Blue Springs, Missouri
Public Works Department

Design & Construction



Manual

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City of Blue Springs

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Blue Springs, Missouri
Public Works Department

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Blue Springs, Missouri
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SECTION 2100 – GRADING AND SITE PREPARATION

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2100 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 2100 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the APWA standard.

Section 2102 Grading

2102.4.G – Granular Bedding Materials

Delete paragraph 2102.4.G, including tables, and replace with the following:

"Granular Bedding Materials: Granular bedding materials shall meet ASTM C33 with the gradation requirements as shown on the City of Blue Springs Standard Details STM-06 for Storm Sewer Embedment, SAN-11 for Sanitary Sewer Embedment, and WAT-16 for Waterline Embedment."

2102.4.J.2 – Standard Trench

Delete paragraph 2102.4.J.2 and replace with the following:

"Standard Trench: Suitable backfill material for trenches between 24 and 48 inches wide shall be either flowable backfill (CLSM) or dense, well-graded aggregate base material. Aggregate base material shall meet the requirements as shown on the City of Blue Springs Standard Detail STR-07 Street Cut Restoration."

2102.4.O.4 – Street Right-of-Way Areas

Delete paragraph 2102.4.O.4 and replace with the following:

"Street Right-of-Way Areas: All structures located under or within paved or graveled areas shall meet the backfill requirements as shown on the City of Blue Springs Standard Details STM-01, STM-02, STM-03, STM-04, STM-06, STR-07, STR-10, SAN-11, and WAT-16."

2102.4.O.5 – Areas other than Street Right-of-Way

Delete paragraph 2102.4.O.5 and replace with the following:

"Areas other than Street Right-of-Way: All structures shall meet the backfill requirements as shown on the City of Blue Springs Standard Details STM-01, STM-02, STM-03, STM-04, STM-06, STR-07, STR-10, SAN-11, and WAT-16."

2102.6.E – Consolidated Rock Embankment

Add the following:

"The upper layer of rocks shall be filled with a 6-inch thick layer of 3/4-inch choker stone prior to placing soil material."

Section 2104 Backfill Details

2104 – Backfill Details

Delete Figures 1, 2, and 3. Add the following:

"Backfill details as shown on the City of Blue Springs Standard Details STM-01, STM-02, STM-03, STM-04, STM-06, STR-07, STR-10, SAN-11, WAT-16."

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SECTION 2150 – EROSION AND SEDIMENT CONTROL

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2150 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 2150 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the APWA standard.

Section 2154 Sediment Controls and Diversions

2154.5.A – (Silt Fence) Materials, Construction Requirements and Maintenance

Add the following:

"1. Silt fence shall not be used in swales, drainage-ways, channels and other conduits of concentrated storm water flow."

"2. Silt fence shall not be used to direct or divert water."

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SECTION 2200 – PAVING

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2200 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 2200 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the APWA standard.

Section 2202 Subgrade Stabilization

2202.3 - Materials

Add the following:

"E. Aggregate: MoDOT Type 5 aggregate may be used for untreated aggregate layer in lieu of the material specified in this paragraph and shall meet the requirements as shown on the City of Blue Springs Standard Details STR-01, STR-02, STR-03, STR-04, and STR-05."

2202.4 – Composition

Delete the first (1st) paragraph of 2202.4 and replace with the following:

"Fly ash shall be applied at a rate determined by laboratory testing using the materials from the site and the specific fly ash to be supplied unless otherwise designated by the Contract Documents. Testing shall be the responsibility of the Contractor and is subsidiary to other items. The minimum application rate shall be 15% by weight unless testing indicates otherwise."

Section 2203 Aggregate Base Course

2203.3.A – Materials

Add the following:

"MoDOT Type 5 aggregate can be used for untreated aggregate layer in lieu of the material specified in this paragraph."

2203.4.C.6 – Plant Mix Bituminous Drainable Base

Delete paragraph 2203.4.C.6 and replace with the following:

"These materials shall be placed, handled, hauled, and accepted based on the requirements of Section 2205 and in accordance with the following:

- ***a. Contamination of the finished base material that affects the drainage capability of the product shall not be permitted. Any areas determined to be contaminated shall be completely removed without disturbing the adjacent or underlying material and replaced at contractor's expense.***
- ***b. Rutting or other displacement of the permeable base or the underlying base will not be permitted. If displacement occurs, the material shall be completely removed without disturbing the adjacent or underlying material and shall be replaced at the contractor's expense.***
- ***c. A minimum of three passes of a 5 to 10 ton steel wheel roller shall be made, compacting the material until no further displacement is noted. Compaction shall begin as soon after spreading the mixture as the mixture is able to bear the weight of the roller without undue displacement and shall be completed before the temperature of the mixture drops below 100 F. The compacted thickness of a single lift shall be a maximum of 4 inches."***

Section 2204 Prime and Tack Coat

2204.3.A Materials

Delete table 2204.3.A and replace with the following:

Material to be Treated	Application Usage	Type of Emulsion of Grade of Cutback	Application Rate (Gal/SY) (L/SM)	Application Temperature °F (°C)	Cure Time at 70°F (21°C)
Existing Asphalt of Concrete Surface	Tack	RC-70	0.05-0.10 Gal/SY (0.23-0.46L/SM)	150-225 (65-107)	1-6 hrs
	Tack	SS-1 SS-1h SS-1HP CSS-1 CSS-1h	0.05-0.15 Gal/SY (0.23-0.69 L/SM)	70-160 (22.5-42)	1-3 hrs
Treated Base (lime, flyash, cement)	Prime	MC-30 MC-70	0.1-0.3 Gal/SY (0.46-1.38 L/SM)	85-120 (29-49)	12-24 hrs
	Prime	SS-1 SS-1h SS-1HP CSS-1 CSS-1h	0.1-0.3 Gal/SY/in (0.46-1.38 L/SM/mm)	70-160 (20-70)	24-48 hrs

Untreated Aggregate Base w/Fines	Prime	MC-30 MC-70	0.1-0.3 Gal/SY (0.46-1.38 L/SM)	85-120 (29-49)	12-24 hrs
Untreated Aggregate Base w/o Fines	Prime	MC-250	0.2-0.5 Gal/SY (0.92-2.30 L/SM)	85-120 (29-49)	12-24 hrs
Untreated Aggregate Base	Prime	SS-1 SS-1h SS-1HP CSS-1 CSS-1H	0.1—0.3 Gal/SY/in (0.46-1.38 L/SM/mm)	70-160 (20-70)	24-48 hrs
	Prime	EAP PAE, or PEP	0.1-0.3 Gal/SY (0.46-1.38 L/SM)	70-160 (20-70)	12-24 hrs

Section 2205 Asphaltic Concrete Surface and Base

2205.3.A – Asphalt

Add the following table:

Asphalt location	*Mix Type*	*Recycled Mix Allowed?*
Industrial/Arterial surface	***5 or 6***	***No***
Base courses greater than 2 inches below the surface on industrial and arterial streets	***5***	***Yes***
Local and Collector surface	***5 or 6***	***No***
Base courses greater than 2 inches below the surface on local and collector streets	***5***	***Yes***

2205.6 – Transportation of Mix

Delete the third (3rd) paragraph of section 2205.6 and replace with the following:

"Haul trucks shall be limited to a max load of twenty-five (25) tons. Haul trucks shall be provided with covers of sufficient size and weight to completely cover the truck bed to protect the load and to prevent cooling of the upper surface. Failure to have the load completely covered shall be sufficient cause for rejection of the entire load. The load shall remain covered until the truck is next in line to be unloaded. In no case shall a load remain uncovered for more than 10 minutes before starting to use the load. If for any reason there is a delay in completely using a load, the remaining part of the load shall be recovered until it can be used. It shall be the responsibility of the Contractor to inform all truck drivers of these provisions before starting work."

2205.9.C Spreading and Finishing

Add the following:

"The maximum compacted lift thickness for the surface coarse shall be two inches (2.00")"

2205.9.D.4 – Longitudinal Joints

Delete the second (2nd) paragraph of section 2205.9.D.4 and replace with the following:

"When paving against existing concrete pavement, curb and gutter or other structure, the edge to be joined shall be tack coated. The elevation of the screed above the surface of the first mat should be equal to the amount of roll-down expected during compaction of the new mat. Where drainage of stormwater will flow from the new mat onto abutting curb and gutter, add an additional ⅛" - ¼" of thickness to the new mat. ADA ramp areas shall be flush with the curb."

Section 2207 Cold Milling

2207.2.A – Machine

Delete paragraph 2207.2.A and replace with the following:

"Machine: The cold milling machine shall be self-propelled and able to automatically control grade and slope of the milled surface. Operate the automatic grade and slope control from a travelling stringline a minimum of 30 feet long, attached the milling machine and operating parallel to the direction of travel. Other methods of positive grade control may be used if approved by the Engineer. The machine shall have the means of milling without damaging the remaining pavement (torn, gouged, shoved, broken, etc.). The machine shall be capable of blading the cuttings into a single windrow or depositing them directly into a truck. Only a track type milling machine shall be used (no rubber tire milling machines are allowed)."

2207.3.C – Cleanup

Delete paragraph 2207.3.C and replace with the following:

"Cleanup: All loose asphalt and debris shall be removed from the street surface and curb and gutter on the same day that milling operations occur. Any material and debris that adheres to the curb and gutter shall be removed."

Section 2208 Portland Cement Concrete Pavement

2208.1 – Scope

Add the following:

"Portland cement concrete pavement shall only be used with approval of the Director of Public Works."

2208.3.A – Concrete

Delete paragraph 2208.3.A including all subsections and replace with the following:

"All concrete materials for paving curb and gutter, sidewalks, paths, commercial driveways and other pavements in the Right-of-Way shall conform to the KCMMB specifications."

2208.6 – Repairing Defects

Delete paragraph 2208.6, including table, and replace with the following:

"Any damaged concrete panel, or panels, with random cracking shall be removed and replaced at the Contractor's expense. The minimum replacement area shall be one full panel. Any alternate repair methods shall be approved by the Owner."

Blue Springs, Missouri
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SECTION 2300 – INCIDENTAL CONSTRUCTION

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2300 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 2300 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the APWA standard.

Section 2301 Standard Sidewalks, Sidewalk Ramps, Driveways, and Bicycle/Pedestrian Paths

2301.3.A – Concrete

Add the following:

"All concrete materials shall conform to the currently approved KCMMB 4k mix specifications, except residential driveways where sidewalk is not present."

2301.3 – Materials

Add the following:

"F. ADA Detectable Warning Surfaces: ADA detectable warning surface shall meet the requirements as shown on the City of Blue Springs Standard Details MIS-01 and MIS-04."

2301.4 – Construction

Delete paragraph 2301.4 and replace with the following:

"The sidewalks, sidewalk ramps, driveway or bicycle/pedestrian paths shall be constructed or reconstructed to the configuration, and to the lines and grades as shown on the Plans, and shall be constructed with concrete within the Right of Way. Generally, sidewalks, sidewalk ramps, driveways, and bicycle/pedestrian paths should be constructed after the curbing. Sidewalk ramp construction shall comply fully with all requirements for sidewalks in this section and shall comply with the requirements of ADAAG for elements outside of the Right-of-Way and the most current version of PROWAG for elements within the Right-of-Way, as adopted by MoDOT."

2301.4.E – Grades and Slopes

Delete paragraph 2301.4 and replace with the following:

"Grades and Slopes: The grade and slope along the length of the walk, or shared use path within the Right-of-Way, shall conform to the most current version of PROWAG. Unless shown otherwise on the Plans or as directed by the Engineer, the cross slope shall be toward the street. The sidewalk and shared use path cross slope shall be carried through the driveways and street intersections."

2301.4.F.1.a – Joint Patterns

Delete paragraph 2301.4.F.1.a and replace with the following:

"Sidewalk or shared use path surfaces shall be marked with a transverse joint spaced at a distance equal to the width of the sidewalk or shared use path. Sidewalks or shared use paths greater than six (6) feet in width shall be divided by longitudinal joints spaced not less than 30 inches nor more than 60 inches with transverse joints spaced to form a square pattern. Edger tool marks (Picture frame) shall be removed, unless approved by the Engineer. Slip-formed sidewalks or shared use path transverse joints shall be saw cut. Curb joints should align with the sidewalk or shared use path joints where they abut."

2301.4.F.2.a – Isolation Joints

Delete paragraph 2301.4.F.2.a and replace with the following:

"General: The preformed isolation joint material shall be flush with the surface."

2301.4.F.3.a – Contraction Joints

Delete paragraph 2301.4.F.2.a and replace with the following:

"Edger tool marks (Picture frame) shall be removed, unless approved by the Engineer. Slip-formed sidewalks or shared use path transverse joints shall be saw cut."

2301.4.G.2.d – Finishing

Delete paragraph 2301.4.G.2.d and replace with the following:

"In all cases, the finished sidewalk, driveway, or bicycle/pedestrian path shall have a true surface, free from sags, twists, or warps, shall have a uniform color and appearance, and shall meet all current ADA/PROWAG guidelines and standards.

2301.4.G.5 – Temperature Limitations

Delete paragraph 2301.4.G.5 and replace with the following:

"Temperature Limitations: Limitations on Mixing and Placing. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated."

a. Cold Weather. Unless authorized in writing by the Engineer, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40 degrees F and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F.

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50 degrees F at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150 degrees F. The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

b. Hot Weather. During periods of hot weather when the maximum daily air temperature exceeds 85 degrees F, the following precautions shall be taken:

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90 degrees F. The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The finished surfaces of the newly placed concrete until the pavement is covered by the curing medium. If necessary, wind screens shall be provided to protect the concrete from an evaporation rate in excess of 0.2 psf per hour as determined in accordance with Figure 2.1.5 in ACI 305R, Hot Weather Concreting, which takes into consideration relative humidity, wind velocity, and air temperature.

When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. Such measures shall consist of windscreens, more effective fog sprays, and similar measures commencing immediately behind the paver. If these measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

c. Temperature Management/Stress Management Program. Prior to the start of paving operation for each day of paving, the contractor shall provide the engineer with a Temperature Management Program for the concrete to be placed to assure that uncontrolled cracking is avoided. As a minimum the program shall address the following items:

1. ***Anticipated tensile strains in the fresh concrete as related to heating and cooling of the concrete material.***
2. ***Anticipated weather conditions such as temperatures, wind velocity, and relative humidity.***
3. ***Anticipated timing of initial sawing of joints."***

2301.4.K – Joint Sealing and Clean-Up:

Delete paragraph 2301.4.K

2301.4.N – Detectable Warnings:

Delete paragraph 2301.4.N and replace with the following:

"Detectable Warnings: Detectable warnings are required standardized surface features built in or applied to walking surfaces on sidewalks, ramps, or shared use path to warn visually impaired people of hazards on a circulation path. Those hazards include, but are not limited to interfaces between sidewalks and areas where moving vehicles may be present. Detectable warning shall be in accordance with the most current version of PROWAG and as shown on the City of Blue Springs Standard Details MIS-01 and MIS-04."

Section 2302 Asphalt Sidewalks, Driveways, and Bicycle/Pedestrian Paths

2302.1 – Asphalt Sidewalks, Driveways, and Bicycle/Pedestrians Paths:

Add the following statement to Paragraph 2302.1

"Asphalt shall not be allowed for sidewalks, driveways, and shared use paths within the public Right-of-Way."

Section 2305 Maintenance of Traffic

2305 – Maintenance of Traffic:

Delete section 2305 in its entirety and replace with the following:

"For maintenance of traffic, see Blue Springs Specification Section 3000."

Section 2306 Pavement Markings

2306.4 – Striping Applicability Chart:

Delete the first table regarding Marking Material and replace with the following:

Marking Material	Roadway Surface	Application	Durability
Thermoplastic	New asphalt	Permanent	High
Aggressive bond thermoplastic	Aged asphalt	Permanent	High
Preformed thermoplastic	Asphalt, concrete	Permanent	High
Cold plastic	Concrete	Permanent	Moderate
Paint	All surfaces	Temporary	Low
Epoxy	All surfaces	Permanent	High
Temporary Tape (Type I)	All surfaces	Temporary	Low
Temporary Tape (Type II)	All surfaces	Temporary	Low
Line masking tape	All surfaces	Temporary	Low

Section 2309 Colored Concrete:

Section 2309 Colored Concrete:

Add the following section:

"Section 2309 Colored Concrete:

a. Description – This work shall consist of constructing stamped concrete streetscapes in accordance with Standard Plan R-29 (Series) and the Missouri Department of Transportation Standard Specifications for Construction, except as modified herein.

b. Materials – The materials shall meet the following requirements.

Sound Earth……205
Granular Materials Class II……....902
Joint Fillers……..914

1. Concrete – Concrete shall be a 4,000 psi mix design, maximum aggregate 3/8". Submit two (2) copies of quarried limestone gradation as specified in Section 902 of the Standard Specifications for Construction.

All course or fine aggregate used in the concrete mixture shall be from the same MoDOT approved source.

The mix shall conform to Lafarge "ultrastamp" mix no. RMXUS40LFW or approved equal.

2. ***Concrete Admixtures – All shall meet the requirements of Section 903 Standard Specifications for Construction. Admixtures containing calcium chloride are not permitted.***

3. ***Integral Color – Integral coloring shall be P1840 Red Barn, manufactured by Prism Pigments, or approved equal. All integral color shall meet ASTM C979 for color steadfastness. Independent laboratory testing shall be submitted if requested.***

4. ***Color Hardener – Dry-shake color hardener shall be, manufactured by Matcrete, or approved equal. Recommended coverage is 60 lbs./100ft^2.***

5. ***Release Agent – Dry-shake powder is facilitating release of imprinting tools shall be liquid, manufactured by Matcrete, or approved equal.***

6. ***Acidic Based Stain – Pre-packaged acidic based stain containing color fast metallic salts. Color shall be N/A, manufactured by Cimarron Wholesale – Sedona Acid Stain, or approved equal.***

7. ***Surface Sealer – The final surface seal shall be two coats of solvent based, non-yellowing, crystal clear, Class A standards or better, with non-skid additive or approved equal.***

    A. ***TK Products:***

        1. ***TK-AK2 Achro Kure 1315 (curing compound – day of pour)***
        2. ***TK Bright Glaze (High Gloss Final Seal 7-10 days later)***
        3. ***Or TK Bright Kure N Seal (Less Gloss Final Seal 7-10 min days later)***

c. ***Equipment – The concrete surface shall be patterned as shown on plans. Acceptable manufacturers and styles of imprinting tools are as follows:***

Pattern:	***12" sandstone Tile Proline***
Pattern Manufacturer Source:	***Matcrete (800) 777-7063*** ***Proline Concrete Tools – Local Distributor*** ***Decorative Concrete Supply (913) 422-4443***

d. ***<u>Construction Methods</u>***

1. ***Preparation of Base – Excavation shall be made to the required depth and to a width that will permit forming. All unsuitable material shall be removed below the required depth and replaced with sound earth. The prepared base shall be compacted to 95% of its maximum unit weight in accordance with Section 205 of the Standard Specifications for Construction. Granular material base shall be placed and compacted on the sound earth, as directed by the Engineer. A vapor barrier shall not be used.***

2. ***Forms – Forms and forming shall meet the requirements of Subsection 803.03.B of the Standard Specifications for Construction.***

3. ***Stamped Mock-ups - Provide (2) when possible. (1) could be used for repairs. 4' x 4' stamped and colored mock-ups shall be constructed from approval by the Engineer and Owner prior to construction. Mock-ups shall include integral coloring, color hardener, release agent, and two coats of sealer.***

4. ***Concrete Coloring – The coloring pigment must be added at the batch plant. The truck mixer drum shall be rotated a minimum of 50 revolutions at mixing speed after adding the coloring pigment. The amount of coloring pigment to be added shall be as specified by the pigment manufacturer.***

5. ***Protection of Surrounding Surfaces – All surrounding surfaces, including, but not limited to walls, store fronts, should be protected to prevent discoloration from the concrete. All clean-up and reports shall be the responsibility of the contractor.***

6. ***Placing Concrete – Concrete placement shall meet the requirements of Subsection 803.03.C of the Standard Specifications for Construction, and as described herein.***

   The surface shall be struck off and floated to produce a smooth even surface with a maximum surface variance of plus or minus 1/8-inch in 10 feet in any direction. All edges and joints shall be rounded to the specified radius with an approved finishing tool.

   Controls shall be laid out prior to stamping the concrete with any necessary strings and stakes for lining up the stamping tools. Unless otherwise specified, ungrouted installations shall be stamped 5/16-inch. The concrete is ready to be stamped when a 2-inch deep impression made with the finger does not fill with water and the concrete maintains its shape.

   The stamps must be clean of foreign matter prior to the stamping operation. It is generally recommended to clean stamps and reapply powdered or clear liquid release to all contact surfaces approximately every 25-30 square yards.

The freshly placed concrete surface shall be barricaded against access for at least 24 hours after the release powder has been applied. The concrete shall not be opened to pedestrian traffic until the release powder has been washed off.

Avoid the use of jitterbug for placements.

(In Freeze-thaw areas 7% +/= 1.5 air entrainment needs to be part of the mix design.)

7. ***Joints – The control joints shall be sawed as soon as the concrete has hardened such that no raveling or spalling occurs, but before any random uncontrolled cracking develops. Joint depths shall be maintained at ¼ of the slab(s) thickness. Layout control joints to follow stamping pattern as closely as possible.***

   Joints shall be sawed with their faces perpendicular to the surface of the sidewalk and shall not vary more than 3/16-inch from their designated position. Transverse joints shall be constructed at right angles to the centerline of the sidewalk and longitudinal joints parallel to the centerline. Locations for longitudinal and transverse joints shall be as directed by the Engineer.

   When the sidewalk is constructed adjacent to a previously placed slab, transverse joints in the succeeding slab shall be aligned with like joints in the adjacent slab.

   Expansion joint filler shall extend to the full depth of the joint with its top surface ¼ - ½-inch below the finished surface.

8. ***Acid Washing – Apply a one (1) part muriatic acid to 10 parts water to the surface and agitate the concrete with the side of a straw broom a minimum of 36 hours after placement. Wash surface until proper color has been achieved and then flush thoroughly. The contractor shall attempt to remove 80% or more of the color release prior to sealing.***

9. ***Detailing – If squeeze joints are present, a grinder or chisel shall be used to remove. Ground areas shall be burnished with dry release agent using a camel back sponge or 1 – 2-inch wide brush with bristles cut down to ½-inch. Blow away excess release with a high velocity blower.***

10. ***Acid Staining – Provide mock-ups when possible. Stain shall be applied per manufacturer's direction on a clean concrete surface that is a minimum of 28 days old. Staining shall be done on random individual bricks so that there is a minimum of 20-inches of the decorative area stained.***

11. ***Sealing Decorative Surface – The surface must also be allowed to completely dry prior to sealing. Surface sealer shall be applied within 24 hours of acid washing.***

    The surface temperature of the concrete shall not exceed 80-degrees F or be below 40-degrees F at the time the sealer is applied. Two (2) uniform thin coats shall be applied to the concrete at the manufacturer's recommendation rate. The concrete surface shall be barricaded against access from the time of the casting to at least 24 hours after the sealer is applied.

12. ***Maintaining Traffic. – The concrete shall not be opened to pedestrian traffic until at least 24 hours after the sealer has been applied. During such period, entrance to all residents and businesses shall be maintained at all times. Construction should be staged to allow for such access.***

e. Measurement and Payment – The completed work as measured for Stamped and Colored Concrete, will be paid for at the contract unit price for the following contract item (pay item).

Contract Item (Pay Item)	***Pay Unit***
Stamped and Colored Concrete, ……..……..	***Square Foot***

Stamped and Colored Concrete, will be measured in place by area in square feet. Payment for Stamped and Colored Concrete, shall include all labor, material and equipment required to perform all work in accordance with this special provision and as shown on the plans, including but not limited to providing the Engineer and the City of Blue Springs with the final documentation of the concrete mix design and a unit of each stamping tool used to complete the project.

The contractor is responsible for all costs associated with construction and disposal of mock-up slabs, with no additional compensation permitted."

Blue Springs, Missouri
Public Works Department

SECTION 2400 – SEEDING AND SODDING

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2400 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition in its entirety.

Blue Springs, Missouri
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SECTION 2600 – STORM SEWERS

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2600 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 2600 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the APWA standard.

Section 2602 Pipe Sewer Construction

2602.2.B – Corrugated Metal Pipe (CMP)

Delete paragraph 2602.2.B including all subsections and tables and replace with the following:

"Corrugated metal pipe shall not be used in the construction of public infrastructure. Storm drainage systems to remain privately owned and maintained may use corrugated Aluminized Steel Pipe."

2602.2 – Materials

Add the following:

"G. Polypropylene Pipe

1. ***For 15-inch to 24-inch pipe, polypropylene pipe shall have a double wall with a smooth interior and annular exterior corrugations and conform to ASTM F2881 and AASHTO M330. For 30-inch and larger pipe sizes, polypropylene pipe shall have a triple wall with smooth interior and exterior surfaces with inner corrugations and conform to ASTM F 2764. The pipe shall not be perforated unless otherwise specified.***

2. ***For 15-inch to 24-inch pipe, pipe shall be joined with a gasketed integral bell and spigot joint meeting the requirements of ASTM F2881. For 30-inch and larger pipe, pipe shall be joined with a gasketed integral bell and spigot joint meeting the requirements of ASTM F2764.***

3. ***Coupling bands shall cover at least two full corrugations on each section of pipe and shall prevent the infiltration of soil into the pipe."***

2602.2.E – Granular Bedding Material

Delete paragraph 2602.E and replace with the following:

"Granular Bedding Material: Granular bedding material shall meet the requirements as shown on the City of Blue Springs Standard Detail STM-06."

2602.3.B.5.d – Structure Connections

Delete paragraph 2602.3.B.5.d and replace with the following:

"Structure Connections: Pipes connected to structures shall be cut parallel with the inside face of the structure for structures having plane walls and parallel with the spring line of the pipe for structures having curved walls. Projection of the pipe beyond the inside face shall be one inch (1.00") to three inches (3.00") (measured at the springline for structures having curved walls). When installed, all gaps and openings intended to be closed, shall be sealed with grout, concrete or other approved materials. Gap between the pipe and structure shall be four inches (4.00") to eight inches (8.00")."

2602.3.C – Backfill of Trenches

Delete paragraph 2602.3.C and replace with the following:

"Backfill of Trenches: Backfill of trenches shall meet the requirements as shown on the City of Blue Springs Standard Detail STM-06."

Section 2603 Boring and Jacking

2603.2.C – Sand Fill

Delete paragraph 2603.2.C and replace with the following:

"Spacers: Spacer and carrier pipe installed to manufacture specifications."

2603.3.C.1 – Sewer Pipe Installation

Delete paragraph 2603.3.C.1

2603.3.C.3 – Sewer Pipe Installation

Delete paragraph 2603.3.C.3

Section 2604 Structures

2604.2.D – Precast Concrete Structures

Add the following:

"Precast concrete structures shall meet the requirements as shown on the City of Blue Springs Standard Details STM-01, STM-02, STM-03, and STM-04."

2604.2.F – Manhole Castings

Add the following:

"3. Metal Castings: Metal castings shall meet the requirements as shown on the City of Blue Springs Standard Detail STM-05."

2604.2.H – Toe Walls

Delete paragraph 2604.H and replace with the following:

"Toe Walls: Flared end sections for concrete and steel pipe shall be set on a concrete toe wall centered on the end of the section. Toe walls shall be 8 inches thick by 36 inches deep by the width of the end section and shall meet the requirements as shown on the City of Blue Springs Standard Detail STM-08."

2604.3.A.1 – Precast Structures

Delete paragraph 2604.3.A.1 and replace with the following:

"1. Precast Structures: The Contractor may, at their option, construct precast inlets, junction boxes, and box culverts, in lieu of the cast-in-place structures indicated on the Plans: except that all concrete base slabs for pre-cast inlets, manholes, and junction boxes may be cast-in-place. Solid concrete brick or block shall be used to block inlets and similar structures to grade during placement of base slab concrete.

Precast concrete box culverts shall have a 3-inch thick grade slab cast under the precast culvert. The grade slab shall be at least as wide as the structure and shall stop short of the toe walls. Commercial grade concrete may be used with minimum 2500 psi compressive strength. The slab should be set with precise grade control to match the elevations required for the culvert.

Any adjustments required for precast structures to meet field conditions shall be at the cost of the Contractor."

2604.3.A.2 – Finishing

Add the following:

"c. When top slab is incorporated into the adjacent sidewalk, it shall meet the latest ADA specifications and requirements as shown on the City of Blue Springs Standard Details STM-01, STM-02, STM-03, and STM-04."

2604.3 – Construction

Add the following:

"D. Cast in Place Box Culvert: Cast in place box culverts shall have a 3-inch thick grade slab cast under the bottom slab. The grade slab shall be at least as wide as the structure and shall stop short of the toe walls. Commercial grade concrete may be used with minimum 2500 psi compressive strength. The slab should be set with precise grade control to match the elevations required for the culvert."

Blue Springs, Missouri
Public Works Department

SECTION 2700 - STRUCTURES

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2700 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition in its entirety.

Blue Springs, Missouri
Public Works Department

SECTION 2800 – STREET LIGHTING

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

Street Lighting

Street lighting is intended to enhance visibility of pedestrians at conflict points at nighttime in which people can see comfortably and can quickly react to conflicts between motorists and pedestrians. Street lighting is not designed to provide security lighting for homes or businesses. Street lighting can improve, safeguard, facilitate, and encourage vehicular and pedestrian traffic.

Subdivisions

Subdivision street lights are owned and maintained by Kansas City Power and Light (KCP&L). Standard practice: a street light shall be provided at each public street intersection and at the end of cul-de-sacs longer than 300-feet in length. The standard city light is a 13,500 lumens (or LED equivalent as specified), 70 watt LED, enclosed fixture on a steel pole, and all electric lines shall be buried underground.

For new subdivisions, the developer or his/her engineer shall contact the City of Blue Springs Public Works, Engineering Division for installation requirements of new streetlights. The final layout shall be reviewed by the engineering division of the city for conflicts and location within easements. Any additional easements shall be acquired and recorded by the developer per KCP&L requirements.

Arterial Street Lighting

KCPL has established design standards for street lighting. Existing street light systems may be required to meet the design criteria and new street light systems shall be designed to them. To maintain reliability and maintenance only fixtures approved by KCPL and the City of Blue Springs will be acceptable. Wooden Poles are prohibited for new or retro-fit applications.

Streetlight Upgrade

For developers or Home Owners Associations (HOA) who choose to improve and beautify their neighborhoods with decorative street lighting, or additional street or area lights is only allowable when an agreement is made between the City and Developer/HOA for the HOA to pay the increased cost for the decorative lighting and/or lighting that exceeds the City's Standards.

Blue Springs, Missouri
Public Works Department

SECTION 2850 – TRAFFIC SIGNALS

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Sections 902, 1050, 1062, 1092 of the Missouri Department of Transportation's (MoDOT) 2017 Specification Book for Highway Construction, latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 902, 1050, 1062, 1092 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the MoDOT standard and Manual on Uniform Traffic Control Devices (MUTCD).

Throughout Section 902, 1050, 1062, 1092

Replace "engineer" with "***City Engineer".***

Replace "commission" with "***City of Blue Springs Public Works Department".***

Section 902.2 General
Add the following paragraphs prior to Section 902.2:

"902.2.a These Specifications may be modified or deleted by appropriate items in the Project Special Provisions or by written authorization by the City Engineer.

902.2.b Work incidental to traffic signal installation that is not covered in these Specifications shall be performed in accordance with the City of Blue Springs specifications and standards. All incidental parts, which are not shown on the Plans or specified in the Specifications and which are necessary to complete the traffic signal installation, shall be supplied and installed by the Contractor to the satisfaction of the City Engineer. No additional payments will be made for incidental work or parts. All systems shall be complete and in operation to the satisfaction of the City Engineer at the time of acceptance.

902.2.c All appurtenances shall be installed as shown on the Plans, or as specified in the Project Special Provisions. Any deviations must be established by the Contractor and authorized by the City Engineer.

902.2.d The Contractor shall contact the Public Works Department before any project work begins to notify the City Engineer of the construction schedule and to request project inspections. The Contractor is responsible for obtaining all necessary permits from the City, and is responsible for all associated costs, before any work can begin.

902.2.e The Contractor is responsible for obtaining a sealed letter from a licensed engineer in the State of Missouri stating that the traffic signal is ready and safe to be energized. The City Inspector will obtain an address for the power supply, which the Contractor shall use when dealing with the electrical utility company.

902.2.f The Contractor is responsible for contacting the electrical utility company (KCP&L: 816-471-KCPL) in advance to schedule the installation of the power cables to the power supply. The contractor shall provide a sealed letter confirming the traffic signals are ready to be energized per KCP&L standards. The Contractor shall be billed for all electrical utility service charges until the test period is successfully completed, at which time service can be transferred to the City."

Section 902.16 Conduit Systems
Add the following section:

"902.16.3.a Conduit may be installed by plowing in unpaved areas. The equipment used for plowing conduit is designed specifically for that purpose with the power and versatility to easily and accurately bury the various sizes of conduit under all normal soil conditions. This equipment places the conduit without twisting, kinking, or damaging the material in any way. The vibrating unit shall be attached to a tractor unit in such a manner that the tractor does not dampen the vibration. The cable way and guides shall be smooth, free of obstructions and sharp edges and shall not cause bending of the conduit at shorter than the minimum bending radius recommended by the manufacturer, nor cause excessive strain to the conduit. Conduit reels may be mounted on the tractor or conduit unreeled along the proposed route before plowing in such a manner to allow as direct a line as possible to the trench to avoid unnecessary bending of the conduit or rubbing of the conduit against the reel. The plow shall not be backed onto the conduit. If an underground obstruction is encountered, the plow shall be lifted out of the ground and the obstruction removed. Conduit may be installed utilizing the pull plow method if approved by the City Engineer. After installation of conduit by plowing, the disturbed earth shall be leveled and, if necessary, compacted by a device approved by the City Engineer. Ends of conduit shall be capped immediately after cutting to prevent moisture and debris from entering the conduit. Red burial tape imprinted with "CAUTION - BURIED CABLE BELOW" shall be installed in all trenches at approximately 1/3 to 1/2 of the depth of the trench. All disturbed areas shall be restored to the satisfaction of the City Inspector."

902.21 Test Period
Modify the first paragraph as follows:

"After the project is open to normal traffic, the Contractor shall notify the City Engineer in writing the date the signal or signal system will be ready for testing. Upon concurrence from the City Engineer, the Contractor shall place the signal or signal system in operation

for a 15 consecutive day test period. The signal turn-on shall be performed by the Contractor, City personnel shall be present at the activation. The signal turn-on shall not occur on Fridays, holidays or weekends and shall be completed between the hours of 9:00 a.m. and 2:00 p.m., unless otherwise noted in the Plans or directed by the City Engineer. At locations without previous traffic signal control, the new traffic signal shall flash for a period of three business days prior to full signal system turn-on. A signal operated independently of other signals or signal systems shall be tested as a single installation. A signal operated as part of a system shall not be tested until all signals in the system are ready to be tested. A system shall be tested as a unit. Any failure or malfunction of equipment during the test period shall be corrected at the Contractor's expense, and the signal or signal system tested for an additional 15 consecutive day period. This procedure shall be repeated until the signal equipment has operated to the City Engineer's satisfaction for 15 consecutive days. The Contractor shall, in the presence of the City Engineer or designee, demonstrate the proper action of the controller's monitor as part of the testing system, if applicable."

902.22 Maintenance Information
Modify the last sentence as follows:

"If this option is invoked, the entire cost of the work performed by City personnel or the third party will be computed and deducted from the payments due the Contractor."

Add the following section:

"902.22.a As-Built Drawings (also known as Record Drawings) marked up to reflect changes to public infrastructure during the construction process shall be prepared and submitted to the Public Works Department in both electronic and hard copy versions. Prior to acceptance of the work, the Contractor shall submit marked-up plans showing in detail all construction changes, especially the location and depth of conduit."

902.23 Final Clean Up
Replace the existing language with the following:

"Before final acceptance, the Contractor shall restore to a condition equal to or better than that existing prior to construction, for all property, both public and private, within, adjacent to and beyond the limits of construction that have been disturbed or damaged while executing the work. This includes, but not limited to, existing curb and gutter, sidewalk, pavement, drainage structures, irrigation systems, street lighting, and traffic signal equipment. All unpaved areas damaged during construction shall be restored to the original condition. Unless otherwise directed, grassy areas, which were originally sodded, shall be re-sodded. Restoration work shall be at the Contractor's expense. All restoration work shall be acceptable to the City Inspector."

Section 1050.4.1 Electric Substation and Service Poles
Replace the existing language with the following:

"For temporary traffic signals, the configuration and installation of equipment mounted on substation and service poles shall be in accordance with the requirements of the utility company furnishing electrical power."

Section 1050.6 Timber Preservatives
Replace the existing language with the following:

"1050.6.a Pentachlorophenol: Pentachlorophenol shall be in accordance with AWPA P8 in a hydrocarbon solvent meeting the requirements of AWPA P9, Type A.

1050.6.b Ammoniacal Copper Arsenate (ACA) or Chromated Copper Arsenate (CCA): Ammoniacal Copper Arsenate and Chromated Copper Arsenate shall be in accordance with AWPA P5.

1050.6.c Copper Naphthenate For Repair: Copper Naphthenate shall be prepared with a solvent in accordance with AWPA Standard P9. The preservative concentration shall contain a minimum of 2 percent copper metal.

1050.6.d Responsibility for Quality: The Contractor shall use preservatives that meet these specifications or the treated material will be subject to rejection, or to approved retreatment with an approved preservative.

1050.6.e Final Steaming: All substation, service and span wire poles; except material treated with ACQ or CCA, shall be cleaned by a final steam bath in accordance with AWPA C2, C4 or C5, as applicable. In lieu of steam cleaning, sign poles may be strip stacked and air-dried for a minimum of 60 days after treatment."

1050.7 Care After Treatment
Replace the last sentence with the following:

"If damaged material is permitted for use by the City Engineer, or framing at site is required, such injuries, cuts or holes shall be liberally field-treated with the preservative of the same type used for the original treatment, or of copper naphthenate. A second coat shall not be applied until after the first coat has been absorbed. Holes shall be treated by plugging one end and filling with preservative."

Section 1062.3 Pull Box Covers
Replace the last 2 sentences in the section with the following:

"Covers for pull boxes to be used for traffic signals, or a combination of traffic signals and street lighting, shall be embossed with "TRAFFIC SIGNALS". Covers for pull boxes to be used for fiber optics shall be embossed with "FIBER OPTICS"."

1092.2 Posts and Mast Arms
Add the following section:

"1092.2.4.5 Traffic Signal Post Painting
1092.2.4.5.1 Description: This work shall consist of painting new or existing traffic signal posts, mast arms, luminaire arms, pedestals and pedestal bases at locations shown on the plans and as described below.

The painting system shall be a top coating of a hot dip galvanized surface with either a high density urethane or triglycidyl isocyanurate (TGIC) polyester powder or a special polyester powder primer over coated with an aliphatic polyurethane liquid to obtain both the synergistic effect of the combined coatings as well as the beautifying effect of a colored top coat. The coating shall provide for the cathodic protection of a steel substrate under the specified performance characteristics when subjected to variable outdoor environmental conditions.

On new steel surfaces prior to application of the hot dip galvanized (zinc) coating, the steel substrate shall be properly cleaned and prepared by removal of excessive mill scale, where required, by shot blasting; degreased by immersion in a heated caustic solution; pickled by immersion in a heated sulfuric acid solution; rinsed clean from residual caustic and/or acid ammonium chloride solution. The hot dip galvanizing coating shall meet ASTMK standards and shall be applied by immersion in a molten bath of prime western grade zinc, coating both internal and external surfaces to a minimum thickness of 2.5 mils. Flux ash shall be skimmed from the molten zinc bath prior to product extraction to assure a debris free zinc coating. On poles with an existing galvanized surface, brushblast to a uniform dull appearance free of all shine and preheat, prior to prime painting. All cleaned assemblies shall be protected from moisture and other foreign materials prior to prime painting. Moisture, oil, grease, loose paint or other foreign material shall be removed prior to painting using a clean rag saturated with thinner or solvent.

The polyester powder top coat or powder primer is to be electrostatically sprayed on all visually exposed exterior zinc coated surfaces and heat cured to a minimum dry film thickness of 2/9 mils. The electrostatic application process assures a uniform, monolithic coating. An additional liquid coat of an aliphatic polyurethane is to be electrostatically sprayed over the powder primer and heat cured to a minimum dry film thickness of 1.5

mils. Prior to applying the additional liquid coat, repair any surface imperfections such as sags or runs by light sanding to obtain a uniform surface. Also, reapply prime paint, as necessary, to any voids or areas having less than the required thickness. Application is to be with airless spray equipment.

The powder top coat and powder primer are to be thermosetting polyester materials. The powders shall be low molecular weight solid resins that, when subjected to elevated temperature up to 400°F, melt, flow and chemically cross-link within themselves (or with other reactive components) to form a higher molecular weight reaction product. The resulting coating is to have a different chemical structure than the basic resin, be heat stable and not regress to either a powder or liquid on further exposure to heat. Powder top coat and primers are to be the latest state-of-the-art, high density, variable gloss, polyester thermosetting resins available.

Either the powder top coat or the liquid overcoat shall provide the current ultimate in ultraviolet durability, gloss and color retention, chemical and abrasion resistance and overall weatherability. The liquid overcoat is to be a two (2) component, high solids, aliphatic polyurethane capable of being accelerated cured at elevated temperatures up to 225°F.

