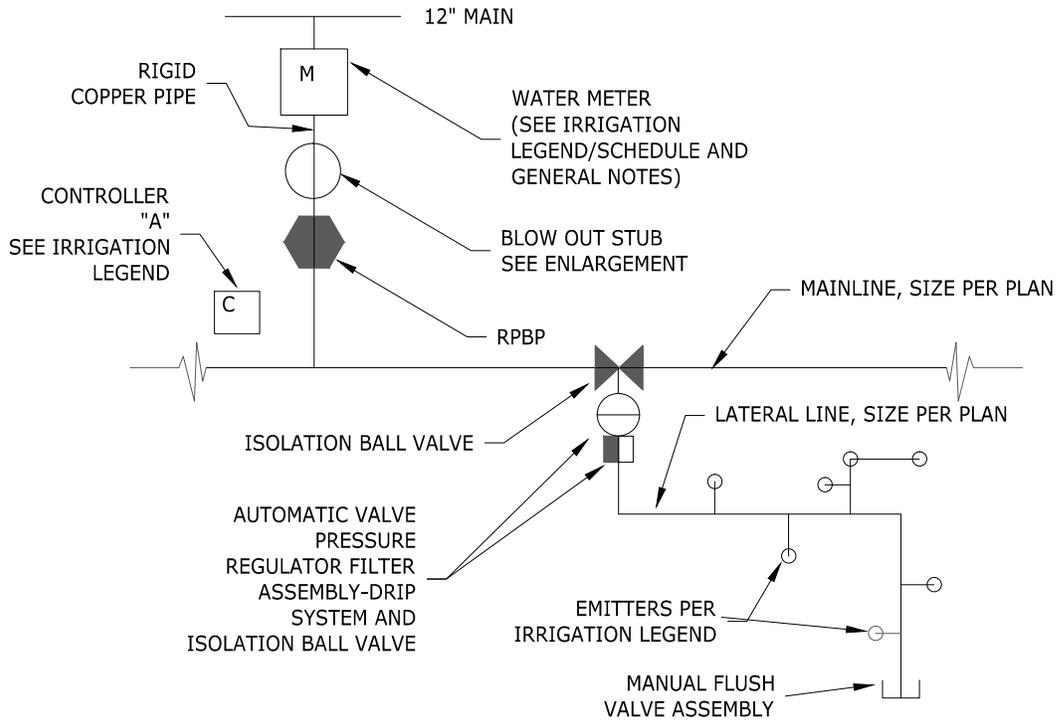
19-02-022

REVISION DATE:

11/22/16

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BLOW OUT STUB

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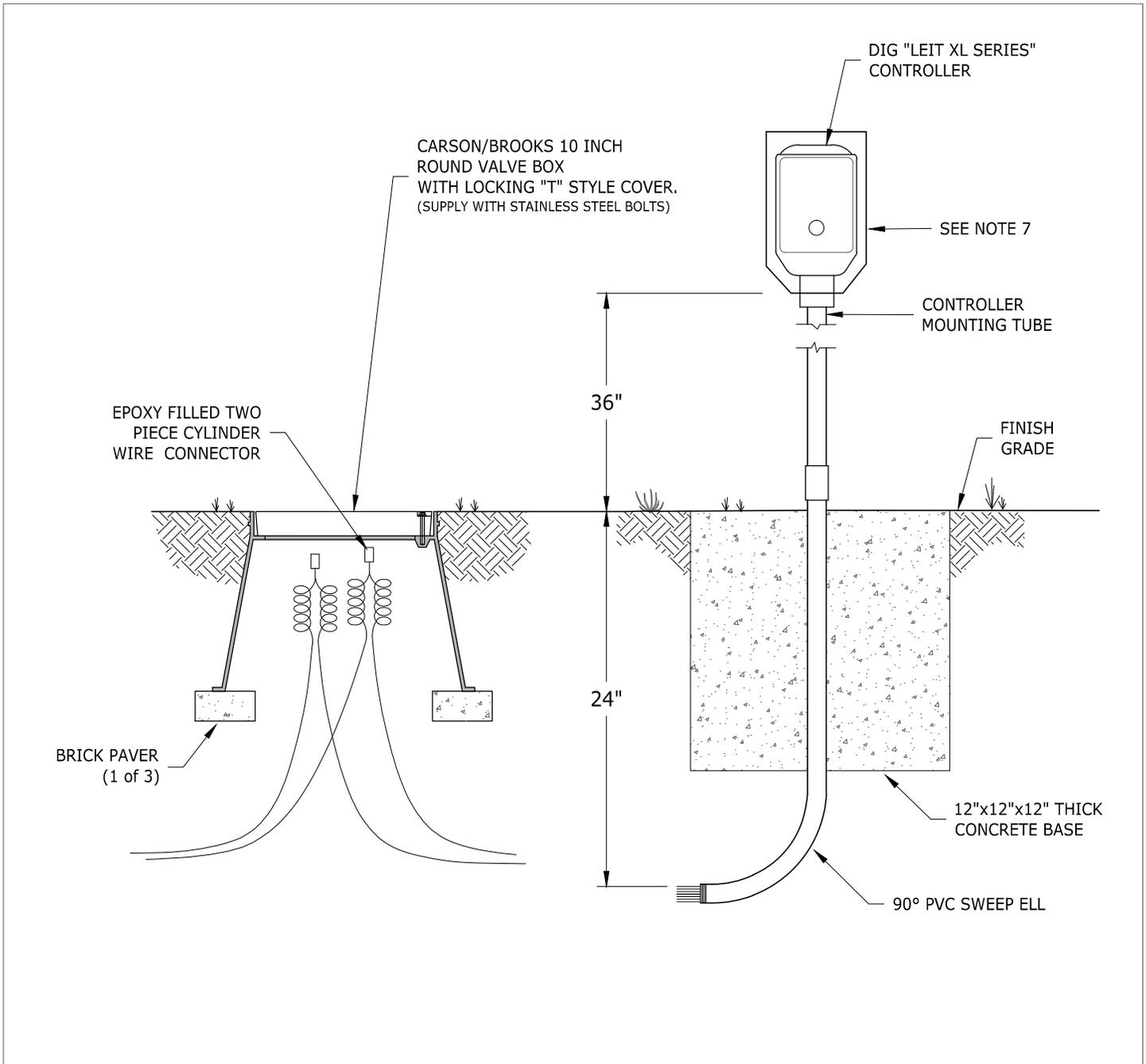
ENGINEERING
DETAIL

SCHEMATIC LAYOUT

DETAIL NO.
19-02-023

REVISION DATE: 11/22/16

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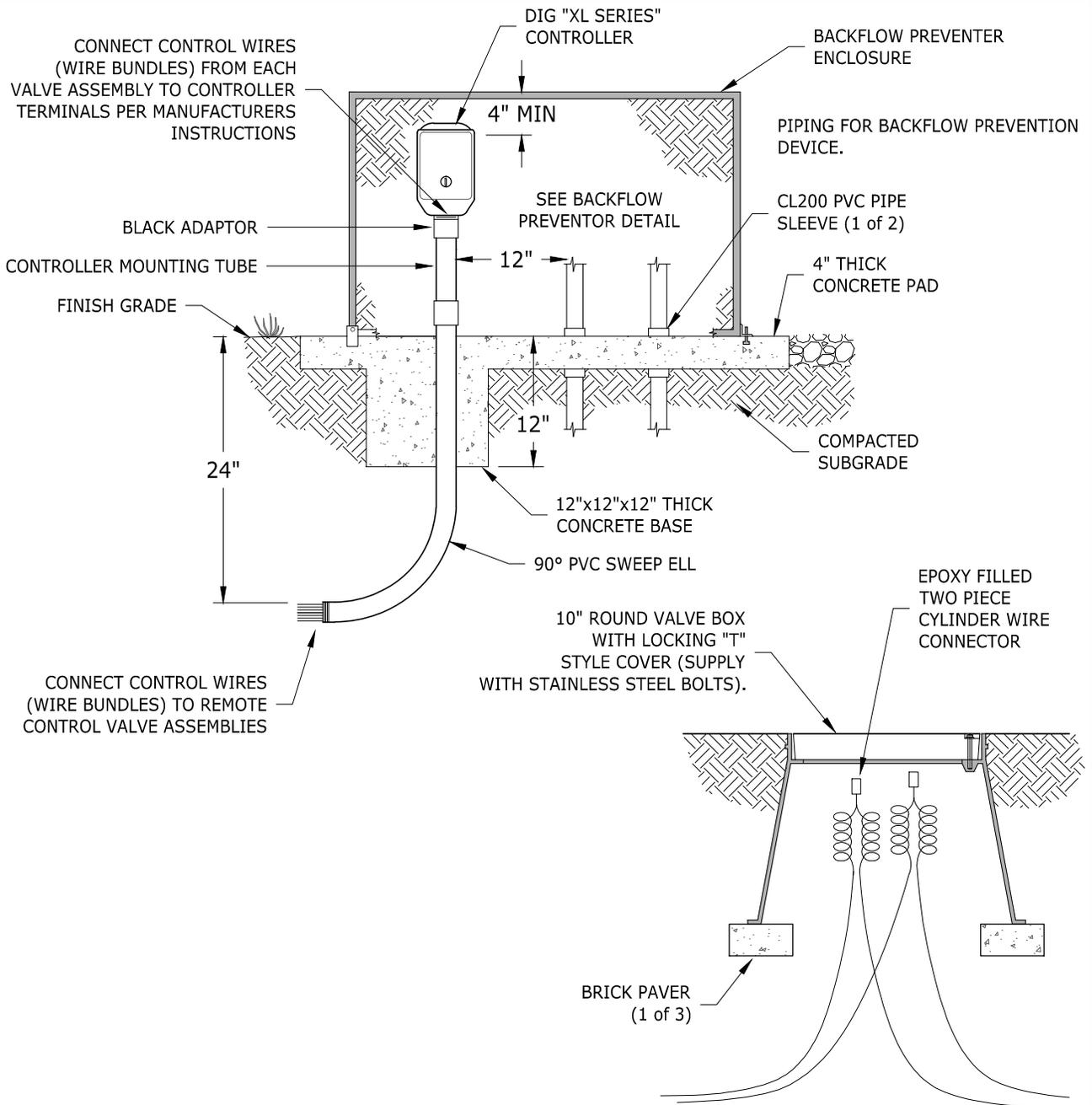


