

GLOSSARY

AASHTO -- American Association of State Highway and Transportation Officials

ACCELERATION LANE -- A speed change lane, including tapered areas, for the purpose of enabling a vehicle entering a roadway to increase its speed to a rate at which it can more safely merge with through traffic.

ACCESS -- Driveway or other point of access such as a street, road or highway that connects to the general street system. Where two public roadways intersect, the secondary roadway shall be the access.

APPROACH -- The portion of an intersection leg which is used by traffic approaching the intersection.

AVERAGE DAILY TRAFFIC (ADT) -- The total bi-directional volume of traffic passing through a given point during a given time period, divided by the number of days in that time period.

BAND WIDTH -- The time in seconds or the percent of cycle between a pair of parallel lines which delineate progressive movement on a time-space diagram. It is a quantitative measurement of through traffic capacity provided by signal progression.

CAPACITY -- The maximum number of vehicles that have a reasonable expectation of passing over a given roadway or section of roadway in one direction during a given time period under prevailing roadway and traffic conditions.

CITY -- shall mean the City of Northglenn, in the State of Colorado, acting by and through the City Manager, Mayor and City Council.

CITY REPRESENTATIVE -- shall mean the Director of Public Works or the Director of Public Works' authorized representative acting on behalf of the City.

CONTRACTOR -- shall mean a person, partnership, company, firm or corporation licensed and bonded in the City in accordance with the Municipal Code, responsible to provide all materials and labor to complete in place all components associated with a specific project.

CRITICAL VOLUME -- A volume (or combination of volumes) for a given street which produces the greatest utilization of capacity for that street in terms of passenger cars or mixed vehicles per hour.

COMMERCIAL -- Establishments where the buying and selling of commodities, entertainment or services is carried on, excluding service stations. Included are such as uses as office buildings, restaurants, hotels, motels, banks, grocery stores, theaters, parking lots, trailer courts and public buildings.

CORNER CLEARANCE (C) -- At an intersecting street, the distance measured along the curb line from the projection of the intersection street Right of Way line to the nearest edge of the curb openings.

CYCLE TIME -- The time period in seconds required for one complete sequence of signal indications.

DECELERATION LANE -- A speed change lane, including tapered areas, for the purpose of enabling a vehicle that is to make an exit turn from a roadway to slow to a safe turning speed after it has left the mainstream of faster-moving traffic.

DELAY -- Stopped time per approach vehicle in seconds per vehicle.



DESIGN HOUR VOLUME (DHV) -- Hourly traffic volume used for street design and capacity analysis, usually one or more peak hours during a twenty-four (24) hour period.

DESIGN SPEED -- Five to ten miles per hour (5-10 mph) above the proposed or desired speed limit of the facility under design.

DESIGN VEHICLE -- Developments intended for public use must be designed for the following types of vehicles:

Residential (excluding single-family or duplex)	SU30
Commercial Uses	WB40
Industrial Uses	WB50

For public streets, the following design vehicles must be used:

Commercial/Multi-Family Locals & Minor Collectors	SU30
Major Collectors	WB40
Arterials	WB50

Definitions for the above vehicle types are found in AASHTO Geometric Highway Design Standards.

DESIGNATED PRIVATE CONSTRUCTION WORK -- private sewer systems, water and sewer service lines to buildings, grading, drainage structures, retaining walls, parking lots, private streets and walks, fire lanes, driveways, and associated construction.

DESIGNER -- shall mean the City contracted Colorado Professional Engineer or the Developer contracted Colorado Professional Engineer who is designing the public infrastructure for a City of Northglenn CIP or development project.

DEVELOPER -- shall mean a person, partnership, company, firm, or corporation that is seeking to develop a property within the City.

DISTANCE BETWEEN DOUBLE DRIVES (D) -- The distance measured along the curb line between the inside edges of the two adjacent curb openings.

DISTRIBUTION SYSTEM -- mains of twelve-inch (12") and smaller diameter, together with all appurtenant and necessary valves, fire hydrants, taps, meters, service pipes and associated materials, property and equipment receiving potable water from large conduits and distributing it to individual consumers.

DIVIDED HIGHWAY -- A highway with separated roadways for traffic in opposite directions, such separation being indicated by depressed dividing strips, raised curbing's, traffic islands, other physical separations or by standard pavement markings and other traffic control devices.

EDGE CLEARANCE (E) -- The distance measured along curb line from the nearest edge of the curb opening to a point where the property line -- extended intersects the curb line.

ENGINEERING DIVISION -- The Engineering staff of the City of Northglenn Public Works Department have the responsibility of ensuring that all aspects of the Standards and Specifications are enforced and implemented.



EXPRESSIONS -- wherever the words “as directed”, “as required”, “as permitted” or words of like meaning are used, it shall be understood that the direction, requirements, or permission of the City Representative is intended. Similarly, the words “approved”, “acceptable”, “satisfactory” shall refer to approval by the City Representative.

FIRE TRUCKS -- Must be considered as a WB40 truck with a minimum forty-five-foot (45') radius for design purposes and any other requirements as determined by local fire protection district.

FLOWLINE -- The transition point between the gutter and the face of the curb. For a cross or valley pan, it is the center of the pan.

FRONTAGE -- The distance along the street Right of Way line of a single property or development within the property lines. Corner property at an intersection would have a separate frontage along each street.

GUARANTEE -- This is the written financial mechanism required by the City from the Developer/Contractor to ensure that the committed or planned infrastructure is completed. This can take the form of cash, performance, or warranty bond, and/or letter or credit.

GRADE -- Rate or percent of slope, either ascending or descending from or along the roadway. It is usually measured along the centerline of the roadway.

GREEN TIME -- The length of a green phase plus its change interval, in seconds.

HOURLY VOLUME -- The number of (mixed) vehicles that pass over a given section of a lane or roadway during a time period of one (1) hour.

IMPROVEMENTS AGREEMENT -- A written contract between the Developer/Owner and the City of Northglenn for installation of all public improvements and/or private improvements in the areas of common ownership, related to a particular project.

INDUSTRIAL OR WAREHOUSE -- Any establishment that manufactures or stores an article or product.

INSPECTOR -- shall mean the authorized representative of the City of Northglenn Public Works Department and Engineering Division at the site of the work.

LEVEL OF SERVICE (LOS) -- A measure of the mobility characteristics of an intersection as determined by vehicle delay and a secondary factor, the volume/capacity ratio.

MAY -- will be interpreted as being permissive.

MILE HIGH FLOOD DISTRICT (MHFD) -- Formerly known as Urban Drainage and Flood Control District (UDFCD)

MUTCD -- Manual on Uniform Traffic Control Devices and the Colorado Supplement.

MUNICIPAL CODE -- shall mean the official adopted Municipal Code of Northglenn, Colorado.

OWNER -- shall mean a person, company, firm, or corporation holding title to land that is being developed or modified within the City.

PRE-APPLICATION MEETING -- A meeting for all development projects with Public Improvement Plans and reports. The meeting is scheduled and organized through the City of Northglenn Planning office.



PUBLIC IMPROVEMENTS -- all work in the public Right of Way, City property, easements dedicated to the City, private property that will become City property or an easement to the City in the future and projects or utilities that will become the City's responsibility to maintain.

PUBLIC WORKS DIRECTOR -- The City of Northglenn Public Works Director shall designate the Engineering Division staff responsible for the review and implementation of these STANDARDS and SPECIFICATIONS.

RADIUS CURB RETURN -- The curved portion of a street curb at street intersections or the curved portion of a curb in the end slopes of a driveway approach.

RESIDENTIAL -- Property used primarily for residential purposes such as single-family, two-family, and multi-family units.

Single-Family (SF) Residential: Single, detached family dwelling units, double bungalows, or duplexes.

Multi-Family (MF) Residential: Three or more attached dwelling units including townhouses, condominiums, and apartments.

SERVICE AREA -- shall mean the area, whether inside or outside City limits, that receives water and sanitary sewer utility service from the City of Northglenn.

SERVICE LINE -- all pipe, fittings, and appurtenances of improvement for conveying water from distribution mains to the premises.

SERVICE STATION -- Any property where flammable liquids such as motor vehicle fuel are used, stored and/or dispensed from fixed equipment into fuel tanks of motor vehicles.

SETBACK (S) -- The lateral distance measured perpendicular to the street Right of Way line and extending from the Right of Way line to the closest point on a structure.

SIGHT DISTANCE -- The length of roadway ahead visible to the driver. The minimum sight distance available should be sufficiently long to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path.

SIGNAL PROGRESSION -- Progressive movement of traffic at a planned rate of speed through adjacent signalized locations within a traffic control system without stopping.

SPEED CHANGE LANE -- A separate lane for the purpose of enabling a vehicle entering or leaving a roadway to increase (acceleration lane) or decrease (deceleration lane) its speed to a rate at which it can more safely merge or diverge with through traffic.

STOPPING SIGHT DISTANCE -- The distance traveled by the vehicle from the instant the driver of a vehicle sights an object necessitating a stop to the instant the brakes are applied and the distance required to stop the vehicle from the instant brake application begins.

STORAGE LANE -- Additional lane footage added to a deceleration lane to store the maximum number of vehicles likely to accumulate during a critical period without interfering with the through lanes.

SHALL -- will be interpreted as being mandatory.



STANDARDS AND SPECIFICATIONS -- reference is made to the “City of Northglenn”, Standards and Specifications for the Design and Construction of Public Improvements.

SUBCONTRACTOR -- any person, partnership, company, firm, or corporation licensed and bonded in the City in accordance with the Municipal Code which has a direct or indirect contract with the Contractor or other Subcontractor and furnishes and/or performs on-site labor and/or furnishes materials in connection with the performance of the work.

SURETY -- shall mean the entity which is bound with and for the Contractor for the performance of the work as described in these specifications. Includes the capability to bond.

TAP -- shall mean the physical connection to the potable water or sanitary sewer system of the City of Northglenn.

TESTING AGENCY -- any individual, partnership or corporation which is qualified and licensed to perform the required sampling, analysis, testing and professional recommendation service.

TRAFFIC ENGINEER -- shall mean the Director of Public Works / Engineering Division authorized representative acting on behalf of the City.

TIME SPACE DIAGRAM -- A chart on which the distance between signals and signal timing is plotted against time. The chart, when completed, indicates signal progression band widths and speed of traffic.

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT (UDFCD) -- Former name for Mile High Flood District (MHFD) **UTILITY SYSTEM** - shall include all water and sanitary sewer facilities owned by the City of Northglenn, including but not limited to, water and sewer mains, fire hydrants, service lines from tap through the meter pit or vault and pump stations.

WIDTH OF CURB OPENING (W) -- The width of curb opening measured at the curb line.

YOKE -- shall mean a metal pipe frame attached to the inlet and outlet sides of the meter providing support and conveying water to and from the meter.

RESOURCE STANDARDS FOR REFERENCES

1. Colorado Department of Transportation, Standard Specifications for Road and Bridge Construction.
2. Colorado Department of Transportation, Standard Plans (M & S Standards).
3. Colorado Department of Transportation, Roadway Design Manual.
4. American Public Works Association, Standard Plans.
5. American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets.
6. Institute of Traffic Engineers (ITE), Trip Generation Volumes 1 through 3.
7. National Cooperative Highway Research Program (NCHRP) Report 279, Intersection Channelization Design Guide, 1985.
8. Institute of Traffic Engineering, Highway Capacity Manual.
9. ASTM, American Society for Testing and Materials.
10. The American with Disabilities Act, (A.D.A.) Regulations.
11. US Department of Transportation, Manual on Uniform Traffic Control Devices (M.U.T.C.D.)
12. Federal Highway Administration, Roundabouts: An Informational Guide.
13. American Association of State Highway and Transportation Officials, Guide for the Development of Bicycle Facilities.
14. Urban Drainage and Flood Control District, Standards.
15. EPA Drinking Water Standards
16. NSF Standards for Water Treatment Systems
17. ANSI Standard, Wastewater Treatment Systems
18. Clean Water Act
19. Denver Water Board, Engineering Standards of the Board of Water Commissioners



Appendix A Plan Development Checklist

APPENDIX A - CONSTRUCTION PLAN CHECKLIST

Civil Development Review

Project Name: _____

Project Location: _____

Review Date: _____

Reviewed By: _____

ITEMS REQUIRED	PLAN SET REQUIREMENT			ENGINEER RESPONSES			COMMENTS
	30%	60%	90% and FINAL	YES	NO	N/A	
Submitted on 24" x 36" size drawings - electronically	x	x	x				
Each sheet title block includes correct project name	x	x	x				
Each sheet title block includes correct drawing number	x	x	x				
Each sheet title block includes correct Designed by, Drafted by and Checked by initials and dates	x	x	x				
Each sheet title block includes Colorado Professional Engineer seal			x				
Each sheet showing plan view includes north arrow and is shown with correct orientation	x	x	x				
Each sheet showing plan/elevation/details includes scale bar and is correct	x	x	x				
Each sheet showing horizontal and vertical control includes appropriate datum reference	x	x	x				
Order of precedence of plans is logical and sheet names/numbers are consistent with plans	x	x	x				
All legend symbols and abbreviations correspond with those shown in the plans	x	x	x				
All general notes correspond with the work of the plans	x	x	x				
Line weights are used properly to represent the work	x	x	x				
Scale is used properly to present the work.	x	x	x				
All details and section are correct for sheet reference numbers, limits, aspects, and orientation	x	x	x				
Project Location is accurately located and project limits are depicted on the plan	x	x	x				
Sheet order of precedence matches plan sequence	x	x	x				
Each plan sheet is included, and sheet number, drawing number and title are consistent with the plans		x	x				
Summary of quantities - all items are included, and quantities and units are consistent with estimate		x	x				
A key map plan, when necessary to identify areas when the plan is separated	x	x	x				
Sheet index included with titles of each sheet and sheet number consistent with actual sheet	x	x	x				
At a minimum, each submittal shall include the following plans (grading, erosion control, survey, street design, storm drainage, paving, utilities, traffic signage and striping, site lighting, landscape and irrigation)	x	x	x				

ITEMS REQUIRED	PLAN SET REQUIREMENT			ENGINEER RESPONSES			
	30%	60%	90% and FINAL	YES	NO	N/A	COMMENTS
EXISTING CONDITIONS/DEMOLITION PLAN							
Topography is shown with appropriate line weight and accuracy	x	x	x				
Boring locations are shown, identified and accurate in their location.		x	x				
Right of Way, easements and other property lines are shown and consistent	x	x	x				
All existing features and elements are clearly identified	x	x	x				
Horizontal and vertical control is established	x	x	x				
Horizontal and vertical datum is identified	x	x	x				
Survey monument identification is correct	x	x	x				
Underground utilities are shown using appropriate symbols, line types and scale, and are complete	x	x	x				
All applicable site utility features and elements are clearly identified		x	x				
All demolition work of project is identified and appropriately referenced		x	x				
Demolition callouts accurately describe the nature and limits of the work		x	x				
All salvage and relocation items are clearly identified		x	x				
All utility demolition is identified by cross-hatching		x	x				
Pavement removal limits are clearly shown and dimensioned		x	x				

ITEMS REQUIRED	PLAN SET REQUIREMENT			ENGINEER RESPONSES			
	30%	60%	90% and FINAL	YES	NO	N/A	COMMENTS
SITE PLAN							
Topography is consistent with existing conditions sheets	x	x	x				
Topography is consistent with proposed new contours shown	x	x	x				
Right of Way, easements, and other property lines are shown and consistent with existing conditions sheets	x	x	x				
Existing utilities consistent with existing utilities sheets	x	x	x				
All applicable features and elements are clearly identified	x	x	x				
Surveying information and applicable datum shown	x	x	x				
All new work on project is identified and appropriately referenced to discipline plan sheets (i.e. see Civil, Structural, Mechanical, Electrical sheets)		x	x				
All new work of project is coordinate between discipline plan sheets		x	x				
All new work is clearly delineated from existing conditions	x	x	x				
Only new work is shown (i.e. All existing work replaced by new work is removed from plan sheets)		x	x				
New work callouts accurately describe the nature and limits of the work		x	x				
Location of ADA ramps, curb and gutter, sidewalk is shown	x	x	x				
Typical street cross-sections are provided		x	x				
New Utilities are shown and complete		x	x				
Show all street names	x	x	x				

ITEMS REQUIRED	PLAN SET REQUIREMENT			ENGINEER RESPONSES			
	30%	60%	90% and FINAL	YES	NO	N/A	COMMENTS
CIVIL PLANS/ROADWAY/TRANSPORTATION							
Topography is consistent with existing condition sheets	x	x	x				
Right of Way, easements, and other property lines are shown and consistent with existing conditions sheets	x	x	x				
All applicable features and elements are clearly identified		x	x				
Civil work clearly identified and dimensioned in appropriate units/coordinates		x	x				
Reference dimensions are indicated as appropriate		x	x				
ROW limits are clearly shown and dimensioned		x	x				
Construction phasing plans are included		x	x				
Construction staging area clearly identified			x				
Slopes for drainage are shown and clear		x	x				
Pavement sections are shown and detailed		x	x				
Signage and striping is shown and complete		x	x				
ADA parking and access are shown and have been coordinated with others		x	x				
Traffic control is shown and complete		x	x				

ITEMS REQUIRED	PLAN SET REQUIREMENT			ENGINEER RESPONSES			
	30%	60%	90% and FINAL	YES	NO	N/A	COMMENTS
GRADING PLAN/STORM WATER MANAGEMENT PLAN							
Topography is consistent with existing condition sheets	x	x	x				
Topography is consistent with proposed new contours shown	x	x	x				
Grading limits are clearly shown and dimensioned		x	x				
Trenching and cut/fill limits are shown		x	x				
Drainage structures grate and invert elevations are shown		x	x				
City of Northglenn standard erosion control notes included	x	x	x				
Storm sewer utility to include plan and profile		x	x				
Storm sewer manholes and inlets include stationing		x	x				
Storm sewer profiles to include HGL		x	x				
BMPs to be selected based on appropriate use (refer to Mile High Flood District for use requirements)		x	x				
Side slopes greater than 3:1 may require terracing or structural retaining walls. Retaining walls greater than 3 feet must have structural design		x	x				
All existing curb, gutter, and sidewalk and proposed curb, gutter, sidewalk	x	x	x				
Shows that adjoining property will not be affected and grading is compatible	x	x	x				
Detention pond details including outlet structure shown		x	x				

ITEMS REQUIRED	PLAN SET REQUIREMENT			ENGINEER RESPONSES			COMMENTS
	30%	60%	90% and FINAL	YES	NO	N/A	
WATER UTILITY PLAN							
Site map with north arrow and scale	x	x	x				
Vicinity map with north arrow and scale	x	x	x				
Title of project (list phases as applicable)	x	x	x				
Label whether town homes, apartments, duplexes or condominiums	x	x	x				
Typical street cross sections showing all existing and proposed utilities with required separation		x	x				
Standard water plan notes		x	x				
Signature blocks	x	x	x				
Fire flow information (max static pressure, residual pressure)		x	x				
Bar scale (1" = 50' of sufficient size to properly show detail)	x	x	x				
Valves must be installed a maximum of every 600 feet or no more than 18 residential units out of services and 1 hydrant		x	x				
System must be looped if more than 12 single family services on a single feed water line		x	x				
Permanent and temporary dead end mains require a hydrant	x	x	x				
Show public water mains, stubouts and hydrants in public ROW or utility easements	x	x	x				
Ensure easements are adequate	x	x	x				
Outage modeling required for shut down of water mains greater than 12 inch diameter			x				
30" minimum pup between fittings		x	x				
Minimum of 5' of cover to top of pipe	x	x	x				
Water lines located on 5 feet north or west of street centerline or 5 feet north of west curb median	x	x	x				
Provide calculations for all concrete thrust blocks for water mains greater than 16 inches and label volume		x	x				
Show and label all existing and proposed utilities including gas and electric. Size and material must be shown.	x	x	x				
Label all existing and proposed water lines as public or private	x	x	x				
Label phase lines with stations		x	x				
Label match lines with stations and corresponding sheet numbers		x	x				
Label all horizontal and vertical bends and size (45 degree max bend, use standard sizes)		x	x				
Label street names (note if private)	x	x	x				
Label all existing valve and fire hydrants		x	x				
Shown anode size, test station, and location on DIP/steel mains		x	x				
Label property lines	x	x	x				
Label subdivision boundaries and adjacent filings	x	x	x				
Label curb and gutter	x	x	x				
Label size of all reducers		x	x				
Label curve data including PC's and PT's with stations and label radius number and widths		x	x				
Provide addresses and lot numbers for all lots/buildings		x	x				

Show stations for all fittings		x	x				
Show stations for all crossings		x	x				
Show stations for all service connections (4" and larger)		x	x				
Label all concrete thrust blocks and show volumes		x	x				
Label pipe as abandoned or removed per Northglenn standards		x	x				
Label length of main to be abandoned		x	x				
Stub-outs must have temporary blow-offs assemblies with thrust blocks		x	x				
Label horizontal distance from proposed waterline to other utilities where it deviates from typical cross section		x	x				
Verify that the water main is located in roadways, in drive aisles of parking areas, or at a minimum 5 feet from edge of easement within that easement		x	x				
Verify that the water main is located 15 feet away from any tree, structure or building		x	x				
Crossings underneath utilities shall have plan and profile and maintain a minimum of 24" separation		x	x				
Show pipe elevations and vertical separations for all wastewater, storm sewer, electrical duct banks and high		x	x				
If vertical separaton is not met flow-fill shall be used to achieve compaction		x	x				
Show secondary containment (casing pipe, encased in flow-fill or HDPE/welded steel) whcihc is required for water		x	x				
Add concrete restraints at top and bottom of slope on grades greater than 10%		x	x				
Install MJ restrained pipe on grade greater than 10%		x	x				
Steel casing should not be more than 5% slope on proposed water line		x	x				
Steel casing needs to be approximately 2 times the diameter of the proposed water line		x	x				
Ensure no taps or tees are proposed at casing locations or within lowering		x	x				
Show casing pipe if water main under another utility greater than 30" in diameter		x	x				
If crossing pressure zones, a pressure regulator station is required		x	x				
Show detail for all pressure regulator stations on construction drawings. Show vents on plan view		x	x				
Profile all pressure regulator stations		x	x				
Profile all air and vacuum valve stations. Show vents on plan view.		x	x				
Hydrant design notes shall include station and offset, flange elevation, GPM, and thrust block sizes		x	x				
No horizontal or vertical bends on hydrant laterals		x	x				
Show bollards, if required.		x	x				
Show concrete reverse anchors for fire hydrant valve if hydrant installed at dead ends		x	x				
Show MJ restraints for pipe joints for PVC and DIP hydrant laterals greater than 20 feet		x	x				
Show and label fire department connections		x	x				
Profiles required for mains greater than 8 inches at scale of 1"-50' horizontal and 1"-5' vertical		x	x				
Profiles required for mains when slopes greater than 10%, at all water line lowering		x	x				
Stations on profile to match plan view		x	x				

Label existing and proposed grades		x	x				
Label all proposed horizontal and vertical bends with elevations		x	x				
Label percent grade on all profile pipes		x	x				
Label all valves and show butterfly valves on 16" water lines and larger		x	x				

ITEMS REQUIRED	PLAN SET REQUIREMENT			ENGINEER RESPONSES			COMMENTS
	30%	60%	90% and FINAL	YES	NO	N/A	
WASTEWATER UTILITY PLAN							
Wastewater general notes	x	x	x				
Wastewater plan and profile to be at a scale of minimum 1"=50' horizontal and 1"=5" vertical	x	x	x				
Wastewater lines to be located five feet south or east of street centerline	x	x	x				
Label street width FL-FL and horizontal separation between utilities	x	x	x				
When connecting to existing manholes or mains shown and label all design information for such facility including size, material, slope, etc.	x	x	x				
Label manholes with stations (offset as required)	x	x	x				
Provide reference stations and horizontal control for intersecting manholes		x	x				
Label interval stationing and distinguish between centerline or wastewater stationing	x	x	x				
Label curve data including PC's and PT's with stations and label radius number and widths		x	x				
Label access road to manholes		x	x				
Label services lines locations with stations (commercial projects)	x	x	x				
Label sleeves with begin and end station and include pipe size and material of sleeve	x	x	x				
Label length and slopes of pipes - must match stationing		x	x				
Label manholes with stations, diameter, rim elevations, and all inverts (existing and proposed)		x	x				
Label under drain including type (passive or active), material, clean outs, trench dams, and discharge points		x	x				
Label existing and proposed grades	x	x	x				
Label grid stations and elevations	x	x	x				
Verify diameter of manholes and pipes	x	x	x				
Label if manhole has locking lid and type		x	x				
Manhole assessment must be completed when modifications or connections to existing manholes are proposed	x	x	x				
Maximum spacing between manholes 400 feet		x	x				
No services allowed on stub for future main extensions	x	x	x				

Appendix B General Notes

Submission of Construction Plans shall include a General Notes sheet as part of the plan set. Include only the notes that apply to the project.

1. All materials, workmanship, and construction of public improvements shall meet or exceed the standards and specifications set forth in the City of Northglenn Standards and Specifications and applicable district, state and federal regulations. Whenever there is conflict between these plans and the specifications, or any applicable standards, the most restrictive standard shall apply. All work shall be inspected and accepted by the Engineering Division.
2. The Developer/Contractor is specifically cautioned that the location and/or elevation of existing utilities, as shown on these plans, is based on records of the various utility companies and, where possible, measurement taken in the field. The information is not to be relied upon as being exact or complete. The Designer shall contact the Utility Notification Center of Colorado (UNCC) at 1-800-922-1987, at least 3 working days prior to beginning excavation or grading, to have all registered utility locations marked. Other unregistered utility entities (i.e. ditch/irrigation companies) are to be located by contacting each agency. It shall be the responsibility of the Developer/Contractor to relocate all existing utilities that conflict with the proposed improvements shown on these plans.
3. No work may commence within any improved public Right of Way until a Right of Way Permit and/or Grading Permit is obtained, if applicable. The Developer shall submit a Construction Traffic Control Plan, in accordance with MUTCD, to the Engineering Division prior to any construction activities within, or affecting, the Right of Way. The Developer shall be responsible for providing any and all traffic devices as may be required for the construction activities.
4. The Developer/Contractor shall be responsible for obtaining all necessary permits for all applicable agencies. The Developer/Contractor shall notify the Engineering Division at least 2 working days prior to the start of any earth disturbing activity, or construction on any and all public improvements.
5. The Designer who has prepared these plans, by execution and/or seal hereof, does hereby affirm responsibility to the City of Northglenn, as the beneficiary of said designer's work, for any errors and omissions contained in these plans, and acceptance of these plans by the City Engineering Division shall not relieve the Designer who has prepared these plans of all such responsibility. Further, to the extent permitted by law, the Designer hereby agrees to hold harmless and indemnify the City, and its officers and employees, from and against all liabilities, claims and demands which may arise from any errors and omissions contained in these plans.
6. All utility installations within or across the roadbed of new residential roads must be completed prior to the final stages of road construction. All service lines must be stubbed to the property lines and marked so as to reduce the excavation necessary for building connections.
7. The Developer/Contractor shall coordinate and cooperate with the City Engineering Division, and all utility companies involved, regarding relocations, adjustments, extensions, and rearrangements of existing utilities during construction, and to assure that the work is accomplished in a timely fashion and with minimum disruption of service. The Developer/Contractor shall be responsible for contacting, in advance, all parties affected by any disruption of any utility service.
8. When applicable, the Developer/Contractor shall have onsite each of the following:



9. The Developer/Contractor shall be responsible for all aspects of safety including, but not limited to, excavation, trenching, shoring, traffic control and security. Refer to OSHA Publication 2226, Excavating and Trenching.
10. If, during the construction process, conditions are encountered which could indicate a situation that is not identified in the plans or specifications, the Developer/Contractor shall contact the Designer and the Engineering Division immediately.
11. All references to any published standards shall refer to the latest revision of said standard.
12. The Developer/Contractor is responsible for providing all labor and materials necessary for the completion of the intended improvements, shown on these drawings.
13. The Developer/Contractor shall be responsible for ensuring that no mud or debris shall be tracked onto the existing public street system. Mud and debris must be removed by the end of each working day by an appropriate mechanical method (i.e., machine broom seep, light duty front end loader, etc.).
14. The Developer/Designer shall be responsible for recording as-built information on a set of record drawings kept on the construction site, and available to the Engineering Division at all times.
15. Dimensions for layout and construction are not to be a scaled form of any drawing. If pertinent dimensions are not shown, contract the Designer for clarification, and annotate the dimension on the as-built record drawings.
16. The Developer/Contractor shall comply with all terms and conditions of the Colorado Permit for Storm Water Discharge, the Storm Water Management Plan (SWMP) and the Erosion Control Plan.
17. All structural erosion control measures shall be installed, at the limits of construction and at areas with disturbed soil, on- and off-site, prior to any other ground-disturbing activity. All erosion control measures shall be maintained in good repair by the Developer/Contractor, until such time as the entire disturbed areas is stabilized with hard surface or landscaping. To mitigate erosion, the Developer/Contractor shall use standard erosion control techniques described in the Mile High Flood District's Urban Storm Drainage Criteria manual, Volume 3 – Best Management Practices.
18. The Developer/Contractor shall sequence installation of utilities in such a manner as to minimize potential utility conflicts. In general, storm drainage and sanitary sewer should be constructed prior to installation of the water lines and dry utilities.
19. There shall be no site construction activities on Saturdays or Sunday or after 3:30 pm on weekdays unless approved otherwise on the Right of Way permit.
20. The Designer shall provide, in this location on the plans, the location and descriptions of the nearest survey benchmark for the project as well as the basis of bearings. The information shall be as follows:

BM Number: _____ Elevation: _____

Description: _____

21. Upon completion of construction, the site shall be cleaned and restored to a condition equal to, or better than, that which existed before construction, or to the grades and condition as required by these plans.



22. Existing fences, trees, streets, sidewalks, curb and gutter, landscaping, structures, and improvements destroyed, damaged, or removed due to construction of this project shall be replaced or restored in like kind at the Developer's/Contractor's expense.
23. Overlot grading construction must comply with the State of Colorado permitting process for "stormwater discharges associated with the construction activity" and City Grading Permit.
24. After Initial Acceptance by the City Engineering Division, public improvements depicted in these plans shall be guaranteed to be free from material and workmanship defects for a period of two years from the date of Initial Acceptance.
25. These public improvement construction plans shall be valid for a period of one year from the date of acceptance by the City Engineering Division. Use of these plans after the expiration date will require a new review and approval process by the City prior to commencement of any work shown in these plans.

Appendix C Construction Notes

C.1 Standard Grading and Erosion and Sediment Control Construction Plan Notes

1. The Engineering Division must be notified at least forty-eight (48) hours in advance of any construction on this site.
2. There shall be no earth-disturbing activity outside the limits designated on the accepted plans.
3. All required perimeter silt and construction fencing shall be installed prior to any land disturbing activity (stockpiling, stripping, grading, etc.). All other required erosion control measures shall be installed at the appropriate time in the construction sequence as indicated in the accepted construction schedule and construction plans including erosion control.
4. At all times during construction, the Developer/Contractor shall be responsible for preventing and controlling on-site erosion including keeping the property sufficiently watered so as to minimize wind-blown sediment. The Developer/Contractor shall also be responsible for installing and maintaining all erosion control facilities shown herein.
5. Pre-disturbance vegetation shall be protected and retained wherever possible. Removal or disturbance of existing vegetation shall be limited to the area(s) required for immediate construction operations, and for the shortest practical period of time.
6. All soils exposed during land disturbing activity (stripping, grading, utility installations, stockpiling, filling) shall be kept in a roughened condition by ripping or disking along land contours until mulch, vegetation, or other permanent erosion control BMPs are installed. No soils in areas outside project street Rights of Way shall remain exposed by land disturbing activity for more than thirty (30) days before required temporary or permanent erosion control (e.g. seed/mulch, landscaping) is installed.)
7. In order to minimize erosion potential, all temporary erosion control measures shall:
 - a. Be inspected at a minimum of once every two (2) weeks and after each significant storm event and repaired or reconstructed as necessary in order to ensure the continued performance of their intended function.
 - b. Remain in place and correctly established until such time as all the surrounding disturbed areas are sufficiently stabilized as determined by the City Engineering Division.
 - c. Be removed after the site has been sufficiently stabilized as determined by the Engineering Division.
8. When temporary erosion control measures are removed, the Developer/Contractor shall be responsible for the clean up and removal of all sediment and debris from all drainage infrastructure and other public facilities.
9. The Contractor shall clean up any inadvertent deposited material immediately and make sure streets are free of all materials by the end of each working day.
10. All retained sediments shall be removed and disposed of in a manner and location so as not to cause their release into any waters of the United States.
11. All soil stockpiles shall be protected from sediment transport by surface roughening, watering and perimeter silt fencing. Any soil stockpile remaining after thirty (30) days shall be seeded and mulched.

12. The stormwater volume capacity of detention ponds will be restored, and storm drainage lines will be cleaned upon the completion of the project.
13. Colorado Discharge Permit System (CDPS) requirements make it unlawful to discharge or allow the discharge of any pollutant or contaminated water from construction sites.
14. A designated area shall be provided on site for concrete truck chute washout. The area shall be constructed to contain washout material and located at least fifty (50) feet away from any waterway during construction. Upon completion of construction activities, the concrete washout material will be removed and properly disposed of prior to the area being restored.
15. If conditions in the field change from the plans anticipated, additional erosion control measures may be required by the Engineering Division.
16. A vehicle tracking control pad shall be installed when needed for construction equipment, including but not limited to personal vehicles exiting existing roadways.
17. Add notes to reflect the storm water runoff control plan of the project.

C.2 Sanitary Sewer Construction Notes

Chapter 1 All design standards, materials and workmanship for public sanitary sewers shall be in accordance with the City of Northglenn standards and specifications.

Chapter 2 Benchmark elevations are based on _____ datum. (similar language that includes description and elevation of an acceptable benchmark may be used. Use navd 88 datum).

Chapter 3 Basis and record of bearing (horizontal control) defined in accordance to Colorado boundary survey minimum standard.

Chapter 4 The Contractor shall call for locates a minimum of two (2) business days prior to commencing construction activities. The Contractor shall keep all locate requests up-to-date and comply with applicable Colorado revised statutes (C.R.S.), pertaining to "blue stake". Errors in locates shall be immediately reported to the Engineering Division.

Chapter 5 The Contractor shall field verify existing sewer elevations and alignments prior to construction and implementation; verification may require potholing.

Chapter 6 Any activity that might affect the sanitary sewer system (materials entering the system, conveyance and treatment) requires approval and/or permit by the Engineering Division prior to any activity.

Chapter 7 Sewer construction shall not commence until a Right of Way permit is issued on accepted construction plans and a pre-construction meeting.

Chapter 8 Immediately report any of the following to the Engineering Division: any release of sewage, any damage to the public sanitary sewage system, or the dropping of debris into the public sanitary sewage system. Take immediate action to contain the sanitary sewage overflow from the sewer system. The Contractor shall be responsible for all costs to repair the system. The contractor shall repair all damage as directed and approved by Engineering Division.

Chapter 9 The inspection of the Contractor's work by an agency shall in no way relieve the Contractor of the responsibility for compliance with the requirements of the contract documents, construction plans and/or specifications. If the engineer of record or Engineering Division fail to point out a defect, deficiency or error in the work



from lack of discovery or for any other reason, it shall in no way prevent later rejection or relieve the contractor of performing corrections to the unsatisfactory work when discovered.

Chapter 10 The Contractor shall comply with applicable occupational safety and health administration (OSHA) regulations at all times and any manhole entry guidelines.

Chapter 11 Sanitary sewer construction shall start at the lowest downstream point and progress upstream, regardless of the stationing shown on the plans.

Chapter 12 The horizontal and vertical separation between public water mains and public sewer lines shall comply with the City of Northglenn STANDARDS AND SPECIFICATIONS.

Chapter 13 New public sewer facilities must be tested, inspected and authorized for discharge by the Engineering Division prior to discharging into the existing public sanitary sewer.

Chapter 14 Only plans accepted by Northglenn Engineering Division shall be used for the installation of sanitary sewer facilities. Plans accepted by the City requiring revisions shall be resubmitted for review and re- acceptance by the Engineering Division prior to start of the revised work.

Chapter 15 Sewer construction will not be accepted by Engineering Division if it includes additional work not provided in the approved set of plans.

Chapter 16 Contractor shall maintain access to all sanitary sewer manhole structures at all times.

Chapter 17 All storm water pollution prevention plan (swppp) measures shall be installed so as to prevent all storm water, construction water, fuels, chemicals, or liquids to be directed into or onto any sanitary sewer facilities. Protection of sanitary sewer facilities shall be a part of the approved construction swppp and best management practices. Protection devices shall be installed and maintained around all potentially affected sanitary sewer facilities within the project limits.

Chapter 18 Survey layout and survey control shall be performed by, or under the direct supervision of, a Registered Land Surveyor (RLS) registered in the state of Colorado.

C.3 Additional general sewer notes; any of the following notes may be omitted when not applicable:

1. The contractor shall furnish, operate, and maintain all equipment and labor necessary to provide continuous 24 hr/day sanitary sewer service to all parties tributary to a live sanitary sewer to which a connection is to be made. The Engineering Division shall be notified a minimum of two (2) business days prior to commencing any construction activities that could either adversely impact the flow within a live sanitary sewer system or involve connection to any public sanitary sewer.
2. Where connections to existing manholes are to be made, the Contractor shall construct new inverts in the existing base to smoothly direct the flow in the proper direction.
3. Ductile iron pipe shall be installed with an approved exterior polyethylene wrapping.
4. Manhole surfaces shall be caulked, sealed, and coated.

5. [length] linear feet of existing [diameter] public sewer from manhole # [manhole #] to manhole # [manhole #] is to be abandoned. Remove sewer completely. Sewer shall not be abandoned in place without prior approval from the Engineering Division.
6. It is the sewer contractor's responsibility to adjust or reconstruct all sanitary sewer manholes to finished grade. All frames and cover adjustments are to be in accordance with the City of Northglenn STANDARDS AND SPECIFICATIONS. While adjusting the manhole to finished grade, it is the contractor's responsibility to ensure that frames and covers are cleaned of any and all attached materials (asphalt, concrete, etc.) And that any vent holes are open and clear of obstructions. If the frame and cover are damaged or cannot be completely cleaned, a new frame and cover are to be put into place. Costs associated with these actions are the responsibility of the Contractor.
7. This public sewer is designed at minimum allowable pipe slope. Special care should be taken to assure design slope is maintained. Sewers found to be constructed at insufficient slopes will not be accepted by the Engineering Division. Corrective action, including re-construction of the sewer(s) at the sole expense of the project owner/contractor would be required.
8. All testing required by the city shall be paid for by the Contractor / Developer.

C.4 Water Construction Notes

1. The minimum cover over water lines is five (5) feet and the maximum cover is six (6) feet.
2. Water mains will be installed according to the latest City of Northglenn Standards and Specifications.
3. Contractor to have on the job site and a copy of the latest Standard Specifications at all times.
4. Contractor shall schedule inspections a minimum of 24 hours in advance and in accordance with the Inspection Checklist requirements. To schedule the inspections, call City of Northglenn Engineering Division.
5. Separation between sanitary sewer and water mains shall be a minimum of 10' HORIZONTAL, 2' VERTICAL (above sewer).
6. Service laterals will be set to grade by Contractor prior to the installation of water meters and boxes.
7. Water meter will not be installed, nor water turned on until the backflow devices required for the building and irrigation systems have been installed, tested, approved, and certified.
8. Protect existing utilities in place.
9. Water mains shall have 60" minimum cover to finish grade.
10. Raise existing water valve covers to grade.
11. Chip 2" "W" in curb face to identify water service location. 20. Install thrust or gravity blocks per requirements of this documents.
12. Contractor to verify depth and location of all utilities prior to trenching.
13. Contractor to install temporary taps for testing and chlorination prior to connecting to existing mains.
14. Design: Marking tape shall have the following properties

15. Color – Blue per APWA color code
16. Width – 3 inches minimum
17. Text – “CAUTION RESTRAINED JOINT BURIED BELOW”
18. Text shall continually repeat every 2 feet
19. Text color – Black
20. Text Size – 1 inch minimum
21. Thickness – 4mil minimum
22. Installation: Marking tape shall be placed along (longitudinally) the top of the water main following the installation of the required poly wrap for pipe and fittings, and taped to the poly wrap (around the water main) at 4 ft intervals for the limits of the installed joint restraint. The tape shall identify the complete restrained length.
23. No work shall begin until the water plans have been accepted for construction by the Engineering Division. When requesting inspections, please refer to the Project # identified on the plans.
24. All work shall conform to City of Northglenn STANDARDS AND SPECIFICATIONS, and to the latest edition of UDACS shall supersede any conflicts contained in the approved drawings and/or specifications.
25. All water meter boxes shall be located outside of driveway areas.
26. All valves shall be located outside of driveways, valley and curb gutters.
27. All water and storm drain or sanitary sewer crossings shall conform to the City of Northglenn STANDARDS AND SPECIFICATIONS.
28. All water facilities shall be filled, disinfected, pressure tested, flushed, filled, and an acceptable water sample obtained, prior to connection to the City of Northglenn distribution system.
29. Any interruption of service must be performed in accordance with The City of Northglenn STANDARDS AND SPECIFICATIONS. Proper written notification must be given to all affected customers.

C.5 Storm Drainage Construction Notes

1. The City shall not be responsible for the maintenance of storm drainage facilities located on private property.

C.6 Street Improvements Construction Notes

1. All street construction is subject to the General Notes on the cover sheet of these plans as well as the Street Improvements Notes listed here.
2. A paving section design, signed and stamped by a Colorado licensed Engineer, must be submitted to the Engineering Division for approval, prior to any street construction activity, (full depth asphalt sections are not permitted at a depth greater than 8 inches of asphalt). The job mix shall be submitted for approval prior to placement of any asphalt.

3. Where proposed paving adjoins existing asphalt, the existing asphalt shall be saw cut, a minimum distance of 12 inches from the existing edge, to create a clean construction joint. The Developer/Contractor shall be required to remove existing pavement to a distance where a clean construction joint can be made. Wheel cuts shall not be allowed unless approved by the Engineering Division.
4. Street subgrades shall be scarified the top 12 inches and re-compacted prior to subbase installation. No base material shall be laid until the subgrade has been inspected and approved by the Engineering Division.
5. Valve boxes and manholes are to be brought up to grade at the time of pavement placement or overlay. Valve box adjusting rings are not allowed.
6. When an existing asphalt street must be cut, the street must be restored to a condition equal to or better than its original condition. The existing street condition shall be documented by the Inspector before any cuts are made. The finished patch shall blend smoothly into the existing surface. The determination of need for a complete overlay shall be made by the Engineering Division.
7. All traffic control devices shall be in conformance with these plans or as otherwise specified in M.U.T.C.D. (including Colorado supplement) and as per the Right of Way Work Permit traffic control plan.
8. The Developer/Contractor is required to perform a gutter water flow test in the presence of the Engineering Division representative and prior to installation of asphalt. Gutters that hold more than ¼ inch deep or 5 feet longitudinally, of water, shall be completely removed and reconstructed to drain properly.
9. Prior to placement of H.B.P. or concrete within the street *and* after moisture/density tests have been taken on the subgrade material (full depth asphalt) or on the subgrade and base material (when a composite section is proposed), a mechanical ‘proof roll’ will be required. The entire subgrade and/or base material shall be rolled with a heavily loaded vehicle having a total GVW of not less than 50,000 lbs. and a single axle weight of at least 18,000 lbs. with pneumatic tires inflated to not less than 90 p.s.i.g. “Proof roll” vehicles shall not travel at speeds greater than 3 mph. Any portion of the subgrade or base material which exhibits excessive pumping or deformation, as determined by the Engineering Division, shall be reworked, replaced, or otherwise modified to form a smooth, non-yielding surface. The Engineering Division shall be notified at least 24 hours in advance of the “proof roll”. All ‘proof rolls’ shall be performed in the presence of the Engineering Division staff.

C.7 Traffic Signing and Pavement Marking Construction Notes

1. All signage and marking are subject to the General Notes on the cover sheet of these plans, as well as the Traffic Signing and Marking Construction Notes listed here.
2. All symbols, including arrows, ONLYS, crosswalks, stop bars, etc. shall be pre-formed thermoplastic.
3. All signage shall be per the City STANDARDS AND SPECIFICATIONS, these Construction Plans or MUTCD.
4. All lane lines for asphalt and concrete pavement shall receive epoxy applications. The epoxy lines shall be specified in CDOT Standard Specifications for Road and Bridge Construction.
5. Pre-formed thermoplastic applications shall be as specified in these Plans and/or these STANDARDS AND SPECIFICATIONS.



6. Prior to permanent installation of traffic striping and symbols, the Developer/Contractor shall place temporary tabs or tape depicting alignment and placement of the same. Their placement shall be approved by the Engineering Division prior to permanent installation of striping and symbols.
7. All surfaces shall be thoroughly cleaned prior to installation of striping or markings.
8. All sign posts shall utilize breakaway assemblies and fasteners per the STANDARDS AND SPECIFICATIONS.



Appendix D Certification of As-Builts

SAMPLE CERTIFICATION FORM

ENGINEER OF RECORD CERTIFICATION OF AS-BUILTS

<DATE>

City of Northglenn

Public Works Department

11701 Community Center Drive

Northglenn, CO 80233

RE: Certification of Substantial Conformance - <project name>

I hereby certify that I am a licensed civil engineer in the State of Colorado. To the best of my knowledge, information, and belief, the site improvements and infrastructure at <project name> were constructed in general conformance to the Construction Drawings issued by <Firm Name> and approved by the City of Northglenn. In my professional opinion, this project is in compliance with all applicable laws, codes and ordinances. This includes the <list of improvements> as shown on the approved plans <Sheets _ through inclusive>.

<Firm Name> bases this opinion on site visits and visual observations of the site improvements, as well as information provided by the Owner and the Contractor.

Respectfully,

<Firm Name>

<engineer of record> P.E. <number>



Appendix E Checklist for Right-of-Way Permits

NORTHGLENN PUBLIC WORKS DEPARTMENT

CONTRACTOR CHECKLIST

FOR RIGHT OF WAY PERMIT APPLICATION SUBMITTAL

All contractors conducting any work in the City of Northglenn Right of Way shall obtain a Right of Way Permit prior to any work. The Contractor should use this checklist to expedite the issuance of the permit. Questions may be directed to 303-450-8984.

_____ Infrastructure Construction Plans

_____ Construction Schedule

Please include a detailed construction schedule which includes time frame for traffic control, construction, inspections, testing, and restoration work.

_____ Performance, Payment, Maintenance and Warranty Bond

100% of the total cost of the project (as submitted by the Contractor and accepted by the City), or minimum \$5,000.00 shall be required for job-specific guarantee and an estimated cost for the year for an Annual guarantee. Bonds need to be written on city bond form. Bonds shall be the original document; photocopies or faxes shall not be acceptable.

_____ Certificate of Insurance

An original Certificate of Insurance listing the City of Northglenn as additional insured* shall be provided to the City, and shall be completed by the Applicant’s insurance agent as evidence that policies providing the minimum required coverage, conditions, and minimum limits are in full force and effect, and shall be reviewed and approved by the City of Northglenn prior to issuance of a permit.

*Per the Northglenn Municipal Code relating to Public Rights of Way, Chapter 16, Article 2, the policy shall be endorsed to include: **“The City of Northglenn and the City of Northglenn’s officers, volunteers and employees as additional insured.”**

Workmen’s Compensation Insurance to cover obligations imposed by applicable laws for any employee engaged in the performance of work under this permit, and Employer’s liability insurance with minimum limits of one hundred thousand dollars (\$100,000) each accident, one hundred thousand dollars (\$100,000) disease – each employee, and five hundred thousand dollars (\$500,000) disease – policy limit. Evidence of qualified self-insured status may be substituted for the workmen’s compensation insurance requirements of this paragraph.

General Liability Insurance with minimum combined single limits of one million dollars (\$1,000,000) each occurrence and one million dollars (\$1,000,000) aggregate. The policy shall be applicable to all premises and operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including independent contractors), products, and completed operations. The policy shall include coverage for explosion, collapse, and underground hazards. The policy shall contain a severability of interest provision.



Comprehensive Automobile Liability Insurance with minimum combined single limits for bodily injury and property damage of not less than one million (\$1,000,000) each occurrence and one million dollars (\$1,000,000) aggregate with respect to each of permittee's owned, hired or non-owned vehicles assigned to or used in performance of the services. The policy shall contain a 'severability of interests' provision.

_____ Traffic and Pedestrian Control Plan

A detailed traffic and pedestrian control plan that complies with the requirements of the Manual of Uniform Traffic Control Devices (MUTCD), latest revised edition, shall be submitted to the Engineering Division for review and approval. Traffic control plans shall be site specific and show signs, barricades, cones, tapers, spacing, driveways, paths and walks along with any other pertinent information. Include the number of workdays as well as specific hours of the proposed work. Pedestrian control shall comply with the requirements of the Americans with Disabilities Act. Generic traffic control plans cannot be accepted.

_____ Standards and Specification Books

A current City Standards and Specifications book (\$50.00) or CD (\$5.00) or downloaded copy from the City's website is required to obtain a Right of Way permit. A Specifications book or the print pages applicable to the project must be maintained on site.

_____ Permit Fee

Permit Fee shall be based on the City of Northglenn Fee Schedule. Permit fee shall include plan review fees, grading permit fees, inspection fees, restoration fees, and other fees as required by Chapter 16, Article 2 of the Northglenn Municipal Code.

_____ Outstanding Fees

Starting work without a permit = \$500.00 plus 2 times the permit fee. Stop Work Order = \$250.00 per day per violation.

_____ Mix Design

Submit mix designs for any concrete, asphalt, flow fill, and Class 6 Recycled Concrete Roadbase that will be used on the project. Concrete Mix Designs should be CDOT 4500 PSI Class B and Asphalt Mix Designs should be CDOT SX PG 64-22 No RAPP

_____ Submittals

Any products or materials used on the project will require submittals. Provide two (2) copies of each for review and approval. (Example: pipe, fittings, tapping saddle, valve, hydrant, polywrap, etc.)

_____ Contractor Registration

Contractors working in the City of Northglenn will be required to complete an application form annually (calendar year), complete with references, and submit to the City for review. A fee based on the City of Northglenn Fee Schedule will be assessed if the application is approved.