All new or existing traffic signal posts, mast arms, luminaire arms, pedestals and pedestal bases painted under this specification shall provide a ten (10) year limited warranty on products factory coated with the system, subject to the following:

The factory applied coatings will not fail to provide corrosion (electro-chemical reaction) protection of the steel substrate for a period of ten (10) years from the date of shipment (the "Warranty Period"). If during the Warranty Period, the steel substrate exhibits any visual and/or physical evidence of corrosion due to coating failure from normal atmospheric environmental conditions, the coating will be repaired or replaced at the discretion of the manufacturer and at no charge and/or cost to the City if the City notifies the manufacturer in writing and provides proof of purchase within 90 days of such failure becoming evident. Failure of the coating to provide the above described corrosion protection shall specifically exclude failure resulting from damage due to acts of God, act of war, civil disturbances, (falling objects, fire, explosion, external forces, radiation, riots, improper storage (includes failure to remove protective shipping packaging and failure to provide good drainage/ventilation during storage), improper handling/erection, misuse or abuse in application or any other occurrences beyond manufacturer's control. The liability of the manufacturer under this warranty, or for any loss or damage arising out of, or connected with, the design, application, sale or use of the coating, whether the claim is based on contract or negligence, shall not exceed the price allocable to the value of the original factory applied coating which gives rise to the claim and upon expiration of the Warranty Period all such liability shall terminate. Manufacturer will not be liable for any

special or consequential damages including, but not limited to, cost of temporary substitute product or labor costs to repair or reinstall the product with failed coating or any product transportation cost to and from manufacturer's process plant if factory replacement of the effective coating is deemed necessary. This warranty is exclusive and in lieu of all other warranties whether express, implied, and/or written. This warranty constitutes the exclusive and sole remedy of the City and liability of manufacturer.

1092.2.4.5.2 Materials:

<u>Primer</u>
Valmont Part No. 347277
Color: Gray
Manufactorer and #: Tnemec Series N69-A3977
Total Thickness (DFT): 2 mils
Thinner: Tnemec #4; Valmont Part No. TR#159047
Cure Temperature: 150°F

<u>Liquid Overcoat (top coat)</u>
All new pedestrian and traffic signal posts located along the Woods Chapel Road corridor shall have a top coat as follows:
Valmont Part No. 347243; Tnemec Series 1074-35GR
Color: Gloss Black
Total Thickness (DFT): 3 mils
Curing Time to Handle: 6 hours; Curing Time to Recoat: 8 Hours
Thinner: Tnemec #42; Valmont Part No. TR#X159120

All new pedestrian and traffic signal posts located along the Adams Dairy Road corridor or within the Adams Dairy Parkway Overlay District shall have a top coat as follows:

Color: Sherwin Williams Custom Manual Match

BAC COLORANT	*02*	*32*	*64*	*128*
G2 – New Green	*12*	*25*	*-*	*-*
R2 – Maroon	*-*	*9*	*1*	*1*
Y3 – Deep Gold	*-*	*29*	*-*	*-*
W1 - White	*-*	*8*	*-*	*-*

1092.2.4.5.3 Method of Measurement: No direct measurement will be made for "Traffic Signal Post or Mast Arm Painting", completed in place in accordance with the plans and specifications and as accepted by the Public Works Department.

1092.2.4.5.4 Basis of Payment: No direct payment will be made for "Traffic signal Post Painting". Payment for "Traffic Signal Post Painting" shall be subsidiary to other traffic

signal bid items, and shall be full compensation for the furnishing of all materials, labor, equipment, tools and incidentals necessary to complete the work."

1092.4.1.1 Controller Cabinets
Add the following section (g)

"(g) All NEMA traffic signals controller shall be the Econolite Model ASC/3-1000 or latest model. All system master controllers shall be the Econolite Model ASC/2M-1000 or latest model. Each controller shall have fiber interface, including the following equipment and quantities:

1 – Fiberoptic patch panel/distribution box (12-port, single mode
1 – Ethernet switch (Cisco IE-3000 switch and power supply)
2 – GBIC models (Cisco GLC-LH-SM and associated patch cords)
1 – Underground splice enclosure (for splicing cable in adjacent pull box)

In addition to the equipment listed, the contractor shall supply and install all additional necessary items to make the fiber optic interconnect operational between the intersections.

The cabinet shall be Econolite type Super P-44 with Opticom interface panel. Install on Type EV Base, modified to accommodate additional width for integrated uninterruptible power supply (UPS) compartment. UPS to be Techpower M-E XL 1000 with batteries and auxiliary equipment necessary to provide backup capability of normal signal operation for at least 2 hours with 4-6 hours of flash time. No separate payment shall be made."

1092.4.3.1 Pre-Emption Interface
Add the following section:

"1092.4.3.1.a Emergency vehicle preemption shall be Global Traffic Technologies equipment with I.D. capability, including detection units (Model 721), communication cable (Model 138), and Phase Selector card (Model 754 or latest model). These items shall be paid for as one (1) emergency vehicle detection system."

1092.4.7.2 Pedestrian Push Button
Add the following section:

"1092.4.7.2.a Pedestrian push button detectors shall be Campbell Model A912 or latest model, equipped with computer cable to connect button to corresponding pedestrian indication."

1092.4.7.7 Video Detection System
Add the following section:

"1092.4.7.7.1.5 The Autoscope Sola Terra/Encore System or latest model shall be used for video detection. The system shall be complete including color cameras, processor, color monitor, mounting hardware, and camera cable per manufacturer's specifications. The processor and cameras shall be preprogrammed for traffic data measurement. These items shall be paid for as one (1) video detection system."

1092.7 CCTV Camera Assembly, Installed
Add the following section:

"1092.7 CCTV Camera Assembly, Installed

1092.7.1 This work shall consist of providing and installing a CCTV Camera Assembly at the signalized intersections shown in the plans. This equipment consists of an AXIS Q6032-R PTZ Dome Network camera or latest model with remotely controlled pan-tilt-zoom (PTZ), and the ability to acquire video images of the various sections of the roadway. Also included are the Ethernet video encoders and equipment necessary to transmit the video signal from the camera location using the designated fiber optic cable.

1092.7.2 All materials shall be in accordance with the AXIS Camera's manufacturer's specifications.

1092.7.3 Installed CCTV Camera Assemblies shall be measured per each.

1092.7.4 Accepted CCTV Camera Assemblies will be paid for at the contract unit price bid for the item specified in the contract documents, CCTV Camera Assembly, Installed. Such payment shall constitute full compensation for all materials, labor, tools, and equipment necessary to complete the construction item. No direct payment will be made for any incidental items necessary to complete the work unless specifically provided as a pay item in the contract."

Blue Springs, Missouri
Public Works Department

SECTION 2900 – WATERLINES

CITY OF BLUE SPRINGS, MISSOURI
CONSTRUCTION SPECIFICATIONS

The City of Blue Springs hereby adopts Section 2900 of the Kansas City Metropolitan Chapter of APWA Construction and Material Specifications, the latest edition. The following additions, deletions and/or revisions are adopted as a part of Section 2900 for use within the City of Blue Springs. Text in bold italics indicates revisions or additions to the APWA standard.

Section 2902 Materials

2902.2.A.1 – Pipe

Delete paragraph 2902.2.A.1 and replace with the following:

"Pipe: Unless indicated otherwise on the construction plans, all ductile iron pipe 6-inch and larger shall be Class 52 complete with all accessories and conforming to ANSI A21.51, AWWA C151, ASTM A 536, and Grade 64-42-10."

2902.2.A.3.c – Restrained Joints

Delete paragraph 2902.2.A.3.a and replace with the following:

"Restrained joint fittings shall be Krause or approved equal One Bolt System."

2902.2.C – Polyvinyl Chloride 2 inch

Delete paragraph 2902.2.C.

2902.2.D – Fusible Polyvinyl Chloride (FPVC)

Add the following:

"FPVC shall only be used with approval of the City Engineer."

2902.2.E – Prestressed Concrete Cylinder, Steel Cylinder Type

Delete paragraph 2902.2.E and all subsections.

2902.3.B – Butterfly Valves

Delete the first paragraph of 2902.3.B and replace with the following:

"Butterfly Valves: Butterfly valves shall be used for water line valves twelve (12) inches and larger in diameter unless otherwise directed by the City Engineer. Butterfly valves shall be of the rubber-seat, tight-closing type. Valve discs shall seat at 90-degree with pipe

axis. Mechanical joint end valves shall be of the short body type. Packing shall be O-ring cartridge designed for permanent duty in underground service."

2902.3.F.2 – Iron

Delete paragraph 2902.3.F.2 and all subsections.

2902.3.H – Valve Operation

Delete paragraph 2902.3.H and replace with the following:

"Valve Operation: All valves shall be equipped with a 2-inch square wrench nut and the direction of rotation to open the valve shall be to the left (counterclockwise)."

2902.3.J – Valve Boxes, Bases, Lids and Covers

Delete paragraph 2902.3.J and all subsections and replace with the following:

"J. Valve Boxes, Bases, Lids and Covers

Valve boxes, bases, lids and covers shall meet the requirements as shown on the City of Blue Springs Standard Details WAT-02 and WAT-03."

2902.4.A.4 – Hydrants

Delete paragraph 2902.4.A.4 and replace with the following:

"Hydrants shall meet the requirements as shown on the City of Blue Springs Standard Detail WAT-01."

2902.5.A – General

Delete paragraph 2902.5.A and replace with the following:

"General: Air release, meter, and pressure-reducing valve vaults shall be precast concrete conforming to ASTM C 478. Access lid castings shall be as shown in Plans, Standard Drawings, or as noted in the Special Provisions, and shall meet the requirements as shown on the City of Blue Springs Standard Detail WAT-12."

2902.5.D – Blow-Off Assemblies

Delete paragraph 2902.5.D and replace with the following:

"Blow-Off Assemblies: Blow-off assemblies shall only be used when approved by the City Engineer. When approved, blow-off assemblies shall be installed at the locations indicated on the Plans or Standard Drawings. Blow-off assemblies shall be installed with the appurtenant piping and valves as indicated on the Plans, Standard Drawings, or Special Provisions."

2902.6 – Bedding Material

Delete paragraph 2902.6 and replace with the following:

"Granular Bedding Material: All materials used for granular embedment for pipe bedding shall conform to the requirements of ASTM C 33 and shall meet the requirements as shown on the City of Blue Springs Standard Detail WAT-16."

2902.7 – Location Wire and Tape

Delete paragraph 2902.7 and all subsections and replace with the following:

"Location wire shall be attached to the top of the water main and shall meet the requirements as shown on the City of Blue Springs Standard Detail WAT-17."

Section 2903 Construction

2903.1.C – Blasting

Change "Engineer" in the first sentence to "Community Development Director".

2903.2.A.3 – Installation

Delete paragraph 2903.2.A.3.

2903.2.D – HDPE Pipe

Add the following:

"HDPE pipe shall only be used with approval of the City Engineer."

2903.2.E – Fusible Polyvinyl Chloride Pipe (FPVC)

Add the following:

"FPVC pipe shall only be used with approval of the City Engineer."

2903.4 – Connection to Existing Mains

Delete section 2903.4 and replace with the following:

"The Contractor shall furnish and install all fittings necessary to join the existing and new water mains as shown on the Plans or Standard Drawings.

The Contractor shall coordinate with the City of Blue Springs at least three (3) business days before the City will shut off any water mains.

Connections shall be made using suitable fittings from the conditions encountered. Each connection with an existing pipe shall be made at a time and under conditions which will minimize any disruption in service. Special care shall be taken to prevent contamination when dewatering, cutting into, and making connections with existing pipe. The interior of all pipe, fittings, and valves installed in such connections shall be thoroughly cleaned and swabbed with, or dipped in chlorine solution having a chorine content of 200 parts per million (ppm).”

2903.7.A – Thrust Restraint

Delete paragraph 2903.7.A and replace with the following:

“Hydrants shall meet the requirements as shown on the City of Blue Springs Standard Detail WAT-01.”

2903.8 – Embedment and Backfilling

Delete paragraph 2903.8 and replace with the following:

“Embedment and backfill shall be accomplished in accordance with the laying condition as specified and as shown on the Plans or Standard Drawings and shall meet the requirements as shown on the City of Blue Springs Standard Detail WAT-16.”

Section 2904 Water Mains Near Sewers

2904.1 – Horizontal Separation

Delete paragraph 2904.1 and replace with the following:

“Water mains shall be located at least ten feet horizontally from any existing or proposed line carrying non-potable fluids such as, but not limited to drains, storm sewers, sanitary sewers, combined sewers, sewer service connections, and process waste or product lines. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten-foot separation, the department may allow deviation on a case by case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a non-potable fluid line, provided that the water main is laid in a separate trench located as far away from the non-potable line as feasible and meets other specific construction requirements. Locating a water main on an undisturbed earth shelf located on one side of the non-potable line is not recommended and requires justification by the engineer and specific case-by-case approval of the department. In either case, an elevation shall be maintained such that the bottom of the water main is at least 18 inches above the top of the non-potable line while meeting minimum cover requirements. In areas where the recommended separations cannot be obtained, either the waterline or the non-potable line shall be constructed of mechanical or manufactured restrained joint pipe, fusion welded pipe, or cased in a continuous casing. Casing pipe must be a material that is

approved for use as water main. Concrete encasement shall be in accordance with the City of Blue Springs Standard Detail MIS-05."

2904.2 – Vertical Separation

Delete paragraph 2904.2 and replace with the following:

"Water mains crossing sewers, or any other lines carrying non-potable fluids shall be laid to provide a minimum vertical clear distance of 18 inches between the outside of the water main and the outside of the non-potable pipeline. This shall be the case where the water main is either above or below the non-potable pipeline. An 18-inch separation is a structural protection measure to prevent the sewer or water main from settling and breaking the other pipe. At crossings, the full length of water pipe shall be located so both joints will be as far from the non-potable pipeline as possible, but not less than ten feet or centered on a 20-foot pipe. In areas where the recommended separations cannot be obtained either the waterline or the non-potable pipeline shall be constructed of mechanical or manufactured restrained joint pipe, fusion welded pipe, or cased in a continuous casing that extends no less than ten feet on both sides of the crossing. Special structural support for the water and sewer pipes may be required. Casing pipe must be a material that is approved for use as water main. Concrete encasement shall be in accordance with the City of Blue Springs Standard Detail MIS-05."

Blue Springs, Missouri
Public Works Department

SECTION 3000 – TRAFFIC CONTROL

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3000 SIGNING GENERAL

3000.1 Scope

This work shall consist of furnishing all material, equipment, and labor for the complete installation of permanent signs. Temporary signing shall conform to the temporary traffic control requirements in Section 3010.

3000.2 Codes and Standards

All work and material shall be in accordance with the latest requirements of the Manual on Uniform Traffic Control Devices (MUTCD), Standard Highway Signs (SHS), and all applicable local ordinances.

3000.3 Modification of Specifications

These Specifications may be modified or deleted by appropriate items in the Project Special Provisions or by written authorization by the City Engineer.

3000.4 Incidental Work and Parts

Work incidental to permanent signage that is not covered in these Specifications shall be performed in accordance with the City of Blue Springs specifications and standards. All incidental parts, which are not shown on the Plans or specified in the Specifications and which are necessary to complete the installation of signage, shall be supplied and installed by the Contractor to the satisfaction of the City's Engineering Department. No additional payments will be made for incidental work or parts.

3000.5 Existing Signing

The Contractor shall maintain all existing signs not shown on the Plans as to be removed. At the onset of the project, the Contractor should verify and document the condition of each sign that is to be reused. The Contractor shall be responsible for the appropriate care of all existing signs that are to be reused. Any signs that are damaged, lost or stolen shall be replaced by the Contractor at the Contractor's expense.

All Stop, Yield, or street name signs shall be maintained in a conspicuous location for the driving public. All Stop and Yield signs removed for construction purposes can be temporarily erected in reflectorized drums (no less than 7 feet above the pavement surface) until they can be reinstalled. Any temporary Stop or Yield sign installation to be left in place overnight will require prior approval from the City Inspector.

3000.6 Permits and Inspections

The Contractor shall contact the Public Works Engineering Department before any project work begins to notify the City Engineer, or assigned designee of the construction schedule and to request project inspections. The Contractor is responsible for obtaining all necessary permits from the City, and is responsible for all associated costs, before any work can begin.

3000.7 Maintenance Work

The Contractor is responsible for making all repairs and replacements, including downed or damaged signs, regardless of the cause or responsible party, until the work is completed, inspected, and accepted by the City.

3001 SIGNING MATERIALS AND EQUIPMENT

3001.1 Scope

This section governs the furnishing of all signs, posts, and other material and equipment supplied by the Contractor, as required to complete the installation of permanent signs as shown on the Plans, the Standard Drawings, and as specified in the Project Special Provisions. All signing material and equipment shall be of new stock unless the contract provides for relocation of existing units or use of units furnished by others. New material and equipment shall be of the best grade, and shall meet the approval of the City Engineer.

3001.2 Sign Blanks

Sign blanks shall be of aluminum, 6061-T6 alloy. Sign blanks shall be degreased and coated with an anodized finish to ensure that sign sheeting adheres to the surface. Sign blank thickness shall be 0.125 inches for signs with an area greater than nine square feet (9 sq. ft.). Sign blanks for

overhead street name signs shall also have a thickness of 0.125 inches. Sign blanks for signs with an area less than or equal to 9 sq. ft. shall be 0.080 inches thick. Sign blanks shall have corner radii and holes punched according the Federal Highway Administration's Standard Highway Signs, or as specified in the Plans.

3001.3 Sign Sheeting

Sign blanks shall be covered with retroreflective, high intensity prismatic sign sheeting, meeting the requirements of ASTM D4956-04 Spec. Type III. Screen-printed signs are no longer acceptable and shall not be used. Signs containing blue, red or green lettering and/or symbols shall be made with acrylic overlay film manufactured by 3M, or approved equal. Signs containing black lettering and/or symbols shall be made of black vinyl. All sign sheeting shall be applied without splices, and shall be free from air bubbles, wrinkles or other blemishes.

3001.4 Sign Posts

The type of sign post shall be supplied as shown on the Plans or as specified in the Project Special Provisions.

3001.4.1 Square Steel Posts

The sign posts, post anchors, and post anchor sleeves shall conform to (1) hot rolled carbon steel ASTM A-570 grade 33 or ASTM structural quality C 1021 with a hot-dipped galvanizing conforming to AASHTO M-120 with an inline system followed by a chromate conversion and a cross-linked polyurethane acrylic exterior coating or (2) a galvanized finish cold rolled carbon steel ASTM A-446 grade A with a galvanizing conforming to ASTM A-525, designation G-90. All square steel sign posts shall be 2" x 2", 14-gauge galvanized steel, square tubular posts, with 7/16 - inch diameter holes or 7/16 – inch diameter embossed ring (die-cut knockouts) at one inch (1") spacing on all sides for the total length of the post. All holes shall be drilled or punched and all welds, cuts, burrs, and sharp edges are to be smoothed off before application of the finish. Square steel posts shall be galvanized according to ASTM A653. All square steel posts shall be furnished with a two-piece breakaway anchor unless the sign is to be located in concrete or asphalt in which case the breakaway anchor shall be a heavy-duty model as manufactured by Accessory Squared, model HDA200-30-G, or equivalent. All components of the break-away anchor shall be galvanized. The post anchor and post anchor sleeve may be furnished without the bolt holes on all four sides with the exception of the holes immediately above the ground line.

3001.4.2 Decorative Sign Posts

For subdivisions who choose to improve and beautify their neighborhoods with decorative sign posts, the City of Blue Springs has developed an Ornamental Street Sign Support Agreement that must be approved by ordinance by the City Council.

3001.5 Sign Mounting Hardware

All sign mounting hardware shall consist of the following:

Grade 2 zinc plated 5/16" bolt, flat washer, nylon washer, sign, lock washer and nut.

3002 SIGNING CONSTRUCTION REQUIREMENTS

3002.1 Scope

This section governs the installation of permanent signs as shown on the Plans, the Standard Drawings, and as specified in the Project Special Provisions.

3002.2 Sign Post Installation

The Contractor shall stake the location for all proposed sign posts. The City Inspector shall inspect the staking before installation begins. Minor relocations to avoid conflicts may be allowed by the City Engineer.

Sign posts shall be located per guidance provided in the latest version of the MUTCD.

The Contractor shall be responsible for determining post lengths to ensure that all signs mounted on a post have the required clearance provided in the latest version of the MUTCD. Field cutting of posts will be permitted, however torch-cutting steel posts is prohibited.

Sign posts shall be plumbed vertical. The cross-sectional dimensions of the posts and/or the coating shall not be damaged during installation. Any post bent or otherwise damaged to the extent that the post is considered unfit for use shall be removed and replaced with an acceptable post at the Contractor's expense.

3002.3 Storage of Signs

Signs delivered for use on a project or existing signs to be reinstalled shall be stored in a manner meeting the approval of the City's Traffic Division of Public Works. Any sign damaged, discolored or defaced during transportation, storage, or installation may be rejected.

3002.4 Sign Installation

Signs shall be mounted directly to the sign post with a grade 2 zinc plated 5/16" bolt, flat washer, nylon washer, sign, lock washer and nut. Signs on traffic signal posts or street light poles shall be mounted with strap or clamp type sign supports, or brackets as shown on the Plans or as approved by the City Traffic Division. The requirements for signs mounted on mast arms are described in the Missouri Department of Transportation's (MoDOT) Engineering Policy Guide, latest edition.

3002.5 Removal and Reinstallation of Existing Signs

Removal, transportation, storage, and reinstallation of existing signs should be as indicated in the Plans, Specifications, or Project Special Provisions. The Contractor is responsible for repair or replacement of any existing signs damaged during the removal and reinstallation operations at the Contractor's expense.

All sign blanks and sign posts that are removed and are not to be reinstalled on the project shall be delivered to the City's Public Works Maintenance Facility, 500 SE Sunnyside School Road. The Contractor is responsible for disposal of any items that are damaged or any items not to be salvaged.

New bolts, nuts, washers, and other required appurtenances shall be provided by the Contractor in order to reinstall existing signs. Such items shall be considered subsidiary to sign reinstallation.

3002.6 Final Clean Up

Before final acceptance, the Contractor shall restore to a condition equal to or better than that existing prior to construction all property, both public and private, within, adjacent to and beyond the limits of construction that have been disturbed or damaged while executing the work. This includes, but not limited to, existing curb and gutter, sidewalk, pavement, drainage structures, irrigation systems, street lighting and traffic signal equipment. All unpaved areas damaged during construction shall be restored to the original condition. Unless otherwise directed, grassy areas which were originally sodded shall be re-sodded. Restoration work shall be at the Contractor's expense. All restoration work shall be acceptable to the City Inspector.

3003 SIGNING MEASUREMENT AND PAYMENT

Measurement and payment shall be specified in the contract documents.

3004 PAVEMENT MARKING GENERAL

3004.1 Scope

This work shall consist of furnishing all material, equipment, and labor for the complete installation of permanent pavement markings. Temporary pavement markings shall conform to the temporary traffic control requirements in Section 3008.

3004.2 Codes and Standards

All work and material shall be in accordance with the latest requirements of the Manual on Uniform Traffic Control Devices (MUTCD) and all applicable local ordinances.

3004.3 Modification of Specifications

These Specifications may be modified or deleted by appropriate items in the Project Special Provisions or by written authorization by the City Engineer, or assigned designee.

3004.4 Incidental Work and Parts

Work incidental to pavement markings that is not covered in these Specifications shall be performed in accordance with the City of Blue Springs specifications and standards. All incidental parts, which are not shown on the Plans or specified in the Specifications and which are necessary to complete the installation of pavement marking, shall be supplied and installed by the Contractor to the satisfaction of the City Engineer, or assigned designee. No additional payments will be made for incidental work or parts.

3004.5 Integrity of Design and Installation Standards

The Contractor shall make no design modification, material substitution, or revision of any kind without prior approval of the City Engineer. Materials or installation procedures deemed unsatisfactory by the City Engineer, with regard to retroreflectivity, bead distribution, paint thickness, overspray, accuracy, line width, consistency, tracking, or failure to comply with approved specifications shall not be used for pavement marking.

3004.6 Permits and Inspections

The Contractor shall contact the Public Works Engineering Department before any project work begins to notify of the construction schedule and to request project inspections. The Contractor is responsible for obtaining all necessary permits from the City, and is responsible for all associated costs, before any work can begin.

3004.7 Warranty

The Contractor shall warranty both the labor and the pavement marking materials used for a minimum period of one year from the date of application; the warranty period and time referenced deficiency measures noted below shall be extended for the duration of applicable project bonds. The Contractor shall submit a written warranty on company letterhead, which at a minimum shall require the Contractor to replace any line or symbol with any of the following deficiencies:

- More than 10% of a 1,000 foot length of a longitudinal line fails due to workmanship or materials within one year of the date of application,
- More than 10% of an individual symbol fails due to workmanship or materials within one year of the date of application, or
- A line or symbol has retroreflectivity values less than 150 millicandelas/sq m/lux for white and 100 millicandelas/sq m/lux for yellow within one year of the date of application.

3005 PAVEMENT MARKING MATERIALS AND EQUIPMENT

3005.1 Scope

This section governs the furnishing of all material and equipment supplied by the Contractor, as required to complete the installation of pavement markings as shown on the Plans or as specified in the Project Special Provisions.

3005.2 Material Selection

The type of pavement marking material to be used on a specific project depends on the type of marking and surface. If the material to be used is not specified in the Plans or in the Project Special Provisions, the table on the following page shall be used for material selection. Selected material shall be approved by the Public Works Department prior application.

TABLE OF PAVEMENT MARKING MATERIALS

Marking / Surface	Longitudinal Lines	Diagonal Lines	Crosswalk & Stop Lines	Dashed Lines	Symbols
Asphalt	Thermoplastic*	Thermoplastic*	Grooved Thermoplastic	Thermoplastic	Grooved Thermoplastic
Concrete	Urethane	Urethane	Grooved Thermoplastic	Urethane	Grooved Thermoplastic
Nova-Chip/Microsurface	Thermoplastic*	Thermoplastic*	Grooved Pre-Formed Thermoplastic	Pre-Formed Thermoplastic	Grooved Pre-Formed Thermoplastic
Slurry Seal	Thermoplastic* or High-Build Paint	Thermoplastic* or High-Build Paint	Grooved Pre-Formed Thermoplastic	Pre-Formed Thermoplastic	Grooved Pre-Formed Thermoplastic

*Binder-sealer recommended by the manufacturer will be required on surfaces older than two months.

3005.3 Grooving for Pavement Marking

A. Description. This work shall consist of furnishing and installing a groove in the pavement for placement of pavement markings as shown on the plans or as directed by the engineer.
B. Construction Requirements.
    a. The grooves shall be cut such that the surface of the groove is uniform with minimal variation in height.
    b. The grooves shall be located where the final pavement marking will be placed according to the plans or as directed by the engineer.
    c. On bituminous pavements the width of the groove shall be 7 inches. On PCCP pavements the width of the groove shall be 10 inches.
    d. The final depth of the groove on bituminous pavements shall be 50 mils, plus or minus 5 mils. The final depth of the grove on PCCP pavement shall be 80 mils, plus or minus 5 mils.
    e. The groove shall be clean and dry before the installation of the pavement marking can begin.
    f. All debris resulting from the installation of the grooves shall be removed and disposed of by the contractor.

3005.4 High-Build Paint

High-build paint shall meet the requirements of Section 1048.90 of the Missouri Department of Transportation's (MoDOT) 2011 Specification Book for Highway Construction, March 2014.

3005.5 Pre-Formed Thermoplastic

Pre-formed thermoplastic materials shall be suitable for use on either asphalt or concrete pavements. A manufacturer recommended heat source fuses the markings to the asphalt or concrete pavements. Glass beads are pre-mixed into the material furnished, and also must be applied to the surface either before or after fusion to the pavement. Upon cooling, the material produces an adherent reflectorized marking of specified thickness and width, capable of resisting deformation by traffic. Pre-formed thermoplastic materials shall comply with AASHTO M 249 with exception of the relevant differences due to the material being supplied in a pre-formed state, and must meet the following requirements:

A. Material shall have a minimum thickness of 90 or 125 mils as supplied by the manufacturer.
B. Material shall be resistant to deterioration due to exposure to sunlight, water, oil, gasoline, salt, or adverse weather conditions.
C. All pigments must be heavy metal free, including, but not restricted to lead, cadmium, and mercury.

D. After application, the material must exhibit no appreciable deformation or discoloration, remain tack free, and not lift from the pavement under normal traffic conditions within a road temperature range of 20° F to 150º F.
E. Material shall be capable of conforming to pavement contours, breaks, and faults through the action of traffic at normal pavement temperatures.
F. Color: Yellow color must meet the following minimum chromaticity coordinates:

CIE Chromaticity Coordinate limits (Initial)								
Color	1		2		3		4	
	x	y	x	y	x	y	x	y
Yellow	0.475	0.450	0.490	0.433	0.520	0.450	0.495	0.475

White color shall be pure white (free of tint)

G. Retroreflectivity: The following minimum retroreflectivity requirements shall be met when using an acceptable 30-meter retroreflectometer within 14 days after application:

i. White 300 millicandelas/sq m/lux (min.)
ii. Yellow 225 millicandelas/sq m/lux (min.)

3005.6 Thermoplastic

Thermoplastic pavement marking material shall be applied to asphalt surfaces in a molten state, and which upon cooling to normal pavement temperature, produces an adherent reflectorized stripe capable of resisting deformation. Thermoplastic material shall meet the requirements of AASHTO M249-79. Thermoplastic shall only be applied to surfaces that are less than two months old, unless a binder-sealer recommended by the manufacturer is applied.

3005.7 Urethane

Urethane pavement marking material shall consist of a homogeneous blend of modified urethane resins and pigments designed to provide a simple volumetric mixing ratio of two components (must be two volumes of Part A to one volume of Part B). No volatile solvent or fillers will be allowed.

A. Pigmentation: The pigment content by weight of component A shall be determined by low temperature ashing according to ASTM 0 3723. The pigment content shall not vary more than ± two percent from the pigment content of the original qualified paint.

White Pigment shall be Titanium Dioxide meeting ASTM D 476 Type II, Rutile.

Yellow Pigment shall be an Organic Yellow and contain no heavy metals.

B. Upon heating to application temperature, the material shall not exude fumes, which are toxic or injurious to persons or property when handled according to manufacturer specifications. The urethane pavement marking material compositions shall not contain free isocyanate functionality.

C. Daylight Reflectance: The daylight directional reflectance of the cured modified urethane. material (without reflective media) shall be a minimum of 80 percent (white) and 50 percent (yellow) relative to magnesium oxide when tested using a color spectrophotometer with a 45 degrees circumferential /zero degrees geometry, iIIuminant C, and two degrees observer angle. The color instrument shall measure the visible spectrum from 380 to720 nm with a wavelength measurement interval and spectral bandpass of 10 nm. In addition, the color of the yellow modified urethane shall visually match Color Number 33538 of Federal Standard 595a with chromaticity limits as follows:

CIE Chromaticity Coordinate limits (Initial)								
Color	1		2		3		4	
	x	y	x	y	x	y	x	y
Yellow	0.490	0.470	0.475	0.438	0.485	0.425	0.539	0.456

D. Weathering Resistance: The modified urethane, when mixed in the proper ratio and applied at 14 to 16 mils wet film thickness to an aluminum alloy panel (Federal Test Std. No. 141, Method 013) and allowed to cure for 72 hours at room temperature, shall be subjected to accelerated weathering for 75 hours. The accelerated weathering shall be completed by using the light and water exposure apparatus (fluorescent UV - condensation type) and tested according to ASTM G 53.

The cycle shall consist of four hours UV exposure at 50nC (122 OF) and four hours of condensation at 40°C (104 OF). UVB 313 bulbs shall be used. At the end of the exposure period, the material shall show no substantial change in color or gloss.

E. Drying Time: The modified urethane material, when mixed in the proper ratio and applied at 14 to 16 mils wet film thickness and with the proper saturation of glass spheres, shall exhibit a no-tracking time of three minutes or less when tested according to ASTM D 711.

F. Adhesion: The catalyzed modified urethane pavement marking materials when applied to a 100 x 100 x 50 mm (4 x 4 x 2 in.) concrete block shall have a degree of adhesion which results in a 100 percent concrete failure in the performance of this test.

The concrete block shall be brushed on one side and have a minimum strength of 3,500 psi. A 2 in. square film of the mixed modified urethane shall be applied to the brushed surface and allowed to cure for 72 hours at room temperature. A 2 in. square cube shall

be affixed to the surface of the modified urethane by means of an epoxy glue. After the glue has cured for 24 hours, the modified urethane specimen shall be placed on a dynamic testing machine in such a fashion so that the specimen block is in a fixed position and the 2 in. cube (glued to the modified urethane surface) is attached to the dynamometer head. Direct upward pressure shall be slowly applied until the modified urethane system fails. The location of the break and the amount of concrete failure shall be recorded.

G. Hardness. The modified urethane marking materials, when tested according to ASTM 0-2240, shall have a Shore D Hardness greater than 75. Films shall be cast on a rigid substrate at 14 to 16 mils in thickness and allowed to cure at room temperature for 72 hours before testing.
H. Abrasion. The abrasion resistance shall be evaluated on a Taber Abrader with a 1,000 gram load and CS-17 wheels. The duration of test shall be 1,000 cycles. The wear index shall be calculated based on ASTM test method 0-4060 and the wear index for the catalyzed material shall not be more than 80. The tests shall be run on cured samples of modified urethane material which have been applied at a film thickness of 14 to 16 mils to code S-16 stainless steel plates. The films shall be allowed to cure at room temperature for at least 72 hours and not more than 96 hours before testing.
I. Tensile. When tested according to ASTM 0-638, the modified urethane pavement marking materials shall have an average tensile strength of not less than 6,000 pounds per square inch. The Type IV Specimens shall be pulled at a rate of X" per minute by a suitable dynamic testing machine. The samples shall be allowed to cure at 75 ºF± 2°F for a minimum of 24 hours and a maximum of 72 hours prior to performing the indicated tests.
J. Compressive Strength. When tested according to ASTM D-695, the catalyzed modified urethane pavement marking materials shall have a compressive strength of not less than 12,000 pounds per square inch. The cast sample shall be conditioned at 75°F± 2°F for a minimum of 72 hours before performing the indicated tests. The rate of compression of these samples shall be no more than ¼” per minute.

3005.8 Drop-On Glass Beads

Drop-on glass beads shall be specifically manufactured to be compatible with pavement markings, and shall comply with AASHTO M 247, Type I.

3006 PAVEMENT MARKING CONSTRUCTION REQUIREMENTS

3006.1 Scope

This section governs the installation and removal of pavement markings as shown on the Plans or as specified in the Project Special Provisions.

3006.2 Surface Preparation

The surface on which markings are to be placed shall be clean and dry. The street surface shall be cleaned of debris, sand, or any other deleterious material by sweeping and or use of jets of compressed air immediately preceding the application of markings. New PCC pavements shall be blast-cleaned to remove all curing compounds.

3006.3 Weather Limitations

The pavement surface temperature and air temperature shall be determined before the start of each day of marking operation and at any other time deemed necessary by the City Engineer, or assigned designee. Temperatures shall be obtained with appropriate devices using the manufacturer's recommended procedure.

The pavement markings shall not be applied if the pavement shows any visible signs of moisture or it is anticipated that damage causing moisture, such as rain showers, may occur during the installation and curing periods.

3006.4 High-Build Paint Application

Paint shall be machine applied using spray guns designed and adjusted to apply paint at the required thickness and width. If there is any evidence of gun clogging, splattering or uneven paint distribution, painting operations shall cease until equipment is restored to proper operation. Paint shall be applied from a vehicle that was specifically manufactured for pavement marking applications.

The pavement surface temperature and ambient air temperatures shall be above 50° F during all times when paint is being applied. Paint shall not be applied if the forecast conditions for the eight hours immediately following final application include precipitation. High-build paint shall be applied to a minimum wet thickness of 20 mils. Paint may be heated to a maximum temperature of 150° F before application.

Drop-on glass beads shall be mechanically applied to the wet paint directly behind the paint spray guns. Glass beads shall be applied evenly at a minimum rate of 9 pounds per gallon of paint. Glass beads shall be applied evenly and shall completely cover the painted area. If beads

do not embed properly in the paint, all marking operations shall cease until the Contractor can demonstrate that the problem has been corrected.

The glass beads shall appear uniform on the entire marking surface. The cured paint shall properly adhere to the pavement surface. If the marking paint does not provide initial retroreflectivity or if the marking does not have the required minimum thickness or required color, the Contractor shall re-apply the marking paint to the required thickness, at the Contractor's expense, and shall meet all requirements as previously described.

3006.5 Pre-Formed Thermoplastic Application

To apply pre-formed thermoplastic, use a heating device recommended by the material manufacturer to fuse the pre-formed thermoplastic to the pavement. Apply the pavement markings as recommended by the manufacturer. When recommended by the manufacturer, use solvent or other type of adhesive primer. Remove all existing markings or exposed aggregate before applying pre-formed thermoplastic.

3006.6 Thermoplastic Application

Thermoplastic material shall be applied to the pavement by the extrusion method wherein one side of the shaping die is the pavement and the other three sides are contained by, or a part of, suitable equipment for heating and controlling the flow of material. The equipment used to install hot thermoplastic materials under this Specification shall be constructed to provide mixing and agitation of the materials. Conveying parts of the equipment between the main material reservoir and the shaping die shall be so constructed as to prevent accumulation and clogging. All parts of the equipment that come in contact with the material shall be constructed as to be easily accessible and exposable for cleaning and maintenance. The equipment shall be constructed so that all mixing and conveying parts up to and including the shaping die will maintain the materials at a temperature not less than 375° F. To assure that the thermoplastic does not fall below the minimum temperature, the shaping die shall be heated by means of a gas-fired infrared heater or a heated, oil-jacketed system. The equipment shall be so constructed as to insure continuous uniformity in the dimensions of the stripe. The applicator shall provide a means for cleanly cutting off square stripe ends and shall provide a method of applying "skip" lines. The use of pans, aprons or similar appliances that the die overruns will not be permitted under this Specification. The equipment shall be so constructed as to provide for varying die widths and to produce varying widths of traffic marking.

A special kettle shall be provided for melting and heating the thermoplastic material. The kettle must be equipped with a thermostat so that heating can be done by controlled heat transfer liquid rather than by direct flame, so as to provide positive temperature control and prevent overheating of the material. The heating kettle and applicator shall be so equipped and arranged as to meet the requirements of the National Board of Fire Underwriters, of the National Fire Protection Association, of the state and local authorities.

Glass beads applied to the surface of the completed strip shall be applied by an automatic bead dispenser attached to the striping machine in such a manner that the beads are dispensed almost instantaneously upon the installed line. The glass bead dispenser shall be equipped with an automatic cut-off control synchronized with the cut-off of the thermoplastic material.

The equipment shall be so arranged as to permit preheating of the pavement immediately prior to application of the thermoplastic material if preheating is recommended by the thermoplastic manufacturer. The applicator shall be mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. The applicator shall be capable of containing a minimum of 125 pounds of molten material.

The pavement and ambient air temperatures shall be not less than 55° F, and the thermoplastic material shall be applied in a melted state at a temperature of 375° F to 450° F. The temperature of the thermoplastic in the shaping die shall be maintained at the manufacturer's recommended application temperature, but in no case shall the temperature fall below 375° F.

The finished lines shall have well defined edges and be free of waviness. All lines will have minimal dribbles, runs and overlaps. In the event that thermoplastic long lines must stop and then continue, the restart shall line up to within 0.5 inches of the existing long line and maintain a totally straight line. The minimum thickness of thermoplastic lines shall be not less than 90 mils near the edges, nor less than 125 mils at the center. The drop-on glass beads shall be applied at a rate of one pound per 20 square feet of line.

3006.7 Urethane Application

The urethane pavement marking compounds shall be applied through equipment specifically designed to precisely meter the two components in the ratio of 2:1. This equipment shall produce the required amount of heat at the mixing head and gun tip and maintain those temperatures within the tolerances specified. This equipment shall also have as an integral part of the gun carriage, a high pressure air spray capable of cleaning the pavement immediately prior to the marking application.

The equipment shall be capable of spraying both yellow and white urethane, according to the manufacturer's recommended proportions and be mounted on a truck of sufficient size and stability with an adequate power source to produce lines of uniform dimensions and prevent application failure. The truck shall have at least two urethane tanks each of 110 gallon minimum capacity and shall be equipped with hydraulic systems and agitators. It shall be capable of applying glass beads by the double drop pressurized bead system. The system shall apply both the first drop glass beads and the second drop glass beads at a rate of 10 lb/gal. The equipment shall be equipped with pressure gauges for each proportioning pump. All guns shall be in full view of operators at all times. The equipment shall have a metering device to register the

accumulated installed quantities for each gun, each day. Each vehicle shall include at least one operator who shall be a technical expert in equipment operations and urethane application techniques.

The pavement markings shall be applied at a minimum uniform wet thickness of 20 mils in accordance with the manufacturer's installation instructions. At the time of installation the pavement surface temperature and the ambient temperature shall be above 35° F and rising. Urethane shall not be applied if the forecast conditions for the eight hours immediately following final application include precipitation.

3006.8 Pavement Marking Removal

All pavement marking removal shall be per the Plans or as authorized by the City Engineer, or assigned designee. Pavement markings shall be completely removed with minimal damage to the pavement. No more than five percent of the existing marking shall remain. The pavement surface shall not be left scarred with an image that misleads traffic. Any excess damage or scarring of the pavement shall be repaired at the Contractor's expense.

3006.9 Deficiencies

The Contractor shall remove and replace, at the Contractor's expense, any finished markings that have the following deficiencies:

- Drag marks, gashes, gouges, foreign covering, discolored areas, or areas that have failed to solidify
- Improper adhesion, length or thickness
- Ragged appearance with areas that do not present sharply defined edges
- Lateral deviation in excess of two inches in a length of 200 feet of marking

3006.10 Final Clean Up

Before final acceptance, the Contractor shall restore to a condition equal to or better than that existing prior to construction all property, both public and private, within, adjacent to and beyond the limits of construction that have been disturbed or damaged while executing the work. The Contractor shall be responsible for removing all pavement marking material spilled upon the road surface or adjoining area. All restoration work shall be acceptable to the City Inspector.

