

Stormwater General Notes
(to be included with all Construction Drawings)

1. All stormwater facility construction shall conform to the most recent version of City of Greeley Standard Details. Construction specifications for stormwater facilities not covered by the City's Standard Details shall be those in the most recent version of the CDOT Standard Specifications for Road and Bridge Construction or those published by the Mile High Flood District (MHFD). Details not covered by the City's Standard Details shall be those in the CDOT Miscellaneous Standard Plans (M-Standards) or those published by the MHFD or as approved by the City of Greeley.
2. City Standard Details are not to scale unless a scale is indicated.
3. Remove all debris from trenches, including soda cans, rags, pipe banding material, etc. before backfilling.
4. All rebar used for storm drainage structures shall be epoxy coated.
5. The Contractor must follow the requirements in the State Stormwater Permit including daily street and walkway sweeping and dust control, using water as a dust palliative where required. Costs for this work are included in the accepted total bid and no additional payment shall be made.
6. The Contractor is responsible for providing As-Constructed Record Drawings to the City of Greeley's Public Works Department in accordance with the City's Storm Drainage Design Criteria.
7. The Contractor is required to have a current City of Greeley Contractor's License to perform any work in public right-of-way or easements.
8. The Contractor is responsible for obtaining all required permits prior to commencement of any work.
9. The Contractor shall be solely and completely responsible for all construction-related conditions at and adjacent to the job site, including the safety of all persons and property, during the performance of the work at all times. Any City inspections completed during construction are not intended to evaluate the adequacy of the Contractor's safety measures in, on, or near the construction site.
10. Working hours shall be between 7:00 am and 6:00 pm on normal City of Greeley business days unless prior approval has been obtained from the City.
11. The Owner shall ensure that the size and type of all underground utilities in the area of the work are located and shown on the Construction Drawings. The Contractor shall notify all utility companies including, but not limited to, Atmos Energy, CenturyLink, Xcel Energy, Comcast, and the Greeley Water and Sewer Department, prior to commencing construction, to have all existing utilities field located.



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Stormwater
General Notes
Detail 1-1

General Erosion Control Notes
(to be included with all ESCP)

1. Contractor shall install all initial sediment and erosion control devices in accordance with the details provided in the ESCP that have been excerpted from either 1. Chapter 7, Construction BMPs, from Volume 3 of the Mile High Flood District (MHFD) Urban Storm Drainage Criteria Manual (USDCM) or 2. CDOT Erosion Control and Stormwater Quality Guide and Standard Plan M-208-1 prior to any land disturbing, clearing, or grading activities. These initial BMPs may include, but are not limited to, silt fence, sediment control logs, inlet protection, vehicle tracking control, concrete washout area, and sediment basins, among many others.
2. The construction of underground utilities is considered a land disturbing activity.
3. Contractor shall limit topsoil stripping to the immediate work area.
4. All materials must be stored and disposed of in accordance with Volume 3 of the USDCM.
5. When possible, all excavated material shall be placed so that any sediment will erode back into the trench or other excavation from which it came. If this is not possible due to grade, containment must be provided. Stockpiles shall not have side slopes steeper than 3H:1V.
6. BMPs must be employed for all stockpiles and in all areas where land disturbance has occurred, in accordance with Volume 3 of the USDCM. Immediately discontinue all land disturbing activities when fugitive dust impacts adjacent properties.
7. All disturbed areas and soil stockpiles that remain inactive for more than 14 days shall be stabilized in accordance with Section 12 of the SDDC. Stabilization is required any time construction ceases on any part of a site for more than 14 days. Permanent or temporary stabilization is also required within 14 days after final grade is achieved.
8. All storm inlets within the limits of disturbance and at least the first two inlets downstream from any land disturbing activity must receive inlet protection in accordance with Volume 3 of the USDCM. Hay bales are not acceptable for inlet or culvert protection.
9. The Contractor shall inspect all BMPs at the end of each day of work. Necessary maintenance and repairs shall be made immediately.
10. The City inspector may provide a written notice to the Contractor to immediately repair, replace, relocate, modify, or remove BMPs.
11. All public right-of-way shall be swept clean of all dirt, mud, and debris at the end of each day of work and after storm events.
12. Temporary erosion & sediment control BMPs shall be removed only at the inspector's direction.
13. Sediment traps and basins may be removed once their tributary area is stabilized. If a sediment basin is to be used as a permanent facility, full design capacity must be restored after final stabilization measures are implemented and before any concrete work in the basin begins. The Contractor must properly dispose of all sediment.
14. The performance security will only be released once the Stormwater Division determines all work has been successfully completed and final stabilization has been achieved. It is the responsibility of the property owner to ensure the ongoing and perpetual maintenance of all final stabilization measures once work is complete.
15. The property owner/operator is liable for any violations resulting from the actions taken by any site contractors, subcontractors, maintenance crews, etc.



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General Erosion
 Control Notes
 Detail 1-2

Seed Mixes

Bluegrass Mix. The Bluegrass Mix is not a native seed mix. It is intended for use in high traffic recreation areas such as parks. A permanent irrigation system is required where the bluegrass mix is used.

Species	Pounds per Acre Pure Live Seed (PLS)
Kentucky bluegrass, Moonlight	65.1
Kentucky bluegrass, Northstar	65.1
Kentucky bluegrass, Quantum Leap	65.1
Perennial ryegrass	21.7

Low Grow Mix. The Low Grow Mix is a native seed mix for unirrigated or native areas. It can be used in open areas where short grasses are desired. It shall be used on the sides of all paths or walkways for a minimum offset width of 15' on each side and for that same width along property lines abutting residential properties.

Species	Pounds per Acre Pure Live Seed (PLS)
Buffalo grass	21.0
Sideoats grama	1.50
Blue grama	1.65
Western wheatgrass	3.95
Alkali sacaton	0.50
Inland saltgrass	1.00
Sheet fescue	4.00
Hard fescue	4.00

Mature height ranges from 8" to 12".

Slope Mix. The Slope Mix is a native seed mix for unirrigated or native areas. It shall be used on all slopes and berms steeper than 5H:1V.

Species	Pounds Per Acre Pure Live Seed (PLS)
Side oats grama	4
Blue grama	4
Little bluestem	4
Sand dropseed	0.12
Streambank wheatgrass	8

Mature height ranges from 1' to 3'.

Riparian Mix. The Riparian Mix is a native seed mix for unirrigated or native areas. It shall be used along irrigation ditches and in areas that are frequently wet such as the lower banks of a vegetated open channel.

Species	Pounds Per Acre Pure Live Seed (PLS)
Switchgrass	6
Prairie cordgrass	5
Streambank wheatgrass	8

Mature height ranges from 3' to 6'.

Pond Mix. The Pond Mix is a native seed mix for unirrigated or native areas. It is to be used in and around detention facilities and in areas that are designed to hold water but may not be frequently wet.

Species	Pounds Per Acre Pure Live Seed (PLS)
Little bluestem	2
Yellow indian grass	2
Switchgrass	1
Blue grama	0.6
Side oats grama	3
Prairie sandreed	1.5
Western wheatgrass	4
Streambank wheatgrass	5

Mature height ranges from 3' to 6'.

Notes

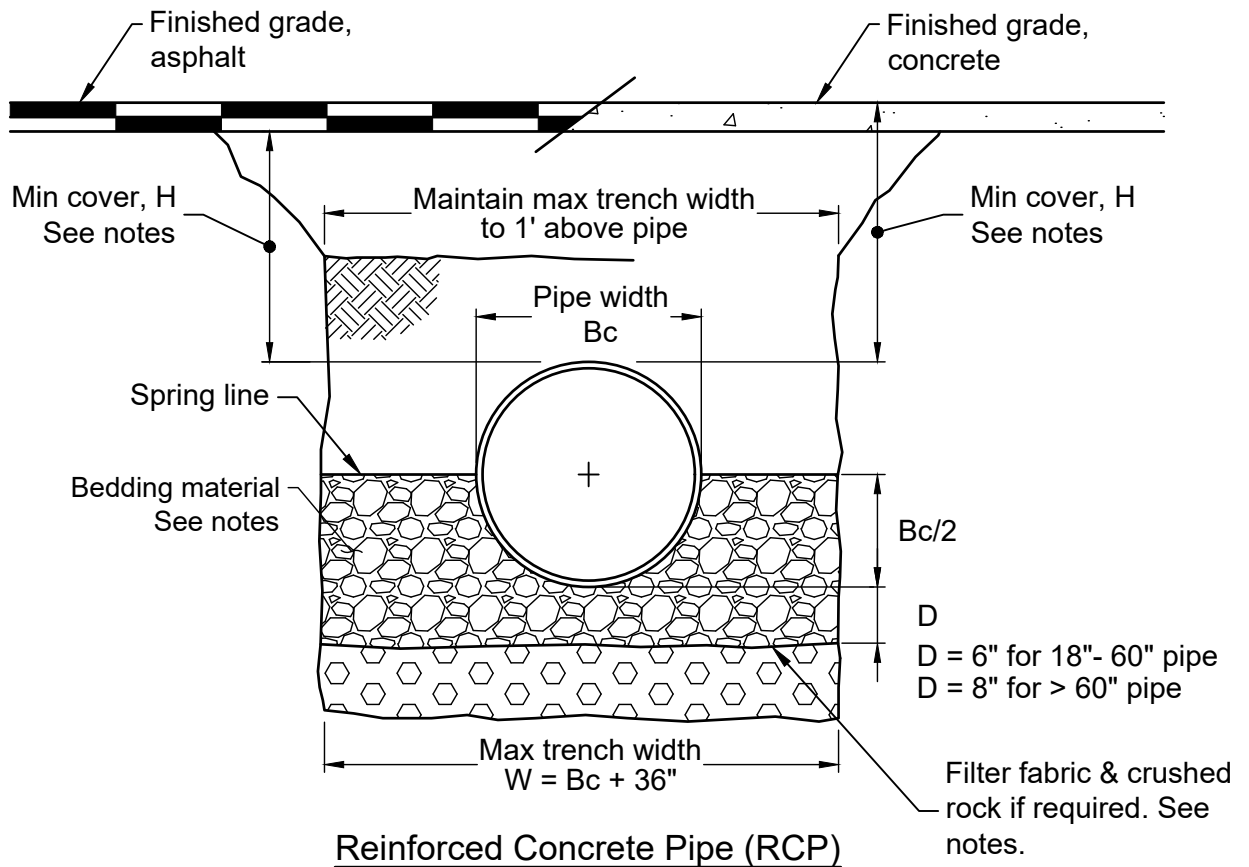
1. Seed mixes can be adjusted to meet site conditions including soil salinity or other conditions that might impede the successful establishment of the standard species with the approval of the City's Natural Areas Group.