NOTES

1. INSTALL WIRE OF APPROPRIATE GAUGE, CONNECTORS, SEALANT, AND ADAPTORS PER MANUFACTURERS INSTRUCTIONS.
2. D.C. LATCHING SOLENOIDS ON REMOTE CONTROL VALVES TO BE COMPATIBLE WITH CONTROLLER.
3. MASTER VALVE TO BE INSTALLED AND WIRED TO CONTROLLER WITH DC LATCHING SOLENOID COMPATIBLE WITH CONTROLLER (IF REQUIRED).
4. PROGRAMMING/ACCESS KEY TO BE SUPPLIED WITH CONTROLLER.
5. INSTALL MANUFACTURERS STAINLESS STEEL ENCLOSURE FOR CONTROLLER.
6. PROVIDE 12" EXPANSION COIL FOR EACH WIRE SPLICE INSIDE SPLICE BOX WHEN SPLICES ARE REQUIRED BY MANUFACTURER.
7. THE CONTROLLER SHALL BE SECURED INSIDE THE MANUFACTURES STAINLESS STEEL ENCLOSURE IF NOT INSTALLED INSIDE THE BACKFLOW PREVENTER ENCLOSURE.
8. ALL WIRES ARE TO BE IN CONDUIT.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	SOLAR CONTROLLER		
	DETAIL NO. 19-02-024	REVISION DATE: 11/22/16	1 1

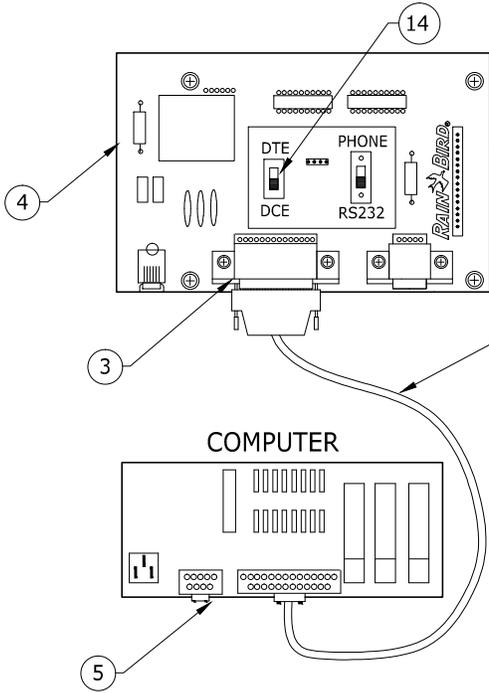


NOTES

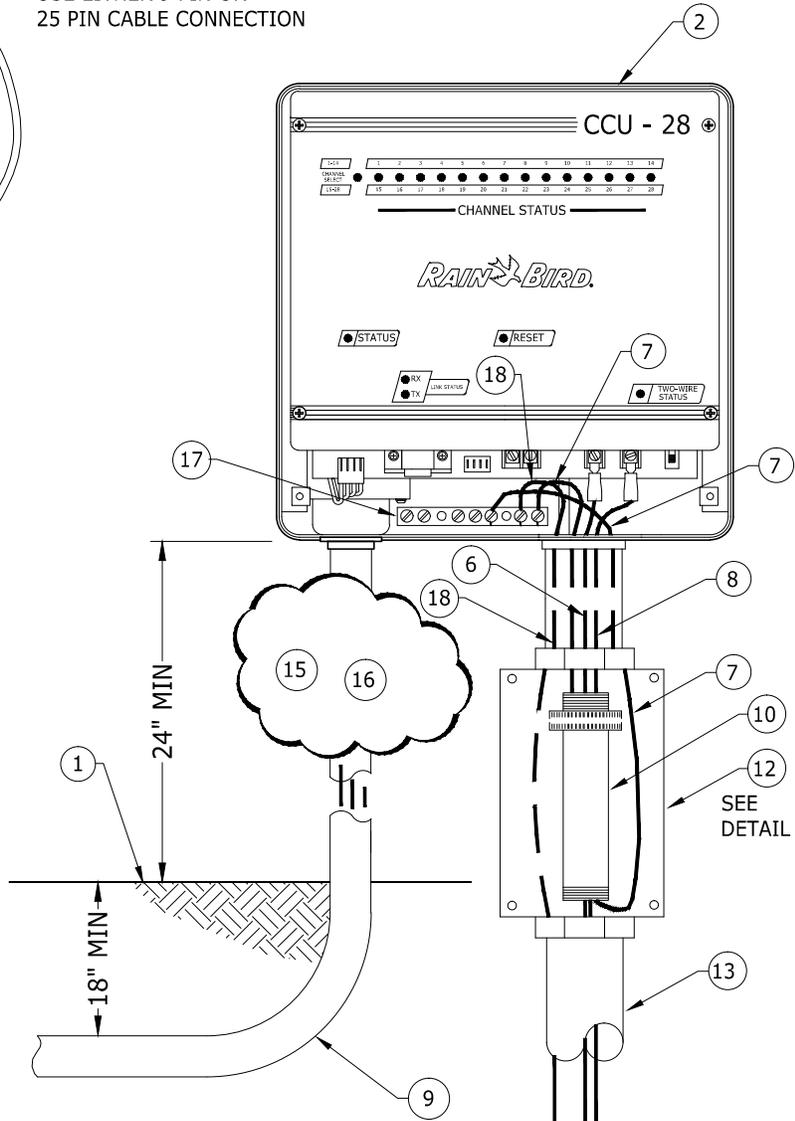
1. INSTALL WIRING OF APPROPRIATE GAUGE, CONNECTORS, SEALANT, AND ADAPTORS PER MANUFACTURERS INSTRUCTIONS.
2. INSTALL CONTROL WIRES, SPLICES, AND MOUNTING COLUMN AS FURNISHED/SPECIFIED BY THE CONTROLLER MANUFACTURER.
3. LABEL ALL WIRES IN CONTROLLER
4. D.C. LATCHING SOLENOIDS ON REMOTE CONTROLS VALVES TO BE COMPATIBLE WITH CONTROLLER.
5. MASTER VALVE TO BE INSTALLED AND WIRED TO CONTROLLER, WITH D.C. LATCHING SOLENOID COMPATIBLE WITH CONTROLLER.
6. ALL WIRES TO BE IN CONDUIT.
7. PROGRAMMING/ACCESS KEY TO BE PROVIDED WITH CONTROLLER.
8. PROVIDE 12" EXPANSION COIL FOR EACH WIRE SPLICE INSIDE SPLICE BOX WHEN SPLICES ARE REQUIRED BY MANUFACTURER.

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 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>SOLAR CONTROLLER AND BACKFLOW PREVENTER ENCLOSURE</p>		<p>1 1</p>
	<p>DETAIL NO. 19-02-025</p>	<p>REVISION DATE: 11/22/16</p>	



NOTE:
USE EITHER 9 PIN OR
25 PIN CABLE CONNECTION



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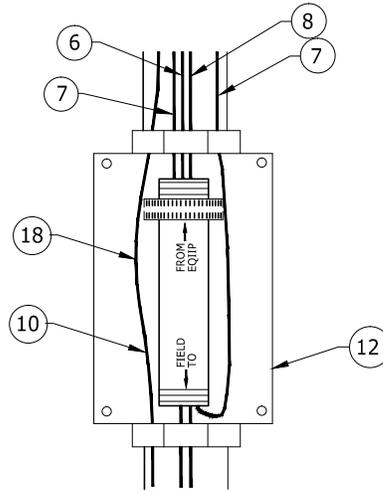
ENGINEERING
DETAIL

MAXICOM CCU (6 or 28) WALL MOUNT

DETAIL NO.
19-02-026

REVISION DATE: 11/22/16

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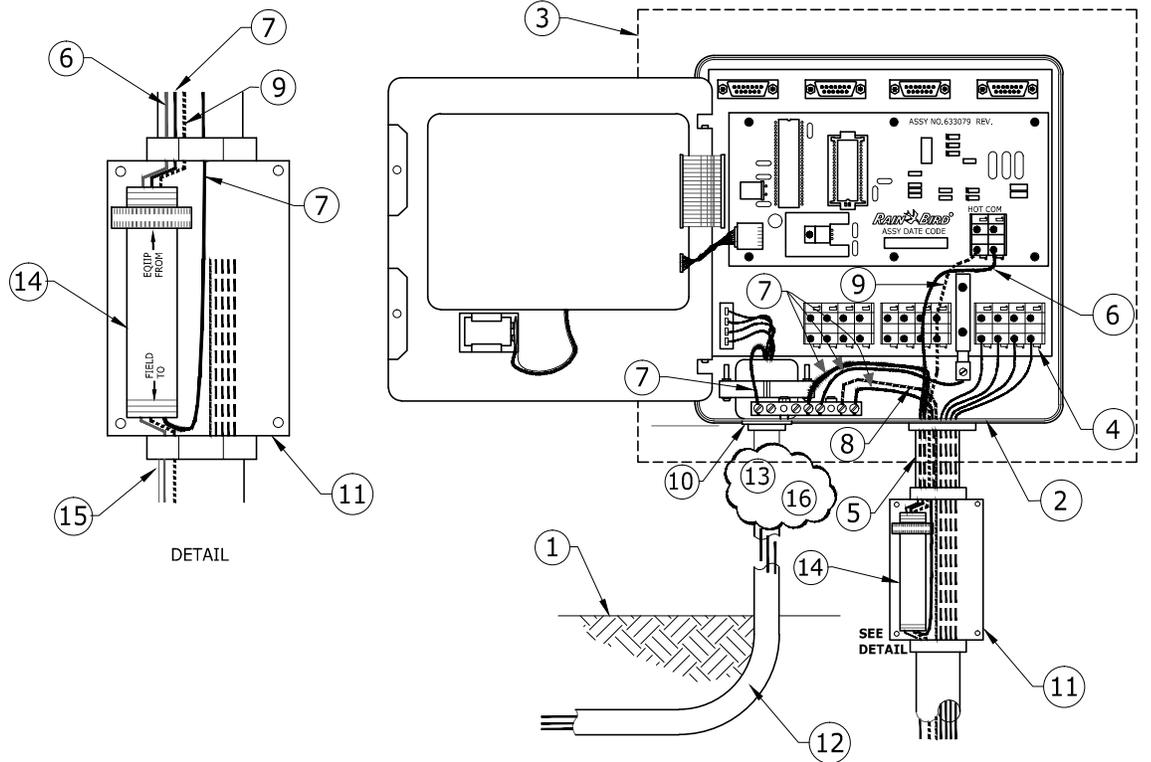
KEYNOTES