3007 PAVEMENT MARKING MEASUREMENT AND PAYMENT

Measurement and payment shall be specified in the contract documents.

3008 TEMPORARY TRAFFIC CONTROL GENERAL

3008.1 Scope

The safety and mobility of all right-of-way users, including workers, drivers, and pedestrians throughout the project area is of paramount importance and shall be the responsibility of the Contractor. All work performed, whether in the right-of-way or adjacent to the right-of-way, that impacts vehicular or pedestrian traffic in any way shall be properly signed, marked, barricaded, and otherwise protected. This work shall consist of furnishing all material, equipment, and labor to provide safe temporary traffic control within or adjacent to the area of work.

3008.2 Codes and Standards

All work and material shall be in accordance with the latest requirements of the Manual on Uniform Traffic Control Devices (MUTCD), Standard Highway Signs (SHS), American Traffic Safety Services Association (ATSSA) Quality Standards for Work Zone Traffic Control Devices, Standards of the American Society of Testing Materials (ASTM), National Cooperative Highway Research Program (NCHRP) Report 350, Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG), City of Blue Springs Pavement Marking and Signing specifications and standards, and all applicable local ordinances.

3008.3 Modification of Specifications

These Specifications may be modified or deleted by appropriate items in the Project Special Provisions or by written authorization by the City Engineer.

3008.4 Traffic Control Plans

If a traffic control plan is not part of the Plans the Contractor shall submit a traffic control plan in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) as well as all federal, state, and local regulations and ordinances. Contractor is responsible for obtaining the Public Works Department's approval of said traffic control plan, before implementation.

If the Contractor would prefer to use a traffic control plan that differs from the approved plans, the Contractor may request modifications to the traffic control plan. The Contractor will submit a plan based on the timeframes and requirements of the Contract. Contractor is responsible for obtaining the Public Works Department's approval of said traffic control plan, before implementation.

Based on field conditions or unforeseen circumstances, the Contractor and/or Public Works Department may request modifications to the traffic control plan, whether it is the approved plan or the Contractor's plan.

The Contractor is required to maintain access to all properties served by the streets within the construction site limits.

3008.5 Minimum Requirements

The temporary traffic control requirements shown on the Plans are minimum requirements only and do not attempt to address in depth the variety of situations that may occur once construction has begun. In no way do the requirements shown on the Plans relieve the Contractor of his responsibility for selecting proper traffic control devices and implementation procedures that will assure the safety of motorists, pedestrians, and workers at all times. The Contractor shall be fully responsible for damage or injuries whether or not traffic control devices have been provided.

3008.6 Incidental Work and Parts

Work incidental to temporary traffic control that is not covered in these Specifications shall be performed in accordance with the City of Blue Springs specifications and standards. All incidental parts, which are not shown on the Plans or specified in the Specifications and which are necessary to provide proper traffic control, shall be supplied and installed by the Contractor to the satisfaction of the Public Works Department. No additional payments will be made for incidental work or parts.

3008.7 Permits and Inspections

The Contractor shall contact the City Inspector 48 hours prior to installing any traffic control devices. The Contractor is responsible for obtaining all necessary permits from the City, and is responsible for all associated costs, before any work can begin. The City Inspector shall inspect and approve the final location of all traffic control devices.

3009 TEMPORARY TRAFFIC CONTROL MATERIALS AND EQUIPMENT

3009.1 Scope

This section governs the furnishing of all channelizers, construction signing, barricades, and other material and equipment supplied by the Contractor, as required, to implement the temporary traffic control as shown on the Plans or as specified in the Project Special Provisions. All equipment and material shall be in good condition, and shall meet the approval of the City Engineer.

3009.2 Construction Signs

All construction signs shall comply with the size, shape, legend, layout, and color requirements of the MUTCD and Standard Highway Signs book. For all signs that will be used at night, the

legend, border, and background other than black shall be made from high intensity retro-reflective sheeting.

Supports or posts used for mounting signs or devices shall be designed to yield upon impact to minimize hazards to motorists, and be approved by NCHRP Report 350. Portable sign supports should not be used for durations of more than three (3) days. Sand bags shall not be used as ballast for sign supports for durations of more than seven (7) days. Supports and posts shall not be installed in pavement.

For mobile operations, a sign may be mounted on a work vehicle, a shadow vehicle, or a trailer stationed in advance of the work area or moving along with it.

3009.3 Channelizers

Channelizers, including cones, tubular markers, drums, and trim-lines shall comply with the size, shape, legend, layout, and color requirements of the MUTCD. Trim-line channelizers are the preferred channelizing devices. Cones may not be used at nighttime.

3009.4 Barricades

Barricades shall comply with the size, shape, legend, layout, and color requirements of the MUTCD. Contractor shall be responsible for removing and cleaning up any sand bags that have sand escaping from them.

3009.5 Arrow Panels

Arrow panels are a matrix of lamps capable of flashing or sequential displays, to be used where necessary to divert traffic. Two types of arrow panels are acceptable for use on City streets; Type C and Type D, meeting the requirements listed in the MUTCD.

3009.6 Warning lights

Type A, B, and C Warning lights shall be portable, battery powered, yellow, enclosed lights. All types of warning lights shall be in accordance with the current edition of "Purchase Specification for Flashing and Steady-Burn Warning Lights", published by the Institute of Transportation Engineers.

3009.7 Temporary Pavement Markings

Temporary pavement markings on finish surface pavement or existing surface pavement shall be removable retro-reflective polymer marking tape. When installed on pavement that will be removed, surfaced, or resurfaced, temporary pavement markings shall be water-borne traffic paint or removable retro-reflective polymer marking tape.

3009.8 Portable Changeable Message Boards

Portable changeable message boards may be provided by the City at the discretion of the Public Works Department. The Engineer shall coordinate the use of portable changeable message boards with the City's Public Works Operations Division. The Operations Division shall be notified at least five (5) days before a portable changeable message board is required. All messages displayed on the boards shall be approved by the City Engineer.

3009.9 Temporary Concrete Traffic Barrier

Temporary concrete traffic barrier shall be per the standards and specifications of the Missouri Department of Transportation (MoDOT).

3010 TEMPORARY TRAFFIC CONTROL CONSTRUCTION REQUIREMENTS

3010.1 Scope

This section governs the installation and placement of traffic control devices as shown on the Plans, the Standard Drawings, and as specified in the Project Special Provisions. All temporary traffic control shall be in conformance with the MUTCD.

3010.2 Sign Installation

The installation of all construction signage shall be in compliance with the MUTCD and the City of Blue Springs Standard Drawings for Signing. All existing and temporary construction signs shall be removed or covered when they are not applicable. No sign posts shall be installed in paved surfaces in a manner that could cause damage to the finished surface.

Signs shall be properly maintained for cleanliness, visibility, and correct positioning. Signs that have lost significant legibility shall be promptly replaced.

Type B warning lights shall be installed in conjunction with all construction warning signs that will be in place at nighttime, which alert road users about a change in alignment, traffic control, lane closure, or road closure. Warning lights shall be mounted on signs in a manner that, if hit by an errant vehicle, they will not be likely to penetrate the windshield.

3010.3 Temporary Pavement Marking Installation

Temporary pavement markings are required to delineate the travel way for vehicles when the intended traffic pattern differs from the normal traffic pattern for a duration of three calendar days or more. The installation of all temporary pavement markings shall be in compliance with the MUTCD and the City of Blue Springs Standard Drawings for Pavement Marking.

All travel lanes should be at least 11 feet wide, however a minimum lane width of 10 feet may be allowed if approved by the Public Works Department. A "Narrow Lanes" sign shall be installed in accordance with the latest requirements of the Manual on Uniform Traffic Control Devices (MUTCD).

Where temporary pavement markings are to be placed on a surface which has existing markings, the incorrect markings shall be removed or obscured to the fullest extent possible without damage to the pavement surface. Any appreciable damage or different appearance from the surrounding surface shall be repaired by the Contractor at his expense, by methods approved by the Public Works Department.

On the finish surface of pavement, interim markings are required if the permanent pavement markings cannot be installed within 24 hours. Interim markings on finish surface of pavement shall consist of four inch (4") wide by two feet (2') long stripes on the center line of the street or lane line, at approximately 50 foot spacing. Interim markings shall be the same color and configuration as the permanent pavement markings.

3010.4 Placement of Channelizers

Channelizers shall be used to delineate the travel way for vehicles when the intended traffic pattern differs from the normal traffic pattern on a street. Channelizers shall be spaced as indicated in the MUTCD.

Type C warning lights may be mounted on channelizers that delineate the edge of the travel way. If warning lights are installed on channelizers, they shall be mounted in a manner that, if hit by an errant vehicle, they will not be likely to penetrate the windshield.

3010.5 Lane Closures

Lane closures are not permitted on arterial or collector streets before 9:00 A.M. and after 4:00 P.M. Monday thru Friday, nor anytime on Saturday, Sunday or holidays observed by the City unless prior approval is received through the Public Works Department. Emergency repairs will be evaluated on a case-by-case basis. The Contractor shall not store materials or park vehicles within an otherwise moving lane of traffic.

All lane closures for durations longer than 30 minutes shall be signed and delineated with traffic control devices as illustrated in the Standard Drawings. Lane closures for durations of 30 minutes or less are considered to be short duration or mobile operations. Lane closures for short duration or mobile operations, at a minimum, shall require that a vehicle be equipped with high-intensity rotating beacon, flashing beacon, oscillating beacon, or strobe lights. Warning signs, channelizers, and/or arrow panels should also be considered, if possible.

The Public Works Department reserves the right to suspend or delay certain operations to adequately provide for the movement of traffic. This may include periods of inclement weather or unusually heavy traffic.

3010.6 Flaggers

Flaggers are required anytime vehicles are directed to cross into an opposing lane of traffic on arterial or collector streets. If proper line-of-sight cannot be provided at intersections, drives, or curves, flaggers will also be required. Flaggers shall be trained by an ATSSA certified program. Flaggers shall be equipped with a STOP/SLOW paddle, and must be properly attired per the requirements of the MUTCD.

3010.7 Street or Sidewalk Closures

All street or sidewalk closures must be approved by the Public Works Department. If a detour route will be provided around the closure, the detour route signing must be inspected and approved before the street or sidewalk can be closed.

When a section of street is completely closed to traffic, Type 3 barricades shall be erected at the points of closure. Barricades must extend completely across a roadway and its shoulders or from curb to curb. Type A warning lights should be installed on each Type 3 barricade used to alert drivers of a closure. Where provisions must be made for access of equipment and authorized vehicles, the Type 3 barricades should be provided with gates or movable sections that can be closed when work is not in progress, or with indirect openings that will discourage public entry. Where access is provided through the Type 3 barricades, the Contractor shall assure closure at the end of each working day.

When a street is closed, but access must still be allowed for local traffic, the Type 3 barricades usually are not erected completely across a roadway. Instead, an arrangement should be devised that will permit local use but effectively discourage use by through traffic. A sign with the appropriate legend concerning permissible use by local traffic shall be installed.

Whenever possible, a section of sidewalk that is removed should be replaced the same day, or other materials may be used to temporarily fill the area in order to maintain pedestrian traffic.

3010.8 Detours

All detour routes are subject to the approval of the Public Works Department. Where detours are permitted, all necessary detour route signing must be installed a minimum of 48 hours before the detour is in effect to allow for inspection. All detour signing shall utilize high intensity retro-reflective sheeting. While traffic is detoured, construction operations shall be expedited. Periods when detours are allowed will be strictly enforced.

3010.9 Excavations, Embankments, and Obstructions

The Contractor shall be responsible for maintaining all safeguards around excavations, embankments, obstructions, or open trenches on an around-the-clock basis, whether or not work is being actively pursued.

An all-weather surface wedge capable of supporting vehicles should be provided adjacent to an edge drop-off of more than two inches (2”), but less than four inches (4”). Such a wedge should have a slope no greater than 1:1. An all-weather surface wedge capable of supporting vehicles shall be provided adjacent to an edge drop-off of more than four inches (4”). For drop-offs of more than four inches (4”), the maximum slope of the wedge shall be 3:1. Concrete traffic barrier may be used in lieu of wedge; and should be considered if an edge drop-off exceeds twenty-four inches (24”), or for other factors such as the presence of heavy machinery or workers. “Shoulder Drop Off” signs (MUTCD No. W8-9) shall be installed adjacent to any edge drop-off of more than two inches (2”) that is not protected by a wedge or barrier.

If it is necessary to leave a trench excavated in the street open during times when work is not actively being pursued, the Contractor shall provide structurally adequate steel plates to bridge the excavation. All steel plates shall be A36 certified steel, minimum one inch (1”) thick, with lift hooks, securely fastened to the pavement with stakes or pins. Steel plates shall be installed per the requirements of the City of Blue Springs specifications and standards.

Orange mesh temporary fencing shall be installed around all excavations outside the street during times when work is not actively being pursued. Fencing shall be at least four feet (4’) in height, bright orange in color, and attached to posts capable of supporting the fencing without significant sagging or bowing. If the excavation or an obstruction extends into a sidewalk or driveway, a Type 2 barricade with a Type A warning light should be placed adjacent to the fencing or obstruction to warn of the hazard.

3010.10 Additional Traffic Control

The Public Works Department may require additional signs, channelizers, barricades, warning lights, flaggers, or other traffic control devices at any time or at any place that, in their opinion, are necessary for proper protection of vehicular or pedestrian traffic and workers.

3010.11 Maintenance Work

The Contractor shall be responsible for maintaining all traffic control devices on an around-the-clock basis, whether or not work is actively being pursued. All traffic control devices shall be maintained in acceptable condition as defined by the latest ATSSA “Quality Standards for Work Zone Traffic Control Devices.” Devices in unacceptable or marginal condition as determined above shall be removed from the job site and replaced with devices in acceptable condition. The

Contractor shall be responsible for cleaning all temporary traffic control devices as needed so that they have a neat and clean appearance at all times.

The Contractor shall be responsible for periodic checks of traffic control devices at night to verify that all devices are visible to drivers.

3010.12 Deficiencies

Deficiencies in traffic control shall be corrected immediately. Should the Contractor fail to enforce the traffic control plan or fail to clean, replace, or otherwise maintain the traffic control devices within 24 hours of verbal or written notice from the City Engineer or designee, the City may take one or more of the actions listed on the following page:

A. City or another agency employed by the City may correct deficiencies in signing or warning devices and deduct the cost from the Contractor's pay estimate,
B. Stop the work until deficiencies are corrected,
C. Suspend all pay estimates until deficiencies are corrected, or
D. Place the Contractor in default.

3010.13 Final Clean Up

Before final acceptance, the Contractor shall restore to a condition equal to or better than that existing prior to construction all property, both public and private, within, adjacent to and beyond the limits of construction that have been disturbed or damaged while executing the work. This includes, but not limited to, existing curb and gutter, sidewalk, pavement, drainage structures, irrigation systems, street lighting and traffic signal equipment. All unpaved areas damaged during construction shall be restored to the original condition. Unless otherwise directed, grassy areas which were originally sodded shall be re-sodded. Restoration work shall be at the Contractor's expense. All restoration work shall be acceptable to the City Inspector.

3011 TEMPORARY TRAFFIC CONTROL MEASUREMENT AND PAYMENT

Measurement and payment shall be specified in the contract documents.

Blue Springs Missouri

STANDARD DETAIL DRAWINGS

APPROVED THIS 15th DAY OF June, 2018

THOMAS S. DEGENHARDT, PE, LS, PTOE, CFM, EnvSP
CITY ENGINEER

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1. CONSTRUCT ADA COMPLIANT SIDEWALK ON WATER MAIN SIDE OF STREET
2. ALL PCC CONCRETE SHALL BE KCMMB 4K MIX.
3. PCC PAVEMENT ALLOWED ONLY WITH APPROVAL FROM THE CITY OF BLUE SPRINGS PUBLIC WORKS DIRECTOR.
4. AC MIXES SHALL CONFORM TO APWA. RECYCLED ALLOWED IN BASE AC ONLY. NO SHINGLES ALLOWED IN MIX DESIGN.
5. SIDEWALK SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE PER APWA SPECIFICATIONS.
6. FOR DRIVEWAY DETAIL SEE MIS-03
7. THERE SHALL BE A MINIMUM OF 1' OF R/W BEHIND THE SIDEWALK.

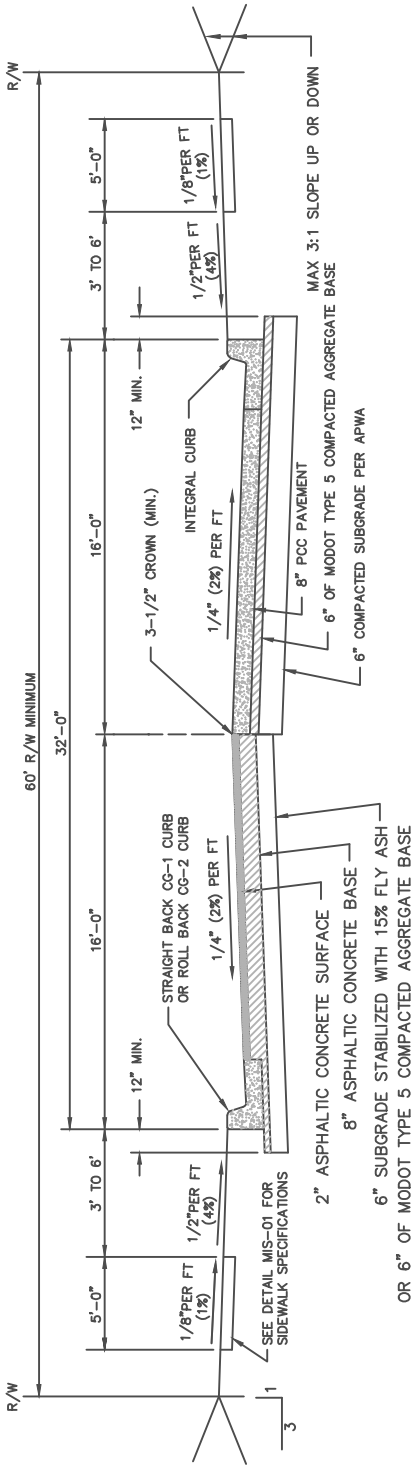
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RESIDENTIAL LOCAL STREET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-12-93
DETAIL NO.:	STR-01	SCALE:	NO SCALE
APPROVED BY:			



RESIDENTIAL COLLECTOR STREET – TYPICAL SECTION

NOTES:

1. CONSTRUCT ADA COMPLIANT SIDEWALK ON EACH SIDE OF STREET
2. ALL PCC CONCRETE SHALL BE KCMMB 4K MIX.
3. PCC PAVEMENT ALLOWED ONLY WITH APPROVAL FROM THE CITY OF BLUE SPRINGS PUBLIC WORKS DIRECTOR.
4. AC MIXES SHALL CONFORM TO APWA. RECYCLED ALLOWED IN BASE AC ONLY. NO SHINGLES ALLOWED IN MIX DESIGN.
5. SIDEWALK SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE PER APWA SPECIFICATIONS.
6. FOR DRIVEWAY DETAIL SEE MIS-03
7. THERE SHALL BE A MINIMUM OF 1' OF R/W BEHIND THE SIDEWALK.

Blue Springs Missouri

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RESIDENTIAL COLLECTOR STREET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1-22-93
DETAIL NO.:	STR-02	SCALE:	NO SCALE
APPROVED BY:			

COMMERCIAL COLLECTOR STREET – TYPICAL SECTION

NOTES:

1. CONSTRUCT ADA COMPLIANT SIDEWALK ON EACH SIDE OF STREET
2. ALL PCC CONCRETE SHALL BE KCMMB 4K MIX.
3. PCC PAVEMENT ALLOWED ONLY WITH APPROVAL FROM THE CITY OF BLUE SPRINGS PUBLIC WORKS DIRECTOR.
4. AC MIXES SHALL CONFORM TO APWA. RECYCLED ALLOWED IN BASE AC ONLY. NO SHINGLES ALLOWED IN MIX DESIGN.
5. SIDEWALK SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE PER APWA SPECIFICATIONS.
6. COMMERCIAL DRIVEWAYS SHALL BE A MINIMUM OF 8" THICK AND RESIDENTIAL DRIVEWAYS SHALL BE 6" THICK AND MAINTAIN A GUTTER PROFILE IN ALIGNMENT WITH THE CURB (SEE DRIVEWAY DETAIL MIS-03).
7. THERE SHALL BE A MINIMUM OF 1' OF R/W BEHIND THE SIDEWALK.

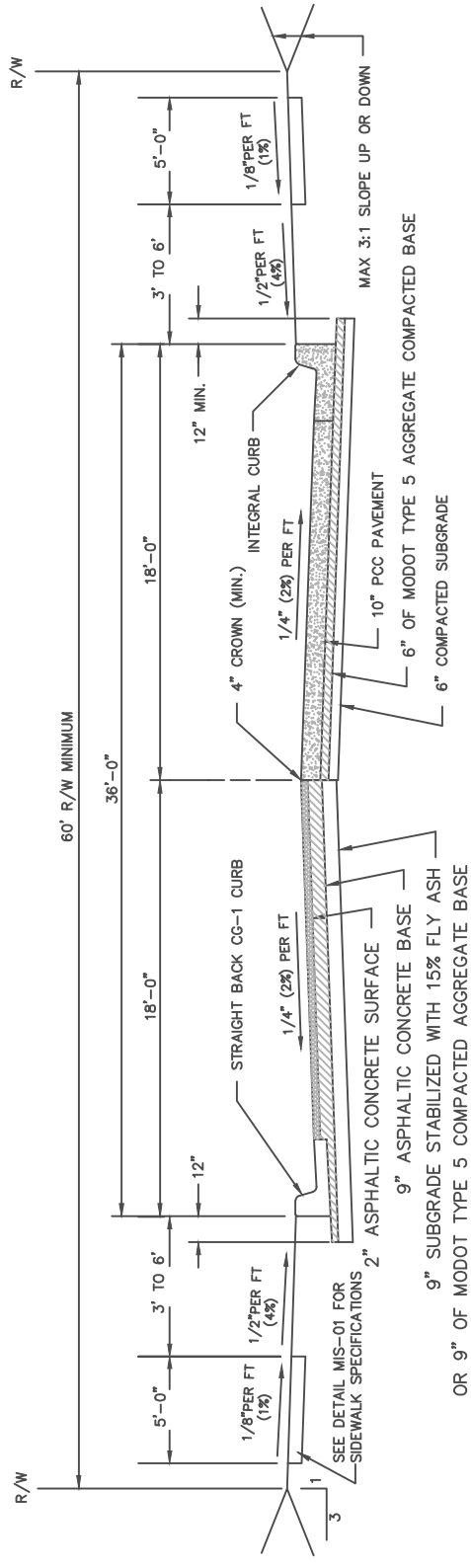
Blue Springs Missouri

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COMMERCIAL COLLECTOR STREET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1-26-93
DETAIL NO.:	STR-03	SCALE:	NO SCALE
APPROVED BY:			



INDUSTRIAL COLLECTOR STREET – TYPICAL SECTION

NOTES:

1. CONSTRUCT ADA COMPLIANT SIDEWALK ON EACH SIDE OF STREET
2. ALL PCC CONCRETE SHALL BE KCMMB 4K MIX.
3. PCC PAVEMENT ALLOWED ONLY WITH APPROVAL FROM THE CITY OF BLUE SPRINGS PUBLIC WORKS DIRECTOR.
4. AC MIXES SHALL CONFORM TO APWA. RECYCLED ALLOWED IN BASE AC ONLY. NO SHINGLES ALLOWED IN MIX DESIGN.
5. SIDEWALK SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE PER APWA SPECIFICATIONS.
6. COMMERCIAL DRIVEWAYS SHALL BE A MINIMUM OF 8" THICK AND RESIDENTIAL DRIVEWAYS SHALL BE 6" THICK AND MAINTAIN A GUTTER PROFILE IN ALIGNMENT WITH THE CURB (SEE DRIVEWAY DETAIL MIS-03).
7. THERE SHALL BE A MINIMUM OF 1' OF R/W BEHIND THE SIDEWALK.

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INDUSTRIAL COLLECTOR STREET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1-26-93
DETAIL NO.:	STR-04	SCALE:	NO SCALE
APPROVED BY:			

MAJOR/MINOR ARTERIAL STREET – TYPICAL SECTION

NOTES:

1. CONSTRUCT ADA COMPLIANT SIDEWALK ON ONE SIDE OF STREET AND CONSTRUCT ADA COMPLIANT SHARED USE PATH ON THE OTHER SIDE.
2. ALL PCC CONCRETE SHALL BE KCMMB 4K MIX.
3. PCC PAVEMENT ALLOWED ONLY WITH APPROVAL FROM THE CITY OF BLUE SPRINGS PUBLIC WORKS DIRECTOR.
4. AC MIXES SHALL CONFORM TO APWA. RECYCLED ALLOWED IN BASE AC ONLY. NO SHINGLES ALLOWED IN MIX DESIGN.
5. SIDEWALK SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE PER APWA SPECIFICATIONS.
6. COMMERCIAL DRIVEWAYS SHALL BE A MINIMUM OF 8" THICK AND RESIDENTIAL DRIVEWAYS SHALL BE 6" THICK AND MAINTAIN A GUTTER PROFILE IN ALIGNMENT WITH THE CURB (SEE DRIVEWAY DETAIL MIS-03).
7. SEE DETAIL DRAWING MIS-04 IF SHARED USE PATH IS REQUIRED.
8. THERE SHALL BE A MINIMUM OF 2' OF R/W BEHIND THE SIDEWALK OR SHARED USE PATH.

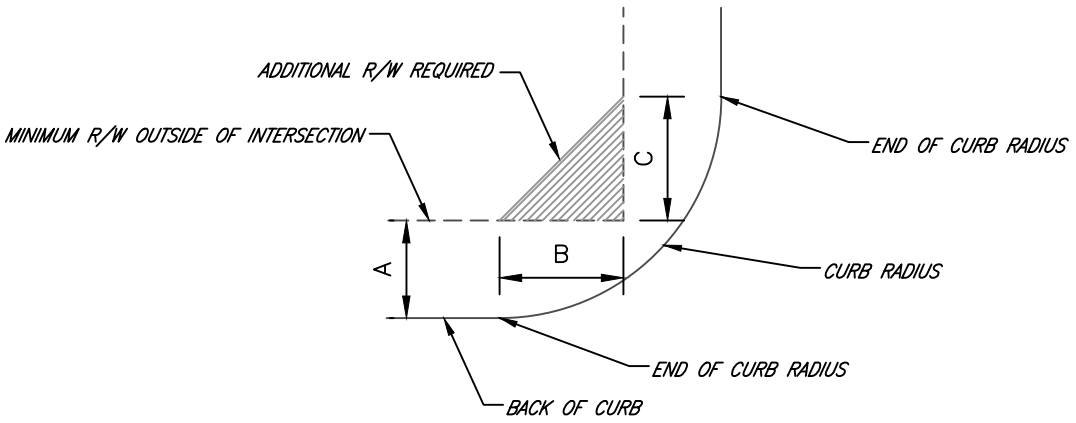
Blue Springs Missouri

STANDARD DETAILS

MAJOR/MINOR ARTERIAL STREET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: SPJ	DATE: 1-22-93
DETAIL NO.: STR-05	SCALE: NO SCALE
APPROVED BY:	



STREET CLASSIFICATION	CURB RADIUS	A MINIMUM	B MINIMUM	C MINIMUM
MAJOR/MINOR ARTERIAL STREET	35'–50'	17'	19'–34'	19'–33'
INDUSTRIAL COLLECTOR STREET	50'	12'	38'	38'
COMMERCIAL COLLECTOR STREET	35'–50'	12'	23'–38'	23'–38'
RESIDENTIAL COLLECTOR STREET	35'	14'	21'	21'
RESIDENTIAL LOCAL STREET	25'	11'	14'	14'

NOTES: 1. ADDITIONAL RIGHT OF WAY IS REQUIRED AT ALL STREET INTERSECTIONS.
2. WHEN TWO STREETS WITH DIFFERENT CLASSIFICATIONS INTERSECT, THE ONE WITH THE LARGEST RADIUS SHALL BE USED TO DETERMINE THE RADIUS REQUIRED FOR THAT INTERSECTION.

INTERSECTION R/W PLAN VIEW

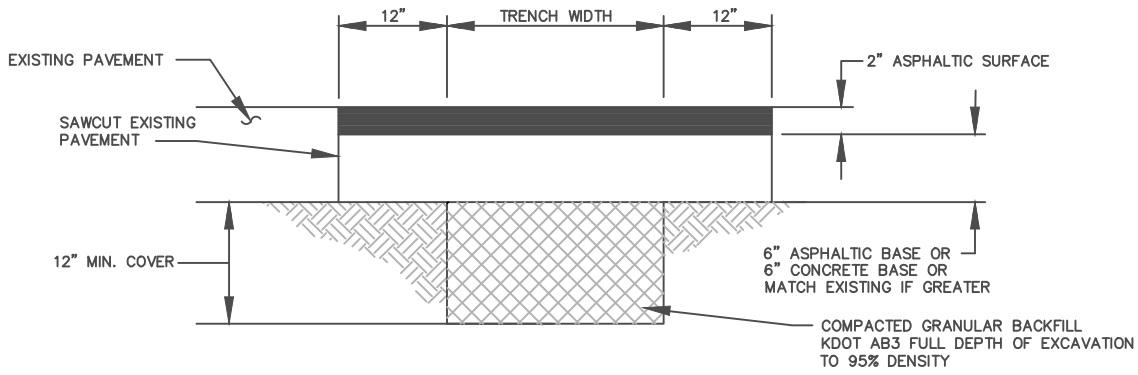
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STANDARD DETAILS

INTERSECTION RIGHT OF WAY

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	04–02–14
DETAIL NO.:	STR–06	SCALE:	NO SCALE
APPROVED BY:			



STREET CUT RESTORATION DETAIL

NOTES:
1. TO OBTAIN A STREET CUT PERMIT, AND A RIGHT OF WAY WORK PERMIT CONTACT ENGINEERING AT 816-228-0121.
2. ALL ASPHALT SHALL CONFORM TO APWA STANDARDS.
3. ALL CONCRETE USED IN THIS APPLICATION SHALL BE 4000 PSI MIX.
4. TRAFFIC CONTROL SHALL CONFORM TO THE M.U.T.C.D.
5. EXCAVATIONS SHALL BE PLATED OR FILLED OVERNIGHT.

Blue Springs Missouri

STANDARD DETAILS

STREET CUT RESTORATION

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	03-25-14
DETAIL NO.:	STR-07	SCALE:	NO SCALE
APPROVED BY:			

NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

REVISIONS

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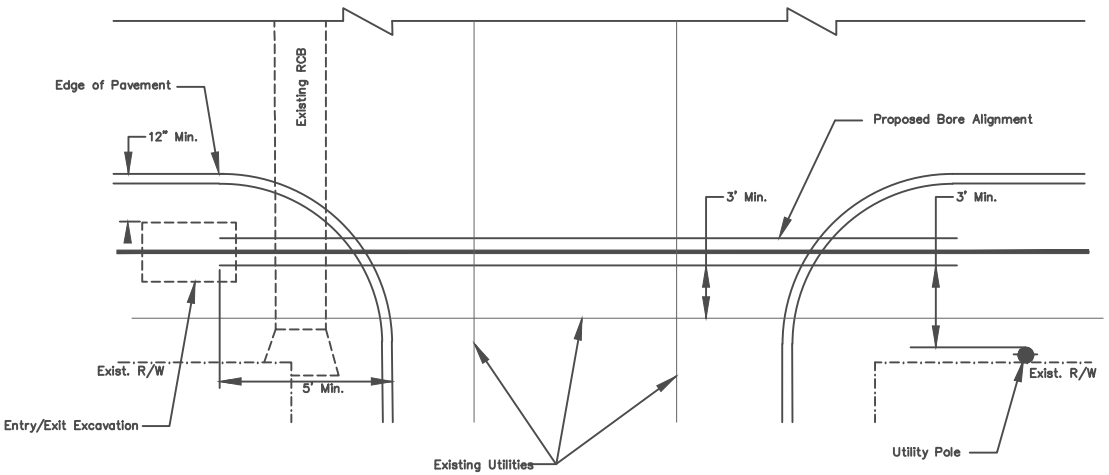
STANDARD DETAILS

HORIZONTAL DIRECTIONAL DRILLING INSTALLATION

DRAWN BY: PWC | DATE: 07-08-15

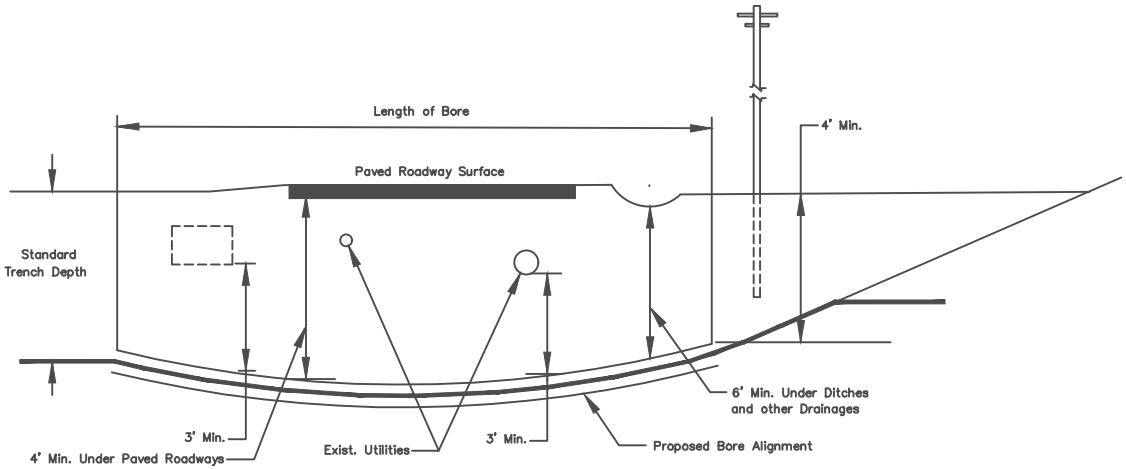
DETAIL NO.: STR-08 | SCALE: NO SCALE

APPROVED BY:



Horizontal Minimum Clearances

Not to Scale



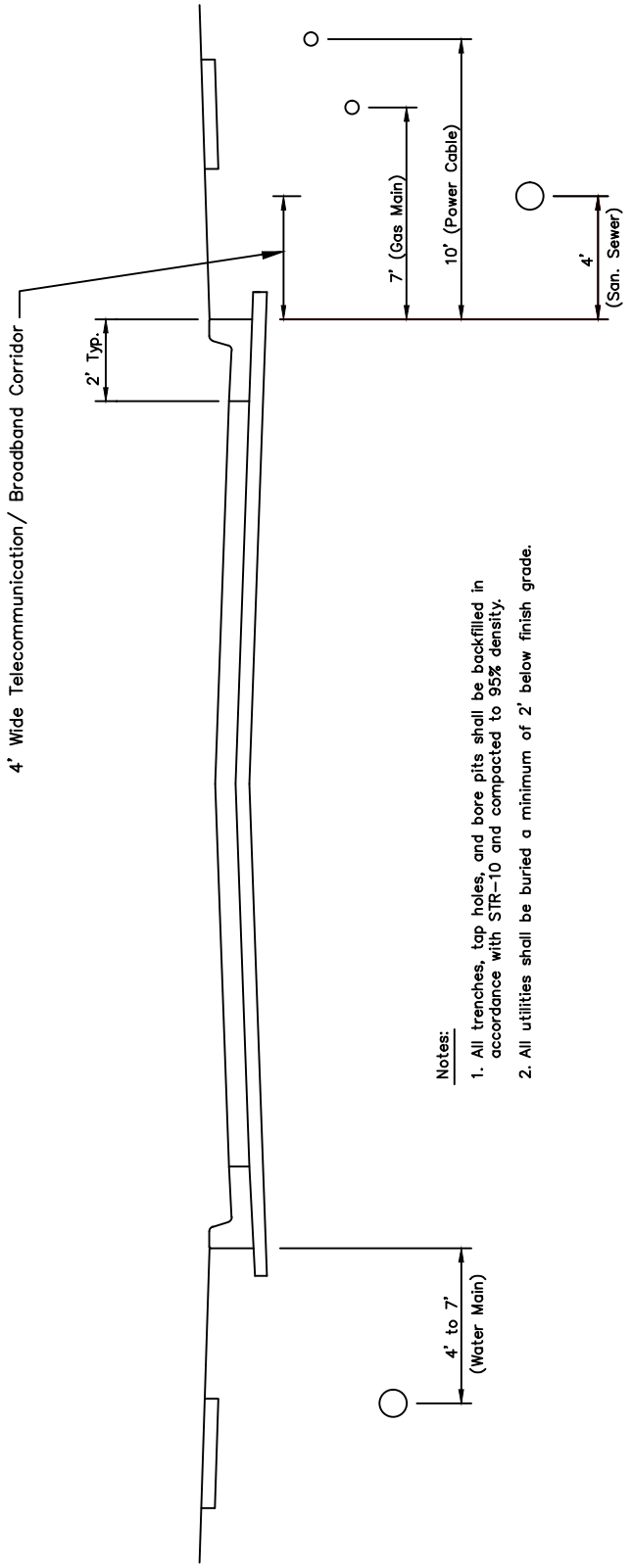
Vertical Minimum Clearances

Not to Scale

HDD Installation Notes:

1. Blue Springs Municipal Code and Blue Springs Design and Construction Manual are incorporated, except as otherwise noted.
2. All Horizontal Directional Drilling (HDD) installation activities shall be in compliance with the Blue Springs HDD Guidelines Handbook.
3. The permittee shall be responsible for notification of one-call services and coordination of all utilities prior to construction.
4. Drilling fluids shall be contained and removed immediately upon bore completion.
5. All construction materials shall be removed from the site prior to restoration of disturbed areas.
6. All restoration work shall match existing or better condition. In restoring the right-of-way, the permittee guarantees its work and shall maintain it for 24 months following its completion.
7. Excavations under paved surfaces shall be restored in compliance with the Blue Springs standards for street trenching located in the Design and Construction Manual.

HORIZONTAL DIRECTIONAL DRILLING INSTALLATION



Notes:

1. All trenches, tap holes, and bore pits shall be backfilled in accordance with STR-10 and compacted to 95% density.
2. All utilities shall be buried a minimum of 2' below finish grade.

Standard Right of Way Utility Location Detail

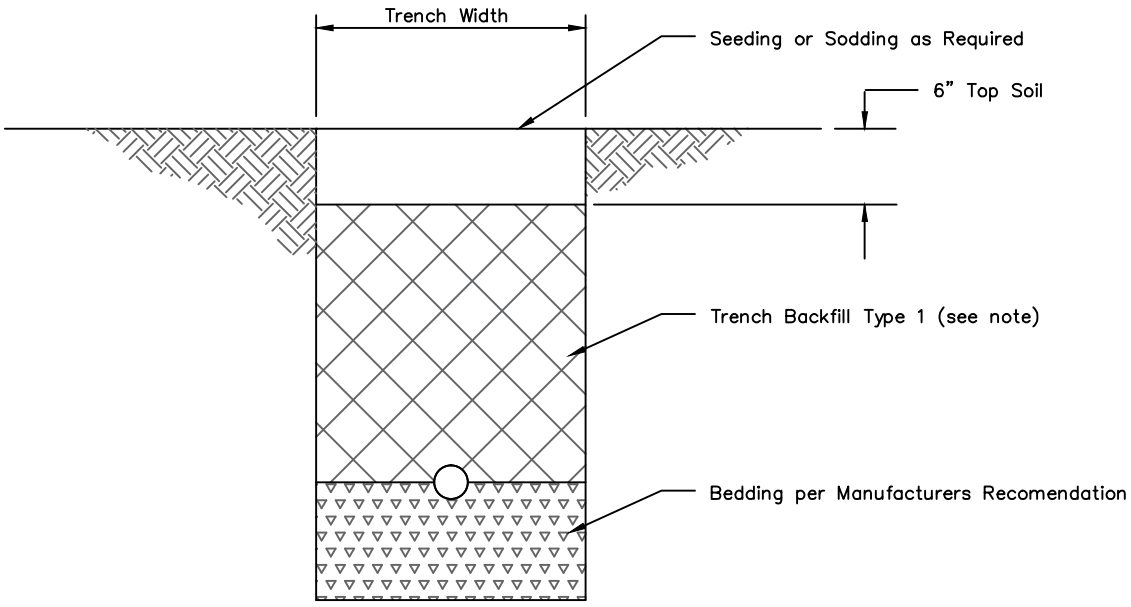
Blue Springs Missouri

STANDARD DETAILS

RIGHT OF WAY UTILITY LOCATIONS

REVISIONS			
NO.	DATE	BY	REMARKS

DRAWN BY:	PWC	DATE:	07-08-15
DETAIL NO.:	STR-09	SCALE:	NO SCALE
APPROVED BY:			



Note: Trench backfill (Type 1) shall be finely divided material free from debris and stones, compacted to 95% minimum density.