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Seed Mixes

Detail 1-3

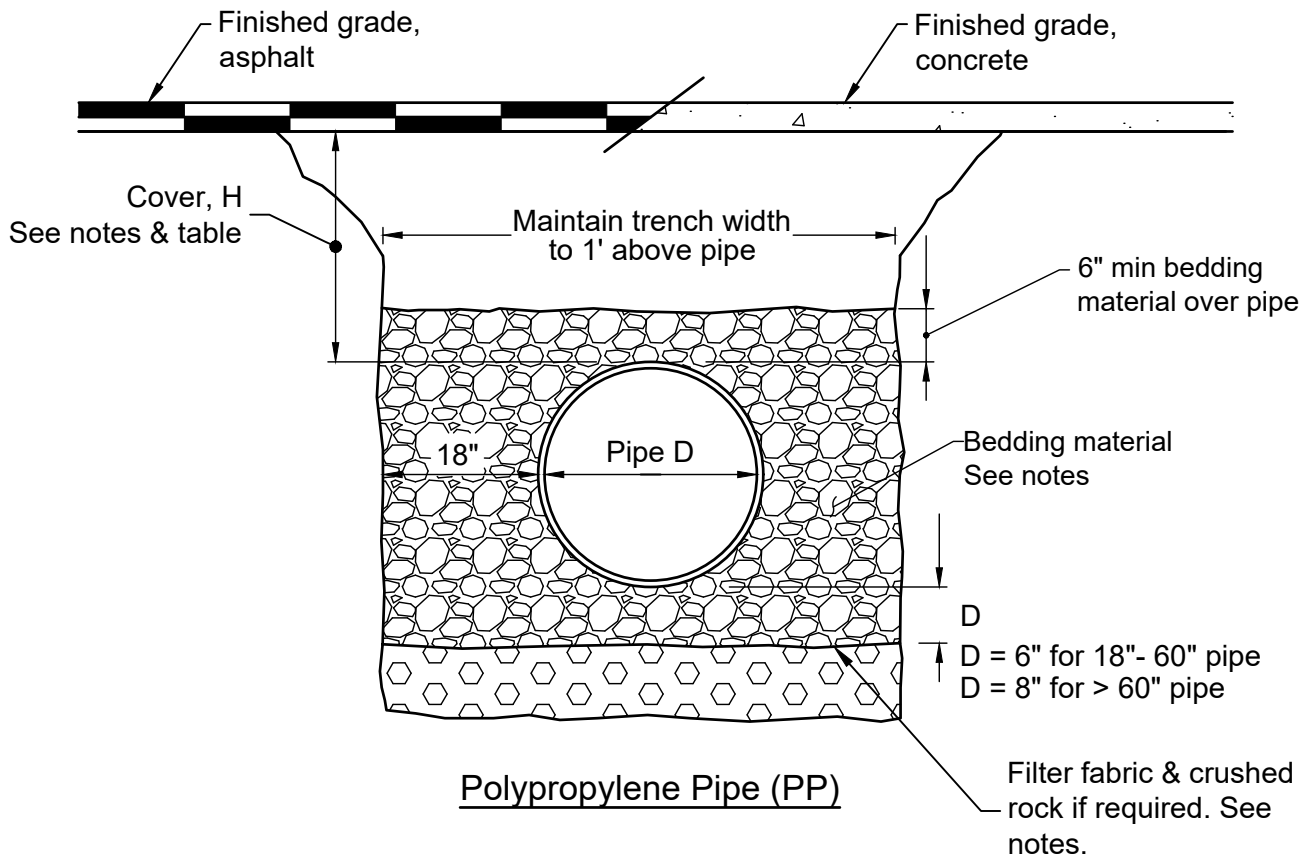


Notes

1. Trench backfill above bedding material shall be per Detail No. S-30 in the City of Greeley Design Criteria Construction Specifications Manual Volume 1 - Streets.
2. Minimum cover over pipe, H, shall be 1'-0" measured from bottom of asphalt or top of concrete pavement.
3. Consolidate the bedding w/ shovel slicing & tamping.
4. Backfill the pipe with bedding to the spring line.
5. Consolidate the bedding w/ shovel slicing & tamping evenly on both sides of pipe.
6. Place a 12" min layer of 1-1/2" to 3" crushed rock, or as required to provide a stable subgrade if groundwater is encountered or if required by the Engineer. Place Class 1 non-woven filter fabric over the crushed rock foundation before placing bedding.

Bedding Material

Bedding shall be CDOT No. 57 or No. 67 coarse aggregate.



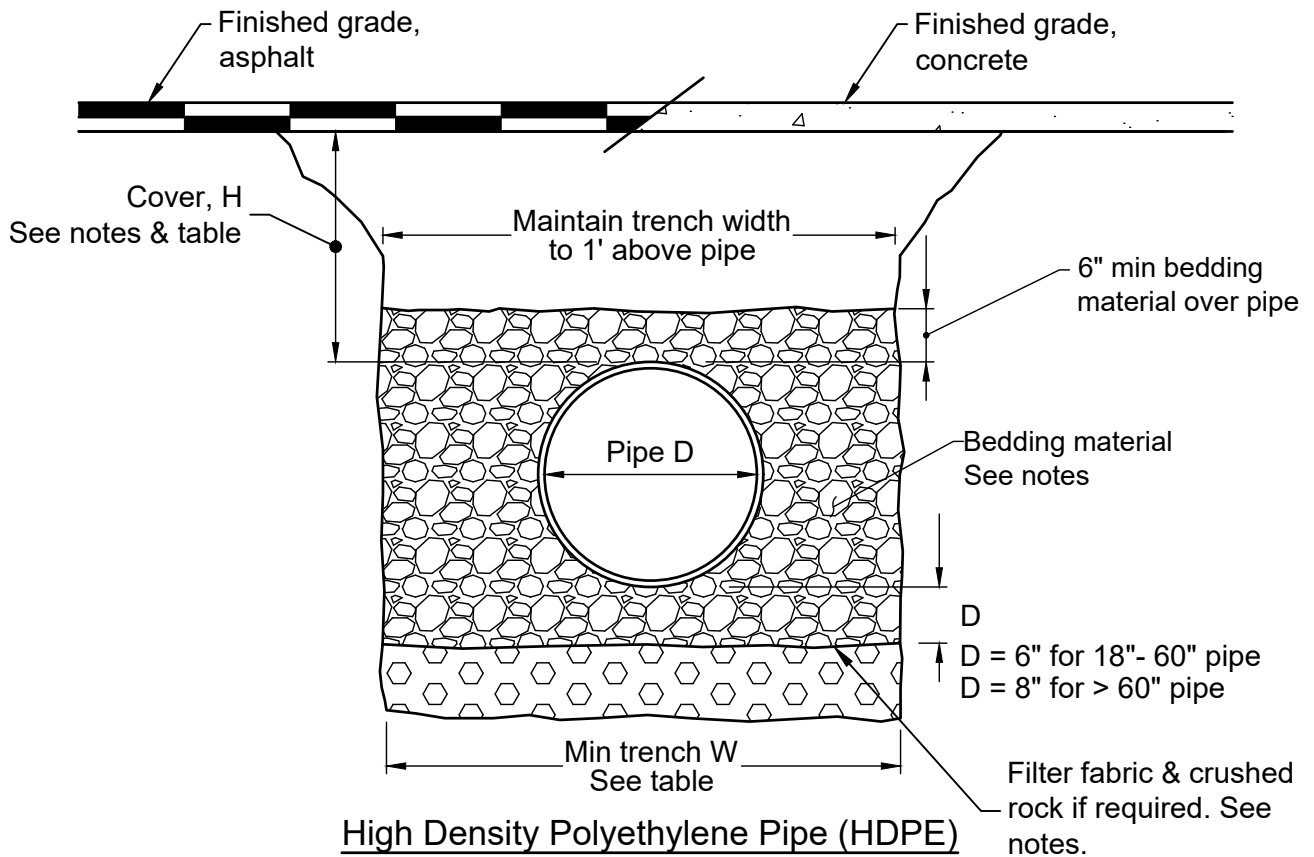
Notes

1. Trench backfill above bedding material shall be per Detail No. S-30 in the City of Greeley Design Criteria Construction Specifications Manual Volume 1 - Streets.
2. Min cover, H, shall be 2'-0" to bottom of asphalt or concrete pavement.
3. Do not use mechanical compaction equipment until pipe has been backfilled to 12" over the top of pipe.
4. Place bedding in 6" lifts on stabilized subgrade.
5. Consolidate each bedding lift w/ shovel slicing & tamping to 95% AASHTO T180 min relative compaction.
6. Place a 12" min layer of 1-1/2" to 3" crushed rock, or as required to provide a stable subgrade if groundwater is encountered or if required by the Engineer. Place Class 1 non-woven filter fabric over the crushed rock foundation before placing bedding.
9. Prevent migration of native fines into backfill material.
10. Multiple pipe installations shall be in accordance with CDOT Standard Detail M-603-4 for AASHTO M330 pipe.

Bedding Material

Bedding shall be CDOT Class 1 compacted structure backfill. Provide documentation of backfill material to Engineer.

Pipe D	Max H
12"	20'
15"	21'
18"	22'
24"	16'
30"	19'
36"	14'
42"	15'
48"	14'
60"	14'



Notes

1. Trench backfill above bedding material shall be per Detail No. S-30 in the City of Greeley Design Criteria Construction Specifications Manual Volume 1 - Streets.
2. Min cover, H, shall be 2'-0" or 1D, whichever is greater, to bottom of asphalt or concrete pavement.
3. Do not use mechanical compaction equipment until pipe has been backfilled to 12" over the top of pipe.
4. Place bedding in 6" lifts on stabilized subgrade.
5. Consolidate each bedding lift w/ shovel slicing & tamping to 95% AASHTO T180 min relative compaction.
6. Place a 12" min layer of 1-1/2" to 3" crushed rock, or as required to provide a stable subgrade if groundwater is encountered or if required by the Engineer. Place filter fabric over the crushed rock foundation before placing bedding.
9. Prevent migration of native fines into backfill material.
10. Multiple pipe installations shall be in accordance with CDOT Standard Detail M-603-4 for AASHTO M294 pipe.

