

City of Leominster

Engineering Division

Department of Public Works

CITY SPECIFICATIONS

For Water-Sewer-Drainage

Effective January 1, 2006

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
S1.00	General Requirements	S-1
S2.00	Trenches	
	S2.01 Excavation of Surfacing Materials and Trenches	S-1
	S2.02 Backfilling of Pipe Trenches	S-2
	S2.03 Restoration of Surface	S-2
	S2.04 Roadway Construction	S-2-3
S3.00	Sewer	
	S3.01 Sewer Mains and Services	S-3-4
	S3.02 Type of Pipe	S-4
	S3.03 Manholes and Catch Basins	S-4-5
	S3.04 Headwalls	S-5
	S3.05 Floor Plans	S-5
S4.00	Water Installation and Renewals	
	S4.01 Type of Pipe	S-5-6
	S4.02 Jointing of Pipe	S-6
	S4.03 Laying of Pipe	S-6
	S4.04 Water Services	S-6-7
S5.00	S5.05 Miscellaneous	S-7
	<u>SEWER-WATER-DRAINAGE PLAN</u>	S-8

DRAWINGS

Typical Resurfacing of Trench	S-9
Earth and Rock Trenches	S-10
Catch Basin Type 1	S-11
Catch Basin Type 2	S-12
Typical Hydrant Detail	S-13
Tapping Sleeve and Value Detail	S-14
Typical Service Connection Detail	S-15

S1.00 General Requirements

In order for a Contractor to do work in the City of Leominster, he must first submit \$5,000.00 cash surety and the proper insurance forms. (call office for details). A Contractor's Insurance must include the following:

1. General Liability not less than \$1,000,000.00 per occurrence/combined single limit and not less than \$2,000,000.00 in aggregate per permit site.
2. Collapse and underground structures and Bodily Injury not less than \$1,000,000.00

Prior to any work, the Contractor must obtain the necessary residential or commercial permits. Before any permits are issued, the Contractor must present a sketch of the work to be done to the City Inspector.

A Contractor will not be allowed to work on Saturdays, Sundays or Holidays.

Unless specified herein, all construction will conform to Massachusetts Highway Standards. When conflict between two, City of Leominster Specifications shall prevail.

Between November 15 and April 15, no street opening permits and excavations will be issued or permitted unless under an emergency condition. Special conditions will be issued by the Director of Public Works under these circumstances.

All Construction must be inspected by the Director of Public Works or his designated-City Inspector-, and approval given any backfilling of trenches will be allowed. If any work is deemed unacceptable by the City Inspector, the Contractor shall immediately correct the problem at his own expense. If the Contractor backfills a trench that has not been inspected, the City Inspector reserves the right to make the Contractor uncover the work at his own expense. If a Contractor is notified to maintain his trench and fails to do so, his bond will be attached to perform the necessary repairs. The Contractor will be responsible for obtaining an approved water, sewer and drainage clearance plan-S-8 before any permits will be issued by the City.

Any main installation-Water-Sewer-Drainage-will require as-built information prepared by a Professional Engineer, supplied to the Engineering Division by the owner or contractor. All inspections require a 24 hour notice.

S2.00 Trenches

S2.01 Excavation of Surfacing Materials and Trenches

When excavations are to be made in paved surfaces, the pavement shall be cut with pneumatic or other approved tools to prevent damage to the surrounding surface. The width of the trench will not exceed the distance of two feet beyond the pipe unless otherwise approved by the City Inspector.

All top soil shall be deposited along side the trench in an approved manner and shall not be mixed with other materials.

S2.00 Trenches-continued

S2.01 Excavation of Surfacing Materials and Trenches

The Contractor shall make excavations in an approved manner to the established line and grade, without damaging any existing structures. All existing gas pipes, water pipes, sewers, drains, catch basins or manholes shall be carefully supported and protected from injury. In case of any damage caused by his actions, the Contractor must notify the City Inspector and obtain approval of the method of repair. If it is necessary to change the locations of any structure, the structure will not be interfered with until the Inspector has given approval.

When making excavations in rock, a minimum of twelve inches of screened gravel must be placed in the trench prior to the laying of any pipe. Pipe laid on unexcavated rock is not acceptable.

S2.02 Backfilling of Pipe Trenches

The most suitable excavated materials shall be used for backfilling pipe trenches. Large stones that have rolled near or lodged under the pipe shall be removed.

The material shall be deposited in the trench in approved manner and shall be thoroughly consolidated by tamping. Backfilling from the bottom of the trench to one foot above the pipe shall be done by hand in layers not to exceed 4 inches in thickness with thorough tamping between each layer. Backfill material in this area shall contain no stones larger than 3 inches at their greatest dimension.