Typical Trench/ Bore Pit Backfill Detail

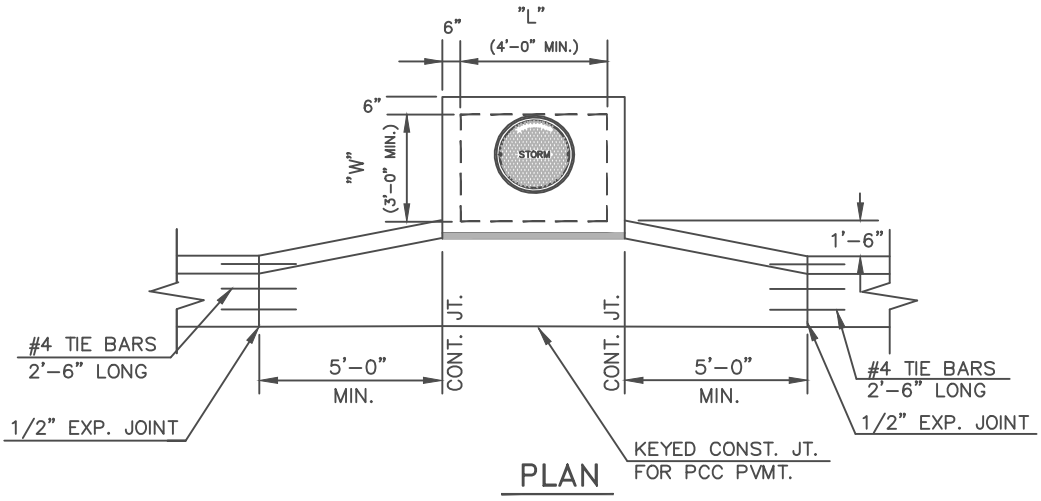
Blue Springs Missouri

STANDARD DETAILS

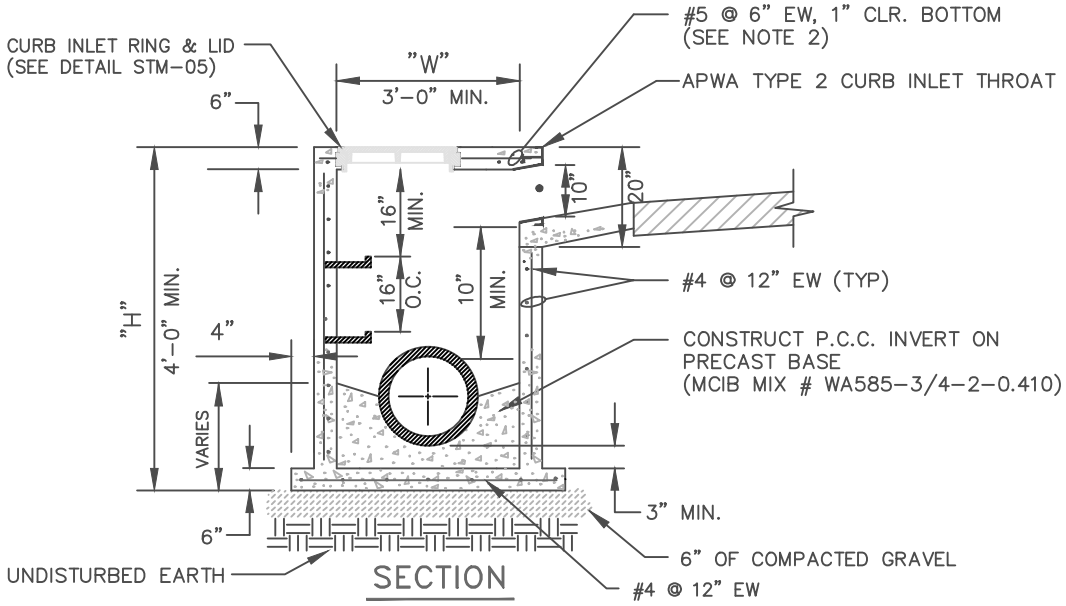
Typical Trench/ Bore Pit Backfill

REVISIONS			
NO.	DATE	BY	REMARKS

DRAWN BY:	PWC	DATE:	07-08-15
DETAIL NO.:	STR-10	SCALE:	NO SCALE
APPROVED BY:			



PLAN



SECTION

PRECAST CURB INLET

NOTES:
1. REMOVE LIFTING HOOKS FLUSH UPON PLACEMENT OF TOP SLAB AND GROUT AS NECESSARY TO REPAIR.
2. TOP SLAB REINFORCEMENT SHALL ALSO INCLUDE 2 #5 @ 4" DIAGONAL FOUR SIDES OF OPENING.
3. TOP SLAB SHALL BE SET @ 1/2" PER FOOT SLOPE (TYP) TO THE INLET THROAT. EXCEPTION: IF ANY PORTION OF THE TOP SLAB IS UTILIZED AS SIDEWALK, THE SLOPE SHALL MEET ADA CROSS SLOPE REQUIREMENTS (SEE DETAIL MIS-01).
4. INLET SHALL BE BACKFILLED TO WITHIN 1' OF FINISH GRADE USING KDOT AB-3 ROCK
5. ON-GRADE INLETS SHALL CONFORM TO STREET GRADE AND SUMP INLETS SHALL BE LEVEL.
6. INLET LOCATION SHALL NOT CONFLICT WITH ADA RAMPS OR CURB RETURNS.
7. RING & LID SHALL BE ALIGNED WITH STEPS.
8. TOP SLAB SHALL FIT TIGHTLY TO INLET. GAPS <3" SHALL BE GROUTED. GAPS 3" TO 5" SHALL BE BLOCKED AND GROUTED. GAPS >5" SHALL BE DOWELED, FORMED, POURED TO EXTEND.
9. ALL PRECAST SHALL HAVE A MINIMUM THICKNESS OF 6".

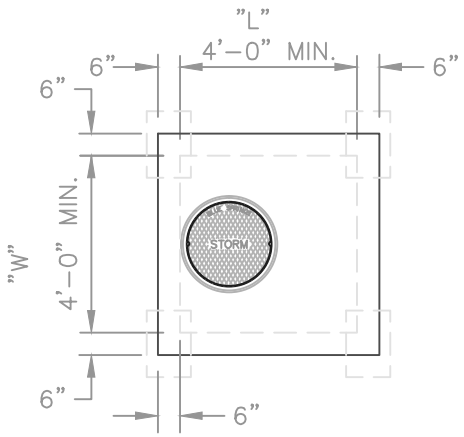
Blue Springs Missouri

STANDARD DETAILS

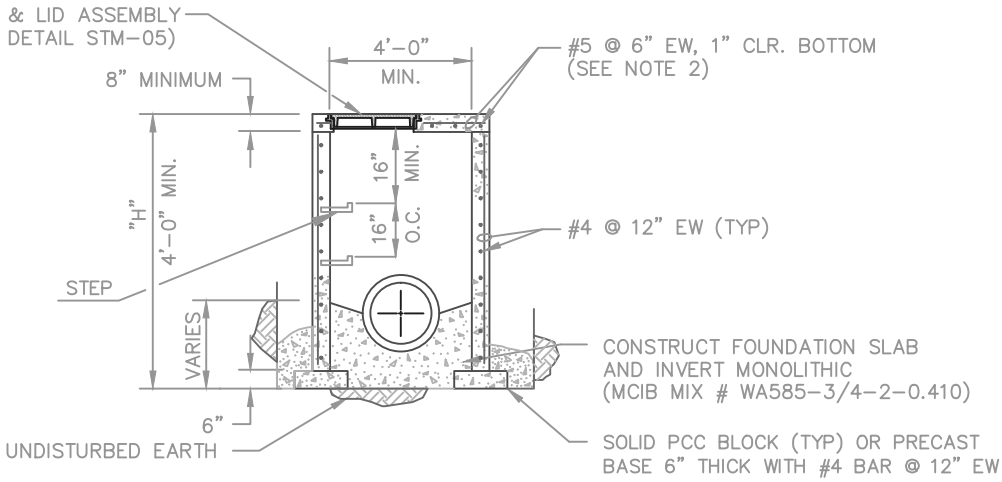
PRECAST CURB INLET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: DW	DATE: 2-3-93
DETAIL NO.: STM-01	SCALE: NO SCALE
APPROVED BY: SPJ	



PLAN



SECTION

PRECAST JUNCTION BOX DETAIL

NOTES:
1. REMOVE LIFTING HOOKS FLUSH UPON PLACEMENT OF TOP SLAB AND GROUT AS NECESSARY TO REPAIR.
2. TOP SLAB REINFORCEMENT SHALL ALSO INCLUDE 2 #5 @ 4" DIAGONAL FOUR SIDES OF OPENING.
3. TOP SLAB SHALL BE SET TO MATCH FINISHED GROUND LINE. EXCEPTION: IF ANY PORTION OF THE TOP SLAB IS UTILIZED AS SIDEWALK, THE SLOPE SHALL MEET ADA CROSS SLOPE REQUIREMENTS (SEE DETAIL MIS-01) AND SHALL INSTALL A FOOTING (SEE MIS-02).
4. JUNCTION BOX SHALL BE BACKFILLED TO WITHIN 1' OF FINISH GRADE USING KDOT AB-3 ROCK WITHIN THE RIGHT OF WAY.
5. JUNCTION BOX LOCATION SHALL NOT CONFLICT WITH ADA RAMPS OR CURB RETURNS.
6. RING & LID SHALL BE ALIGNED WITH STEPS.
7. TOP SLAB SHALL FIT TIGHTLY TO INLET. GAPS <3" SHALL BE GROUTED. GAPS 3" TO 5" SHALL BE BLOCKED AND GROUTED. GAPS >5" SHALL BE DOWELED, FORMED, POURED TO EXTEND.
8. PRECAST WALLS SHALL HAVE A MINIMUM THICKNESS OF 6" AND THE TOP SLAB SHALL HAVE A MINIMUM THICKNESS OF 8".

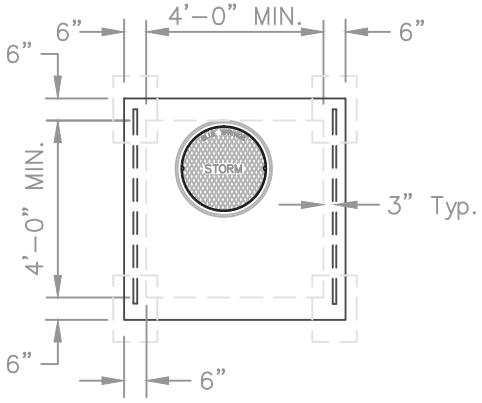
Blue Springs Missouri

STANDARD DETAILS

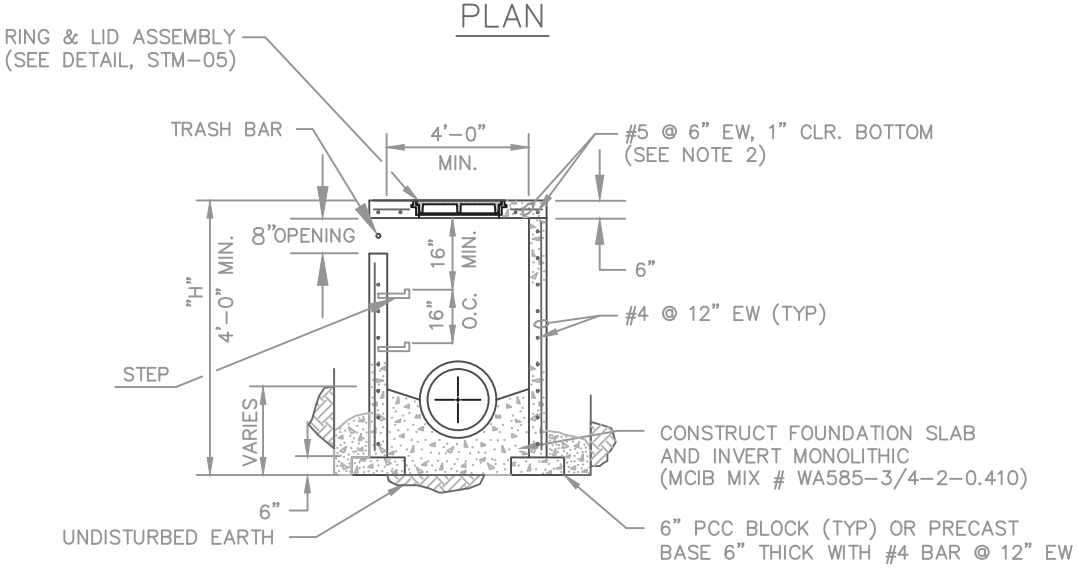
PRECAST JUNCTION BOX

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-11-93
DETAIL NO.:	STM-02	SCALE:	NO SCALE
APPROVED BY:			



PLAN



SECTION

PRECAST STANDARD AREA INLET DETAIL

NOTES:
1. REMOVE LIFTING HOOKS FLUSH UPON PLACEMENT OF TOP SLAB AND GROUT AS NECESSARY TO REPAIR.
2. TOP SLAB REINFORCEMENT SHALL ALSO INCLUDE 2 #5 @ 4" DIAGONAL FOUR SIDES OF OPENING.
3. TOP SLAB SHALL BE SET TO MATCH FINISHED GROUND LINE. EXCEPTION: IF ANY PORTION OF THE TOP SLAB IS UTILIZED AS SIDEWALK, THE SLOPE SHALL MEET ADA CROSS SLOPE REQUIREMENTS (SEE DETAIL MIS-01).
4. INLET SHALL BE BACKFILLED TO WITHIN 1' OF FINISH GRADE USING KDOT AB-3 ROCK WITHIN THE RIGHT OF WAY.
5. JUNCTION BOX LOCATION SHALL NOT CONFLICT WITH ADA RAMPS OR CURB RETURNS.
6. RING & LID SHALL BE ALIGNED WITH STEPS.
7. TOP SLAB SHALL FIT TIGHTLY TO INLET. GAPS <3" SHALL BE GROUTED. GAPS 3" TO 5" SHALL BE BLOCKED AND GROUTED. GAPS >5" SHALL BE DOWELED, FORMED, POURED TO EXTEND.
8. ALL PRECAST SHALL HAVE A MINIMUM THICKNESS OF 6".
9. TRASH BAR(S) SHALL BE 1" DIAMETER GALVINIZED ROD CENTERED IN EACH OPENING.
10. ENGINEER SHALL CLEARLY INDICATE FIELD OPENING LOCATION(S) ON THE PLANS AND CONTRACTOR SHALL ORIENT OPENING(S) AS SHOWN ON THE APPROVED PLANS.

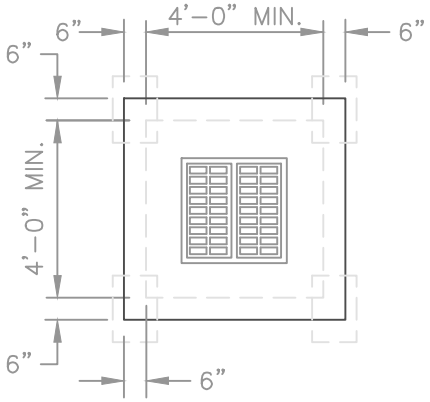
Blue Springs Missouri

STANDARD DETAILS

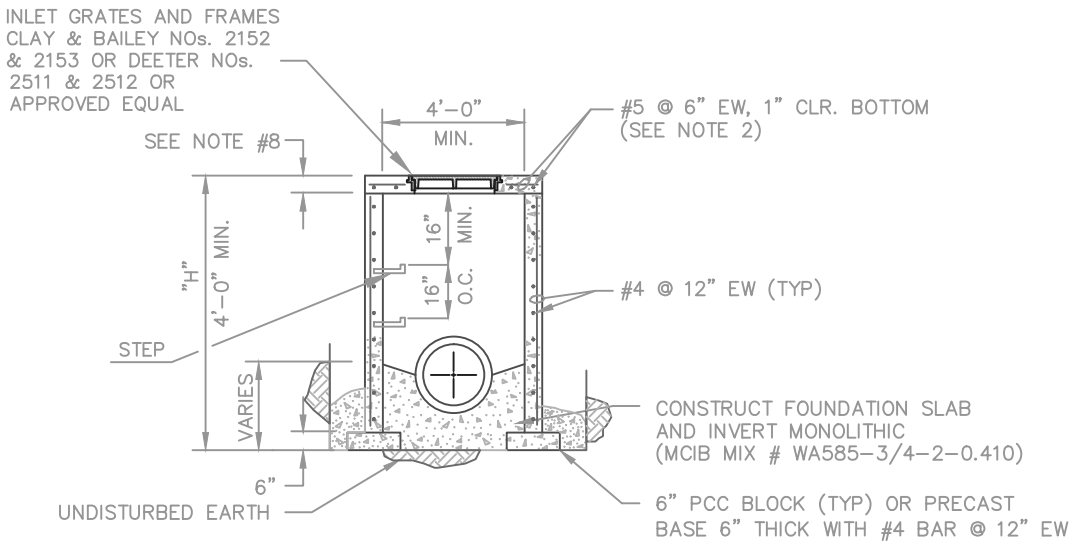
PRECAST STANDARD AREA INLET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: JOS	DATE: 2-12-93
DETAIL NO.: STM-03	SCALE: NO SCALE
APPROVED BY:	



PLAN



SECTION

PRECAST STANDARD GRATE INLET DETAIL

NOTES:
1. REMOVE LIFTING HOOKS FLUSH UPON PLACEMENT OF TOP SLAB AND GROUT AS NECESSARY TO REPAIR.
2. TOP SLAB REINFORCEMENT SHALL ALSO INCLUDE 2 #5 @ 4" DIAGONAL FOUR SIDES OF OPENING.
3. TOP SLAB SHALL BE SET TO MATCH FINISHED GROUND LINE. EXCEPTION: IF ANY PORTION OF THE TOP SLAB IS UTILIZED AS SIDEWALK, THE SLOPE SHALL MEET ADA CROSS SLOPE REQUIREMENTS (SEE DETAIL MIS-01).
4. INLET SHALL BE BACKFILLED TO WITHIN 1' OF FINISH GRADE USING KDOT AB-3 ROCK WITHIN THE RIGHT OF WAY.
5. GRATE INLET LOCATION SHALL NOT CONFLICT WITH ADA RAMPS OR CURB RETURNS.
6. NO RISERS ALLOWED. TOP SLAB MUST BE ADJUSTED TO MATCH FINISH GRADE.
7. TOP SLAB SHALL FIT TIGHTLY TO INLET. GAPS <3" SHALL BE GROUTED. GAPS 3" TO 5" SHALL BE BLOCKED AND GROUTED. GAPS >5" SHALL BE DOWELED, FORMED, POURED TO EXTEND.
8. ALL PRECAST SHALL HAVE A MINIMUM THICKNESS OF 6". EXCEPTION: TOP SLAB SHALL BE 8" THICK IN AREAS WITH VEHICULAR TRAFFIC.
9. WHEN INSTALLED IN PAVED AREAS, ALL GRATES MUST BE APPROVED FOR BICYCLE TRAFFIC AND ORIENTED PROPERLY PER MANUFACTURERS SPECIFICATIONS.

Blue Springs Missouri

STANDARD DETAILS

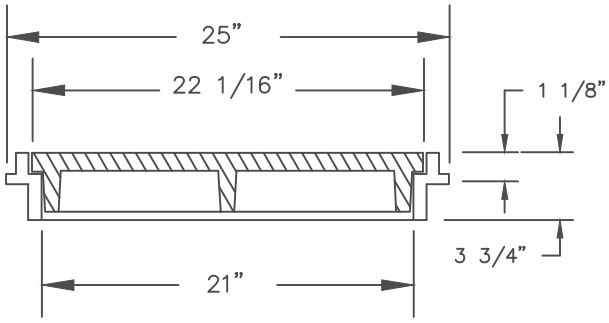
PRECAST STANDARD GRATE INLET

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	JOS	DATE:	2-12-93
DETAIL NO.:	STM-04	SCALE:	NO SCALE
APPROVED BY:			



APPROVED RING AND LID	
CLAY & BAILEY	2020
DEETER	2016
NEENAH	R–1537
GCI	SM 2100
EJ	1501A



NOTES: 1. MINIMUM LID WEIGHT IS 140 POUNDS.
2. ALL LETTERING ON THE LID FACE IS ONE INCH TALL.

STORM SEWER RING AND LID DETAIL

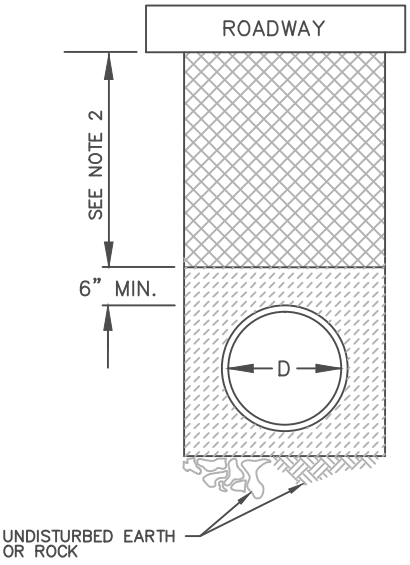
Blue Springs Missouri

STANDARD DETAILS

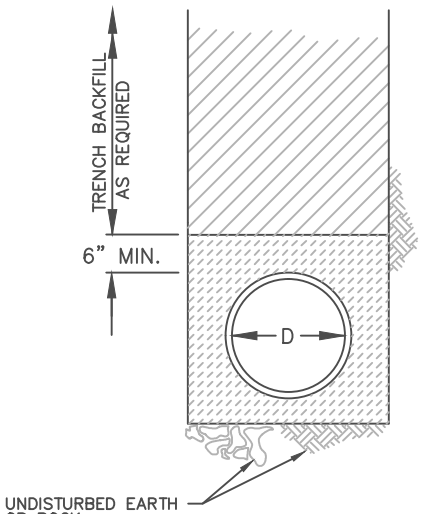
STORM SEWER RING & LID

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/14	CAY	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2–11–93
DETAIL NO.:	STM–05	SCALE:	NO SCALE
APPROVED BY:			



STORM SEWER EMBEDMENT BENEATH ROADWAY



RCP & HDPE PIPE EMBEDMENT

LEGEND	
D	NOMINAL PIPE DIAMETER
	TRENCH BACKFILL
	TAMPED GRANULAR BACKFILL (KDOT AB-3)
	GRANULAR BEDDING

MINIMUM PIPE CLEARANCES (IN)		
D	PIPE SIDE CLEARANCE[2] (SOIL/ROCK)	PIPE BOTTOM CLEARANCE (SOIL/ROCK)
0"-27"	6/6	4/6
30"-60"	8/9	6/9
66"-UP	12/12	8/12

STORM SEWER BEDDING MATERIAL GRADATION LIMITS (% PASSING)			
SIEVE SIZE	3/4"	1/2"	3/8"
1"	100		
3/4"	90-100	100	
1/2"		80-100	
3/8"	20-55	40-77	100
NO. 4	0-10	0-15	30-40
NO. 8	0-5	0-5	0-4

NOTES:
1. GRANULAR BEDDING SHALL MEET THE GRADATION REQUIREMENTS ON THE TABLE ABOVE. MATERIAL TO BE PLACED IN NOT MORE THAN 6" LAYERS AND COMPACTED BY SLICING WITH A SHOVEL OR BY VIBRATING.
2. TAMPED GRANULAR BACKFILL (KDOT AB-3) THIS MATERIAL SHALL BE USED FOR ALL EXISTING AND PROPOSED STREET CROSSINGS.
3. TRENCH BACKFILL SHALL BE FINELY DIVIDED MATERIAL FREE FROM DEBRIS AND STONES, COMPACTED TO 95% MAXIMUM DENSITY.

STORM SEWER EMBEDMENT DETAIL

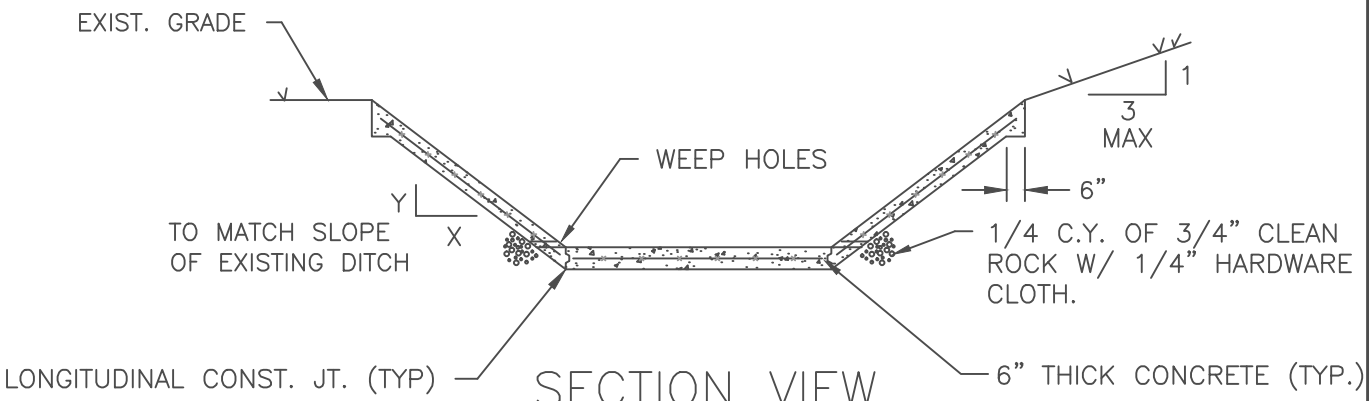
Blue Springs Missouri

STANDARD DETAILS

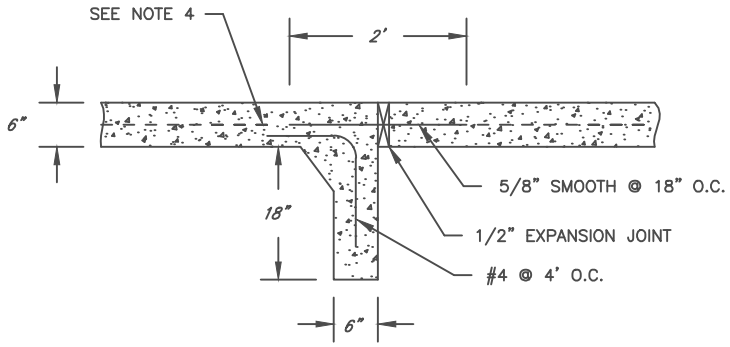
STORM SEWER EMBEDMENT

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

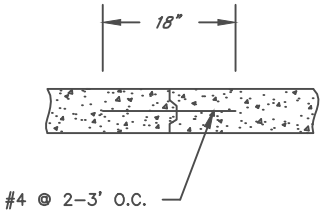
DRAWN BY:	SPJ	DATE:	2-11-93
DETAIL NO.:	STM-06	SCALE:	NO SCALE
APPROVED BY:			



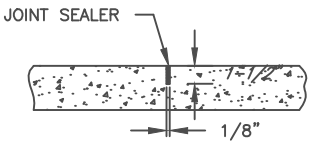
SECTION VIEW



EXPANSION JOINT



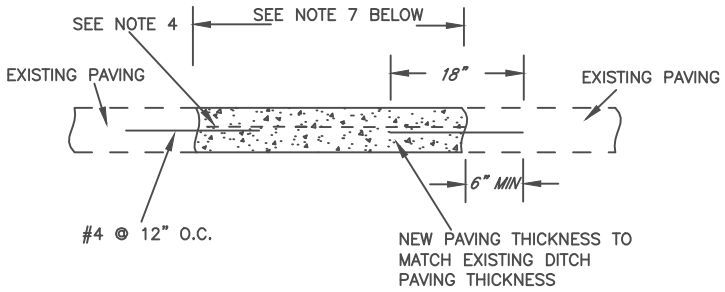
LONGITUDINAL CONST. JT.



CONTRACTION JOINT



TRANSVERSE CONST. JT.



DITCH REPAIR DETAIL

JOINT DETAILS

NOTES:

1. EXPANSION JOINTS SHALL BE PLACED WHERE DITCH LINER ABUTS ANOTHER STRUCTURE, AT 250' CTRS. MAXIMUM AND AT POINTS OF CURVATURE.
2. TRANSVERSE CONTRACTION JOINTS SHALL BE PLACED AT 15' INTERVALS. IF A POUR IS DELAYED OVER 30 MIN. A TRANSVERSE CONSTRUCTION JOINT SHALL BE SUBSTITUTED FOR A CONTRACTION JOINT AND EXCESS CONCRETE WASTED.
3. DITCH LINER CONSTRUCTION TO BE AS REQUIRED TO MATCH EXISTING DITCH THICKNESS
4. CONCRETE REINFORCEMENT TO BE 6"X6"-W3XW3 WELDED WIRE MESH.
5. 2" DIA. PLASTIC WEEP HOLES @ 30' CTRS. TO BE INSTALLED ON EACH SIDE OF DITCH LINING.
6. LONGITUDINAL CONTRACTION JOINTS SHALL BE PLACED AS SHOWN BUT NOT TO EXCEED 10' SPACING.
7. REMOVE DITCH TO NEAREST JOINT LINE AND RESTORE.

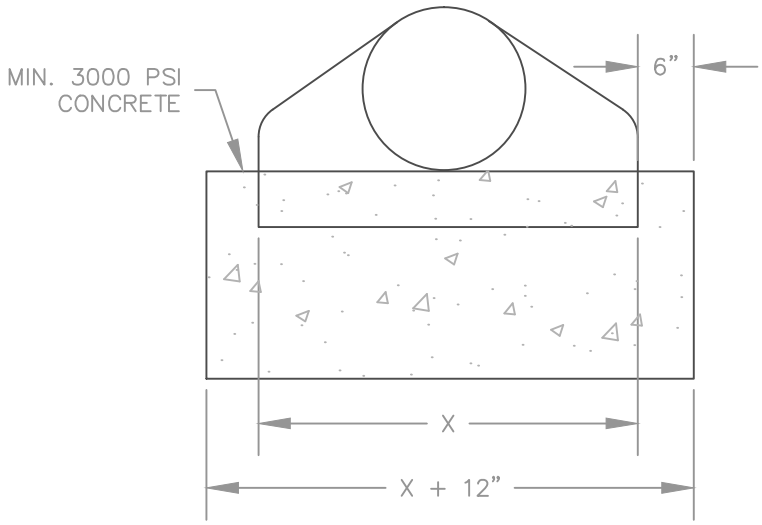
Blue Springs Missouri

STANDARD DETAILS

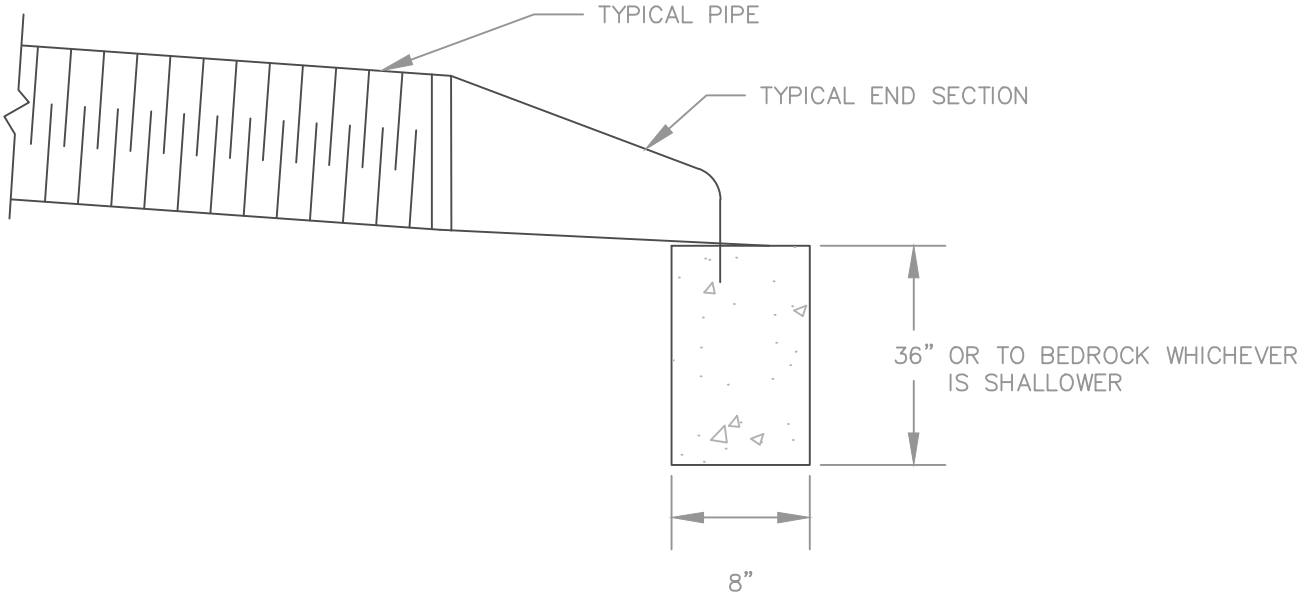
CONCRETE PAVED DITCH

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/06	CAY	GENERAL UPDATE

DRAWN BY:	JOS	DATE:	2-12-93
DETAIL NO.:	STM-07	SCALE:	NO SCALE
APPROVED BY:			



END VIEW



PLAN VIEW

TYPICAL TOE WALL DETAIL

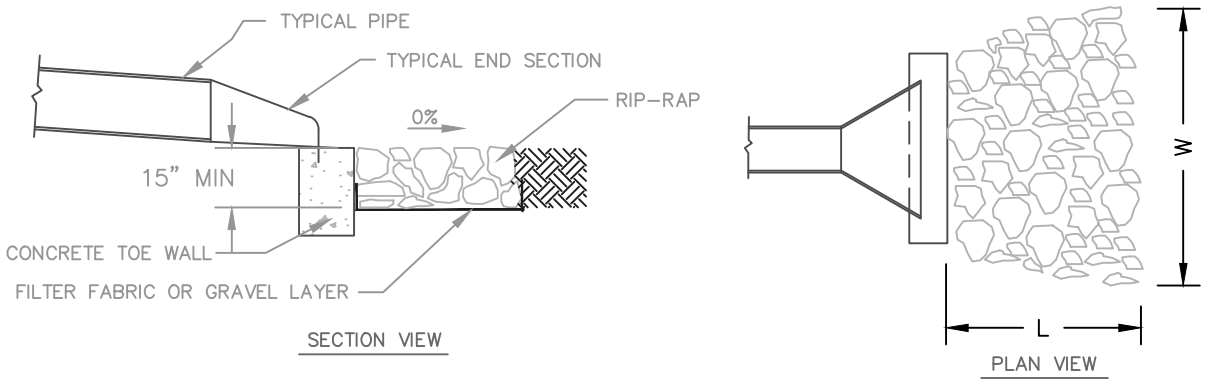
Blue Springs Missouri

STANDARD DETAILS

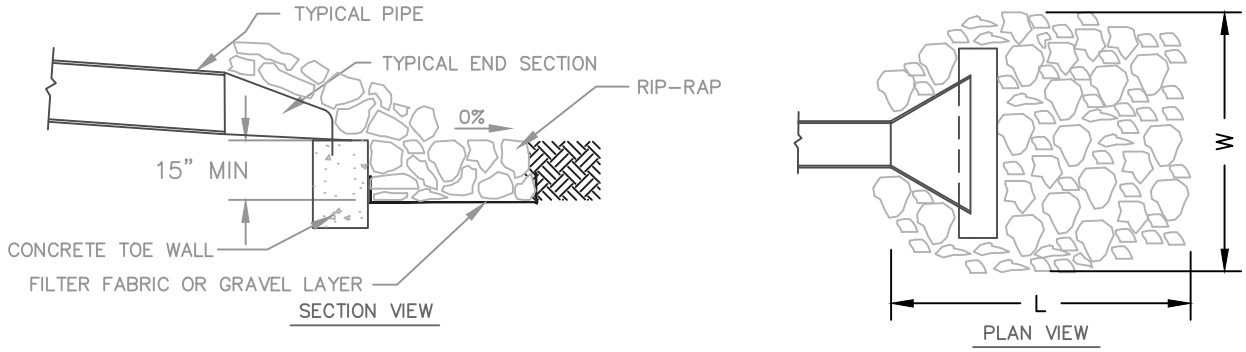
TYPICAL TOE WALL

REVISIONS			
NO.	DATE	BY	REMARKS

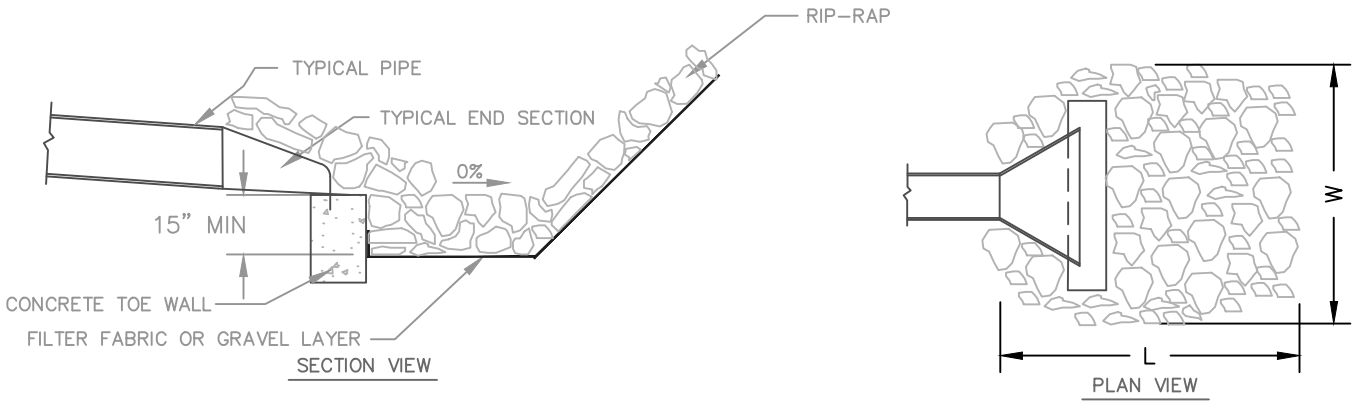
DRAWN BY: PWC	DATE: 09/29/98
DETAIL NO.: STM-08	SCALE: NO SCALE
APPROVED BY:	



PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL



PIPE OUTLET LINEAL TO A WELL DEFINED CHANNEL



PIPE OUTLET PERPENDICULAR TO A WELL DEFINED CHANNEL

NOTES:
1. L & W AS DETERMINED BY ENGINEER.
2. ALL RIP-RAP SHALL BE GROUTED.
3. ALL RIP-RAP SHALL BE SIZED BY AN ENGINEER.

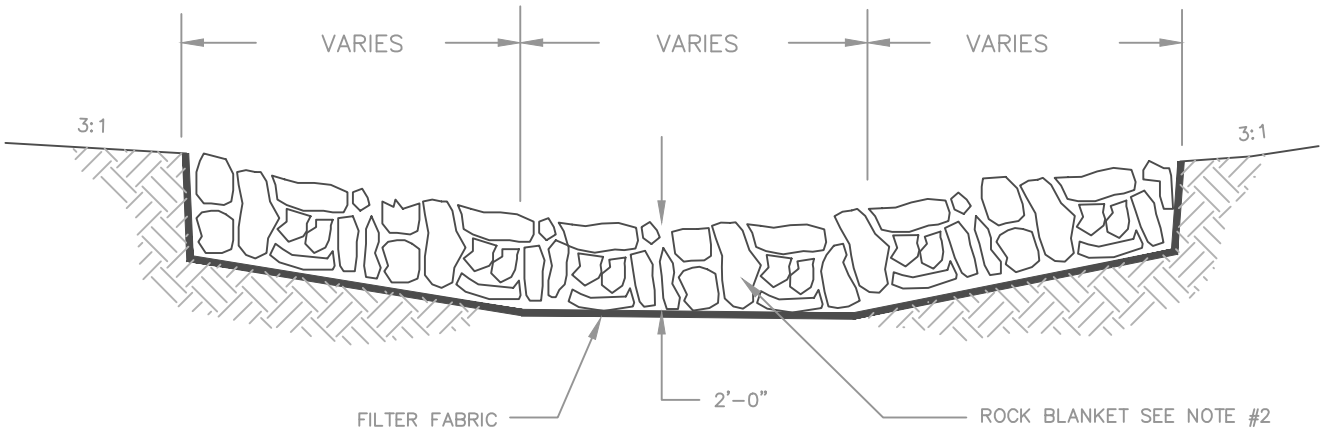
Blue Springs Missouri

STANDARD DETAILS

PIPE OUTLET RIP-RAP

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/06	CAY	GENERAL UPDATE
2	01/14	BM	GENERAL UPDATE

DRAWN BY: PWC	DATE: 03/08/99
DETAIL NO.: STM-09	SCALE: NO SCALE
APPROVED BY:	



NOTES: 1. LENGTH AND WIDTH AS DETERMINED BY ENGINEER.
2. ALL RIP-RAP SHALL BE SIZED BY AN ENGINEER.
3. ALL RIP-RAP SHALL BE GROUTED.

RIP-RAP DITCH - TYPICAL SECTION

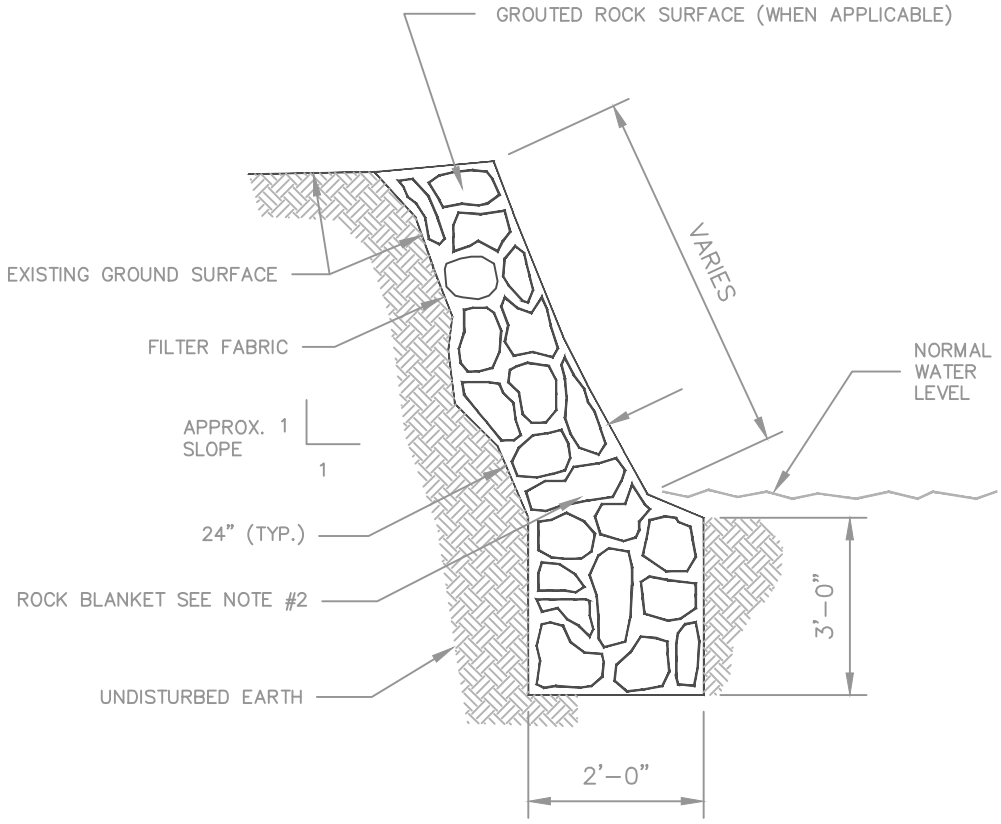
Blue Springs Missouri

STANDARD DETAILS

TYPICAL RIP-RAP DITCH

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	10/02/98
DETAIL NO.:	STM-10	SCALE:	NO SCALE
APPROVED BY:			



NOTES: 1. LENGTH AND WIDTH AS DETERMINED BY ENGINEER.
2. ALL RIP-RAP SHALL BE SIZED BY AN ENGINEER.