Bedding Material

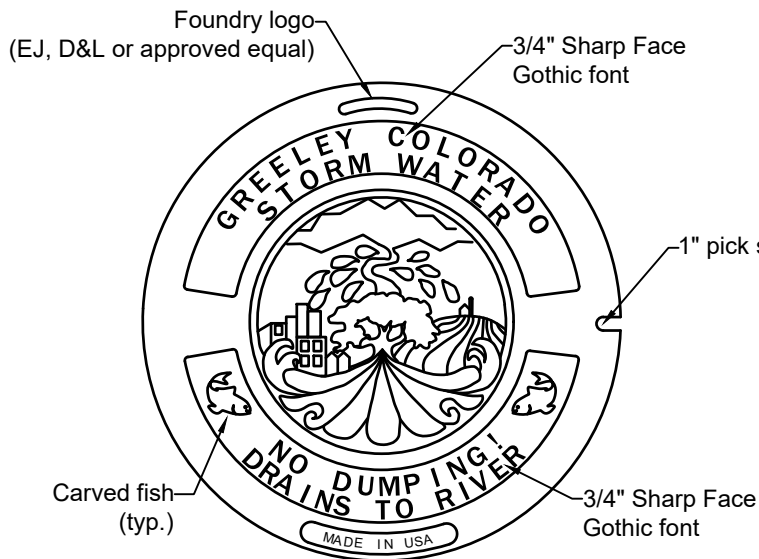
Bedding shall be CDOT Class 1 structure backfill. Provide documentation of backfill material to Engineer

Pipe D	Max H	Min Trench W
12"	17'	30"
15"	18'	34"
18"	17'	39"
24"	14'	48"
30"	14'	56"
36"	13'	64"
42"	11'	72"
48"	12'	80"
60"	12'	96"

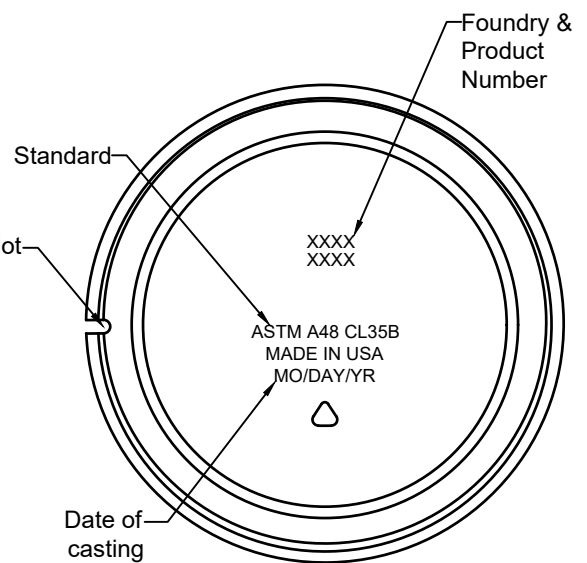


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Standard Storm Drain Bedding
 High Density Polyethylene (HDPE)
 Detail 6-6C

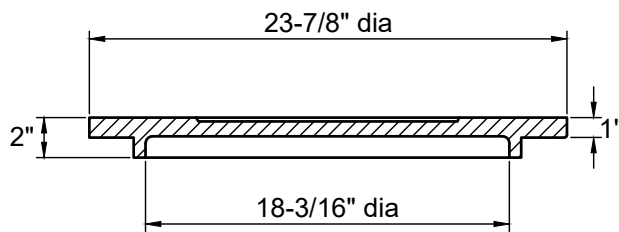


Cover Face Plan



Cover Bottom Plan

Plan



24" Cover Section

Approved Covers		
Nominal Ø	East Jordan	D&L
24"	2408A 00240890	A-1043
30"	2508A 00250821	A-1361

Notes

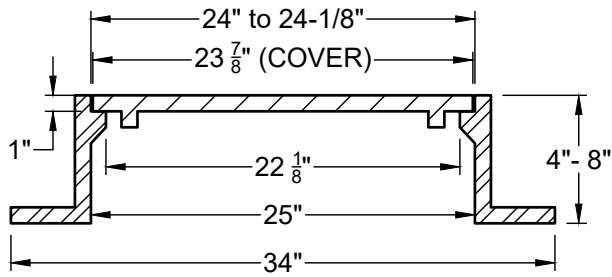
1. Cover shall be gray iron, manufactured per AASHTO M105-06/ASTM A48 Class 35B & conform to AASTHO M306-07. Cover diameter varies based on size of MH. See City Standard Details.
2. Cover shall be non-perforated, with lettering as shown, cast on the top of the lid for storm MHs.
3. Cover shall be bolted, if specified by the Public Works Department. Bolts shall be SS 3/8" dia hex bolts.
4. Material for rings & covers shall be gray or ductile cast iron conforming to CDOT-712.06.
5. This cover shall be used on all storm MHs & inlets. Covers reading "Storm Sewer" or "Sewer" are not acceptable.
6. Other foundries may produce this cover. The City must approve the product drawing and manufactured product as an approved equivalent prior to approval for installation.
7. All MH covers must have 1" pick slots. Hidden pick holes will not be acceptable.



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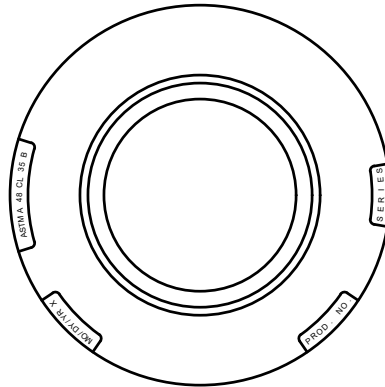
Standard Storm
 Manhole Cover
 Detail 6-8A

Standard 24" Ring

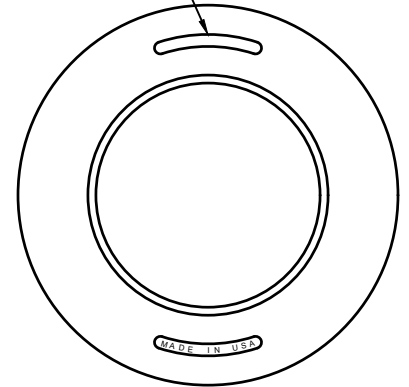


Section

Foundry logo (EJ, D&L, or approved equal)

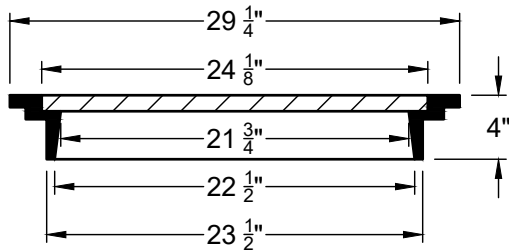


Bottom of Frame



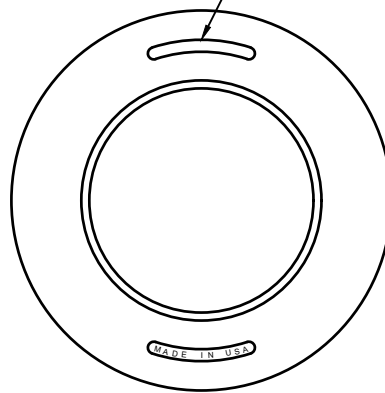
Top of Frame

24" Top Flange Ring

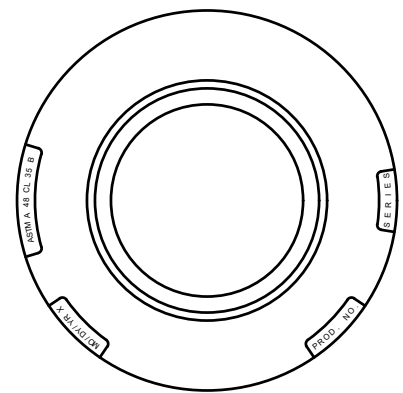


Section

Foundry logo (EJ, D&L, or approved equal)



Bottom of Frame



Top of Frame

Approved Products

Type	Nominal Ø	Nominal H	East Jordan	D&L
Standard	24"	8"	2420Z2 00242013	A-1161
Standard	30"	8"	2508Z 00250811	A-1361-R1
Reversible	24"	4"	2425Z 00242511	A-1075
Reversible	30"	4"	2510Z 00251011	B-5490
Top Flange	24"	4"	2416Z 00241611	B-5086

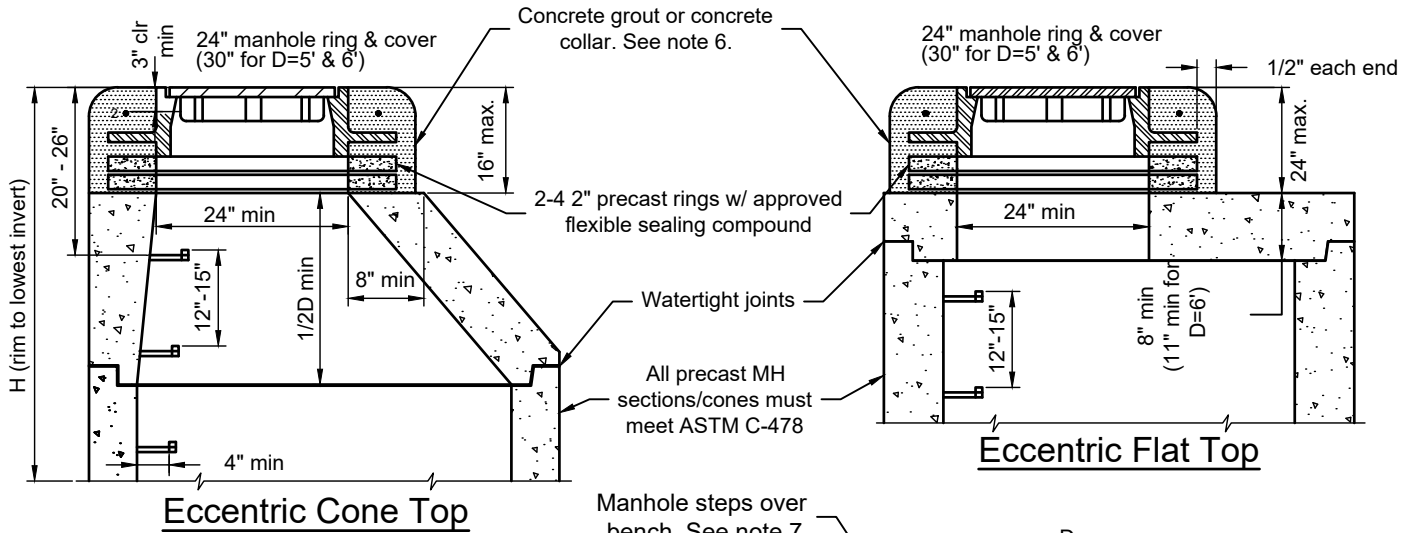
Notes

- Standard ring shall be used for all flat top & eccentric cone top manholes.
- Top flange ring shall be used for all inlets. See cover details for cover specifications.
- All rings & covers shall be heavy duty, meeting the AASHTO M306-10 Proof Load criteria.
- Manhole rings produced by other foundries may be accepted by the City as an approved equivalent.
- Dimensions shown are nominal and shall include a 1/16" tolerance for cover fit.
- Standard ring height is 8". Others may be approved if all other specifications & dimensions are met.
- Reversible 4" frames are not required but may be accepted.
- Frame diameter varies based on size of MH. See City Standard Details.