_____ Construction Water Permit



Contractors needing to utilize City water for construction purposes may apply for a construction water permit. A refundable deposit of \$1,000.00 will be required. In addition, the first month's use fee of \$150.00 will need to be paid at the time of application for a construction water permit.

_____ Grading Permit

If the applicant's project involves working on slopes in excess of 6%, encompasses more than 1 acre of land, or exceeds 200 cubic yards of earthwork, then you will need to obtain this permit. If applicable, it may require additional bond and fees. Detailed information may be obtained by speaking with the Engineering Division.

_____ Stormwater Discharge Permit

Contact Northglenn's Stormwater Coordinator at 303-450-8792 for information regarding new City, State, and Federal regulations which may be required for the project.



Appendix F Design Forms



Grease Interceptors for Non-Domestic Facilities

Protecting public health and safety is the primary responsibility of the City's Public Works. Sewer blockages and spills pose a threat to public health and safety, and is prevented with proper FOG management. FOG includes animal fat products, dairy, cooking oil, shortening, and grease. FOG is often used in the preparation of food and beverages, so water used to wash equipment, dishes and floors in food service and preparation facilities contain FOG.

When FOG, or food and wastewater containing FOG, are poured down the drain, it cools and usually solidifies in the sewer pipes of buildings and the City's sewer collection system, which restricts and eventually clogs wastewater flow. Wastewater back-up into homes, businesses and the environment is known as sanitary sewer overflow and causes serious water quality problems, property damage and threat to public health. The most effective way to prevent sanitary sewer overflow and minimize FOG accumulation in sewer pipes is to prevent the introduction of FOG into the sanitary sewer system with Best Management Practices (BMPs).

All non-domestic facilities that prepare, serve, or otherwise make any type of food or beverages available for consumption (Food Service Establishment) are required to install and maintain a gravity grease interceptor. Interceptors prevent FOG from entering the City's sewers in the event of BMP failure. Full gravity grease interceptor criteria are given in the City's Grease Interceptor Design Form, but see page 2 of this document to estimate the required volume. Interceptors shall be maintained by regularly scheduled cleaning (pump-out) at a minimum every 90 days, or more often if required by the City.

Food Service Establishments are required to have a plan review approved by the City of Northglenn's Public Works. As part of this review, facilities submit to the City the following:

1. Industrial Waste Questionnaire
2. Grease Interceptor Design Form, completed and stamped by a Professional Engineer, or otherwise approved by City of Northglenn Public Works
3. List of fixtures and appurtenances that discharge to the sanitary waste system with manufacturer and model number.
4. Building/Kitchen floor plan with fixtures noted
5. Anticipated Best Management Practices (BMPs) used to limit FOG entering sanitary system
6. Anticipated maintenance (pump-out) schedule for grease interceptor.

The Industrial Waste Questionnaire and Grease Interceptor Design Form are found online at:

<http://www.northglenn.org/IndustrialPretreatment>

To submit plan review documents, and for questions about the City's FOG control program, please contact:

Alex Gan, Industrial Pretreatment Specialist
(303) 450-4026

ipprogram@northglenn.org



Gravity Grease Interceptor Volume Estimate

The following is provided as a guide to estimate the volume required for a gravity grease interceptor. Volume calculated using this document is **not** accepted as a replacement for the completed Gravity Grease Design Form when submitting documents for a food service establishment plan review. Structurally, the interceptor must also be equipped with a particular design of inlet, baffle wall and outlet tee. This guide is only intended to allow a food service professional to quickly estimate the approximate volume of gravity grease interceptor required for their establishment. The estimate may vary high or low by up to 33% of actual depending on kitchen design factors.

Gravity grease interceptors are sized based on the expected flow rate of different categories of kitchen fixtures in gallons per minute (gpm) with criteria of a hydraulic residence time of 30 minutes and a 25% FOG and solids storage factor. The design flow rate is one-third the maximum flow rate because of the bulk hydraulic compensation of short-term peak flow events. Refer to Water Research Foundation project reports 03-CTS-16Ta & b for design justification.

$$\text{Volume} = [\text{Maximum Flow Rate (gpm)}] \times 30 \text{ min} \times 1.25 \text{ storage factor} \div 3$$

To calculate the Maximum Flow Rate, select the appropriate fixture flow rate from the table below. Fixture flows are displayed for different drainage pipe diameters. Sum together the flow rates of all fixtures and insert into the Volume equation above.

		Fixture Flows (gpm)		
		1.5"	2.0"	2.5"
A	Ware Washing (3-comp sinks)	15	30	60
B	Food Preparation		2.2	
C	Pre-Rinse		2.2	
D	Dishwashing Machine		5	
E	Cooking Equipment	15	30	60
F	Mop Sink / Service Fixture		5	
G	Waste Food Disposal		2.2	
H	Floor Drains (one or many)		5	

Consider the following example for a kitchen with:

Two 3-comp wash sinks, 2" diameter drain pipe	A = 2 × 30	= 60
Two 2-comp prep sinks	B = 2 × 2.2	= 4.4
One pre-rinse sink	C = 1 × 2.2	= 2.2
One dishwashing machine	D = 1 × 5	= 5
One wok range, 1.5" diameter drain pipe	E = 1 × 15	= 15
One mop sink	F = 1 × 5	= 5
No waste food disposals	G = 0	= 0
Several floor drains	H = 5	= 5
A + B + C + D + E + F + G + H =		96.6

$$\text{Volume} = [\text{Maximum Flow Rate (gpm)}] \times 30 \text{ min} \times 1.25 \text{ storage factor} \div 3$$

$$= 96.6 \times 30 \times 1.25 \div 3 = 1207.5 \approx \mathbf{1200 \text{ gallons}}$$



Gravity Grease Interceptor Design Form

Project Name:	
Project Address:	
Date Grease Interceptor Sized:	
Company Sizing Grease Interceptor:	
Engineer Name:	
Engineer Phone:	
Engineer E-mail:	

Instructions

This form must be completed and stamped by a licensed Professional Engineer, or otherwise approved by City of Northglenn Public Works. Return the completed form and the following attachments to the Industrial Pretreatment division:

1. Completed Industrial Waste Questionnaire
2. List of fixtures with manufacturer and model
3. Building or kitchen floor plan with fixtures noted
4. Anticipated Best Management Practices used to limit FOG entering system
5. Anticipated grease interceptor maintenance and pump-out schedule

Gravity grease interceptors are sized based on the expected flow rate of three categories of kitchen fixtures (listed below) in gallons per minute (gpm) with criteria of a hydraulic residence time of 30 minutes and a 25% FOG and solids storage factor. The design flow rate is one-third the maximum flow rate because of the bulk hydraulic compensation of short-term peak flow events. Refer to Water Research Foundation project reports 03-CTS-16Ta & b for design justification.

$$\text{Volume} = [\text{Maximum Flow Rate (gpm)}] \times 30 \text{ min} \times 1.25 \text{ Storage Factor} \div 3$$

- **Drainage** fixtures are filled and completely drained at the end of their use and includes the 3-compartment sink and cooking equipment like tilt skillets, braising pans, rotisserie ovens and wok ranges. Flow is calculated using the Manning Formula (see page 2), which accounts for sink pipe drain size, pipe material types and pipe slope to determine the maximum flow rate from the fixture. Most Drainage fixtures connect to a single drain pipe; if the fixture connects to separate drain pipes, list it as multiple fixtures.
- **Faucet** fixtures are not filled, but instead drain at their faucet's flow rate and includes sinks for food preparation, pre-rinse, equipment cleaning and waste food disposal units. If floor drains are present, their combined flow equals the fixture(s) supplying the spray. Sinks with two faucets count as two fixtures. Ignore hand-wash-only fixtures for sizing.
- **Cleaning** fixtures have specific peak discharge rates that exceed faucet flow but are less than the maximum rate the drain pipe permits and includes dishwashers, clothes washers used for cleaning of food service-associated linens, and automatic hood cleaning systems. Enter the manufacturer-specified flow rate per discharge cycle.

Structurally, the gravity grease interceptor must be equipped a particular design of inlet, baffle wall and outlet tee. Refer to pages 3-4 for details.



Drainage Fixtures

Flow Rate (gpm) = $669 \times A \times R^{2/3} \times S^{1/3} \div n$

A = $0.7254 \times [\text{Pipe Diameter (inches)} \div 12]^2$

R = $0.0251 \times \text{Pipe Diameter (inches)}$

S = Pipe slope, n = Roughness coefficient

Drainage Pipe Diameter	Minimum Slope
2 ½ inches or smaller	0.0208
3 to 6 inches	0.0104
8 inches or larger	0.0052

87.5% of horizontal drainage pipe depth is assumed wettable due to flow caused by gravity alone. Contact City if sewage ejector pumps are used.

Manning's roughness coefficient, n, depends on the material and age of the drainage pipe:

	PVC	Copper
Minimum (new)	0.008	0.010
Normal (used)	0.009	0.011
Maximum (old)	0.010	0.012

	Fixture Name	Diameter (in)	Slope	Roughness (n)	Flow Rate
1.					
2.					
3.					
4.					
Total Drainage Fixtures Flow Rate (DFQ) =					

Faucet Fixtures

International Plumbing Code requires most faucets discharge a maximum 2.2 gpm at 60 psi and service/mop sinks should discharge a minimum 3 gpm at 8 psi. Measure flow rate if uncertain.

	Fixture Name	Maximum Flow Rate
1.		
2.		
3.		
4.		
	If floor drains exist, use flow rate for spray-supplied fixture(s)	
Total Faucet Fixtures Flow Rate (FFQ) =		

Cleaning Fixtures

Provide manufacturer and model with list of fixtures that is provided with this form.

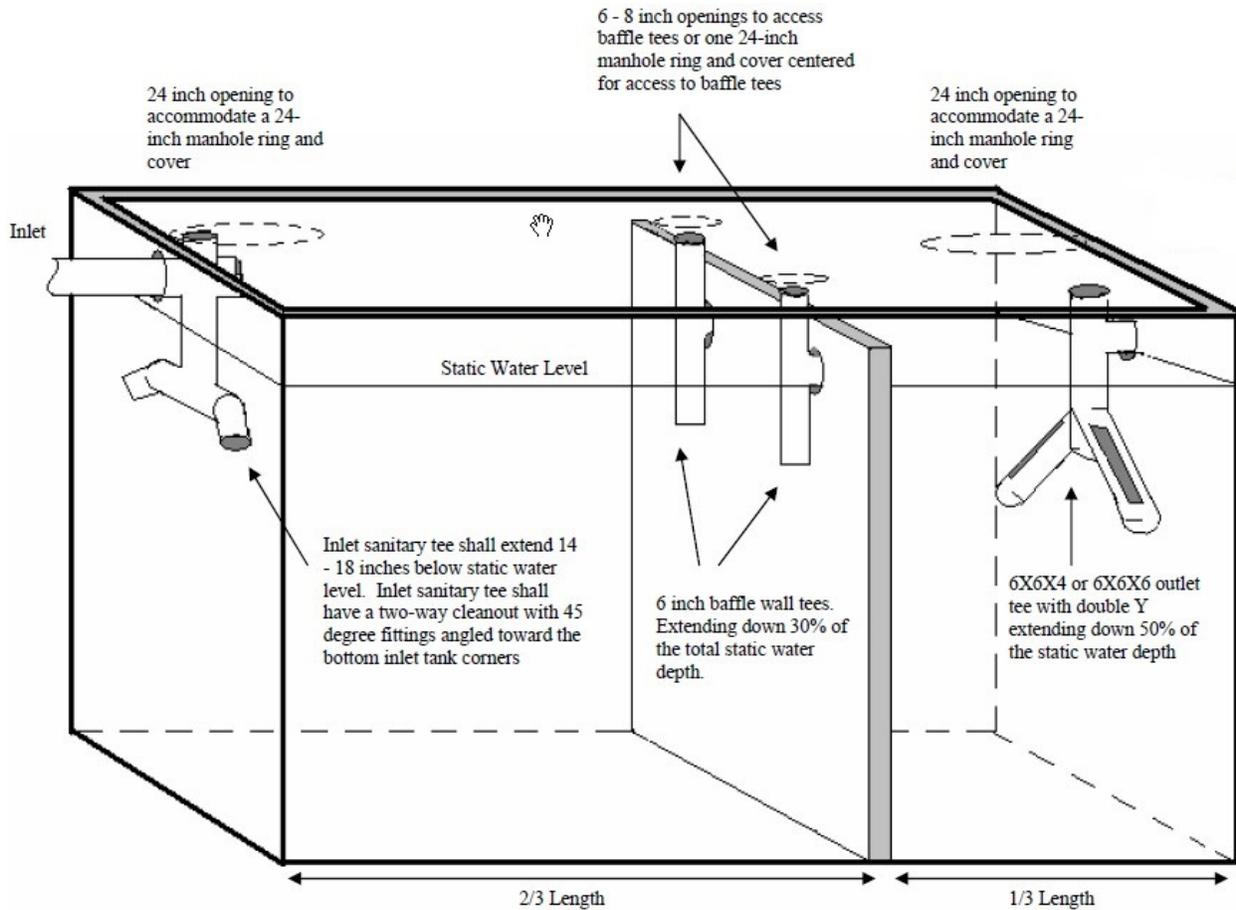
	Fixture Name	Mfg. Specified Flow Rate
1.		
2.		
3.		
4.		
Total Cleaning Fixtures Flow Rate (CFQ) =		

Grease Interceptor Volume

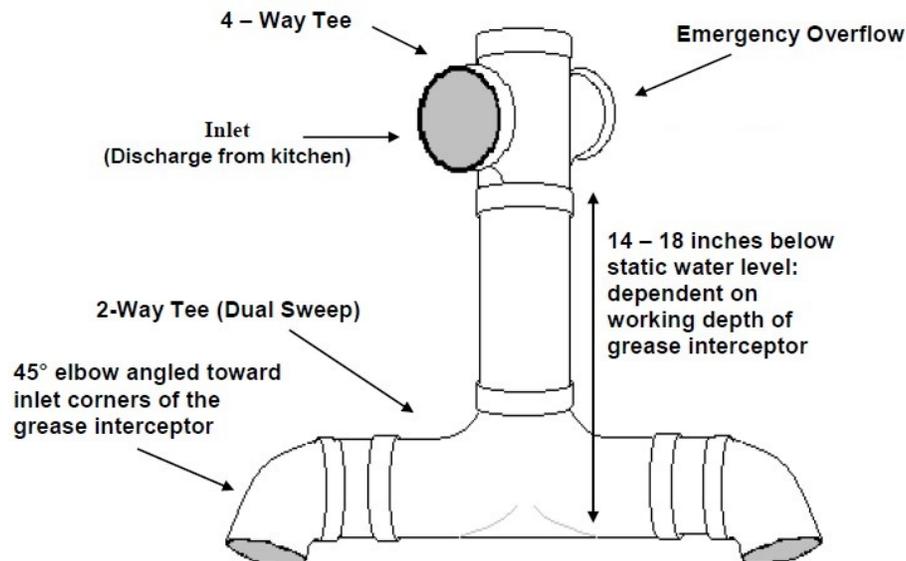
$[\text{DFQ} + \text{FFQ} + \text{CFQ}] \times 30 \text{ minutes} \times 1.25 \div 3 = \text{Volume in gallons}$

			× 12.5 =	
--	--	--	-----------------	--

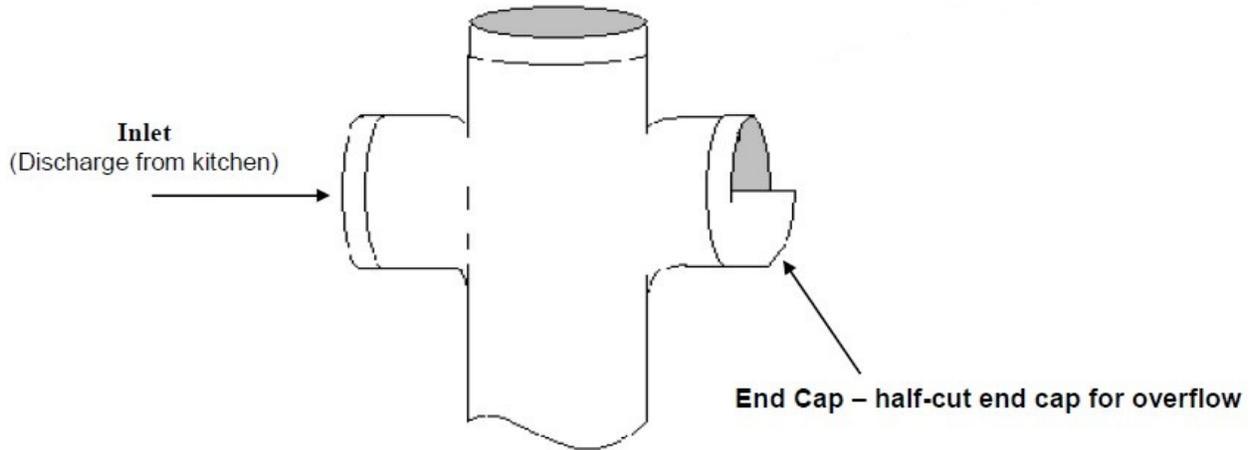
Inlet, Baffle Wall and Outlet Tee Design Overview



Inlet Tee Design

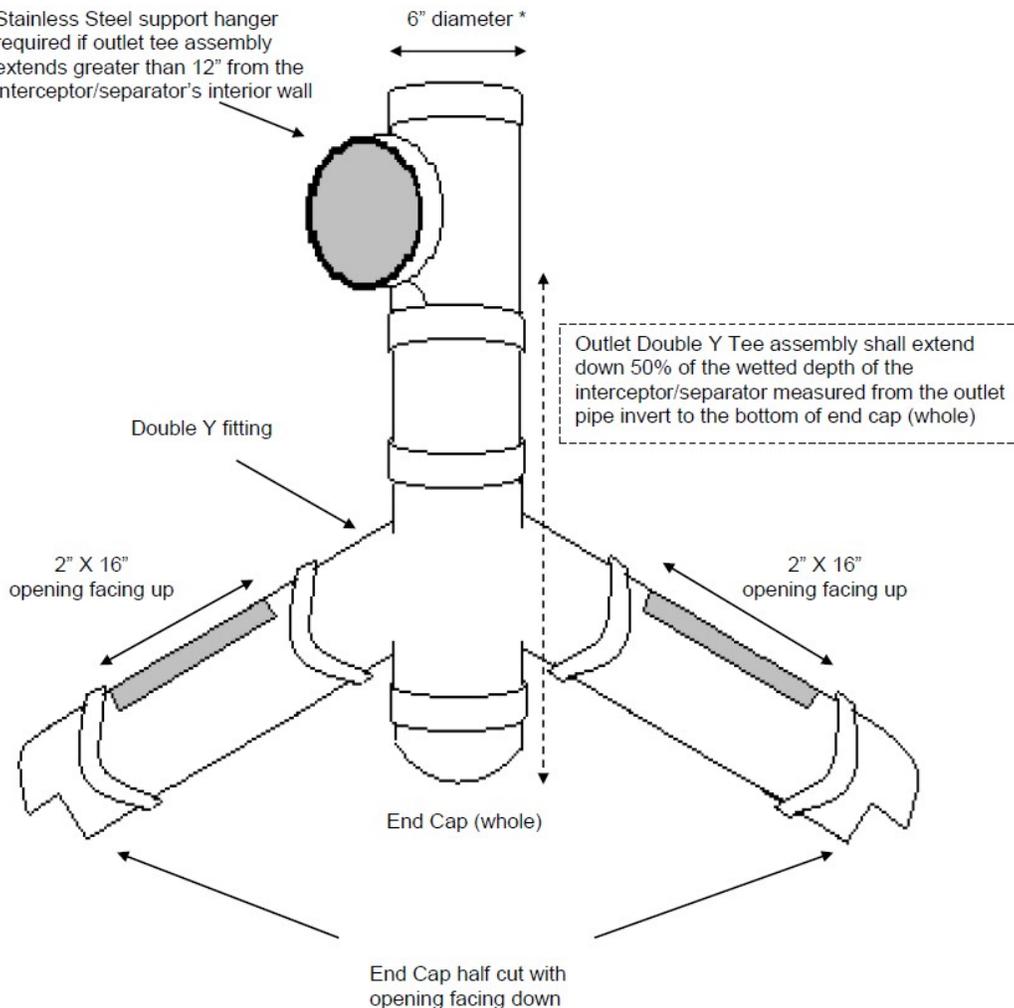


Emergency Overflow Close-up



Outlet Tee Design

Stainless Steel support hanger required if outlet tee assembly extends greater than 12" from the interceptor/separator's interior wall





Appendix G Standard Drawings

G.1 Erosion Control Standard Drawings

EC - 1 Concrete Washout

EC - 2 Vehicle Tracking Control

EC - 3 Sediment Control Log

EC - 4 Silt Fence Erosion Barrier

EC - 5a Sediment Basin

EC - 5b Sediment Basin

EC - 6a Inlet Protection

EC - 6b Inlet Protection

EC - 7 Curb Sock

G.2 Sanitary Sewer Standard Drawings

SS – 1 Standard Manhole Base

SS – 2 Manhole Barrels and Alternate Tops

SS – 3 Intermediate Platform for Manholes greater than 17' deep

SS – 4 Typical Trench Section for Pipe Protection

SS – 5 Typical House Service Location

SS – 6 Standard Clean Out

SS – 7 Jacking Detail

SS – 8 Typical Underdrain Clean Out

SS – 9 Encasement for Conduit Crossing

SS – 10 Sanitary Sewer Manhole Cover

SS – 11 Standard Sanitary Sewer Underdrain Clean Out

G.3 Storm Drainage Standard Drawings

ST – 1 Standard Manhole Base

ST – 2 Manhole Barrels and Alternative Tops



ST – 3 Intermediate Platform for Manholes greater than 17’ deep

ST – 4 Typical Pipe Bedding

ST – 5a Curb Inlet – Type R

ST – 5b Curb Inlet – Type R

ST – 5c Curb Inlet – Type R

ST – 6 Storm Drainage Manhole Cover

ST – 7 Encasement for Conduit Crossings

G.4 Street Standard Drawings

R – 1 Local Typical Section

R – 2 Collector Typical Section

R – 3 Arterial Typical Section

R – 4 Vertical Curb and Gutter

R – 5 Combination Curb, Gutter and Sidewalk

R – 6 Curb Ramp Combination Curb, Gutter and Sidewalk

R – 7 Curb Ramp Vertical Curb and Walk

R – 8 Sidewalk Ramp with Cross pan, Vertical Curb

R – 9 Ramp Drive for Vertical Curb, Attached Walk

R – 10 Ramp Drive for Vertical Curb, Detached Walk

R – 11 Truncated Dome/Detectable Warning

R – 12a Standard Sidewalk Chase Drain

R – 12b Standard Sidewalk Chase Drain

R – 13 Median Cover Material – Patterned Concrete

R – 14 Median Edging – Patterned Concrete

R – 15 Sleeve Detail

R – 16 Trench Patch Back

G.5 Traffic Standard Drawings

- T – 1 Typical Signpost Anchor Detail
- T – 2 Loop Detector Details
- T – 3 Loop Detector/Pull Box – Water Valve Stem Type
- T – 4 Traffic Signal Pole Box
- T – 5 Pedestrian Push Button Post and Sign
- T – 6 School Flashing Beacon Assembly – Side of Road
- T – 7a School Flashing Beacon Assembly – Overhead
- T – 7b School Flashing Beacon Assembly – Overhead

G.6 Water Standard Drawings

- W – 1 Typical Trench Section Pipe Protection
- W – 2 Fire Hydrant Installation
- W – 3 Concrete Thrust Blocks Bearing Surfaces and Installation
- W – 4 Concrete Thrust Block Dimensions
- W – 5 Concrete Thrust Blocking for Unbalanced Fittings
- W – 6 Polyethylene Wrap for Ductile Iron Pipe
- W – 7 Tracer Wire on Plastic Pipe
- W – 8a Settings for 5/8" x 3/4" thru 1" Meters
- W – 8b Settings for 5/8" x 3/4" thru 1" Meters
- W – 9 Meter Settings for 1 1/2" and 2" Meter with Valve and Bypass
- W – 10 Standard 3" and 4" Meter Setting
- W – 11 Typical Meter Vault
- W – 12 Standard Concrete Meter Support
- W – 13 Wall and Body Clamps 3" Meter
- W – 14 Wall Clamps for 4" to 12" Meters
- W – 15 Standard Blow-Off Installation



W – 16 A.C. to D.I. Pipe Adaptor

W – 17 Conduit Crossing

W – 18 Standard Air Valve Installation

W – 19 Butterfly Valve Installation in Mains 16” or Larger

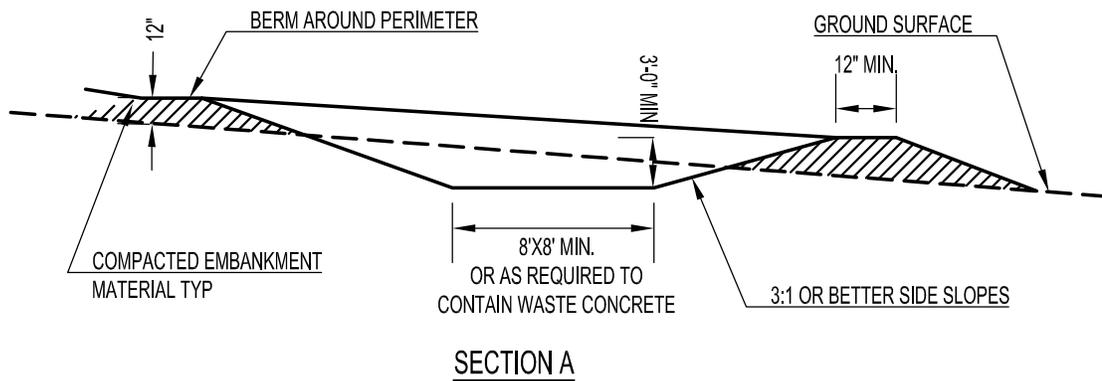
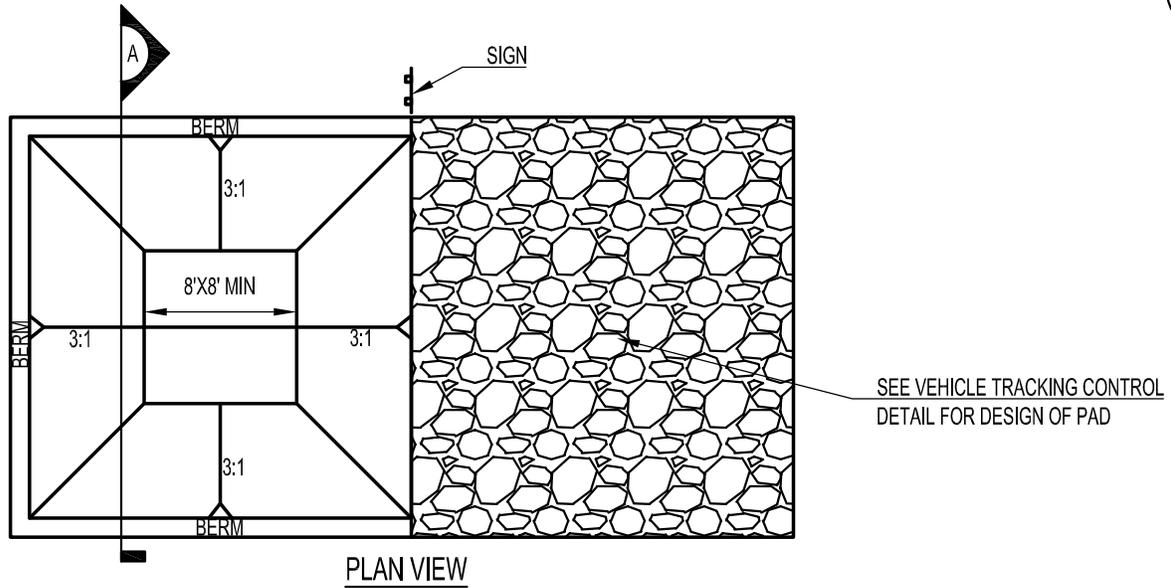
W – 20 Water Distribution System – Typical Plan for Cul-de-Sac

W – 21 Boring Detail

W – 22 Transmission Main Blow-Off Installation

W – 23 Water Manhole Cover

W – 24 Residential Service Tap



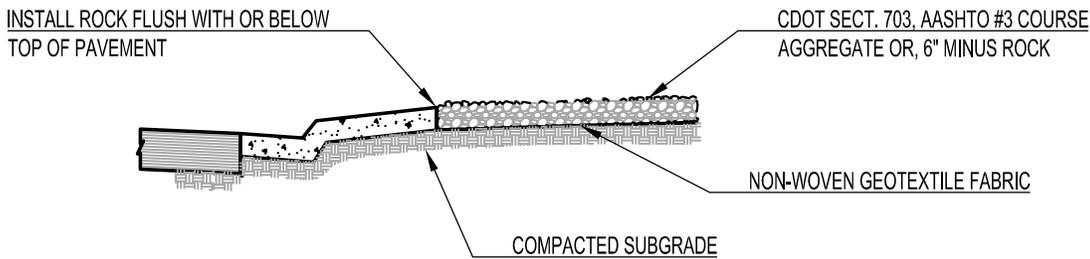
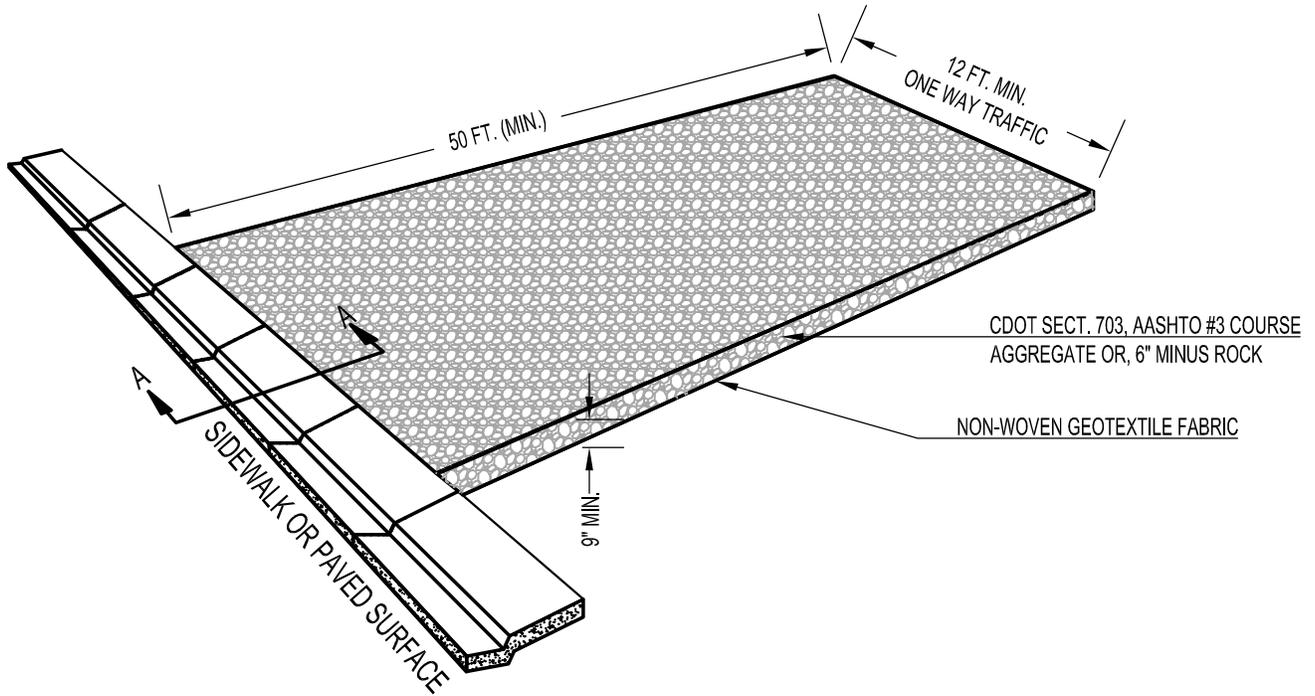
CONCRETE WASHOUT AREA INSTALLATION NOTES:

1. SEE PLAN SET FOR LOCATIONS OF CONCRETE WASHOUT AREA.
2. THE CONCRETE WASHOUT SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
3. VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.
4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREA TO THE OPERATOR OF CONCRETE TRUCKS AND PUMP RIGS.
5. EXCAVATION MATERIAL SHALL BE UTILIZED IN PERIMETER BERM CONSTRUCTION.

CONCRETE WASHOUT AREA MAINTENANCE NOTES:

1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTE CONCRETE.
2. AT THE END OF CONSTRUCTION ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, DRILL SEED AND CRIMP MULCH OR OTHERWISE STABILIZE IN A MANNER APPROVED BY THE LOCAL JURISDICTION.
4. INSPECT AS REQUIRED UNDER ANY PERMITS.

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DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG	CITY OF Northglenn	APPROVED BY:		
				DRAWING NO.	EC 1	
				SCALE	N.T.S.	
				CONCRETE WASHOUT		

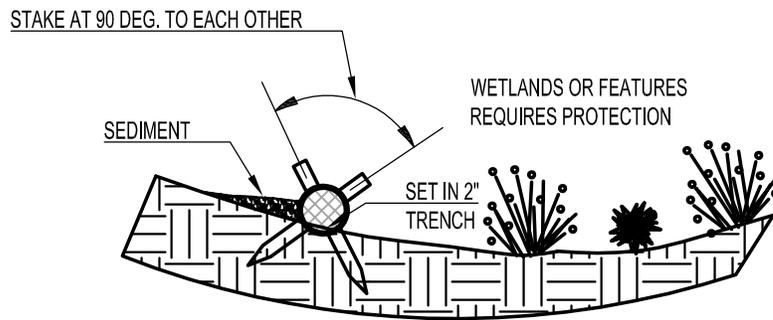
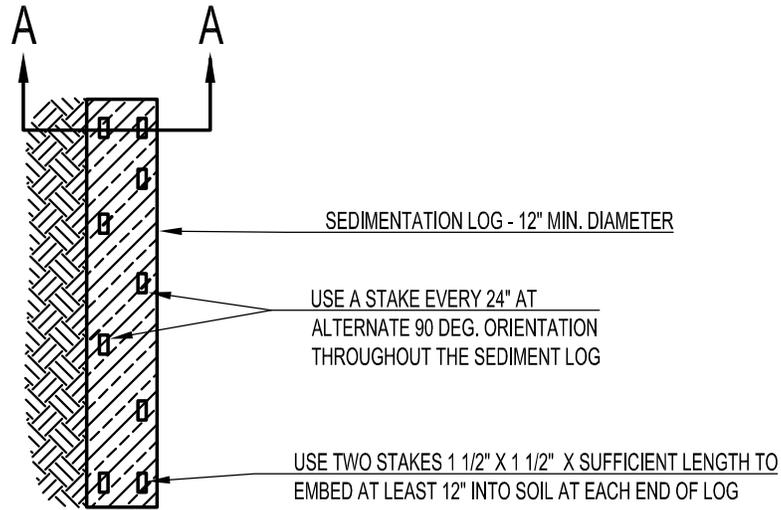


SECTION A-A

NOTES

1. EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES AS DIRECTED BY LOCAL JURISDICTION
2. ALL ROCK TO BE REMOVED UPON COMPLETION OF CONSTRUCTION.
2. PUBLIC ROADWAY TO BE KEPT CLEAN AND FREE OF MUD, DIRT AND DEBRIS AT ALL TIMES.

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DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG			APPROVED BY:	
			VEHICLE TRACKING CONTROL		DRAWING NO.	EC 2
					SCALE	N.T.S.



SECTION A-A

SEDIMENT CONTROL LOG INSTALLATION NOTES

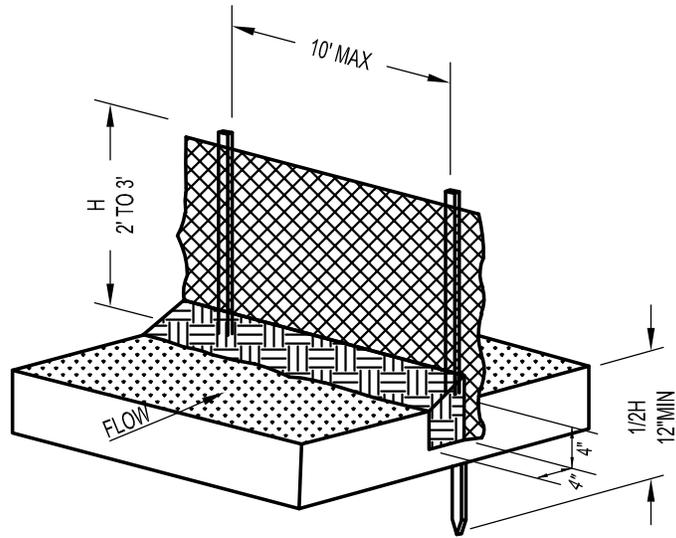
1. SEE PLAN VIEW FOR:
- LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
2. SEDIMENT CONTROL LOGS INDICATED ON INITIAL SWMP PLAN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
4. NOT FOR USE IN CONCENTRATED FLOW AREAS
5. THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

SEDIMENT CONTROL LOG MAINTENANCE NOTES

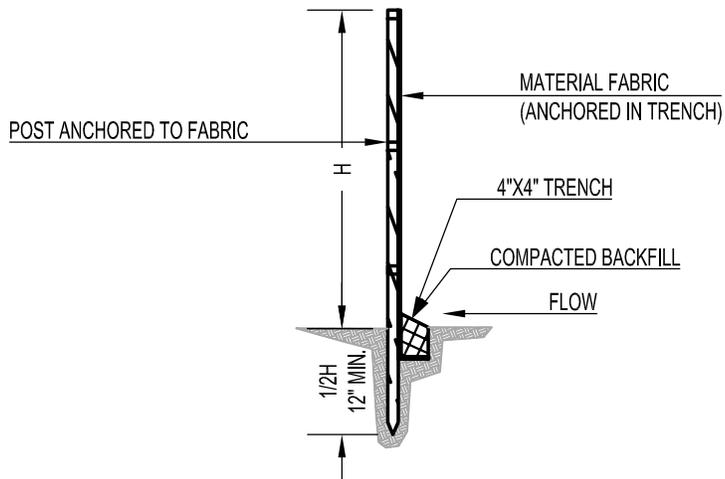
1. THE SWMP MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS AS REQUIRED UNDER ANY PERMITS AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN 1/2 THE HEIGHT OF THE CREST OF LOG.
3. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION, IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

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3/2020		UTLEIG			APPROVED BY:	
					DRAWING NO.	EC3
					SCALE	N.T.S.

SEDIMENT CONTROL LOG



SILT FENCE INSTALLATION

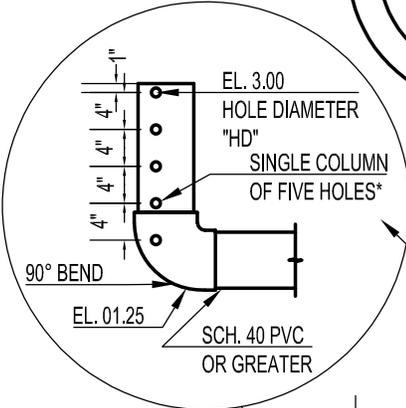
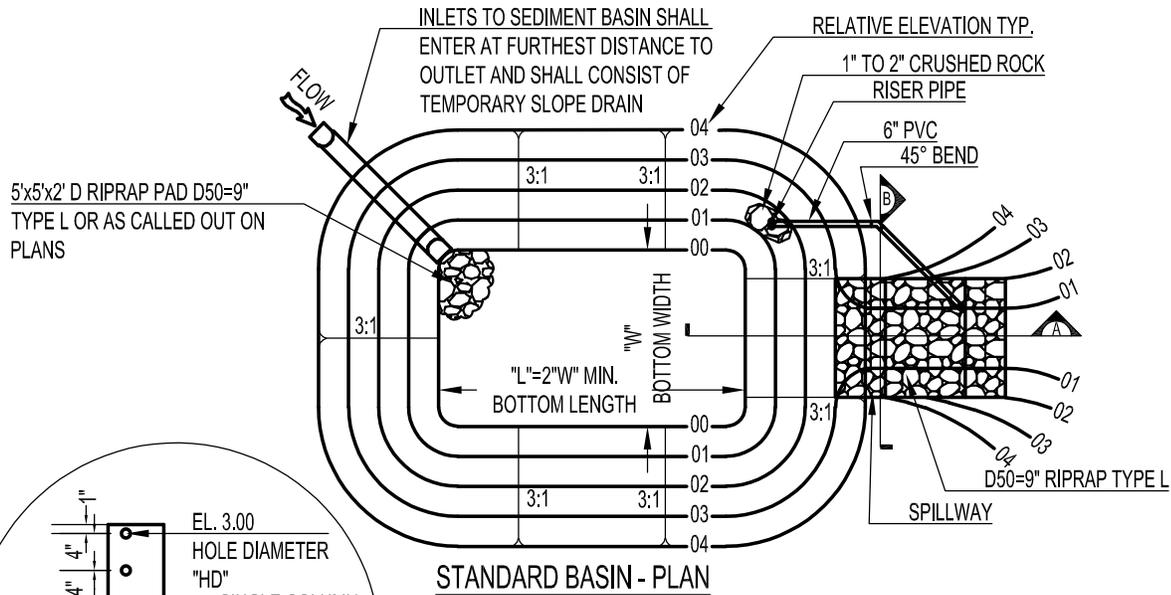


SECTION

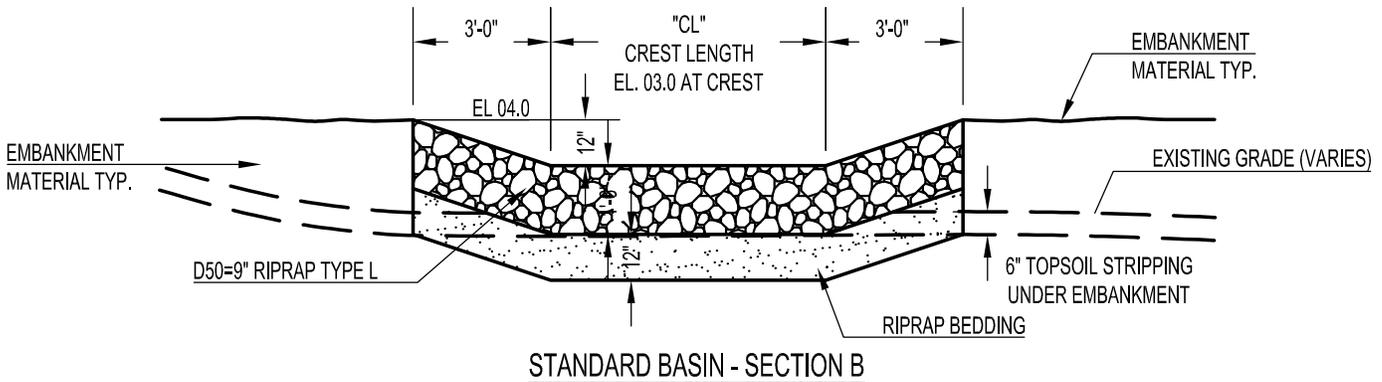
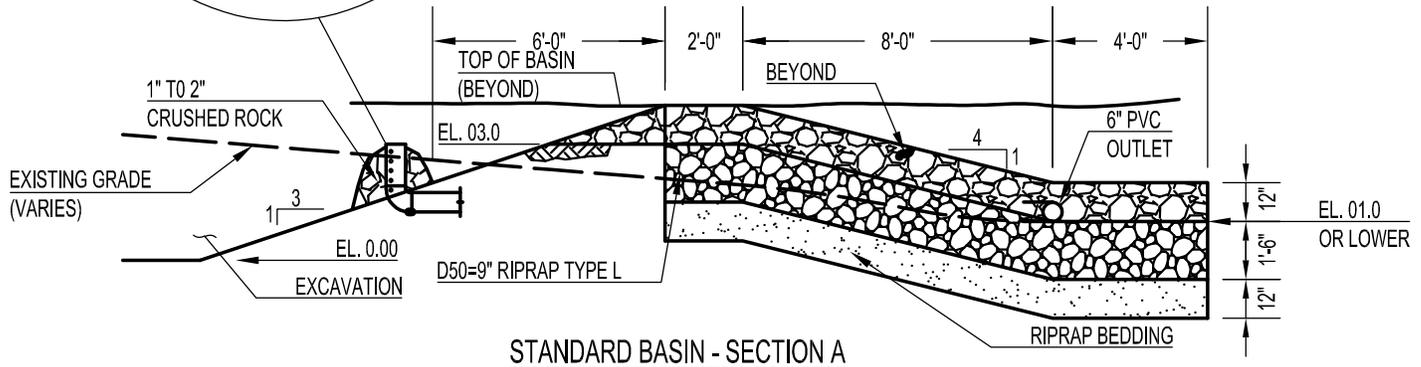
NOTE:
 EROSION CONTROL MEASURES SHALL BE
 MAINTAINED UNTIL LANDSCAPING IS COMPLETED,
 OR AS DIRECTED BY LOCAL JURISDICTION.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
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			SILT FENCE EROSION BARRIER		DRAWING NO.	EC4
					SCALE	N.T.S.

SEDIMENT BASIN SHEET 1 OF 2



*EXCEPT WHERE THE HOLES EXCEED 1" DIAMETER, THEN UP TO TWO COLUMNS OF SAME SIZED HOLES MAY BE USED (ONE COL. PREFERRED)



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SEDIMENT BASIN				DRAWING NO.	EC5 - A	
				SCALE	N.T.S.	

SEDIMENT BASIN SHEET 2 OF 2



SIZING INFORMATION FOR STANDARD SEDIMENT BASIN			
UPSTREAM DRAINAGE AREA (ROUNDED TO NEAREST ACRE) (AC)	BASIN BOTTOM WIDTH (W) (FT)	SPILL CREST LENGTH (CL) (FT)	HOLE DIAMETER (HD) (IN)
1	12 1/2	2	9/32
2	21	3	13/16
3	28	5	1/2
4	33 1/2	6	9/16
5	38 1/2	8	21/32
6	43	9	21/32
7	47 1/4	11	25/32
8	51	12	27/32
9	55	13	7/8
10	58 1/4	15	15/16
11	61	16	31/32
12	64	18	1
13	67 1/2	19	1 1/16
14	70 1/2	21	1 1/8
15	73 1/4	22	1 3/16

MINIMUM BOTTOM WIDTH AND DIAMETER OF OUTLET PLATE HOLES BASED ON 2,700 CU. FT. / ACRE OF TRIBUTARY AREA AND 72 HOUR DRAIN TIME.

SEDIMENT BASIN INSTALLATION NOTES

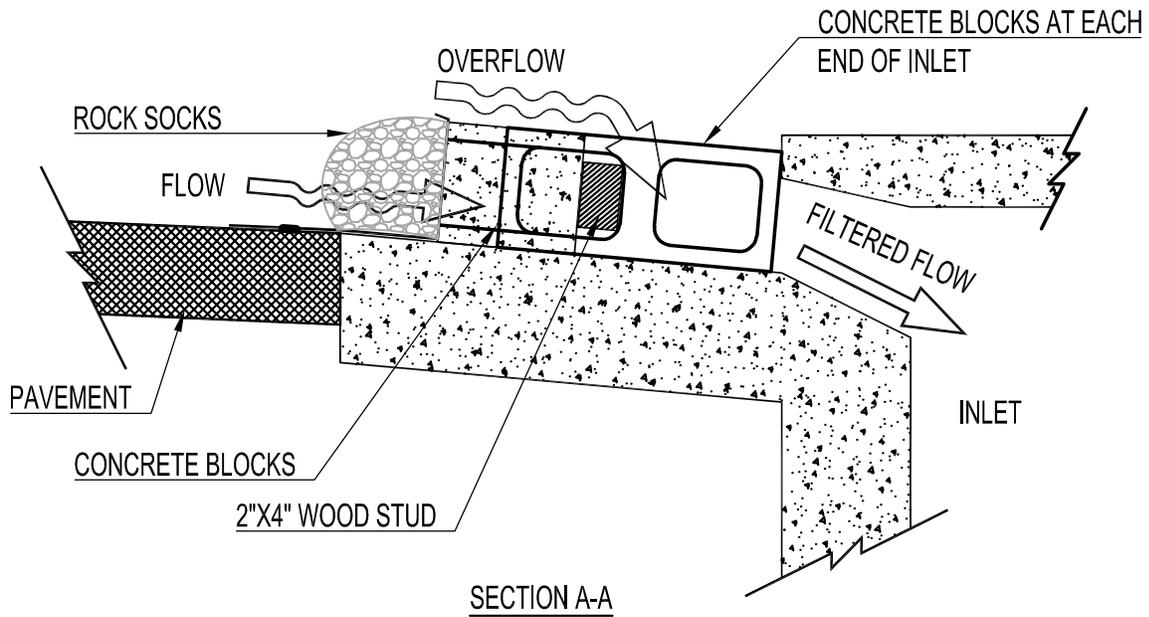
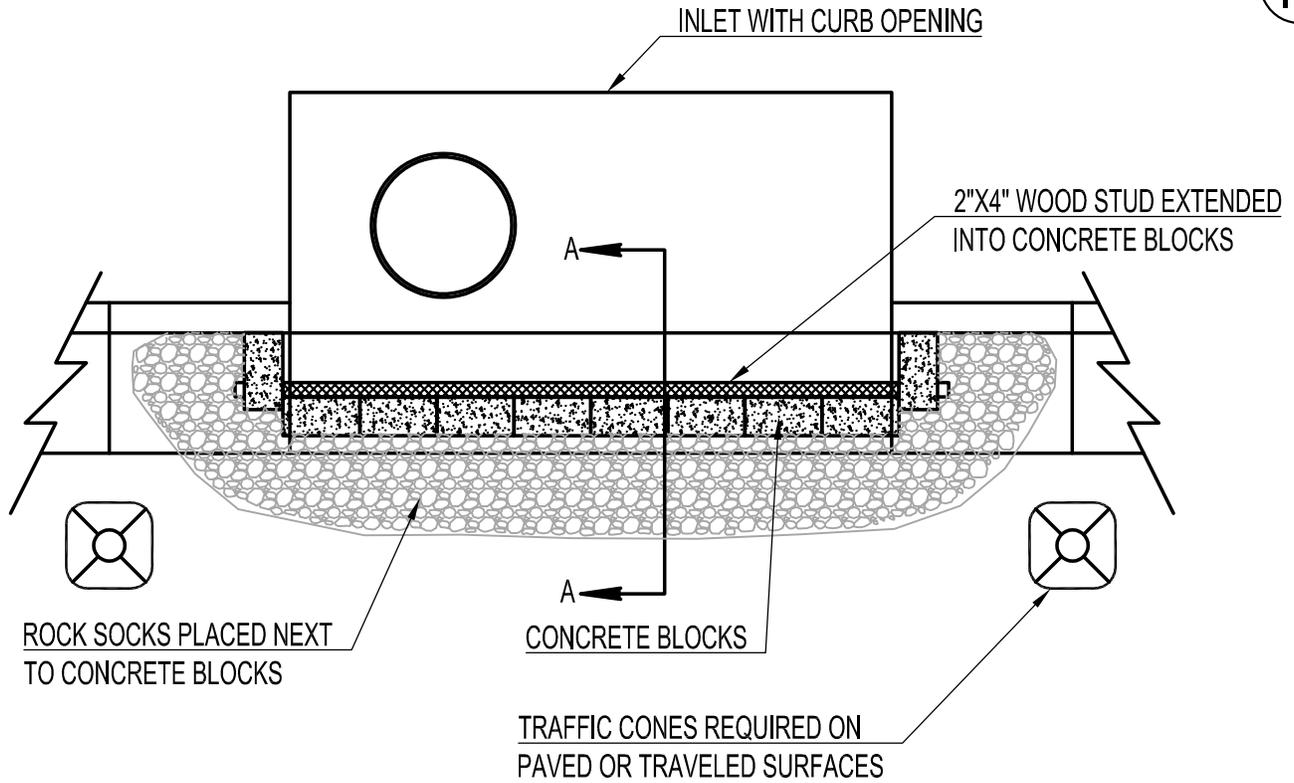
- SEE PLAN VIEW AND SECTIONS FOR
 - LOCATION OF SEDIMENT BASIN
 - TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN)
 - FOR STANDARD BASIN BOTTOM WIDTH "W", CREST LENGTH "CL", AND HOLE DIAMETER "HD"
 - FOR NONSTANDARD BASIN SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT "H", NUMBER OF COLUMNS "N", HOLE DIAMETER "HD", AND PIPE DIAMETER "D"
- FOR STANDARD BASIN, BOTTOM DIMENSIONS MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED
- SEDIMENT BASINS INDICATED ON INITIAL SWMP PLAN SHALL BE INSTALLED PRIOR TO ANY OTHER LAND DISTURBANCE ACTIVITY
- EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.
- EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D 698
- PIPE SCH. 40 OR GREATER SHALL BE USED
- THE DETAILS ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) IDENTIFIED ON THE SWMP PLAN VIEW DRAWINGS USED FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES

SEDIMENT BASIN MAINTENANCE NOTES

- THE SWMP MANAGER SHALL INSPECT SEDIMENT BASIN AS REQUIRED UNDER ANY PERMITS AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
- SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED WHEN SEDIMENT DEPTH IS ONE FOOT (I.E., 2- FEET BELOW THE SPILLWAY CREST).
- SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.
- WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

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					SCALE	N.T.S.