CREEK BANK STABILIZATION DETAIL

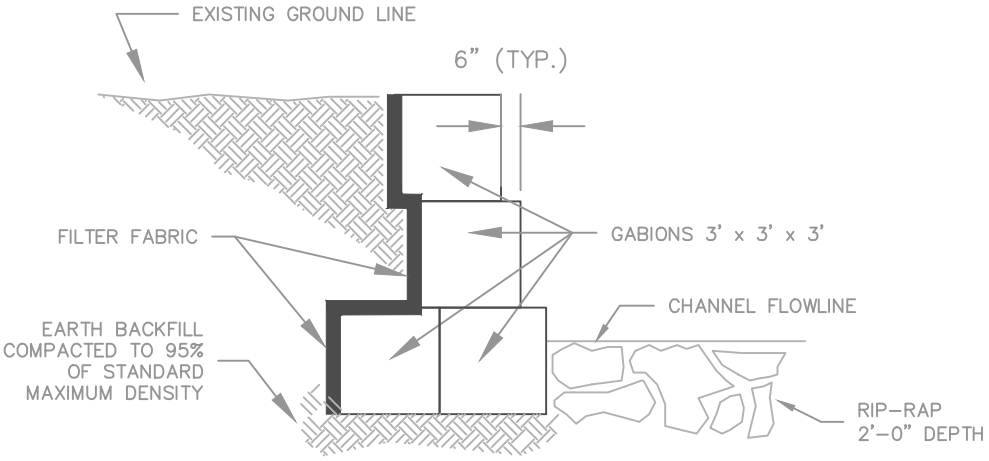
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STANDARD DETAILS

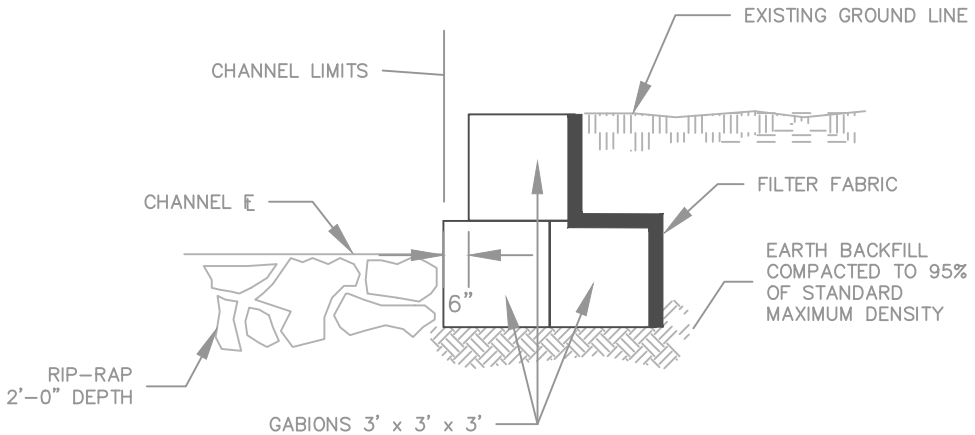
CREEK BANK STABILIZATION

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09-22-98
DETAIL NO.:	STM-11	SCALE:	NO SCALE
APPROVED BY:			



TYPE 1 GABION PLACEMENT



NOTE: SHALL BE DESIGNED BY AN ENGINEER.

TYPE 2 GABION PLACEMENT

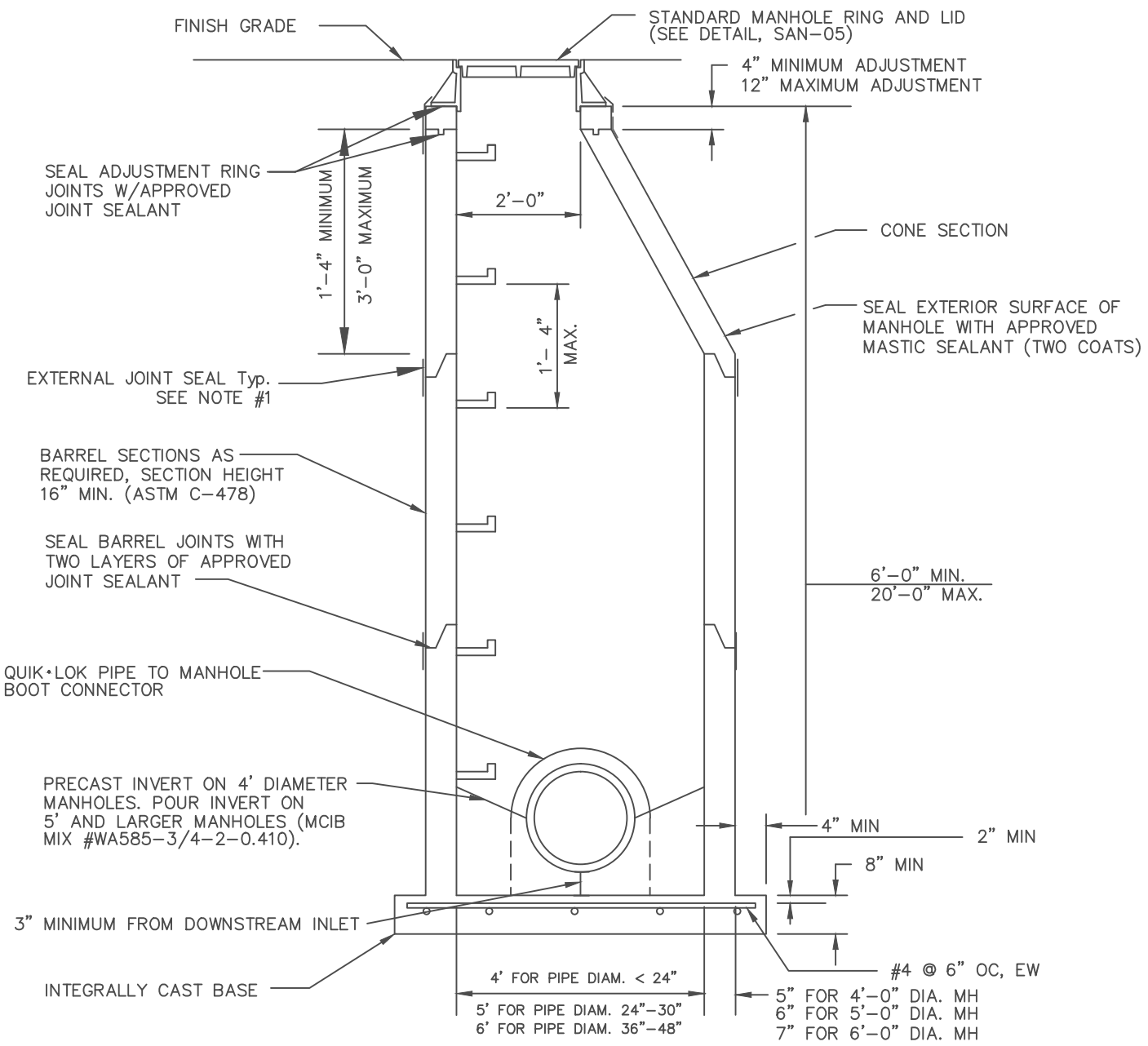
Blue Springs Missouri

STANDARD DETAILS

GABION PLACEMENT

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE

DRAWN BY: PWC	DATE: 09/15/98
DETAIL NO.: STM-12	SCALE: NO SCALE
APPROVED BY:	



STANDARD PRECAST MANHOLE

NOTES;
1. ALL CONCRETE JOINTS, INCLUDING ADJUSTMENT RING(S), SHALL HAVE CONSEAL CS–212 OR INFI–SHIELD 6" GATOR WRAP INSTALLED OR APPROVED EQUAL.
2. ALL MANHOLES SHALL BE VACUUM TESTED.
3. BASE TO BE SET ON 6" OF COMPACTED GRANULAR MATERIAL.
4. MANHOLE ADJUSTING RINGS IN PAVEMENT SHALL BE 4 OR 6 INCHES THICK AND BE EAST JORDAN IRON WORKS INFRA–RISER® RUBBER COMPOSITE OR APPROVED EQUAL. FOR NON PAVEMENT APPLICATION USE LADTECH HDPE OR APPROVED EQUAL.
5. ALL CONCRETE SHALL BE CORROSION RESISTANT USING CONSHIELD ANTIMICROBIAL ADDITIVE WITH CONTINT COLORANT ADDED.

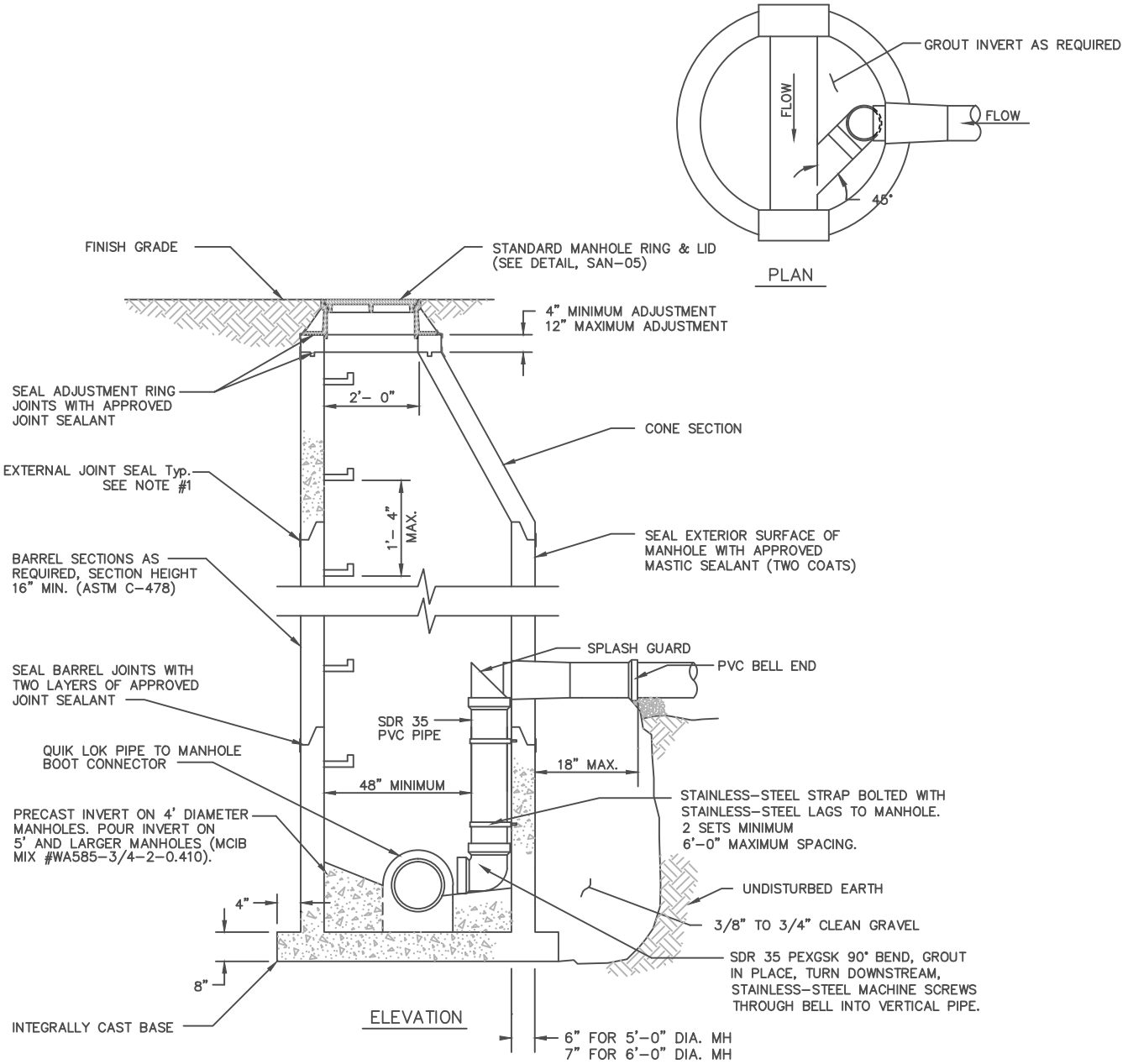
Blue Springs Missouri

STANDARD DETAILS

PRECAST SEWER MANHOLE

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1–26–93
DETAIL NO.:	SAN–01	SCALE:	NO SCALE
APPROVED BY:			



STANDARD DROP MANHOLE

NOTES;
1. ALL CONCRETE JOINTS, INCLUDING ADJUSTMENT RING(S), SHALL HAVE CONSEAL CS-212 OR INFI-SHIELD 6" GATOR WRAP INSTALLED OR APPROVED EQUAL.
2. ALL MANHOLES SHALL BE VACUUM TESTED.
3. BASE TO BE SET ON 6" OF COMPACTED GRANULAR MATERIAL.
4. MANHOLE ADJUSTING RINGS IN PAVEMENT SHALL BE 4 OR 6 INCHES THICK AND BE EAST JORDAN IRON WORKS INFRA-RISER® RUBBER COMPOSITE OR APPROVED EQUAL. FOR NON PAVEMENT APPLICATION USE LADTECH HDPE OR APPROVED EQUAL.
5. ALL CONCRETE SHALL BE CORROSION RESISTANT USING CONSHIELD ANTIMICROBIAL ADDITIVE WITH CONTINT COLORANT ADDED.

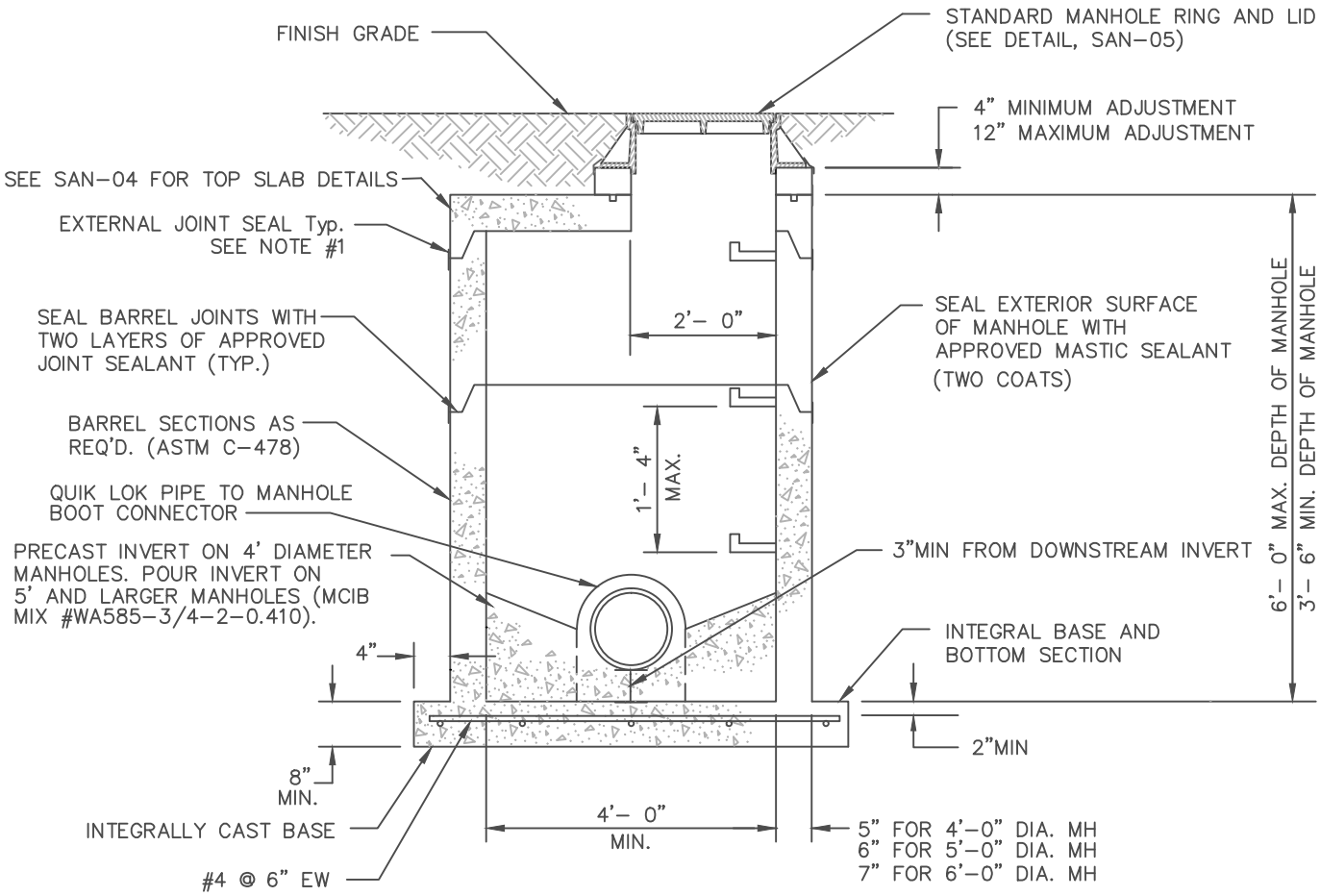
Blue Springs Missouri

STANDARD DETAILS

DROP SEWER MANHOLE

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/06	CAY	GENERAL UPDATE
2	01/14	BM	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1-26-93
DETAIL NO.:	SAN-02	SCALE:	NO SCALE
APPROVED BY:			



STANDARD SHALLOW MANHOLE

NOTES;
1. ALL CONCRETE JOINTS, INCLUDING ADJUSTMENT RING(S), SHALL HAVE CONSEAL CS–212 OR INFI–SHIELD 6" GATOR WRAP INSTALLED OR APPROVED EQUAL.
2. ALL MANHOLES SHALL BE VACUUM TESTED.
3. BASE TO BE SET ON 6" OF COMPACTED GRANULAR MATERIAL.
4. MANHOLE ADJUSTING RINGS IN PAVEMENT SHALL BE 4 OR 6 INCHES THICK AND BE EAST JORDAN IRON WORKS INFRA–RISER RUBBER COMPOSITE OR APPROVED EQUAL. FOR NON PAVEMENT APPLICATION USE LADTECH HDPE OR APPROVED EQUAL.
5. ALL CONCRETE SHALL BE CORROSION RESISTANT USING CONSHIELD ANTIMICROBIAL ADDITIVE WITH CONTINT COLORANT ADDED.

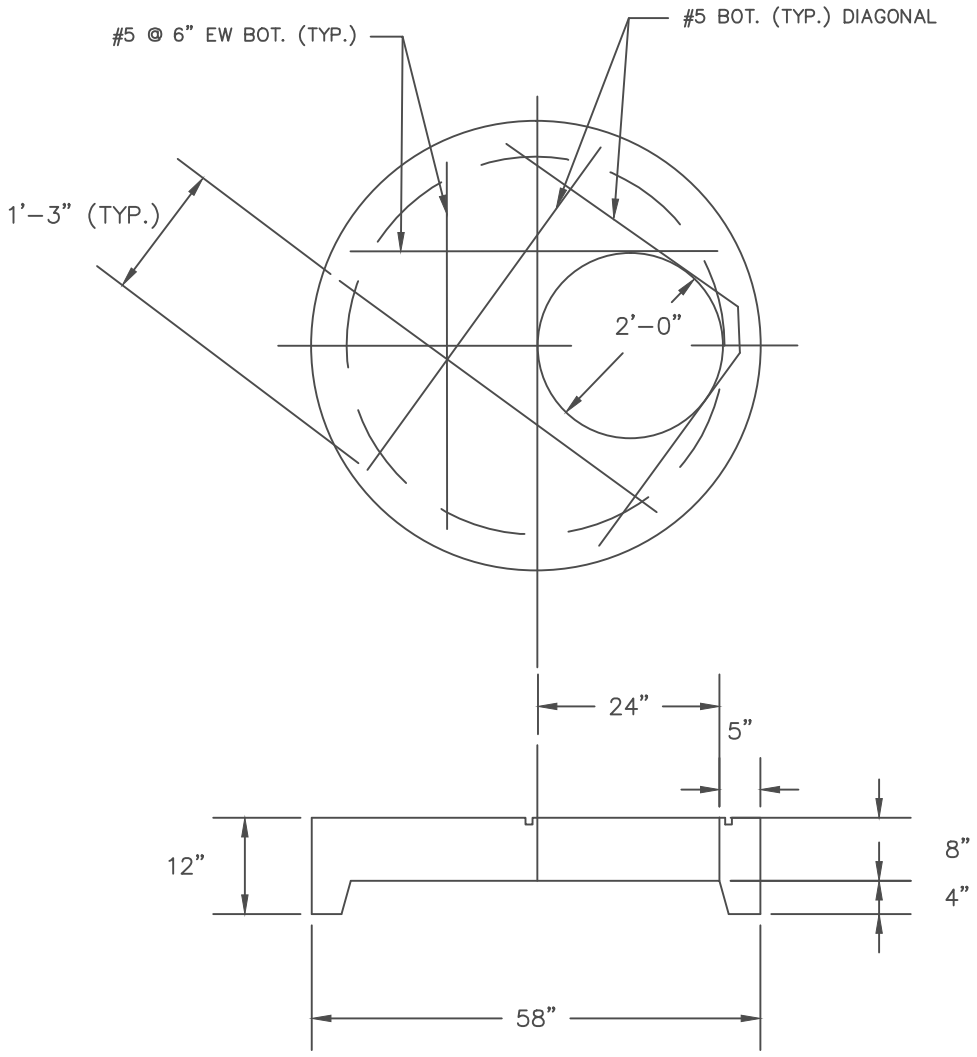
Blue Springs Missouri

STANDARD DETAILS

SHALLOW SEWER MANHOLE

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1–26–93
DETAIL NO.:	SAN–03	SCALE:	NO SCALE
APPROVED BY:			



TOP SLAB FOR 48" STANDARD PRECAST SHALLOW SEWER MANHOLE DETAIL

NOTE: ALL CONCRETE SHALL BE CORROSION RESISTANT USING CONSHIELD ANTIMICROBIAL ADDITIVE WITH CONTINT COLORANT ADDED.

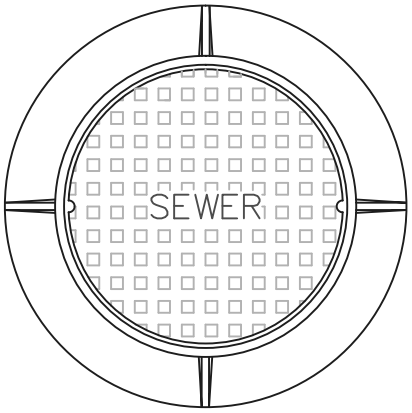
Blue Springs Missouri

STANDARD DETAILS

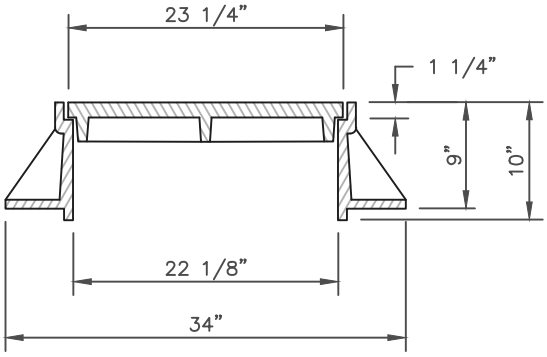
SHALLOW MANHOLE TOP SLAB

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09/25/98
DETAIL NO.:	SAN-04	SCALE:	NO SCALE
APPROVED BY:			



APPROVED RING AND LID	
CLAY & BAILEY	2008
DEETER	1315
NEENAH	R-1736
CLAY & BAILEY	2014
GCI	2205
EJ	V1383



NOTE: MINIMUM LID WEIGHT = 135 lb

MANHOLE RING AND LID DETAIL

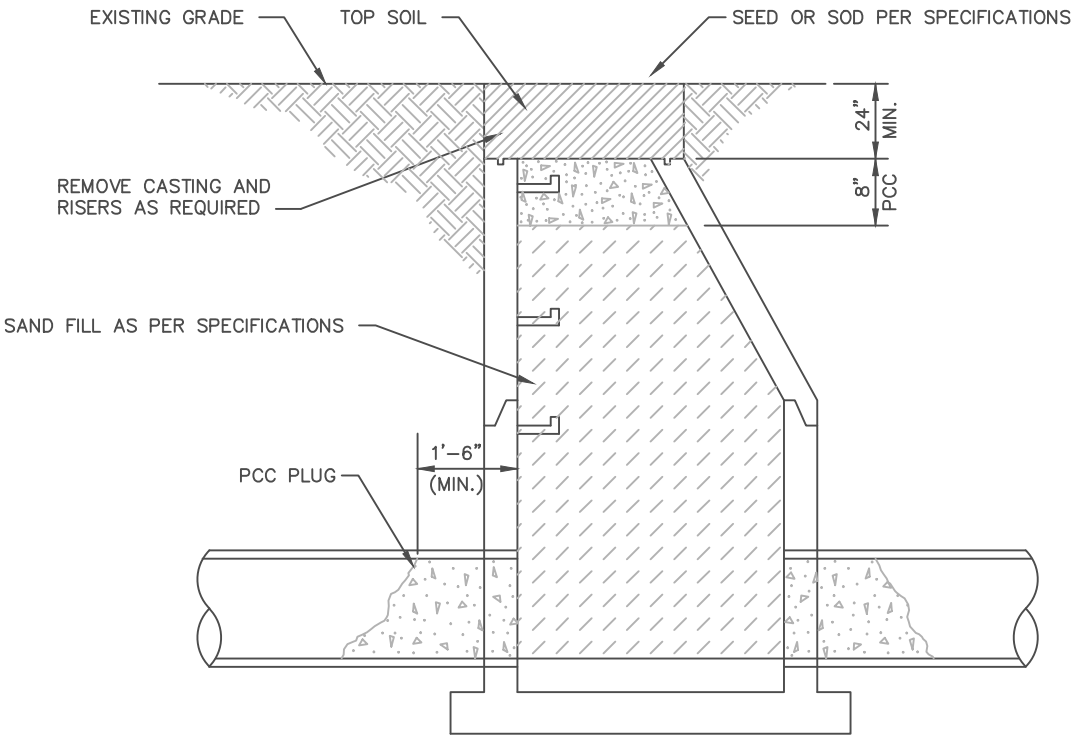
Blue Springs Missouri

STANDARD DETAILS

SANITARY SEWER RING & LID

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1-22-93
DETAIL NO.:	SAN-05	SCALE:	NO SCALE
APPROVED BY:			



MANHOLE ABANDONMENT DETAIL

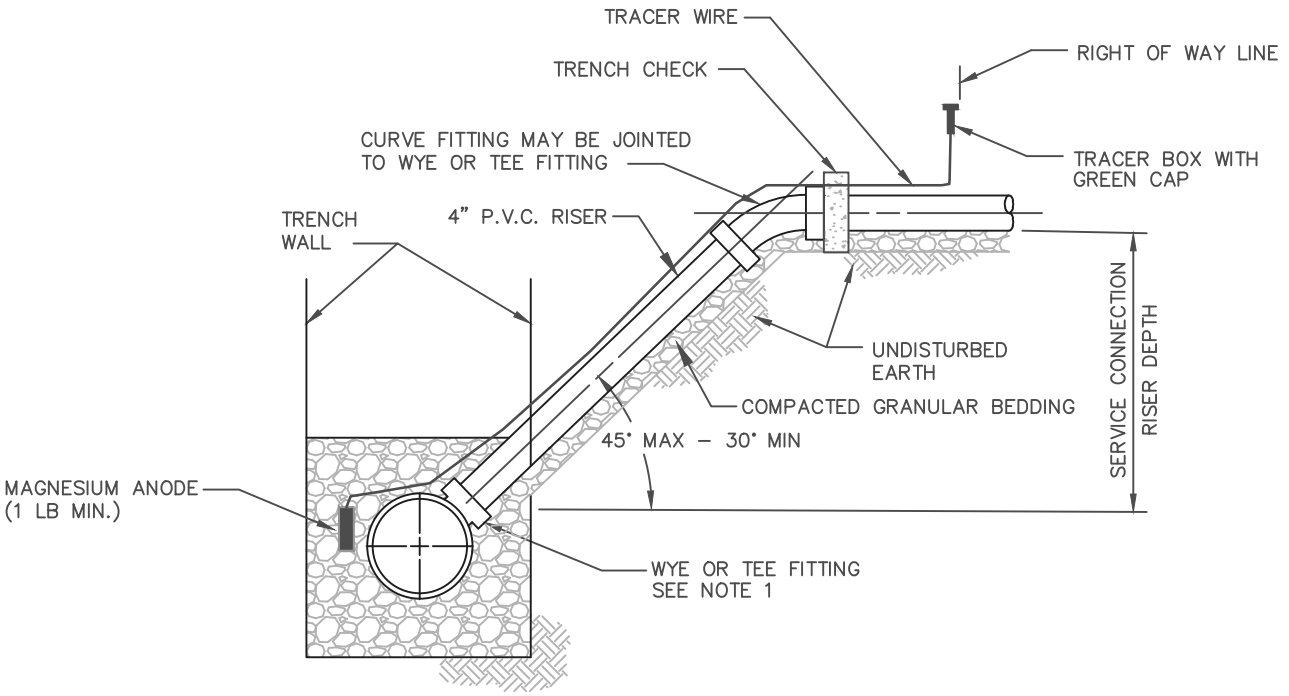
Blue Springs Missouri

STANDARD DETAILS

MANHOLE ABANDONMENT

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	1-22-93
DETAIL NO.:	SAN-06	SCALE:	NO SCALE
APPROVED BY:			



SEWER SERVICE CONNECTION DETAIL

NOTES:
1. WHEN THREE OR MORE SEWER SERVICE CONNECTIONS ARE NEEDED WITHIN A TWENTY FOOT SECTION OF SEWER MAIN, INSERTA–TEE BRAND CONNECTORS OR APPROVED EQUAL MUST BE USED WITH 2' SPACING MINIMUM. NO CONNECTIONS ALLOWED WITHIN 2' OF THE PIPE JOINT.
2. SEWER SERVICE LINE SHALL BE CONSTRUCTED OF SDR 26 PVC PIPE AND HAVE A SLOPE OF AT LEAST 2%.
3. SEWER SERVICE LINE SHALL EXTEND TO 10' BEYOND THE RIGHT OF WAY OR EASEMENT LINE FOR NEW CONSTRUCTION.
4. ALL NEW CONSTRUCTION OF SEWER STUBS AND TRACER BOXES SHALL BE TEMPORARILY MARKED WITH A MARKING STAKE, 48" ABOVE GRADE AND PAINTED GREEN.
5. IMPERVIOUS TRENCH CHECKS SHALL BE PLACED ON BUILDING SEWER STUBS (AT LEAST 5' AWAY FROM THE SANITARY MAIN). TRENCH CHECKS SHALL EXTEND 6" BELOW THE BOTTOM OF THE PIPE. LENGTH SHALL BE A MINIMUM OF 12". THE HEIGHT OF THE TRENCH CHECK SHALL EXTEND 12" ABOVE THE TOP OF THE PIPE. THE WIDTH OF THE TRENCH CHECK SHALL BE THE WIDTH OF THE TRENCH.
6. TRACER WIRE IS REQUIRED ON ALL SANITARY SERVICE LINES FROM THE SEWER MAIN TO THE RIGHT OF WAY LINE. TRACER WIRE SHALL BE COPPERHEAD REINFORCED TRACER WIRE, #12 AWG, WITH APWA GREEN COLORED INSULATION OR APPROVED EQUAL. TRACER WIRE CAN BE SPLICED USING COPPERHEAD SNAKEBITE TWIST LOCK LSC CONNECTORS. TRACER WIRE SHALL BE TAPED TO THE TOP OF THE SEWER SERVICE STUB WITH PLASTIC TAPE EVERY 5'
7. COPPERHEAD SNAKBITE TRACER BOXES SHALL BE USED OR APPROVED EQUAL. TRACER BOX SHALL BE COLOR CODED APWA GREEN. TRACER BOX SHALL BE FLUSH WITH FINISH GRADE, DIRECTLY OVER THE SANITARY SEWER STUB AT THE RIGHT OF WAY LINE.

BREAK–IN SEWER CONNECTIONS ONLY:

1. ARE ONLY ALLOWED WITH PRIOR APPROVAL FROM THE CITY OF BLUE SPRINGS PUBLIC WORKS DEPARTMENT (816)228–0195.
2. MUST USE INSERTA TEE BRAND CONNECTOR INSTALLED USING MANUFACTURERS SPECIFICATIONS OR APPROVED EQUAL.
3. SHALL BE INSPECTED BY PUBLIC WORKS PRIOR TO BACKFILLING.

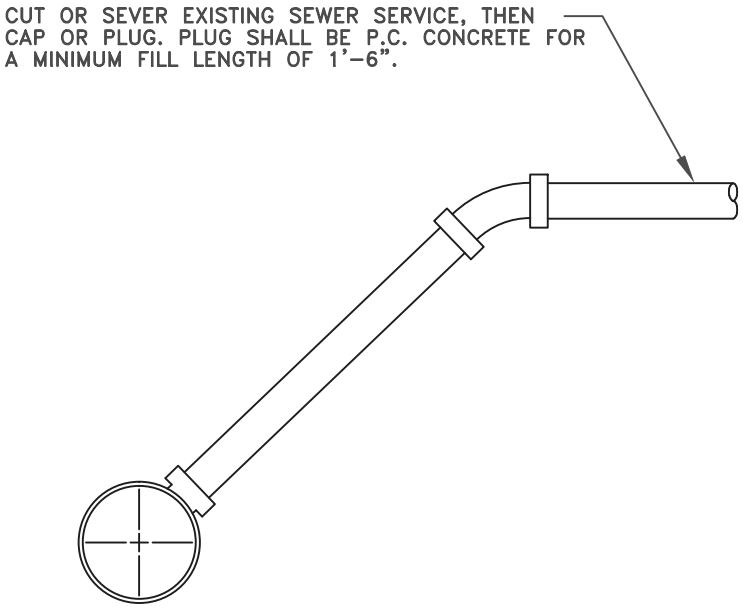
Blue Springs Missouri

STANDARD DETAILS

SANITARY SEWER SERVICE

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	10–12–92
DETAIL NO.:	SAN–07	SCALE:	NO SCALE
APPROVED BY:			



SANITARY SEWER SERVICE DEMOLITION

NOTE: CONTACT BLUE SPRINGS PUBLIC WORKS AT (816)228-0195 BEFORE PERFORMING DISCONNECTION.

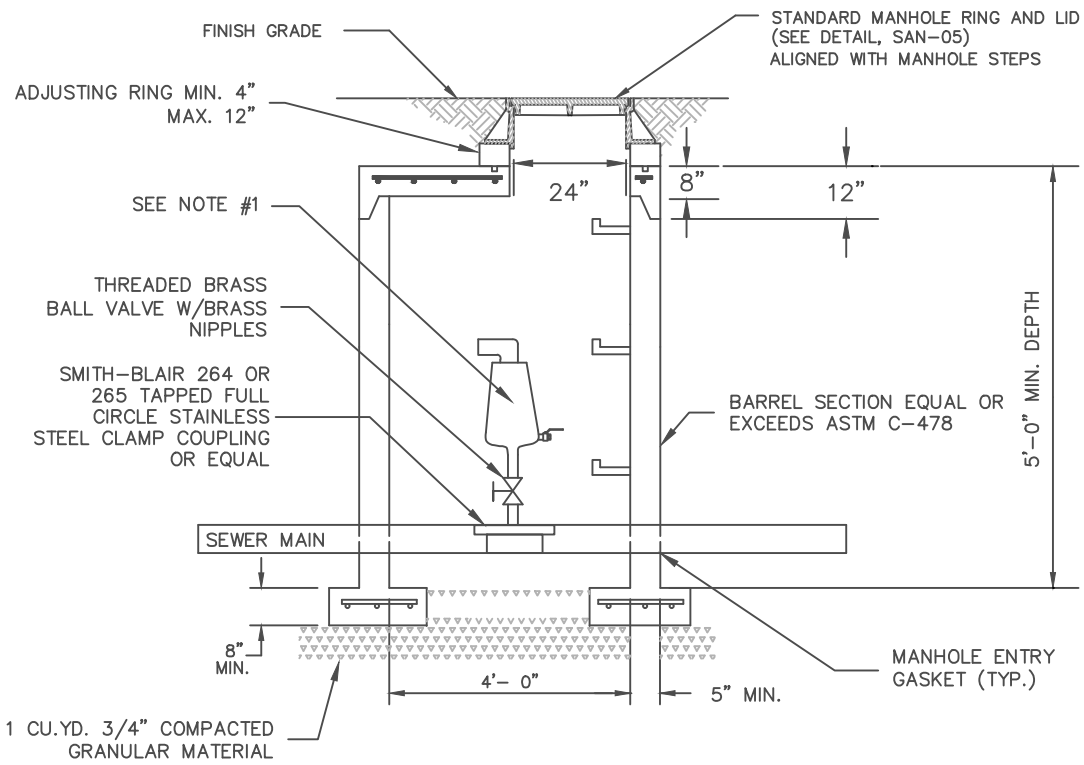
Blue Springs Missouri

STANDARD DETAILS

SEWER SERVICE DEMOLITION

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	12-17-93
DETAIL NO.:	SAN-08	SCALE:	NO SCALE
APPROVED BY:			



SEWER COMBINATION AIR/VACUUM ASSEMBLY

NOTES:

1. COMBINATION AIR & VACUUM VALVE ASSEMBLY – A.R.I. D-025 FOR 150 PSI AND BELOW, A.R.I. D-020 ABOVE 150 PSI, OR NSF RATED APPROVED EQUAL.
2. VAULT SHALL BE STANDARD PRECAST SHALLOW TYPE MANHOLE, SEE SAN-03.
3. MANHOLE ADJUSTING RINGS SHALL BE CONCRETE FOR PAVEMENT APPLICATIONS. FOR NON PAVEMENT APPLICATIONS USE LADTECH HDPE OR APPROVED EQUAL.
4. ALL CONCRETE SHALL BE CORROSION RESISTANT USING CONSHIELD ANTIMICROBIAL ADDITIVE WITH CONTINT COLORANT ADDED.

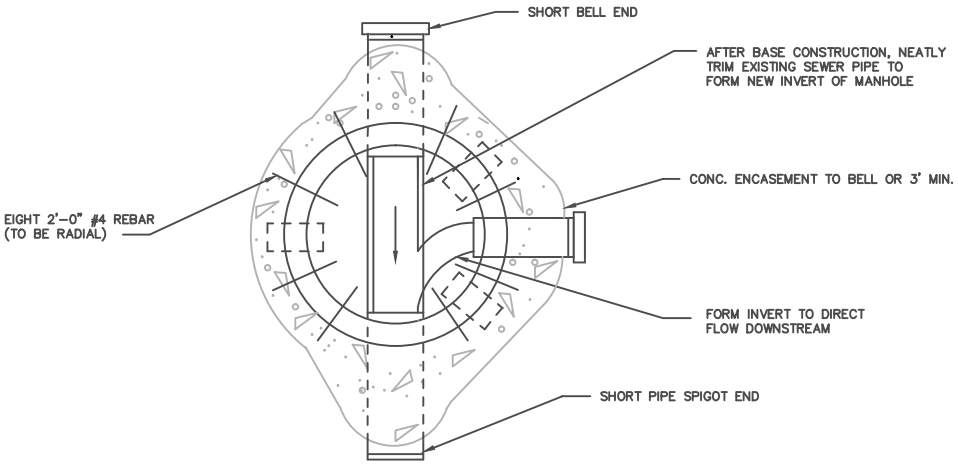
Blue Springs Missouri

STANDARD DETAILS

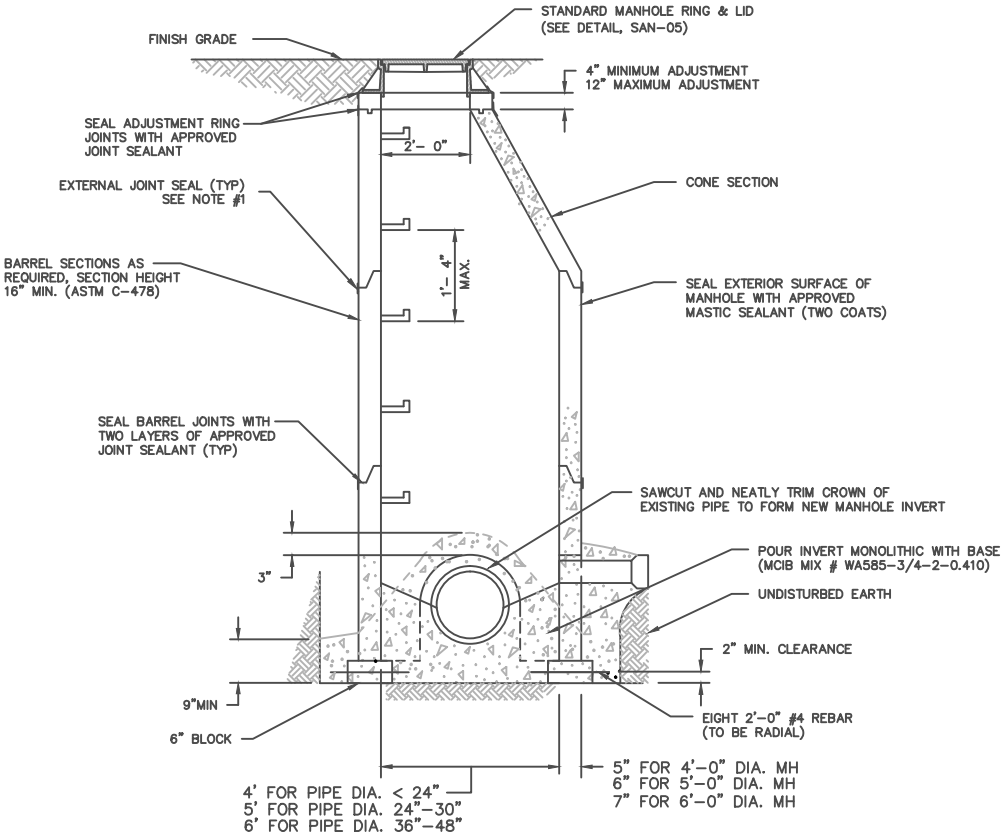
AIR & VACUUM VALVE ASSEMBLY

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	03/30/06
DETAIL NO.:	SAN-09	SCALE:	NO SCALE
APPROVED BY:			



PLAN VIEW



STANDARD PRECAST MANHOLE-EXISTING SEWER

NOTES;
1. ALL CONCRETE JOINTS, INCLUDING ADJUSTMENT RING(S), SHALL HAVE CONSEAL CS-212 OR INFI-SHIELD 6" GATOR WRAP INSTALLED OR APPROVED EQUAL.
2. ALLOW CONCRETE BASE TO CURE 5 HOURS MINIMUM PRIOR TO BACKFILL.
3. BASE TO BE SET ON 6" OF COMPACTED GRANULAR MATERIAL.
4. MANHOLE ADJUSTING RINGS IN PAVEMENT SHALL BE 4 OR 6 INCHES THICK AND BE EAST JORDAN IRON WORKS INFRA-RISER RUBBER COMPOSITE OR APPROVED EQUAL. FOR NON PAVEMENT APPLICATIONS USE LADTECH HDPE OR APPROVED EQUAL.
5. ALL PRECAST CONCRETE SHALL BE CORROSION RESISTANT USING CONSHIELD ANTIMICROBIAL ADDITIVE WITH CONTINT COLORANT ADDED.