- ① FINISH GRADE
- ② RAIN BIRD WALL MOUNT CLUSTER CONTROL UNIT (CCU)
- ③ 25 PIN CONNECTOR (USE RS232 CABLE)
- ④ INTERFACE BOARD
- ⑤ COMPUTER COMPORT
- ⑥ COMMON WIRE (BLACK) FROM MAXICABLE TO MSP-1 SURGE ARRESTOR AND FROM MSP-1 SURGE ARRESTOR TO CCU COMMON WIRE TERMINAL POST
- ⑦ GROUND WIRE (GREEN) TO GROUNDING BUSS BAR
- ⑧ HOT WIRE (RED) FROM MAXICABLE TO MSP-1 SURGE ARRESTOR AND FROM MSP-1 SURGE ARRESTOR TO CCU HOT WIRE TERMINAL POST
- ⑨ 120 VOLT 60 CYCLE POWER SUPPLY
- ⑩ RAIN BIRD MSP-1 RECOMMENDED SURGE ARRESTOR
- ⑪ RS232 SERIAL CABLE (TO MODEM). MAXIMUM 50 FEET
- ⑫ JUNCTION BOX - SIZE AS REQUIRED
- ⑬ CONDUIT (SIZE AS REQUIRED)
- ⑭ SET SWITCH AS NEEDED
- ⑮ REFER TO LOCAL ELECTRIC CODE FOR CONNECTIONS
- ⑯ RAIN BIRD WARRANTY REQUIRES PROPER SURGE PROTECTION. USE INTERMATIC AG2401 OR TRIPPLITE ISOBAR
- ⑰ CCU GROUNDING BUSS BAR
- ⑱ #10 COPPER GROUND WIRE FROM CCU GROUNDING BUSS BAR TO GROUNDING GRID

NOTE:

CONTRACTOR MUST CONFER WITH MAXICOM REPRESENTATIVE FOR PROPER INSTALLATION.

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<p>MAXICOM CCU (6 or 28) WALL MOUNT</p>		<p>2 2</p>
	<p>DETAIL NO. 19-02-026</p>	<p>REVISION DATE: 11/22/16</p>	

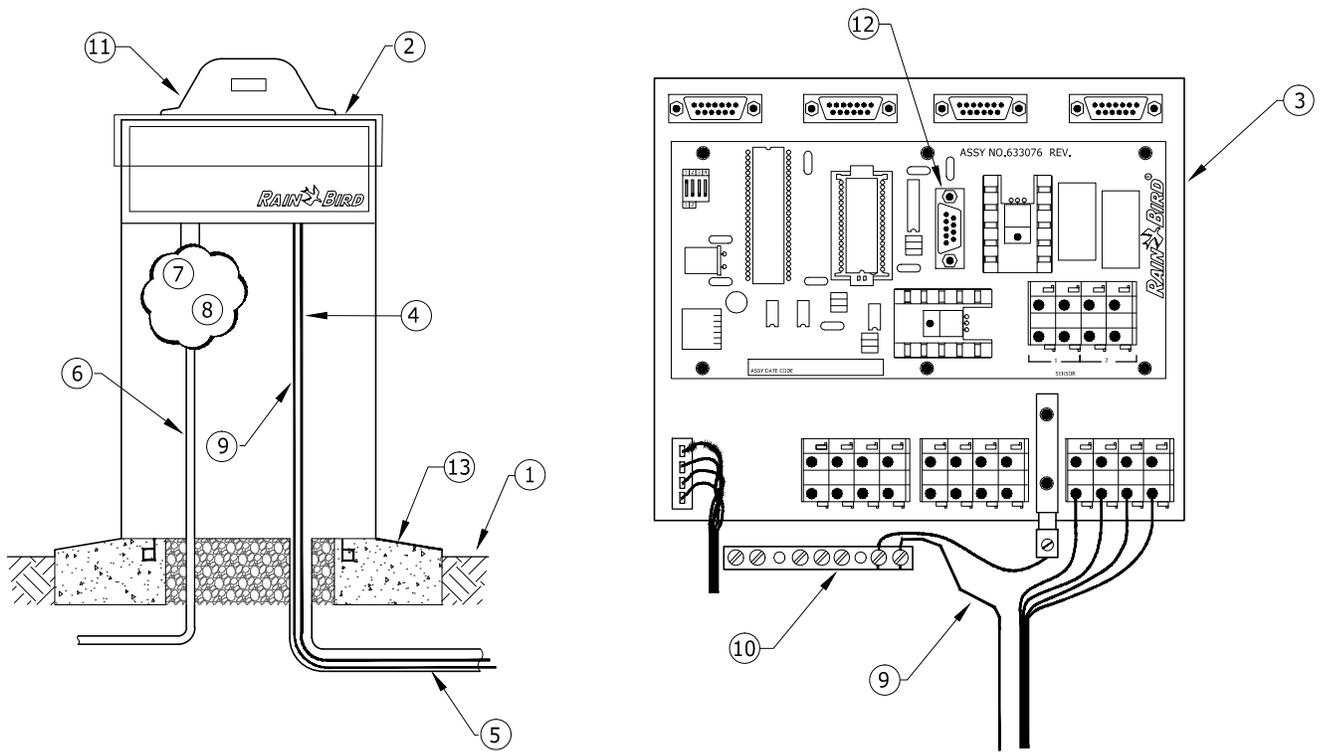


KEYNOTES

- ① FINISH GRADE
- ② RAIN BIRD ESP-SAT WALL MOUNT (METAL) FIELD SATELLITE CONTROLLER
- ③ RAINSAFE STRONGBOX VANDAL-RESISTANT ENCLOSURE
- ④ WIRE TERMINAL CONNECTORS TO REMOTE CONTROL VALVES
- ⑤ COMMUNICATION CABLE CONDUIT - SIZE AS REQUIRED
- ⑥ COMMON WIRE (BLACK) FROM MSP-1 SURGE ARRESTOR TO MAXICOM INTERFACE BOARD (MIB)
- ⑦ ALL GROUND WIRES (GREEN) TO GROUNDING BUSS BAR
- ⑧ #10 COPPER GROUND WIRE FROM ESP FIELD SATELLITE CONTROLLER GROUNDING BUSS BAR TO GROUNDING GRID
- ⑨ HOT WIRE (DASHED/RED) FROM MSP-1 SURGE ARRESTOR TO MAXICOM INTERFACE BOARD (MIB)
- ⑩ ESP FIELD SATELLITE CONTROLLER GROUNDING BUSS BAR
- ⑪ JUNCTION BOX - SIZE AS REQUIRED
- ⑫ 120 VOLT POWER SUPPLY
- ⑬ REFER TO LOCAL ELECTRIC CODE FOR CONNECTIONS
- ⑭ RAIN BIRD MSP-1 RECOMMENDED SURGE ARRESTOR
- ⑮ TO TWO WIRE PATH WHEN REQUIRED.
- ⑯ RAIN BIRD WARRANTY REQUIRES PROPER SURGE PROTECTION. USE INTERMATIC AG2401 OR TRIPPLITE ISOBAR

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 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h2 style="margin: 0;">MAXICOM ESP-SAT FIELD SATELLITE CONTROLLER - WALL MOUNT</h2>
<p>DETAIL NO. 19-02-027</p>	<p>REVISION DATE: 11/22/16</p>
<p>1</p>	<p>1</p>



KEYNOTES

- ① FINISH GRADE
- ② RAIN BIRD ESP-SAT STAINLESS STEEL PEDESTAL FIELD SATELLITE CONTROLLER
- ③ ESP-SAT MAXILINK MAXICOM INTERFACE BOARD (MIB)
- ④ WIRE TERMINAL CONNECTORS FOR CONTROL AND COMMON WIRES TO REMOTE CONTROL VALVES
- ⑤ PVC CONDUIT FOR CONTROL AND COMMON WIRES - SIZE AS REQUIRED.
- ⑥ 3/4" PVC CONDUIT FOR 120 VAC POWER SUPPLY
- ⑦ RAIN BIRD WARRANTY REQUIRES PROPER SURGE PROTECTION. USE INTERMATIC AG2401 OR TRIPPLITE ISOBAR
- ⑧ REFER TO LOCAL ELECTRIC CODE FOR CONNECTIONS
- ⑨ #10 COPPER GROUND WIRE FROM ESP FIELD SATELLITE CONTROLLER GROUNDING BUSS BAR TO GROUNDING GRID
- ⑩ ESP FIELD SATELLITE CONTROLLER GROUNDING BUSS BAR
- ⑪ MAXILINK ANTENNA. CONNECT TO RAIN BIRD RADIO MODEM KIT (RMK) (IF REQUIRED) NOT SHOWN. USE PROPER ANTENNA SURGE PROTECTION POLYPHASER MODEL IS-IE50LN-C1
- ⑫ 9-PIN CABLE CONNECTION TO RAIN BIRD RAIDO MODEM KIT (RMK) NOT SHOWN
- ⑬ POURED CONCRETE BASE

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ENGINEERING
DETAIL

**MAXICOM ESP-SAT FIELD SATELLITE CONTROLLER
STAINLESS STEEL PEDESTAL**

DETAIL NO.