SEDIMENT BASIN

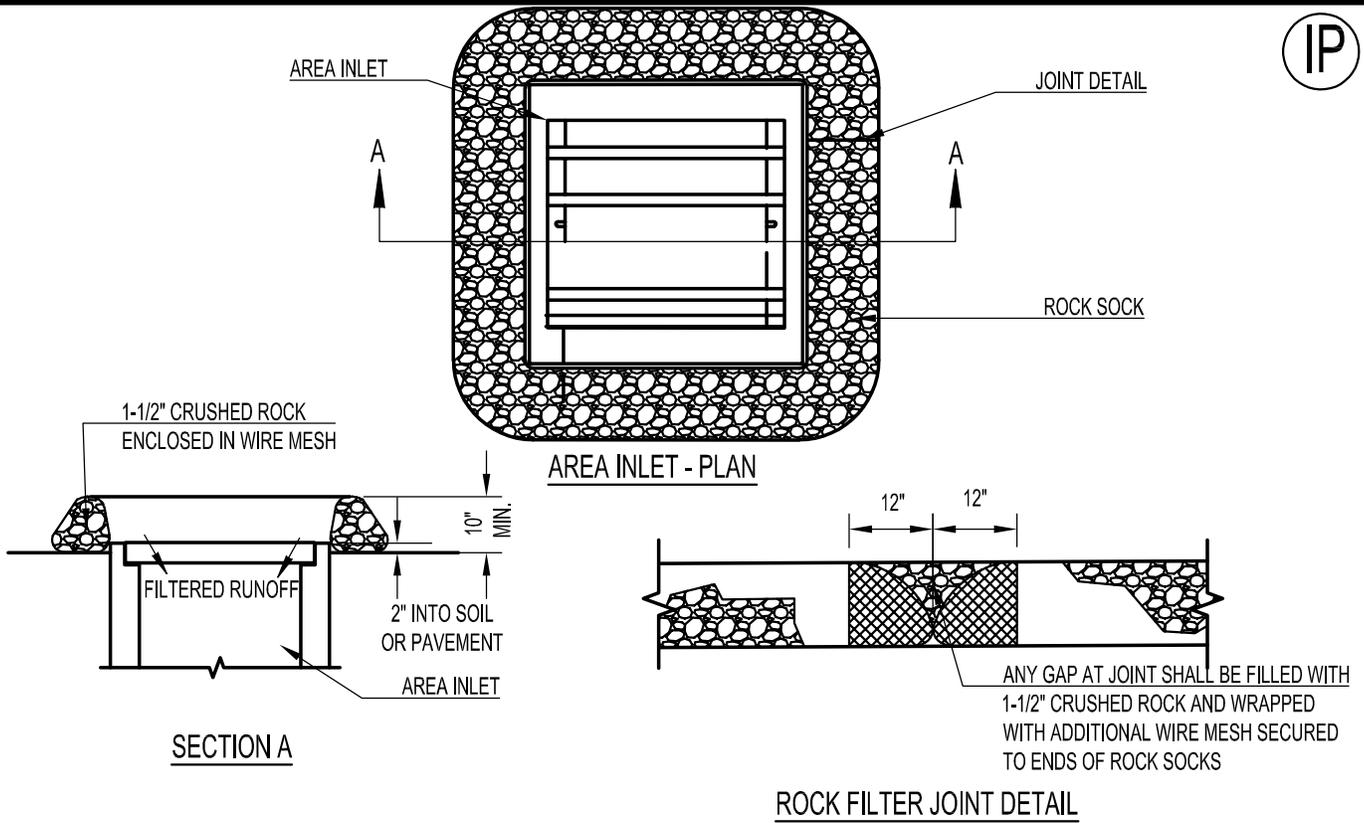


NOTE
EROSION CONTROL MEASURES SHALL BE MAINTAINED
AT ALL TIMES AS DIRECTED BY LOCAL JURISDICTION

DETAIL
CURB INLET GRAVEL FILTER

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
					DRAWING NO.	EC6 - A
					SCALE	N.T.S.

INLET PROTECTION



INLET PROTECTION INSTALLATION NOTES

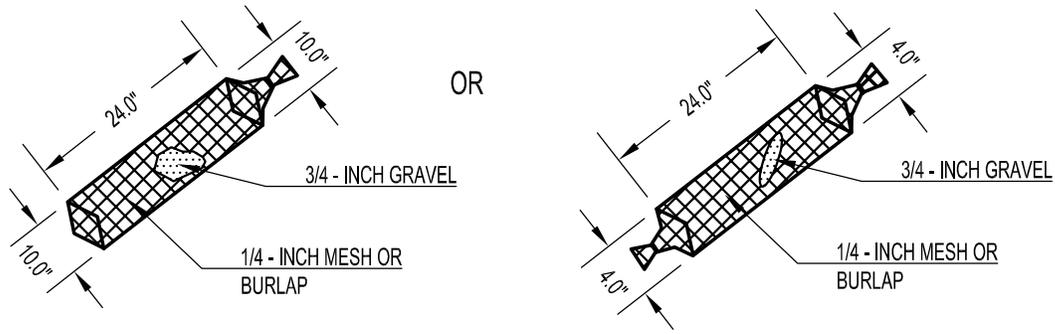
1. INLET PROTECTION AFTER INLET CONSTRUCTION OR AFTER PAVEMENT SHALL BE INSTALLED WITHIN 48 HOURS AFTER NLET CONSTRUCTION OR PAVING IS COMPLETED
2. CRUSHED ROCK BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN IN CDOT SECT. 703-2, #4 AGGREGATE (1-1/2" MINUS)
3. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1 INCH (COMPLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48 INCHES
4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6 INCH CENTERS ALONG ALL JOINTS AND 2 INCH CENTERS ON ENDS OF BERM
5. ROCK SOCKS SHALL BE CONSTRUCTED IN ONE PIECE OR SHALL BE CONSTRUCTED USING JOINT DETAIL

INLET PROTECTION MAINTENANCE NOTES

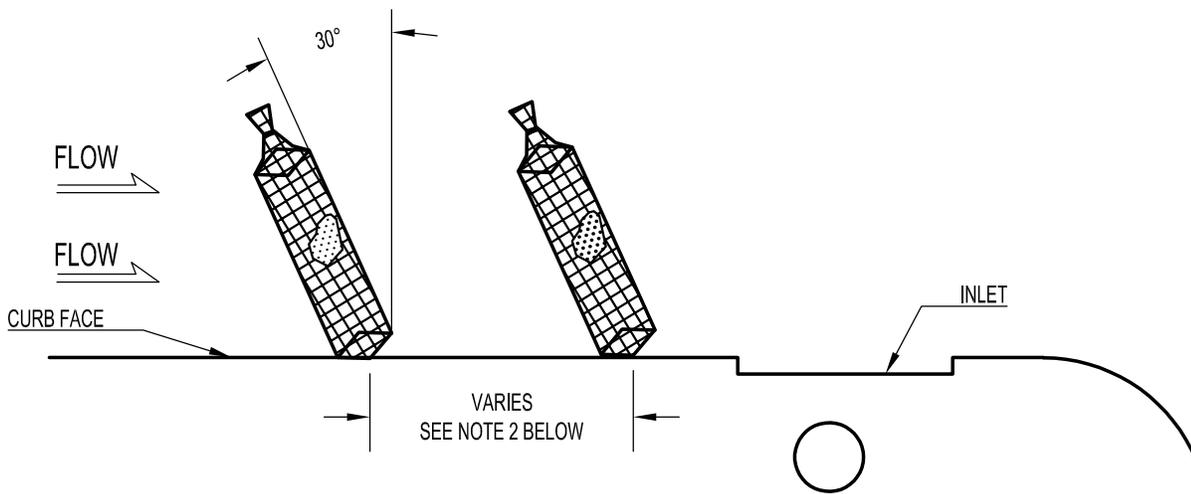
1. THE SWMP MANAGER SHALL INSPECT INLET PROTECTION AS REQUIRED UNDER ANY PERMITS AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY. INSPECT MORE FREQUENTLY DURING WINTER CONDITIONS DUE TO FREEZE THAW PROBLEMS AND REPAIR AS NEEDED.
2. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK SOCK IS WITHIN 2-1/2 INCHES OF CREST.
3. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS
4. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
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3/2020		UTLEIG			APPROVED BY:	
					DRAWING NO.	EC6 - B
					SCALE	N.T.S.

INLET PROTECTION



DETAIL 1



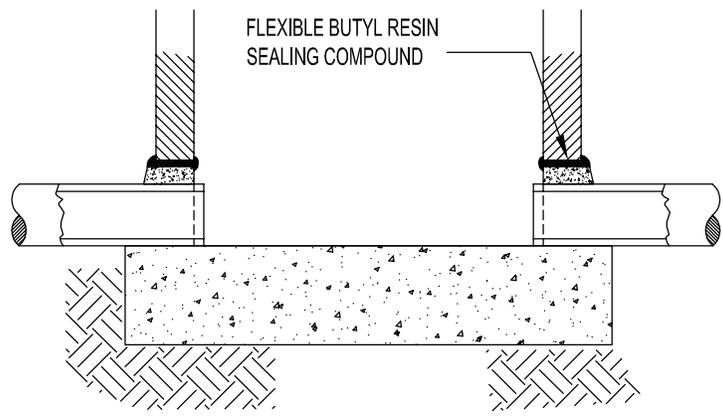
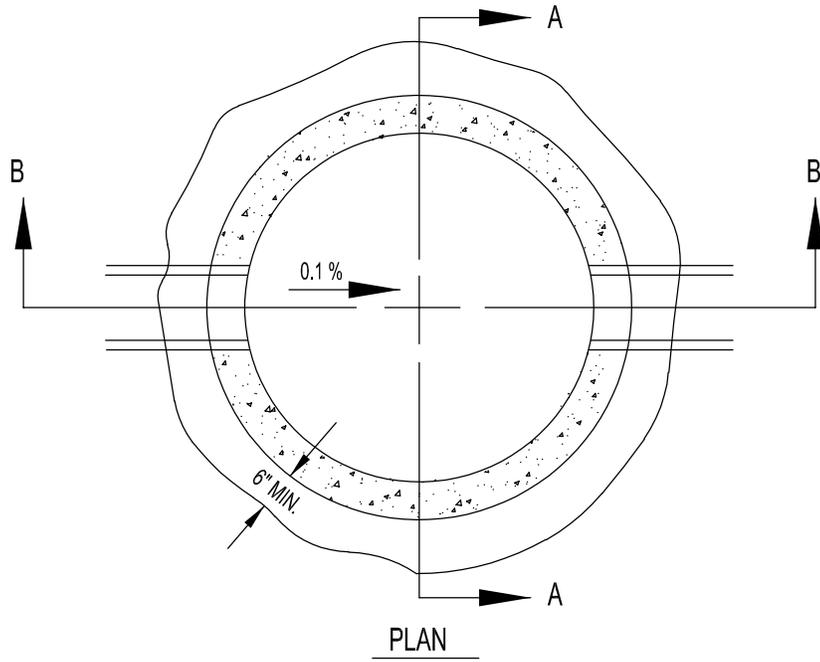
DETAIL 2

NOTES

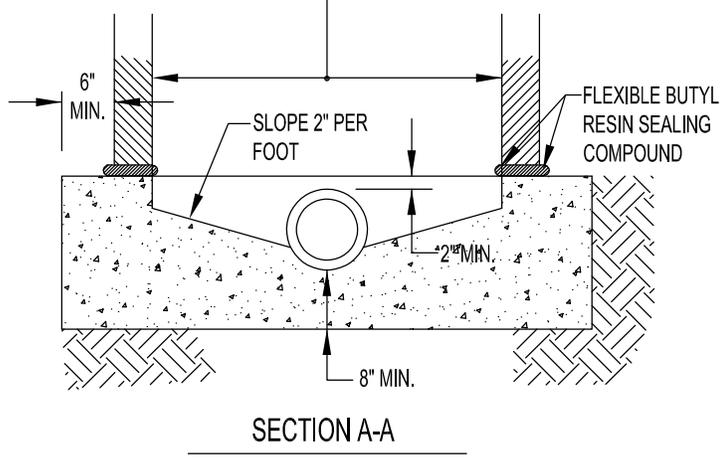
1. SOCKS WILL BE USED UPGRADIENT OF INLET
2. NO LESS THAN TWO 10 INCH DIAMETER SOCKS MUST BE USED IN SEQUENCE, SPACED NO MORE THAN FIVE FEET APART UPGRADIENT OF INLET. NO LESS THAN SIX SOCKS SHALL BE USED IF THE 4 INCH SOCK IS USED AND SPACED AT NO MORE THAN 5 FEET APART
3. INCLINE AT 30 DEGREES FROM PERPENDICULAR, OPPOSITE THE DIRECTION OF FLOW (SEE DETAIL 2)
4. EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES AS DIRECTED BY THE LOCAL JURISDICTION

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
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3/2020		UTLEIG			APPROVED BY:	
					DRAWING NO.	EC7
					SCALE	N.T.S.

CURB SOCK



4'-0" DIA. (PIPE 15" AND SMALLER)
 5'-0" DIA. (PIPE 18" THROUGH 27")
 6'-0" DIA. (PIPE 30" AND LARGER)



NOTES:

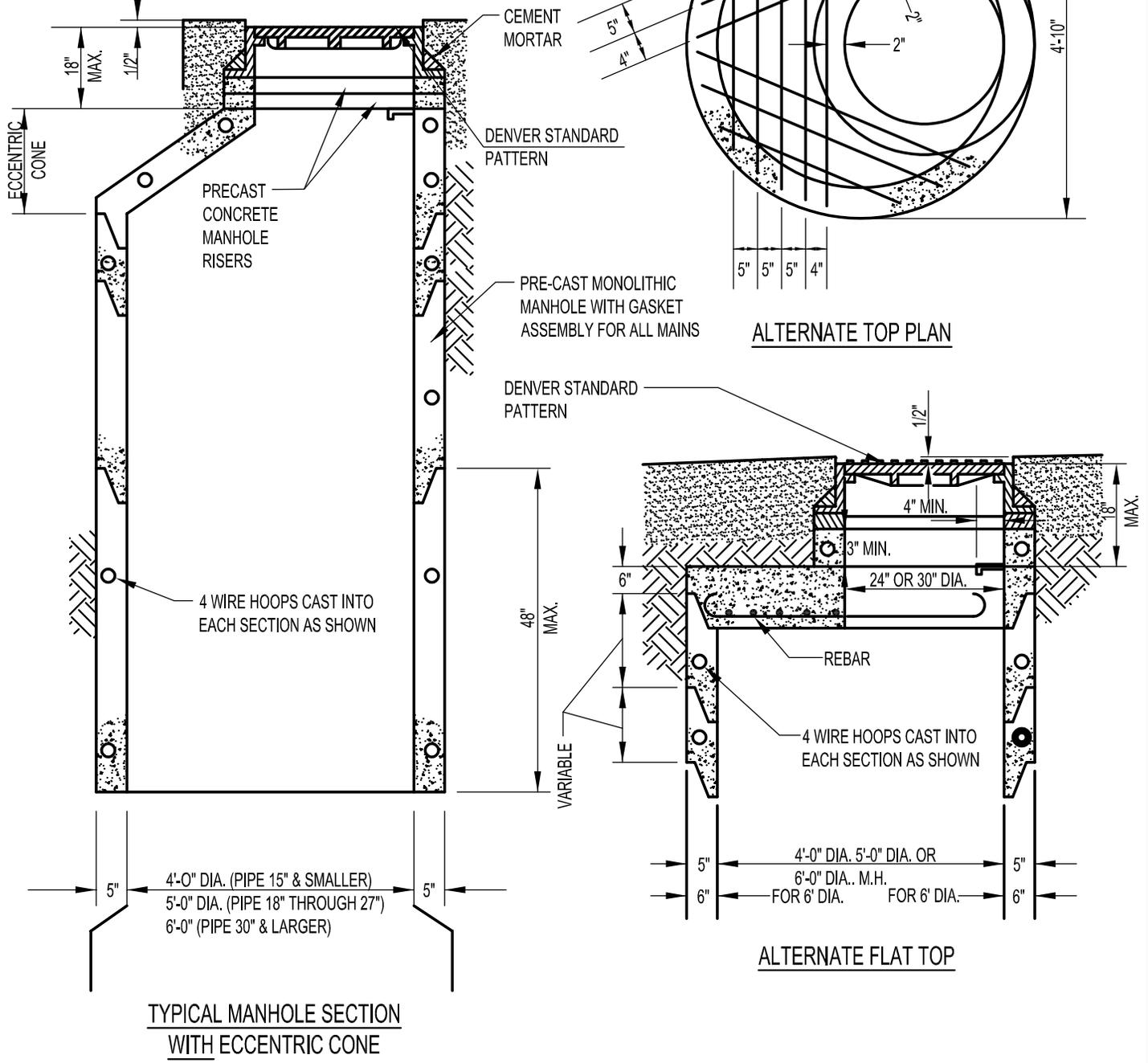
1. JOINTS TO BE SET IN FLEXIBLE COAL TAR OR EQUAL COMPOUND AND GROUTED WITH MORTAR INSIDE AND OUTSIDE.
2. ALL BASES SHALL BE REINFORCED AND TO BE APPROVED BY CITY ENGINEERING DIVISION.
3. ALL CONCRETE REINFORCEMENT TO BE PER CDOT STANDARD SPECIFICATIONS (LATEST REVISION).
4. MINIMUM 0.1% FALL THRU MH ON BASE.
5. THE CITY PREFERS PRE-CAST BASES.

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DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG			APPROVED BY:	
					DRAWING NO.	SS1
					SCALE	N.T.S.

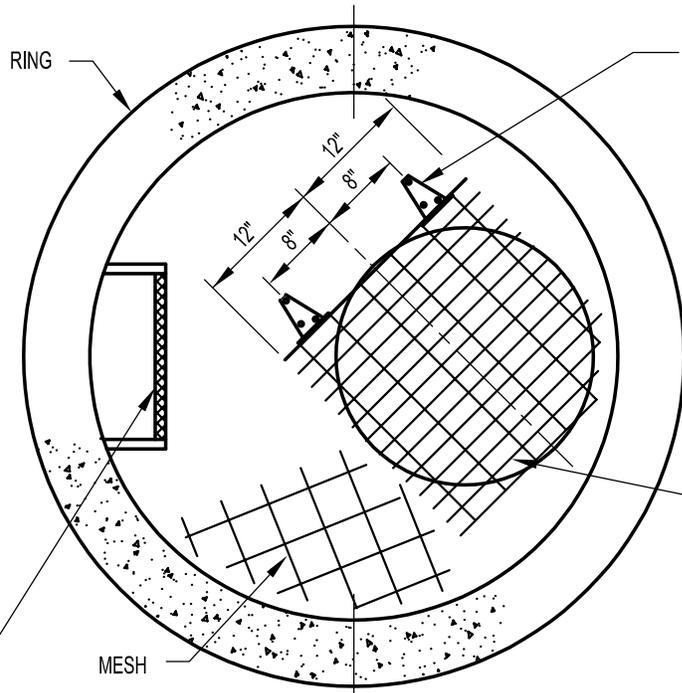
STANDARD MANHOLE BASE

NOTES:

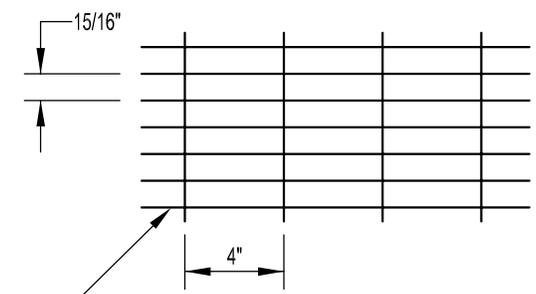
1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING OR EQUAL. SEALING COMPOUND AND PLASTERED WITH MORTAR $\frac{5}{8}$ " THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE, RUBBER GASKETS ON ALL JOINTS. JOINT TO MEET ALL ASTM 433 REQUIREMENTS.
2. MORTAR ON RISER RINGS IS ACCEPTABLE.
3. MANHOLES INSTALLED OUTSIDE OF STREET RIGHT-OF- WAY SHALL HAVE LOCKING COVERS.
4. "SEWER" TO BE IMPRINTED ON COVER.
5. CONCRETE REINFORCEMENT PER CDOT STANDARD SPECIFICATIONS (LATEST REVISION).
6. NO STEPS ARE PERMITTED IN SANITARY SEWER MANHOLES.
7. NO HOLES ARE TO BE CUT INTO MANHOLE ON SITE.
8. 14-20 MILS OF COAL TAR EPOXY OR EQUAL ON ALL EXTERNAL SURFACES OF MANHOLE.



REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG	MANHOLE BARRELS AND ALTERNATE TOPS	APPROVED BY:		
				DRAWING NO.	SS2	
				SCALE	N.T.S.	



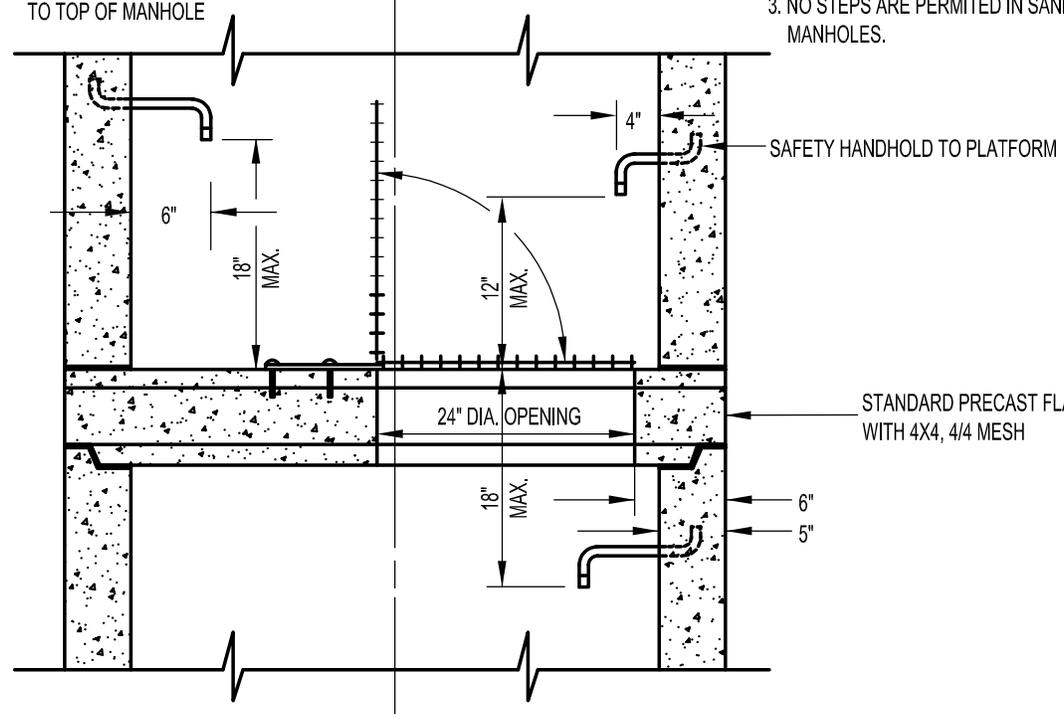
ATTACH HINGE TO GRATING WITH (2) 3/8" DIA. BOLTS x 1" O.C. WITH HEX NUTS. ATTACH HINGE TO PLATFORM WITH (2) 3/8 DIA. x 3" LG. RED HEADS OR EQUAL.



ALUMINUM GRATING, 3/16" x 1 1/4" BEARING BARS.

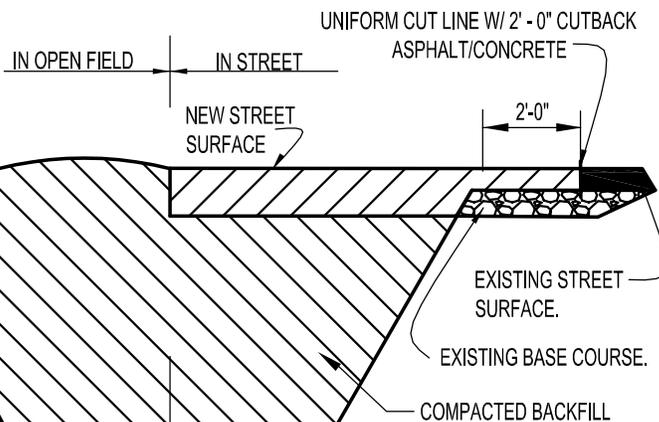
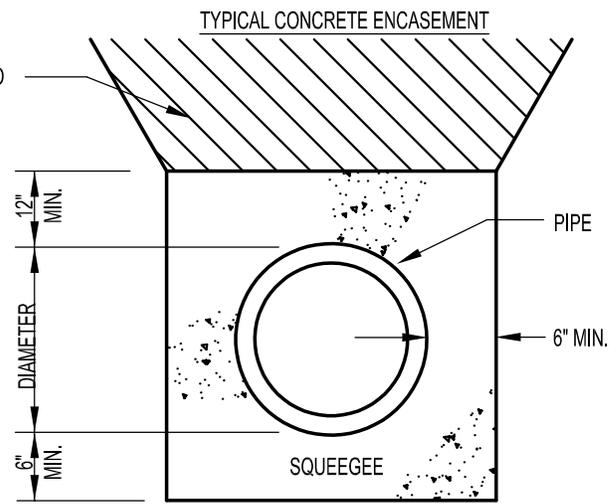
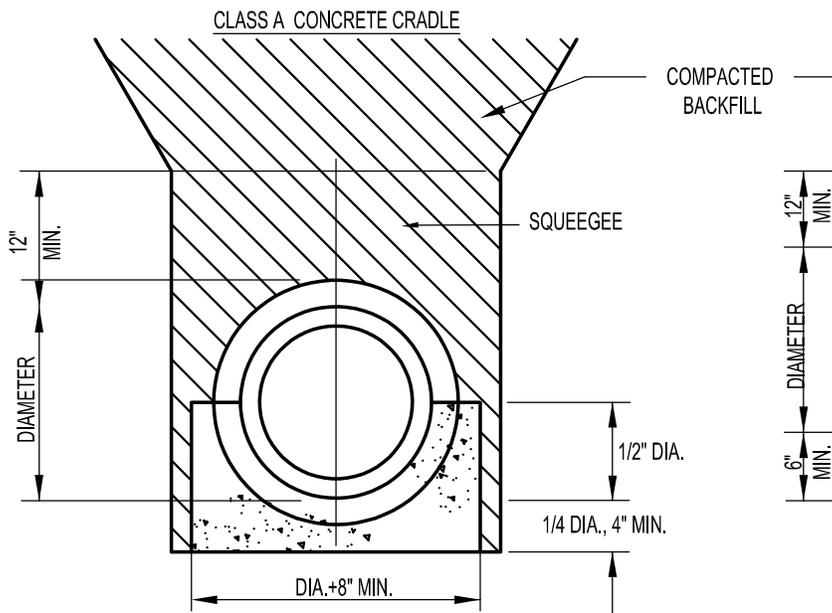
- NOTE:**
1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND PLASTERED WITH MORTAR 5/8" THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE.
 2. CONCRETE REINFORCEMENT PER CDOT STANDARD SPECIFICATIONS (LATEST REVISION).
 3. NO STEPS ARE PERMITTED IN SANITARY SEWER MANHOLES.

ALIGN STEPS ABOVE & OPPOSITE PLATFORM OPENING AS SHOWN TO TOP OF MANHOLE



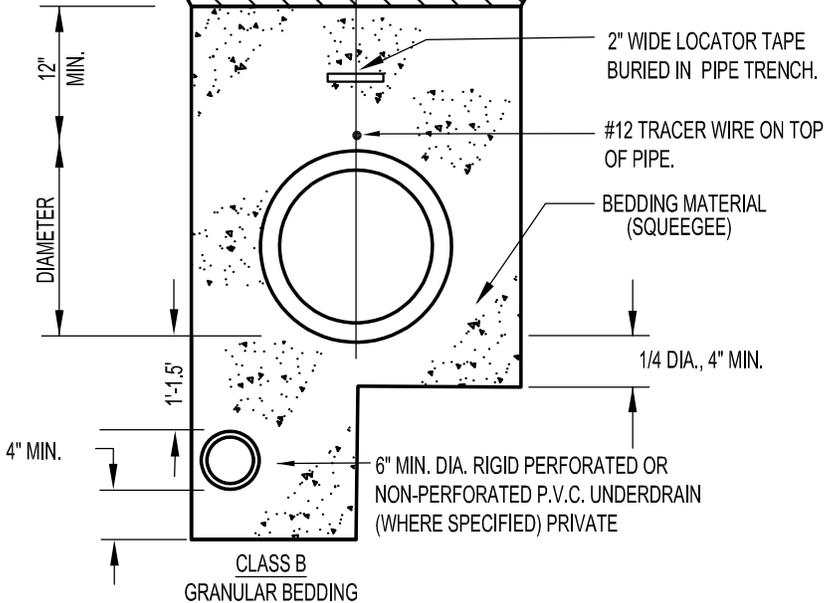
TO BE USED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER EXCEEDS 17 FT.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
INTERMEDIATE PLATFORM FOR MANHOLES OVER 17' IN DEPTH				DRAWING NO.	SS3	
				SCALE	N.T.S.	



NOTES:

1. THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS. WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.
2. GRANULAR BEDDING IS ALLOWED ONLY FOR LARGE PROJECTS. THE PROJECT DESIGNATED AS LARGE INCLUDES PROJECTS OVER 200' LENGTH ONLY.
3. ALL SMALL PROJECTS SHALL BE BACKFILLED WITH FLOWABLE FILL AS DESIGNATED IN CHAPTER 14.
4. CLASS VI BACKFILL FROM 1' ABOVE PIPE FOR LARGER PROJECTS. THE CITY WILL REQUIRE CONTRACTORS TO USE FLOW-FILL (SEE RIGHT OF WAY PERMIT).



FOR PATCHING IN STREET SURFACE USE FULL DEPTH ASPHALT AS NOTED BELOW OR MATCH EXISTING PLUS ONE (1) INCH, WHICH EVER IS GREATER

STREET CLASSIFICATION	DEPTH ASPHALT
ARTERIAL	10"
COLLECTOR	8"
LOCAL	6"

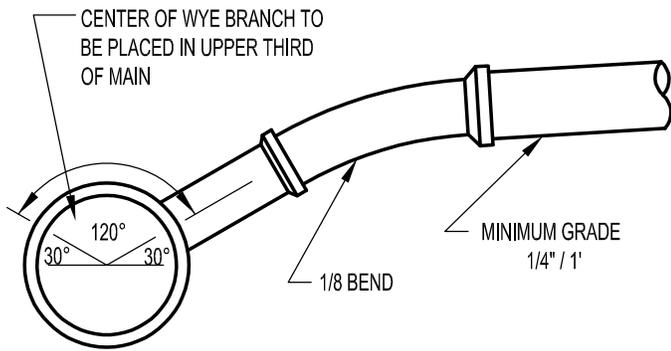
PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-8"	2'-4"
6"	1'-10"	2'-6"
8"	2'-0"	2'-8"
12"	2'-4"	3'-0"

REVISIONS		
DATE	ITEM	BY
3/2020		UTLEIG

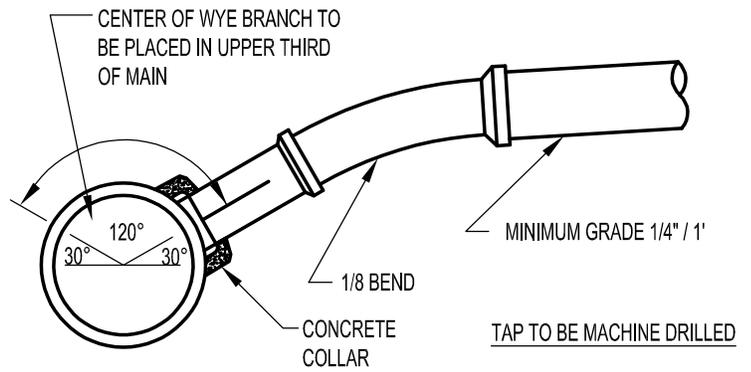
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

TYPICAL TRENCH SECTION
PIPE PROTECTION

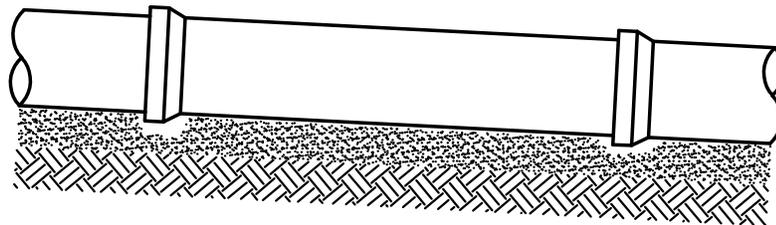
ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	SS4
SCALE	N.T.S.



1/8 BEND CONNECTION TO TEE



1/8 BEND & SADDLE CONNECTION

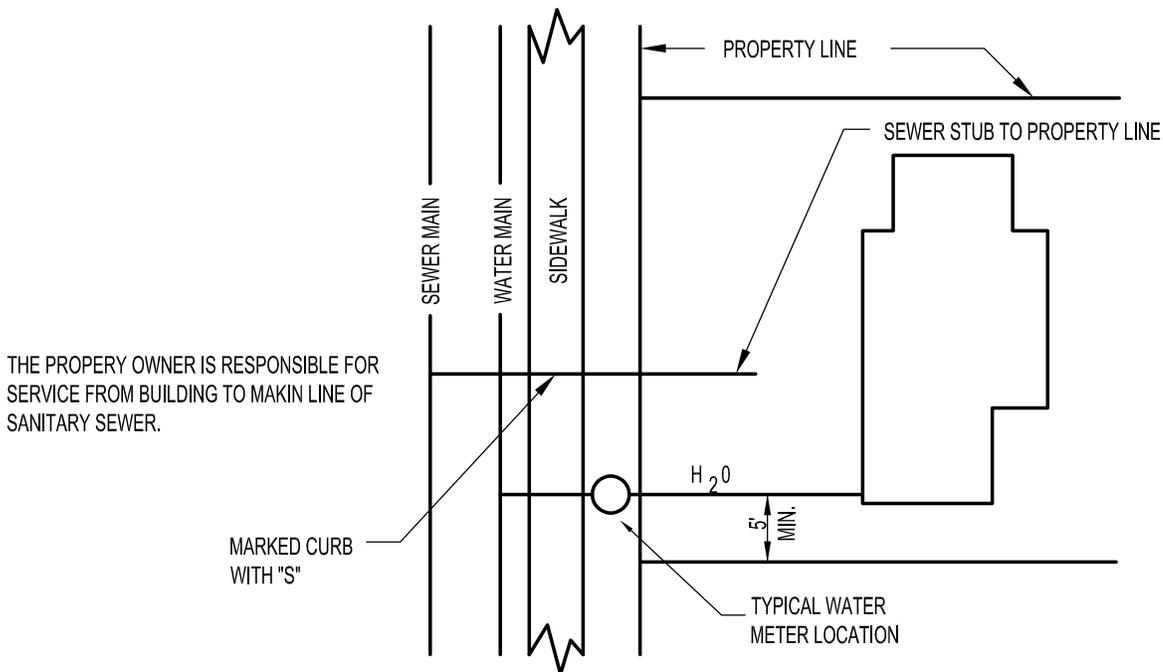


FACTORY PREPARED A.S.T.M. C-425
COMPRESSION TYPE JOINTS ONLY OR
APPROVED EQUIVALENT.

BELL SHOULD NOT TOUCH SIDES
OR BOTTOM OF BELL HOLE.

4" MINIMUM BEDDING
ABOVE AND BELOW PIPE.

ACCEPTABLE BEDDING



THE PROPERTY OWNER IS RESPONSIBLE FOR
SERVICE FROM BUILDING TO MAKIN LINE OF
SANITARY SEWER.

MARKED CURB
WITH "S"

PROPERTY LINE

SEWER STUB TO PROPERTY LINE

H₂O

5'
MIN.

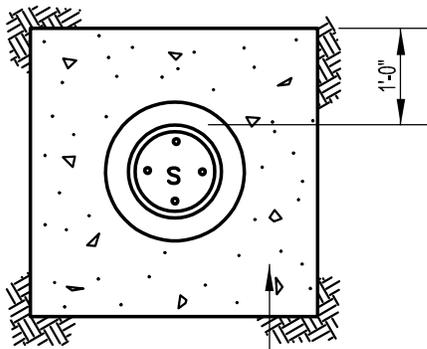
TYPICAL WATER
METER LOCATION

REVISIONS		
DATE	ITEM	BY
3/2020		UTLEIG

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

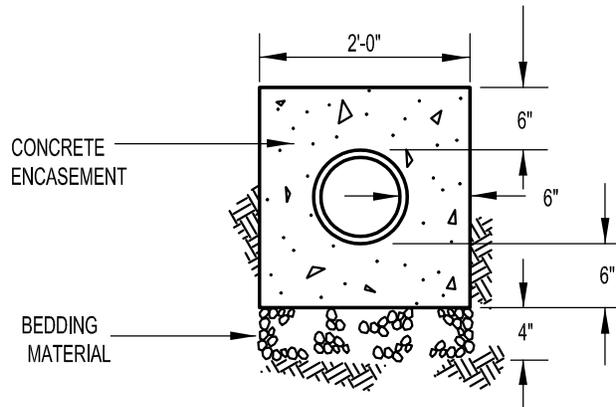
TYPICAL HOUSE SERVICE LOCATION

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	SS5
SCALE	N.T.S.



CONCRETE COLLAR TO BE USED IN UNPAVED AREAS ONLY

PLAN VIEW

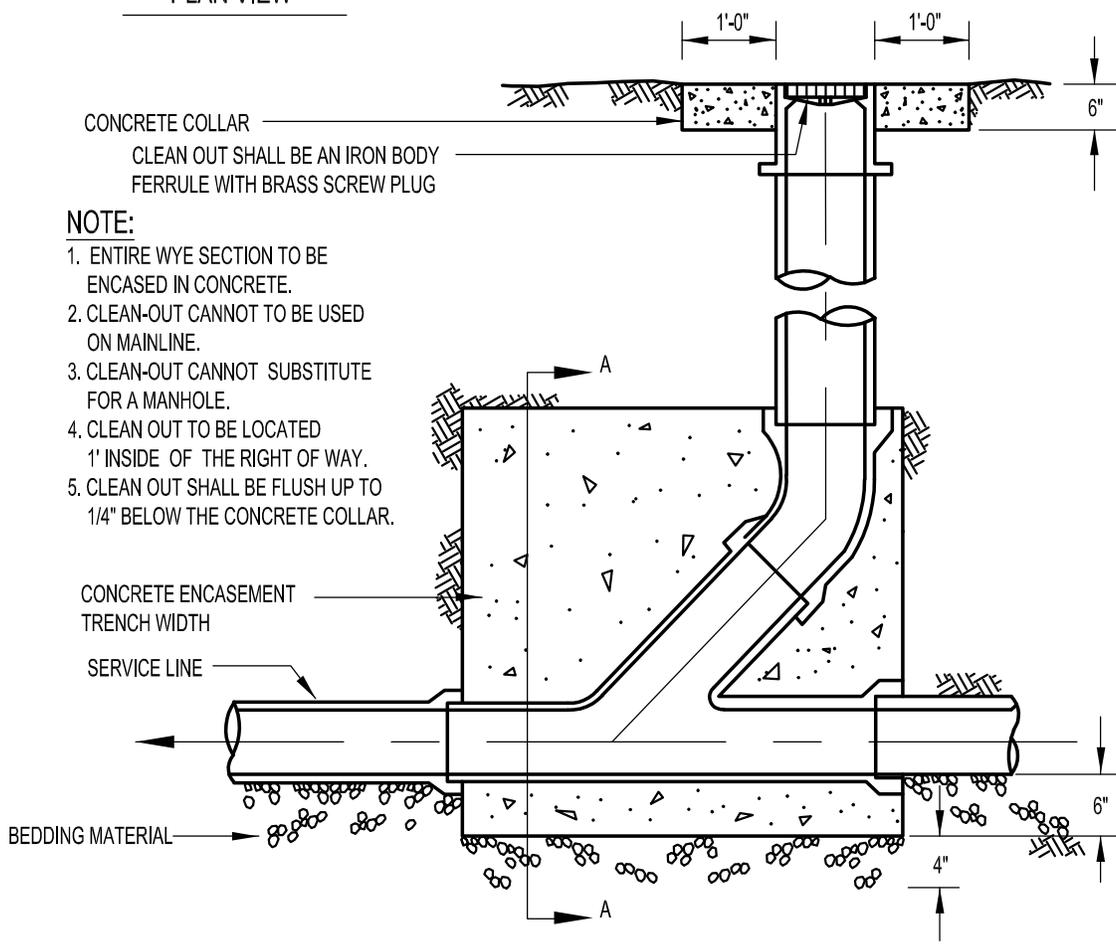


SECTION A-A

CONCRETE COLLAR
 CLEAN OUT SHALL BE AN IRON BODY FERRULE WITH BRASS SCREW PLUG

NOTE:

1. ENTIRE WYE SECTION TO BE ENCASED IN CONCRETE.
2. CLEAN-OUT CANNOT TO BE USED ON MAINLINE.
3. CLEAN-OUT CANNOT SUBSTITUTE FOR A MANHOLE.
4. CLEAN OUT TO BE LOCATED 1' INSIDE OF THE RIGHT OF WAY.
5. CLEAN OUT SHALL BE FLUSH UP TO 1/4" BELOW THE CONCRETE COLLAR.



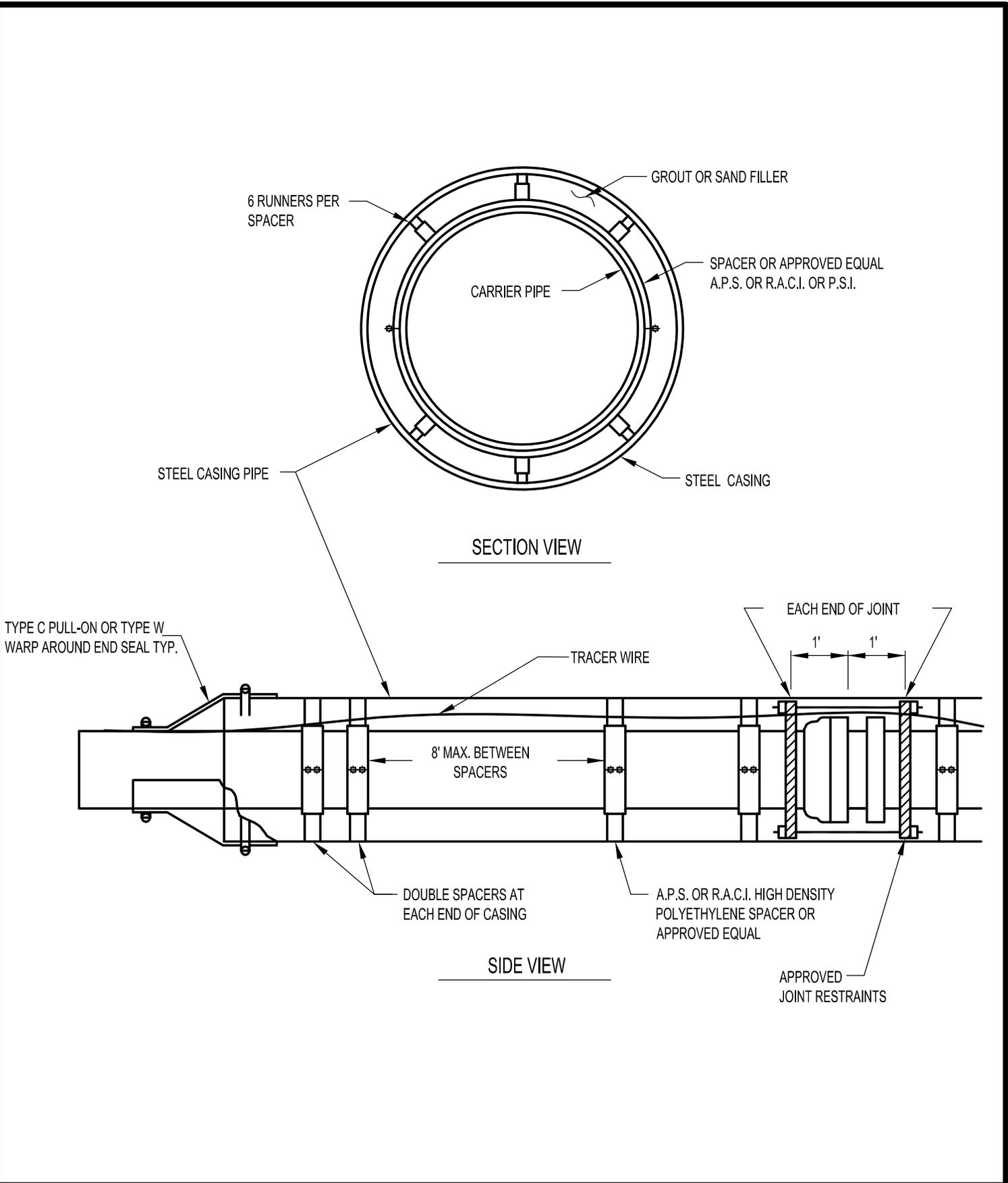
ELEVATION

REVISIONS		
DATE	ITEM	BY
3/2020		UTLEIG

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

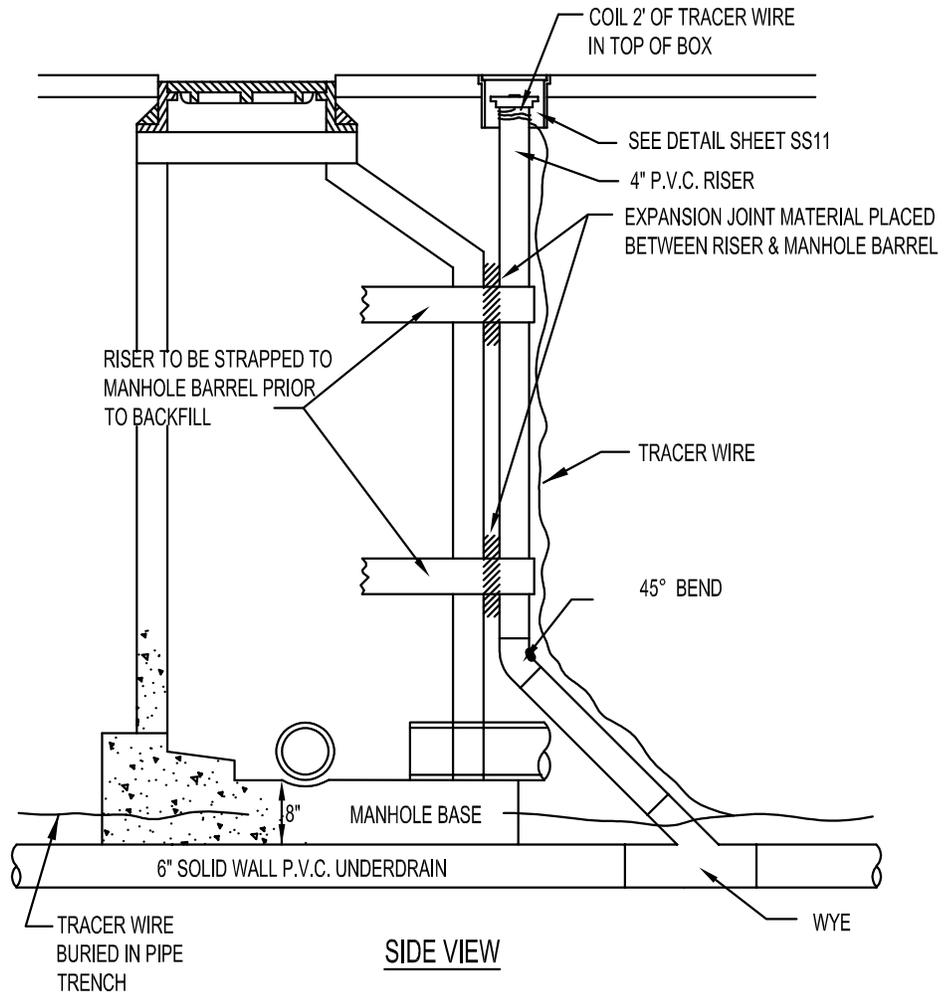
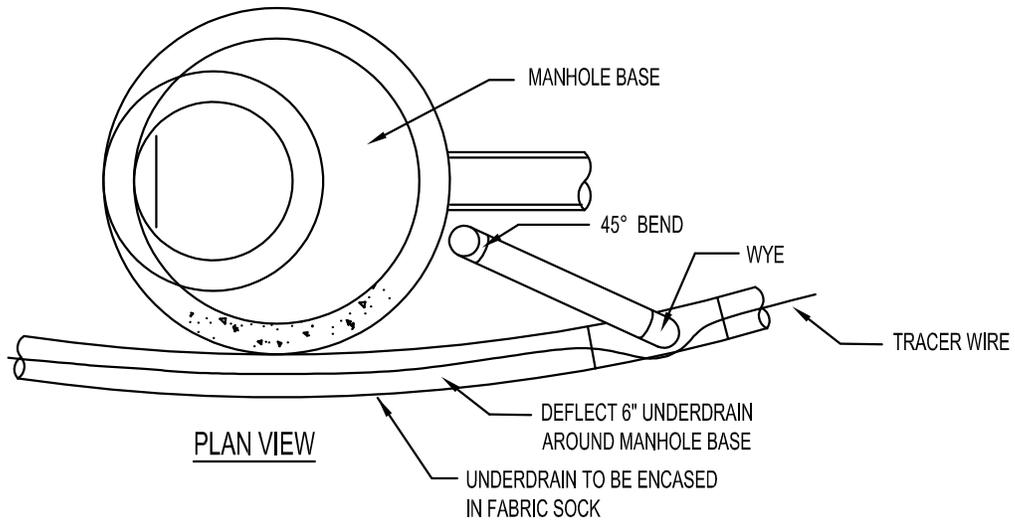
STANDARD CLEAN-OUT

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	SS6
SCALE	N.T.S.