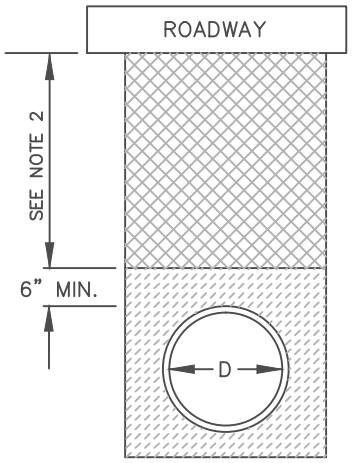
Blue Springs Missouri

STANDARD DETAILS

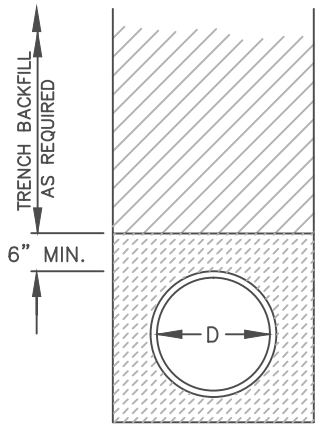
MANHOLE @ EXIST. SAN. SEW.

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-3-93
DETAIL NO.:	SAN-10	SCALE:	NO SCALE
APPROVED BY:			



SANITARY SEWER EMBEDMENT BENEATH ROADWAY



TYPICAL SANITARY SEWER EMBEDMENT

LEGEND	
D	NOMINAL PIPE DIAMETER
	TRENCH BACKFILL
	TAMPED GRANULAR BACKFILL (KDOT AB-3)
	GRANULAR BEDDING

MINIMUM PIPE CLEARANCES (IN)		
D	PIPE SIDE CLEARANCE[2] (SOIL/ROCK)	PIPE BOTTOM CLEARANCE (SOIL/ROCK)
0"-18"	6/6	6/6
21"-30"	8/9	6/9

SANITARY SEWER BEDDING GRADATION LIMITS (% PASSING)	
SIEVE SIZE	3/4"
1"	100
3/4"	90-100
3/8"	20-55
NO. 4	0-5
NO. 8	0-2

NOTES: 1. GRANULAR BEDDING SHALL MEET THE GRADATION REQUIREMENTS OF THE TABLE ABOVE. MATERIAL TO BE PLACED IN NOT MORE THAN 6" LAYERS AND COMPACTED BY SLICING WITH A SHOVEL OR BY VIBRATING.

2. TAMPED GRANULAR BACKFILL (KDOT AB-3) THIS MATERIAL SHALL BE USED FOR ALL EXISTING AND PROPOSED STREET CROSSINGS FOR MAIN AND SERVICE LATERAL CONSTRUCTION.

3. TRENCH BACKFILL SHALL BE FINELY DIVIDED MATERIAL FREE FROM DEBRIS AND STONES, COMPACTED TO 95% MAXIMUM DENSITY.

SANITARY SEWER EMBEDMENT DETAILS

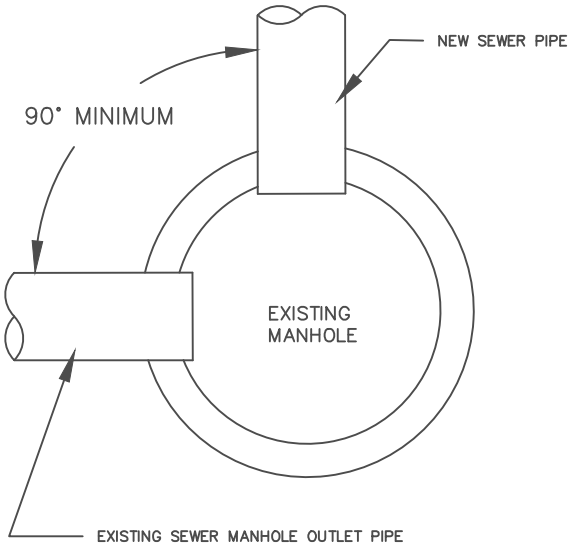
Blue Springs Missouri

STANDARD DETAILS

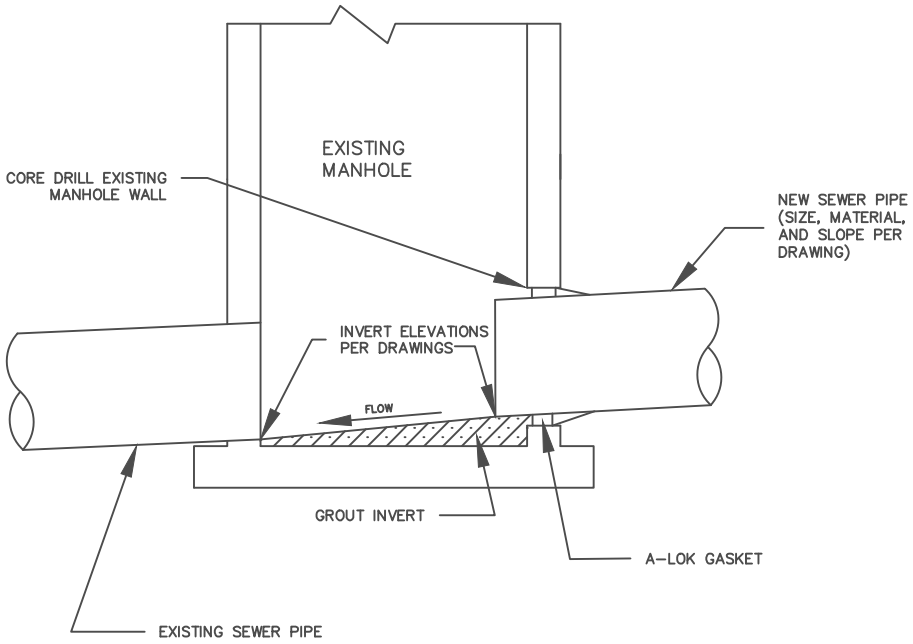
SANITARY SEWER EMBEDMENT

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: SPJ		DATE:	10-12-92
DETAIL NO.: SAN-11		SCALE:	NO SCALE
APPROVED BY:			



PLAN VIEW



SECTION VIEW

TYPICAL CONNECTION TO EXISTING MANHOLE

NOTES: 1. NEW PIPE SHALL BE A MINIMUM OF 90° FROM MANHOLE OUTLET PIPE.
2. INVERT TROUGH SHALL BE SLOPED A MINIMUM OF 5% AND A MAXIMUM OF 50%.

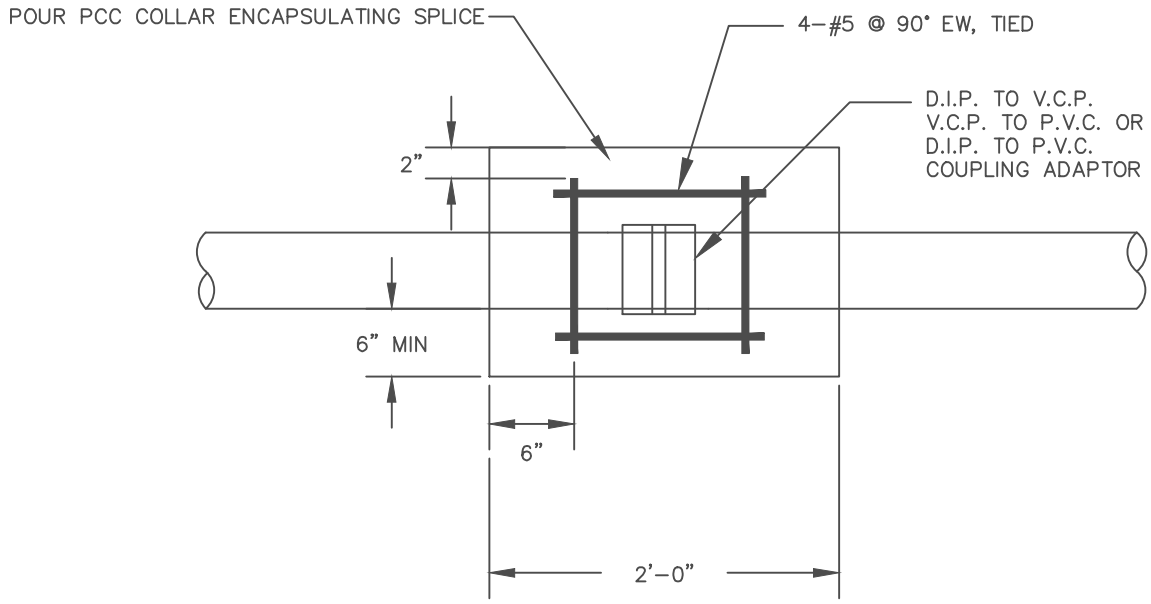
Blue Springs Missouri

STANDARD DETAILS

TYP CONN TO EXIST MANHOLE

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09/15/98
DETAIL NO.:	SAN-12	SCALE:	NO SCALE
APPROVED BY:			



CONCRETE COLLAR DETAIL

(FOR JOINTING TWO DIFFERENT TYPES OF PIPE)

NOTE: CONCRETE MIX DESIGN SHALL BE MCIB MIX # WA535–3/4–2–0.410.

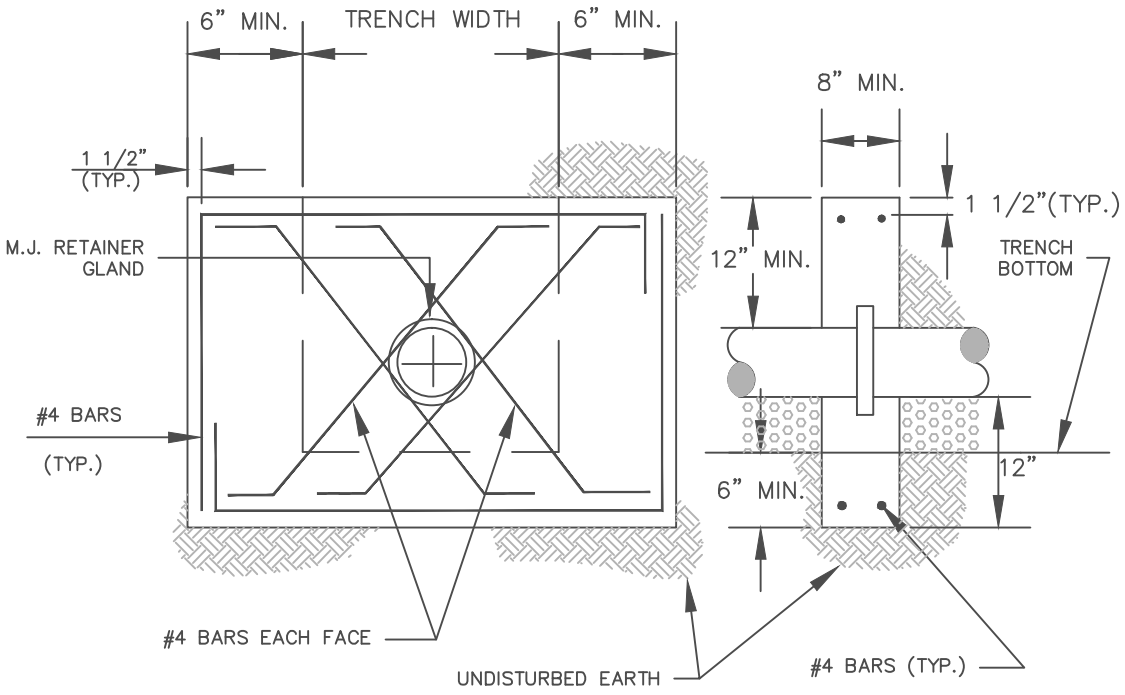
Blue Springs Missouri

STANDARD DETAILS

CONCRETE COLLAR

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09/15/98
DETAIL NO.:	SAN–13	SCALE:	NO SCALE
APPROVED BY:			



CONCRETE THRUST COLLAR DETAIL

NOTES: 1. CONCRETE THRUST COLLAR TO BE INSTALLED ON GRAVITY SEWER LINES LAID AT 20% SLOPES OR GREATER, AT INTERVALS INDICATED BY THE ENGINEER ON SANITARY SEWER PROFILE DRAWINGS.

2. CONCRETE MIX DESIGN SHALL BE MCIB MIX # WA535-3/4-2-0.410.

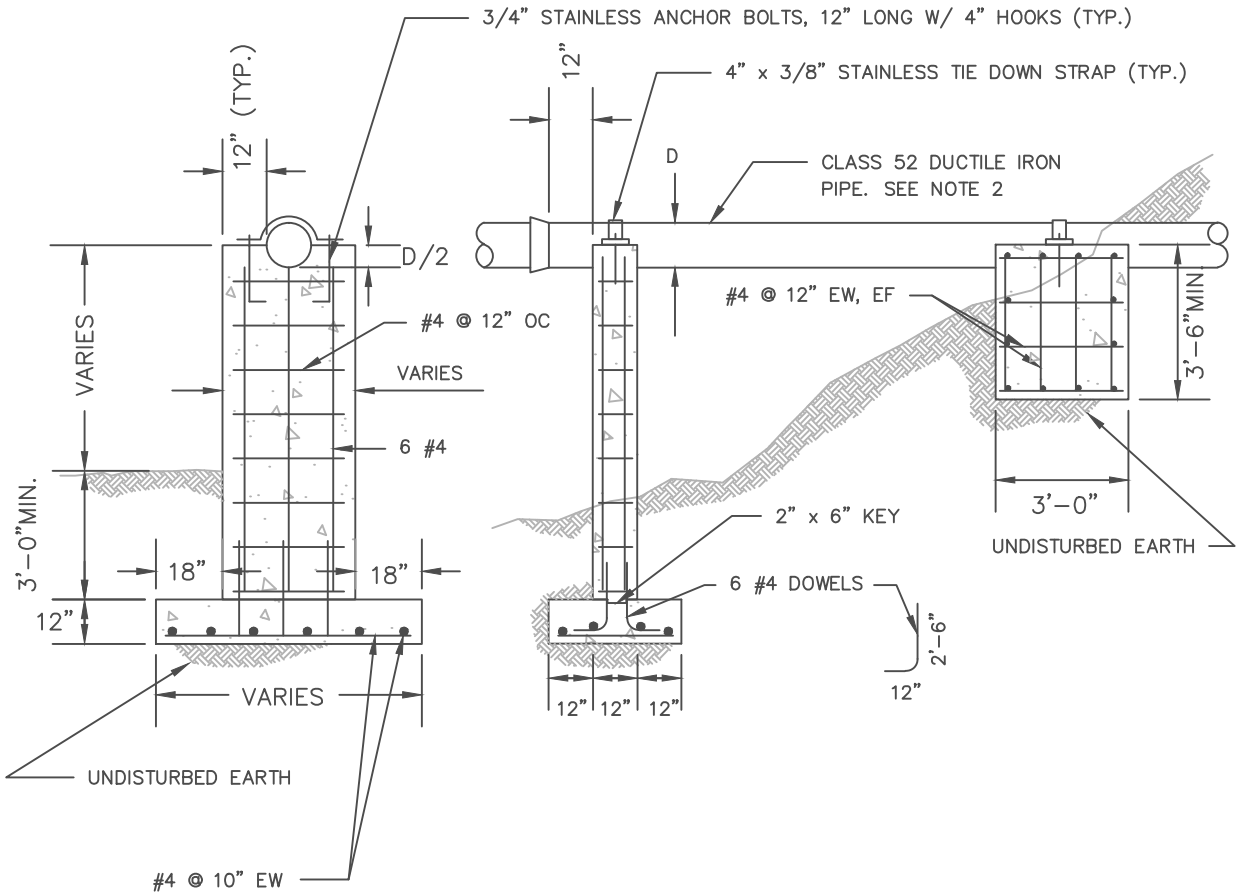
Blue Springs Missouri

STANDARD DETAILS

CONCRETE THRUST COLLAR

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09/24/98
DETAIL NO.:	SAN-14	SCALE:	NO SCALE
APPROVED BY:			



TYPE 1 AERIAL CROSSING DETAIL

NOTES: 1. ONE PIER REQUIRED FOR EACH LENGTH OF PIPE.
2. DUCTILE IRON PIPE AND FITTINGS SHALL BE HYDROGEN SULFIDE RESISTANT LINED AND CONFORM TO APWA, LATEST VERSION.

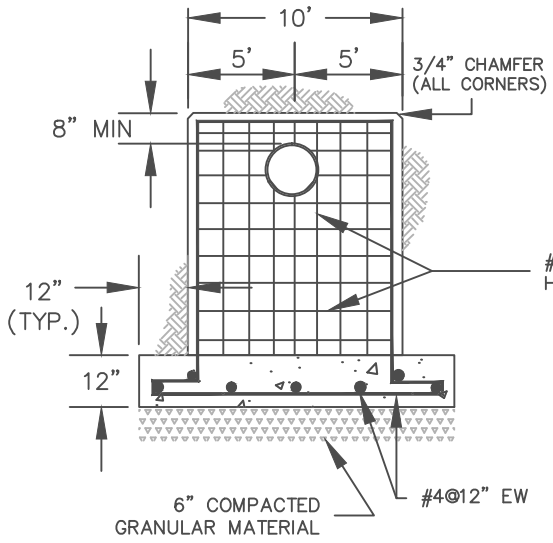
Blue Springs Missouri

STANDARD DETAILS

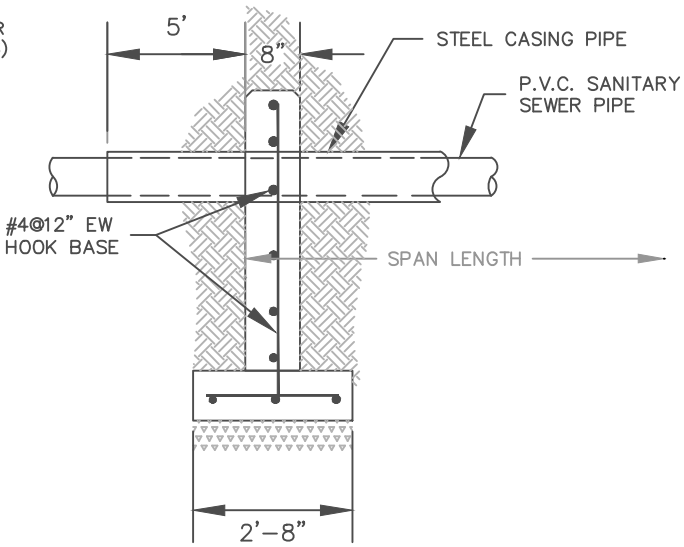
TYPE 1 AERIAL CROSSING

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

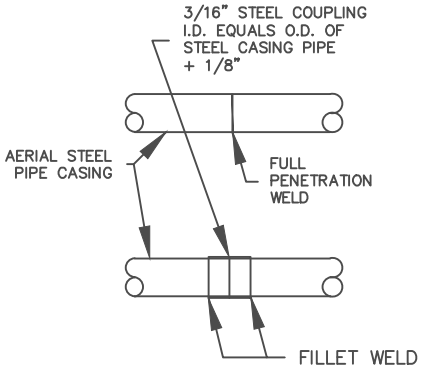
DRAWN BY:	PWC	DATE:	10/01/98
DETAIL NO.:	SAN-15	SCALE:	NO SCALE
APPROVED BY:			



ELEVATION



SECTION



SPLICE DETAIL

SEWER PIPE DIA. IN.	CASING PIPE DIA.IN.	WALL IN.	MAXIMUM SPAN FEET
8	16	0.375	50
10	18	0.375	50
12	20	0.375	50

CLEAR SPAN TYPE II AERIAL CROSSING DETAIL

NOTES:

1. CONTRACTOR SHALL INDICATE TO ENGINEER SPLICE OPTION TO BE UTILIZED. SEE SPECIFICATIONS.
2. CARRIER PIPE SPACERS SHALL BE RACI OR APPROVED EQUAL INSTALLED PER MANUFACTURERS SPECIFICATIONS.

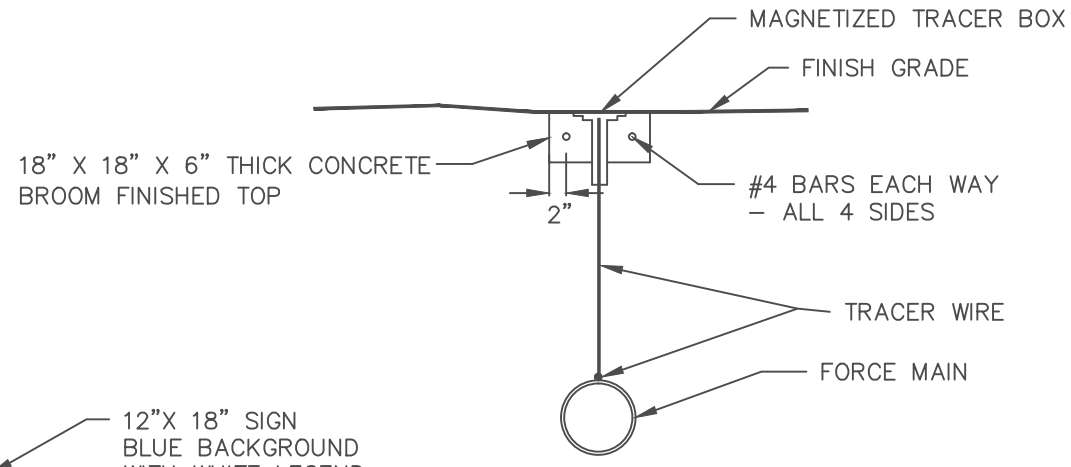
Blue Springs Missouri

STANDARD DETAILS

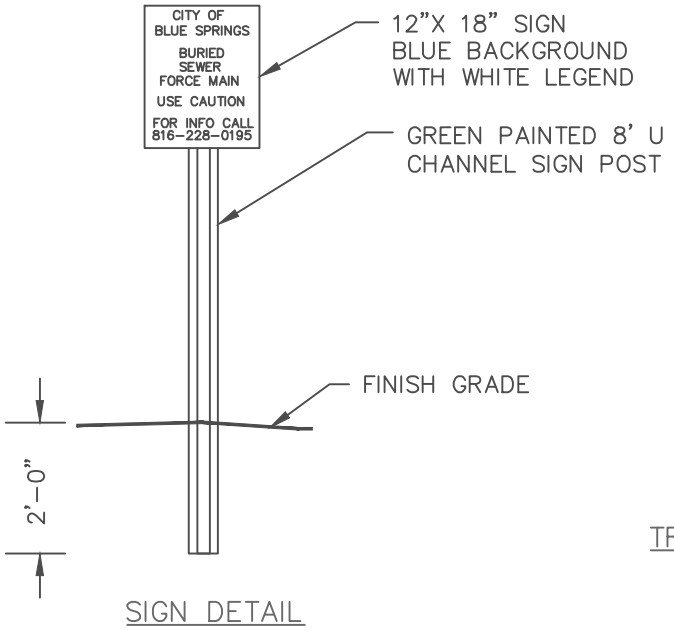
TYPE II AERIAL CROSSING

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/06	CAY	GENERAL UPDATE
2	01/14	BM	GENERAL UPDATE

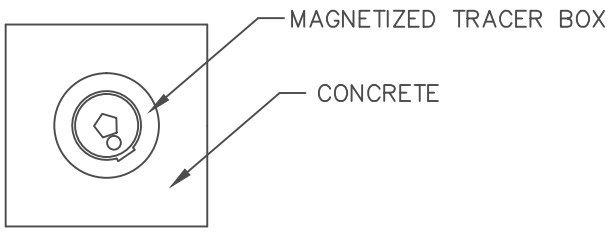
DRAWN BY:	PWC	DATE:	09/22/98
DETAIL NO.:	SAN-16	SCALE:	NO SCALE
APPROVED BY:			



TRACER WIRE & BOX SECTION VIEW



SIGN DETAIL



TRACER BOX PLAN VIEW

SEWER TRACER WIRE DETAIL

NOTES:
1. TRACER WIRE INSTALLATION IS REQUIRED ON ALL SEWER FORCE MAINS.
2. TRACER WIRE SHALL RUN CONTINUOUSLY ABOVE THE FORCE MAIN. WIRE SHALL BE COPPERHEAD REINFORCED TRACER WIRE, #12 AWG, WITH APWA GREEN COLORED INSULATION OR APPROVED EQUAL. TRACER WIRE CAN BE SPLICED WITH COPPERHEAD SNAKEBITE TWIST LOCK LSC CONNECTORS.
3. COPPERHEAD SNAKEPIT MAGNETIZED TRACER BOXES SHALL BE USED OR APPROVED EQUAL. TRACER BOX SHALL BE COLOR CODED WITH APWA GREEN.
4. THERE SHALL BE A SIGN AND A TRACER BOX INSTALLED AT THE BEGINNING AND END OF EVERY FORCE MAIN INSTALLATION AND A MAXIMUM OF EVERY 500' IN BETWEEN.
5. TRACER BOX SHALL ME MOUNTED FLUSH WITH THE FINISH GRADE, DIRECTLY OVER THE FORCE MAIN.
6. TRACER WIRE SHALL BE TAPED TO THE TOP OF THE FORCE MAIN EVERY 10' WITH PLASTIC TAPE.
7. SIGN SHALL BE INSTALLED WITHIN 1' OF CONCRETE SURROUNDING TRACER BOX.

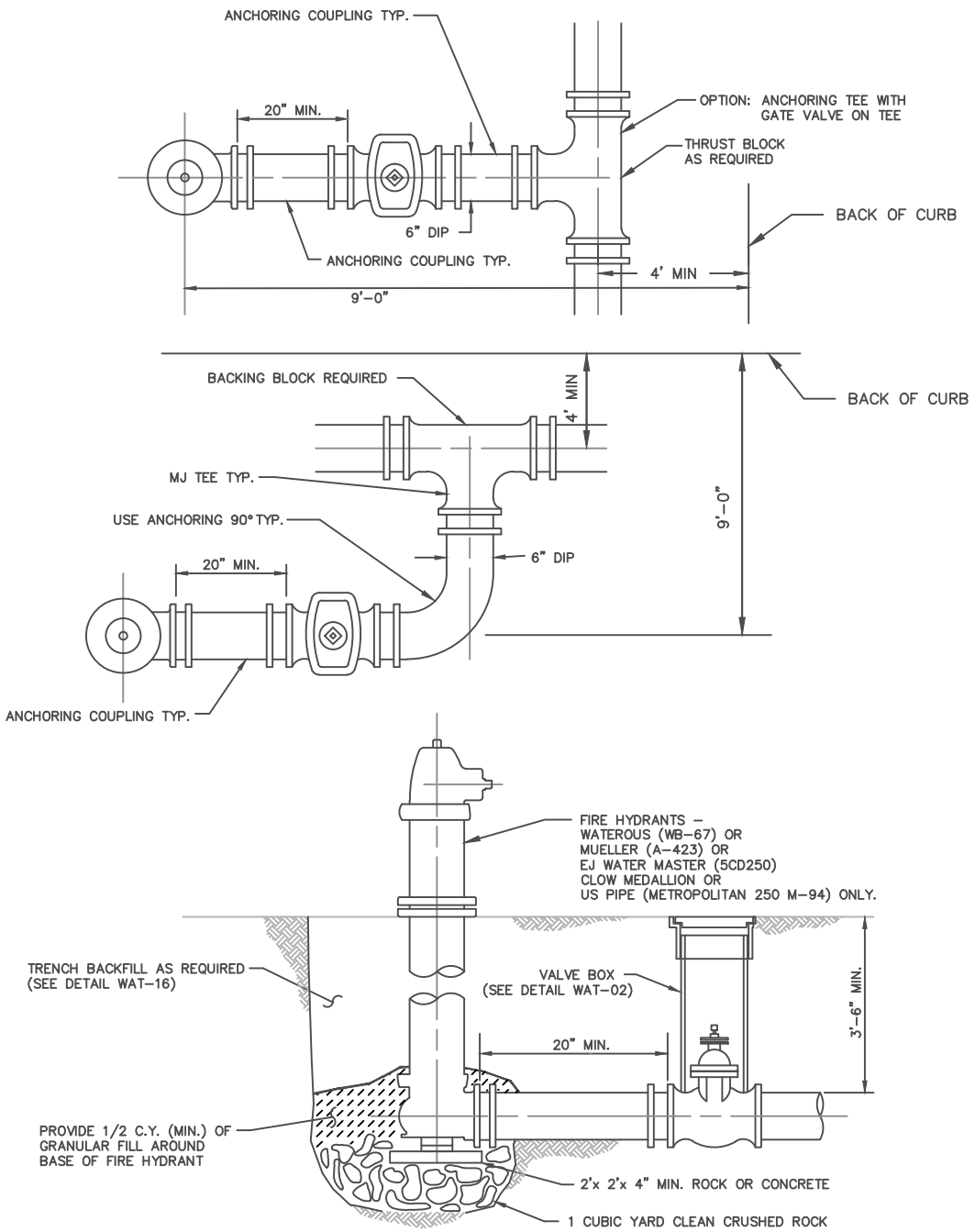
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STANDARD DETAILS

FORCE MAIN TRACER WIRE

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/06	CAY	STYLE UPDATE
2	01/14	BM	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09/29/98
DETAIL NO.:	SAN–17	SCALE:	NO SCALE
APPROVED BY:			



FIRE HYDRANT DETAIL

NOTES:
1. FIRE HYDRANT AND VALVE ASSEMBLY SHALL BE CLEAR OF SIDEWALK PLACEMENT.
2. NO FIRE HYDRANT SHALL BE LOCATED IN THE RIGHT OF WAY WITHIN THE INTERSECTION CURB RADIUS PLUS 10 FEET BEYOND THE INTERSECTION CURB RADIUS..
3. FROM THE TEE TO THE FIRE HYDRANT, ALL PIPING AND FITTINGS SHALL BE CLASS 52 DUCTILE IRON PIPE.
4. ALL VALVES, HORIZONTAL, AND VERTICAL (UP TO THE GRADE LINE) DUCTILE IRON PIPE SHALL BE POLY WRAPPED.
5. FIRE HYDRANT SHALL BE PAINTED RED IN COLOR BY THE MANUFACTURER.
6. DIRECTION TO OPEN HYDRANT SHALL BE COUNTERCLOCKWISE AND MARKED AS SUCH.
7. NO ALL-THREAD RESTRAINT ALLOWED.

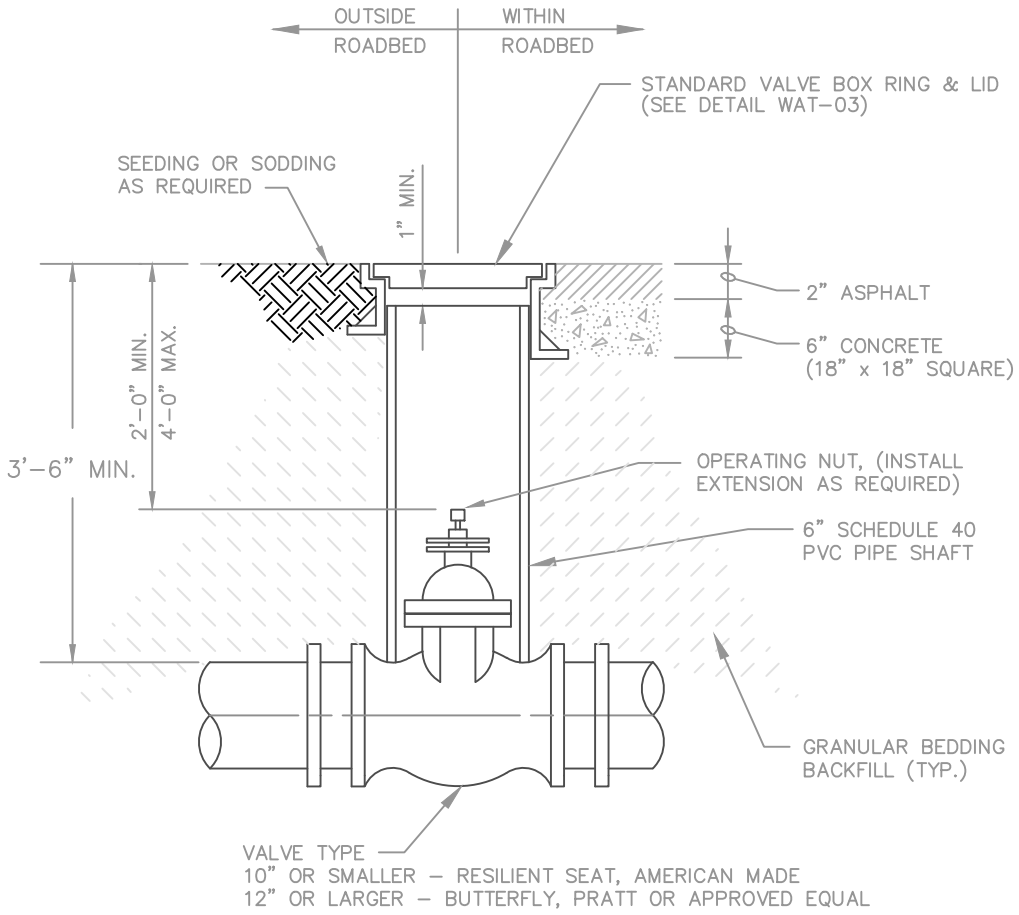
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STANDARD DETAILS

FIRE HYDRANT ASSEMBLY

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-12-93
DETAIL NO.:	WAT-01	SCALE:	NO SCALE
APPROVED BY:			



VALVE BOX DETAIL

NOTES: 1. ALL VALVES SHALL BE POLY WRAPPED.

2. WITHIN LAWN AREAS ALL VALVE STACKS SHALL BE ADJUSTED TO BE FLUSH WITH THE FINISH YARD GRADE BEFORE CERTIFICATE OF OCCUPANCY CAN BE GRANTED.

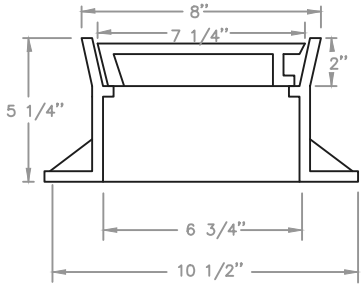
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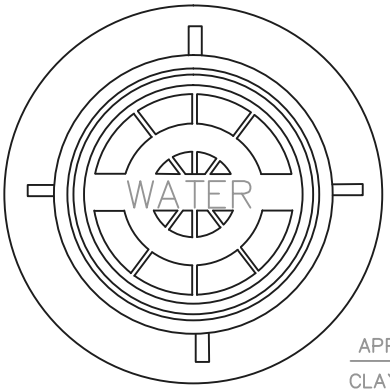
STANDARD DETAILS

VALVE BOX DETAIL

REVISIONS			
NO.	DATE	BY	REMARKS
1	11/98	JFH	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-12-93
DETAIL NO.:	WAT-02	SCALE:	NO SCALE
APPROVED BY:			

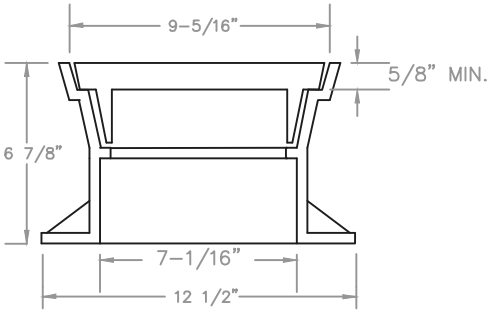


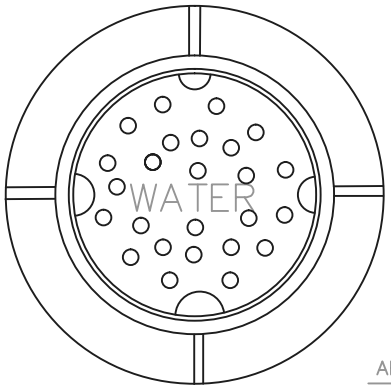


APPROVED RING AND LID

CLAY & BAILEY	2194
GCI	V 0675

YARD MODEL





APPROVED RING AND LID

CLAY & BAILEY	2196
GCI	V 0706

PAVEMENT MODEL

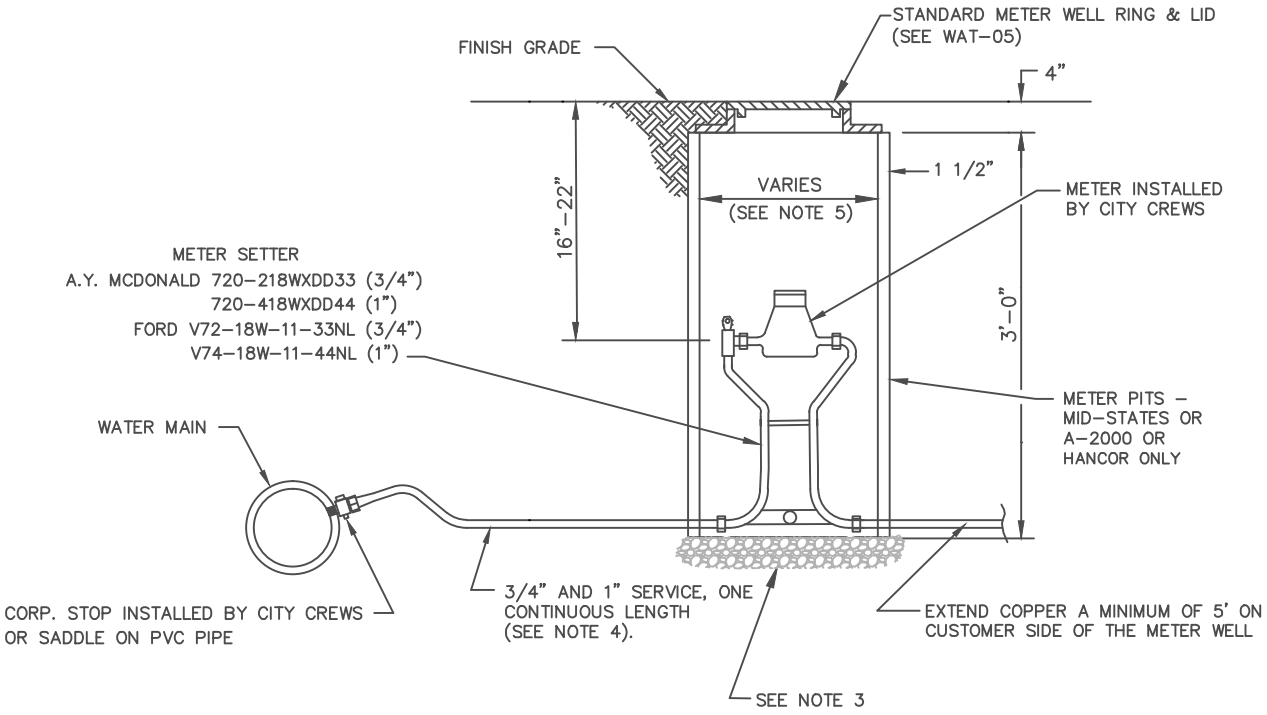
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STANDARD DETAILS

VALVE BOX RING AND LID

REVISIONS			
NO.	DATE	BY	REMARKS

DRAWN BY; BKL	DATE 6-14-00
DETAIL NO.: WAT-03	SCALE: NO SCALE
APPROVED BY:	



SECTION VIEW

NOTES:

1. METER WELL TO BE SET PLUMB.
2. METER WELLS ARE NOT ALLOWED TO BE LOCATED WITHIN DRIVEWAYS, SIDEWALKS, WALKWAYS, OR SHARED USE PATHS..
3. METER WELL TO BE SET ON 4" OF CLEAN GRAVEL BEDDING.
4. SERVICE LINE TO BE TYPE "K" COPPER.
5. FOR SINGLE 1" SERVICE USE 24" DIAMETER WELL, FOR SINGLE 3/4" SERVICE USE 18" DIAMETER WELL. SHARED METER WELLS ARE NOT PREFERRED, BUT IF NEEDED A 24" DIAMETER WELL SHALL BE THE MINIMUM SIZE FOR 2, 3/4" METERS, AND A 36" DIAMETER WELL FOR 2, 1" METERS OR 3, 3/4" METERS, OR A CUSTOM METER VAULT MAY BE USED WITH PRIOR APPROVAL FROM THE PUBLIC WORKS DIRECTOR.
6. THE METER PIT WILL BE LOCATED WITHIN 3' OF THE RIGHT OF WAY LINE, ON THE PRIVATE PROPERTY SIDE.
7. ALL EXTENSIONS FOR RING AND LID ADJUSTMENTS SHALL BE MID-STATES METER WELL ADJUSTING RINGS OR APPROVED EQUAL.
8. THE MAXIMUM A METER LID CAN BE ADJUSTED IS 12". IF ADDITIONAL ADJUSTMENT IS NEEDED THE METER WELL SHALL BE RESET. THE METER SHALL MEET DEPTH TOLERANCES SHOWN ON SECTION VIEW.
9. ALL WATER SERVICE LINE OUTSIDE OF THE METER WELL SHALL HAVE A MINIMUM OF 36" OF COVER.