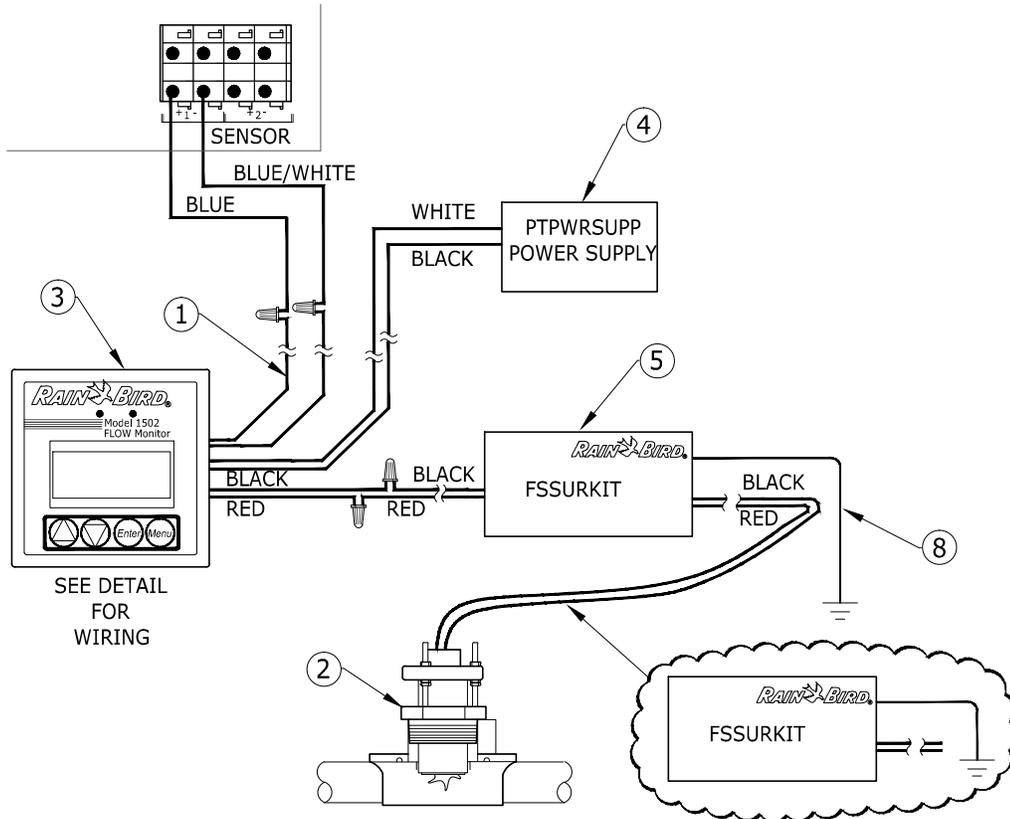
19-02-028

REVISION DATE:

11/22/16

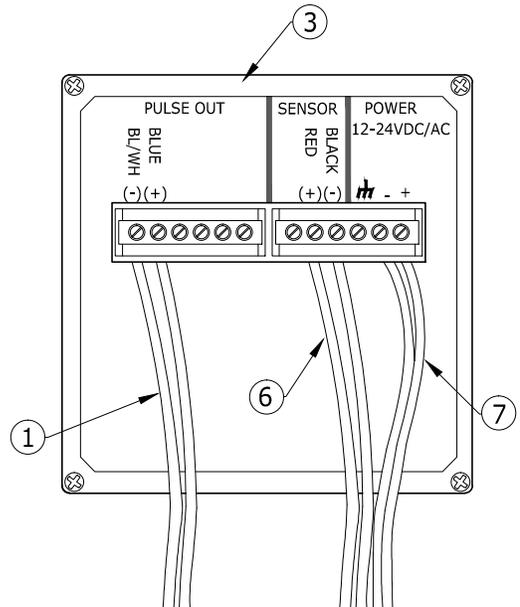
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SEE DETAIL FOR WIRING

DETAIL



KEYNOTES

- ① TO RAIN BIRD ESP-SAT OR ESP-SITE-SAT SENSOR INPUT
- ② RAIN BIRD FS SERIES FLOW SENSOR
- ③ RAIN BIRD MODEL PT1502 TRANSMITTER
- ④ RAIN BIRD PTPWSUPP POWER SUPPLY
- ⑤ RAIN BIRD FSSURKIT SURGE PROTECTOR
- ⑥ TO RAIN BIRD FSSURKIT
- ⑦ TO RAIN BIRD PTPWSUPP POWER SUPPLY
- ⑧ GREEN WIRE TO GROUND

NOTES:

- 1. IF THE FLOW SENSOR IS LOCATED MORE THAN 150 FEET FROM THE FLOW TRANSMITTED, INCLUDE AN ADDITIONAL FSSURKIT AND GROUND ROD AT THE FLOW SENSOR LOCATION.

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City of Flagstaff

ENGINEERING
DETAIL

MAXICOM FLOW SENSOR (PT1502)

DETAIL NO.

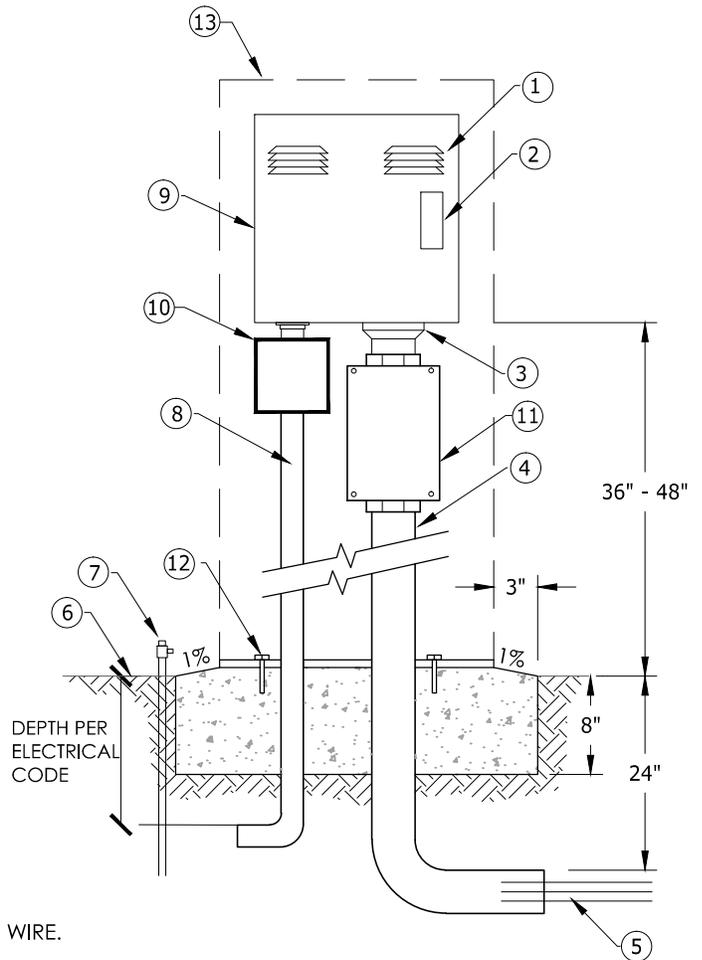
19-02-029

REVISION DATE:

11/22/16

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KEYNOTES

- ① VENTS W/ BAFFLE
- ② 3 POINT LATCH W/ LOCKABLE HANDLE
- ③ 2" MALE ADAPTER W/ LOCK RING
- ④ 2" PE3408 SDR 9 SLEEVE W/ 2" SWEEP FOR 24 VOLT CONTROL WIRE. SECURE TO WALL W/ CONDUIT STRAP, TOP AND BOTTOM
- ⑤ CONTROL WIRES IN MAINLINE TRENCH
- ⑥ FINISH GRADE
- ⑦ 8' COPPER CLAD GROUND ROD W/ 10 GAUGE NON-INSULATED GROUND WIRE CONNECTED TO GROUND TERMINAL BLOCK
- ⑧ 1/2" E.M.T. CONDUIT FOR 110-V POWER SUPPLY
- ⑨ LOCKABLE STAINLESS STEEL CABINET (OR APPROVED EQUAL)
- ⑩ 4" x 4" ELECTRICAL JUNCTION BOX W/ 120 VOLT POWER SURGE ARRESTOR
- ⑪ ELECTRICAL JUNCTION BOX AS REQUIRED
- ⑫ STAINLESS "J" BOLTS (OPTION: ZINC-PLATED STEEL EMBEDDED BASE)
- ⑬ RAINSAFET™ STRONGBOX VANDAL-RESISTANT ENCLOSURE

NOTES:

- 1. POWER SOURCE FOR CONTROLLER TO BE HARD WIRED FROM CIRCUIT BREAKER
- 2. MOUNTED INSIDE CABINET TO CONTROLLER.
- 3. LOCATION OF POWER SOURCE TO BE NOTED ON CIRCUIT BREAKER PANEL.
- 4. REMOTE CONTROL VALVES FOR D.C. APPLICATIONS MUST HAVE D.C.
- 5. LATCHING SOLENOIDS AND APPROVED SOLAR PANEL FOR POWER SOURCE.