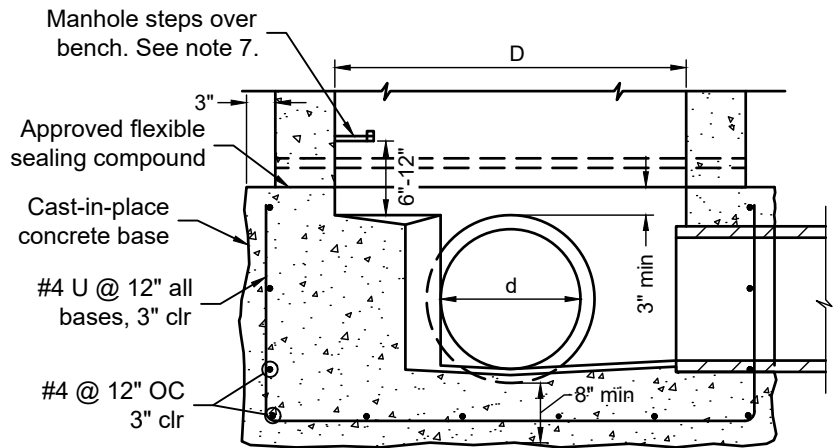


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Standard Storm Manhole
 Frames and Rings
 Detail 6-8B

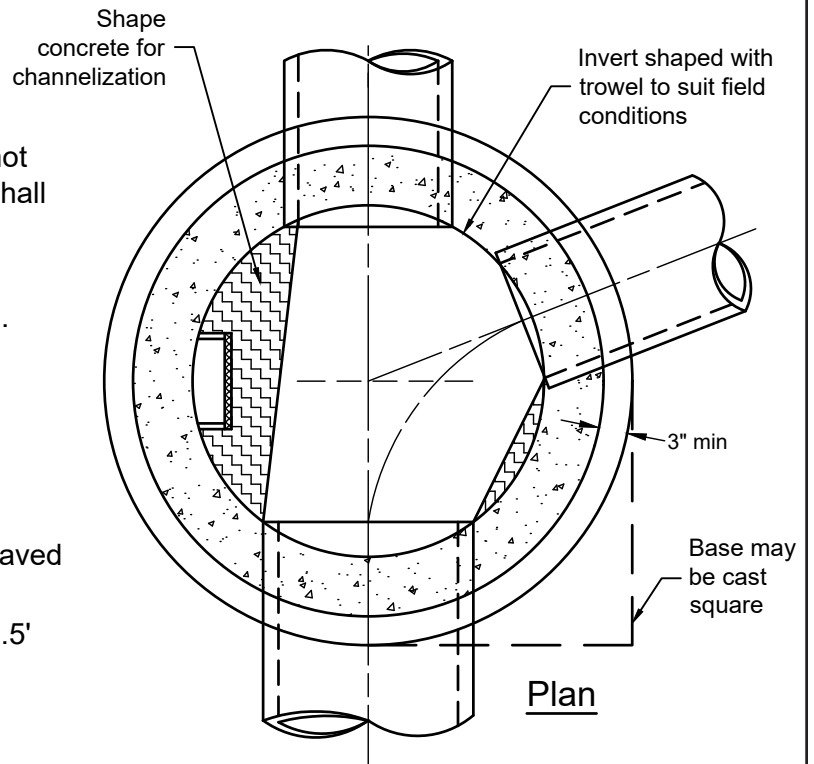


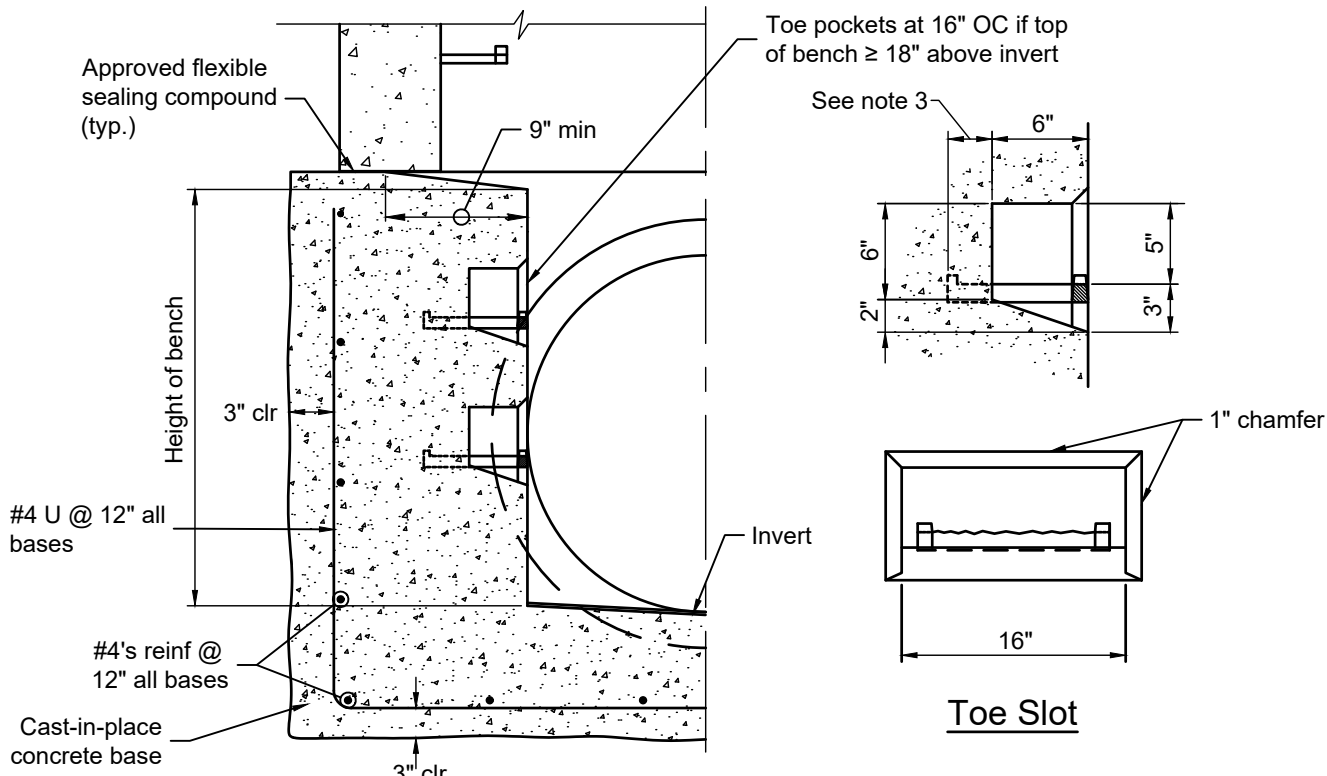
Pipe d	Manhole D	Bottom Reinf
15" to 18"	4 ft	#4 @ 12
21" to 30"	5 ft	#4 @ 12
36" to 54"	6 ft	#4 @ 12
≥ 60"	CDOT std M-604-20	



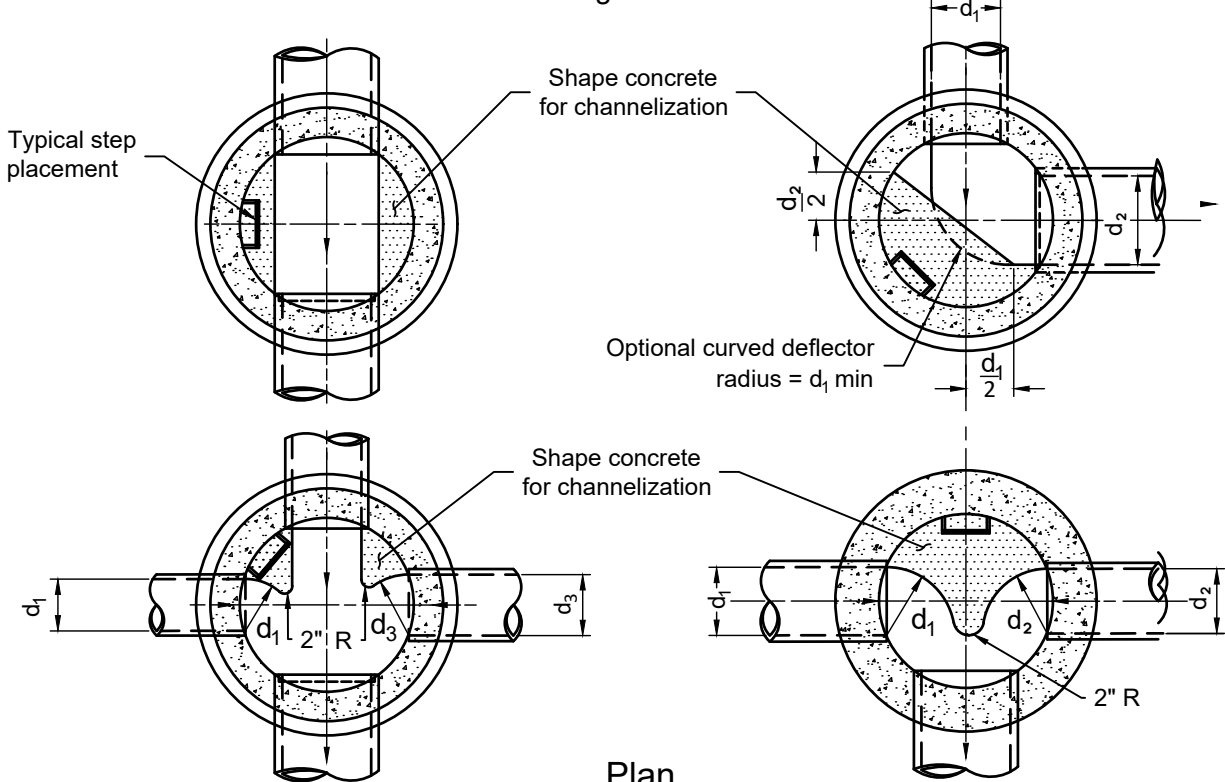
Notes

1. Risers, cones, reducers, & flat tops to be precast reinforced concrete. Reinforcing not shown for clarity. Cast in place concrete shall be CDOT Class B.
2. Horiz #4-rebar to have 12" min lap splice.
3. Eccentric cone top may be used for $H \geq 8'$. Eccentric flat top may be used on shallow manholes.
4. Slope top of bench to drain to channel.
5. All rebar shall be epoxy coated.
6. Concrete collar shall be used in all paved areas; 4500 psi grout may be used in unpaved areas.
7. Steps are required for manhole depths $>3.5'$ and shall conform to AASHTO M199