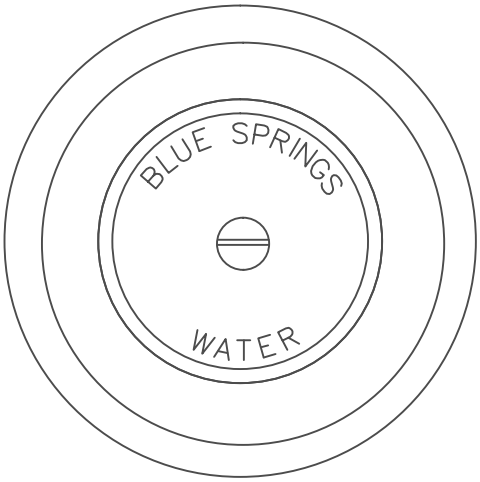
Blue Springs Missouri

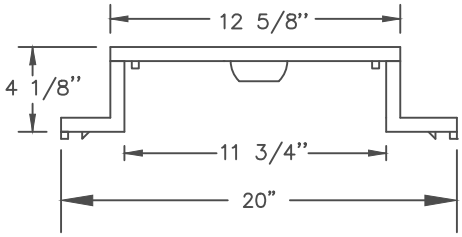
STANDARD DETAILS

3/4" & 1" SERVICE METER WELL

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/06	CAY	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-12-93
DETAIL NO.:	WAT-04	SCALE:	NO SCALE
APPROVED BY:			





APPROVED RING AND LID

CLAY & BAILEY	2210
GCI	W 1175
EJ	8425A1

ADAPTER TABLE

METER WELL DIA.	CLAY & BAILEY	GCI
24"	2424	MBA1176
36"	2436	MBA1178

METER WELL RING & LID

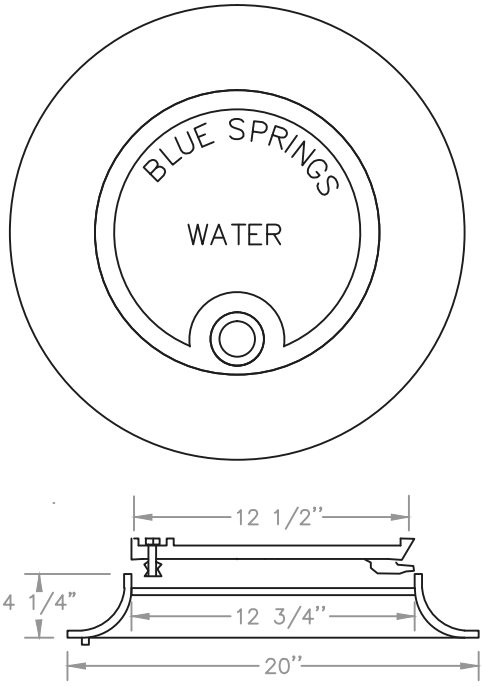
Blue Springs Missouri

STANDARD DETAILS

METER WELL RING AND LID

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	BKL	DATE:	6-14-00
DETAIL NO.:	WAT-05	SCALE:	NO SCALE
APPROVED BY:			



APPROVED RING AND LID	
CLAY & BAILEY	2350
NEENAH	R-1914-B
FORD	C-32
GCI	MBA 1154

✳ NOT TO BE USED UNLESS SPECIFIED BY CITY

LOCKING METER WELL RING AND LID

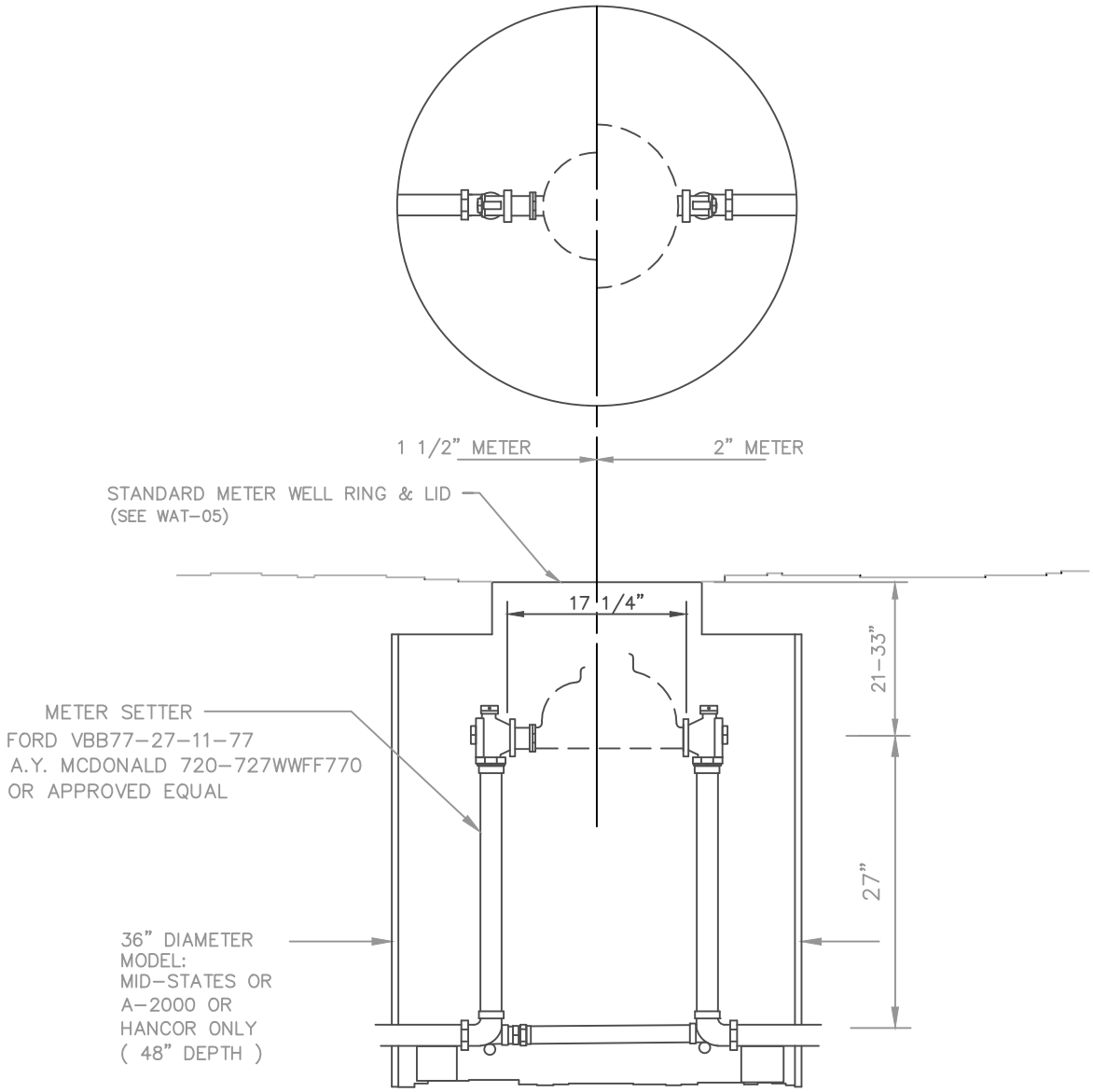
Blue Springs Missouri

STANDARD DETAILS

LOCKING METER WELL RING AND LID

REVISIONS			
NO.	DATE	BY	REMARKS

DRAWN BY: BKL	DATE: 6-14-00
DETAIL NO.: WAT-06	SCALE: NO SCALE
APPROVED BY:	



1-1/2" & 2" SERVICE METER

NOTES:
1. WHEN A TAP LARGER THAN 1" IS REQUIRED, THE PROPERTY OWNER IS RESPONSIBLE FOR CONTRACTING WITH AND PAYING FOR A QUALIFIED PLUMBER TO PERFORM THE TAP.
2. METER SETTER WITH LOCKABLE BYPASS ALLOWED ONLY WITH PRIOR APPROVAL OF THE DIRECTOR OF PUBLIC WORKS. FOR LOCKABLE BYPASS METER SETTER USE A.Y. MCDONALD 720-B727WWFF775 OR APPROVED EQUAL.

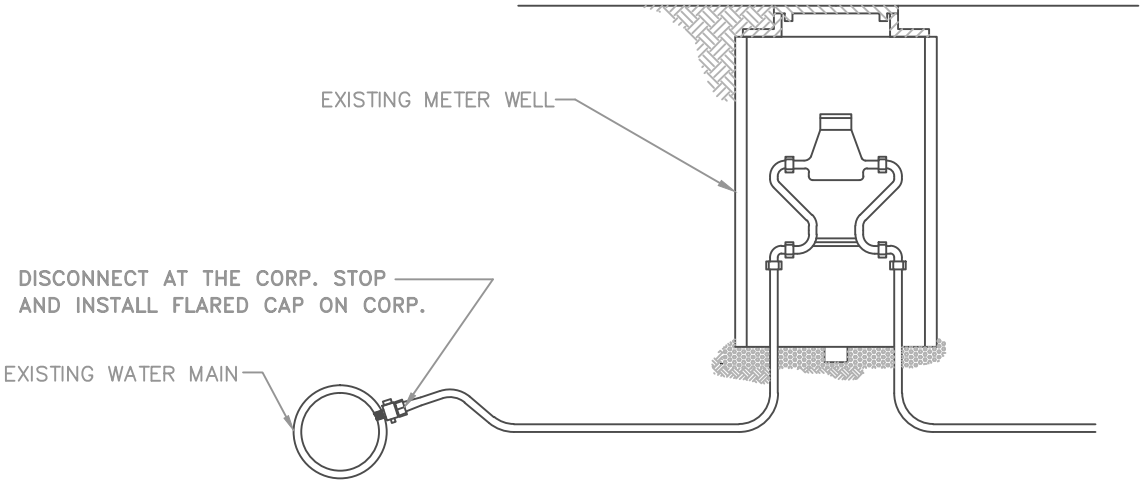
Blue Springs Missouri

STANDARD DETAILS

1-1/2" & 2" SERVICE METER

REVISIONS			
NO.	DATE	BY	REMARKS
1	12/05	CAY	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	JOS	DATE:	2-12-93
DETAIL NO.:	WAT-07	SCALE:	NO SCALE
APPROVED BY:			



SERVICE METER WELL DISCONNECTION DETAIL

NOTES:
1. BLUE SPRINGS PUBLIC WORKS (816)228-0195 MUST BE CONTACTED TO PULL METER PRIOR TO DEMOLITION.
2. WHEN SERVICE METER IS TO BE RE-USED, THE SERVICE LINE SHALL BE CUT AND CAPPED ON THE CUSTOMER SIDE 5' FROM THE METER WELL.

Blue Springs Missouri

STANDARD DETAILS

DISCONNECTION DETAIL

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/06	CAY	GENERAL UPDATE

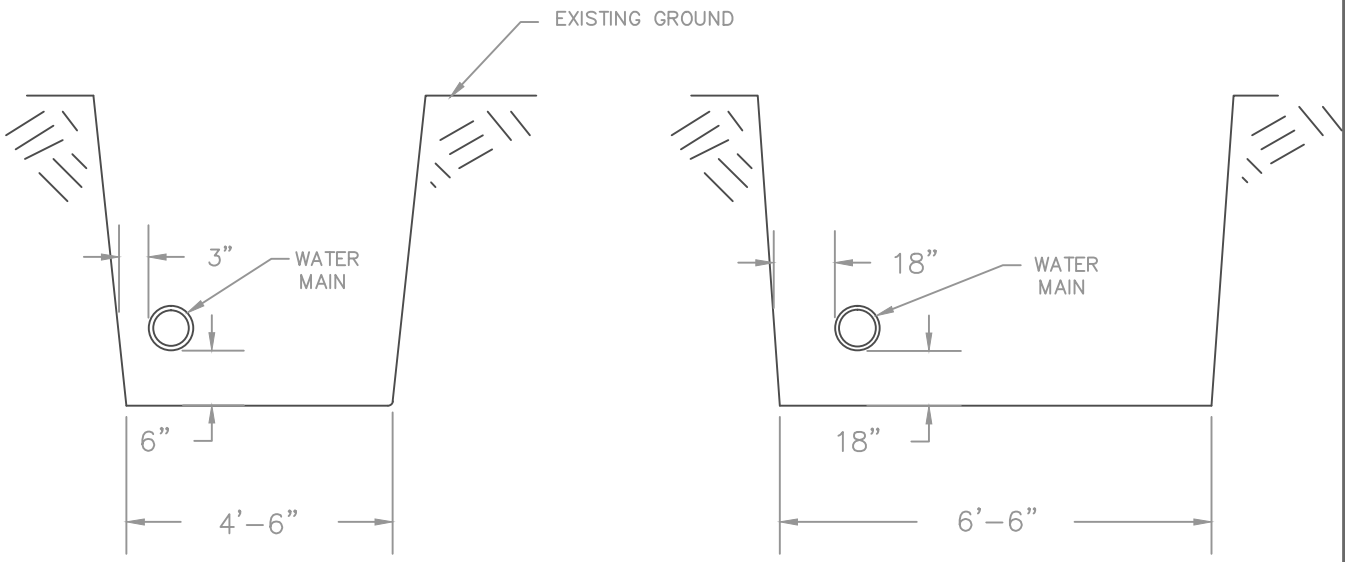
DRAWN BY: SPJ	DATE: 12-17-93
DETAIL NO.: WAT-08	SCALE: NO SCALE
APPROVED BY:	

CORPORATION TAPS

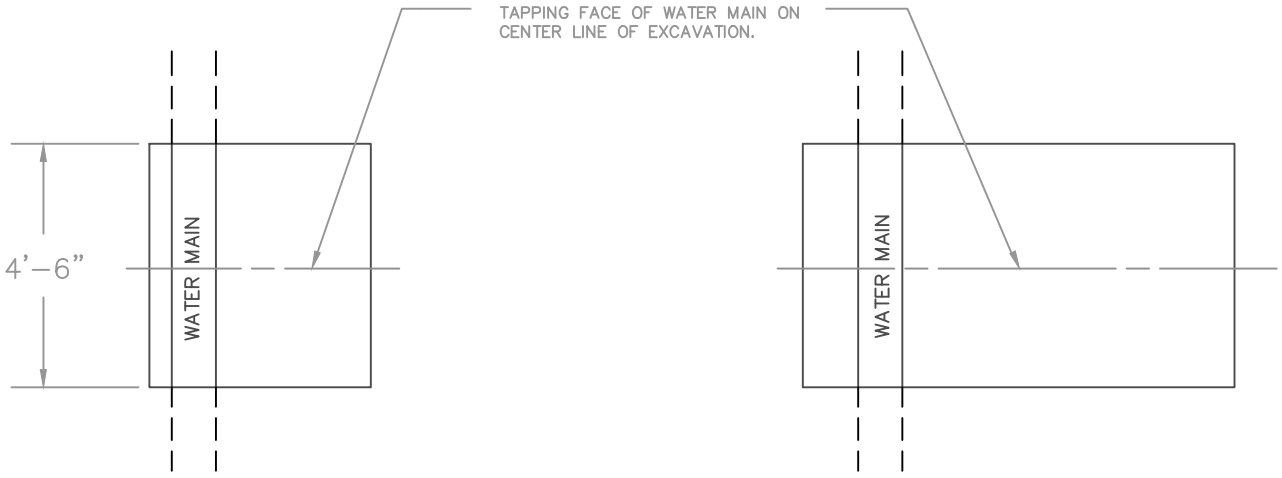
NOTE: A CORPORATION TAP SHALL NOT BE CLOSER THAN 18" TO A BELL FITTING OR ANOTHER TAP.

TAPPING VALVES

NOTE: TAPS SHALL NOT BE LESS THAN 3' FROM SPIGOT END & 18" FROM BELL OF PIPE.



SECTION VIEWS



PLAN VIEWS

NOTES:
1. EXCAVATIONS EXCEEDING 5' IN DEPTH MUST BE SHORED.
2. ALL MATERIAL FOR SERVICE MUST BE INSTALLED PRIOR TO TAP BEING MADE.
3. ON PLASTIC WATER MAINS, PROTECT THE INTEGRITY OF THE TRACER WIRE.

Blue Springs Missouri

STANDARD DETAILS

EXCAVATION DETAILS

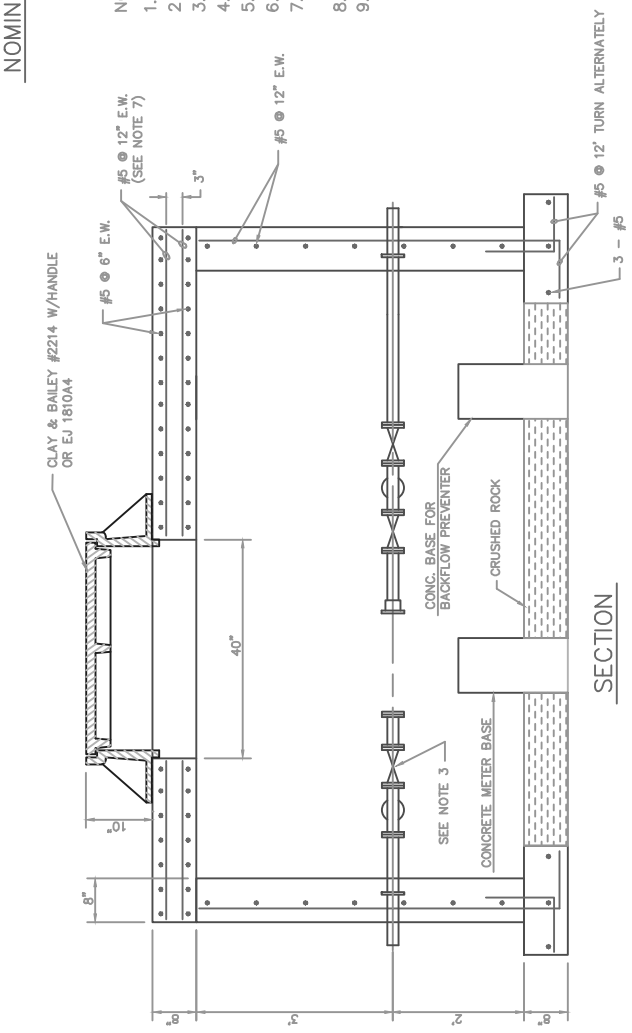
REVISIONS			
NO.	DATE	BY	REMARKS
1	11/98	JFH	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: JOS	DATE: 1-22-93
DETAIL NO.: WAT-09	SCALE: NO SCALE
APPROVED BY:	

METERING PIT & SETTING W/BYPASS
FOR SINGLE 2" THRU 6" METERS

NOTES:

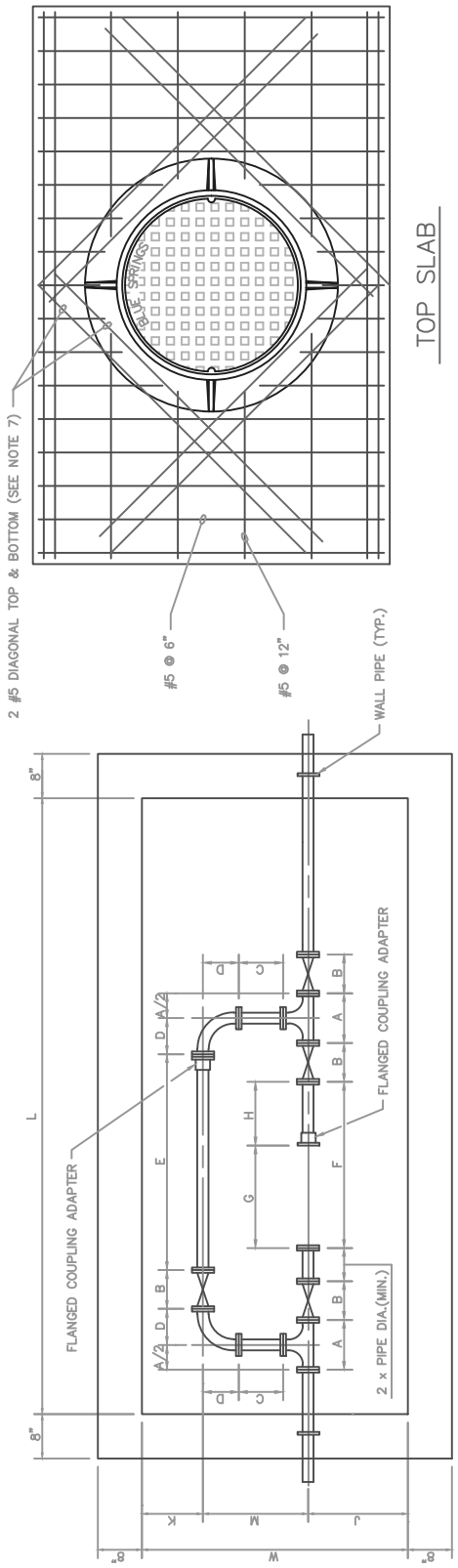
1. POUR FOOTING ON FIRM UNDISTURBED EARTH.
2. ALL PIPING IN METER PIT SHALL BE D.I.P. OR C.I.P.
3. VALVES SHALL BE GATE TYPE; BYPASS VALVE SHALL BE O.S. & Y.
4. WALLS TO BE DOUBLE FORMED.
5. ALL RE-BARS TO HAVE 3/4" COVER.
6. CONCRETE SHALL BE MCIB MIX #WA585-3/4-2-0.410.
7. TOP LAYER OF SLAB REINFORCEMENT MAY BE ELIMINATED IN CURBED NON-TRAFFIC AREAS.
8. 3" OR GREATER SIZE METER SHALL HAVE AN UPSTREAM STRAINER.
9. WHEN A TAP LARGER THAN 1" IS REQUIRED, THE PROPERTY OWNER IS RESPONSIBLE FOR CONTRACTING AND PAYING FOR A QUALIFIED PLUMBER TO PERFORM THE TAP.



* VARIES BY MANUFACTURER

NOMINAL DIMENSIONS FOR SINGLE METER PITS
ALL DIMENSIONS ARE IN INCHES

METER SIZE	L	W	A	B	C	D	E	F	G	H	J	K	M
2"	122	48	9	7	8	4.5	39	30	*	*	18	11	19
3"	150	72	11	8	12	4.5	52	42	*	*	24	23	26
4"	171	72	13	9	12	4.5	52	42	*	*	24	21	28
6"	202	72	16	10.5	9	8	61	51	*	*	24	20	29

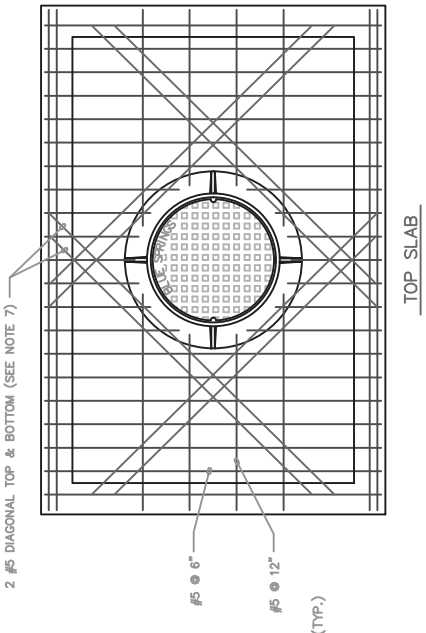


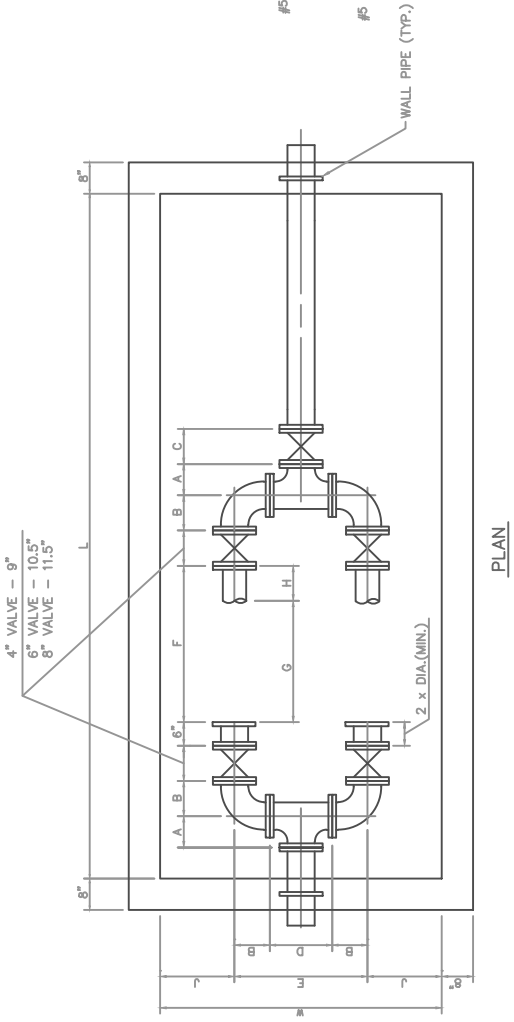
STANDARD DETAILS
2"-6" SINGLE METERING PIT

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: SPJ	DATE: 1-22-93
DETAIL NO.: WAT-10	SCALE: NO SCALE
APPROVED BY:	

METERING PIT & SETTING W/BYPASS
FOR DOUBLE 2" THRU 6" METERS





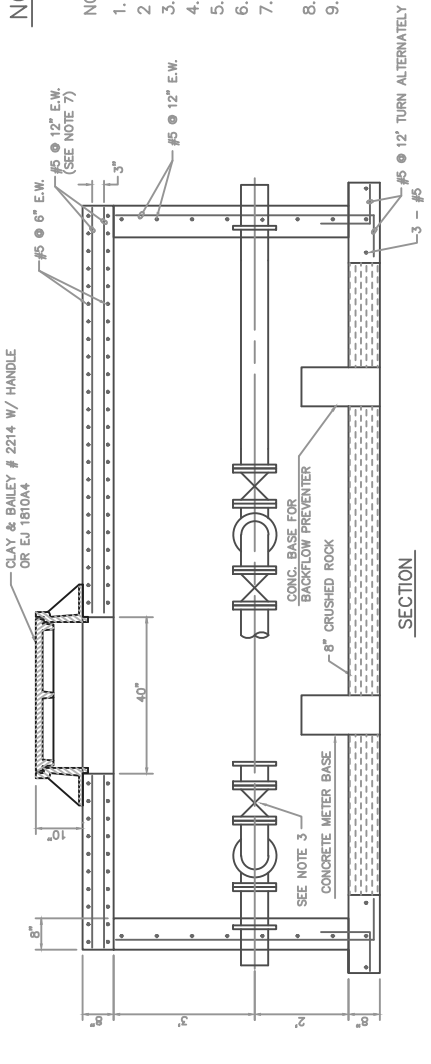
* VARIES BY MANUFACTURER

INLET & OUTLET	METER SIZE	L	W	A	B	C	D	E	F	G	H	J
6"	2-4"	183	72	8	8	9	16	34	42	*	*	9
8"	2-6"	216	84	9	12	11	18	41	48	*	*	21

NOMINAL DIMENSIONS FOR DOUBLE METER PITS
ALL DIMENSIONS ARE IN INCHES

NOTES:

1. POUR FOOTING ON FIRM UNDISTURBED EARTH.
2. ALL PIPING IN METER PIT SHALL BE D.I.P. OR C.I.P.
3. VALVES SHALL BE GATE TYPE; BYPASS VALVE SHALL BE O.S. & Y.
4. WALLS TO BE DOUBLE FORMED.
5. ALL RE-BARS TO HAVE 3/4" COVER.
6. CONCRETE SHALL BE MCIB MIX #WA585-3/4-2-0.410.
7. TOP LAYER OF SLAB REINFORCEMENT MAY BE ELIMINATED IN CURBED NON-TRAFFIC AREAS.
8. 3" OR GREATER SIZE METER SHALL HAVE AN UPSTREAM STRAINER.
9. WHEN A TAP LARGER THAN 1" IS REQUIRED, THE PROPERTY OWNER IS RESPONSIBLE FOR CONTRACTING AND PAYING FOR A QUALIFIED PLUMBER TO PERFORM THE TAP.



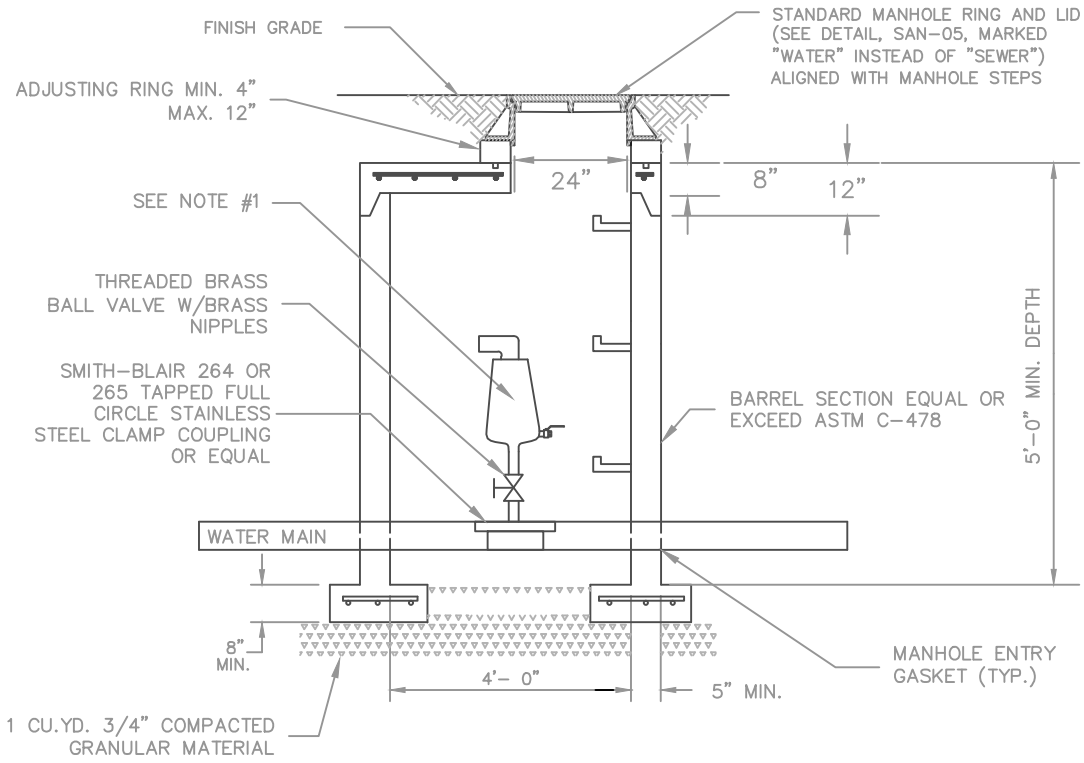
Blue Springs Missouri

STANDARD DETAILS

2"-6" DOUBLE METERING PIT

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: SPJ	DATE: 1-22-93
DETAIL NO.: WAT-11	SCALE: NO SCALE
APPROVED BY:	



NOTES: 1. COMBINATION AIR & VACUUM VALVE ASSEMBLY – A.R.I. D–015 OR APPROVED EQUAL. ASSEMBLY MUST BE APPROPRIATELY SIZED BY THE ENGINEER FOR THE APPLICATION.

2. VAULT SHALL BE STANDARD PRECAST SHALLOW TYPE MANHOLE, SEE SAN–03. CONSHEILD OR CONTINT IS NOT REQUIRED FOR WATER VAULTS.

3. TAP SIZE DETERMINED BY THE MANUFACTURER BASED ON THE APPLICATION.

4. MANHOLE ADJUSTING RINGS SHALL BE CONCRETE FOR PAVEMENT APPLICATIONS. FOR NON PAVEMENT APPLICATIONS USE LADTECH HDPE OR APPROVED EQUAL.

WATER COMBINATION AIR/VACUUM VALVE ASSEMBLY

Blue Springs Missouri

STANDARD DETAILS

AIR & VACUUM VALVE ASSEMBLY

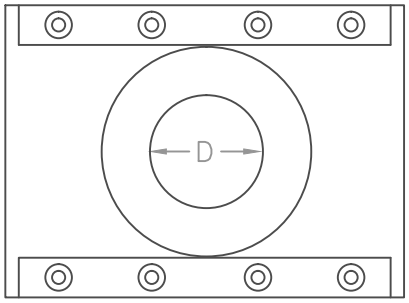
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NO.	DATE	BY	REMARKS
1	04/06	CAY	GENERAL UPDATE
2	01/14	BM	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09/30/98
DETAIL NO.:	WAT–12	SCALE:	NO SCALE
APPROVED BY:			

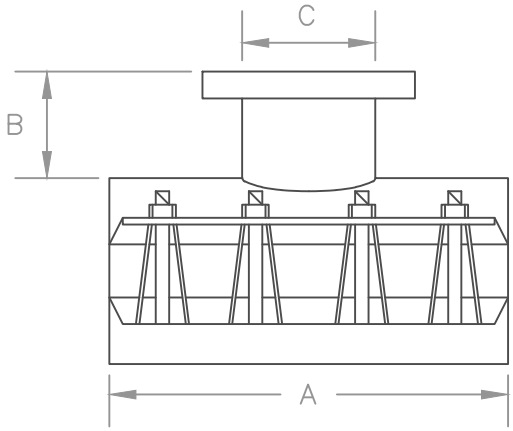
SMITH–BLAIR TAPPING SLEEVES
662 & 663 OR EQUAL

FLANGE SIZE	STANDARD A	B	C	D	SIZE ON SIZE C	D	NUMBER OF BOLTS
4"	15"	5"	5–1/16"	4–11/16"	NONE	NONE	8
6"	15"	5"	7–1/16"	6–11/16"	7–1/16"	6.00	8
8"	20"	5"	9–1/16"	8–11/16"	9–1/16"	8.00	10

* AVAILABLE IN 6" – 12" NOMINAL PIPE SIZES.



PLAN VIEW



ELEVATION VIEW

Blue Springs Missouri

STANDARD DETAILS

STAINLESS STEEL TAPPING SLEEVES

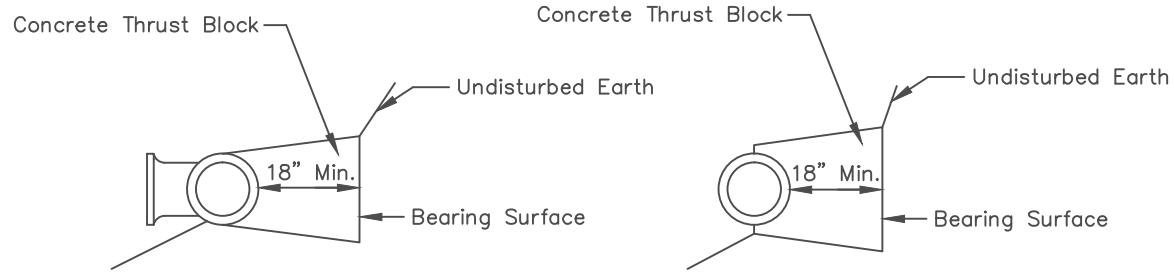
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DRAWN BY: JOS	DATE: 2–12–93
DETAIL NO.: WAT–13	SCALE: NO SCALE
APPROVED BY:	

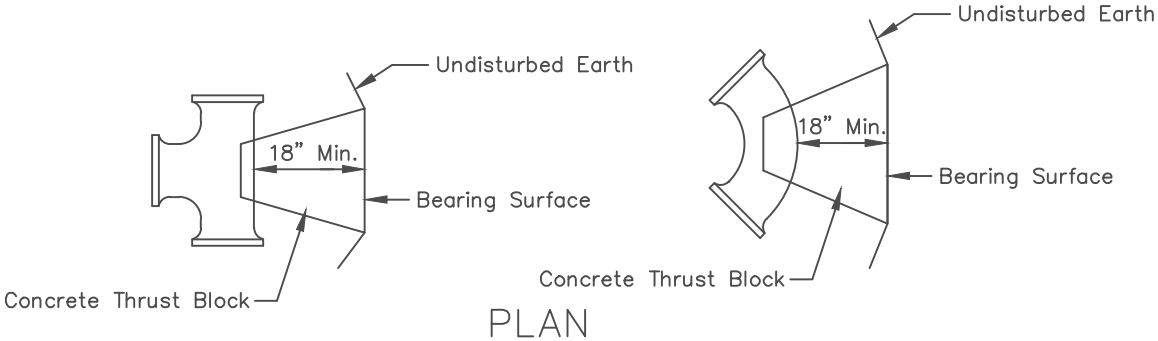
HORIZONTAL CONCRETE THRUST BLOCKING

Working Pressure	150	psi
Surge Allowance	100	psi
Design Pressure	250	psi
Soil Bearing Capacity	2,000	psf
Safety Factor	1.0	
Minimum Bearing Area	4.0	sf
Maximum Bearing Area	50.0	sf

Nom. Dia (inches)	180° Tee, Plug	90° Bend	45° Bend	22.5° Bend	11.25° Bend
6	4.0	5.0	4.0	4.0	4.0
8	6.5	9.0	5.0	4.0	4.0
10	10.0	14.0	7.5	4.0	4.0
12	14.5	20.0	11.0	5.5	4.0
14	19.5	27.5	15.0	7.5	4.0
16	25.5	35.5	19.5	10.0	5.0
18	32.0	45.0	24.5	12.5	6.5
20	39.5	55.5	30.5	15.5	8.0
24	56.5	80.0	43.5	22.5	11.5



PROFILE



PLAN

THRUST BLOCK DETAIL

Notes:
1. All bearing surface areas shown in chart are minimums.
2. All mechanical joint fittings shall be restrained joints and have concrete thrust blocks installed for restraint.
3. If any of the conditions of the Standard Detail cannot be met, sealed Engineered design blocking is required.
4. All ductile iron pipe and fittings shall be poly wrapped.

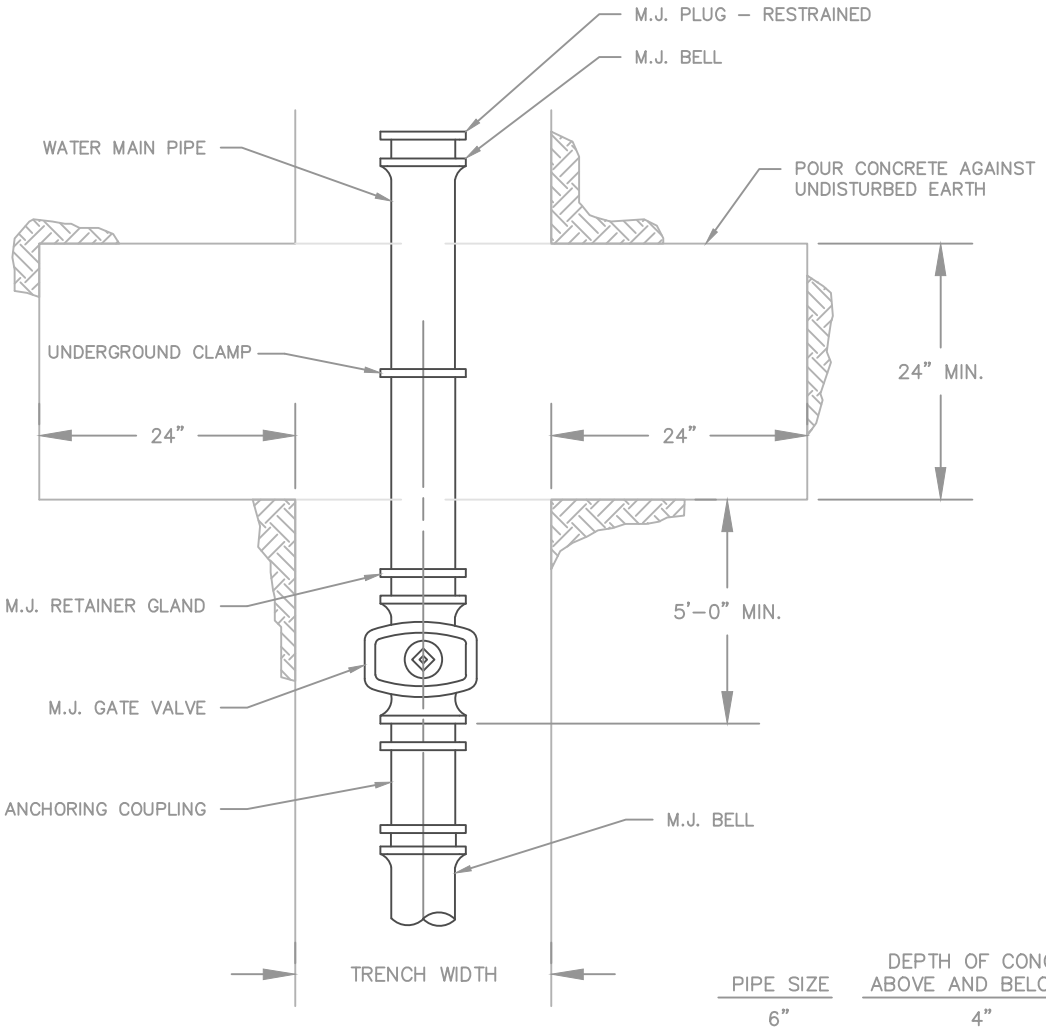
Blue Springs Missouri

STANDARD DETAILS

THRUST BLOCKS

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-12-93
DETAIL NO.:	WAT-14	SCALE:	NO SCALE
APPROVED BY:			



PIPE SIZE	DEPTH OF CONCRETE ABOVE AND BELOW PIPE
6"	4"
8"	8"
12"	15"

NOTE: PIPE TO BE STRADDLED SHALL BE POLY WRAPPED CLASS 52 DUCTILE IRON PIPE EXTENDING 18" BEYOND CONCRETE STRADDLE BLOCK IN EACH DIRECTION.