S2.03 Restoration of Surface

The Contractor shall replace all surfaces material, and shall restore pavement, shrubbery, sod and other surfaces or structures disturbed to a condition equal to that before the work began.

In restoring pavement surfaces, new pavement surface is required. Temporary patch must be left in place and remain for a minimum of 30 days. When repairing with permanent patch, the Contractor shall first cut back the trench, one foot on each side, keeping the sides as square as possible. The permanent patch will consist of a rolled 2 inches of Bituminous Concrete Type-I-1 base and one inch of Bituminous Concrete Type I top. Paving of new roads will only be permitted when the temperature is above 40 Degrees F. under fair conditions. When new main is installed the city will require a full width overlay of pavement to all disturbed areas.

The City may require, at its discretion, the need to use flowable fill or infra red treatment for the repairing of trench work in any City Street. One or both of these methods of repair will be used in any recently overlaid road determined by the inspector.

S2.04 Roadway Construction

The following are guidelines to be met with respect to Roadway Construction in the City of Leominster.

S2.04 Roadway Construction-continued

Roadway gravel will meet the Massachusetts Highway Department Standard Specifications for Highway and Bridges Mi .03.0 Gravel Borrow type B. This gravel will be tested for grain size-Gradation-prior to placement to assure it meets these criteria.

3"	-	100 %	Passing
½"	-	50-85 %	Passing
#4	-	40-75 %	Passing
#50	-	8-28 %	Passing
#200	-	0-10 %	Passing

If the gravel satisfies this Specification, then a Proctor Determination will be performed to obtain the maximum dry density of this material. Field Density Tests will be performed prior to placement of H.M.A.-Hot Mix Asphalt-to assure that a minimum of 95% of this maximum dry density has been obtained.

Core samples for the intermediate course-Binder-will be performed at intervals of 200 feet, however, not less than 4 cores taken on any roadway. The thickness of these cores will be recorded for acceptance. If 1 in 4 cores fail to meet the required thickness, two additional cores will be performed at 25 feet in both directions of the roadway as a retest. If these two samples meet the required thickness, this will be acceptable.

In most cases, the top or wearing course of H.M.A. is not tested but will be up to the discretion of the Engineer. If tests are required, the same criteria will be used as in the intermediate course.

Subgrades will be compacted with a minimum of 6 passes with a 10 ton vibratory roller.

Gravel Base will be compacted to a minimum of 95% of the maximum Dry Density as determined by ASTM Specification D-1557C.

S3.00 Sewers

S3.01 Sewer Mains and Services

All mains shall be aligned and graded using either a laser or transit. Manholes will be required at all bends greater than 22 1/2 degrees. If sewer pipe is laid straight, a manhole is required every 250 feet.

A minimum 4 feet of cover is required on all sewer services and main lines. Every sewer main must be ended in an approved precast manhole.

A minimum of 4 inches of crushed stone must be used under all sanitary sewer mains and under all pipes during excavation.

When new main line is installed or extended all laterals are required to all unconnected homes and available lots.

S3.01 Sewer Main and Services continued

All pipes shall be jointed in strict accordance with the manufacturer's specifications. When connecting sanitary services to the existing main, saddles must be used. All connections for services shall use a "WYE" at the main. If a "WYE" cannot be used, the Contractor must notify the City Inspector to obtain approval for an alternate solution. The contractor shall keep all sewer pipe and manholes watertight. In new main construction saddles are not allowed, only a "WYE" may be used.

Internal cleanouts for sewer services will be located in an accessible place so they can be easily worked on. Cleanouts shall not be located under stairs. If there is no other alternative, approval must be given by the City Inspector.

Contractors will be responsible for supplying the City with a video-audio tape of all new sewer mains, which will become the property of the City of Leominster Department of Public Works. Air pressure testing is also required.

S3.02 Type of Pipe

All sanitary pipes shall be SDR 35 or equal. Force Main Sewer Pipe shall be ductile iron CI.52. Drain pipe shall be SDR 35 or Class III reinforced concrete. HDPE drain pipe will be allowed provided it remains private and all flow remains on private property. If any drain water is designed to flow to a City maintained system an approved pipe material must be used.

When construction sewer services, 4" cast iron pipe must be used to extend at least 10 feet from the building. PVC sewer pipe for services must be at least 6" in diameter. In multifamily dwellings, commercial, or industrial buildings where an 8" sewer service is required, 6" cast iron pipe must be used.