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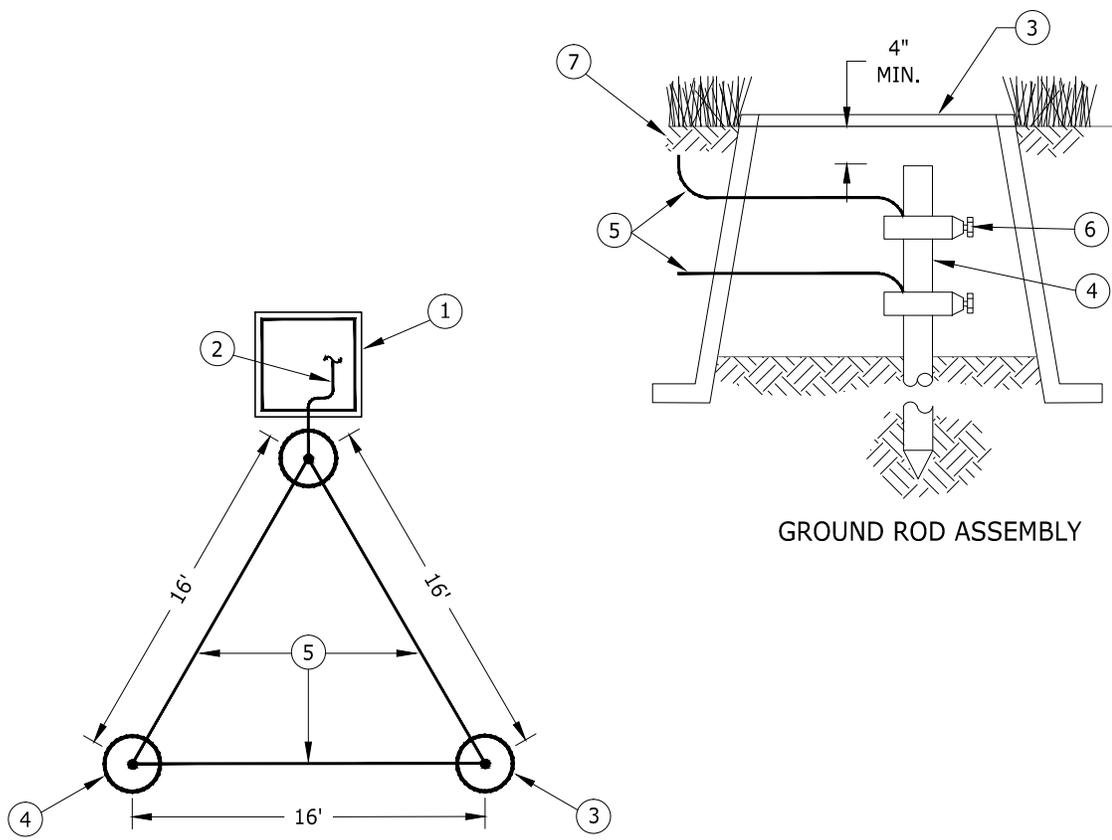
ENGINEERING
DETAIL

CONTROLLER ENCLOSURE

DETAIL NO.
19-02-030

REVISION DATE: 11/22/16

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GROUND ROD LAYOUT

GROUND ROD ASSEMBLY

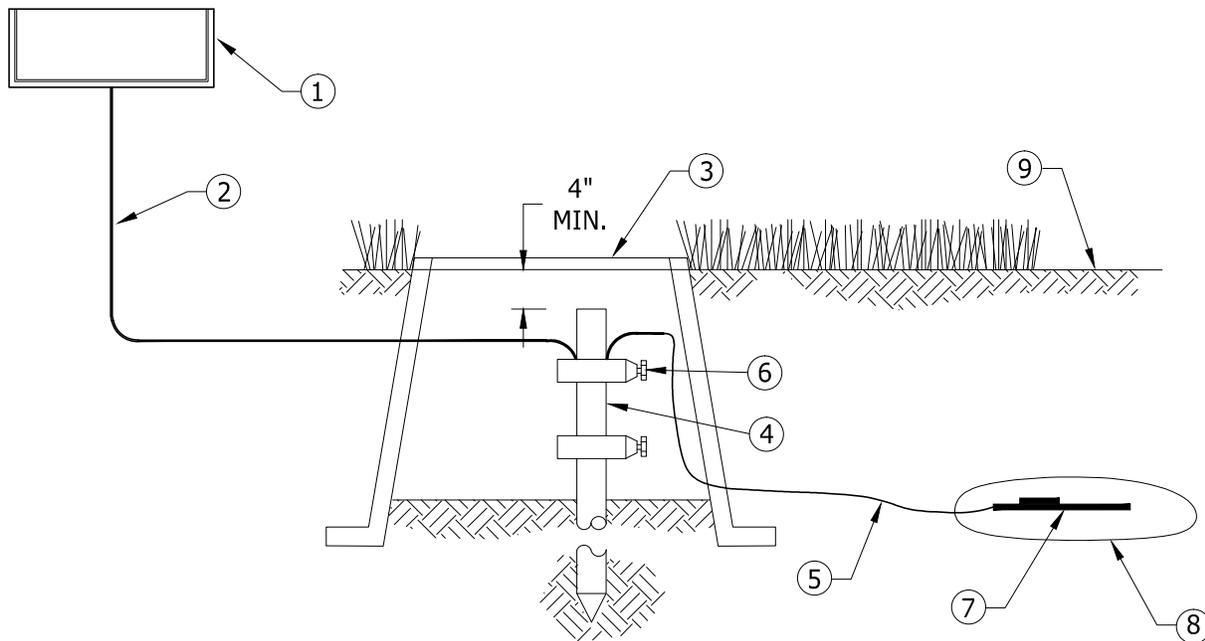
KEYNOTES

- ① MAXICOM FIELD SATELLITE, WEATHER STATION OR CCU ASSEMBLY
- ② SOLID BARE COPPER WIRE (#10 AWG) FROM GROUNDING ROD TO SATELLITE OR CCU. MAKE WIRE AS SHORT AND STRAIGHT AS POSSIBLE
- ③ COVER GROUNDING ROD WITH #10 ROUND VALVE BOX AS SHOWN
- ④ 5/8-INCH X 8 FT COPPER CLAD GROUNDING ROD OR GROUNDING PLATE. INSTALL RODS IN SOIL IN A TRIANGULAR PATTERN SPACED A MINIMUM OF 16 FT APART FROM EACH OTHER. GROUNDING GRID TO HAVE A RESISTANCE OF TEN (10) OHMS OR LESS
- ⑤ BARE COPPER WIRE (#10 AWG MIN.) BETWEEN GROUNDING RODS
- ⑥ GROUND ROD CLAMP OR WELDS
- ⑦ FINISH GRADE
- ⑧ GROUNDING RESISTANCE SHALL EQUAL 11 OHMS OR LESS TO MEET MANUFACTURERS SPECIFICATIONS.

NOTES:
REFER TO RAIN BIRD CENTRAL CONTROL TECHNICAL BULLETIN TB-9001-MULTI FOR INSTALLATION GUIDELINES.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	<h1>GROUNDING ROD GRID</h1>		<p>1 1</p>
	<p>DETAIL NO. 19-02-031</p>	<p>REVISION DATE: 11/22/16</p>	



KEYNOTES

- ① MAXICOM FIELD SATELLITE, WEATHER STATION OR CCU ASSEMBLY
- ② SOLID BARE COPPER WIRE (#10 AWG) FROM GROUNDING ROD TO SATELLITE OR CCU. MAKE WIRE AS SHORT AND STRAIGHT AS POSSIBLE
- ③ COVER GROUNDING ROD WITH #10 ROUND VALVE BOX AS SHOWN
- ④ 5/8-INCH X 10 FT COPPER CLAD GROUNDING ROD OR GROUNDING PLATE. INSTALL RODS IN SOIL IN A TRIANGULAR PATTERN SPACED A MINIMUM OF 16 FT APART FROM EACH OTHER. GROUNDING GRID TO HAVE A RESISTANCE OF TEN (10) OHMS OR LESS
- ⑤ BARE COPPER WIRE (#6 AWG MIN.) BETWEEN GROUNDING ROD AND GROUNDING PLATE
- ⑥ GROUND ROD CLAMP OR WELDS
- ⑦ COPPER GROUNDING PLATE
- ⑧ GROUND ENHANCEMENT MATERIAL (IF REQUIRED)
- ⑨ FINISH GRADE