STRADDLE BLOCK DETAIL

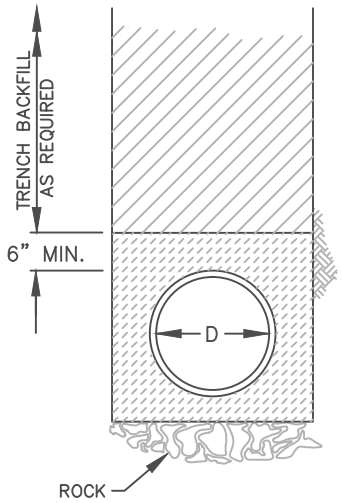
Blue Springs Missouri

STANDARD DETAILS

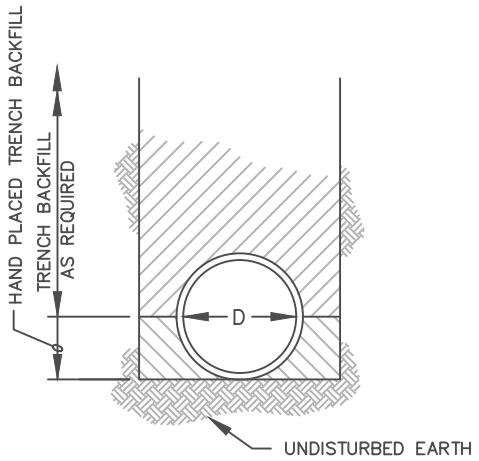
STRADDLE BLOCK

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2–12–93
DETAIL NO.:	WAT–15	SCALE:	NO SCALE
APPROVED BY:			



WATERLINE PIPE EMBEDMENT (IN ROCK)



WATERLINE PIPE EMBEDMENT (IN SOIL)

LEGEND	
D	NOMINAL PIPE DIAMETER
	TRENCH BACKFILL
	TAMPED GRANULAR BACKFILL (KDOT AB-3)
	GRANULAR BEDDING

MINIMUM PIPE CLEARANCES (IN)		
D	PIPE SIDE CLEARANCE[2] (SOIL/ROCK)	PIPE BOTTOM CLEARANCE (SOIL/ROCK)
0"-18"	6/6	0/6
21"-30"	8/9	0/9

WATERLINE BEDDING MATERIAL GRADATION (% PASSING)		
SIEVE SIZE	TYPE 1 (1/2")	TYPE 2 (BUCKSHOT)
3/4"	95-100	
3/8"	40-60	100
1/4"		
NO. 4		60-80
NO. 8	0-5	0-15
NO. 50		
NO. 200		0

NOTES: 1. GRANULAR BEDDING SHALL MEET THE GRADATION REQUIREMENTS OF THE TABLE ABOVE. MATERIAL TO BE PLACED IN NOT MORE THAN 6" LAYERS AND COMPACTED BY SLICING WITH A SHOVEL OR VIBRATING.

2. TAMPED GRANULAR BACKFILL (KDOT AB-3) THIS MATERIAL SHALL BE USED FOR ALL EXISTING AND PROPOSED STREET CROSSINGS.

3. TRENCH BACKFILL SHALL BE FINELY DIVIDED MATERIAL FREE FROM DEBRIS AND STONES, COMPACTED TO 95% MAXIMUM DENSITY.

WATERLINE EMBEDMENT DETAILS

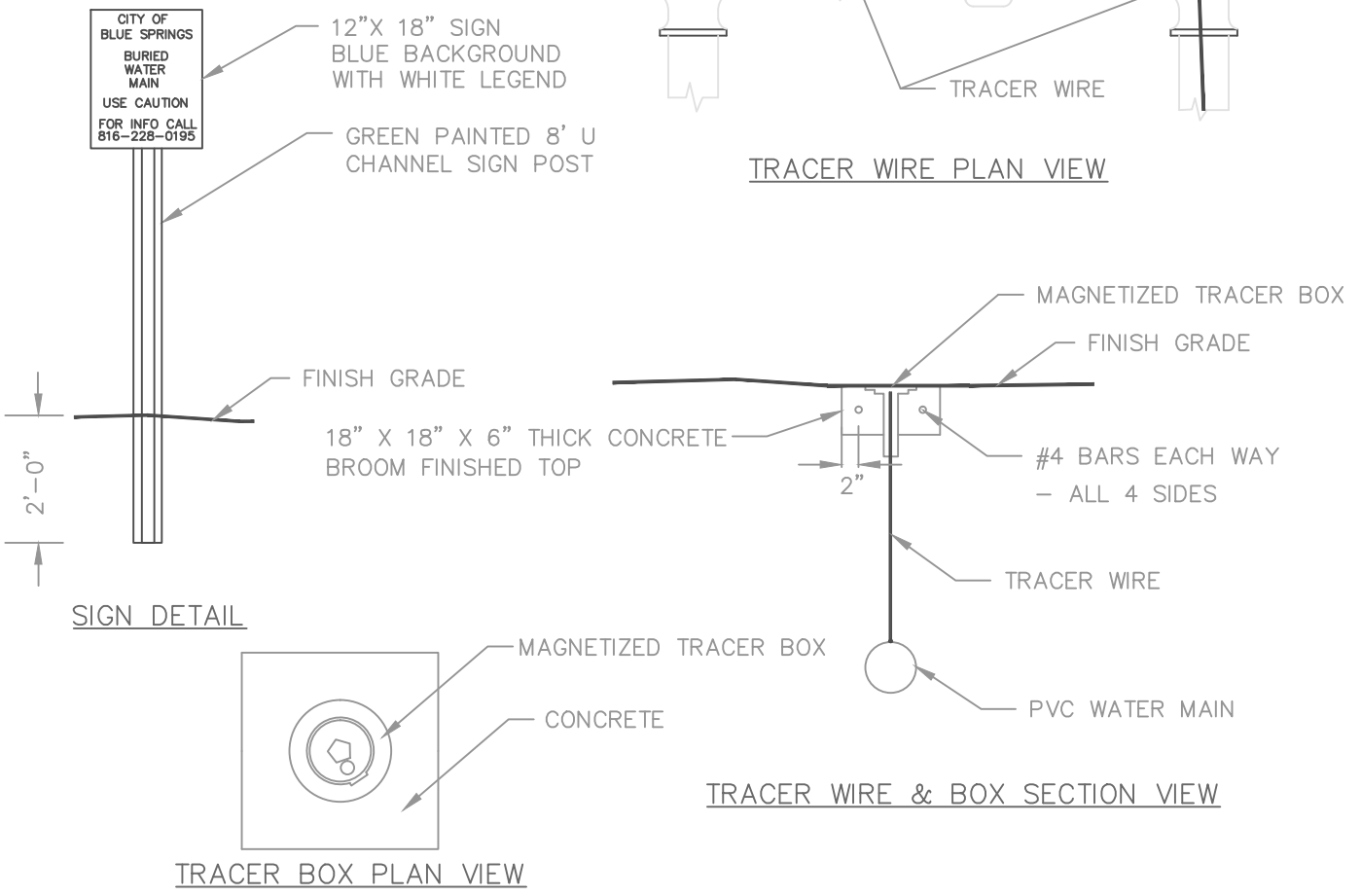
Blue Springs Missouri

STANDARD DETAILS

WATERLINE EMBEDMENT

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	8-12-92
DETAIL NO.:	WAT-16	SCALE:	NO SCALE
APPROVED BY:			



PVC WATER MAIN TRACER WIRE

NOTES:
1. TRACER WIRE INSTALLATION IS REQUIRED ON ALL PVC WATER MAINS.
2. TRACER WIRE SHALL RUN CONTINUOUSLY ABOVE THE PVC WATER MAIN. WIRE SHALL BE COPPERHEAD REINFORCED TRACER WIRE, #12 AWG, WITH APWA BLUE COLORED INSULATION OR APPROVED EQUAL. TRACER WIRE CAN BE SPLICED WITH COPPERHEAD SNAKEBITE TWIST LOCK LSC CONNECTORS.
3. COPPERHEAD SNAKEPIT MAGNETIZED TRACER BOXES SHALL BE USED OR APPROVED EQUAL. TRACER BOX SHALL BE COLOR CODED APWA BLUE.
4. WHERE FIRE HYDRANTS ARE LOCATED MORE THAN 600' APART, THERE SHALL BE A SIGN AND A TRACER BOX INSTALLED AT THE BEGINNING, END, TEE, AND ANY 90° CHANGE OF DIRECTION OF PVC WATER MAIN INSTALLATION AND A MAXIMUM OF EVERY 500' IN BETWEEN. ADDITIONALLY A SIGN SHALL BE INSTALLED WITHIN 2' OF EVERY TRACER BOX INDICATING THE PRESENCE OF A WATER MAIN.
5. WHERE FIRE HYDRANTS ARE LOCATED 600' OR LESS APART, THERE SHALL BE A TRACER BOX INSTALLED AT THE BEGINNING, END, TEE, AND A 90° CHANGE OF DIRECTION OF PVC WATER MAIN INSTALLATION AND ABOVE EVERY FIRE HYDRANT TEE.
6. TRACER BOX SHALL ME MOUNTED FLUSH WITH THE FINISH GRADE, DIRECTLY OVER THE WATER MAIN FITTING.
7. TRACER WIRE SHALL BE TAPED TO THE TOP OF THE WATER MAIN WITH PLASTIC TAPE EVERY 10'. WHEN TRACER WIRE ENCOUNTERS A VALVE, WIRE SHALL MOVE TO THE SIDE AND NOT BE LOCATED WITHIN THE VALVE BOX AREA.

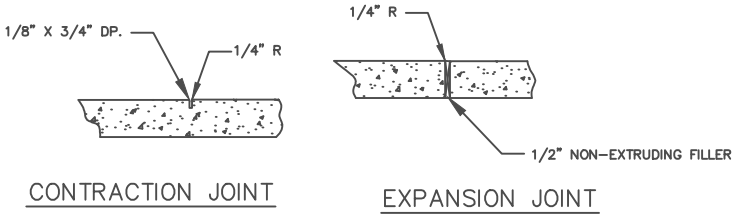
Blue Springs Missouri

STANDARD DETAILS

PVC WATER MAIN TRACER WIRE

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

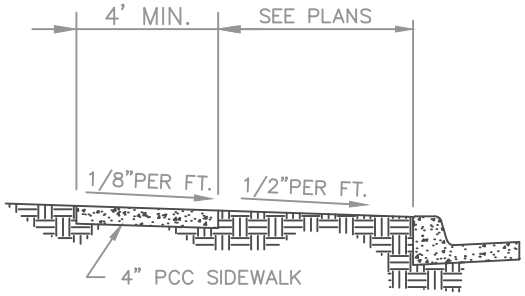
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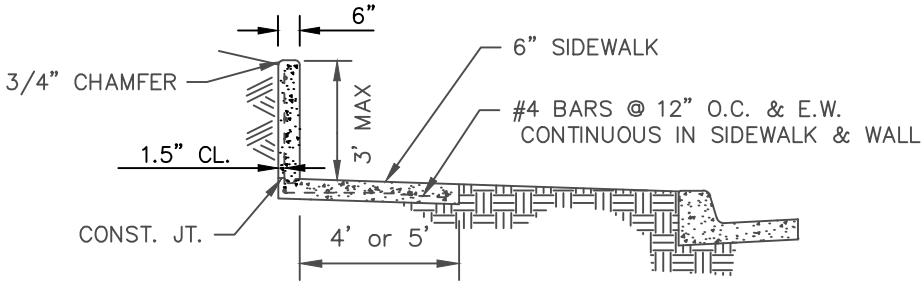
CONTRACTION JOINT

EXPANSION JOINT

SIDEWALK JOINT DETAILS



TYPICAL SIDEWALK SECTION



SIDEWALK WITH INTEGRAL RETAINING WALL

NOTES:
1. CONTRACTION JOINTS 4' O.C. OR EQUAL TO THE WIDTH OF SIDEWALK.
2. EXPANSION JOINTS SHALL ABUT EXISTING WALKS, CURBS, DRIVEWAYS, SIMILAR STRUCTURES AND 150' CTRS. MAXIMUM.
3. SIDEWALK SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE PER APWA SPECIFICATIONS.
4. KEY ALL CONSTRUCTION JOINTS.
5. SIDEWALK THICKNESS SHALL BE INCREASED TO 6" MINIMUM WHEN CROSSING A RESIDENTIAL DRIVEWAY AND SHALL MATCH THE THICKNESS OF THE CONCRETE WHEN CROSSING A COMMERCIAL DRIVEWAY.
6. ALL CONCRETE SHALL BE KCMMB 4K MIX.
7. FOR ALL ADA RAMPS AND SIDEWALKS, REFER TO MODOT PROWAG SPECIFICATIONS. EXCEPTIONS: REFER TO NOTE #6 FOR CONCRETE SPECIFICATIONS AND NOTE #8 FOR TRUNCATED DOME PANELS ALLOWED.
8. TRUNCATED DOME PANELS SHALL BE ARMOR TILE CAST IN PLACE OR ADA SOLUTIONS CAST IN PLACE SYSTEMS OR APPROVED EQUAL. PANELS SHALL BE BRICK RED IN COLOR. PANEL SHALL BE 2' X WIDTH OF SIDEWALK.
9. WHENEVER ANY PORTION OF A CURB INLET LID IS UTILIZED FOR SIDEWALK, A FOOTING SHALL BE INSTALLED. SEE STANDARD DETAIL MIS-02.
10. ALL SIDEWALK SHALL MEET MoDOT AND PROWAG ADA REQUIREMENTS.
11. ANY SIDEWALK INSTALLED PARALLEL TO THE STREET WITH A GREEN SPACE LESS THAN 3' WIDE BETWEEN THE BACK OF THE CURB AND THE SIDEWALK, THE SIDEWALK THICKNESS SHALL BE INCREASED TO 6" AND THE SIDEWALK WIDTH INCREASED BY 1'.
12. SIDEWALK SHALL BE 6" THICK AT STREET INTERSECTIONS FROM THE BACK OF CURB FOR THE FIRST 8 LINEAL FEET AND SHALL BE A MINIMUM OF 5' WIDE FROM THE BACK OF CURB THROUGH THE LANDING.
13. SIDEWALK SHALL BE INSTALLED AT THE WIDTH SHOWN ON THE CONSTRUCTION PLANS.

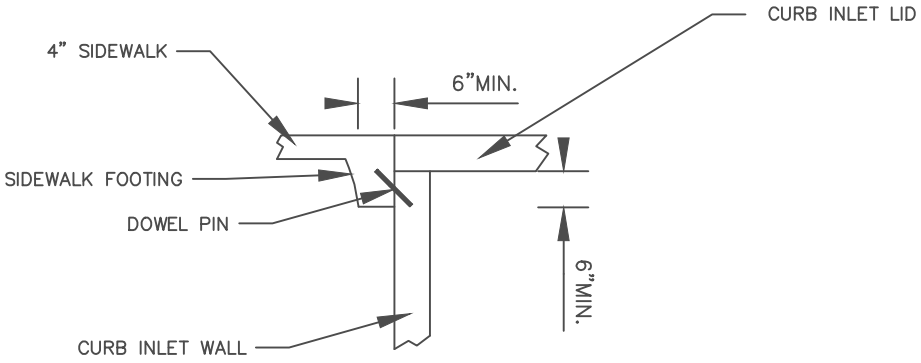
Blue Springs Missouri

STANDARD DETAILS

SIDEWALK SECTION

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY: SPJ	DATE: 2-3-93
DETAIL NO.: MIS-01	SCALE: NO SCALE
APPROVED BY:	



NOTES:

1. DOWEL PINS SHALL BE #4 BARS, 7" LONG, INSERTED A MINIMUM OF 3" AND A MAXIMUM OF 4" INTO CURB INLET WALL.
2. EXPANSION JOINTS SHALL BE PLACED AROUND THE LID WHERE THE SIDEWALK ABUTS AND SHALL ISOLATE THE SIDEWALK FROM THE FULL DEPTH OF THE LID. THESE SHALL NOT BE COUNTED TOWARDS THE EXPANSION REQUIRED.
3. DOWEL PINS SHALL BE PLACED ON 18" CENTERS WITH A MINIMUM OF ONE PER EVERY SIDE AFFECTED.
4. FOOTING SHALL BE USED WHENEVER ANY PORTION OF THE CURB INLET LID IS UTILIZED FOR SIDEWALK AND TOP . OF CURB INLET AND SIDEWALK SHALL BE FLUSH. IF CURB INLET LID IS USED IT MUST MEET ADA CROSS SLOPE REQUIREMENTS.
5. COST OF FOOTING IS SUBSIDAIRY TO THE SIDEWALK BID.

SIDEWALK FOOTING AT CURB INLET DETAIL

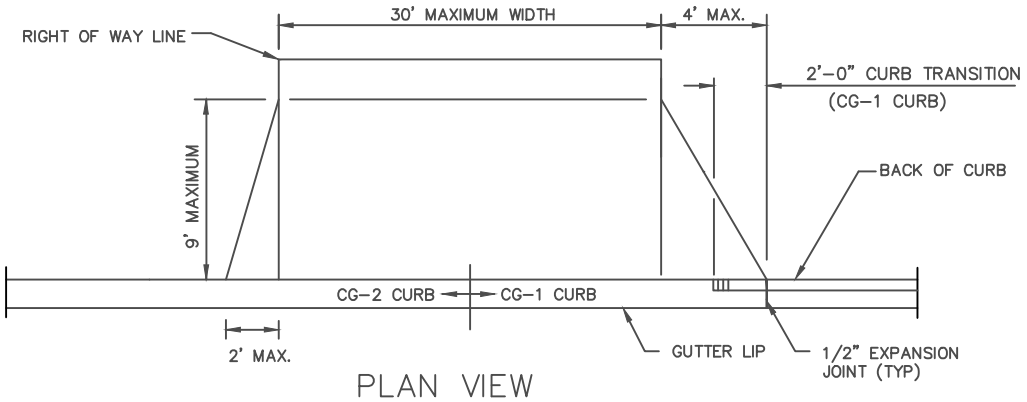
Blue Springs Missouri

STANDARD DETAILS

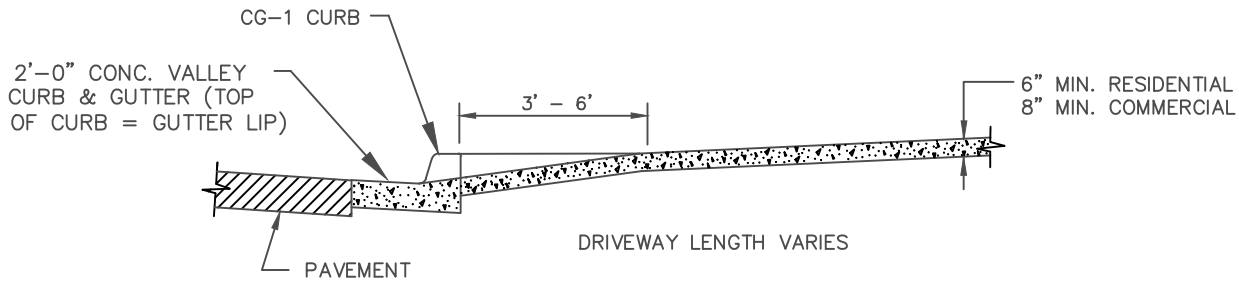
SIDEWALK FOOTING AT C.I.

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	03-20-14
DETAIL NO.:	MIS-02	SCALE:	NO SCALE
APPROVED BY:			



PLAN VIEW



SECTION WITH STRAIGHT BACK CURB (CG-1)

DRIVEWAY DETAIL WITH CURB TRANSITION



SECTION WITH ROLL BACK CURB (CG-2)

DRIVEWAY DETAIL

NOTE:
1. WINGS NOT REQUIRED FOR DRIVEWAY WITH NO TRANSITION.
2. GUTTER FLOW LINE SHALL BE MANTAINED.
3. ALL CONCRETE WITHIN THE RIGHT OF WAY SHALL BE KCMMB 4K MIX. EXCEPTION: DRIVEWAYS LOCATED ON THE NON SIDEWALK SIDE OF THE STREET ARE NOT REQUIRED TO USE KCMMB FOR DRIVEWAY CONSTRUCTION.
4. DRIVEWAY WIDTH IN THE RIGHT OF WAY SHALL MATCH WHAT IS SHOWN ON THE APPROVED PLOT PLAN. WINGS THAT DO NOT EXCEED THE PLAN VIEW SHOWN ABOVE DO NOT COUNT TOWARDS THE DRIVEWAY WIDTH.
5. ON DRIVEWAYS WHERE A SIDEWALK CROSSES, ADA CROSS SLOPE (2% MAXIMUM) REQUIREMENTS SHALL BE MET. THE CITY RECOMMENDS A 1% CROSS SLOPE.
6. REFER TO THE DESIGN AND CONSTRUCTION MANUAL FOR FURTHER REQUIREMENTS.

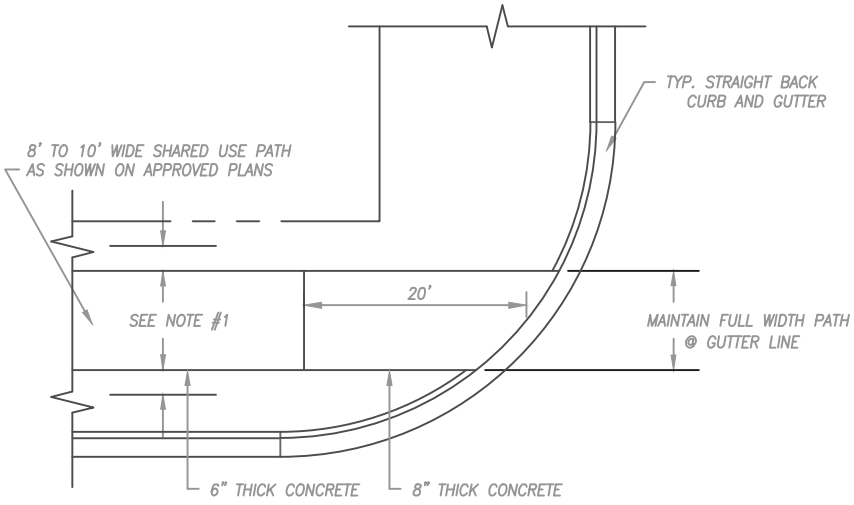
Blue Springs Missouri

STANDARD DETAILS

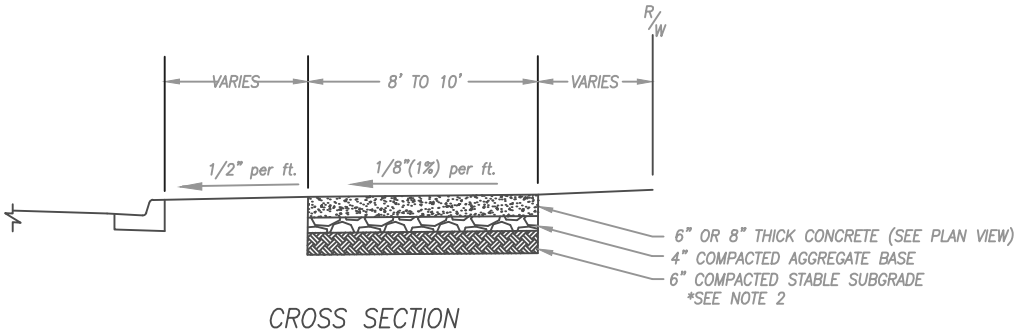
RESIDENTIAL DRIVEWAY

REVISIONS			
NO.	DATE	BY	REMARKS
1	01/14	BM	GENERAL UPDATE
2	04/18	TSD	GENERAL UPDATE

DRAWN BY:	SPJ	DATE:	2-22-95
DETAIL NO.:	MIS-03	SCALE:	NO SCALE
APPROVED BY:			



PLAN VIEW



CROSS SECTION

CONCRETE SHARED USE PATH

NOTES:
1. MAINTAIN 2' WIDE ZONE CLEAR OF SIGNS, POSTS, RAILINGS, ETC.
2. SHARED USE PATH SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE PER APWA SPECIFICATIONS.
3. EXPANSION JOINTS SHALL BE PLACED EVERY 150' AND CONTRACTION JOINTS SHALL BE SAW CUT EVERY 10'. PICTURE FRAMING (JOINTING AND EDGING) IS NOT ALLOWED.
4. ALL CONCRETE SHALL BE KCMMB 4K MIX.
5. FOR ADA RAMPS, REFER TO MODOT PROWAG SPECIFICATIONS. EXCEPTIONS: REFER TO NOTE #4 FOR CONCRETE SPECIFICATIONS AND NOTE #6 FOR TRUNCATED DOME PANELS ALLOWED.
6. TRUNCATED DOME PANELS SHALL BE ARMOR TILE CAST IN PLACE OR ADA SOLUTIONS CAST IN PLACE SYSTEMS OR APPROVED EQUAL. PANELS SHALL BE BRICK RED IN COLOR. PANEL SHALL BE 2' X WIDTH OF SHARED USE PATH.
7. WHENEVER ANY PORTION OF A CURB INLET TOP SLAB IS UTILIZED FOR A SHARED USE PATH, A FOOTING SHALL BE INSTALLED. SEE STANDARD DETAIL MIS–02. IF A TOP SLAB IS USED FOR A PORTION OF THE SIDEWALK, IT MUST MEET ADA CROSS SLOPE REQUIREMENTS.
8. SHARED USE PATH SHALL MEET MoDOT AND PROWAG ADA REQUIREMENTS.

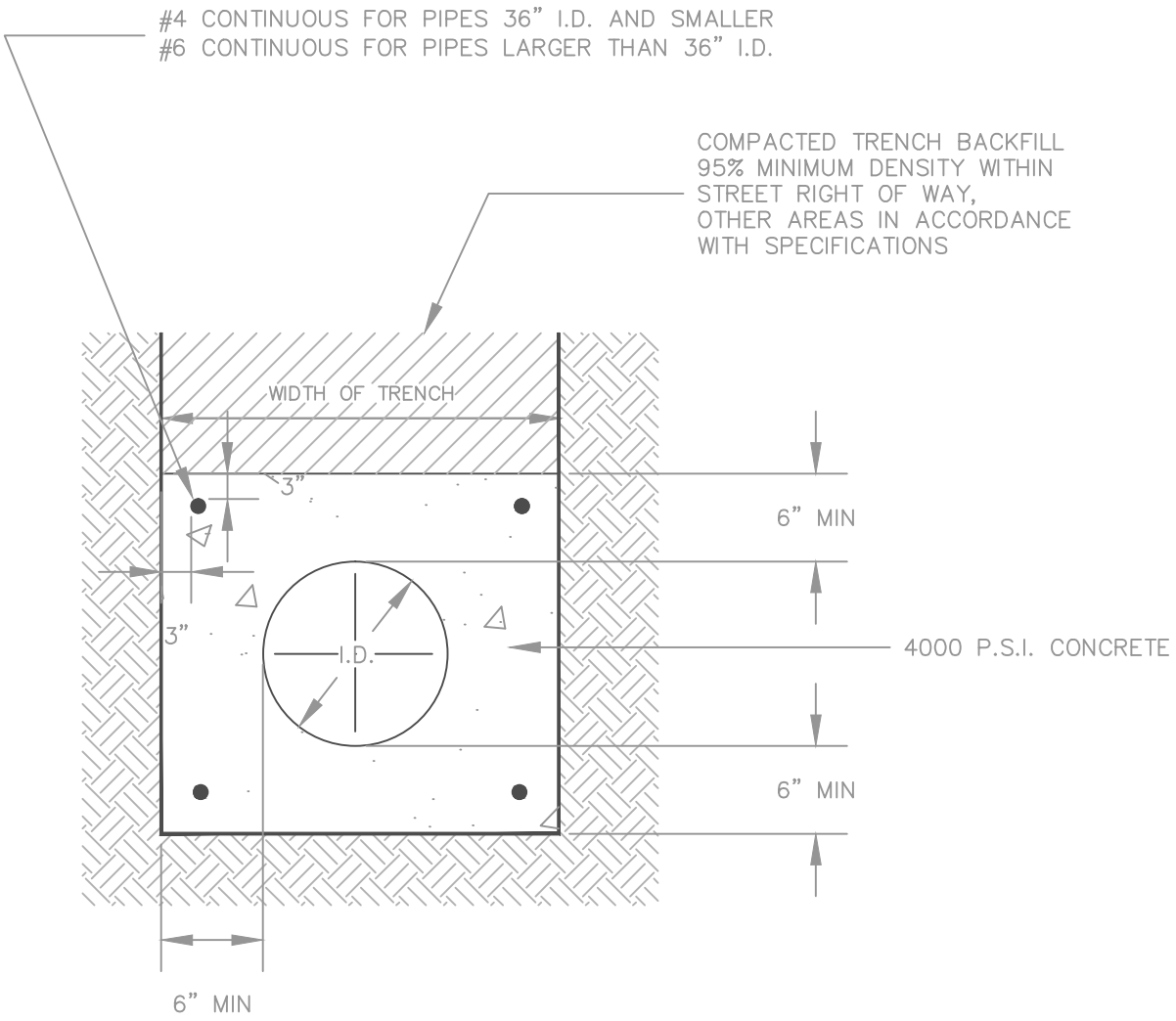
Blue Springs Missouri

STANDARD DETAILS

CONCRETE SHARED USE PATH

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	REPLACED ASPHALT SHARED USE PATH

DRAWN BY:	PWC	DATE:	04–11–06
DETAIL NO.:	MIS–04	SCALE:	NO SCALE
APPROVED BY:			



CONCRETE ENCASEMENT DETAIL

NOTES:

1. CONTRACTOR SHALL BLOCK UP PIPE WITTH 8" X 8" X 16" SOLID CONCRETE BLOCKS TO GIVE MINIMUM PIPE CLEARANCE INDICATED.
2. CONTRACTOR SHALL PROVIDE PIPE TIE DOWNS AS NECESSARY TO PREVENT FLOATING.
3. ALLOW CONCRETE TO SET 4 HOURS MINIMUM PRIOR TO TRENCH BACKFILL.

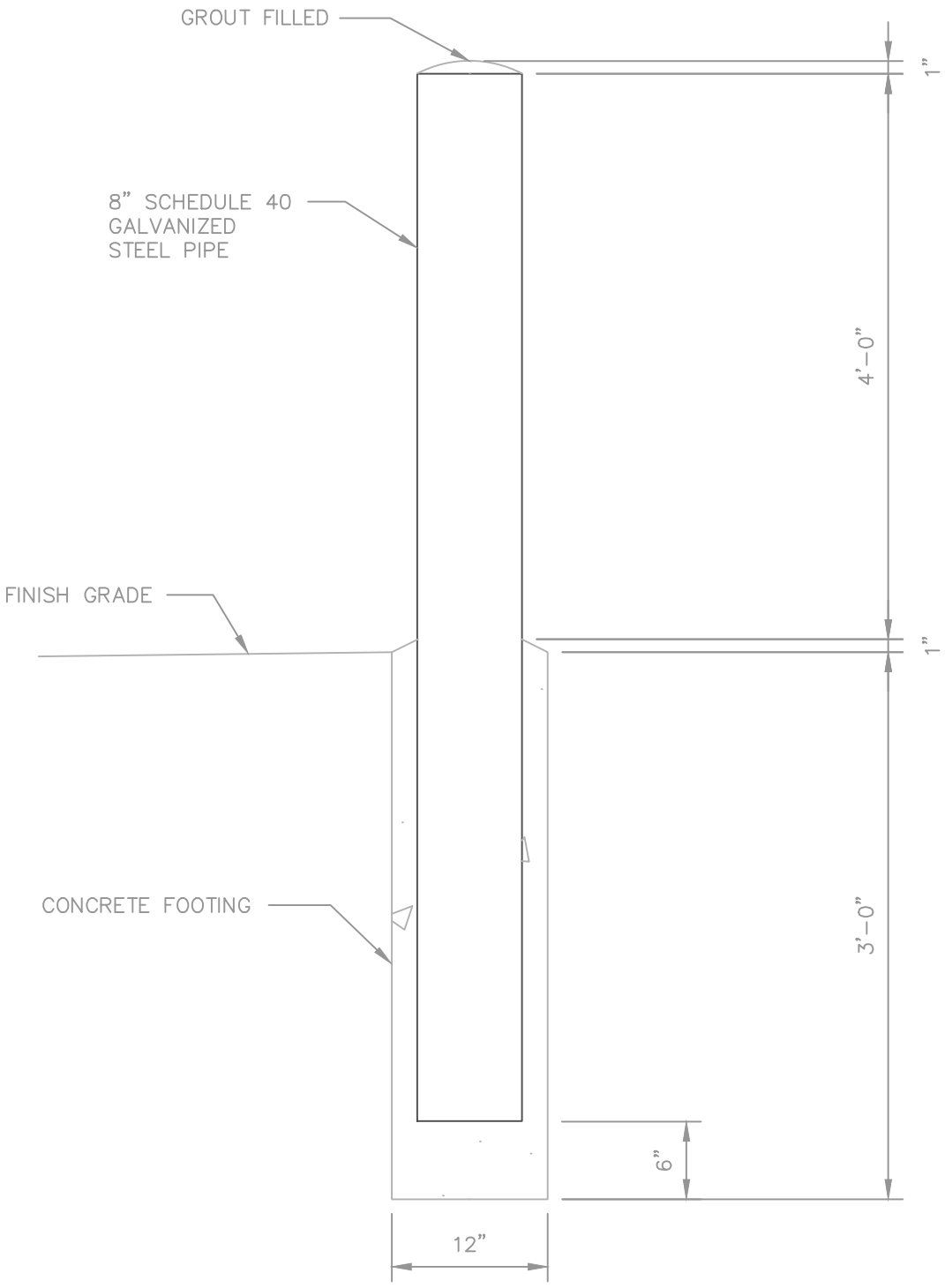
Blue Springs Missouri

STANDARD DETAILS

CONCRETE ENCASEMENT

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	09/16/98
DETAIL NO.:	MIS-05	SCALE:	NO SCALE
APPROVED BY:			



GUARD POST DETAIL

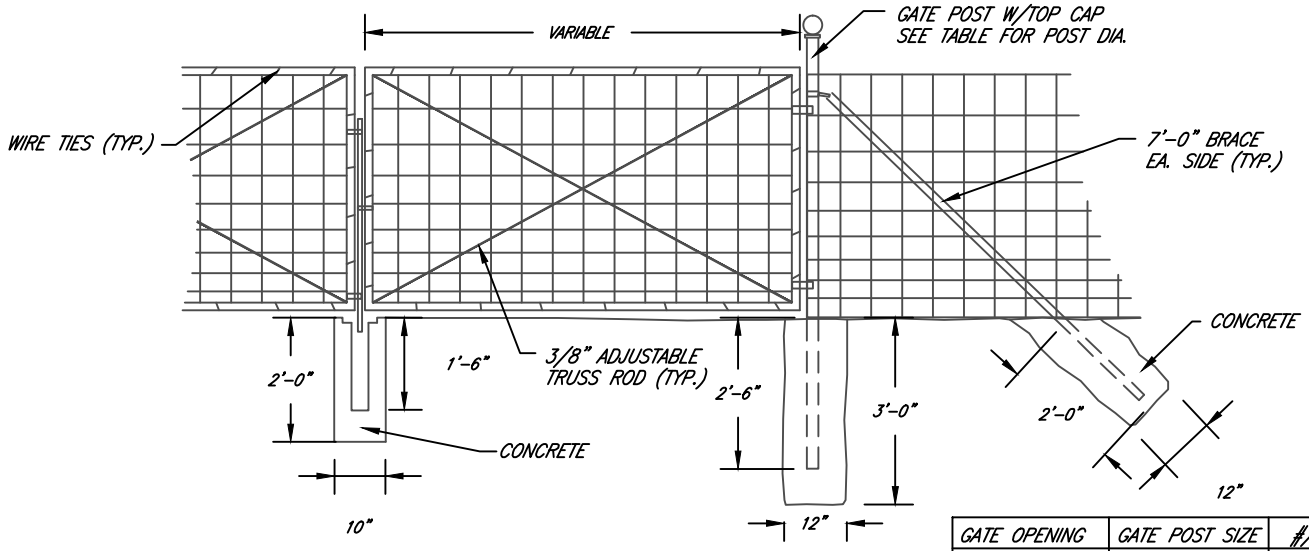
Blue Springs Missouri

STANDARD DETAILS

GUARD POST

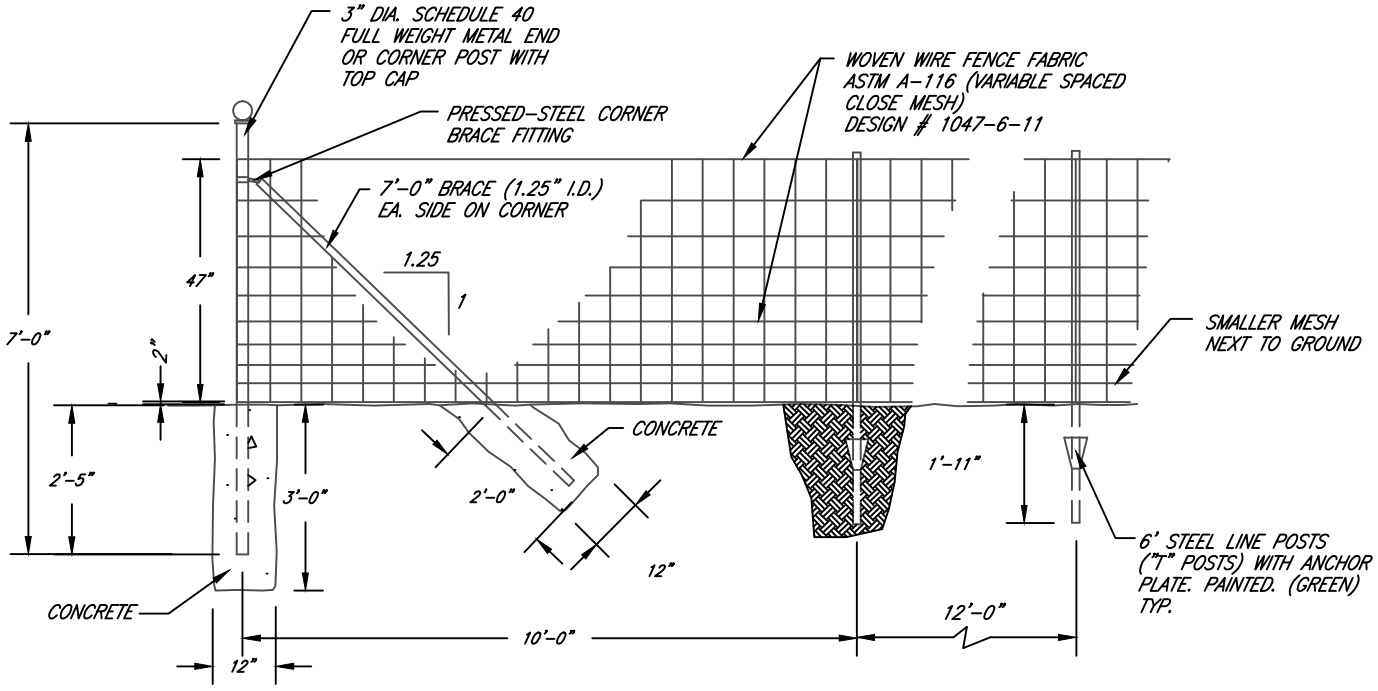
REVISIONS			
NO.	DATE	BY	REMARKS

DRAWN BY:	PWC	DATE:	09-11-98
DETAIL NO.:	MIS-06	SCALE:	NO SCALE
APPROVED BY:			



GATE OPENING	GATE POST SIZE	#/FT.
6'-0" & LESS	2" I.D.	3.65
13'-0" & LESS	2.5" I.D.	5.79
18'-0" & LESS	3.5" I.D.	9.10
OVER 18'-0"	6" I.D.	18.97
GATE FRAME	1.5 I.D.	2.72

GATE ASSEMBLY



FENCE DETAIL

NOTES:
1. ATTACHMENT OF FABRIC TO STEEL POSTS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
2. DOUBLE GATES REQUIRED FOR ALL OPENINGS GREATER THAN 12'-0".
3. THIS TYPE OF FENCING ONLY ALLOWED FOR SPECIFIC APPLICATIONS AND MUST HAVE PRIOR APPROVAL FROM THE CITY OF BLUE SPRINGS.

Blue Springs Missouri

STANDARD DETAILS

WOVEN WIRE FENCE

REVISIONS			
NO.	DATE	BY	REMARKS
1	04/18	TSD	GENERAL UPDATE

DRAWN BY:	PWC	DATE:	1/26/00
DETAIL NO.:	MIS-07	SCALE:	NO SCALE
APPROVED BY:			