Toe Pocket Details
Bench height > 30"



Plan

Notes

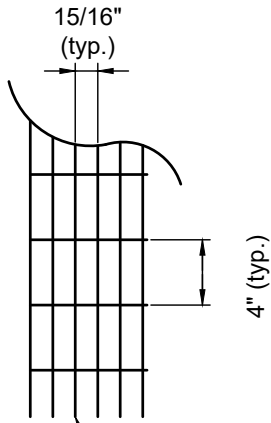
1. Concrete shall be CDOT Class B.
2. All rebar shall be epoxy coated.
3. Manhole step embedment shall be a min of 3" or as recommended by the manufacturer.



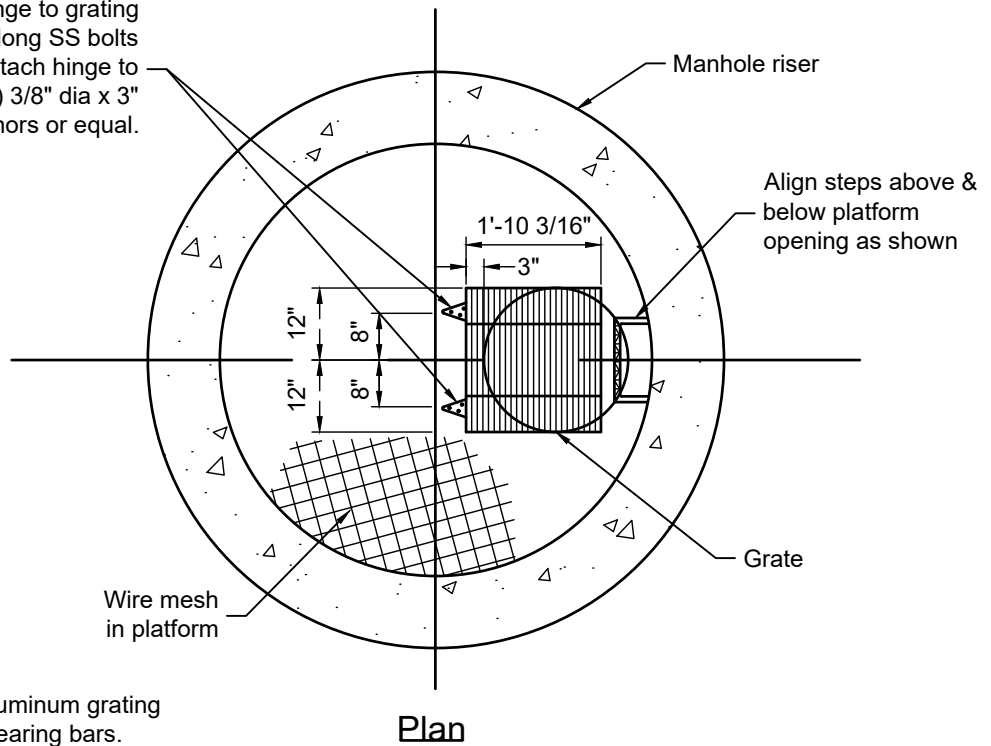
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Storm Manhole
Typical Base Channel
Detail 6-10

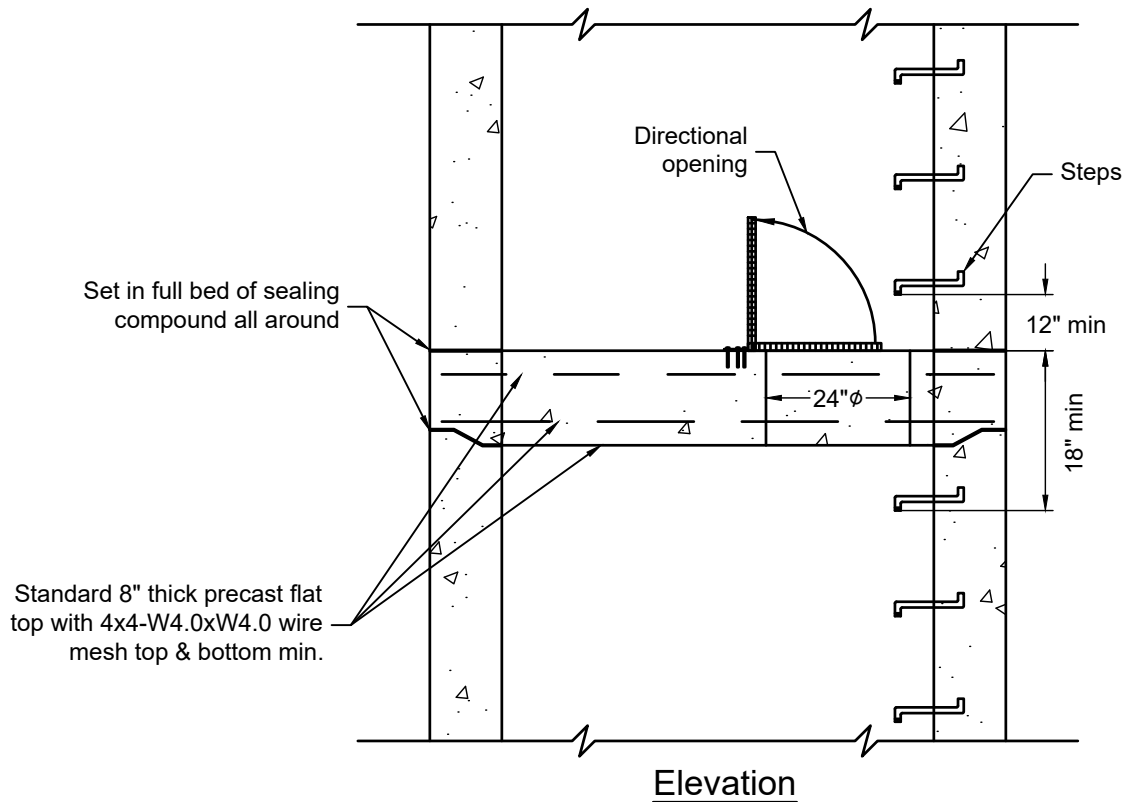
Attach each hinge to grating w/(2) 3/8" dia x 1" long SS bolts w/ SS hex nuts. Attach hinge to platform with (3) 3/8" dia x 3" long red head anchors or equal.



Fiberglass or aluminum grating
3/16" x 1-1/4" bearing bars.
Serrated grating optional.