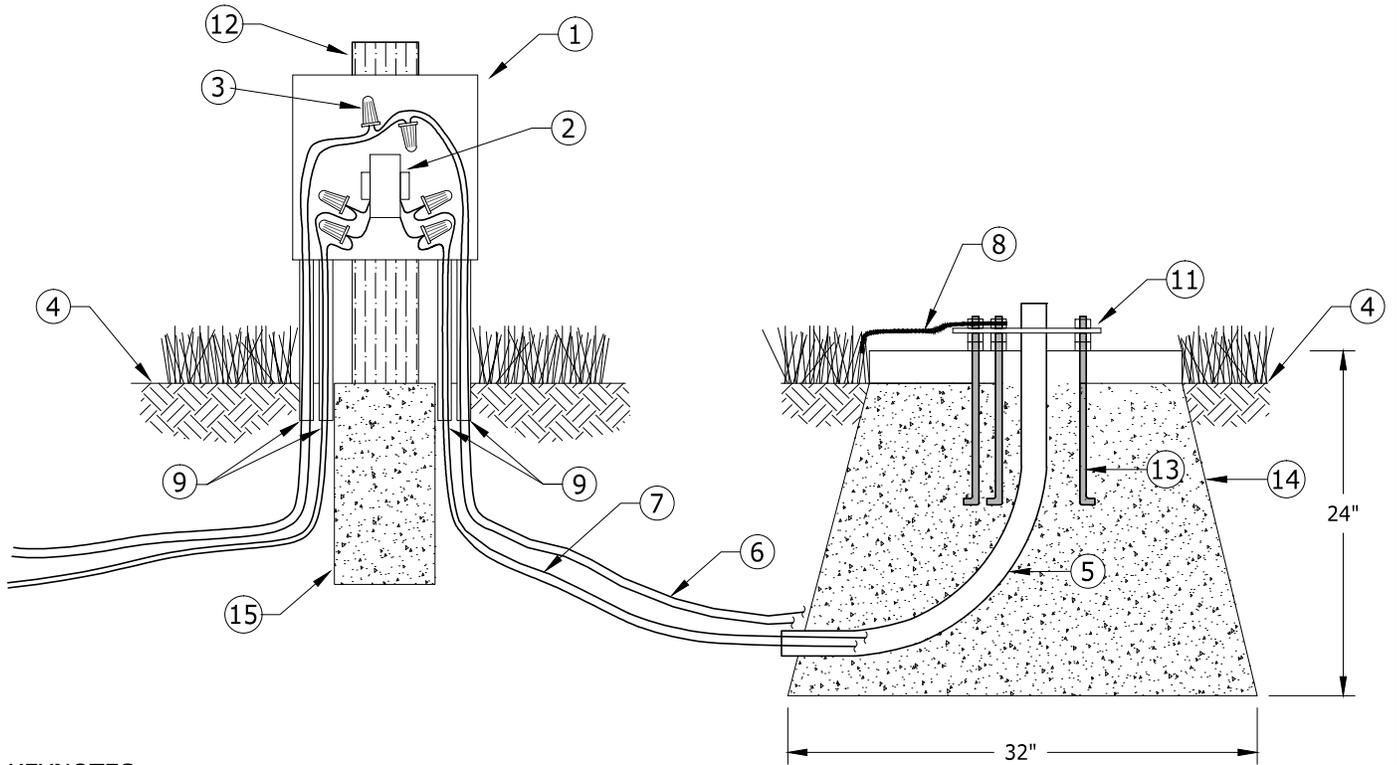
NOTES:

1. REFER TO RAIN BIRD CENTRAL CONTROL TECHNICAL BULLETIN TB-9001MULTI FOR INSTALLATION GUIDELINES.

NTS

 <p>City of Flagstaff ENGINEERING DETAIL</p>	GROUNDING PLATE DESIGN LAYOUT		
	DETAIL NO. 19-02-032	REVISION DATE: 11/22/16	1

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KEYNOTES

- ① 12-INCH X 12-INCH ENCLOSURE (NEMA 3)
- ② 120/16 VAC TRANSFORMER
- ③ WIRE NUT CONNECTORS
- ④ FINISH GRADE
- ⑤ TWO (2) LONG SWEEP ELBOWS (ONE HIDDEN WITH COMMUNICATION WIRE). ORIENT PROPERLY FOR WIRING (SIZE AS REQUIRED)
- ⑥ TELEPHONE LINE OR DIRECT CONNECT CABLE TO HIDDEN LONG SWEEP ELBOW
- ⑦ 16 VAC TO WEATHER STATION THROUGH LONG SWEEP ELBOW
- ⑧ GROUND WIRE TO GROUND RODS. SEE MAXICOM DETAIL 305
- ⑨ CONDUITS
- ⑩ 120 VAC POWER SUPPLY
- ⑪ WEATHER STATION TEMPLATE
- ⑫ 4-INCH X 4-INCH POST (TREATED)
- ⑬ WEATHER STATION ANCHOR BOLTS
- ⑭ CONCRETE PAD, REFER TO MAXICOM DETAIL 300
- ⑮ CONCRETE

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City of Flagstaff

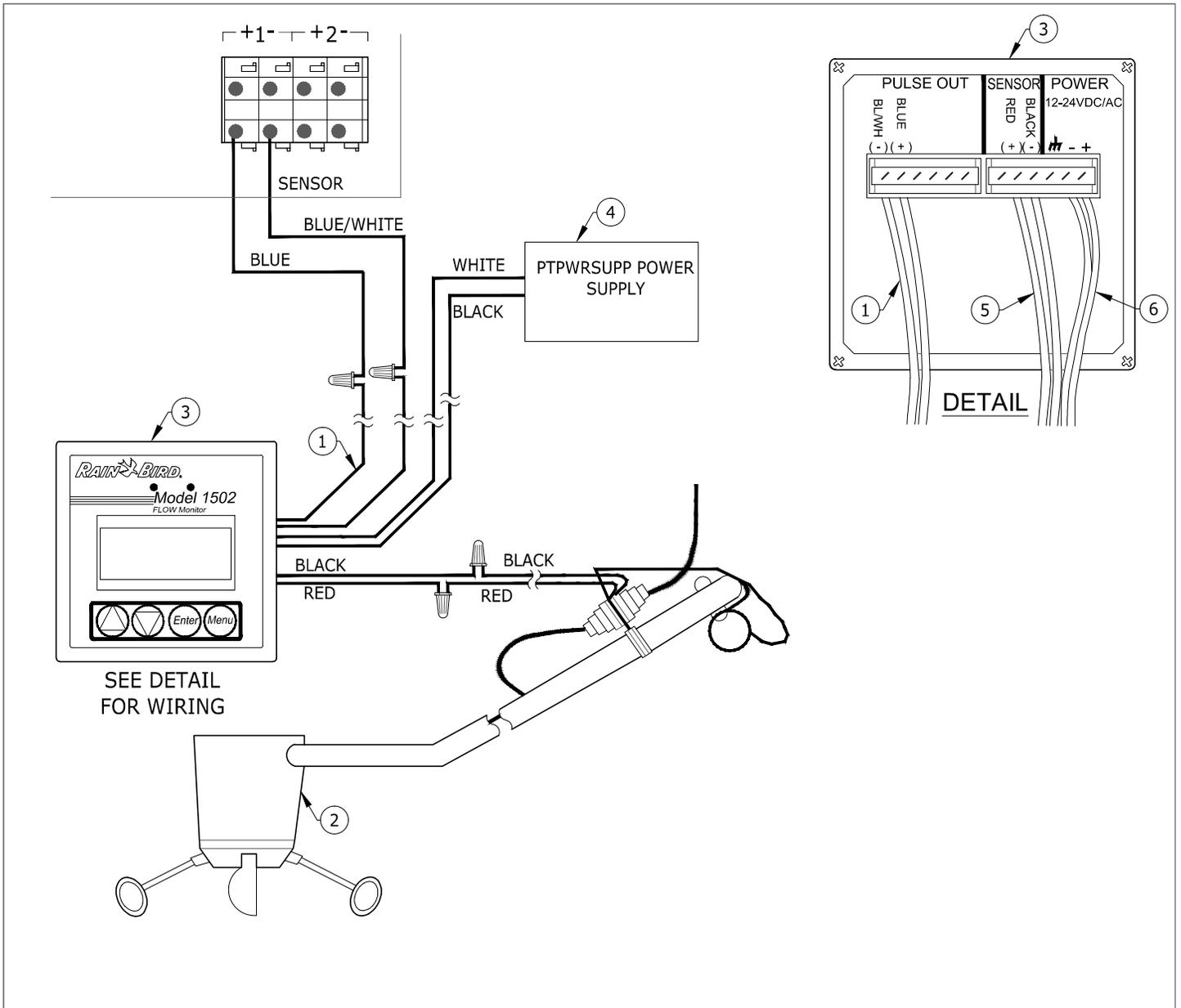
ENGINEERING
DETAIL

WEATHER STATION EXTERNAL WIRE CONNECTION

DETAIL NO.
19-02-033

REVISION DATE: 11/22/16

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KEYNOTES

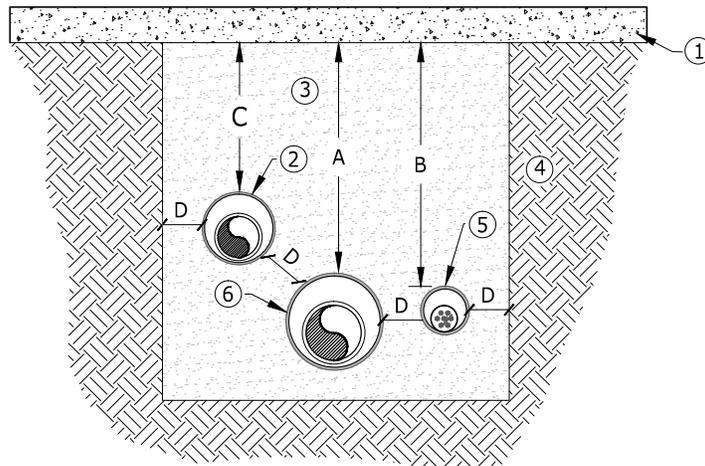
- ① TO RAIN BIRD ESP-SAT OR ESP-SITE-SAT SENSOR INPUT
- ② RAIN BIRD ANEMOMETER WIND SPEED SENSOR ON POLE IN UNOBSTRUCTED AREA
- ③ RAIN BIRD MODEL PT1502 PULSE TRANSMITTER
- ④ RAIN BIRD PTPWSUPP POWER SUPPLY
- ⑤ TO WIND SENSOR
- ⑥ TO RAIN BIRD PTPWSUPP POWER SUPPLY

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 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<h2 style="margin: 0;">MAXICOM VARIABLE WIND SPEED DETECTION</h2>		
	<p>DETAIL NO.</p> <h1 style="margin: 0;">19-02-034</h1>	<p>REVISION DATE:</p> <p style="font-size: 1.2em;">11/22/16</p>	<p style="font-size: 2em; margin: 0;">1</p> <p style="font-size: 2em; margin: 0;">1</p>

DETAIL ALSO FOR PIPE INSTALLED IN ROCK SOIL.