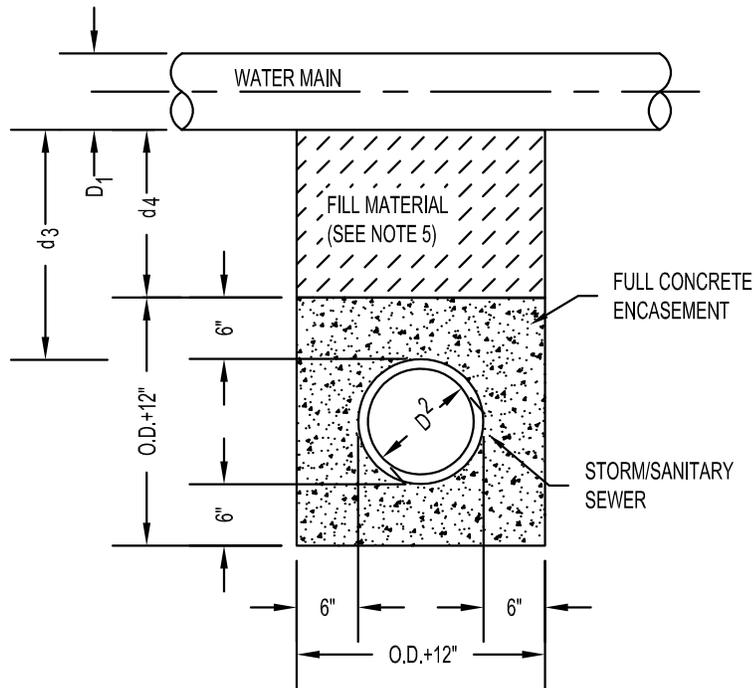


REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG			APPROVED BY:	
					DRAWING NO.	SS7
					SCALE	N.T.S.

JACKING DETAIL

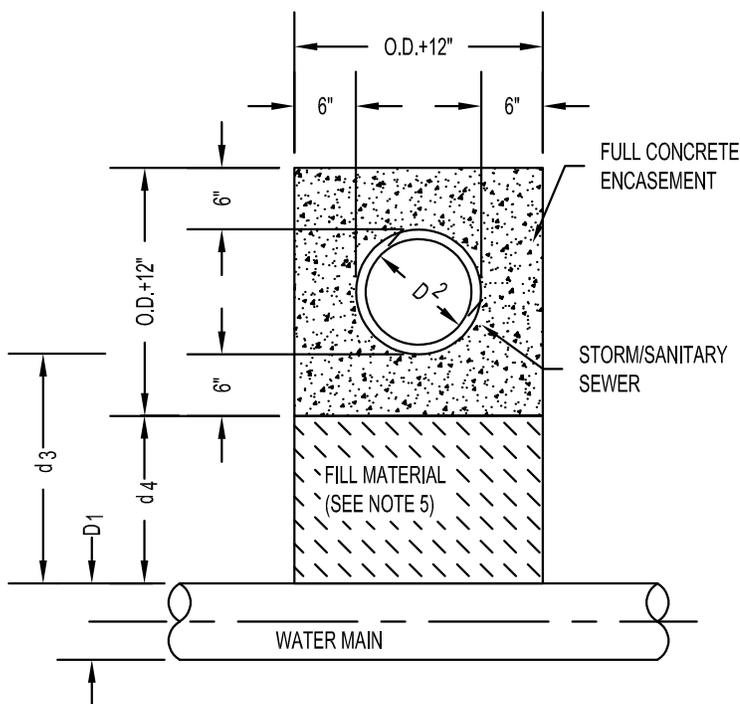


REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG	CITY OF Northglenn	APPROVED BY:		
				DRAWING NO.	SS8	
				SCALE	N.T.S.	
TYPICAL UNDERDRAIN CLEANOUT						



STORM OR SANITARY SEWER CROSSING UNDER WATER MAIN

IF $d_3 > 24"$, ENCASEMENT NOT REQUIRED



STORM OR SANITARY SEWER CROSSING OVER TOP OF WATER MAIN ENCASEMENT

REQUIRED REGARDLESS OF DIMENSION d_3
(SEE NOTE 1 FOR SPECIAL CASES)

NOTES:

1. CONCRETE COLLAR AROUND STORM SEWER JOINTS MAY BE ACCEPTED WITH WRITTEN APPROVAL BY THE CITY ENGINEERING DIVISION AND ONLY FOR PIPE 30" OR LARGER.
2. CONCRETE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING.
3. LENGTH OF ENCASEMENT SHALL EXTEND AT LEAST 10- FEET EACH SIDE OF WATER MAIN.
4. UNLESS OTHERWISE NOTED ON PLAN/PROFILE DRAWINGS, ENCASEMENTS NEED NOT BE REINFORCED.
5. FILLER MATERIAL BETWEEN CONDUITS TO BE:
 - a. APPROVED COMPRESSIBLE MATERIAL SUCH AS STYROFOAM, ETC. IF $d_i < 6"$.
 - b. COMPACTED BACKFILL, IF $d_i > 6"$.
6. SHORING OR SHEETING, IF USED, TO BE CUT OFF AT TOP OF ENCASEMENT

REVISIONS

DATE	ITEM	BY
3/2020		UTLEIG

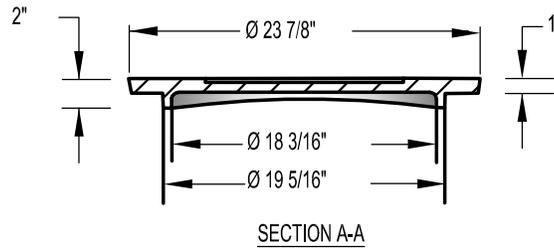
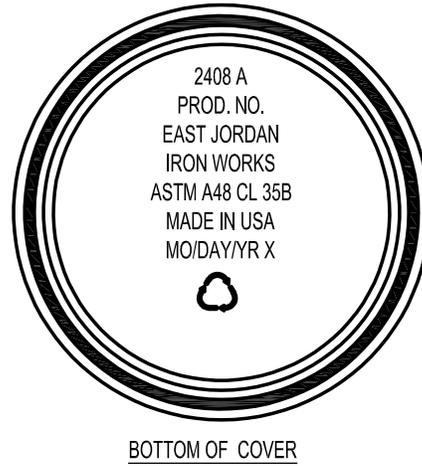
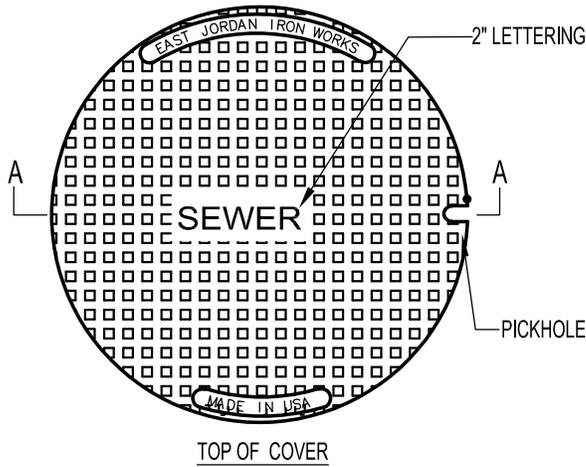


PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ENCASEMENT FOR CONDUIT CROSSINGS

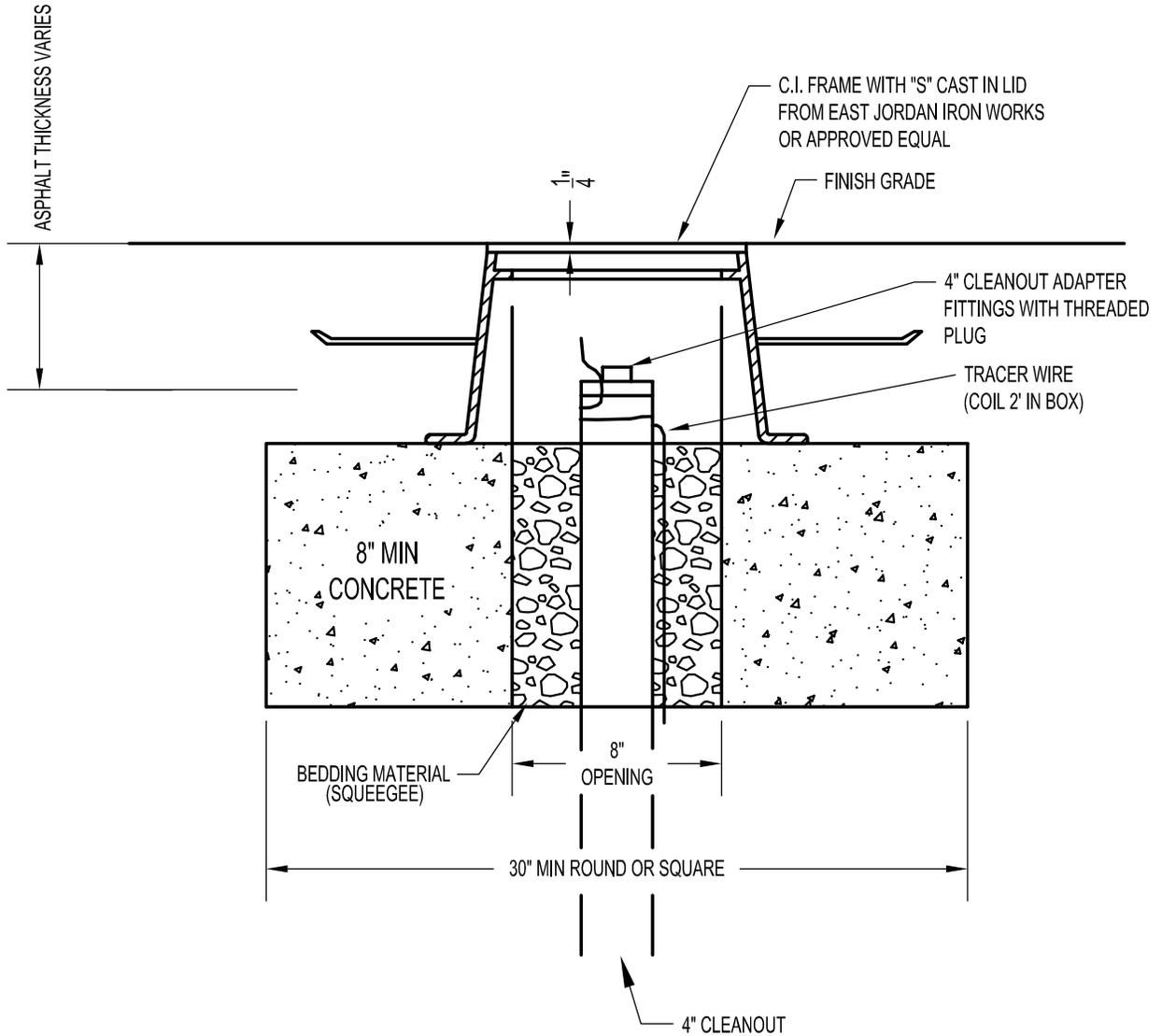
ISSUED

DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	SS9
SCALE	N.T.S.

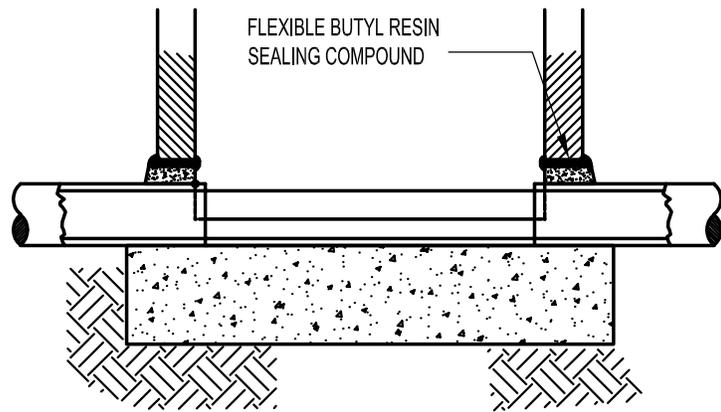
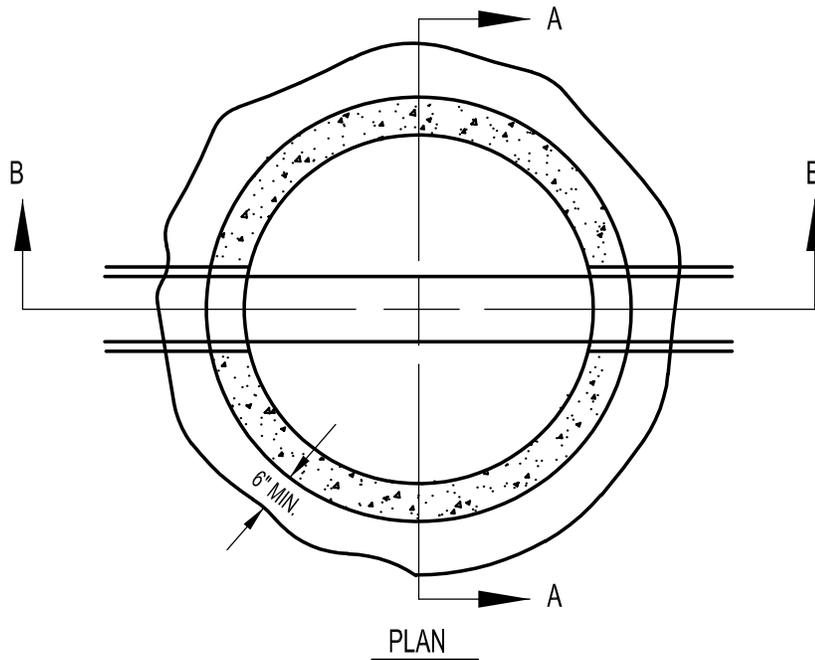


COVER: GRAY IRON ASTM A 48 CL35 B
 LOAD RATING: HEAVY DUTY
 WEIGHT: 135LBS. (61kg)
 MACHINED SURFACE
 EAST JORDAN IRON WORKS PRODUCT OR APPROVED
 EQUAL

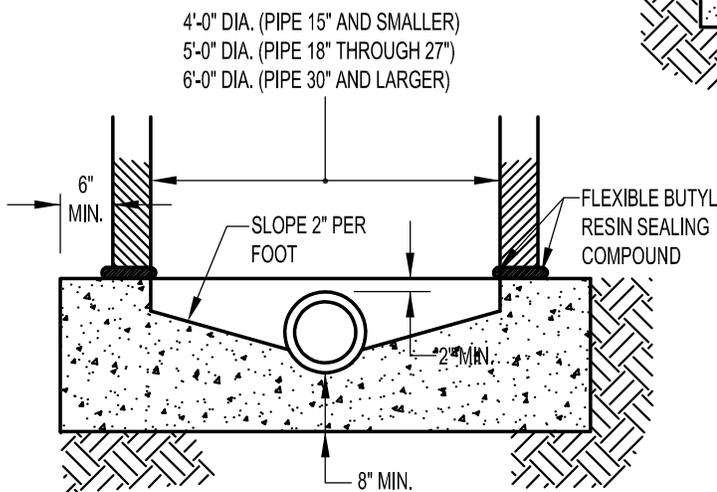
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
			SANITARY SEWER MANHOLE COVER		DRAWING NO.	SS10
					SCALE	N.T.S.



REVISIONS			 CITY OF Northglenn	PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
			STANDARD SANITARY SEWER UNDERDRAIN CLEAN-OUT		DRAWING NO.	SS11
					SCALE	N.T.S.



SECTION B-B



SECTION A-A

NOTES:

1. JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND GROUTED WITH MORTAR INSIDE AND OUTSIDE.
2. ALL BASES SHALL BE REINFORCED AND TO BE APPROVED BY CITY ENGINEER.
3. SQUARE BASES ARE ACCEPTABLE.
4. ALL CONCRETE REINFORCEMENT TO BE PER CDOT STANDARD SPECIFICATIONS (LATEST REVISION).
5. FOR PIPES 36" AND LARGER OR WHERE CONDITIONS SUCH AS MULTIPLE PIPES WARRANT A CONCRETE BOX BASE WILL BE REQUIRED (SEE CDOT STANDARD DRAWINGS)

REVISIONS

DATE	ITEM	BY
3/2020		ULTEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

STANDARD MANHOLE BASE

ISSUED

DRAWN BY: JLT

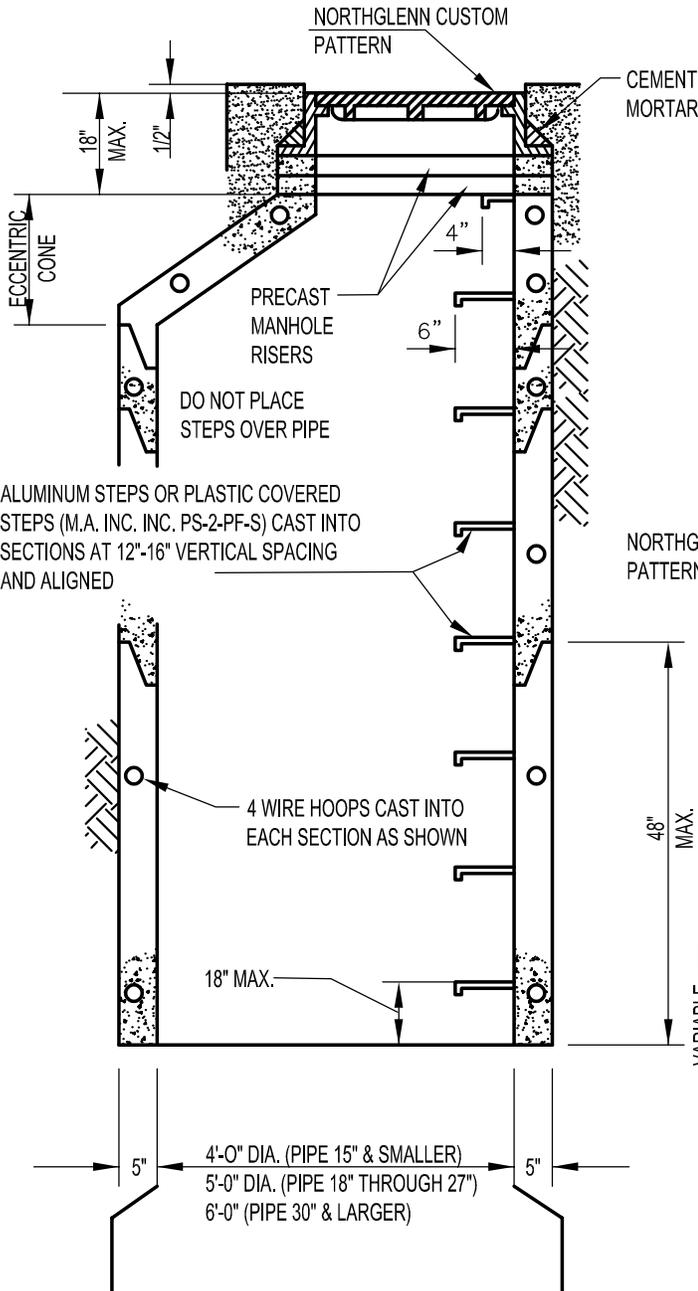
APPROVED BY:

DRAWING NO. ST1

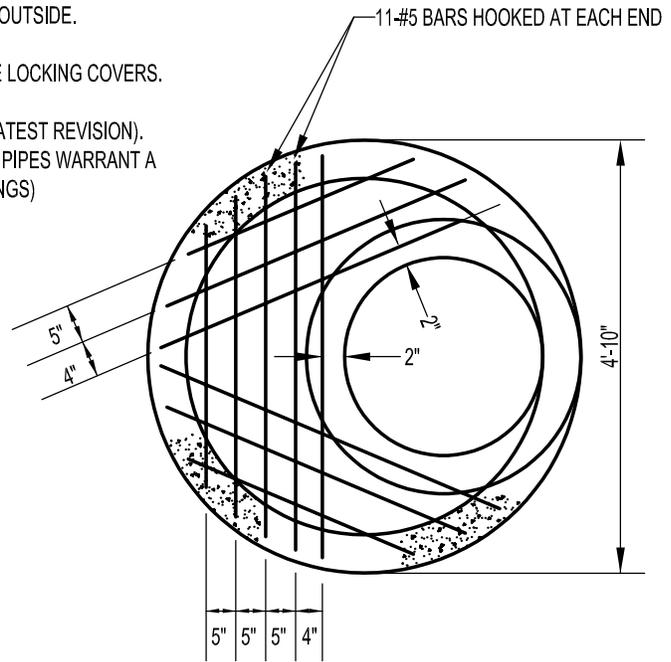
SCALE N.T.S.

NOTES:

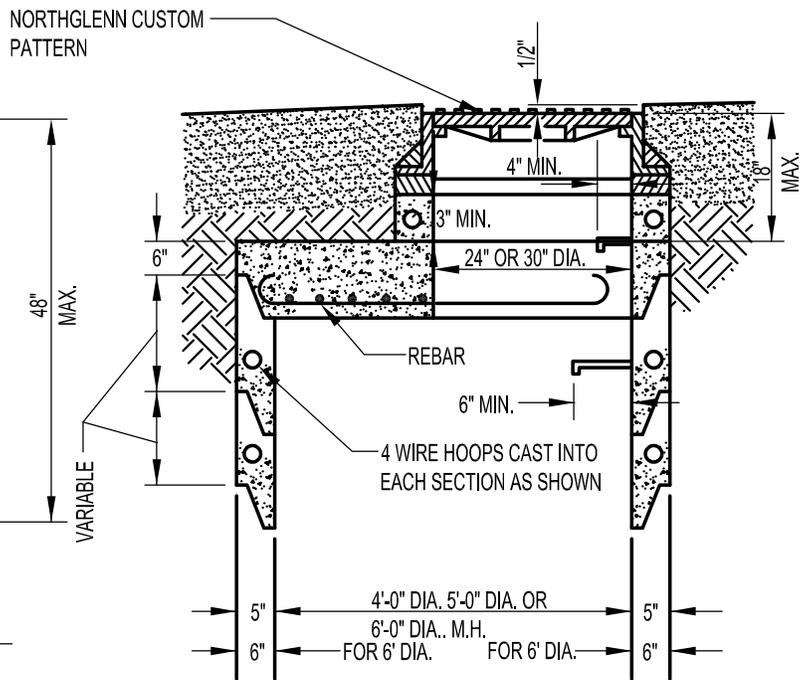
1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND PLASTERED WITH MORTAR 5/8" THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE.
2. MORTAR ON RISER RINGS IS ACCEPTABLE.
3. MANHOLES INSTALLED OUTSIDE OF STREET RIGHT-OF-WAY SHALL HAVE LOCKING COVERS.
4. "STORM SEWER" TO BE IMPRINTED ON COVER.
5. CONCRETE REINFORCEMENT PER CDOT STANDARD SPECIFICATIONS (LATEST REVISION).
6. FOR PIPES 36" AND LARGER OR WHERE CONDITIONS SUCH AS MULTIPLE PIPES WARRANT A CONCRETE BOX BASE WILL BE REQUIRED (SEE CDOT STANDARD DRAWINGS)



TYPICAL MANHOLE SECTION WITH ECCENTRIC CONE



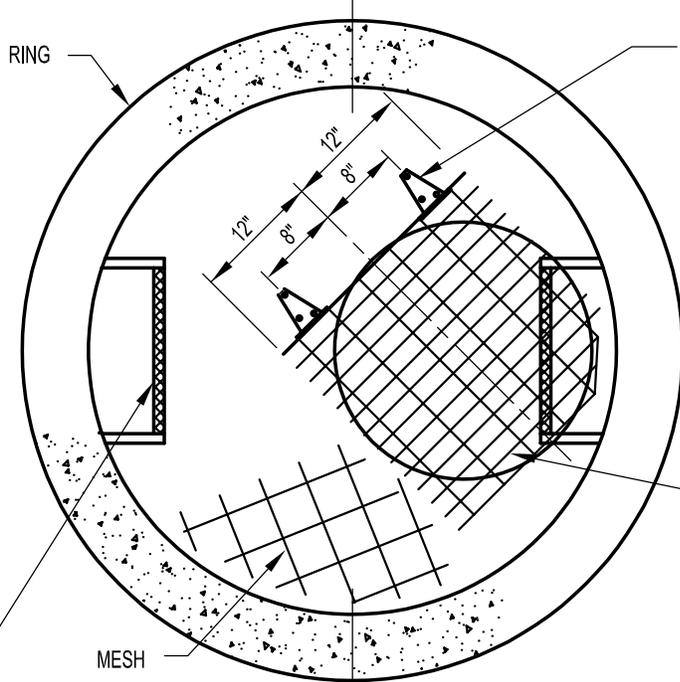
ALTERNATE TOP PLAN



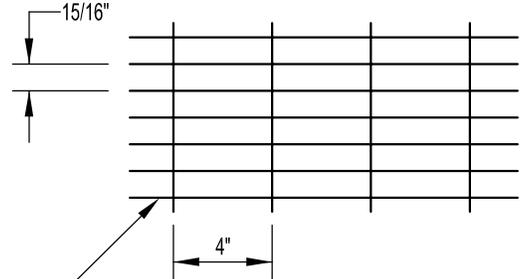
ALTERNATE FLAT TOP

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG			APPROVED BY:	
					DRAWING NO.	ST2
					SCALE	N.T.S.

MANHOLE BARRELS AND ALTERNATIVE TOPS



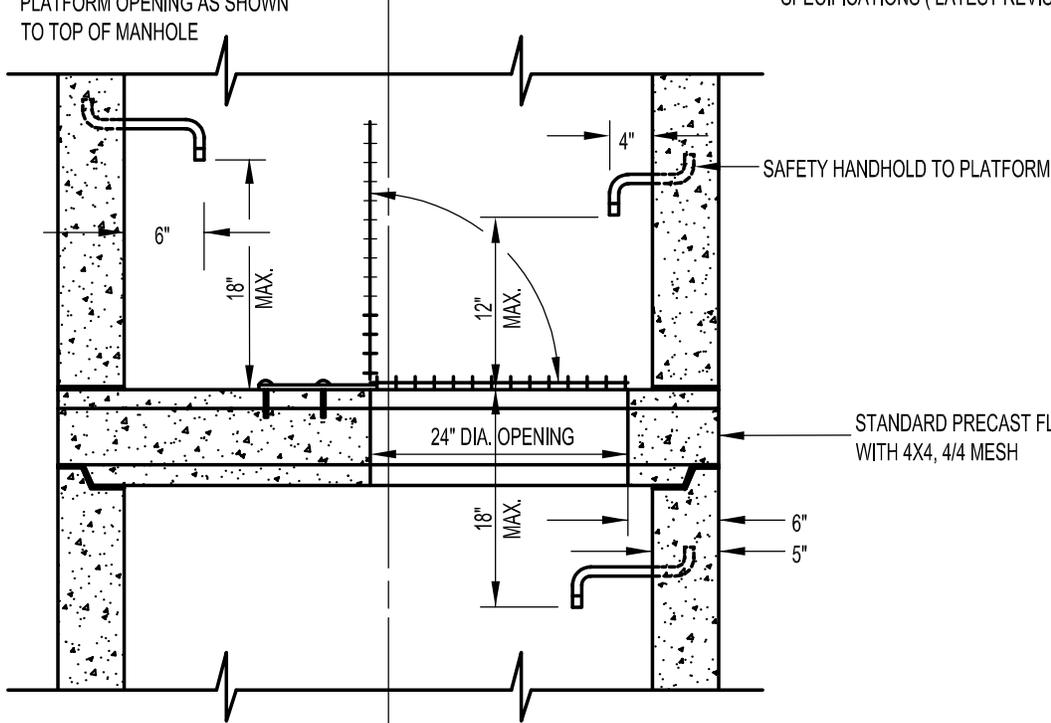
ATTACH HINGE TO GRATING WITH (2) 3/8" DIA. BOLTS x 1" O.C. WITH HEX NUTS. ATTACH HINGE TO PLATFORM WITH (2) 3/8 DIA. x 3" LG. RED HEADS OR EQUAL.



ALUMINUM GRATING, 3/16" x 1 1/4" BEARING BARS.

- NOTE:**
1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND PLASTERED WITH MORTAR 5/8" THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE.
 2. CONCRETE REINFORCEMENT PER CDOT STANDARD SPECIFICATIONS (LATEST REVISION).

ALIGN STEPS ABOVE & OPPOSITE PLATFORM OPENING AS SHOWN TO TOP OF MANHOLE



TO BE USED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER EXCEEDS 17 FT.

REVISIONS

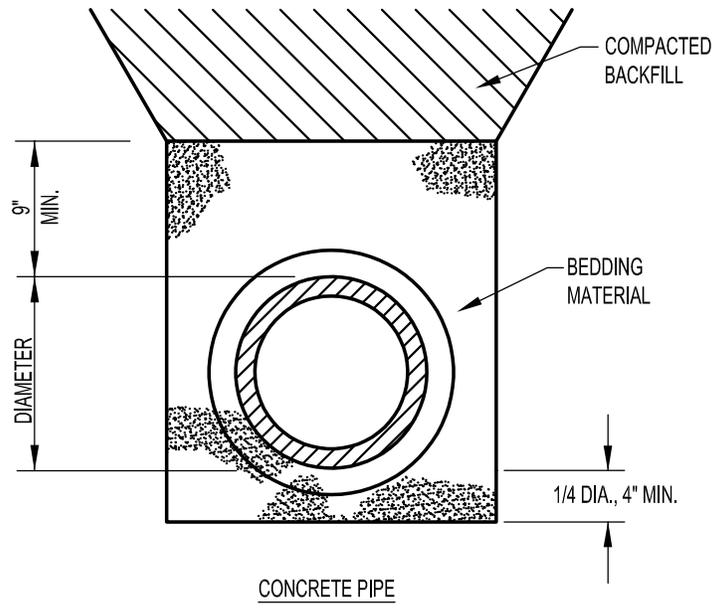
DATE	ITEM	BY
3/2020		ULTEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

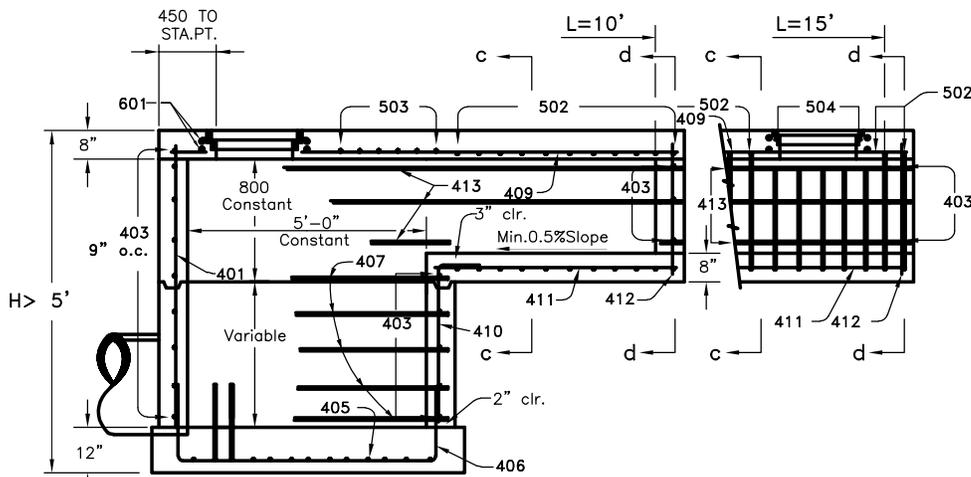
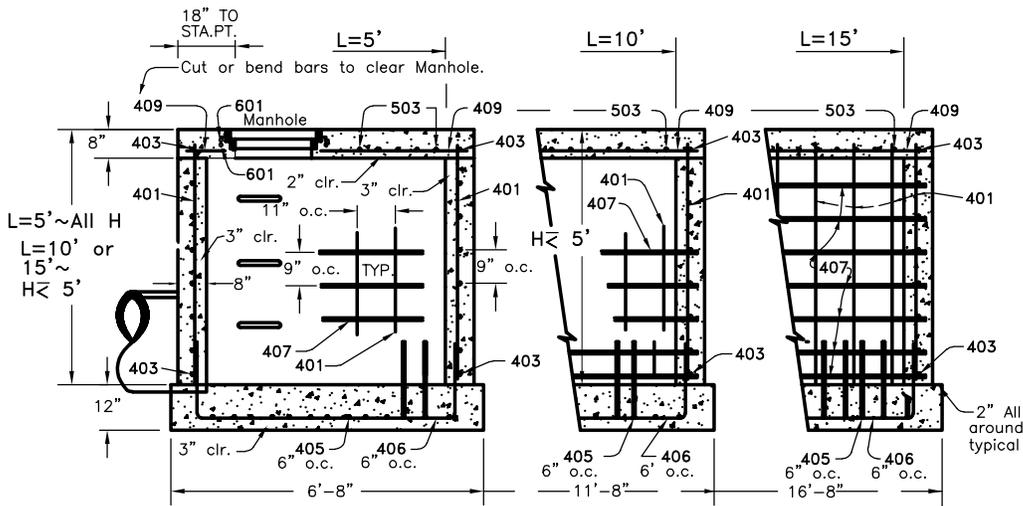
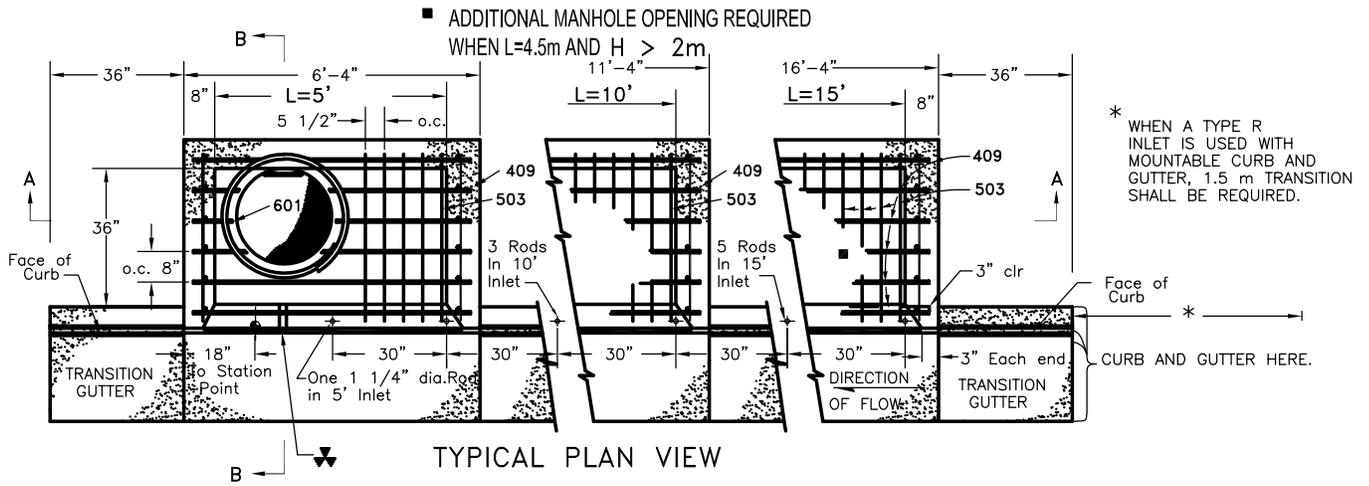
INTERMEDIATE PLATFORM FOR
MANHOLES OVER 17' IN DEPTH

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	ST3
SCALE	N.T.S.



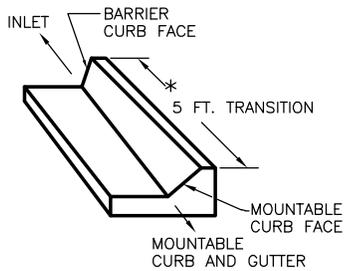
NOTES:
 THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS.
 WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
			TYPICAL PIPE BEDDING		DRAWING NO.	ST4
					SCALE	N.T.S.



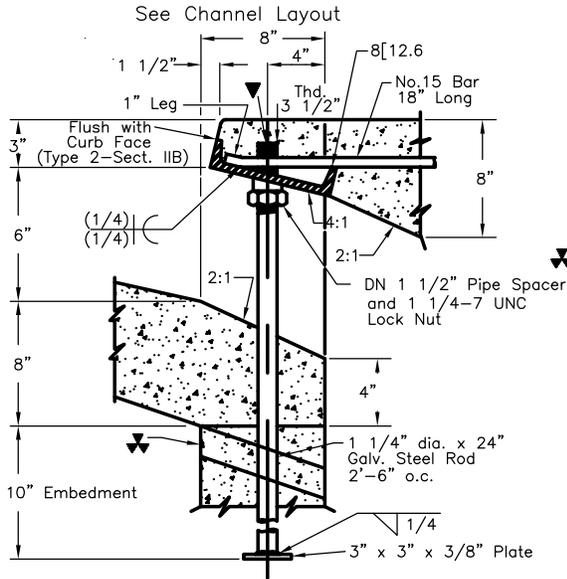
(SHOWN FOR REFERENCE PURPOSES ONLY - REFER TO CDOT STANDARDS FOR ALL UPDATED DETAILS TO TYPE R INLET)

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
CURB INLET TYPE R				DRAWING NO.	ST5 - A	
				SCALE	N.T.S.	

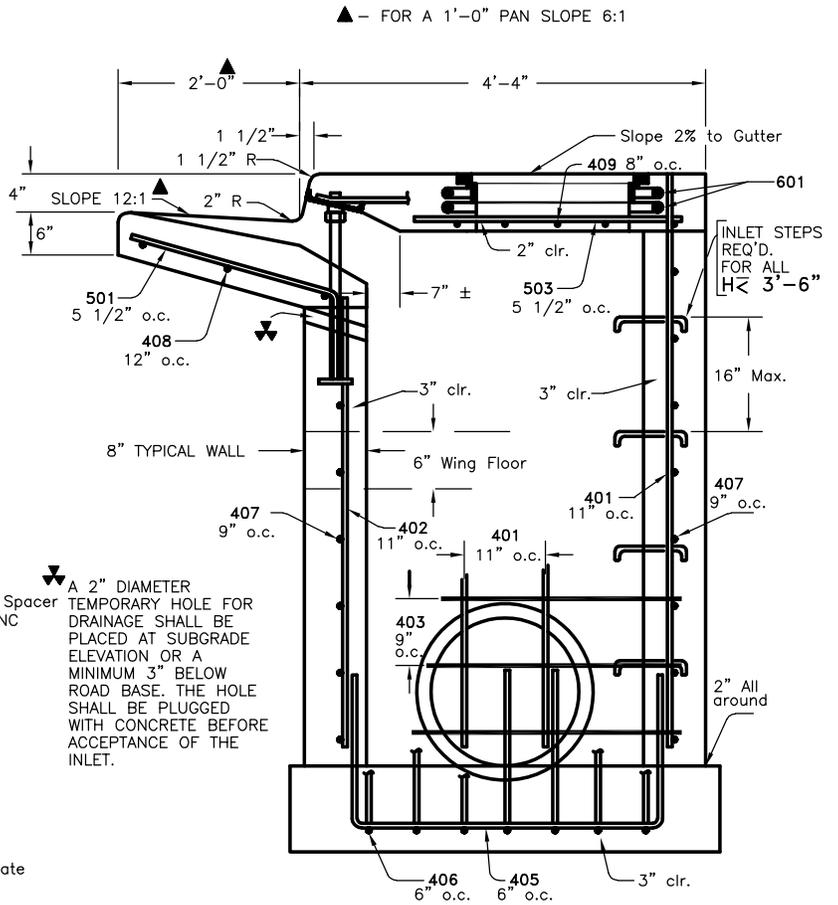


TRANSITION CURB

MEET SHAPE OF NORMAL BARRIER

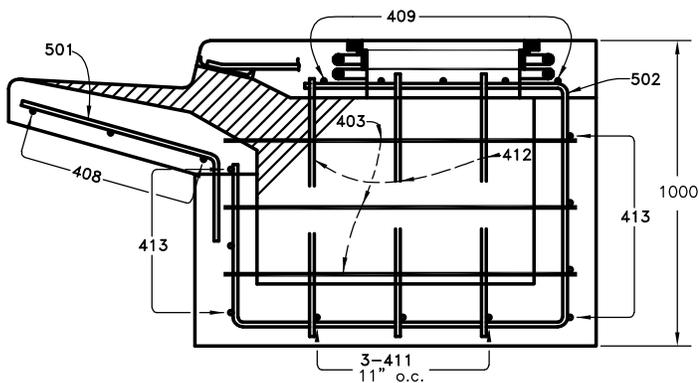


**▼ CURB FACE ASSEMBLY,
PLACE ENTIRE ASSEMBLY BEFORE
POURING CONCRETE**



**SECTION B-B
TYPICAL END VIEW**

NOTE:
MANHOLE COVER, STATION POINT AND OUTFLOW
PIPE SHALL BE LOCATED AT THE SAME END OF
THE INLET.



(DOTTED BARS ARE IN SECTION d-d)

SECTIONS c-c & d-d

**(SHOWN FOR REFERENCE PURPOSES ONLY - REFER TO CDOT
STANDARDS FOR ALL UPDATED DETAILS TO TYPE R INLET)**

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
					DRAWING NO.	ST5 - B
					SCALE	N.T.S.

CURB INLET TYPE R

TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

MARK	DIA (in)	O.C. SPACING (in)	TYPE	ALL INLETS				INLETS, H ≤ 5'				INLETS, H > 5'			
				L = 5'		10'		15'		10'		15'			
				NO. REQ'D.	LENGTH (ft-in)	NO. REQ'D.	LENGTH (ft-in)	NO. REQ'D.	LENGTH (ft-in)	NO. REQ'D.	LENGTH (ft-in)	NO. REQ'D.	LENGTH (ft-in)		
401	11"	11"	II	15	*	21	*	26	*	11	*	11	*		
402	11"	11"	II	7	*	13	*	18	*	7	*	7	*		
403	9"	9"	II	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"		
405	6"	6"	VI	11	6'-10"	21	6'-10"	31	6'-10"	11	6'-10"	11	6'-10"		
406	6"	6"	VIII	7	8'-10"	7	13'-10"	7	18'-10"	7	8'-10"	7	8'-10"		
407	1/2"	9"	II	*	5'-10"	*	10'-10"	*	15'-10"	*	5'-10"	*	5'-10"		
408	12"	12"	II	3	6'-0"	3	11'-0"	3	16'-0"	3	11'-0"	3	16'-0"		
409	8"	8"	II	6	5'-10"	6	10'-10"	6	15'-10"	6	10'-10"	6	15'-10"		
410	11"	11"	VI							3	*	3	*		
411	11"	11"	II							3	5'-2"	3	10'-2"		
412	11"	11"	II							3	2'-9"	3	2'-9"		
413	9"	9"	II							7	10'-10"	7	15'-10"		
501	5 1/2"	5 1/2"	IV	11	3'-4"	22	3'-4"	33	3'-4"	22	3'-4"	33	3'-4"		
502	5/8"	5 1/2"	III							11	11'-5"	17	11'-5"		
503	5 1/2"	5 1/2"	II	5	3'-6"	16	3'-6"	27	3'-6"	6	3'-6"	6	3'-6"		
504	5 1/2"	5 1/2"	II									5	8'-4"		
601	3/4"	2 1/2"	V	2	8'-10"	2	8'-10"	2	8'-10"	2	8'-10"	4	8'-10"		
∅8[8.5				1	5'-10"	1	10'-10"	1	15'-10"	1	10'-10"	1	15'-10"		
▼				2 BARS, 1 ROD		4 BARS, 3 RODS		8 BARS, 5 RODS		4 BARS, 3 RODS		8 BARS, 5 RODS			

* VARIABLE, REFER TO TABLE TWO.

∅ INCLUDE 18" NO. 4 BARS (SEE CHANNEL LAYOUT DETAIL).

▼ SEE CURB FACE ASSEMBLY ON SHEET ST5B AND CHANNEL LAYOUT DETAILS.

REGULAR INLETS

DROP BOX INLETS

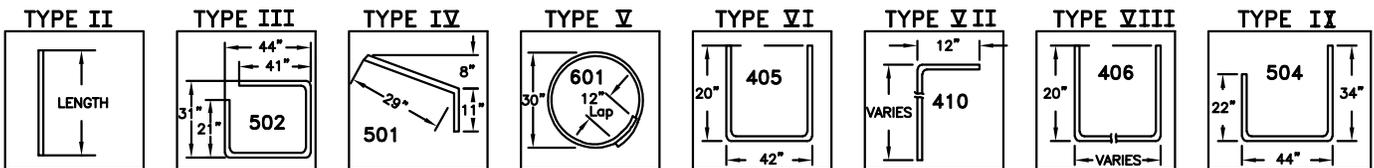
TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"

"H" (ft-in)	LENGTH (ft-in)			NO. REQ'D. REGULAR		NO. REQ'D. DROP BOX		L = 5'		L = 10'		L = 15'	
	401	402	410	403	407	403	407	CONC. CU.YD.	STEEL LBS.	CONC. CU.YD.	STEEL LBS.	CONC. CU.YD.	STEEL LBS.
	3'-0"	2'-8"	1'-8"		10	7			3.2	285	5.3	497	7.4
3'-6"	3'-2"	2'-2"		10	7			3.4	305	5.7	528	7.9	747
4'-0"	3'-8"	2'-8"		12	9			3.7	326	6.0	559	8.4	786
4'-6"	4'-2"	3'-2"		12	9			3.9	334	6.4	571	8.8	803
5'-0"	4'-8"	3'-8"		14	11			4.1	354	6.7	602	9.3	844
5'-6"	5'-2"	4'-2"	3'-5"	16	13	15	6	4.4	375	6.0	607	7.4	850
6'-0"	5'-8"	4'-8"	3'-11"	16	13	16	6	4.6	382	6.2	616	7.6	860
6'-6"	6'-2"	5'-2"	4'-5"	18	15	18	8	4.8	402	6.4	637	7.8	880
7'-0"	6'-8"	5'-8"	4'-11"	20	17	19	10	5.0	423	6.6	654	8.0	897
7'-6"	7'-2"	6'-2"	5'-5"	20	17	20	10	5.3	430	6.9	664	8.3	907
8'-0"	7'-8"	6'-8"	5'-11"	22	19	22	12	5.5	451	7.1	684	8.5	927
8'-6"	8'-2"	7'-2"	6'-5"	24	21	23	14	5.7	471	7.3	702	8.7	944
9'-0"	8'-8"	7'-8"	6'-11"	24	21	24	14	6.0	479	7.6	711	9.0	954
9'-6"	9'-2"	8'-2"	7'-5"	26	23	26	16	6.2	499	7.8	732	9.2	974
10'-0"	9'-8"	8'-8"	7'-11"	28	25	27	18	6.4	520	8.0	749	9.4	992
10'-6"	10'-2"	9'-2"	8'-5"	28	25	28	18	6.7	527	8.3	759	9.7	1001
11'-0"	10'-8"	9'-8"	8'-11"	30	27	30	20	6.9	547	8.5	779	9.9	1022

NOTE: FOR L = 5', L = 10' AND L = 15'

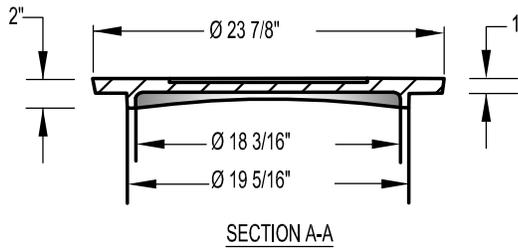
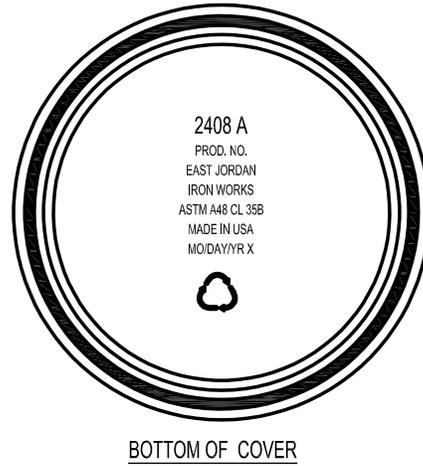
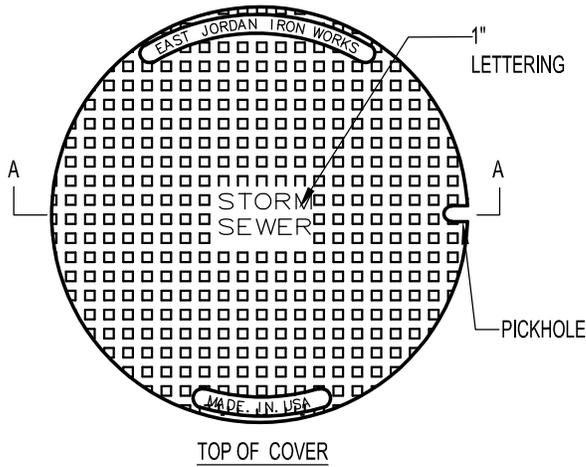
REGULAR INLETS: TOTAL QUANTITIES NEEDED ARE OUTSIDE OF THE HEAVY BLACK LINE.
DROP BOX INLETS: TOTAL QUANTITIES NEEDED ARE INSIDE OF THE HEAVY BLACK LINE.

STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL.



BAR BENDING DIAGRAMS ~ (Dimensions are Out-to-Out of bar)
(SHOWN FOR REFERENCE PURPOSES ONLY - REFER TO CDOT STANDARDS FOR ALL UPDATED DETAILS TO TYPE R INLET)

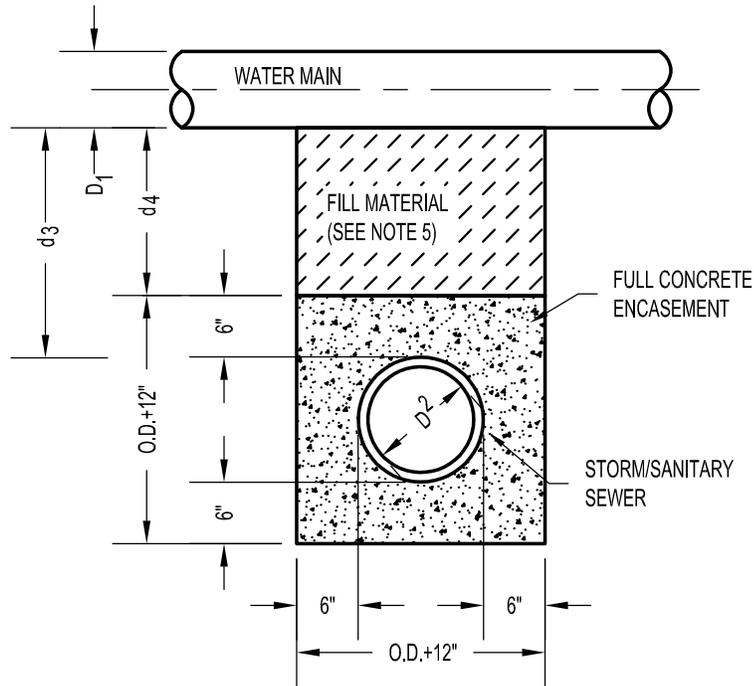
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG	CITY OF Northglenn	CURB INLET TYPE R	APPROVED BY:	
					DRAWING NO.	ST5 - C
					SCALE	N.T.S.



COVER: GRAY IRON ASTM A 48 CL35 B
 LOAD RATING: HEAVY DUTY
 WEIGHT: 135LBS. (61kg)
 MACHINED SURFACE
 EAST JORDAN IRON WORKS PRODUCT
 OR APPROVED EQUAL

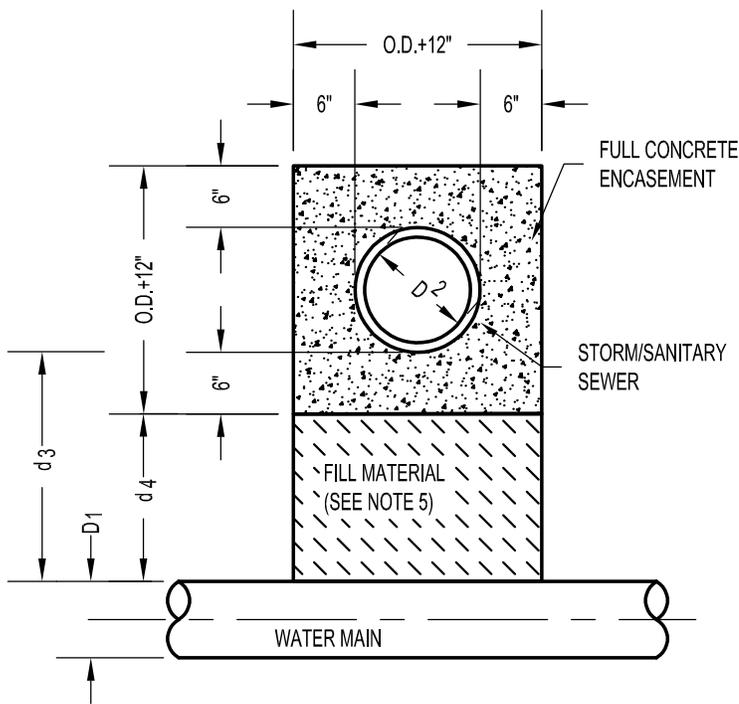
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
				DRAWING NO.	ST6	
				SCALE	N.T.S.	

STORM SEWER MANHOLE COVER



STORM OR SANITARY SEWER CROSSING UNDER WATER MAIN

IF $d_3 > 24"$, ENCASEMENT NOT REQUIRED



STORM OR SANITARY SEWER CROSSING OVER TOP OF WATER MAIN ENCASEMENT

REQUIRED REGARDLESS OF DIMENSION d_3
(SEE NOTE 1 FOR SPECIAL CASES)

NOTES:

1. CONCRETE COLLAR AROUND STORM SEWER JOINTS MAY BE ACCEPTED WITH WRITTEN APPROVAL BY THE CITY ENGINEER AND ONLY FOR PIPE 30" OR LARGER.
2. CONCRETE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING.
3. LENGTH OF ENCASEMENT SHALL EXTEND AT LEAST 10-FEET EACH SIDE OF WATER MAIN.
4. UNLESS OTHERWISE NOTED ON PLAN/PROFILE DRAWINGS, ENCASEMENTS NEED NOT BE REINFORCED.
5. FILLER MATERIAL BETWEEN CONDUITS TO BE:
 - a. APPROVED COMPRESSIBLE MATERIAL SUCH AS STYROFOAM, ETC. IF $d_4 < 6"$.
 - b. COMPACTED BACKFILL, IF $d_4 > 6"$.
6. SHORING OR SHEETING, IF USED, TO BE CUT OFF AT TOP OF ENCASEMENT

REVISIONS

DATE	ITEM	BY
3/2020		ULTEIG

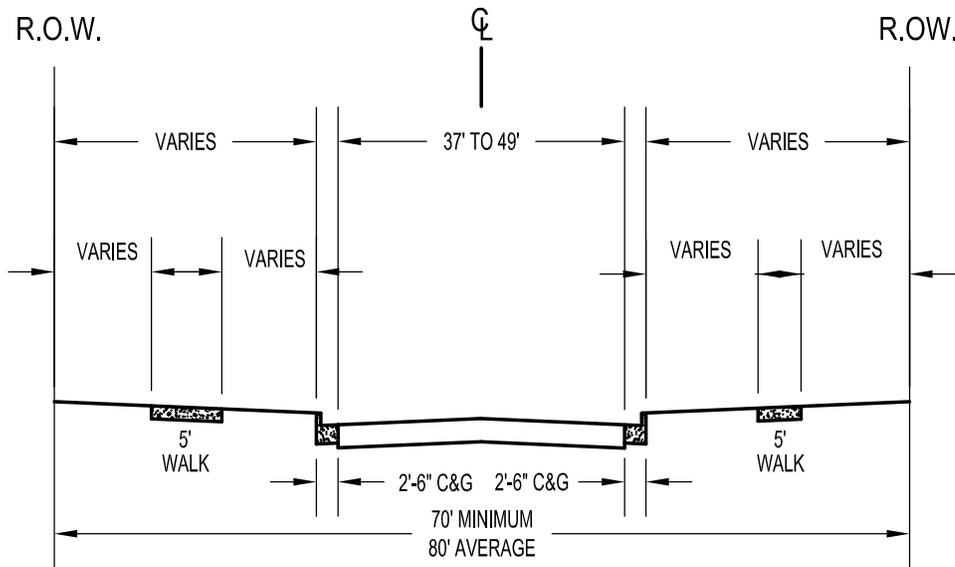


PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ENCASEMENT FOR CONDUIT CROSSINGS

ISSUED

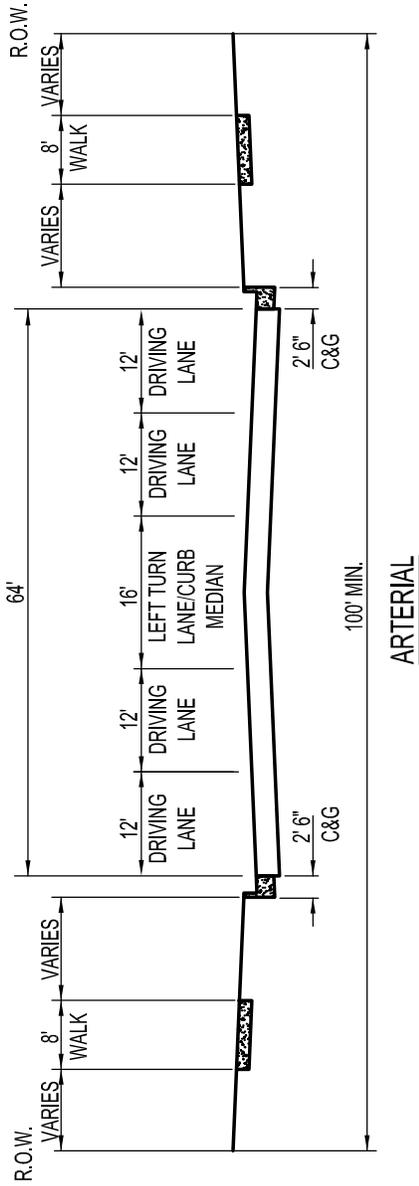
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	ST7
SCALE	N.T.S.



- PARKING ALLOWED BY APPROVAL OF PUBLIC WORKS DIRECTOR
- UTILIZED IN INDUSTRIAL, COMMERCIAL, MULTI-FAMILY, AND SINGLE-FAMILY RESIDENTIAL AREAS WHERE ON-STREET PARKING IS REQUIRED
- 80' AVERAGE RIGHT-OF-WAY (ROW) IS EXTENDED TO PROVIDE VARYING FENCE ALIGNMENTS ALONG ROW LINE

COLLECTOR

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	GY
3/2020		UTLEIG			APPROVED BY:	
			COLLECTOR TYPICAL SECTION		DRAWING NO.	R2
					SCALE	N.T.S.



ARTERIAL

- NO PARKING ALLOWED.
- MEDIAN MAY BE PAINTED OR CURBED. .

REVISIONS

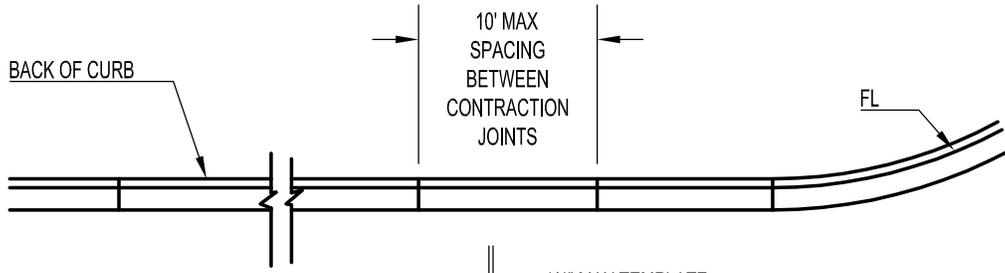
DATE	ITEM	BY
3/2020		ULTEIG



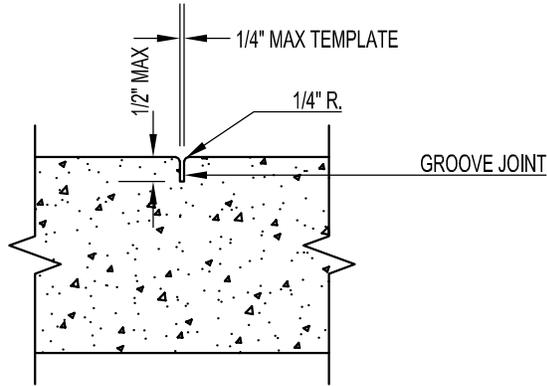
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

ARTERIAL TYPICAL SECTION

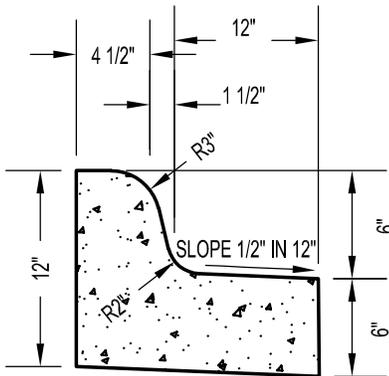
ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	R3
SCALE	N.T.S.



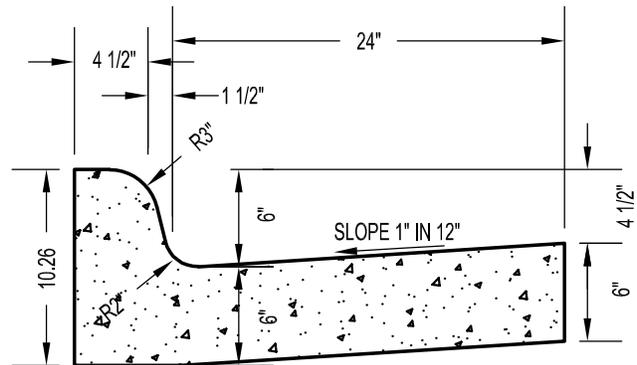
LAYOUT



CONTRACTION JOINT
10' MAXIMUM SPACING

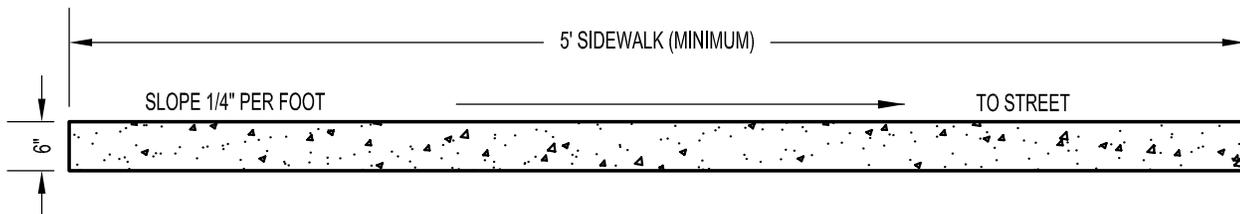


6" VERTICAL MEDIAN
CURB AND GUTTER



6" VERTICAL CURB AND GUTTER

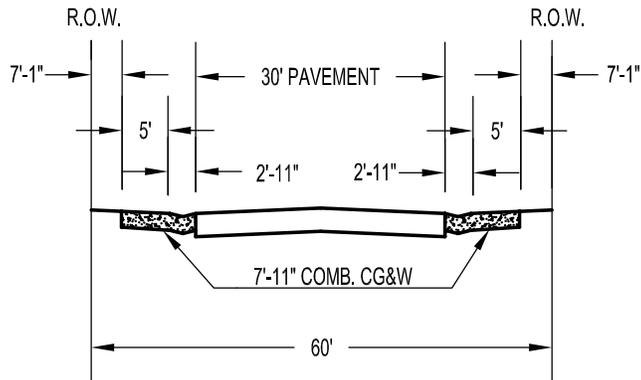
NOTE: 2' 6" CURB AND GUTTER FOR NEW
CONSTRUCTION



ATTACHED OR DETACHED WALK

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
				DRAWING NO.	R4	
				SCALE	N.T.S.	

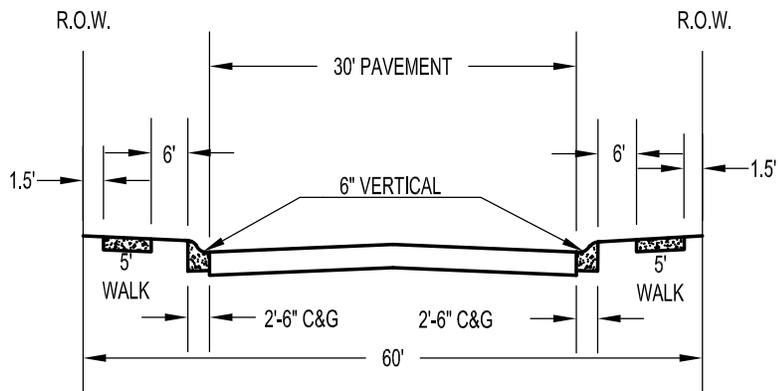
VERTICAL CURB AND GUTTER



- PARKING ALLOWED ON BOTH SIDES OF STREET
- UTILIZED IN SINGLE FAMILY RESIDENTIAL AREAS

LOCAL W/ ATTACHED WALK

TO BE USED ONLY WITH WRITTEN PERMISSION FROM
THE PUBLIC WORKS DIRECTOR

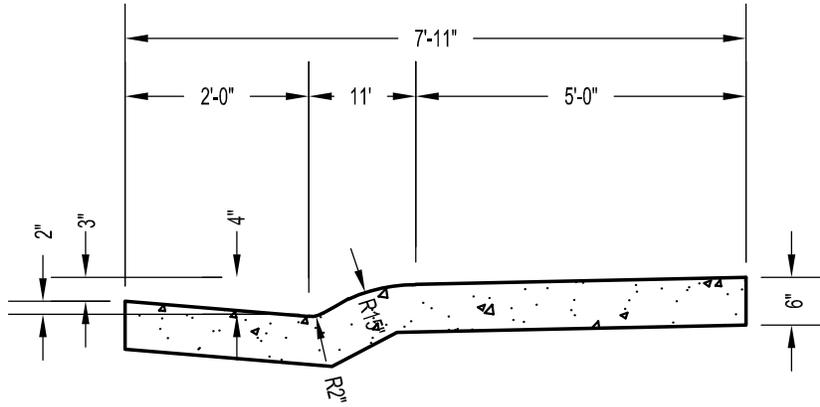


- PARKING ALLOWED ON BOTH SIDES OF STREET
- UTILIZED IN SINGLE FAMILY RESIDENTIAL AREAS

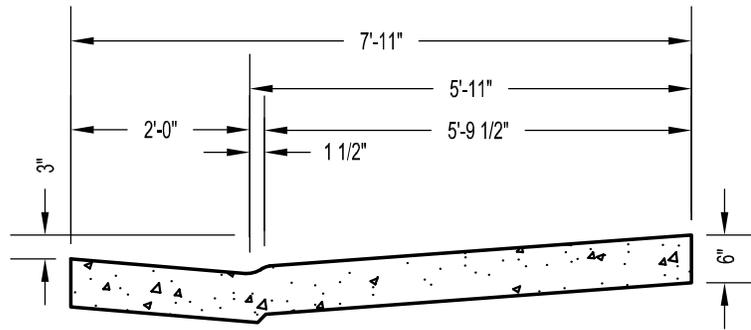
LOCAL W/ DETACHED WALK

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG			APPROVED BY:	
					DRAWING NO.	R1
					SCALE	N.T.S.

LOCAL TYPICAL SECTION



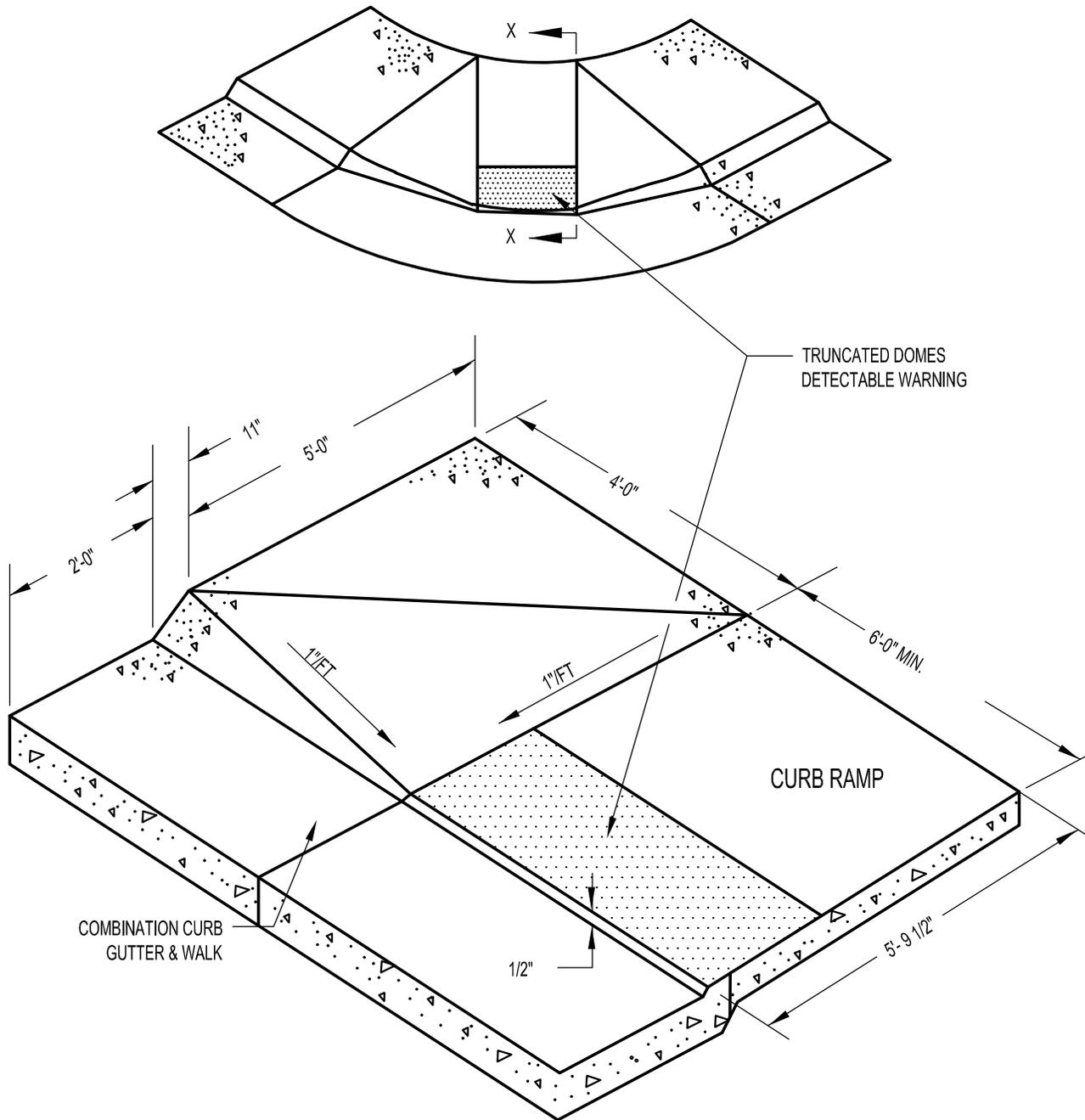
COMBINATION CURB, GUTTER & WALK STANDARD SECTION



COMBINATION CURB, GUTTER & WALK DEPRESSED SECTION

ONLY AS APPROVED BY THE PUBLIC WORKS DIRECTOR

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG	CITY OF Northglenn	APPROVED BY:		
				DRAWING NO.	R5	
				SCALE	N.T.S.	
			COMBINATION CURB, GUTTER AND WALK			

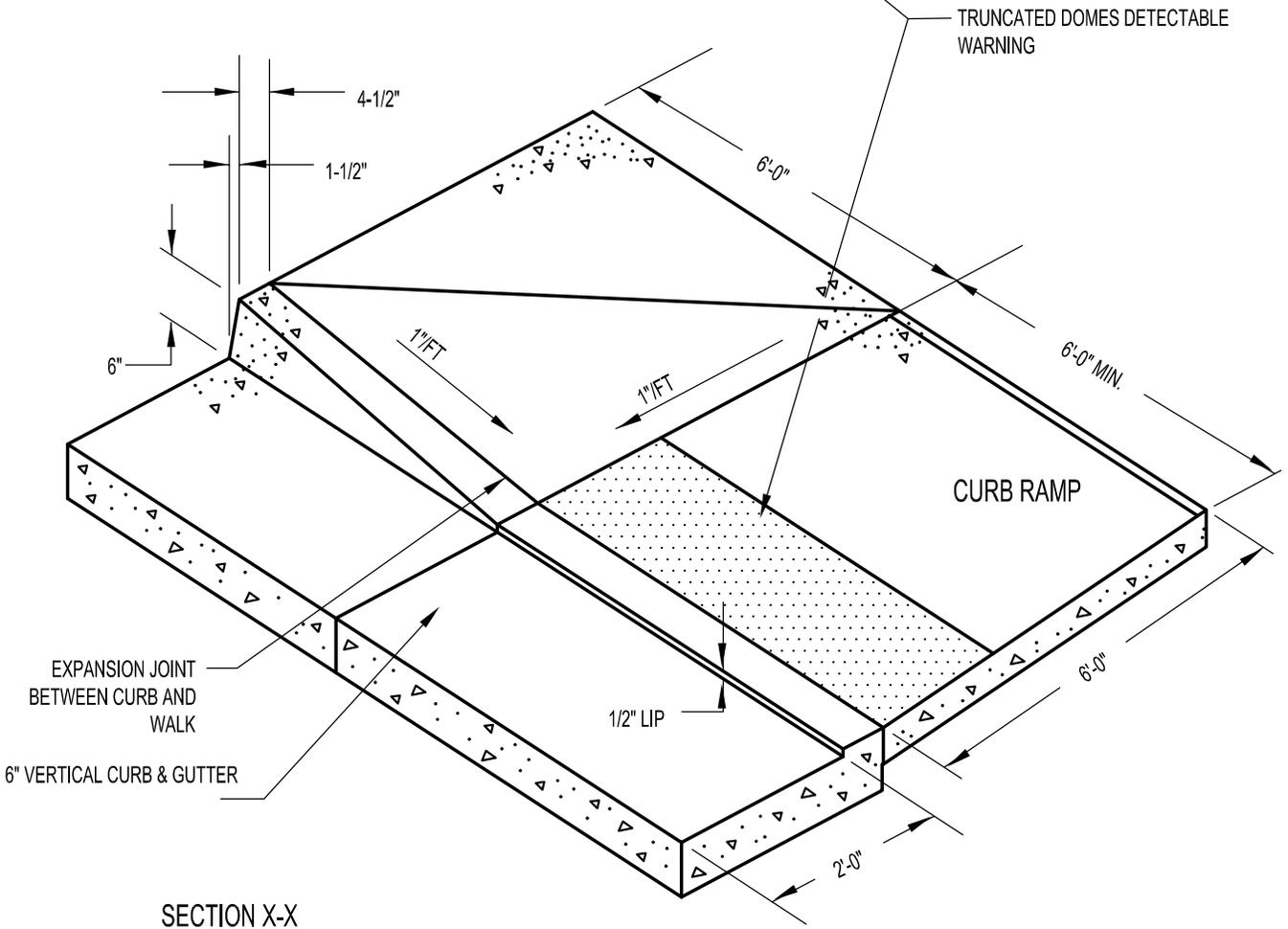
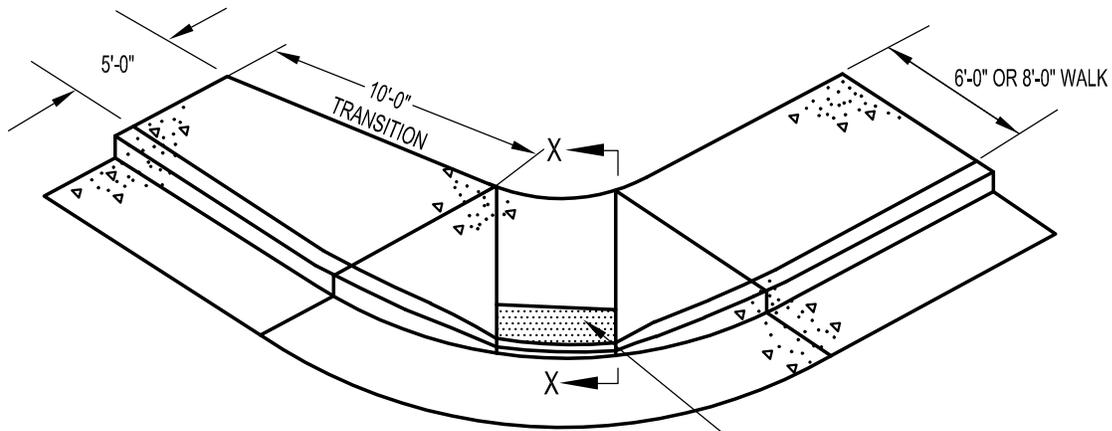


SECTION X-X

NOTE:

1. COARSE BROOM FINISH ON RAMP.
2. SPECIAL DESIGNS ARE REQUIRED WHEN GRADES ARE OVER 4% OR WHERE THE ANGLE OF THE INTERSECTION IS LESS THAN 78 DEGREES OR MORE THAN 105 DEGREES.
3. MAINTAIN BACK OF WALK ELEVATION AT 2.0% ABOVE TOP OF CURB.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG			APPROVED BY:	
			CURB RAMP COMBINATION CURB GUTTER AND WALK		DRAWING NO.	R6
					SCALE	N.T.S.

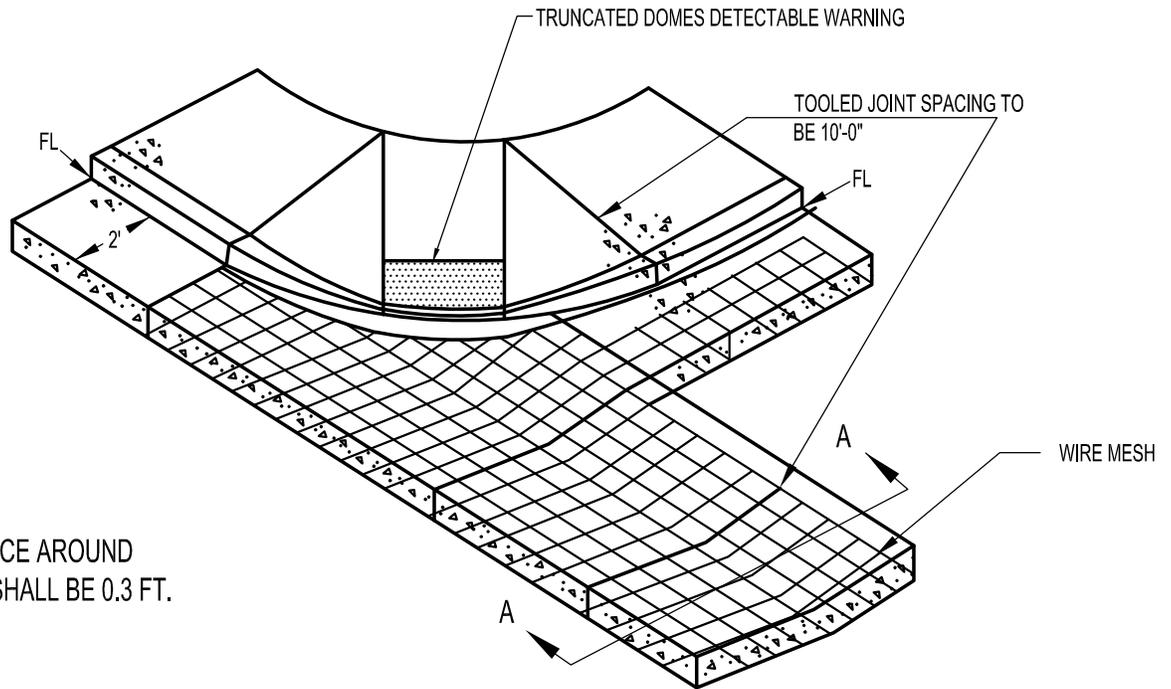


SECTION X-X

NOTE:
 MIDBLOCK RAMP IS SAME AS ABOVE WITH 10 FOOT TRANSITIONS
 TO SIDEWALKS OF A DIFFERING DIMENSION OR A DETACHED WALK.

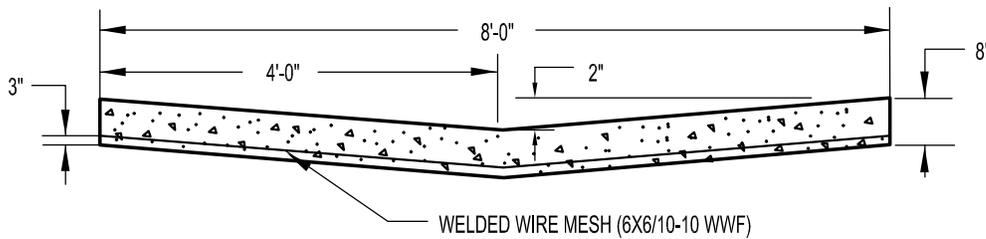
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
				DRAWING NO.	R7	
				SCALE	N.T.S.	

CURB RAMP VERTICAL
 CURB AND WALK



NOTE:
MINIMUM FACE FACE AROUND
CURB RETURNS SHALL BE 0.3 FT.

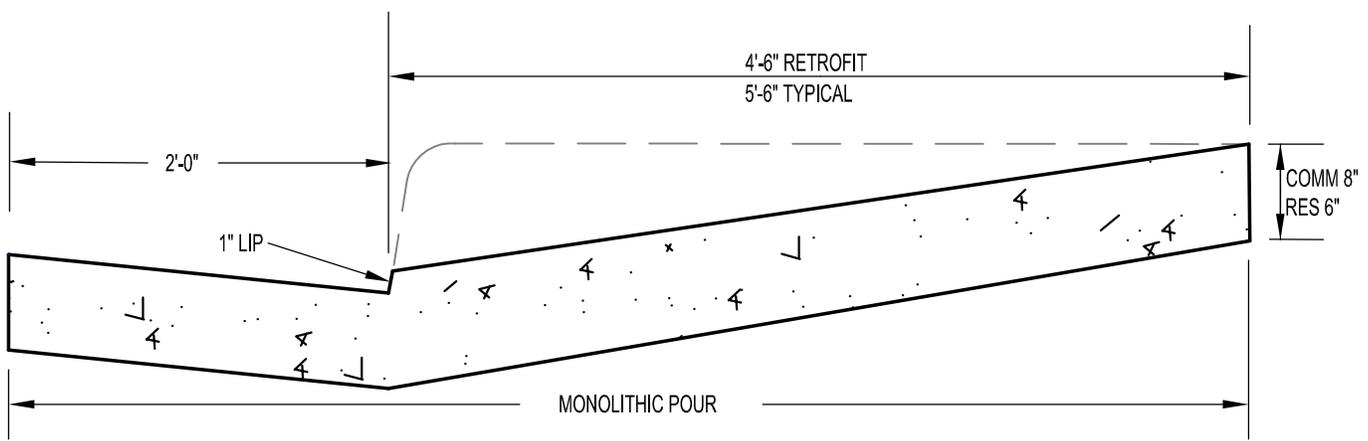
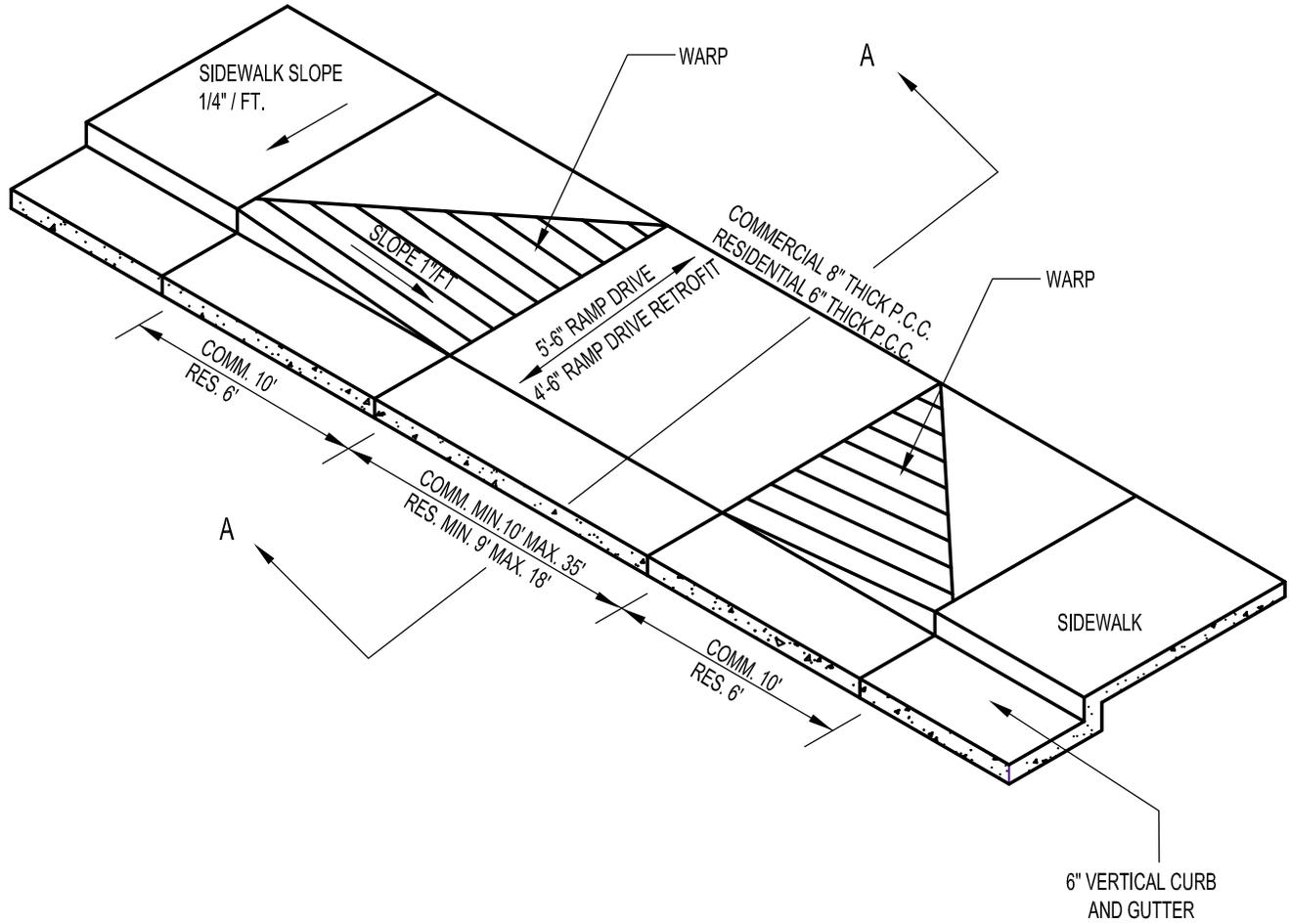
CURB, GUTTER & WALK



SECTION A-A

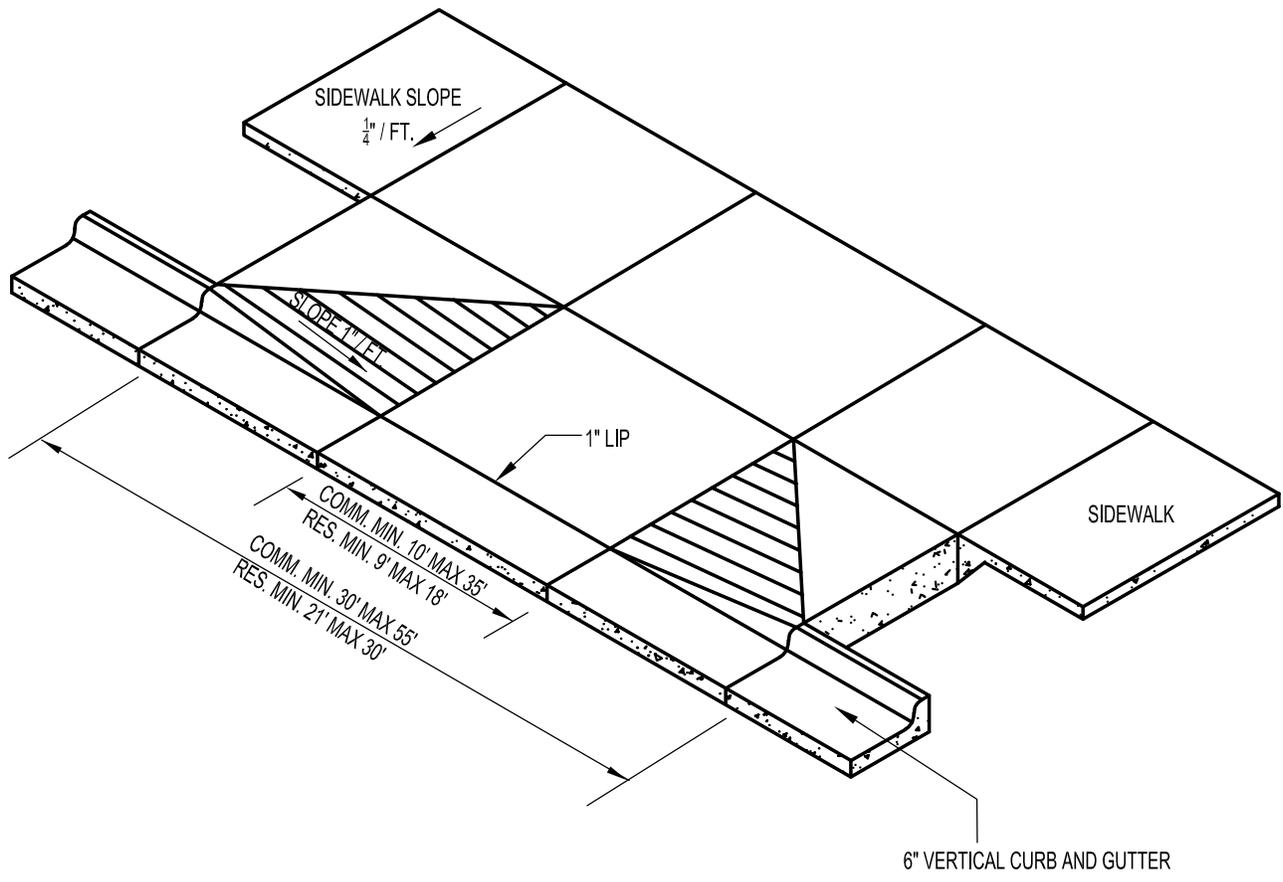
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG	CITY OF Northglenn	SIDEWALK RAMP WITH CROSS PAN VERTICAL CURB	APPROVED BY:	
					DRAWING NO.	R8
					SCALE	N.T.S.

NOTE:
CONTRACTION JOINTS ARE REQUIRED AT EACH SIDE
OF WARPED SECTION AND EVERY 10' (MAX) ALONG
THE DRIVEWAY.



SECTION A-A

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG	RAMP DRIVE FOR VERTICAL CURB ATTACHED WALK	APPROVED BY:		
				DRAWING NO.	R9	
				SCALE	N.T.S.	



REVISIONS

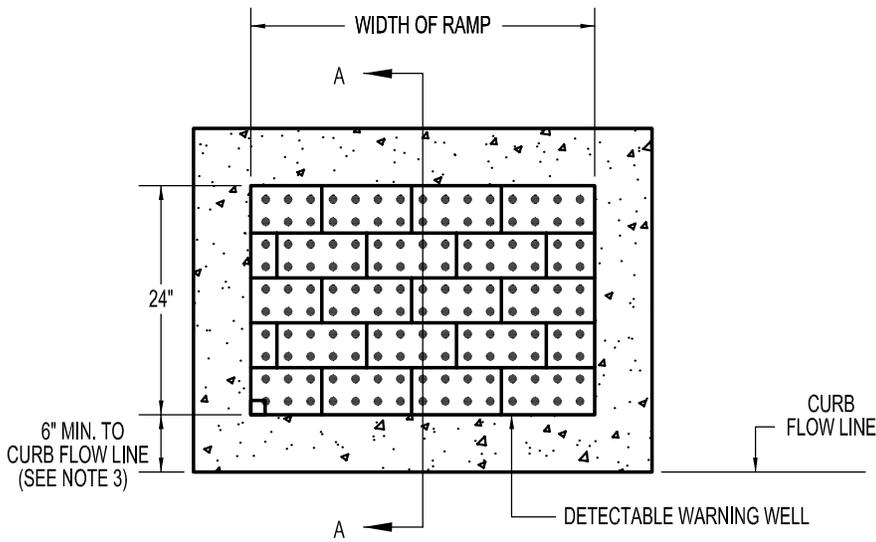
DATE	ITEM	BY
3/2020		ULTEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

RAMP DRIVE FOR VERTICAL CURB
AND DETACHED WALK

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	R10
SCALE	N.T.S.

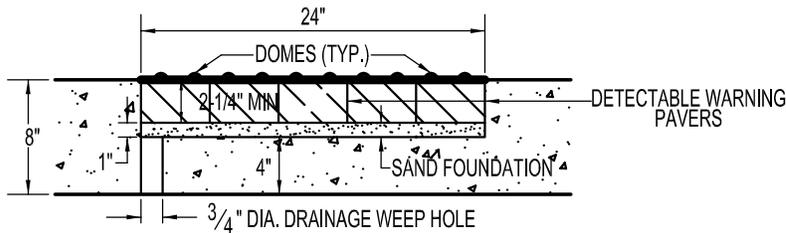


PLAN VIEW OF
DETECTABLE WARNING AND WELL

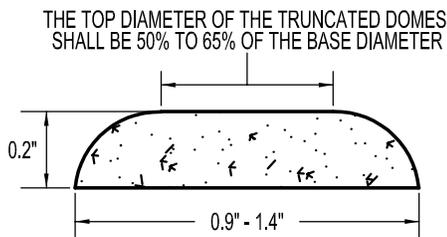
(PAVERS NOT DRAWN TO SCALE)

GENERAL NOTES

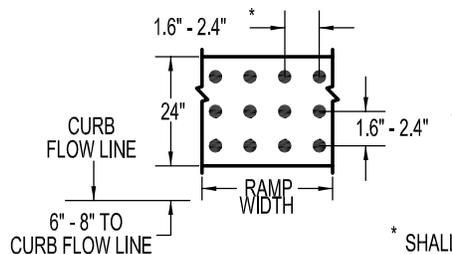
1. THE DETECTABLE WARNINGS SHALL BE INSTALLED AT SIDEWALK/STREET TRANSITIONS. THEY SHALL BE MADE IN PAVER FORM WITH A TRUNCATED DOME SURFACE. THE DOMES SHALL BE PLACED IN A SQUARE GRID.
2. THE TOP OF THE DRAINAGE WEEP HOLE SHALL BE LOCATED AT THE LOWEST POINT OF THE DETECTABLE WARNING WELL.
3. ALL DETECTABLE WARNING AREAS SHALL START A MINIMUM OF 6 INCHES FROM THE FLOW LINE OF THE CURB AND NOT BE MORE THAN A MAXIMUM OF 8 INCHES FROM ANY POINT ON THE FLOW LINE OF THE CURB. ALL DETECTABLE WARNING AREAS SHALL BE 24 INCHES IN LENGTH AND COVER THE COMPLETE WIDTH OF THE RAMP AREA ONLY. THE DETECTABLE WARNING AREA SHALL BE INCLUDED IN THE COST OF THE CONCRETE CURB RAMP.
4. RAMP SLOPES SHALL NOT BE STEEPER THAN 12:1.
5. DETECTABLE WARNING AND WELL AREA SLOPES SHALL NOT BE STEEPER THAN 20:1.
6. COLOR SHALL BE PAVESTONE "RIVER RED"
7. CONTRACTOR MAY USE PRE-MANUFACTURED TRUNCATED DOME PLATES THAT MEET THE MINIMUM REQUIREMENTS SET FORTH.