Plan



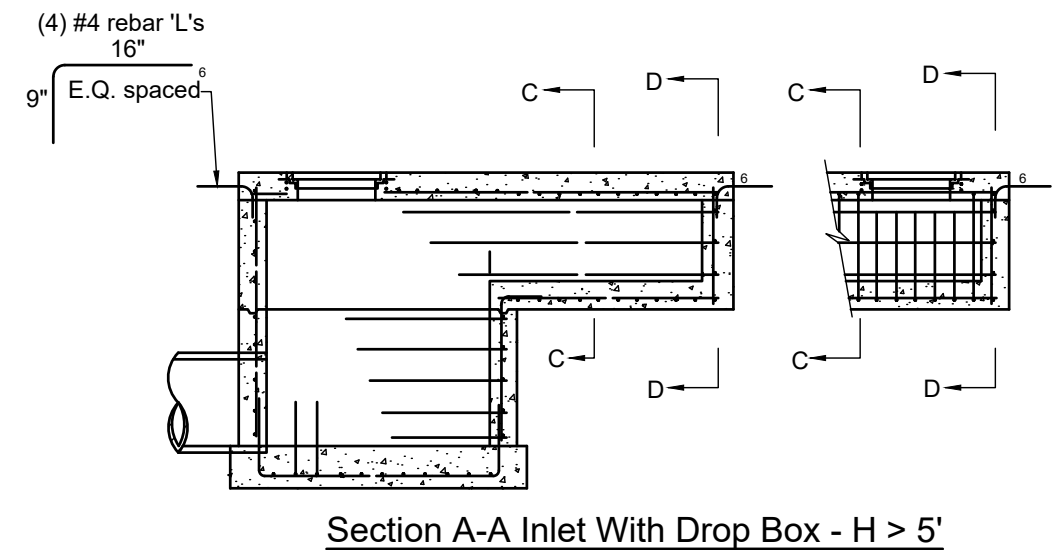
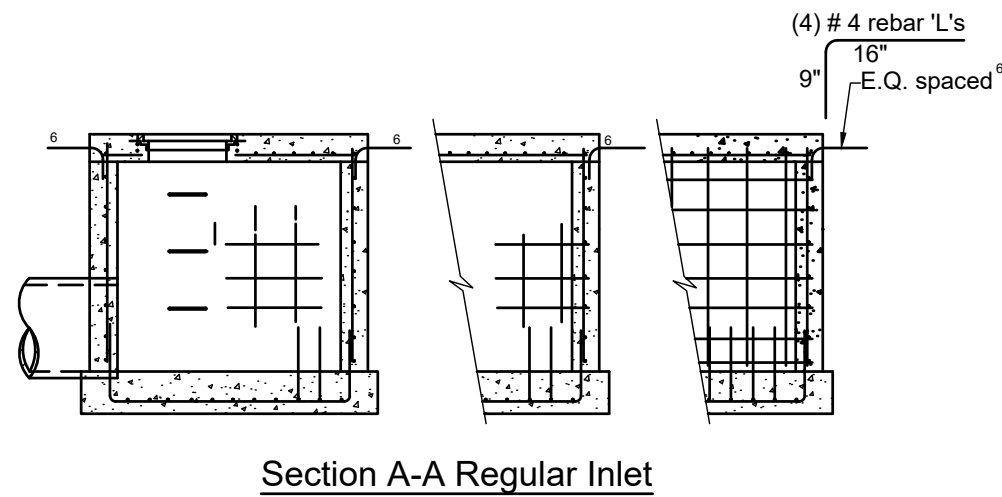
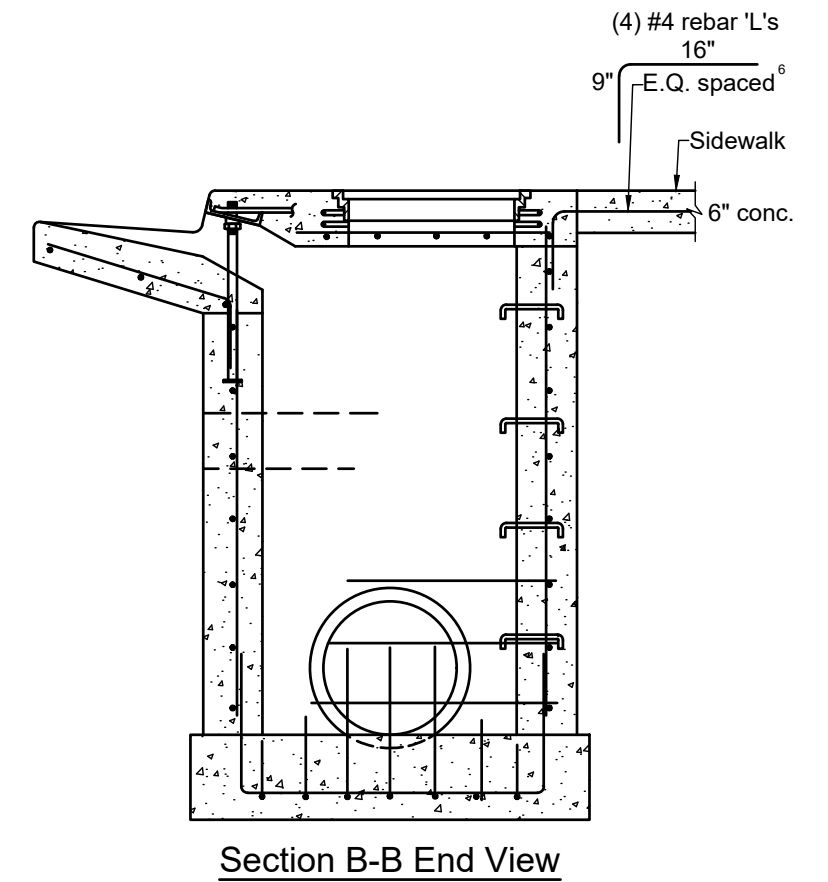
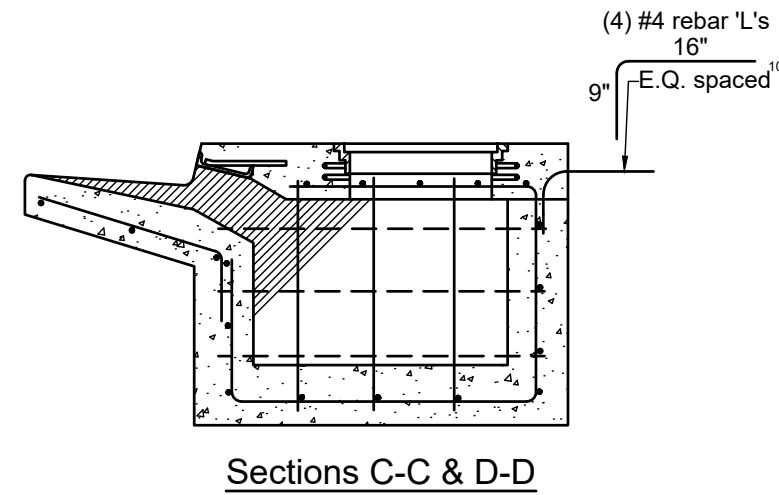
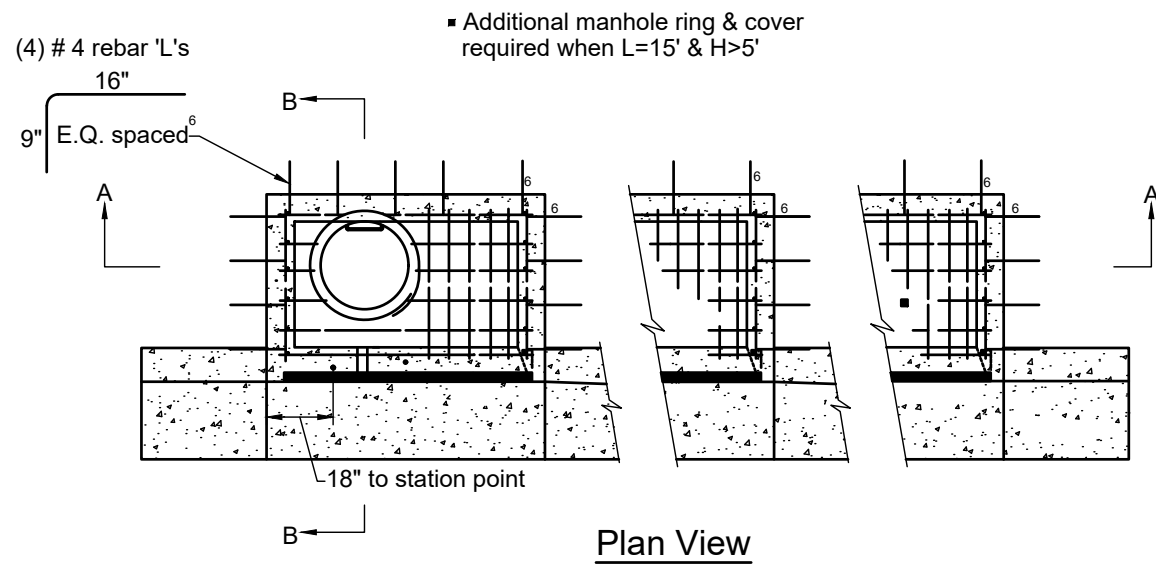
Elevation

Standard 8" thick precast flat top with 4x4-W4.0xW4.0 wire mesh top & bottom min.



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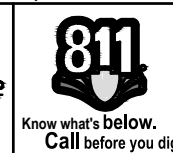
Intermediate Platform for Manholes
Over 20' Deep
Detail 6-11



Notes

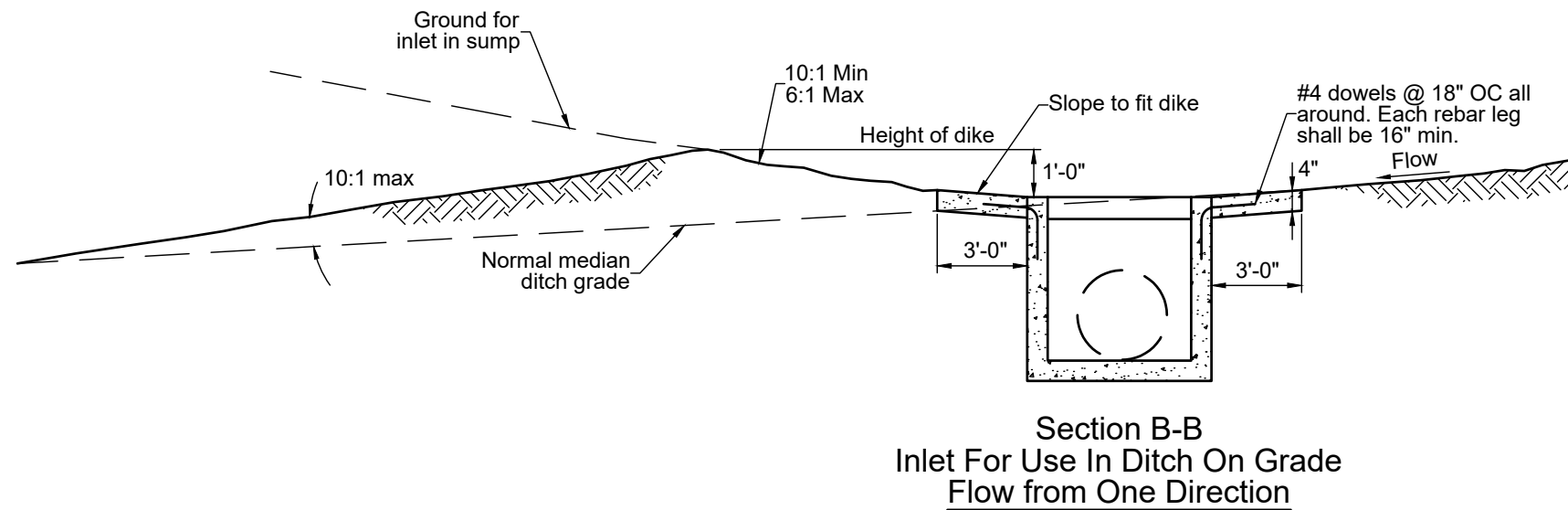
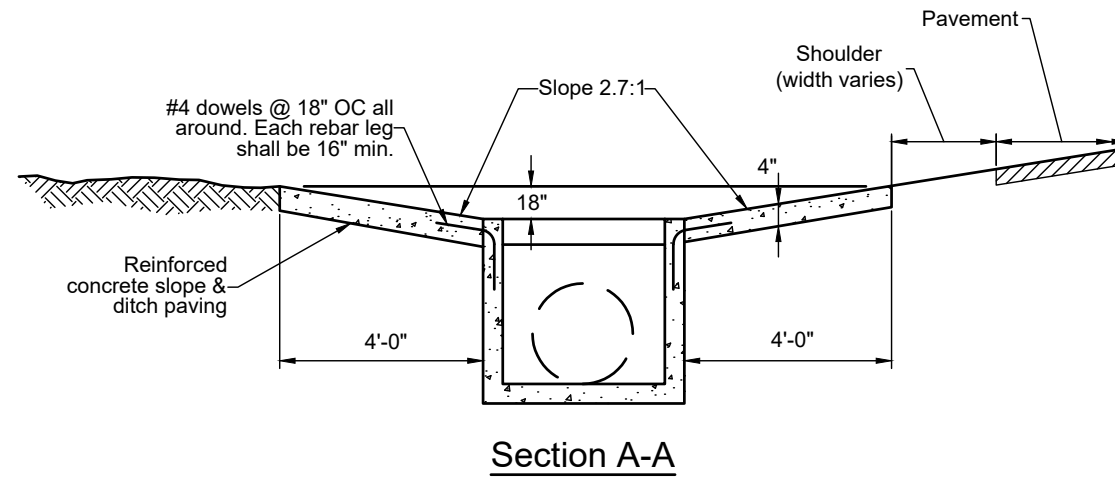
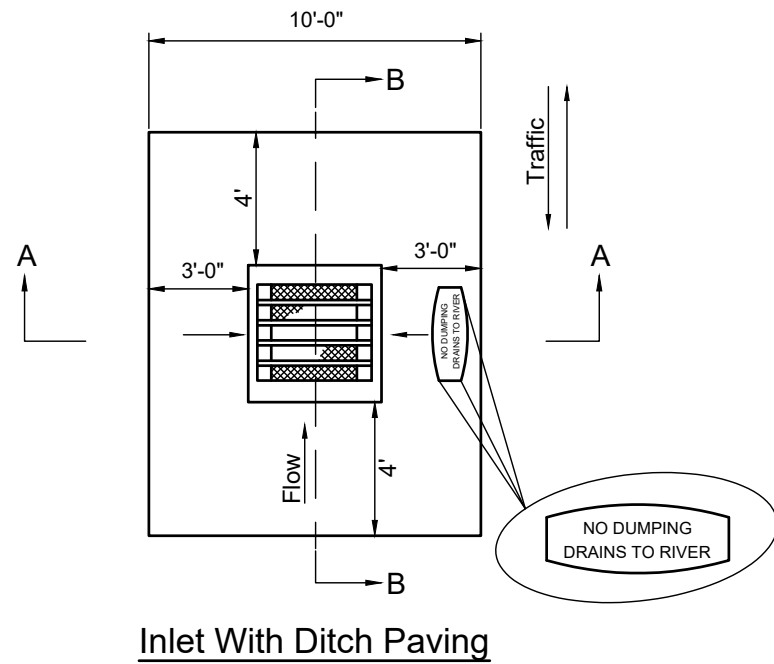
1. Type R inlets shall conform to the CDOT standard drawing & notes for Type R inlets except as noted herein.
2. All grates & frames shall be designed to withstand an HS-20 loading.
3. Use of a Type R is discouraged along drive over curbs.
4. Inlet structures shall not be constructed until the curb & gutter has been installed, or contractor stakes the curb & gutter for 100' on each side of inlet. Contractor must also stake inlet box corners.
5. Minimum rebar splice length shall be 10".
6. Add (4) #4 rebars-"L" shaped, equally spaced mid-depth into the concrete lid & wall & mid-depth into each sidewalk section poured next to the inlet (typ L=5') along both back and sides. 4 additional bars are required for each 5' of length added for double or triple inlet. Adjust for manhole.
7. Slope inlet floors toward pipes a min. of 2% so they will drain completely.
8. All rebar shall be epoxy coated.