DIMENSION	A	B	C	D
PAVED AREA/DRIVEWAY	36"	36"	24"	4"
PUBLIC ROADS	36"	36"	24"	4"



SECTION VIEW

KEYNOTES

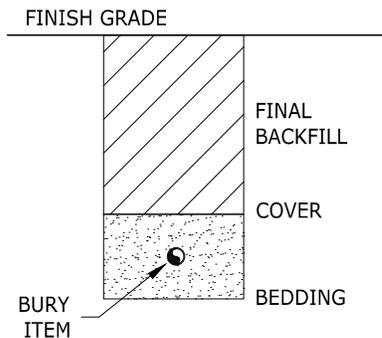
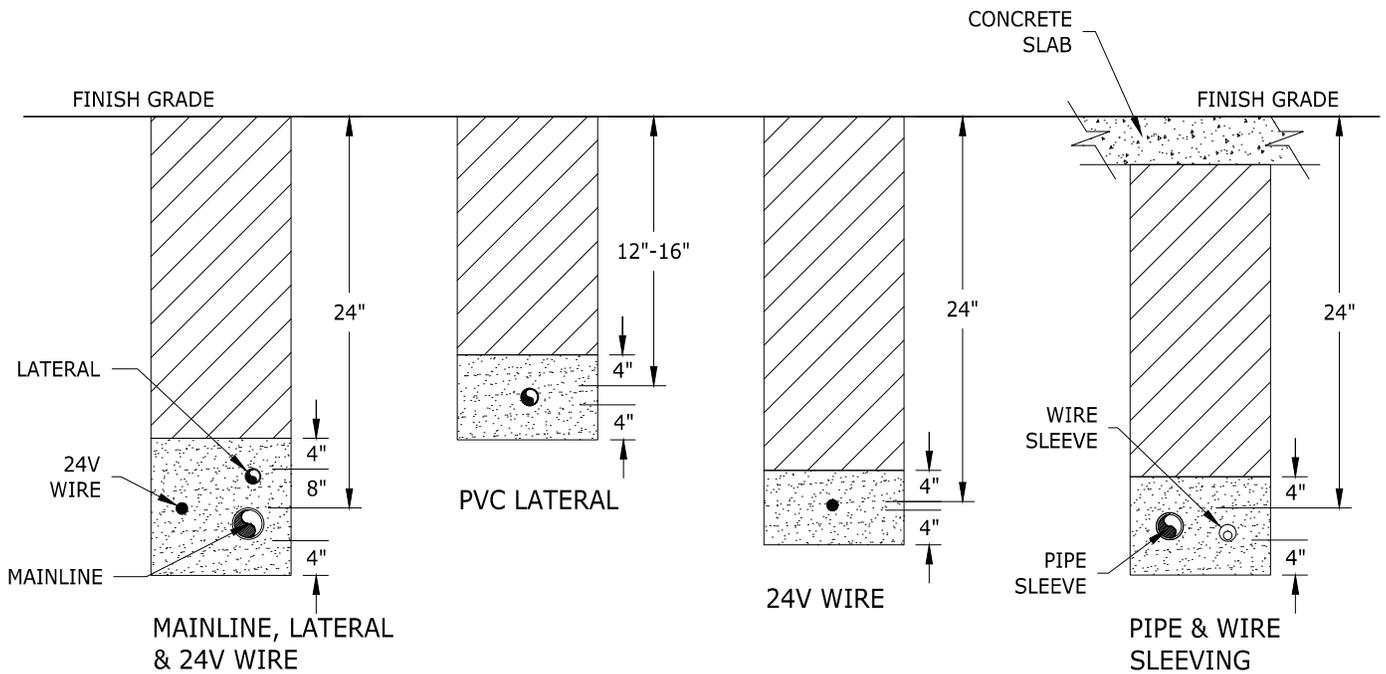
- ① PAVING
- ② LATERAL LINES IN HDPE SLEEVE
- ③ SAND BACKFILL COMPACTED TO THE DENSITY OF EXISTING SOIL
- ④ UNDISTURBED SOIL
- ⑤ CONTROL WIRES IN HDPE SLEEVE
- ⑥ PRESSURE MAINLINE IN HDPE SLEEVE. HDPE SLEEVES TO BE TWICE THE DIAMETER OF THE PIPE OR WIRE BUNDLE CARRIED.

NOTES:

- 1. BUNDLE WIRING AND WRAP W/ ELECTRICAL TAPE @ 10' INTERVALS.
- 2. ALL MAINLINE PIPING TO BE INSTALLED IN ACCORDANCE W/ MANUFACTURER'S INSTALLATION SPECIFICATIONS.
- 3. ALL MAINLINE, LATERAL LINES AND CONTROL WIRES SHALL BE SLEEVED BELOW ALL HARDSCAPE ELEMENTS WITH HDPE PE 3408, SDR 11 PIPE, 2.5 TIMES THE DIAMETER OF THE PIPE OR WIRE BUNDLE WITHIN.
- 4. ALL CURBS SHALL BE MARKED W/ A "SCORE" MARK TO DESIGNATE SLEEVE LOCATION, TYPICAL.

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 <p>City of Flagstaff ENGINEERING DETAIL</p>	SLEEVE TRENCHING DETAIL		
	DETAIL NO. 19-02-035	REVISION DATE: 11/22/16	1 1



 EXCAVATED MATERIAL SHALL BE FINELY SCREENED WITH NO ROCKS LARGER THAN 1"

 BEDDING AND COVER MATERIAL SHALL BE TOPSOIL WITH NO ROCKS.

NOTES

1. BEDDING SHALL BE PLACED AND LEVELED PRIOR TO INSTALLATION OF BURY ITEM.
2. BACKFILL SHALL BE PLACED IN MAXIMUM 6" LIFTS.
3. SLEEVE ALL PIPE AND WIRE SEPARATELY. SLEEVE 2 X DIA. OF PIPE (MIN 2"). ONE PIPE PER SLEEVE. SLEEVES TO BE PRIMED AND SOLVENT WELDED.
4. ALL PIPE TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS WITH PIPE LABELING FACING UP FOR INSPECTION PURPOSES. PROVIDE A MINIMUM OF 2" CLEARANCE TO SIDE OF TRENCH AND BETWEEN PIPES.
5. ALL 120 V. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.
6. TAPE AND BUNDLE IRRIGATION CONTROL WIRES EVERY 10'. PROVIDE LOOSE 20" LOOP AT ALL CHANGES OF DIRECTION OVER 30°.
7. ALL REMOTE CONTROL VALVE WIRING SHALL BE INSTALLED IN A MINIMUM 2" SCHEDULE 40 GREY ELECTRICAL CONDUIT OR AS APPROVED.
8. "NON-POTABLE" WARNING TAPE TO BE INSTALLED ON ALL PRESSURIZED MAINLINES 12" ABOVE THE PIPE.
9. INSTALL ONE ADDITIONAL SLEEVE SIZED TO MATCH THE LARGEST REQUIRED SLEEVE WITH ENDS TAPED FOR FUTURE USE.
10. SLEEVES TO EXTEND A MINIMUM OF 12" PAST HARDSCAPE PLANTERS, CURBS, SIDEWALKS, ETC. SLEEVES TO BE STAGGERED/OFFSET SO THAT SLEEVE USE IS NOT OBSTRUCTED BY OTHER PIPES.
11. WHERE PRESSURE SUPPLY PIPING IS INSTALLED WITHOUT CONTROL WIRING, A 14 GA. TRACKING WIRE SHALL BE INSTALLED.

NTS

City of Flagstaff



ENGINEERING
DETAIL

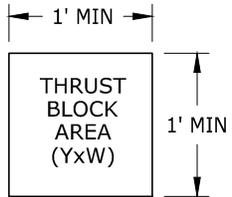
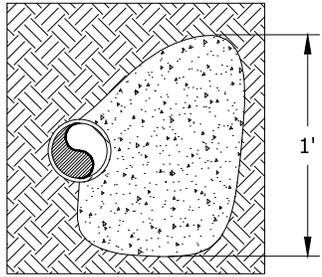
IRRIGATION TRENCHING

DETAIL NO.
19-02-036

REVISION DATE: 11/22/16

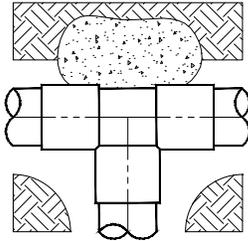
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MINIMUM THRUST BLOCK AREA (YxW)		
PIPE SIZE	IRRIGATION PIPE	
	TEE, DEAD END 90° BEND	45°, 22.5°
3"	1 SF	.5 SF
4"	1.5 SF	1 SF
5" & LARGER	2 SF	1.5 SF
	PER MAG DETAIL 380	PER MAG DETAIL 380

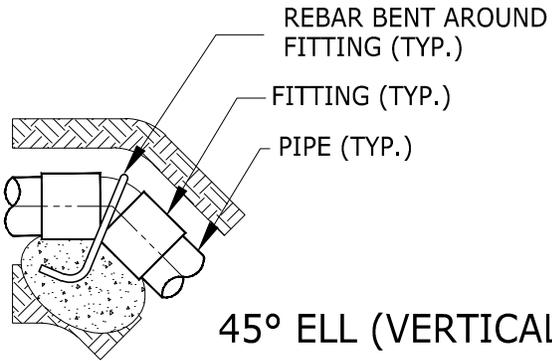


NOTES

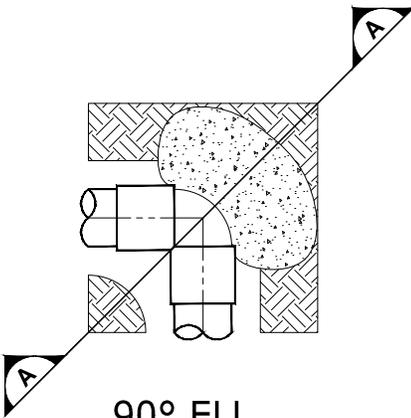
1. MINIMUM THRUST BLOCK AREAS ARE BASED ON A SOIL BEARING CAPACITY OF 3000 LBS/SF
2. THRUST BLOCK SHALL EXTEND INTO UNDISTURBED SOIL.
3. THRUST BLOCK SHALL BE MAG SECT. 725-CLASS C.
4. MAINLINE PIPING 4" AND LARGER SHALL HAVE MEGA/LUG JOINT RESTRAINTS INSTALLED AT ALL FLOW DIRECTION CHANGES (CONCRETE THRUST BLOCK NOT REQUIRED).