SECTION A-A



ELEVATION VIEW

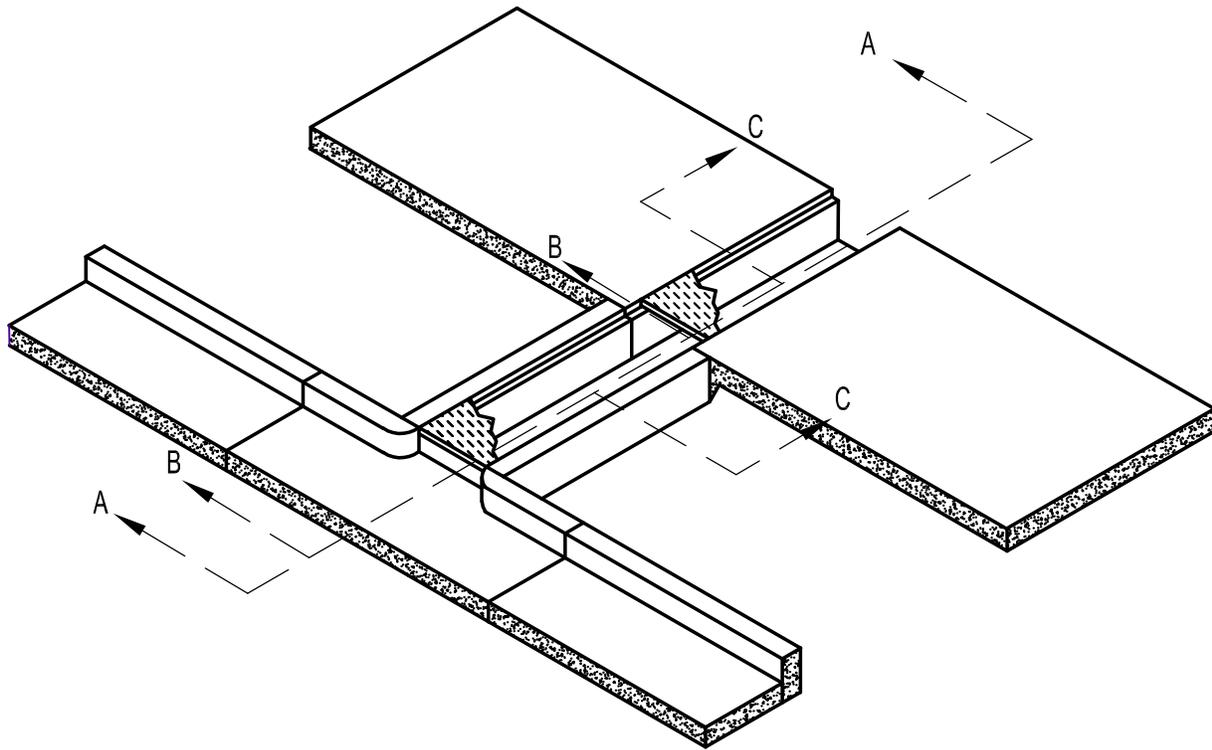


PLAN VIEW

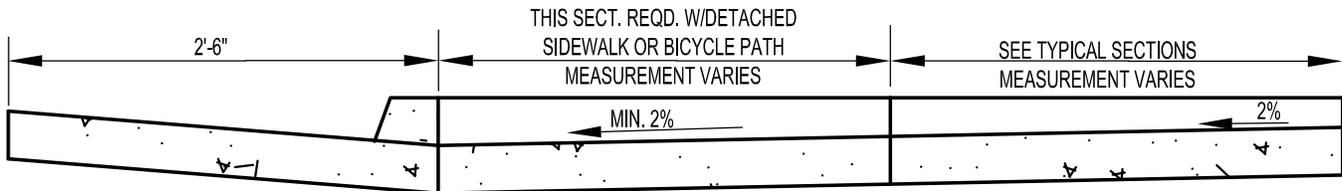
* SHALL BE EQUAL IN BOTH DIRECTIONS.

DOMES AND DETECTABLE WARNING DETAILS

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY				
3/2020		ULTEIG			APPROVED BY:	
					DRAWING NO.	R11
					SCALE	N.T.S.
				TRUNCATED DOME/DETECTABLE WARNING		

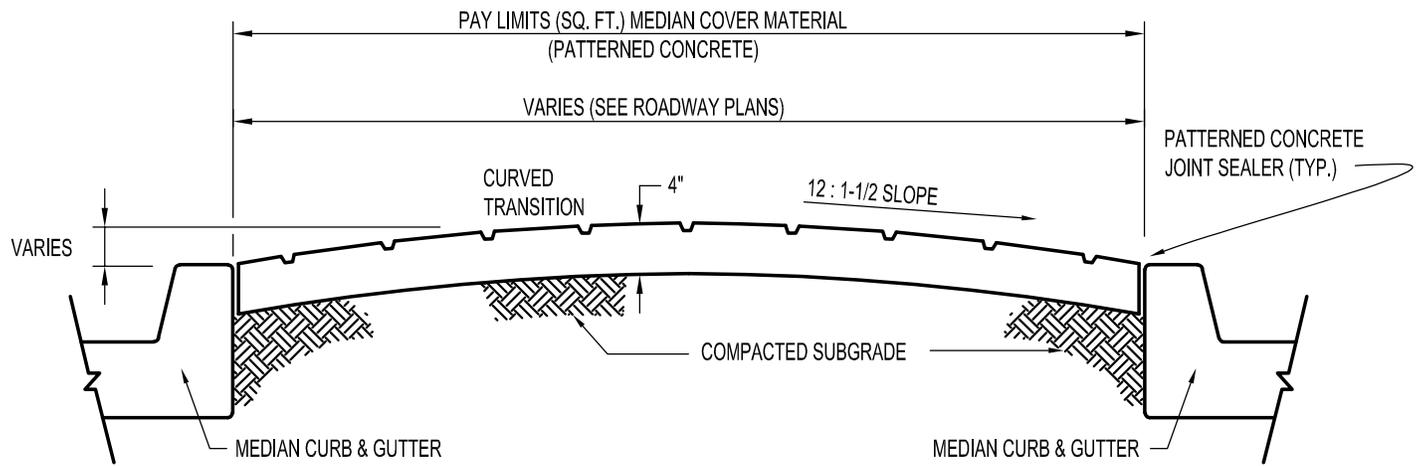


CHASE DRAIN



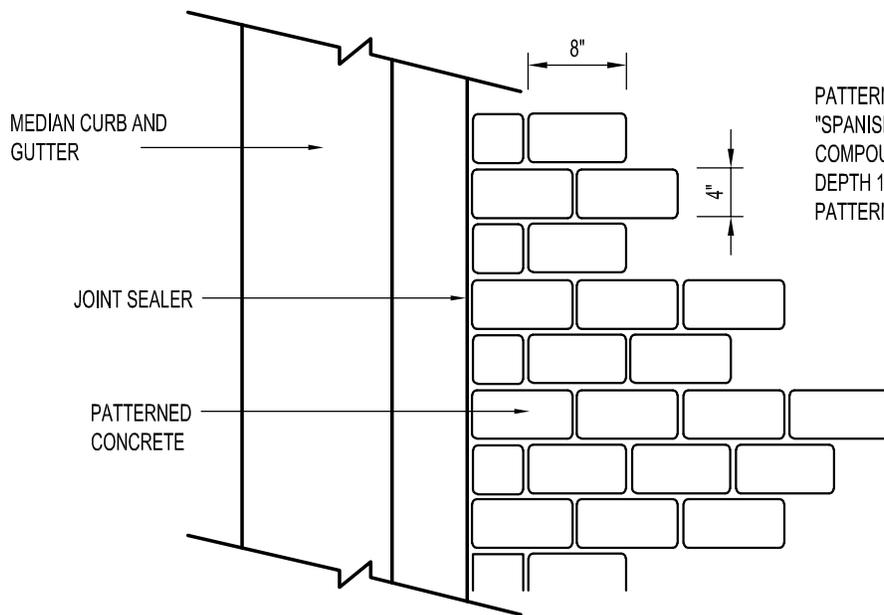
SECTION A-A

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG	STANDARD SIDEWALK CHASE DRAIN	APPROVED BY:		
				DRAWING NO.	R12 - A	
				SCALE	N.T.S.	



SECTION VIEW

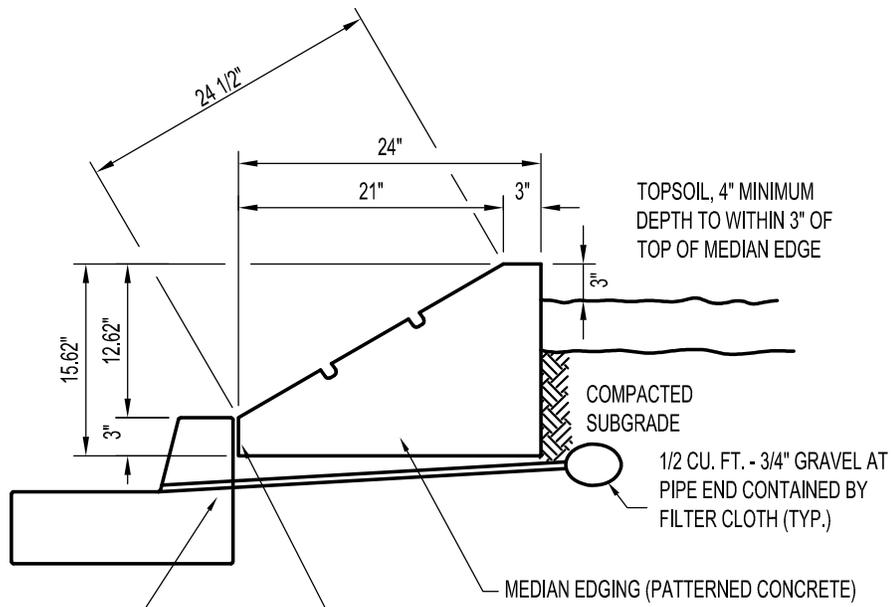
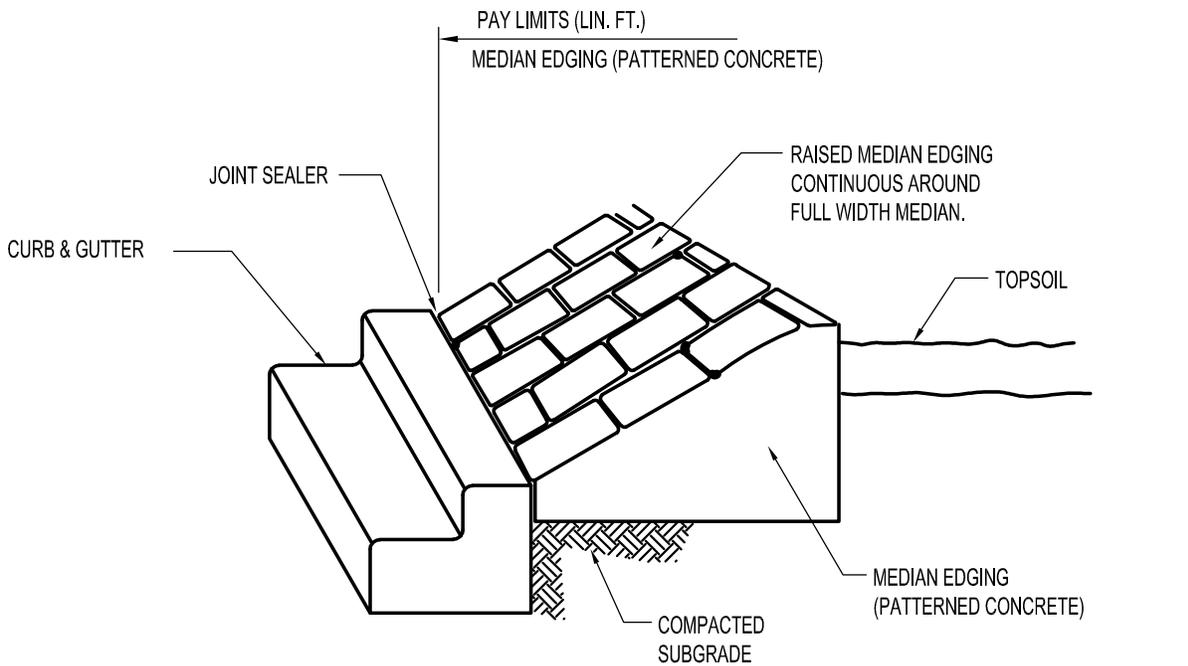
PLACE JOINT SEALER IN JOINT BETWEEN PATTERNED CONCRETE ABUTTING CONCRETE (TYP). JOINT SEALER TO BE PEARL WHITE SIKAFLEX-2C OR APPROVED EQUAL. COST OF JOINT SEALER TO BE INCLUDED IN PATTERNED CONCRETE.



PATTERNED CONCRETE - RUNNING BOND BRICK PATTERN DAVIS "SPANISH GOLD" COLOR FINISH WITH CLEAR CURING COMPOUND. CONTROL JOINT SPACED EVERY 10'. MINIMUM DEPTH 1". REFER TO PERSPECTIVE DETAIL SHOWING PATTERNED CONCRETE MEDIAN AT RAISED MEDIAN.

PLAN VIEW

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
			MEDIAN COVER MATERIAL (PATTERNED CONCRETE)		DRAWING NO.	R13
					SCALE	N.T.S.



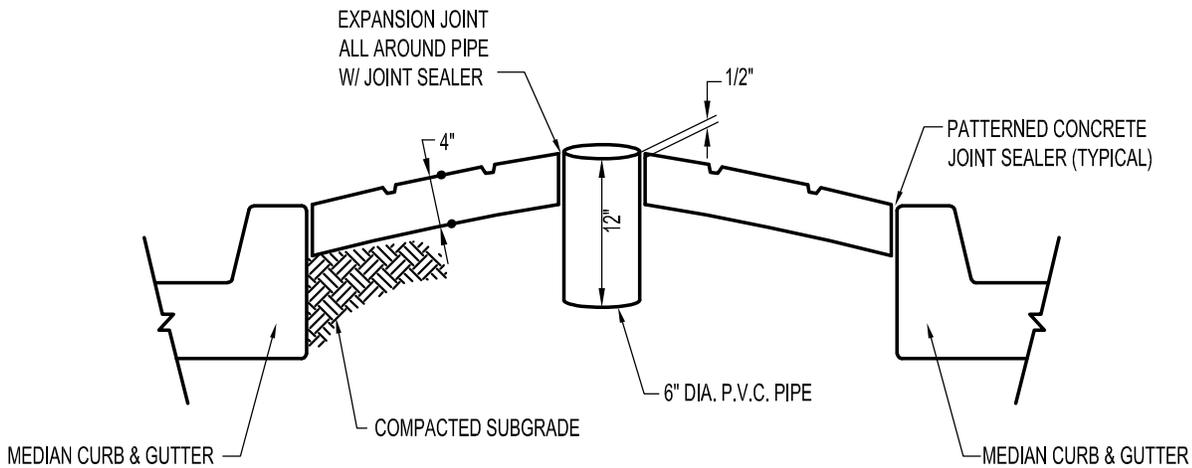
WEEP HOLE WITH 3/4" PVC PIPE CONSTRUCTED AT 20' SPACING CENTERS WITH 1/2 CU. FT. GRAVEL PACK. COST OF ALL MATERIALS TO BE INCLUDED IN MEDIAN EDGING (PATTERNED CONCRETE) PLACE WEEP HOLES UNDER ALL RAISED MEDIAN EDGING THAT ABUTS CURBING.

PLACE JOINT SEALER IN JOINTS BETWEEN PATTERNED CONCRETE

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG			APPROVED BY:	
					DRAWING NO.	R14
					SCALE	N.T.S.

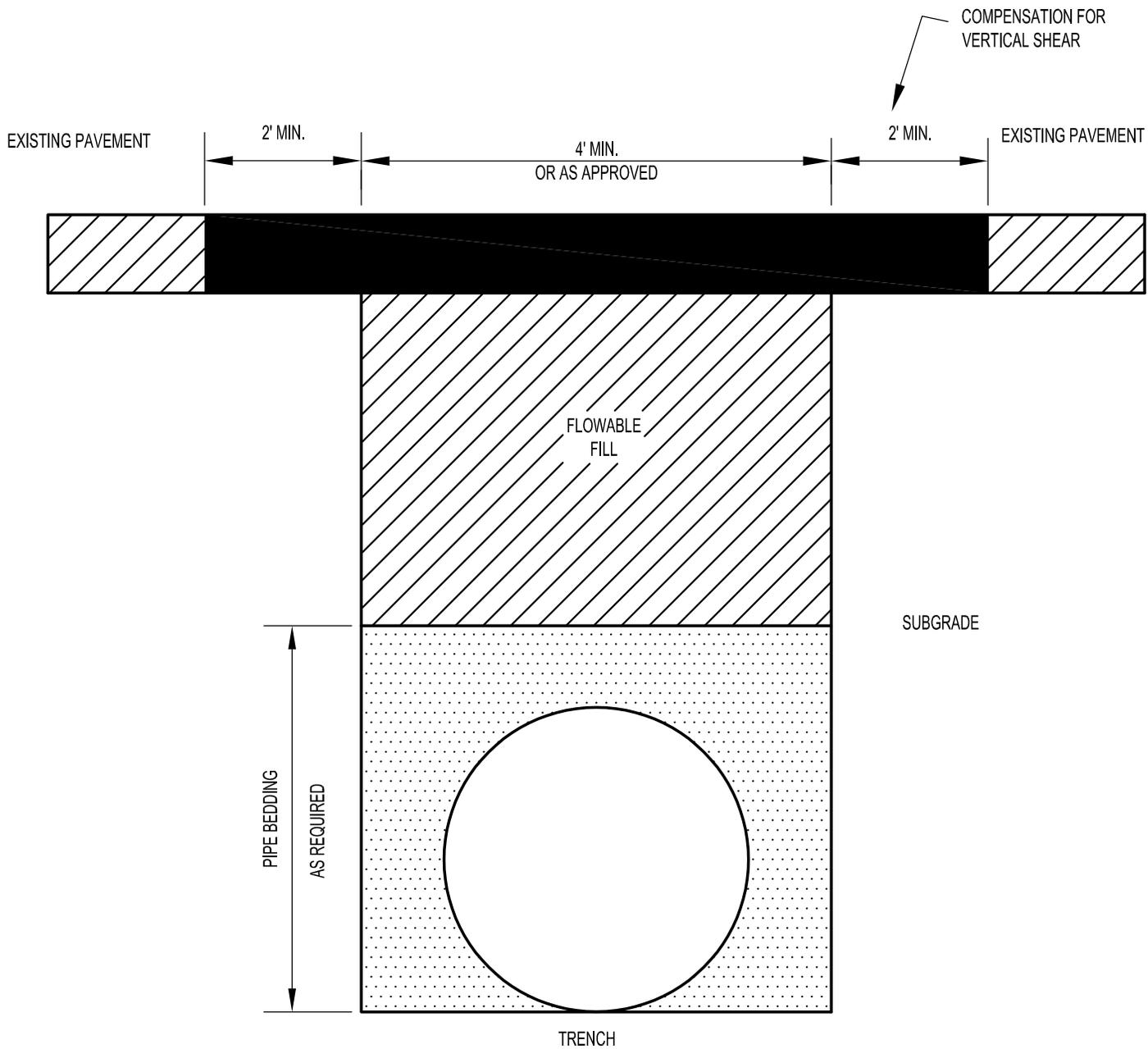
MEDIAN EDGING
(PATTERNED CONCRETE)

USE SLEEVE WHERE TRAFFIC SIGN POST IS TO BE PLACED IN MEDIAN ISLAND WITH PATTERNED CONCRETE. COST INCLUDED IN COST OF PATTERNED CONCRETE. (LOCATION AS DIRECTED BY ENGINEER OR AS SHOWN ON PLANS.)



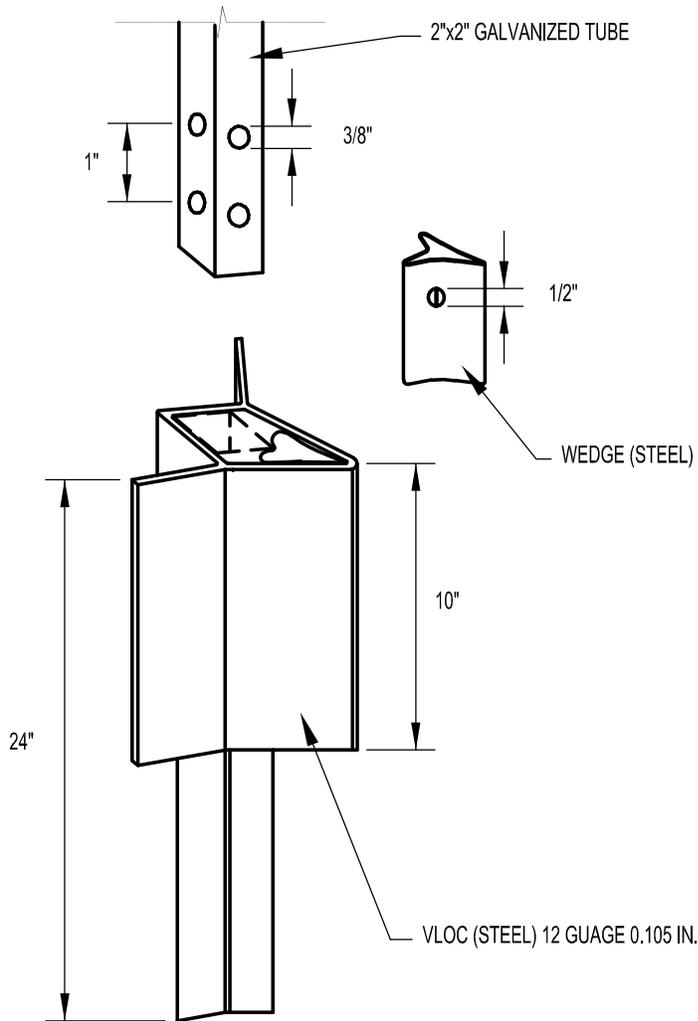
SLEEVE DETAIL

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG			APPROVED BY:	
					DRAWING NO.	R15
					SCALE	N.T.S.



NOTE: SEE CHAPTER 9 FOR ADDITIONAL REQUIREMENTS

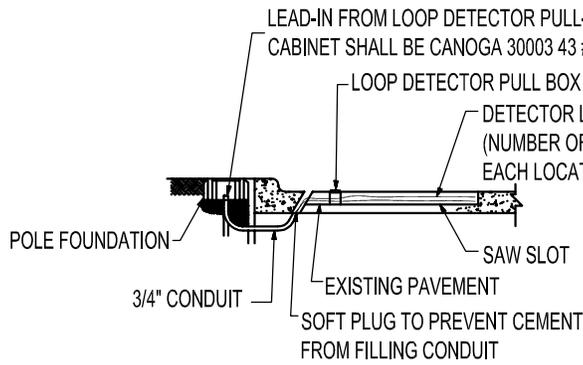
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG	CITY OF Northglenn	APPROVED BY:		
				DRAWING NO.	R16	
				SCALE	N.T.S.	
				TRENCH PATCH BACK		



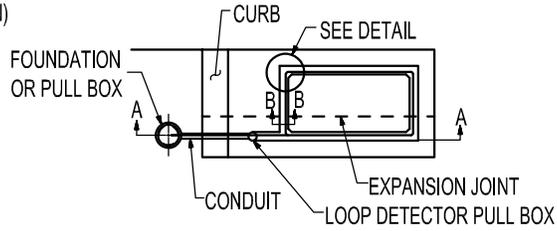
NOTES:

1. CONTRACTOR MAY USE APPROVED CDOT POST ANCHOR WITH APPROVAL OF PUBLIC WORKS DIRECTOR

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
			TYPICAL SIGN POST ANCHOR DETAIL		DRAWING NO.	T1
					SCALE	N.T.S.



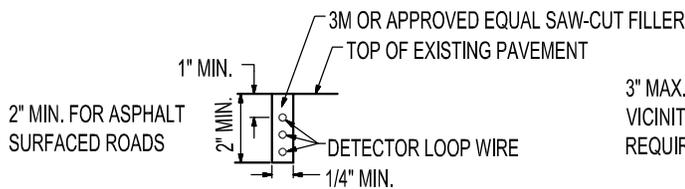
SECTION A-A



STANDARD LOOP

NOTE:

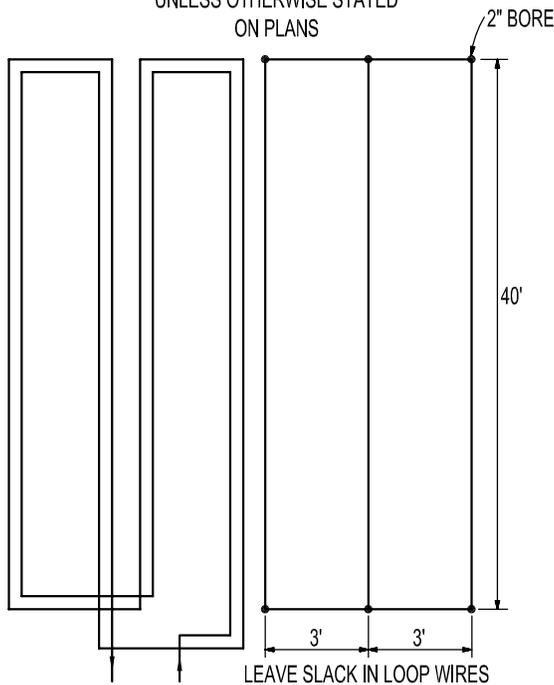
FINISHED LOOP MUST SHOW NO SHORTED TURNS NO BROKEN WIRE AND 15 MEGOHMS (MINIMUM) TO GROUND, MEASURED WITH A QUALITY MEGOHM METER (SEE GENERAL NOTES).



SECTION B-B

3" MAX. WILL BE PERMITTED IN ASPHALT AND IN VICINITY OF EXPANSION JOINTS TO ALLOW FOR REQUIRED CLEAR DISTANCE TO TUBING.

LOOPS SHALL BE SIZE SHOWN UNLESS OTHERWISE STATED ON PLANS



WIRE CONFIGURATION

LAYOUT

LOOP DETECTOR INSTALLATION DETAIL

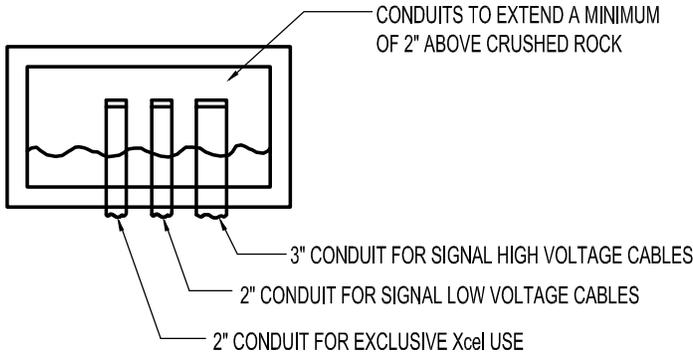
GENERAL NOTES FOR TD-5 DETECTORS:

1. LOOP SIZE AND LOCATION SHALL BE AS SHOWN IN THE PLANS.
2. THE NUMBER OF TURNS OF WIRE SHALL BE AS INDICATED IN THE PLANS OF THE SPECIFIC INSTALLATION OR AS OTHERWISE SPECIFIED BY THE EQUIPMENT MANUFACTURER SUPPLYING THE LOOP DETECTOR AMPLIFIERS AND APPROVED BY THE TRAFFIC ENGINEERING DIVISION. ALL LOOP WIRE IN ADJACENT LOOPS SHALL BE LAID EITHER IN A CLOCKWISE OR COUNTER-CLOCKWISE DIRECTION AND THE LEADS TAGGED AT THE TIME OF INSTALLATION TO CLEARLY IDENTIFY THEIR DIRECTION.
3. IMMEDIATELY BEFORE LAYING THE LOOP CABLE, THE SAW CUT SHALL BE THOROUGHLY CLEANED AND DRIED WITH HIGH PRESSURE COMPRESSED AIR.
4. THE WIRE SHALL BE POSITIONED BY USE OF A BLUNT INSTRUMENT SO AS TO MINIMIZE THE CHANCE OF DAMAGE TO THE CABLE INSULATION. (THE USE OF A SCREWDRIVER, SAW BLADE, ETC. WILL NOT BE PERMITTED.)
5. LOOP WIRE SHALL BE CONTINUOUS (NO SPLICES PERMITTED) FROM THE PULL BOX OR FOUNDATION THROUGHOUT THE LOOP CONFIGURATION.
6. AFTER THE LOOP WIRE IS INSTALLED, 3M OR APPROVED EQUAL SAW-CUT SEALER SHALL BE USED TO FILL THE SAW CUT BEFORE MOISTURE OR DIRT CAN ACCUMULATE. LOOP INSTALLATION MAY BE RESTRICTED DUE TO ADVERSE CLIMATICAL CONDITIONS (DAMPNESS, DUST, ETC.)
7. SPLICES TO THE LOOP LEAD-IN CABLE SHALL BE WATERPROOFED WITH 3M SPLICE KITS OR APPROVED EQUAL.
8. ELECTRICAL CONTINUITY TESTS SHALL BE PERFORMED FOR EACH LOOP:
 - A. BEFORE ANY LOOP SEALER IS INSTALLED.
 - B. AFTER LOOP SEALER IS PLACED BUT PRIOR TO CONNECTION TO LEAD-IN CABLE.
 - C. AFTER LEAD-IN CABLE IS SPLICED AND TRAINED TO THE CONTROLLER.

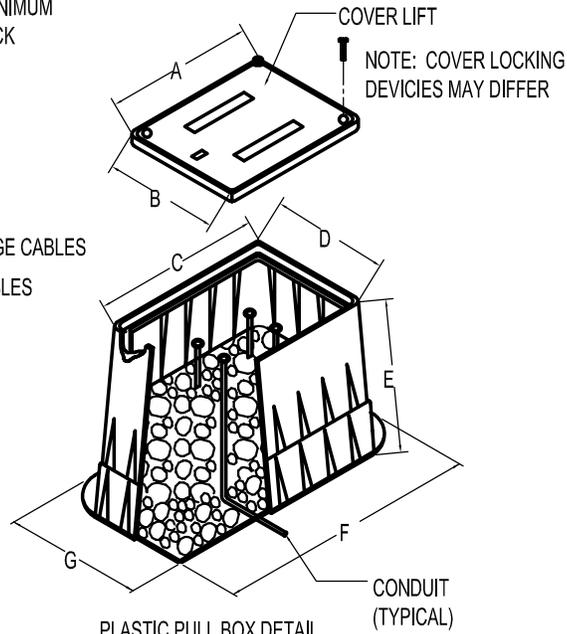
IN ADDITION, "RESISTANT-TO-GROUND" AND "INDUCTANCE" OF EACH LOOP SHALL BE MEASURED AND RECORDED FOR EACH OF THE THREE TESTS PERFORMED TO THE LOOP DETECTOR.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
					DRAWING NO.	T2
					SCALE	N.T.S.

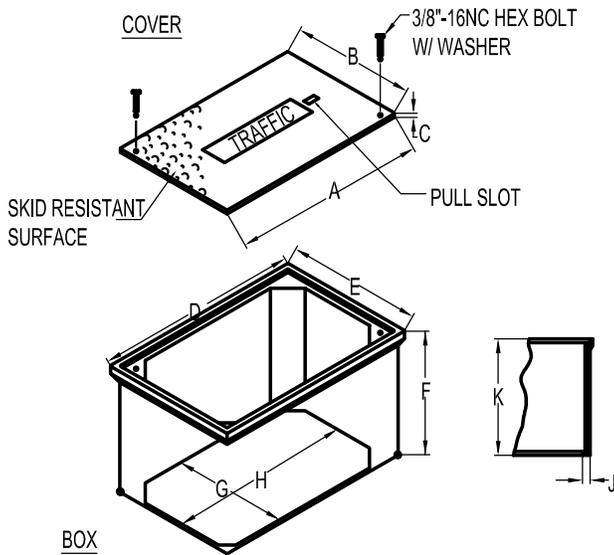
LOOP DETECTOR DETAILS



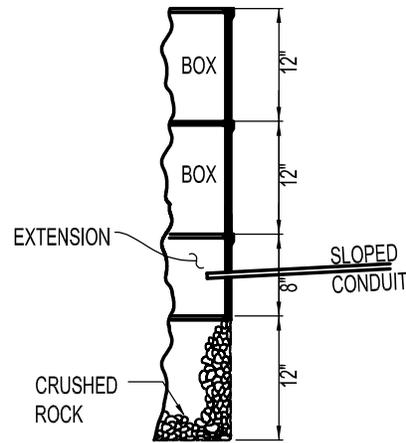
TYPICAL PULL BOX



PLASTIC PULL BOX DETAIL FOR USE IN GRASS/SOIL AREAS



FIBERGLASS REINFORCED POLYMER CONCRETE DESIGNED FOR FULL VEHICULAR TRAFFIC (H2O LOADING)



TWO BOXES AND EXTENSION

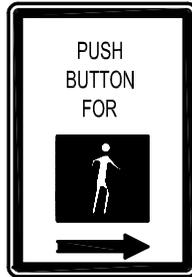
TABLE OF DIMENSIONS (MINIMUMS)

DESCRIPTION	DIMENSIONS (IN.)										TO BE USED AT
	A	B	C	D	E	F	G	H	J	K	
LARGE 18x30 2 BOXES & EXT.	31 1/4	18 1/4	3/4	33 1/8	20 1/8	12	16 3/8	29 3/8	1/2	11 1/4	CONTROLLER CABINET
MEDIUM 12x18 2 BOXES & EXT.	11 1/2	18 1/2	5/8	20 1/2	13 1/2	12	10 1/4	17 1/4	3/8	11 1/4	TRAFFIC SIGNAL POLE
SMALL 12x12 SINGLE BOX	12 7/8	12 7/8	5/8	14	14	12 3/4	10 1/2	10 1/2	1	12	UPSTREAM DETECTOR SPLICES, INTERCONNECT

PRECAST PULL BOX FOR USE IN CONCRETE/ASPHALT/ SIDEWALK AREAS BEHIND CURB
SEE CONTRACT DOCUMENTS FOR MATERIAL SPECIFICATIONS.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG		APPROVED BY:		
				DRAWING NO.	T4	
				SCALE	N.T.S.	

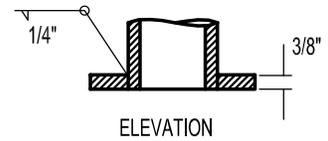
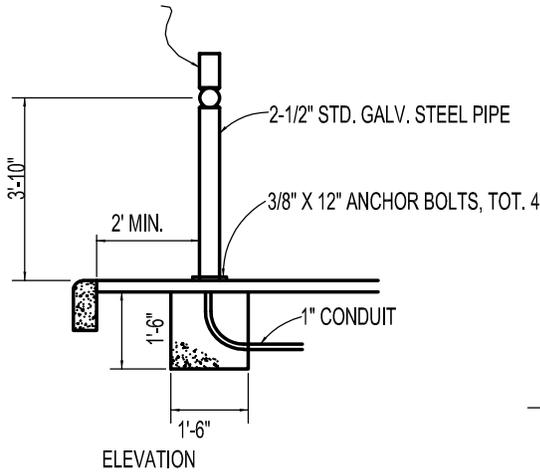
TRAFFIC SIGNAL POLE BOX



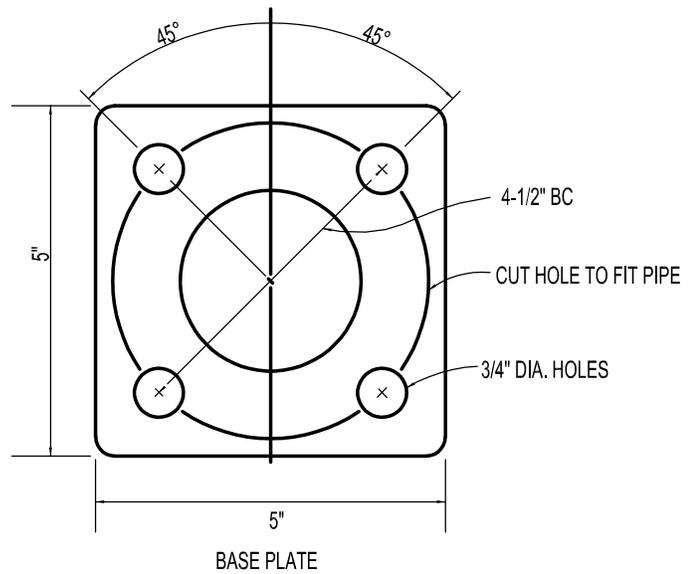
R10-4b
9"x12"

SIGN SHALL BE LABEL (STICK-ON) TYPE

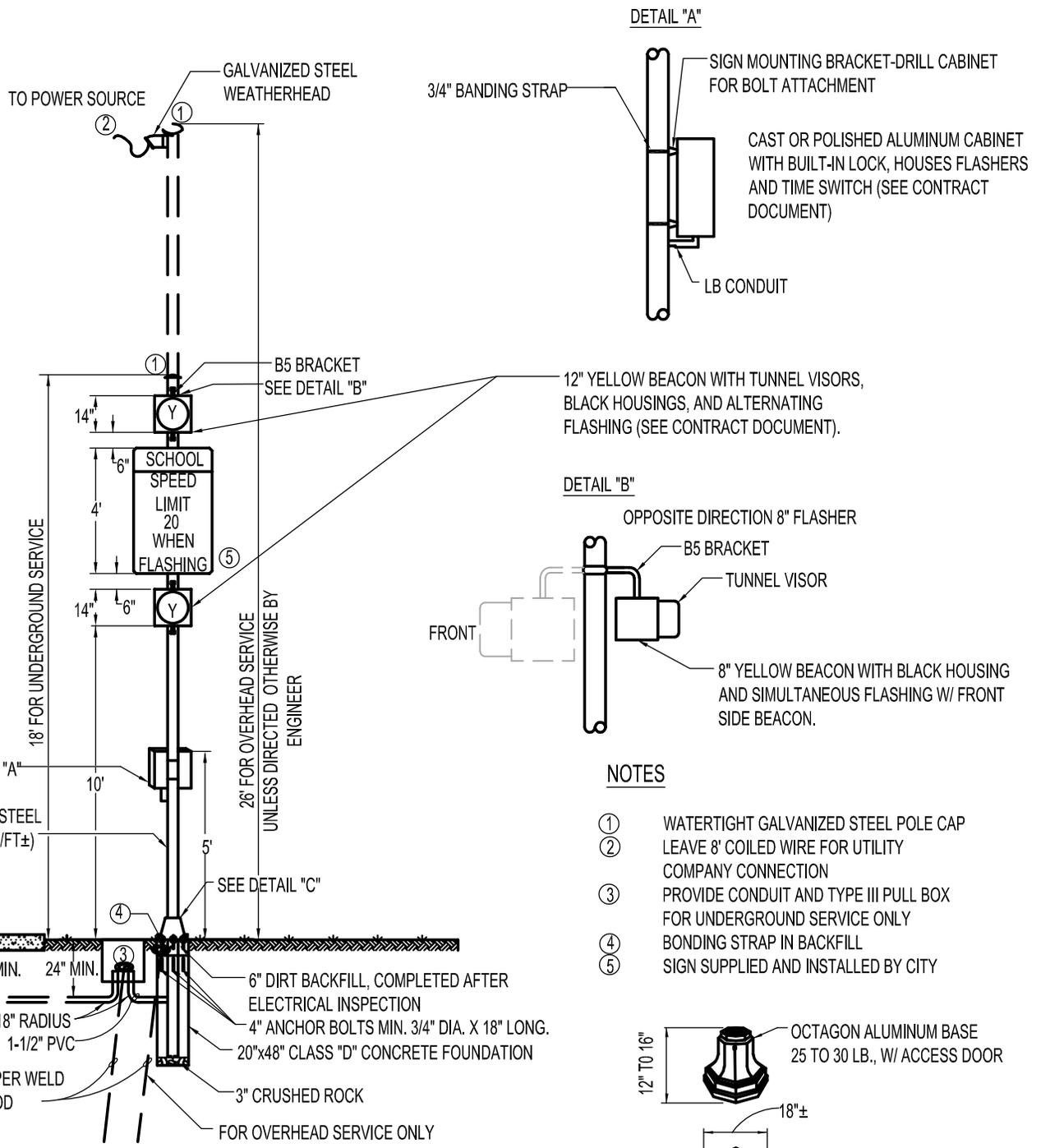
PUSHBUTTON WITH 2-1/2" POLE TOP MOUNTING FOR 5" X 7" SIGN



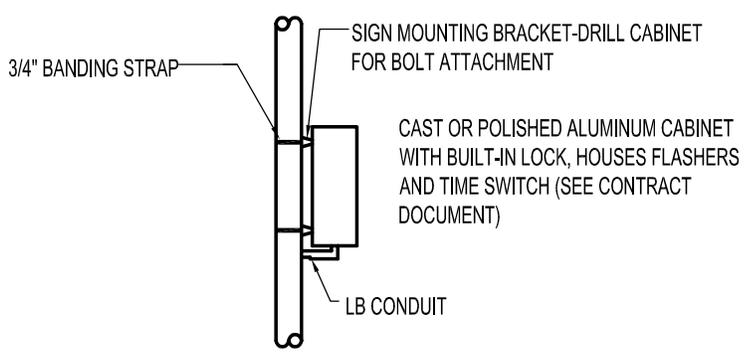
NOTE: CONDUIT SHALL PROTRUDE 2" MAX ABOVE FINISHED SURFACE FOUNDATION.



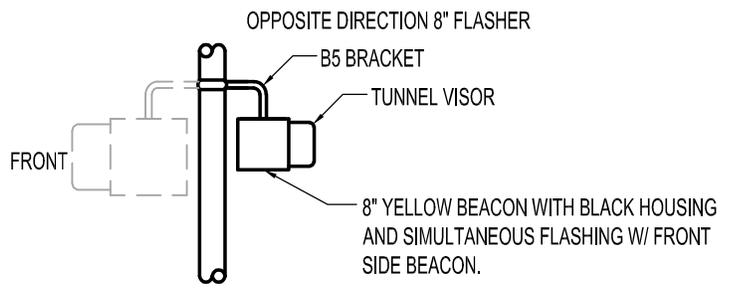
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG	PEDESTRIAN PUSH BUTTON POST AND SIGN	APPROVED BY:		
				DRAWING NO.	T5	
				SCALE	N.T.S.	



DETAIL "A"

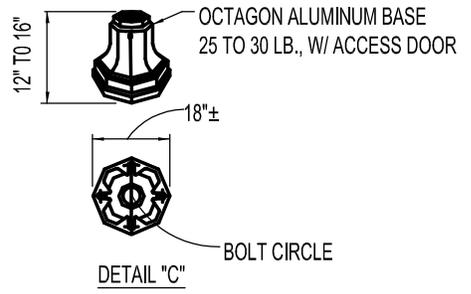


DETAIL "B"



NOTES

- ① WATERTIGHT GALVANIZED STEEL POLE CAP
- ② LEAVE 8' COILED WIRE FOR UTILITY COMPANY CONNECTION
- ③ PROVIDE CONDUIT AND TYPE III PULL BOX FOR UNDERGROUND SERVICE ONLY
- ④ BONDING STRAP IN BACKFILL
- ⑤ SIGN SUPPLIED AND INSTALLED BY CITY



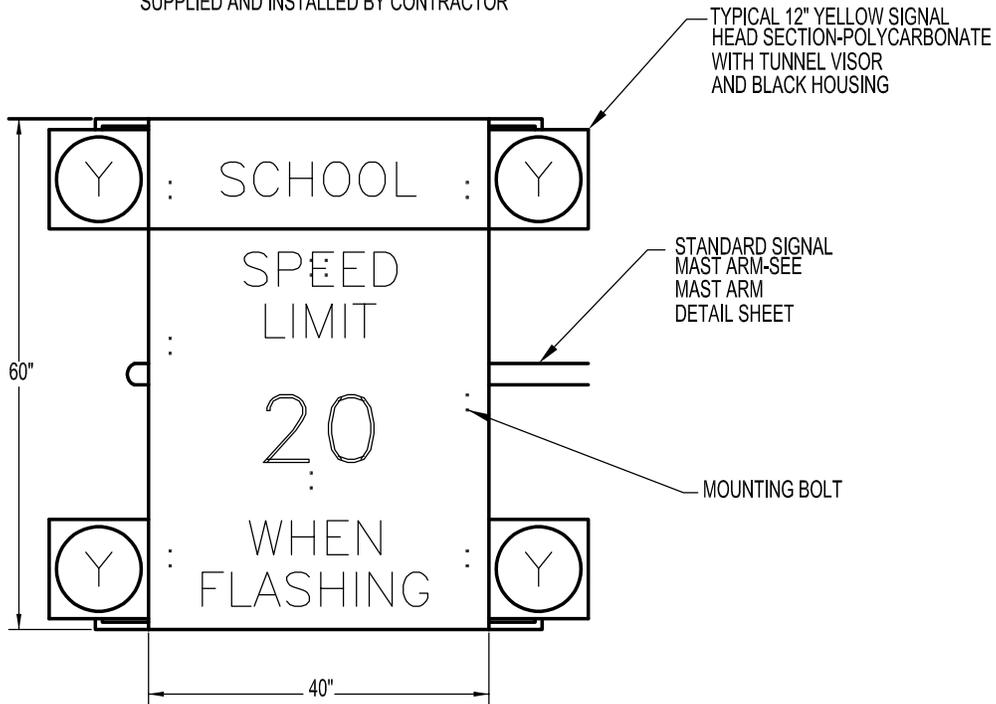
REVISIONS		
DATE	ITEM	BY
3/2020		ULTEIG

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

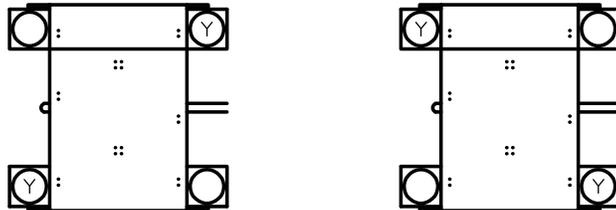
SCHOOL FLASHING BEACON ASSEMBLY
SIDE OF ROAD

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	T6
SCALE	N.T.S.

FRONT VIEW
 40"x60" SIGN TO BE
 SUPPLIED AND INSTALLED BY CONTRACTOR



FLASHING SEQUENCE SHALL BE:

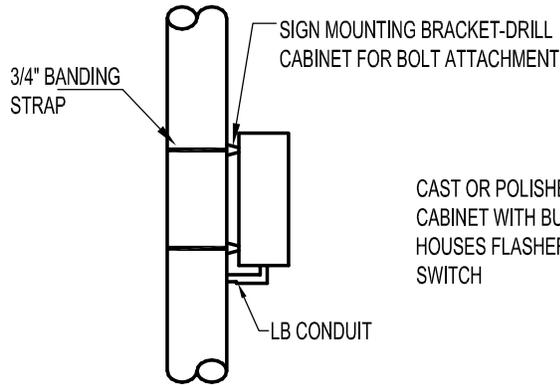


PLACEMENT NOTES:

1. ROADWAY WITH ONE THROUGH LANE: SIGN AND FLASHER ASSEMBLY CENTERED ON THROUGH LANE.
2. ROADWAY WITH TWO THROUGH LANES: SIGN AND FLASHER ASSEMBLY CENTERED ON LANE LINE BETWEEN THROUGH LANES.
3. ROADWAY WITH THREE THROUGH LANES: SIGN AND FLASHER ASSEMBLY CENTERED ON CENTER THROUGH LANE.

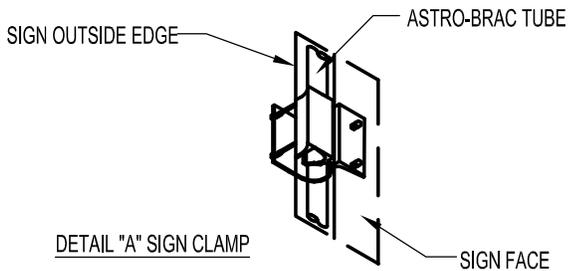
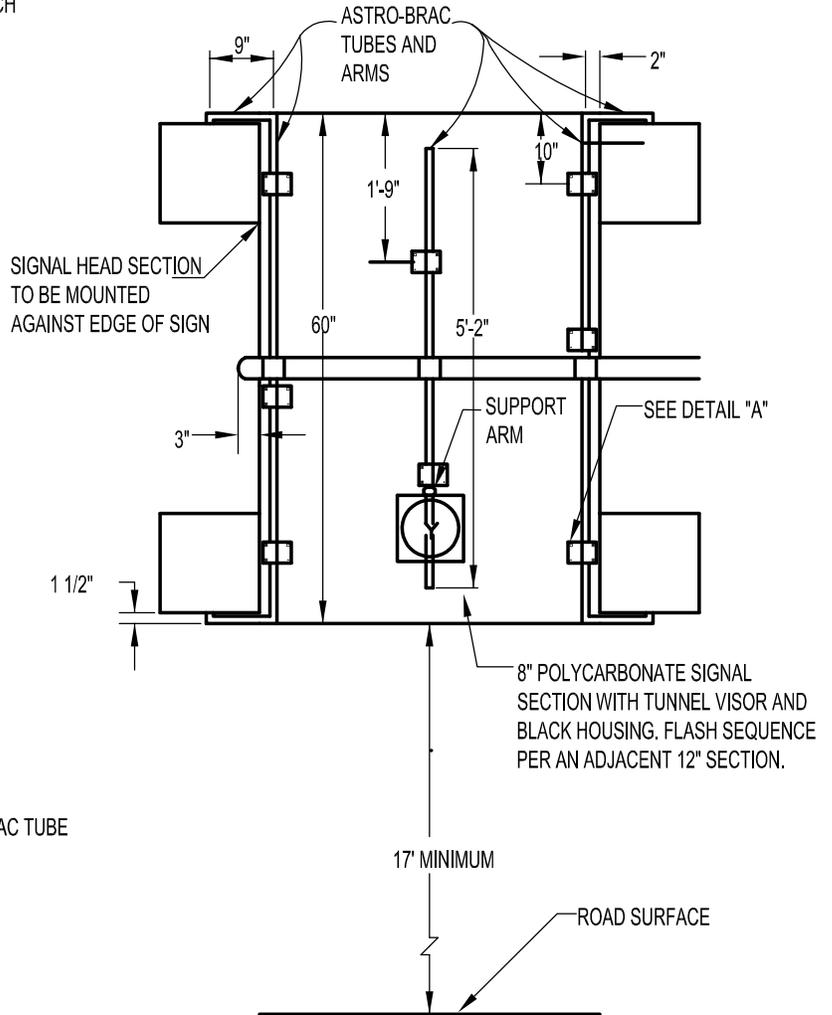
REVISIONS			 CITY OF Northglenn	PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		ULTEIG			APPROVED BY:	
			SCHOOL FLASHING BEACON ASSEMBLY OVERHEAD		DRAWING NO.	T7 - A
					SCALE	N.T.S.