Reference: Colorado Department of Transportation Standard M-604-12. Refer to the latest M&S Standards.



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Curb Inlet
Type R
Detail 7-1



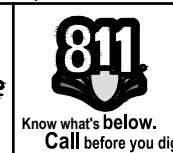
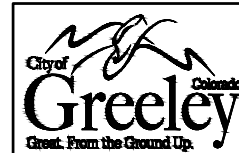
Stamp Notes

1. Contractor shall imprint the plastic concrete w/stamp as shown.
2. Final impression shall be clear & legible & free of any aggregate & debris.

Notes

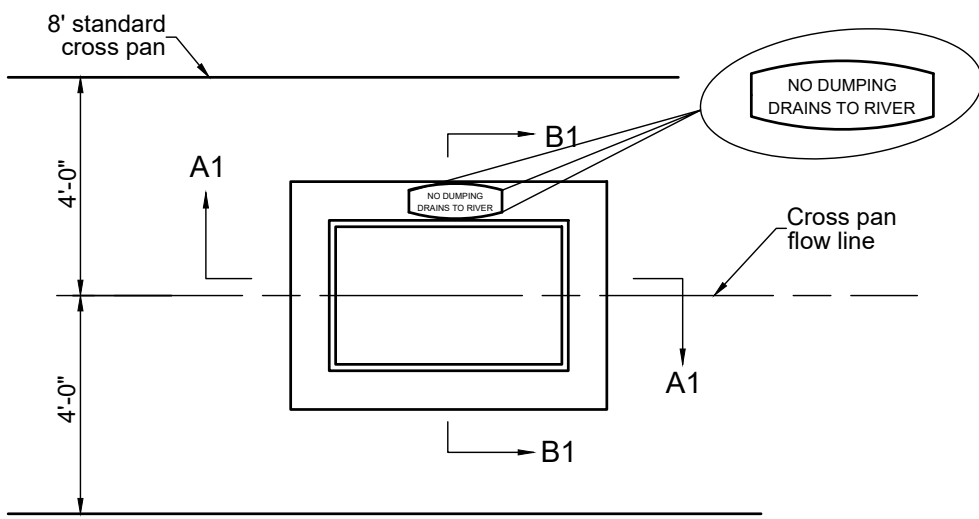
1. Type C inlets shall conform to the CDOT standard drawing & notes for Type C inlets except as noted herein.
2. Close mesh grate shall be used for pedestrian & bicycle areas. Follow CDOT Drawing M-604-10 to manufacture grate.
5. Refer to CDOT Drawing No M-604-10 for multiple additional details.
6. Minimum rebar splice length shall be 10".
7. Slope inlet floors toward pipes a min of 4%.
8. Concrete slope and ditch paving will be required when shown on plans.
9. All quantities shown are for estimating only. Additional may be required.

Reference: Colorado Department of Transportation Standard M-604-10. Refer to the latest M&S Standards.

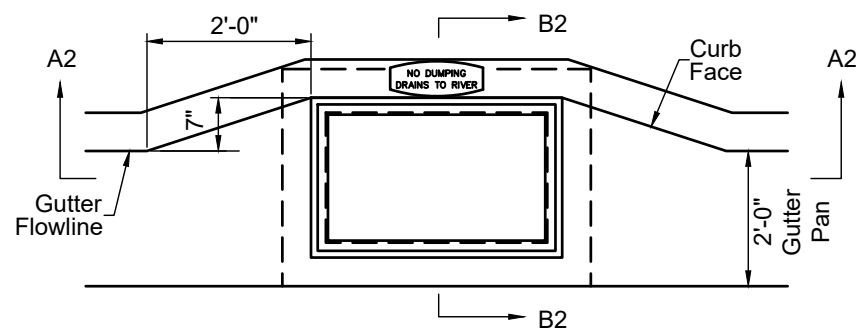


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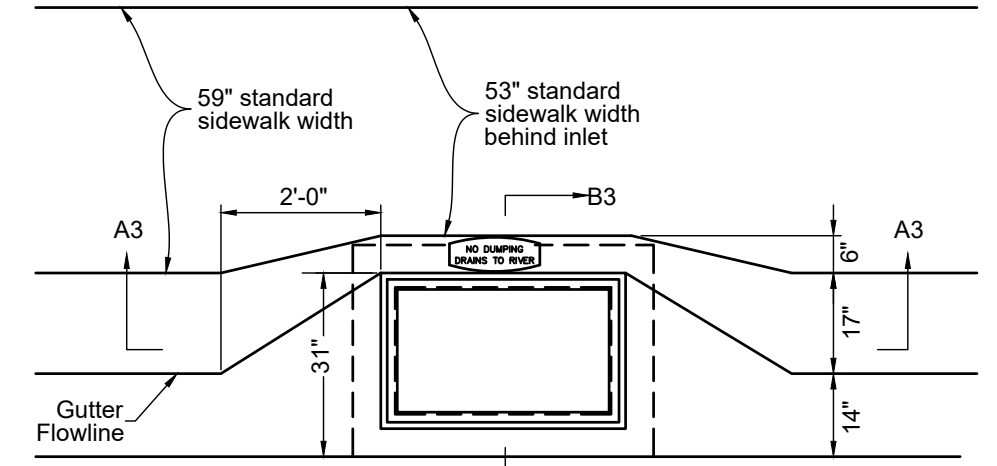
Grated Inlet
Type C
Detail 7-2



Plan View along Standard Cross Pan



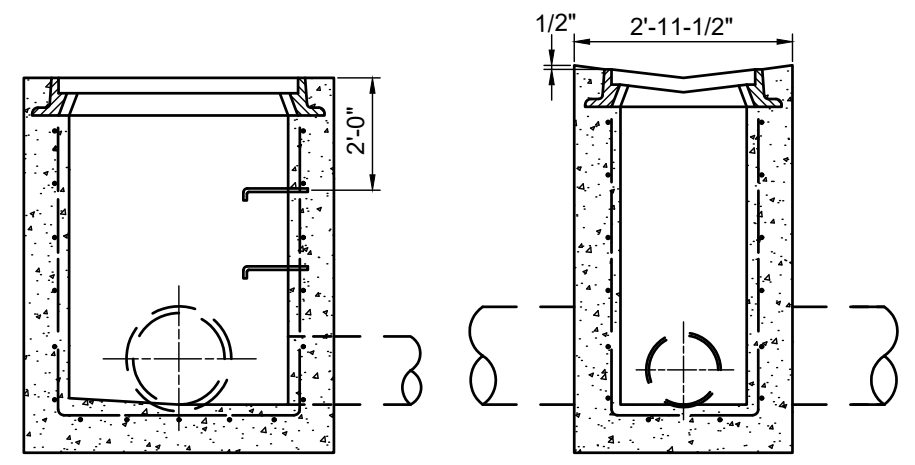
Plan View along Vertical Face Curb



Plan View along Drive Over Curb

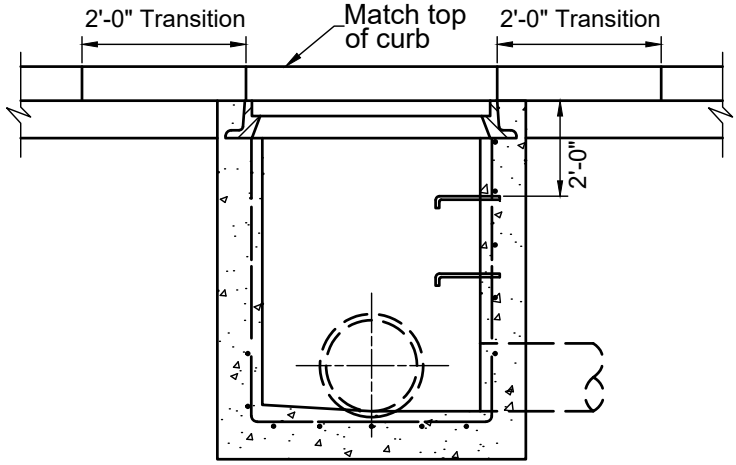
Stamp Notes for all Inlet Installations

1. Contractor shall imprint the plastic concrete w/stamp as shown on all Type 13 inlets.
2. Final impression shall be clear & legible & free of any aggregate & debris.
3. For inlet installations along curbs, stamp may be placed on the gutter lip side of the inlet at Contractor's option