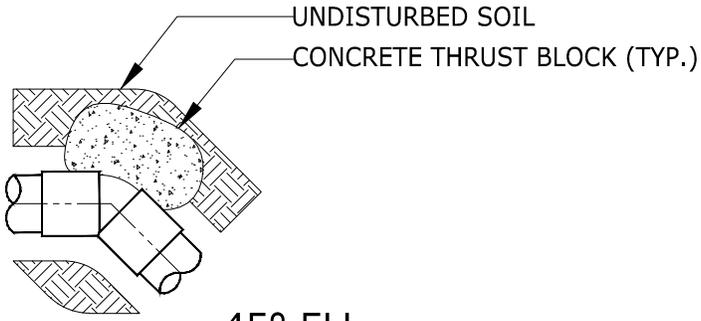
TEE



45° ELL (VERTICAL)



90° ELL



45° ELL

NTS



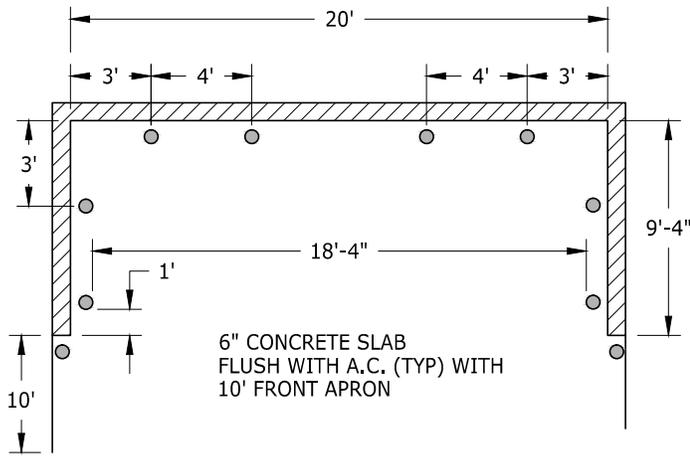
City of Flagstaff
ENGINEERING
DETAIL

IRRIGATION THRUST BLOCK

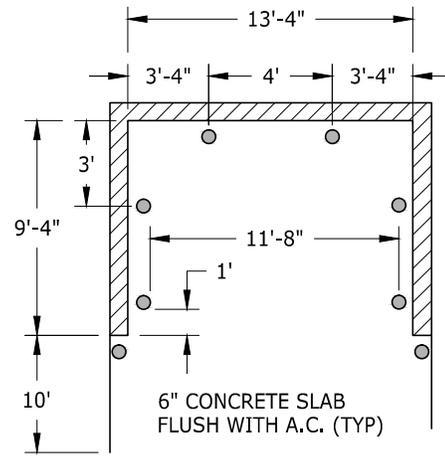
DETAIL NO.
19-02-037

REVISION DATE: 11/22/16

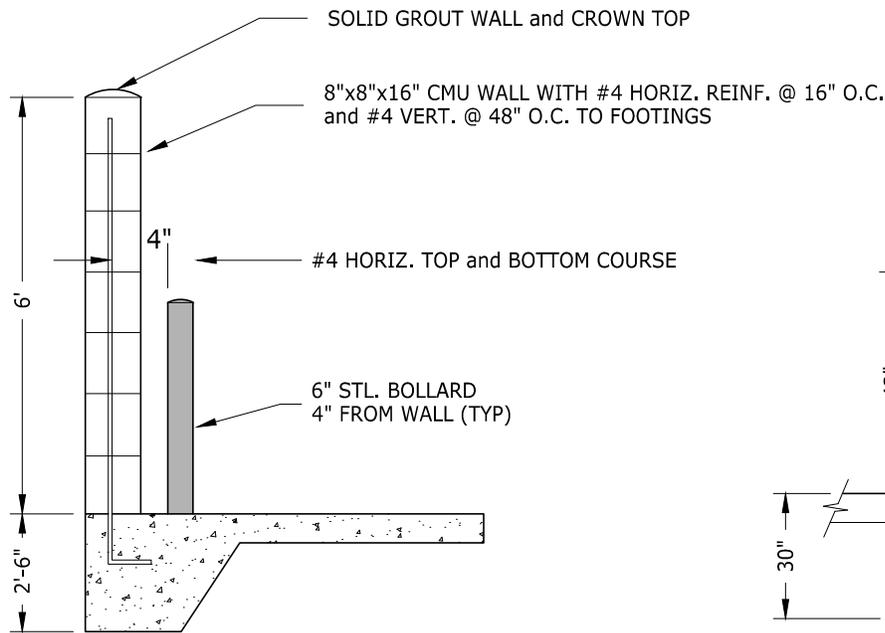
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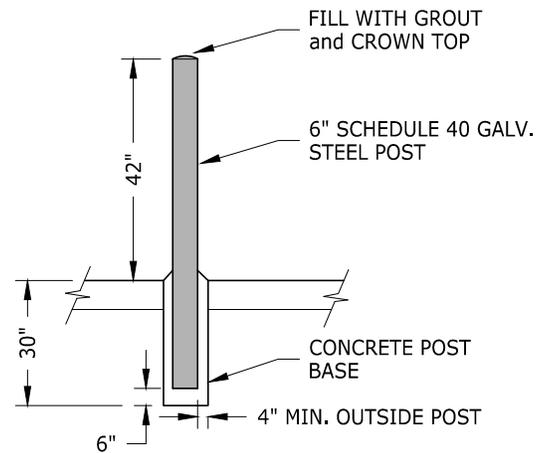
DOUBLE ENCLOSURE



SINGLE ENCLOSURE



TYP. WALL SECTION



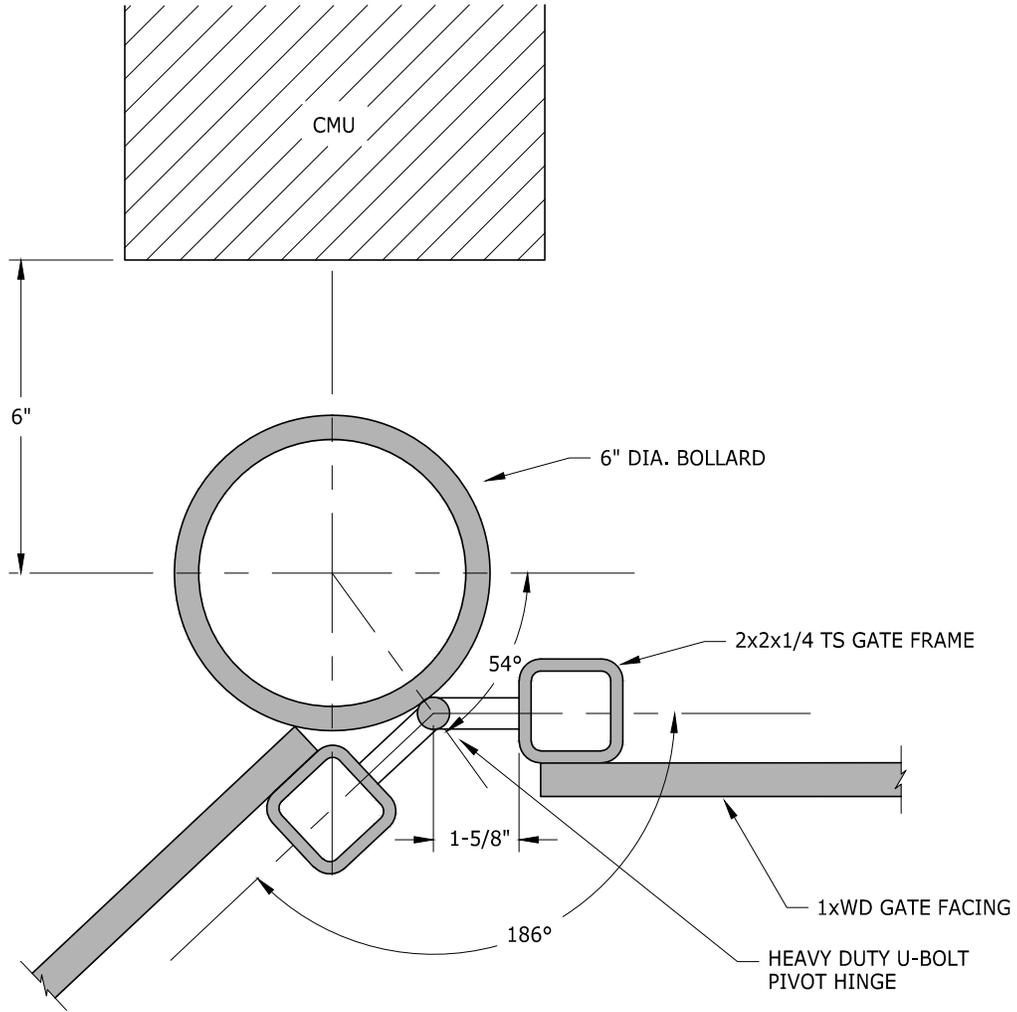
TYP. STEEL BOLLARD

NOTES:

WHEN THE ENCLOSURE INCLUDES GATES, THE PLANS SHALL PROVIDE A WAY TO SECURE THE GATES OPEN AND CLOSED.

NTS

 <p>City of Flagstaff</p> <p>ENGINEERING DETAIL</p>	<p>SINGLE and DOUBLE TRASH ENCLOSURE</p>		
	<p>DETAIL NO. PW-50-10</p>	<p>REVISION DATE: 11/22/16</p>	<p>1 2</p>



NTS

City of Flagstaff

GATE HINGEL DETAIL



ENGINEERING
DETAIL

DETAIL NO.
PW-50-10

REVISION DATE: 11/22/16

2
2