CABINET AND FLASHER DETAIL



CAST OR POLISHED ALUMINUM CABINET WITH BUILT-IN LOCK, HOUSES FLASHERS AND TIME SWITCH

BACK VIEW



REVISIONS

DATE	ITEM	BY
3/2020		ULTEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

SCHOOL FLASHING BEACON ASSEMBLY
OVERHEAD

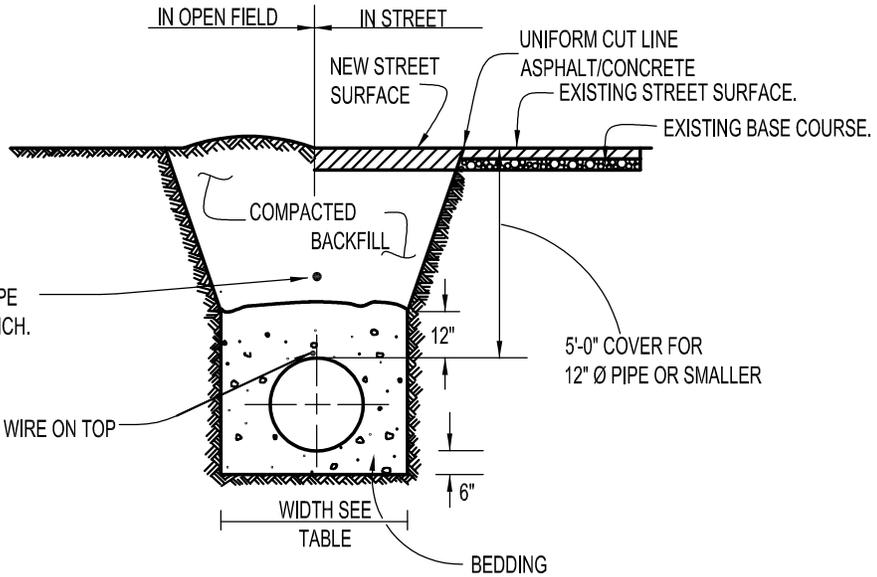
ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	T7 - B
SCALE	N.T.S.

NOTE: MINIMUM COVER TO BE BELOW OFFICIAL STREET GRADE.

TRENCH TO BE BRACED OR SHEETED AS REQUIRED BY OSHA.

2" WIDE LOCATOR TAPE BURIED IN PIPE TRENCH.

#12 TRACER WIRE ON TOP OF PIPE.



TYPICAL TRENCH SECTION

FOR PATCHING IN STREET SURFACE USE FULL DEPTH ASPHALT AS NOTED BELOW OR MATCH EXISTING PLUS ONE (1) INCH, WHICH EVER IS GREATER

PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-8"	2'-4"
6"	1'-10"	2'-6"
8"	2'-0"	2'-8"
12"	2'-4"	3'-0"

STREET CLASSIFICATION	DEPTH ASPHALT
ARTERIAL	10"
COLLECTOR	8"
LOCAL	6"

REVISIONS

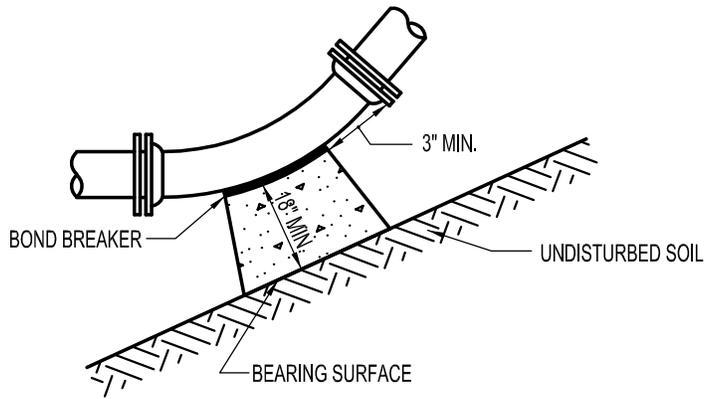
DATE	ITEM	BY
3/2020		UTLEIG



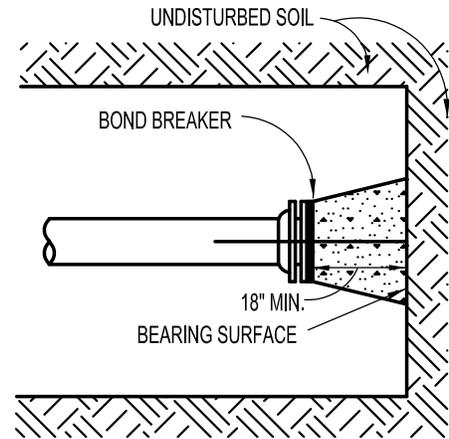
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

TYPICAL TRENCH SECTION PIPE PROTECTION

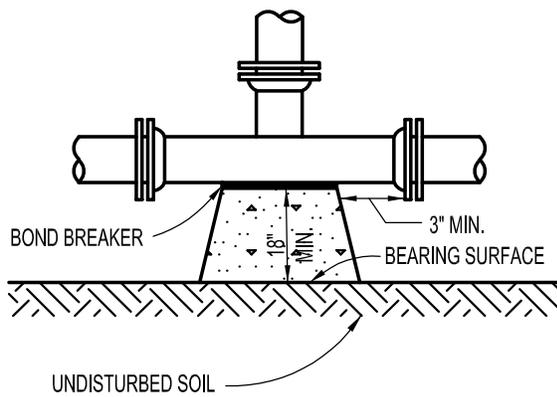
ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	W1
SCALE	N.T.S.



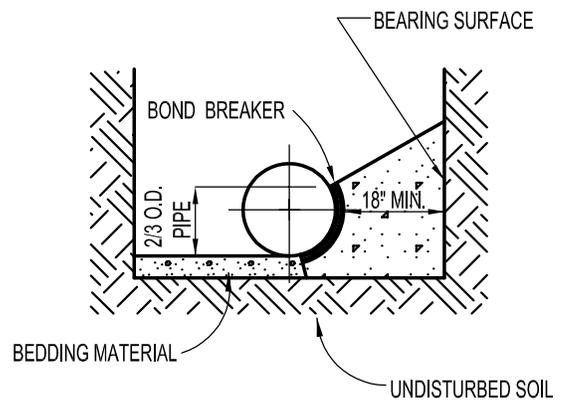
11¼°, 22½° AND 45° BENDS



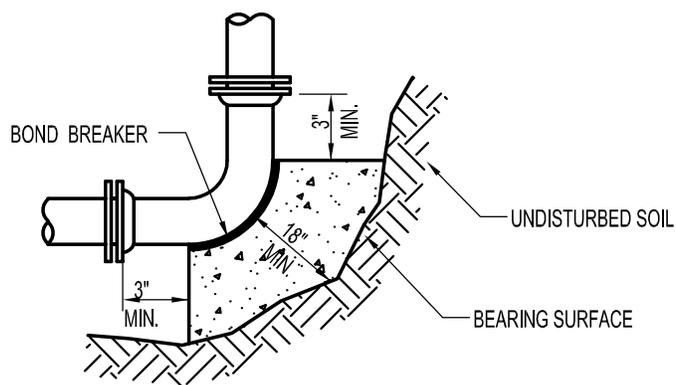
DEAD END



TEE



TYPICAL CROSS SECTION



90° BEND

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG			APPROVED BY:	
			CONCRETE THRUST BLOCKS BEARING SURFACES AND INSTALLATION		DRAWING NO.	W3
					SCALE	N.T.S.

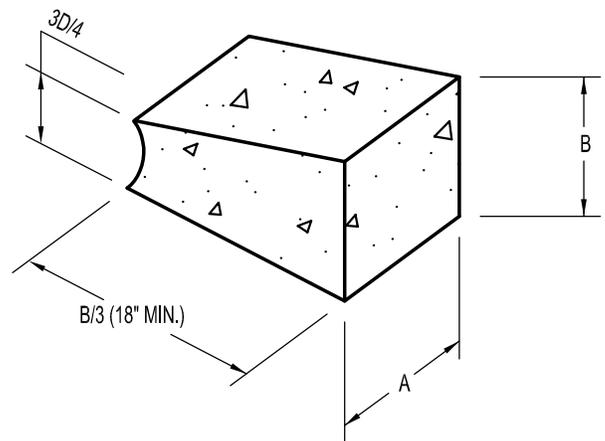
MINIMUM DIMENSIONS FOR THRUST BLOCKS

FITTING SIZE	TEES & PLUGS		90° BEND		45° BENDS & WYES	
	A	B	A	B	A	B
4"	1'-7"	1'-2"	1'-9"	1'-6"	1'-8"	0'-10"
6"	2'-0"	1'-11"	2'-5"	2'-2"	1'-10"	1'-7"
8"	2'-8"	2'-6"	3'-2"	3'-0"	2'-5"	2'-1"
10"	3'-4"	3'-3"	4'-0"	3'-10"	3'-0"	2'-9"
12"	4'-0"	3'-10"	4'-8"	4'-8"	3'-8"	3'-3"
14"	5'-5"	3'-10"	6'-6"	4'-11"	4'-9"	3'-5"
20"	5'-0"	5'-0"	6'-0"	6'-0"	5'-0"	4'-0"
24"	6'-0"	6'-0"	7'-0"	7'-0"	5'-0"	5'-0"
30"	7'-6"	7'-6"	8'-0"	8'-0"	6'-3"	6'-3"

FITTING SIZE	REDUCERS & 22 1/2° BENDS		11 1/4° BENDS	
	A	B	A	B
4"	1'-7"	0'-6"	0'-6"	0'-6"
6"	1'-9"	0'-10"	1'-0"	0'-6"
8"	1'-9"	1'-6"	1'-0"	1'-0"
10"	2'-2"	1'-11"	1'-6"	1'-0"
12"	2'-7"	2'-3"	2'-0"	1'-0"
14"	3'-5"	2'-5"	2'-0"	1'-6"
20"	3'-6"	3'-0"	3'-0"	2'-0"
24"	4'-6"	3'-0"	3'-0"	3'-0"
30"	4'-9"	4'-6"	3'-3"	3'-3"

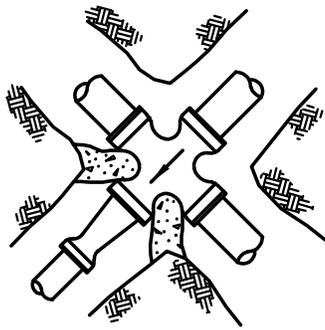
GENERAL NOTES:

1. BEARING SURFACE AREAS SHOWN IN CHART ARE MINIMUM.
2. BASED ON 150 P.S.I. INTERNAL PIPE PRESSURE.
3. SOIL BEARING CAPACITY = 2000 LB./SQ. FT.
4. ALL FITTINGS TO BE WRAPPED WITH POLYETHYLENE (MINIMUM 8 MIL.).

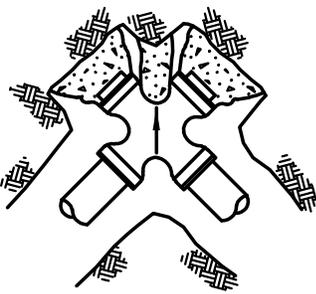


NOT TO SCALE

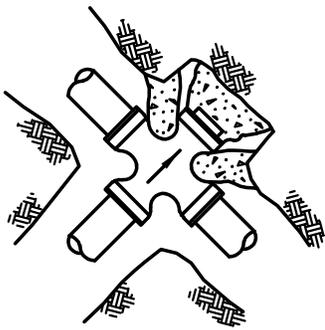
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG	CONCRETE THRUST BLOCK DIMENSIONS	APPROVED BY:		
				DRAWING NO.	W4	
				SCALE	N.T.S.	



UNBALANCED CROSS



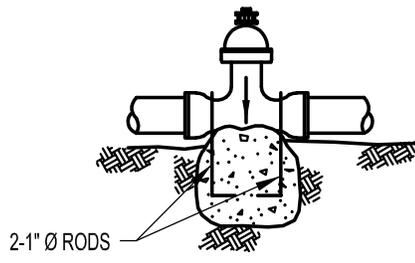
PLUGGED CROSS



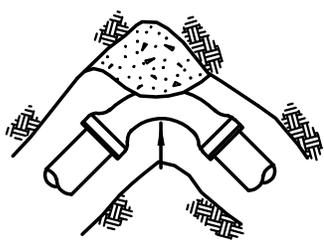
PLUGGED CROSS



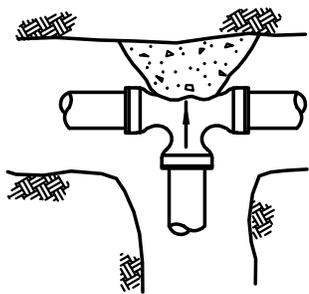
PLUGGED TEE



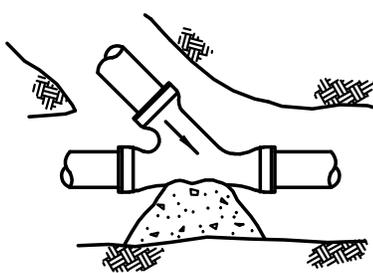
VALVE



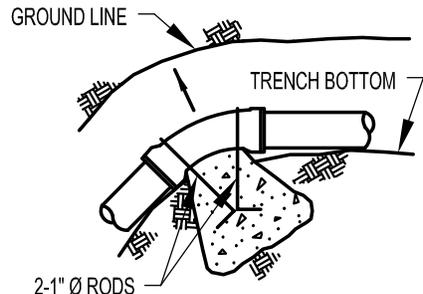
HORIZONTAL BEND



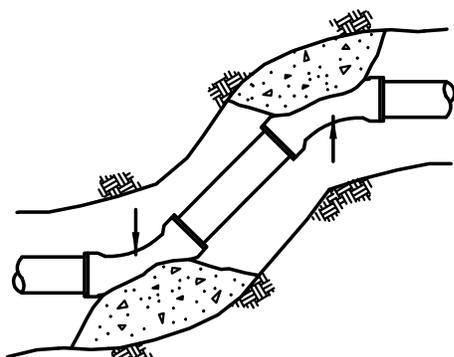
TEE



"Y" BRANCH



VERTICAL BEND



OFFSET

- NOTES:
 1. SIZE OF BLOCK TO BE A MINIMUM OF 18" THICK.
 2. ALL BLOCKING TO BE ON UNDISTURBED MATERIAL.

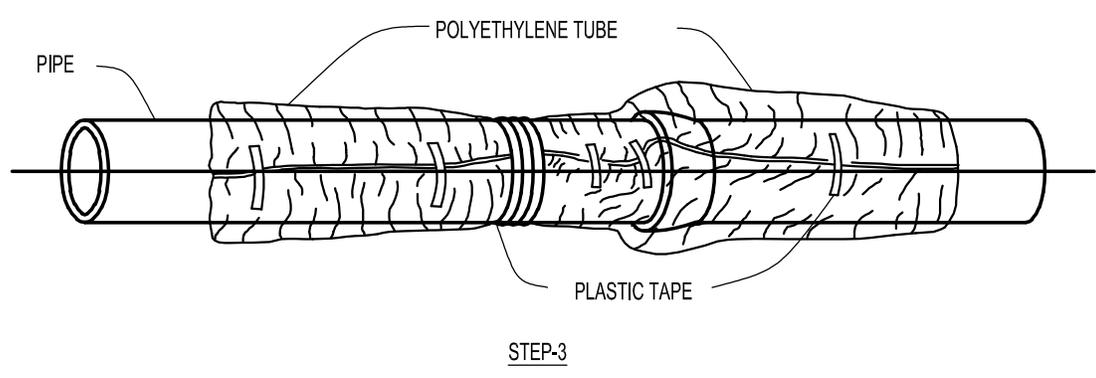
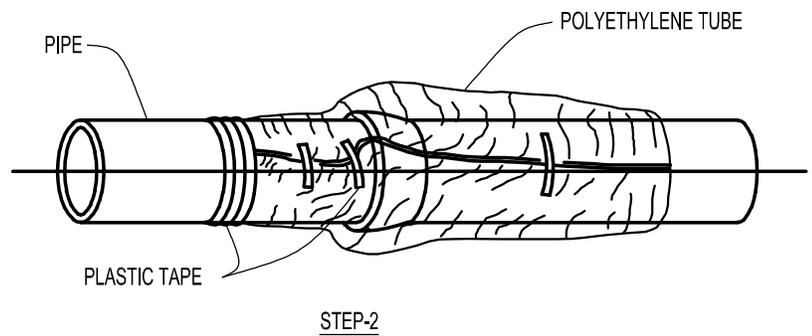
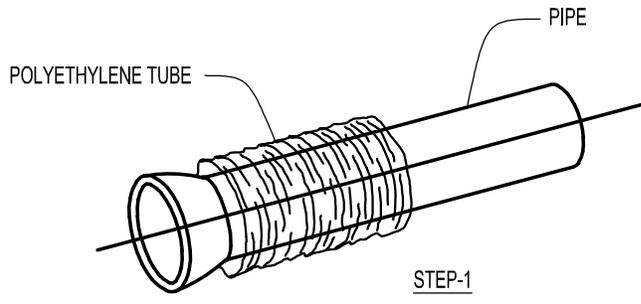
REVISIONS		
DATE	ITEM	BY
3/2020		UTLEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CONCRETE THRUST BLOCKING
FOR UNBALANCED FITTINGS

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	W5
SCALE	N.T.S.



FIELD INSTALLATION-POLYETHYLENE WRAP

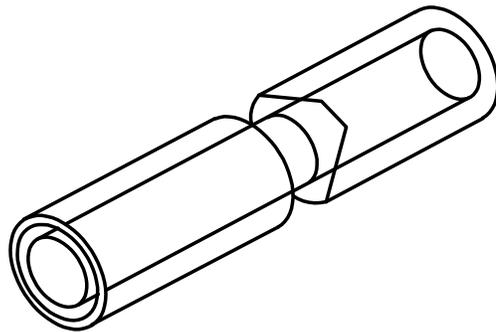
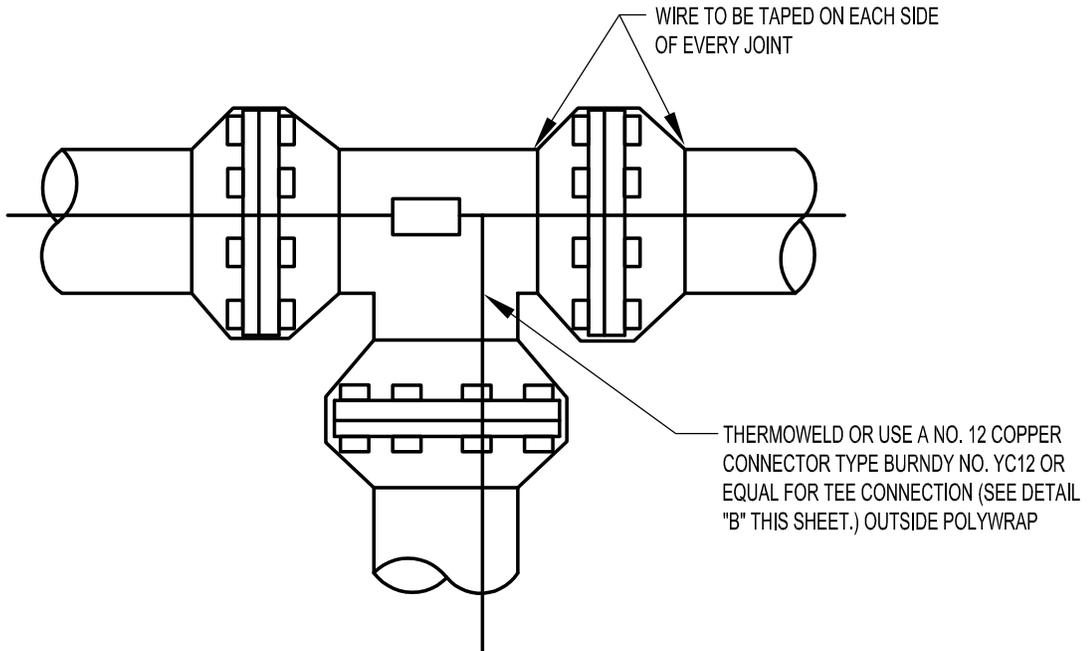
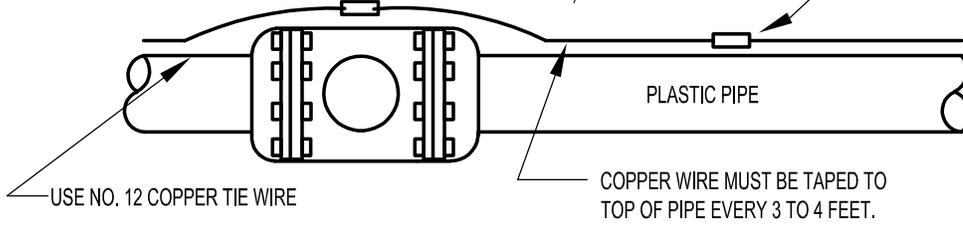
- STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH.
- STEP-2 PULL THE TUBE OVER THE LENGTH OF THE PIPE, TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.
- STEP-3 OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF THE PIPE AND TAPED IN PLACE.

NOTE: POLYETHYLENE SHALL BE MINIMUM 8-MIL THICKNESS

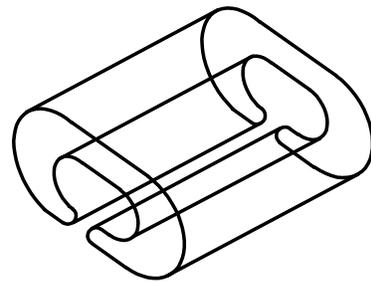
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG			APPROVED BY:	
			POLYETHYLENE WRAP FOR DUCTILE IRON PIPE		DRAWING NO.	W6
					SCALE	N.T.S.

THERMOWELD OR USE A NO. 12 COPPER CONNECTOR TYPE BURNDY NO. YC12 OR EQUAL

THERMOWELD OR USE A NO. 12 COPPER CONNECTOR TYPE DOSSERT NO. DCP2 HOMAC NO. CST OR EQUAL (SEE DETAIL "A" THIS SHEET)



DETAIL A



DETAIL B

REVISIONS

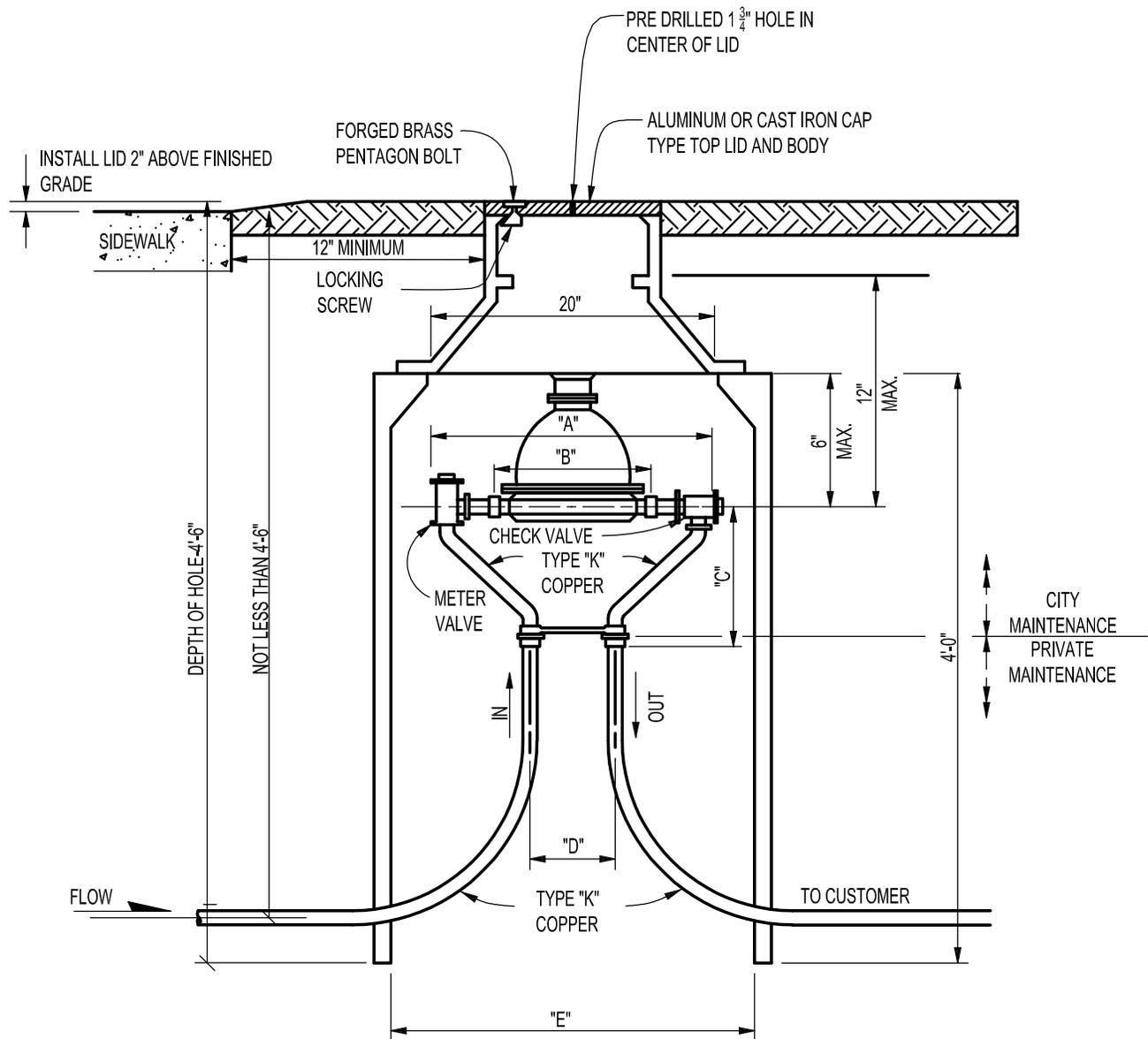
DATE	ITEM	BY
3/2020		UTLEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

TRACER WIRE ON PLASTIC PIPE

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	W7
SCALE	N.T.S.



METER SIZE	A	B	C	D	E
*5/8"x3/4"	14 1/4"	9 5/16"	8 15/16"	5"	20"
1"	17 1/4"	11 1/16"	11 1/4"	6"	24"

* REQUIRES FORD A23 ADAPTOR
 VERIFY ALL DIMENSIONS BASED ON MANUFACTURES SPECIFICATIONS

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY				DRAWN BY:
3/2020		ULTEIG		APPROVED BY:		
				DRAWING NO.	W8 - A	
				SCALE	N.T.S.	
SETTINGS FOR 5/8" x 3/4" THRU 1" METERS						

GENERAL NOTES

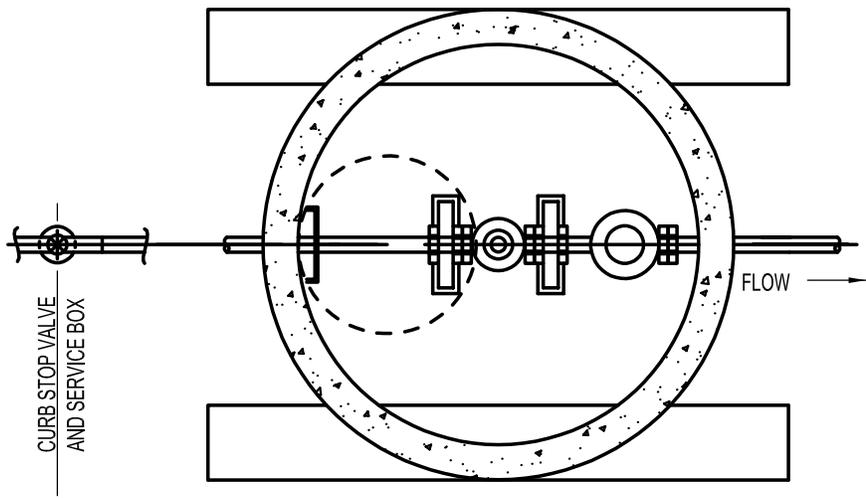
1. NOT FOR INSTALLATION IN ROADWAYS, DRIVEWAYS, PARKING AREAS, SIDEWALKS, OR CONCRETE.
2. IF SURFACE IS NOT TO OFFICIAL GRADE AT TIME OF INSTALLATION OF METER, OWNER MUST RAISE OR LOWER PIT WHEN SURFACE IS GRADED.
3. METER SHALL BE SET WITHIN PUBLIC R.O.W.
4. NO CONCRETE FLOOR TO BE LAID IN METER PIT.
5. METER PIT SHALL BE CONSTRUCTED OF MODIFIED HI-DENSITY POLYETHYLENE.
6. ADJUSTMENT RINGS SHALL BE 2", 3", 4" OR 6" IN HEIGHT AND SHALL BE INSERTED BETWEEN THE TWO TOP RINGS.
7. FOR WATER SERVICE LINES 1" AND LARGER: IF THE METER PIT IS NOT INSTALLED WITHIN THE PUBLIC R.O.W. THEN A CURB STOP AND BOX SHALL BE INSTALLED WITHIN THE PUBLIC R.O.W.
8. REINSPECTION FEE: A FEE WILL BE ASSESSED FOR EACH REINSPECTION IF THE METER PIT AND YOKE ASSEMBLY FAIL TO PASS THE FIRST TWO INSPECTIONS.
9. IRRIGATION TAPS SHALL BE PAID FOR PRIOR TO THE TAP BEING MADE.
10. ADDRESSES SHALL BE MARKED FOR EACH METER PRIOR TO SETTING THE METER.
11. ANY METER SETTING LOCATED IN A DRIVING SURFACE SHALL BE INSTALLED IN A VAULT IN CONFORMANCE WITH DETAIL W11

IN CASE OF A BROKEN RADIO FREQUENCY METER

1. REGISTER/HRT TO ORDER A PIT TRANSPONDER W/HRT II WHICH WILL FIT A BADGER MTR MODEL 25, PLEASE CALL NATIONAL METER AT 303-339-9100.
2. RES DOME LTD PURCHASE A CASTING INC. METER LID ONLY (MADE OF CAST IRON).
3. CALL CALL THE CITY CUSTOMER SERVICE. SET UP A MEETING AFTER ALL MATERIALS ARE IN HAND. (THE CITY WILL RE-INSTALL AFTER THE INSPECTION.)
 - a. CONTRACTORS WILL HAVE FIVE (5) FULL WORKING DAYS TO COMPLY WITH THESE SPECIFICATIONS.
 - b. METERS WILL BE SET WITHIN THE SUBDIVISION UNTIL THE FIFTH DAY.
 - c. AFTER THE FIFTH DAY, IF NOT ALL OF THE REQUIREMENTS ARE MET, METERS WILL NOT BE SET IN THE SUBDIVISION UNTIL THE CITY REQUIREMENTS ARE COMPLIED WITH.
 - d. THE CITY ALSO REQUIRES A RECEIPT SHOWING THE REGISTER WAS PAID FOR BY THE CONTRACTOR.

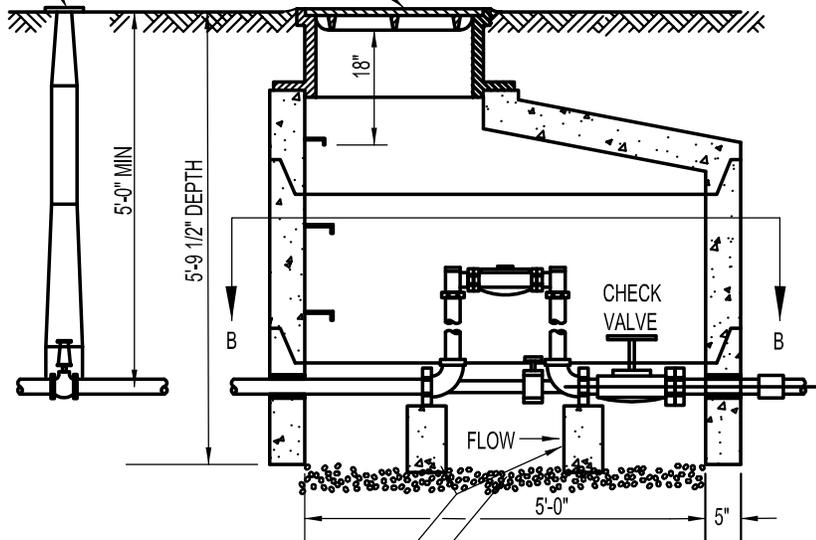
PLEASE KEEP IN MIND THAT ALL JUMPERS FOUND IN THE METER PITS ARE SUBJECT TO A FINE.

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG	CITY OF Northglenn	SETTINGS FOR 5/8" x 3/4" THRU 1" METERS	APPROVED BY:	
					DRAWING NO.	W8 - B
					SCALE	N.T.S.



SECTION B-B

CURB STOP AND BOX SHALL BE INSTALLED WITHIN THE PUBLIC R.O.W.
 24" ALUMINUM MANHOLE RING AND COVER WITH CAM LOCK. INSTALL COVER TO 2" ABOVE FINISH GRADE.

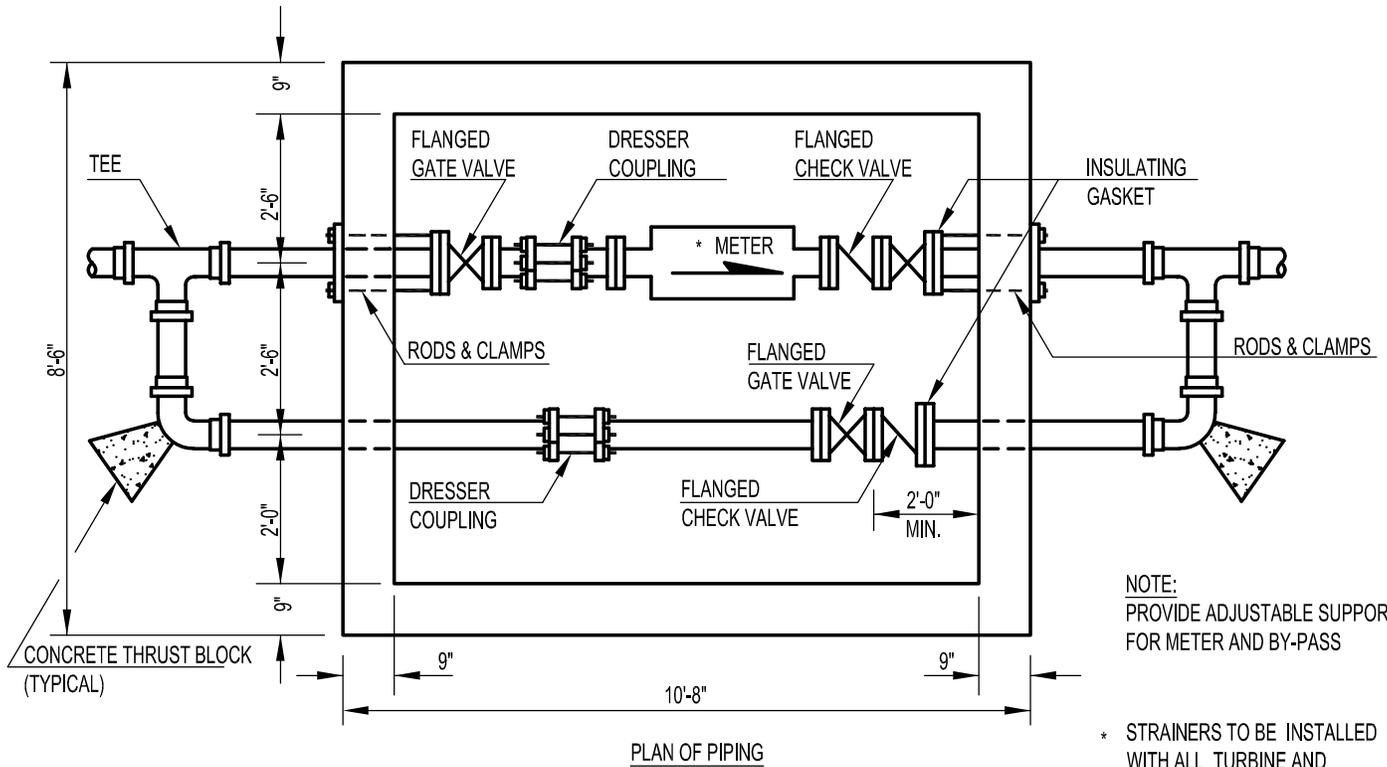


3/4" OR 1-1/2" ROCK
 SUPPORT UNDER METER
 ELEVATION SECTION

GENERAL NOTES:

1. IF SURFACE IS NOT TO OFFICAL GRADE AT TIME OF INSTALLATION OF METER, OWNER MUST RAISE OR LOWER PIT WHEN SURFACE IS AT FINAL GRADE.
2. METER SETTING MUST BE INSPECTED BEFORE BACKFILLING.
3. BYPASS IS TO BE INSTALLED UNLESS OTHERWISE SPECIFIED.
4. NO CONCRETE TO BE LAID IN FLOOR OF METER PIT.
5. PIPING SHALL BE TYPE "K" COPPER OR THREADED BRASS.
6. IF GROUND CONDITIONS ARE UNSTABLE, THE ENGINEER MAY REQUIRE THAT FOOTINGS BE INSTALLED.
7. THE WORD "WATER" SHALL BE CAST ON THE LID.
8. 3/4" OR 1-1/2" ROCK SHALL BE PLACED IN THE FLOOR OF METER PIT 6" THICK.
9. SUPPORT UNDER METER MAY BE BRICK OR CONCRETE BLOCK.
10. COMPRESSION JOINTS ONLY WILL BE USED.

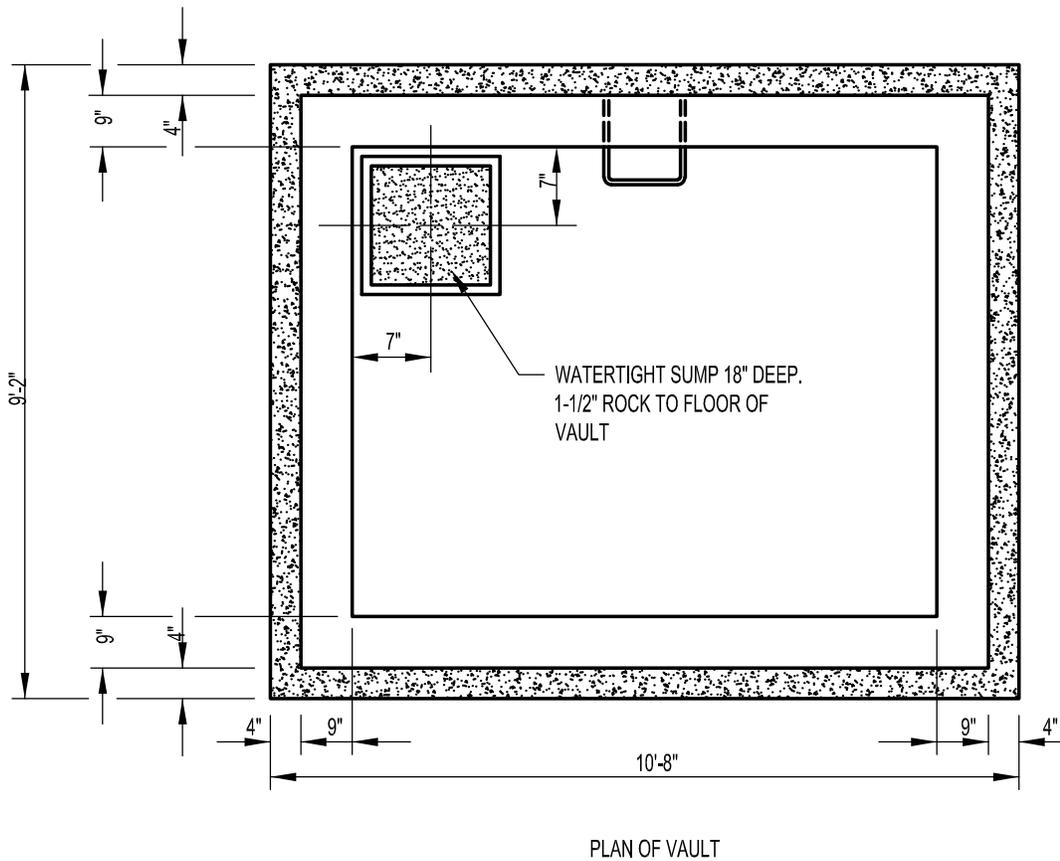
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
			METER SETTINGS FOR 1-1/2" AND 2" METER WITH VALVE AND BYPASS		DRAWING NO.	W9
					SCALE	N.T.S.



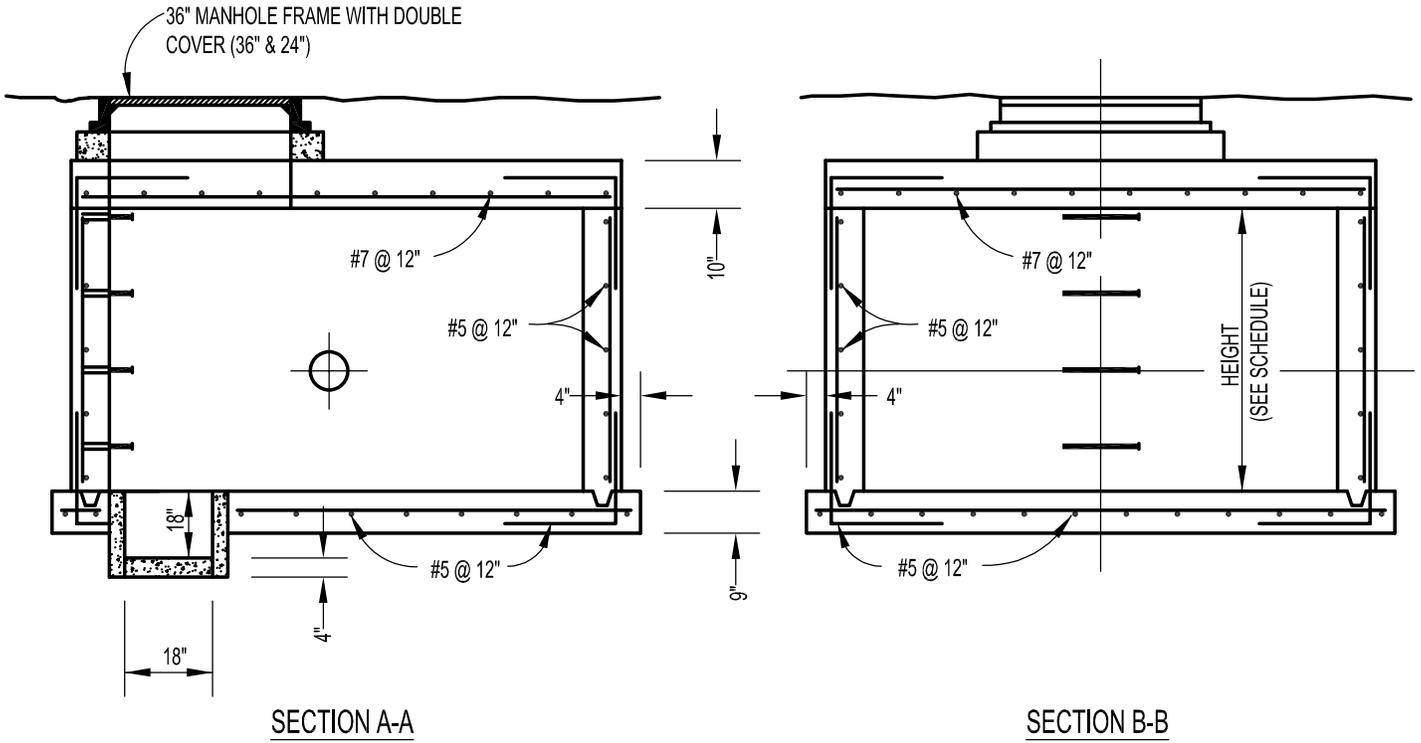
NOTE:
PROVIDE ADJUSTABLE SUPPORT
FOR METER AND BY-PASS

* STRAINERS TO BE INSTALLED
WITH ALL TURBINE AND
COMPOUND METERS.

GENERAL NOTE:
1. SOME INSTALLATIONS MAY
REQUIRE INSULATION FOR
PROTECTION OF CATHODIC
PROTECTION SYSTEM



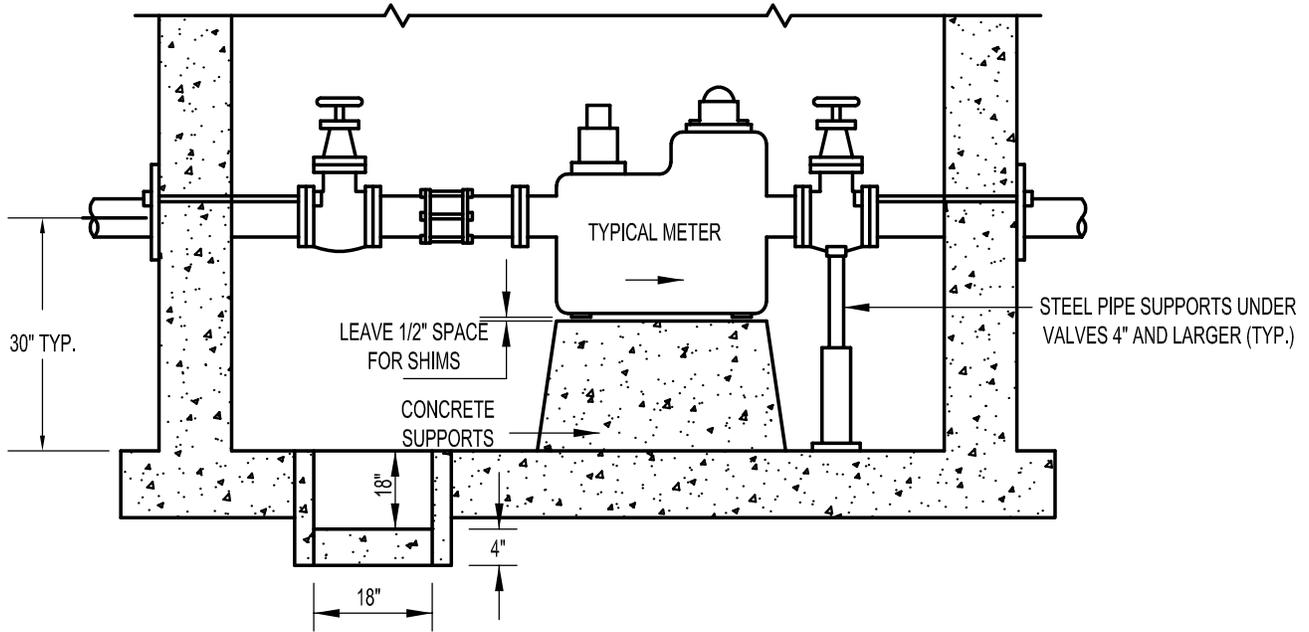
REVISIONS			 PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY		DRAWN BY:	JLT
3/2020		UTLEIG	APPROVED BY:		
			DRAWING NO.	W10	
			SCALE	N.T.S.	
STANDARD 3" AND 4" METER SETTING					



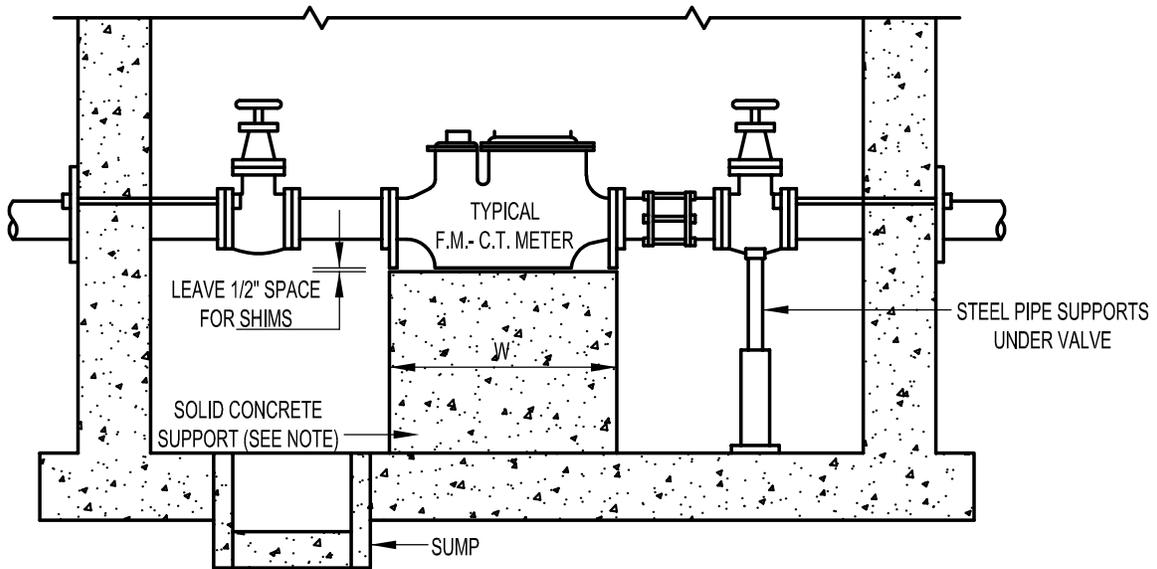
METER VAULT-INSIDE DIMENSION SCHEDULE

METER SIZE	LENGTH	WIDTH	HEIGHT	WALL THICKNESS
3"	8'-0"	7'-0"	7'-0"	8"
4"	10'-0"	7'-0"	7'-0"	8"
6"	12'-0"	9'-0"	7'-0"	8"
8"	12'-0"	9'-0"	7'-0"	8"
12"	12'-0"	10'-0"	8'-0"	8"

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
			TYPICAL METER VAULT		DRAWING NO.	W11
					SCALE	N.T.S.



TYPICAL CONC. METER SUPPORTS
FOR 3", 4", 6", 8", & 10" METERS



TYPICAL CONC. METER SUPPORT
FOR F.M.-M.C.T. OR TURBINE

NOTES:

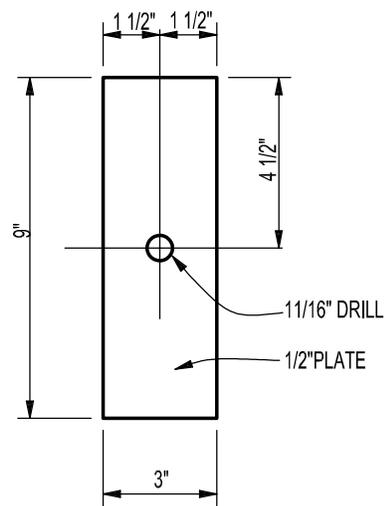
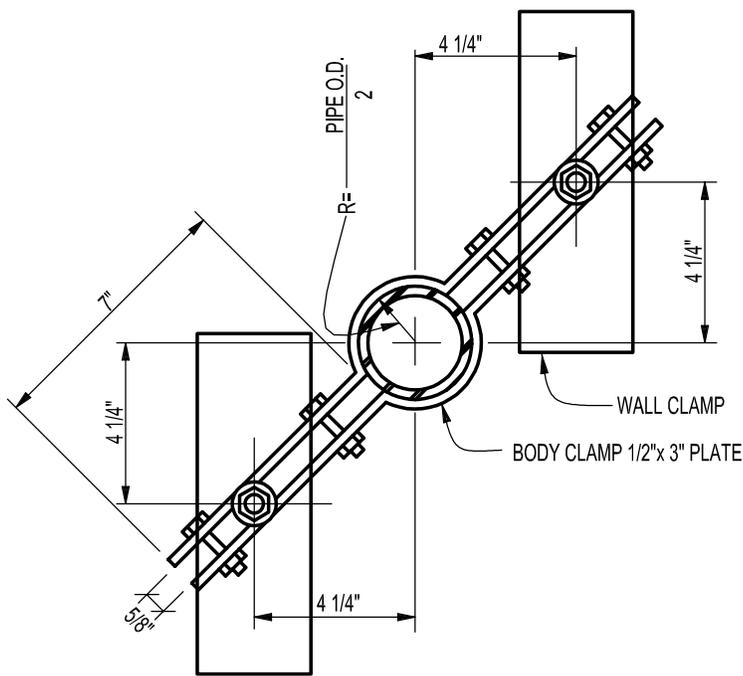
1. SOLID CONCRETE BASE EXTENDS UNDER THE F.M.-C.T. METER BYPASS FOR 6", 8" & 10".
2. SOLID CONCRETE BASE MAY BE PRECAST.