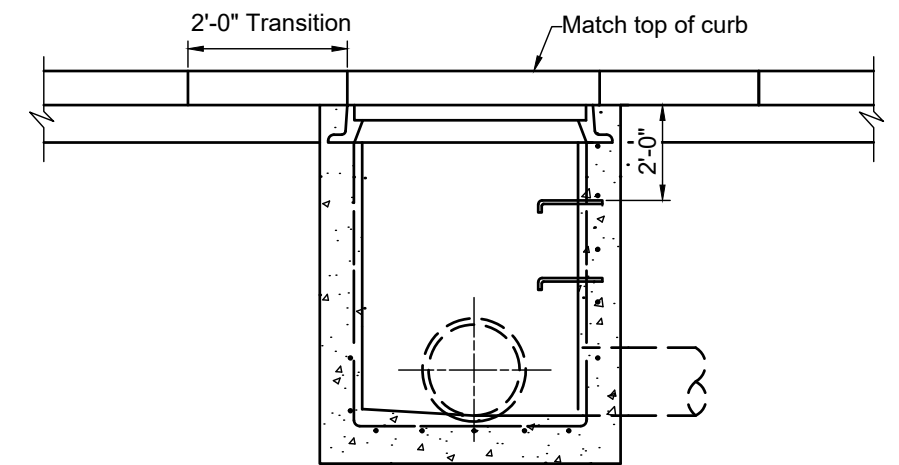


Section A1-A1

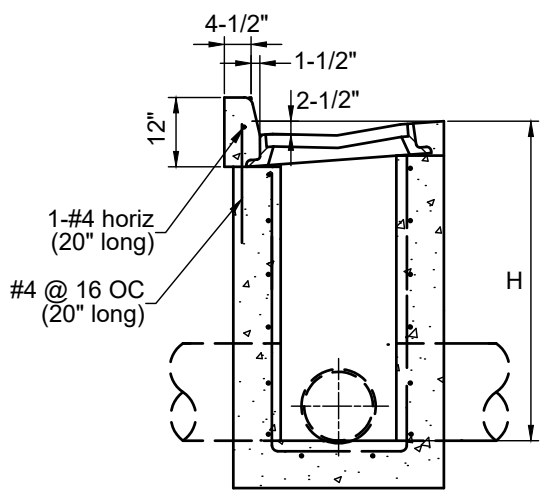
Section B1-B1



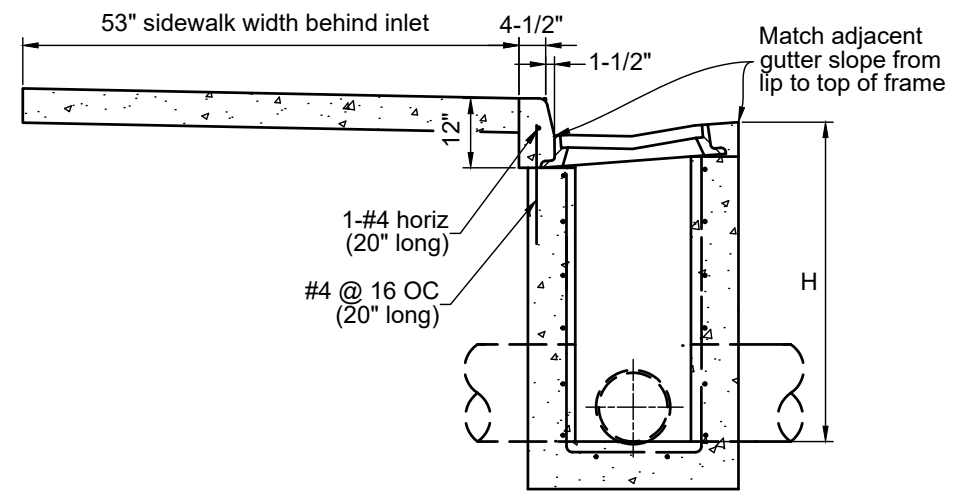
Section A2-A2



Section A3-A3



Section B2-B2



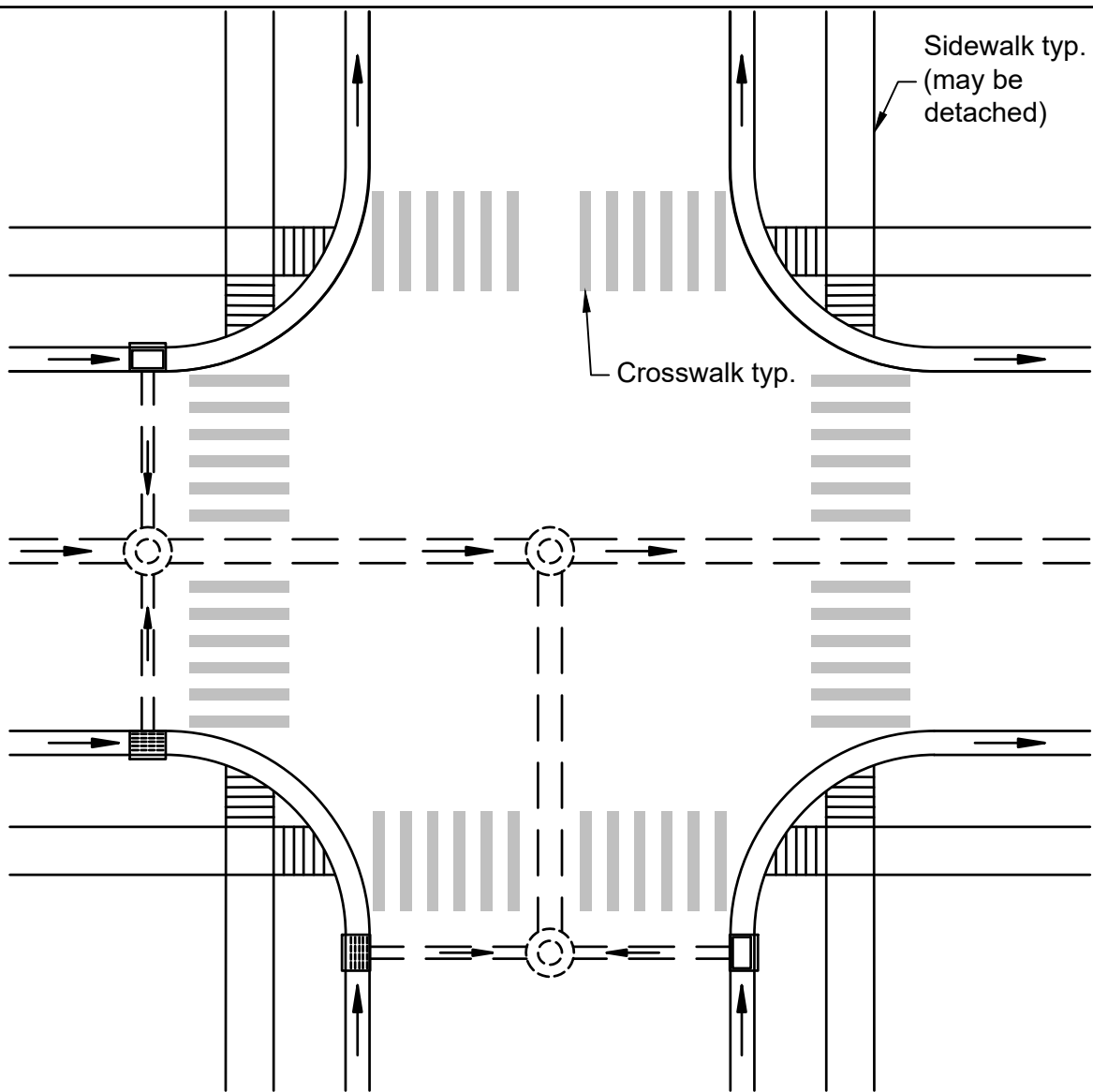
Section B3-B3


Notes

1. All Type 13 inlets, regardless of the installation, shall conform to the CDOT standard drawing & notes for Type 13 inlets except as noted herein.
2. All rebar shall be epoxy coated.
3. The notes on this sheet are applicable to all Type 13 City Standard Details, regardless of the location of the installation.
4. Inlet structures shall not be constructed until the curb & gutter has been installed, or contractor stakes the curb & gutter for 100' on each side of inlet. Contractor must also stake inlet box corners.
5. Minimum rebar splice length shall be 10".
6. See City of Greeley Design Criteria and Construction Specifications Volume I, Streets for curb, gutter, and sidewalk details.

Reference: Colorado Department of Transportation Standard M-604-13. Refer to the latest M&S Standards.


		Issued: 9/3/2024	Type 13 Inlet
		Revised: ----	
		Revised: ----	
Detail 7-3			

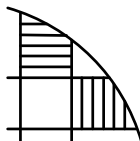


 One of these inlets is required if slope around curb return is more than 1%, otherwise both of these inlets are required.

 Inlets required to prevent intersection flooding

 Flow direction

 Storm sewer

 Curb ramp

 Manhole

Notes

1. Inlet sizing shall be determined based on hydrologic & hydraulic analysis.
2. See the SDDC for the types of intersections this detail applies to.
3. Pipe & manhole locations are conceptual & may vary based on utility clearance requirements.