SIZE OF CONCRETE SUPPORT

- 6" F.M.-C.T. W=3'-9" L=3'-0"
- 8" F.M.-C.T. W=4'-5" L=3'-8"
- 10" F.M.-C.T. W=5'-8" L=4'-8"

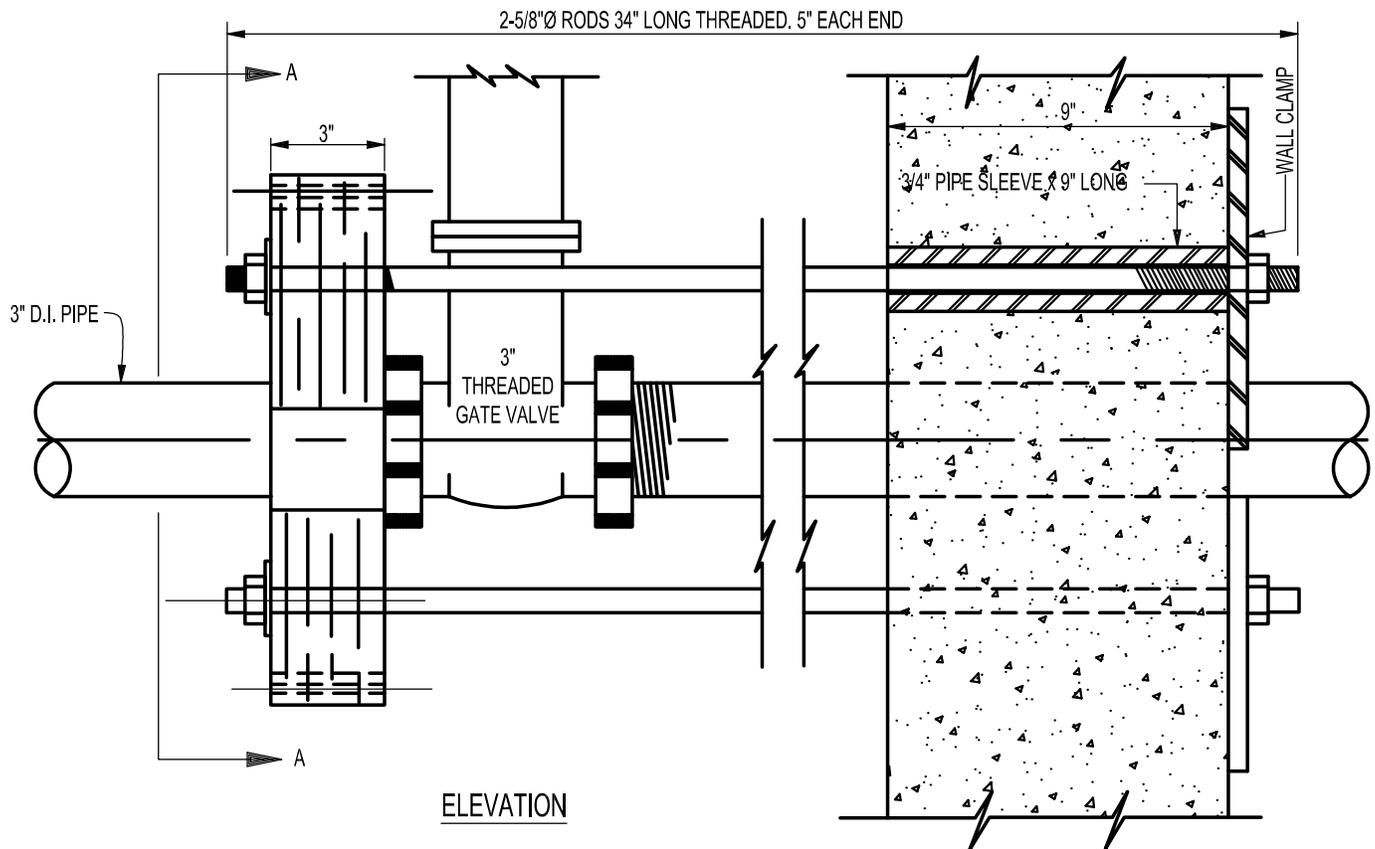
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG			APPROVED BY:	
					DRAWING NO.	W12
					SCALE	N.T.S.

STANDARD CONCRETE METER SUPPORT



WALL CLAMP
4 REQUIRED

SECTION A-A



ELEVATION

REVISIONS

DATE	ITEM	BY
3/2020		UTLEIG

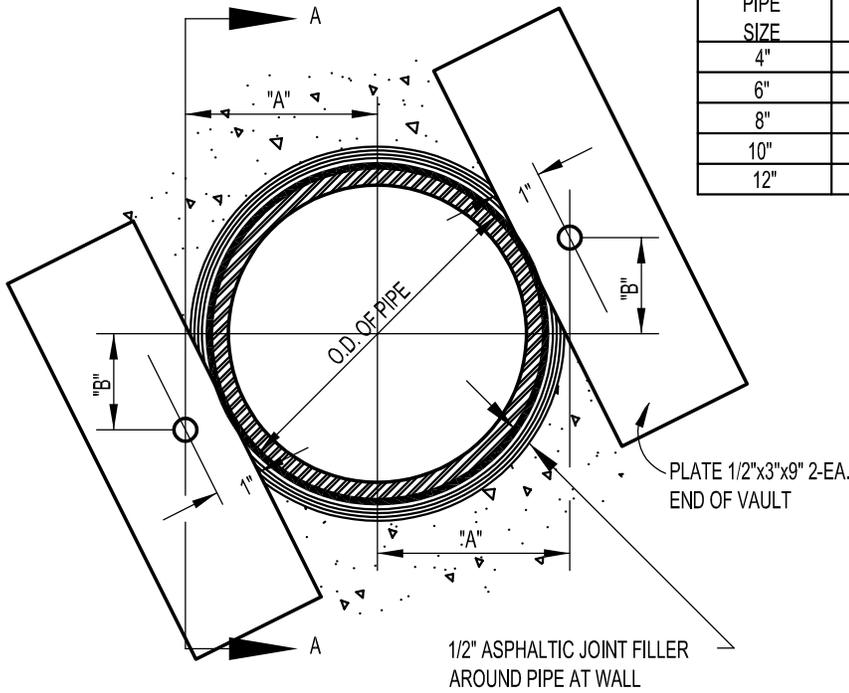


PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

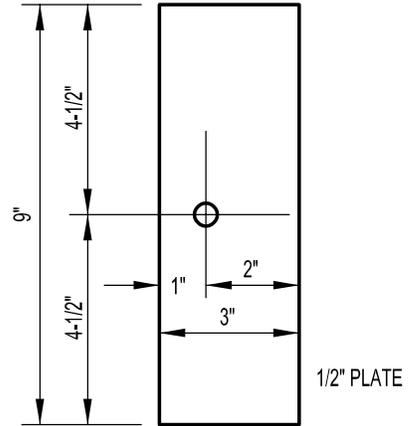
WALL AND BODY CLAMPS 3" METER

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	W13
SCALE	N.T.S.

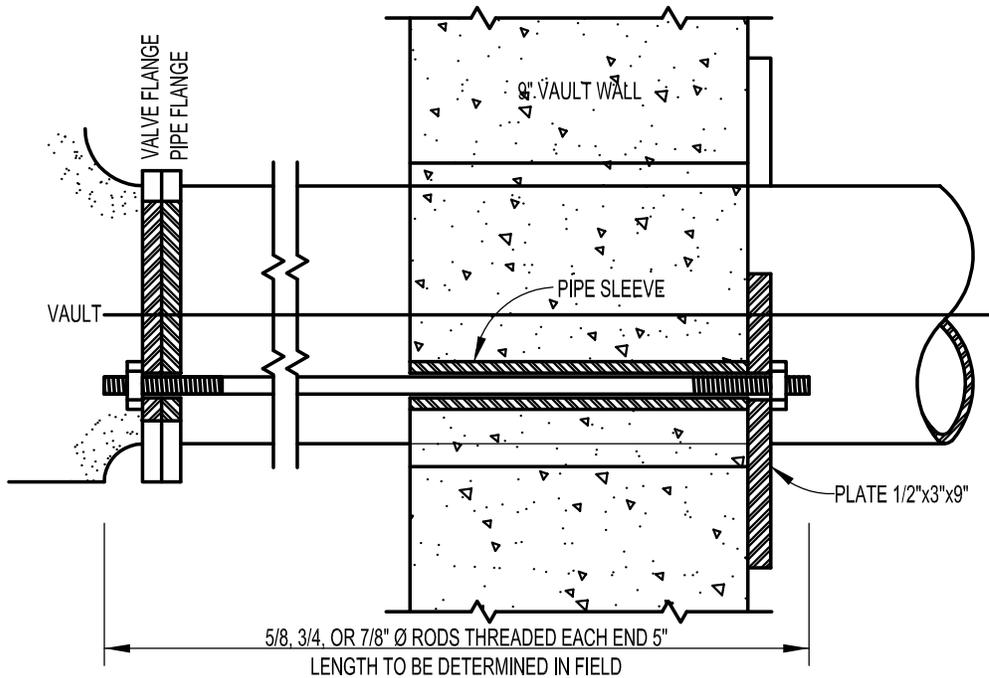
PIPE SIZE	RODS #, SIZE	WALL SLEEVE	"A"	"B"
4"	2-5/8 Ø	3/4x9"	3-1/2"	1-7/16"
6"	2-5/8 Ø	3/4x9"	4-3/8"	1-13/16"
8"	2-3/4 Ø	1"x9"	5-7/16"	2-1/4"
10"	2-7/8 Ø	1-1/2x9"	5-7/8"	3-3/8"
12"	2-7/8 Ø	1-1/2x9"	6-1/2"	3-15/16"



EXTERIOR ELEVATION



WALL PLATE



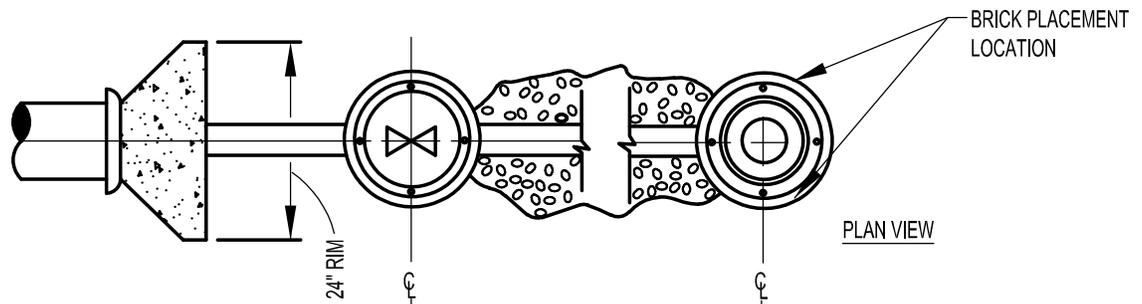
SECTION A-A

REVISIONS		
DATE	ITEM	BY
3/2020		UTLEIG

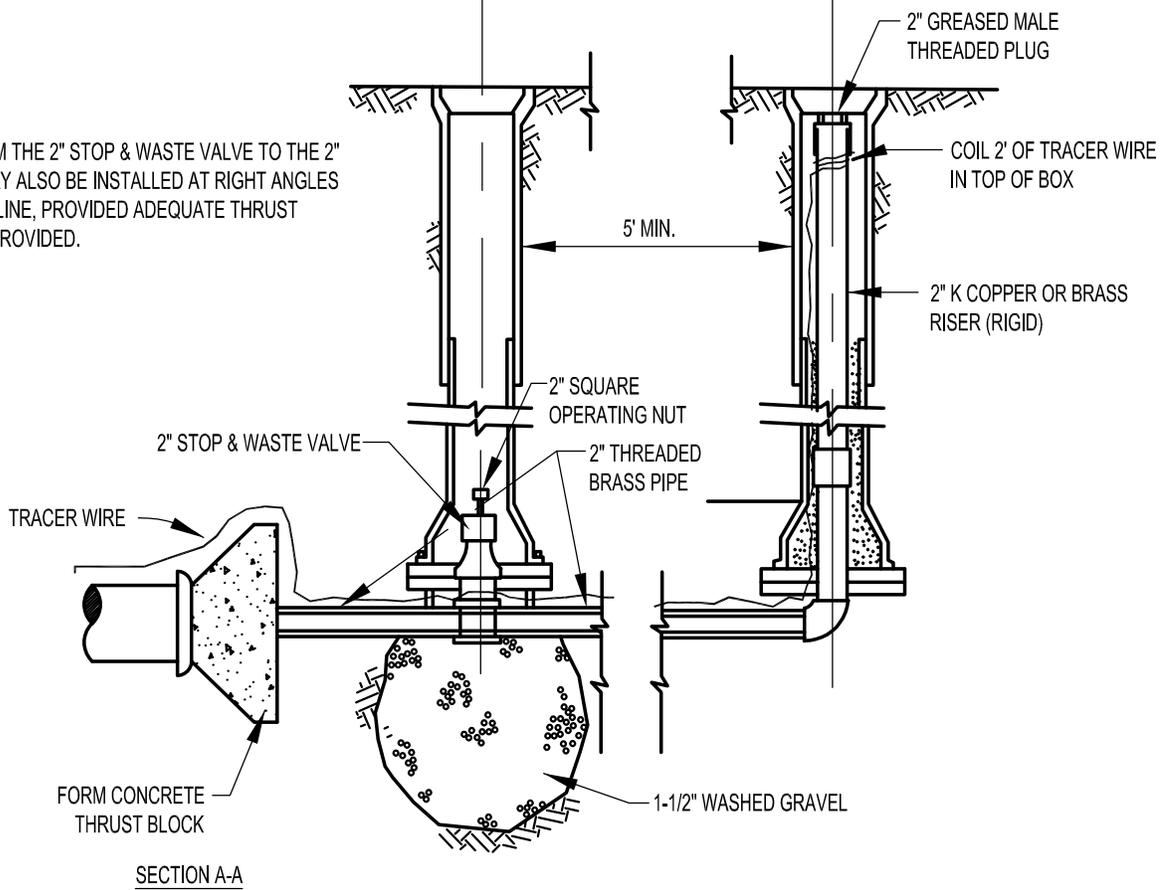
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

WALL CLAMPS FOR 4" TO 12" METERS

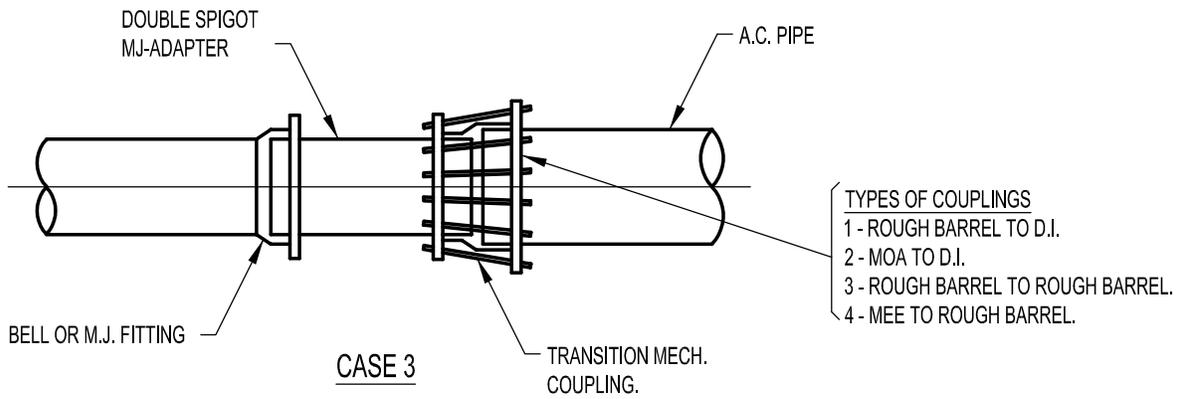
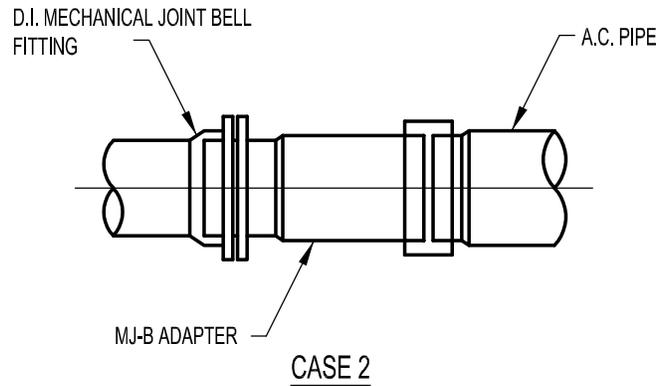
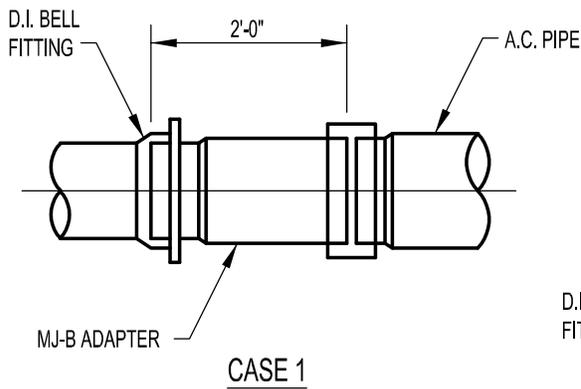
ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	W14
SCALE	N.T.S.



NOTE:
 THE LINE FROM THE 2" STOP & WASTE VALVE TO THE 2" RISER PIPE MAY ALSO BE INSTALLED AT RIGHT ANGLES TO THE MAIN LINE, PROVIDED ADEQUATE THRUST BLOCKING IS PROVIDED.



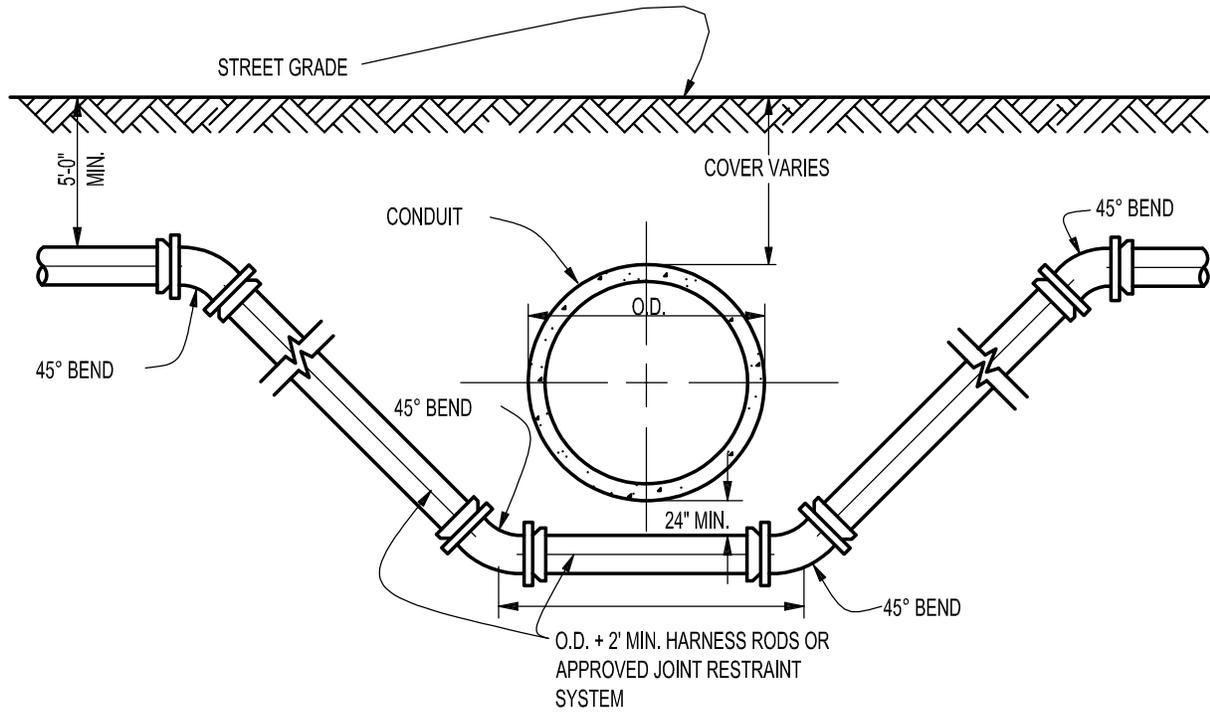
REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
			STANDARD BLOW-OFF INSTALLATION		DRAWING NO.	W15
					SCALE	N.T.S.



MOA = MACHINED OVER ALL.
 MEE = MACHINED EACH END.
 MJ = MECHANICAL JOINT.
 MJ-B = MECHANICAL JOINT-BELL ADAPTER.

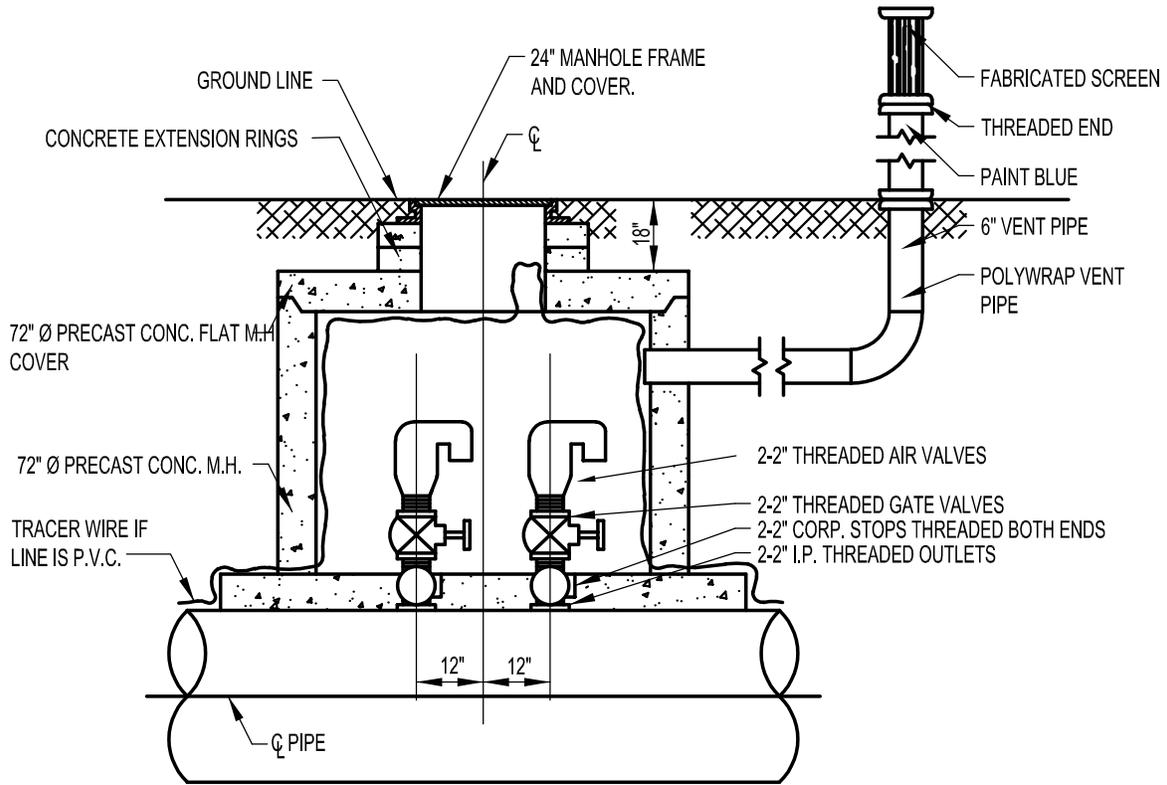
REVISIONS			 CITY OF Northglenn	PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
				DRAWING NO.	W16	
				SCALE	N.T.S.	

A.C. TO D.I. PIPE ADAPTER

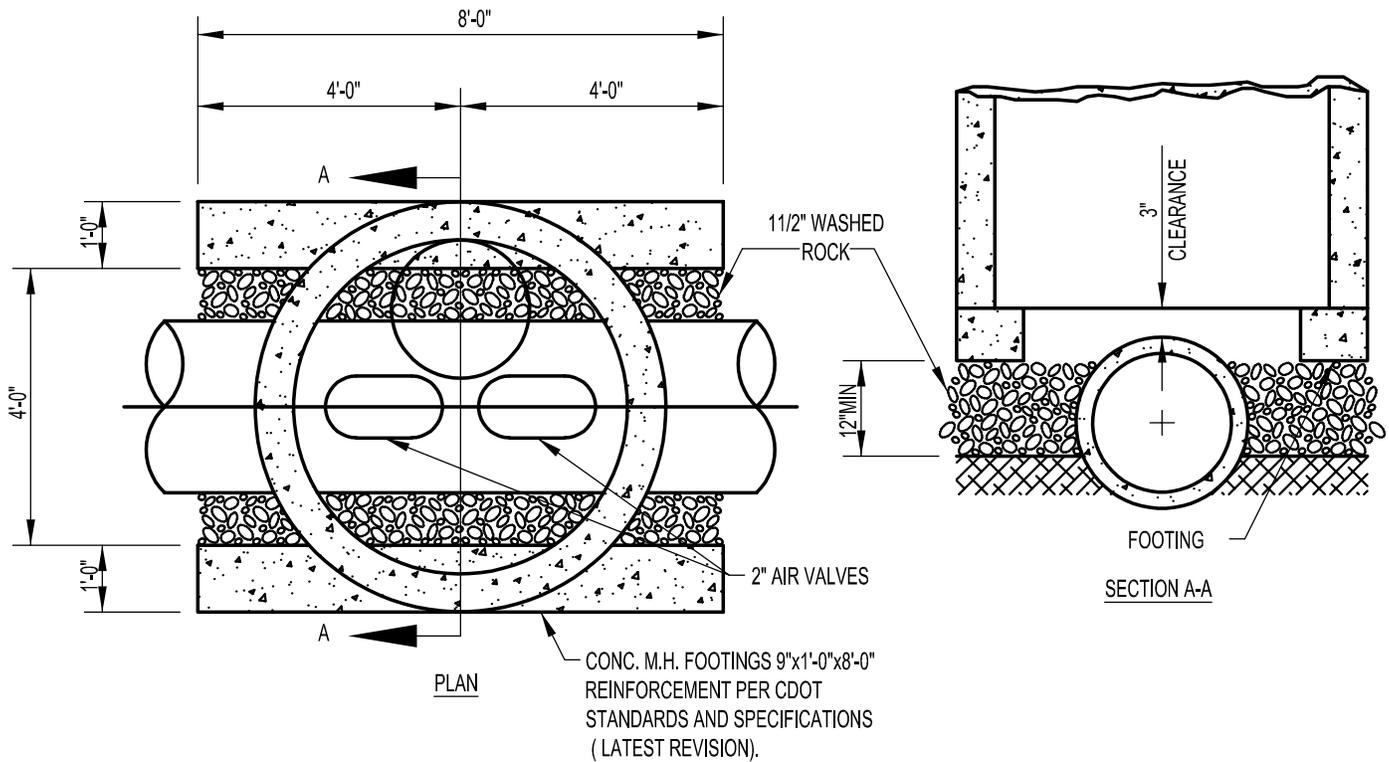


- NOTES:
1. SEWER LINES CROSSING ABOVE WATER MAINS SHALL BE DUCTILE IRON PIPE 9' EACH SIDE OF CROSSING (MIN.).
 2. MINIMUM CLEARANCE 18" AS SHOWN ABOVE.
 3. D.I.P. WILL BE WRAPPED.
 4. CONDUIT TO BE PROPERLY SUPPORTED.
 5. WHEN HARNESS RODS ARE USED, CONCRETE THRUST BLOCKS SHALL BE INCLUDED.
 6. SEE ENCASUREMENT DETAIL FOR CONDUIT CROSSING WHEN ENCASUREMENT IS REQUIRED

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG	CONDUIT CROSSING	APPROVED BY:		
				DRAWING NO.	W17	
				SCALE	N.T.S.	



ELEVATION



PLAN

SECTION A-A

REVISIONS

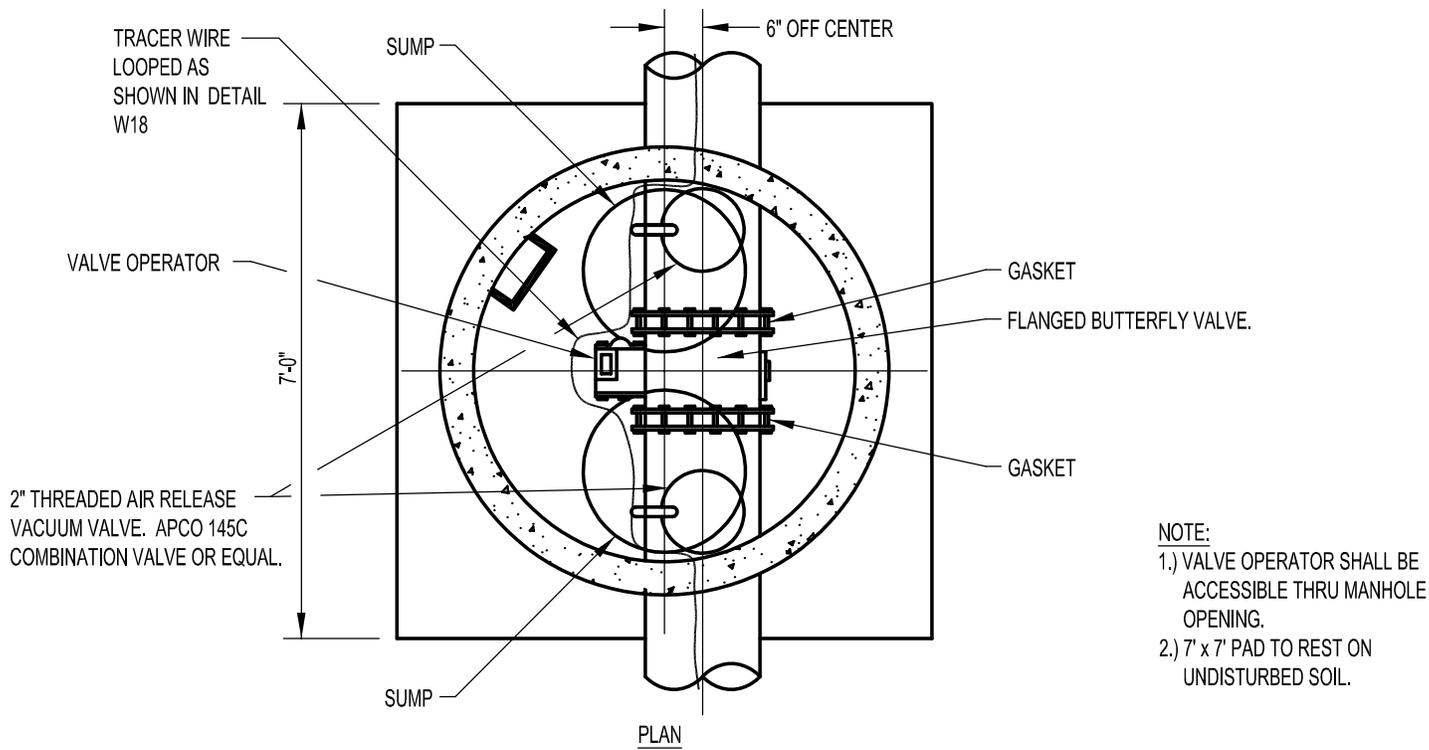
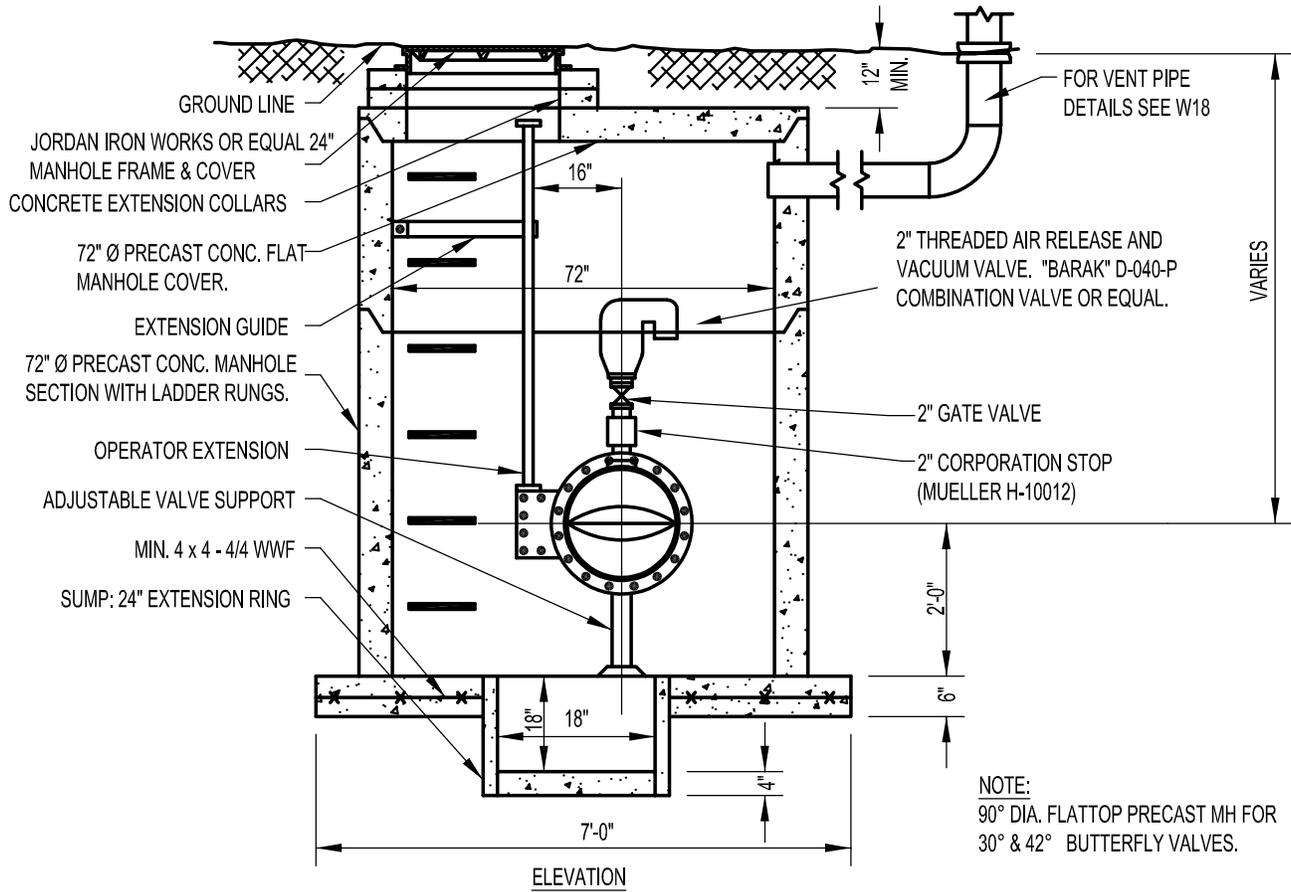
DATE	ITEM	BY
3/2020		UTLEIG



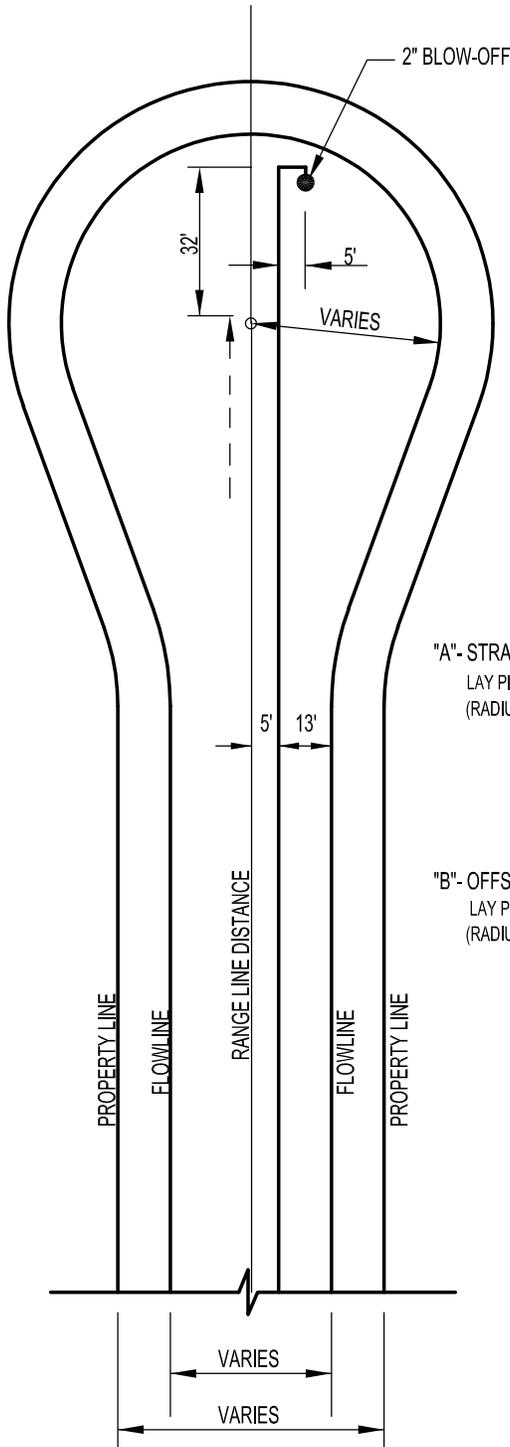
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

STANDARD AIR VALVE INSTALLATION

ISSUED	
DRAWN BY:	JLT
APPROVED BY:	
DRAWING NO.	W18
SCALE	N.T.S.

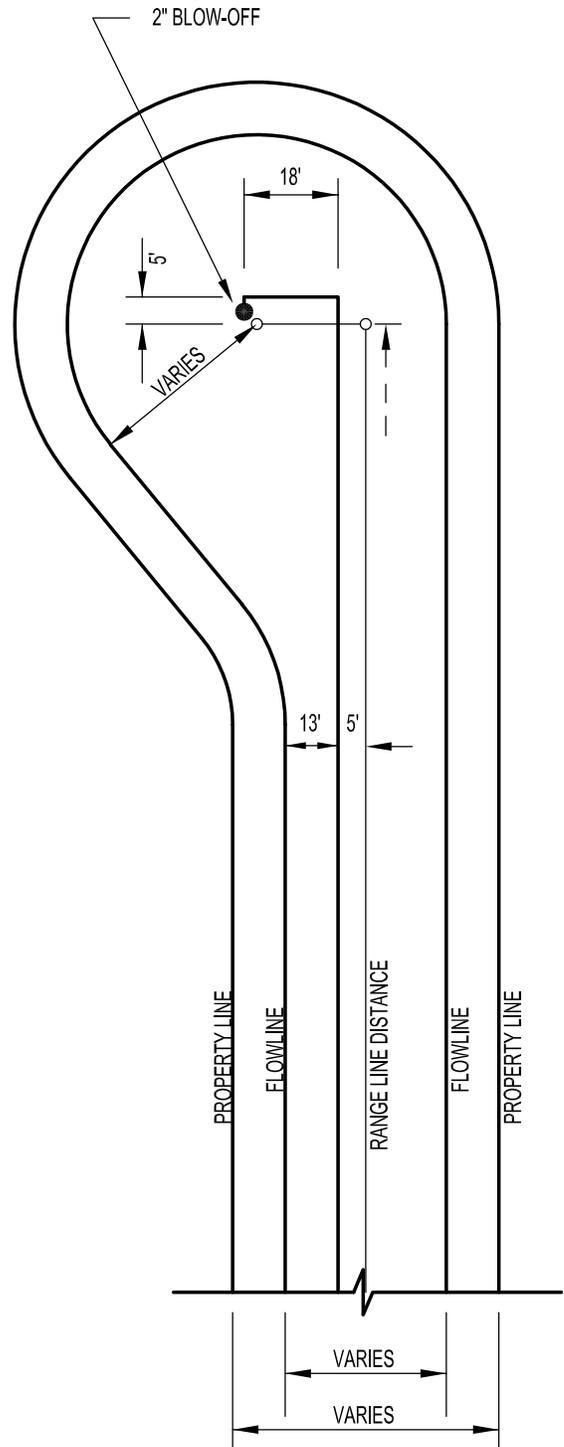


REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG		APPROVED BY:		
			BUTTERFLY VALVE INSTALLATION IN MAINS 16" OR LARGER		DRAWING NO.	W19
					SCALE	N.T.S.



"A"- STRAIGHT LINE CUL-DE-SAC:
LAY PIPE TO 32' BEYOND THE CENTER
(RADIUS POINT) OF CUL-DE-SAC.

"B"- OFFSET CUL- DE-SAC:
LAY PIPE TO 5' BEYOND CENTER
(RADIUS POINT) OF CUL-DE-SAC.



"A"

"B"

REVISIONS

DATE	ITEM	BY
3/2020		UTLEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

WATER DISTRIBUTION SYSTEM
TYPICAL PLAN FOR CUL-DE-SAC

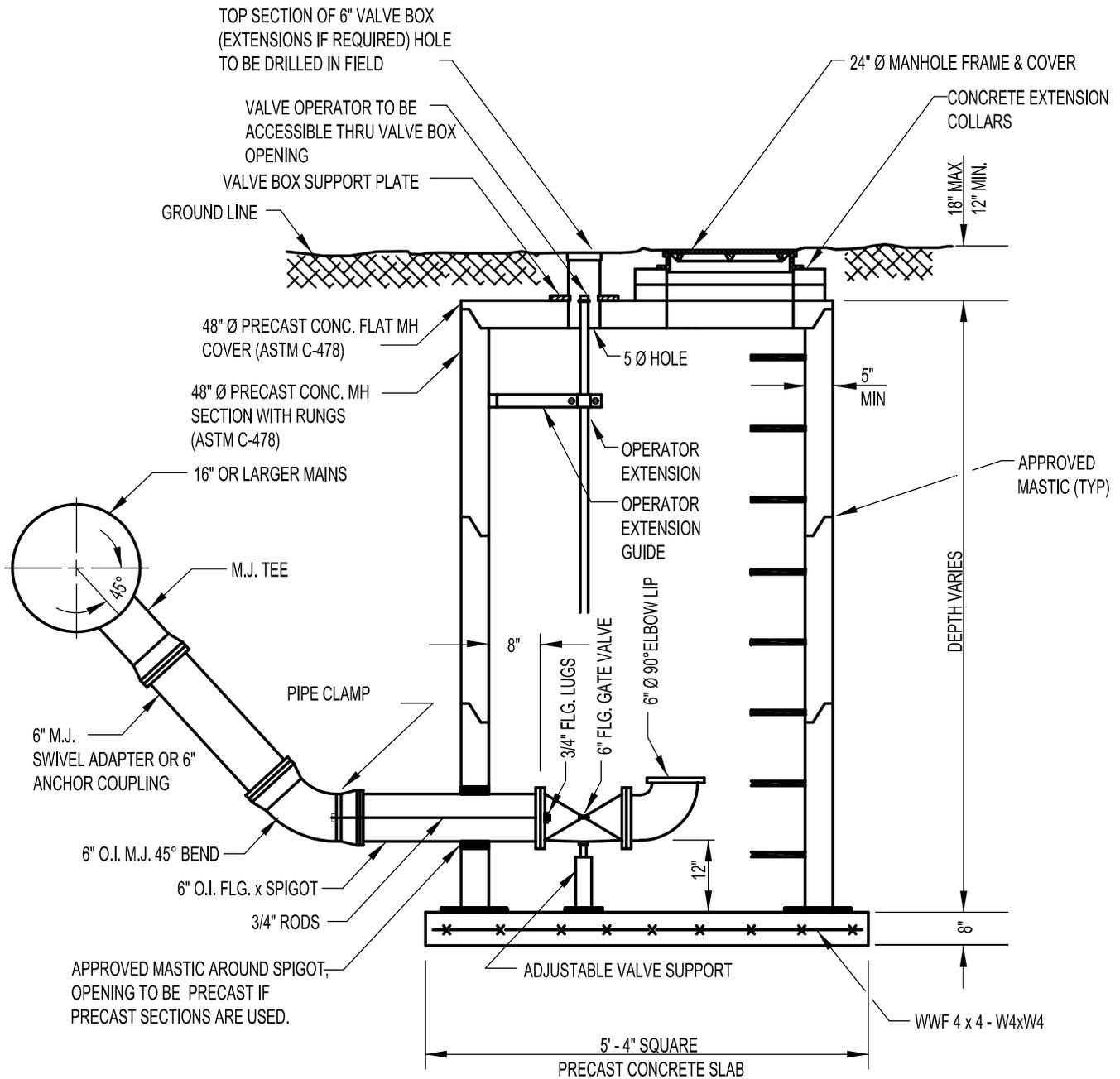
ISSUED

DRAWN BY: JLT

APPROVED BY:

DRAWING NO. W20

SCALE N.T.S.



REVISIONS

DATE	ITEM	BY
3/2020		UTLEIG



PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

TRANSMISSION MAIN BLOW-OFF INSTALLATION

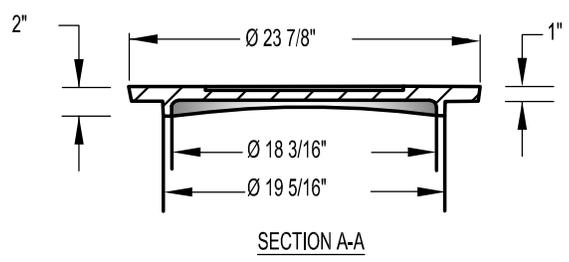
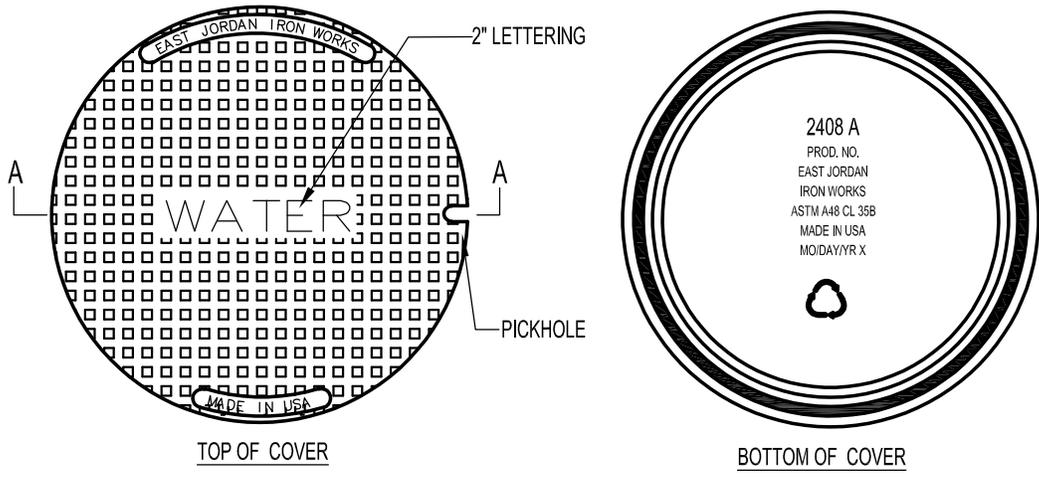
ISSUED

DRAWN BY: JLT

APPROVED BY:

DRAWING NO. W22

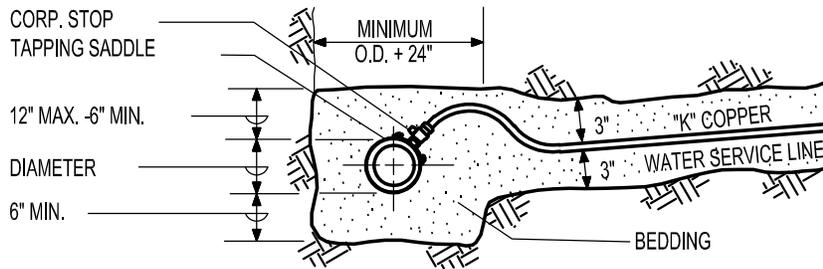
SCALE N.T.S.



COVER: GRAY IRON ASTM A 48 CL35 B
 LOAD RATING: HEAVY DUTY
 WEIGHT: 135LBS. (61kg)
 MACHINED SURFACE
 EAST JORDAN IRON WORKS PRODUCT
 OR APPROVED EQUAL

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG			APPROVED BY:	
			WATER MANHOLE COVER		DRAWING NO.	W23
					SCALE	N.T.S.

NOTE:
 "K" COPPER SERVICE TO HAVE MIN. 6" BEDDING FOR UP TO 3" SERVICE.
 ANY SERVICE LARGER THAN 3" SHALL HAVE TYPICAL WATER MAIN
 BEDDING.



RESIDENTIAL SERVICE TAP
 AND SERVICE LINE BEDDING

REVISIONS				PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	ISSUED	
DATE	ITEM	BY			DRAWN BY:	JLT
3/2020		UTLEIG	CITY OF Northglenn	RESIDENTIAL SERVICE TAP	APPROVED BY:	
					DRAWING NO.	W24
					SCALE	N.T.S.