S3.03 Manholes and Catch Basins

All manhole and catch basins are to have interlocking sections and be Standard Precast with either cast iron, aluminum or approved plastic steps spaced 18 inches apart. A water tight seal must be placed between precast manhole sections. Inverts must be built in both sanitary and storm manholes. Precast sewer manholes shall have rubber "O" ring gaskets. All manholes will be precast and require a water preventing tar coated exterior.

All manhole covers used on City streets will be of heavy duty construction with the frame and cover height of at least 8". Covers shall also have the words "Drain and Sewer" integrally cast as appropriate.

All brick used in sanitary sewer manholes, including brick used for inverts and raising covers shall conform to A.S.T.M. Standard Specifications for Sewer Brick. Barrel block and cement brick are acceptable in drain manholes only. In case the City Inspector rejects any brick it shall be immediately removed and substituted with an acceptable brick.

All sewer pump stations will be Smith & Loveless, or equal, flooded suction type lift station. Electrical power will be 3 phase.

S3.03 Manholes and Catch Basins-continued

Mortar used in manholes shall be composed of one part Portland Cement, hydrated lime and two parts sand, in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. Lime and sand shall conform to A.S.T.M. Standards.

When installing manholes and catch basins, the trench shall be excavated so that there is two feet clear on each side of the structure. Four to six inches of crushed stone shall be placed under the manhole or catch basin and gravel shall be compacted in six inch layers around the structure to secure it firmly. Catch basins will maintain a two foot minimum sump. Basin to basin connections will not be allowed and drain manholes must be utilized. Precast catch basin top section will be Precast basin top section will be 24" x 28" opening to allow proper throat and mouth opening. 24" x 24" section will not be allowed.

S3.04 Headwalls

Headwalls shall be constructed of A.S.T.M. approved Portland Concrete. Headwalls will be built as directed to connect surface drains, culverts, and like structures and must be approved by the City Inspector.

S3.05 Floor Drains

Floor drains in any garage must connect to a gas trap before running into the sanitary sewer. Gas traps will conform to the latest state regulations.

S4.00 Water Installation and Renewals

S4.01 Type of Pipe

Ductile-iron, cement-lined pipe shall be used for all water mains. PVC pipe SDR-C900 may be used if approved by the Director of Public Works.

PVC pipe shall conform to A.W.W.A. Standards with an established hydrostatic-design-basis HDB rating of 4,00 p.s.i. for water at 73.4 degrees F.

Ductile-iron pipe shall be CL 52. The outside surface of the pipe shall be coated with a bituminous coating of either coal tar or asphalt base. The inside surface of the pipe shall receive a cement mortar lining and bituminous seal coat in accordance with A.N.S. Standards for Cement Lining for Cast-Iron Pipes and Fittings for Water.

Hydrants shall be AVK Nostalgic, Mueller Centurion, Clow Medallion. When installing a hydrant, the hydrant must be rodded to the gate valve. (See Sketch) All hydrants will open left and a 5 ¼ inch valve opening.

All new water main line will be looped to create circulating flows for a better quality water supply.

S4.00 Water Installation and Renewals-continued

S4.02 Jointing of Pipe

PVC pipe shall be jointed and coupled in strict accordance with the manufacturer's recommendations.

Ductile-iron pipe shall have push on type joints except where the pipe is to be jointed with special fittings, or valves, in which case mechanical joints shall be used.

Any installation of C.L.D.I. or C900 water main will have the capability of location by utilizing one of the following methods: wire tape or wedges, to be installed in conjunction with water main. Method to be approved by the Public Works Department prior to beginning work.

Any water main pressure testing will be performed by an independent A.W.W.A approved testing agency. This is for the testing of any newly installed water mains, hydrants and water services.

S4.03 Laying of Pipe

Water mains shall be laid and maintained to lines and grades established by the fittings, valves, tapped or brass outlets and hydrants at the required location unless otherwise approved by the Director of Public Works. Valve-operating stems shall be oriented in a manner to allow proper operations.

Valves twelve inches and smaller shall be resilient wedge gate valves and valves sixteen inches and larger will be butterfly valves. All valves will be Dresser, Mueller or equal and will open right. When installing new water mains at intersection, triple gating is required at a tee and four gates are required at a cross.

Water mains and services must be kept five feet apart from any sewer pipe and in a separate trench. A minimum of five feet of cover is required for all mains and service.

Thrust blocks are required behind bends, hydrants, tees, and dead ends and at new mains tapped into existing mains. A minimum of five feet of cover is required for all mains. A minimum of 1/3 cubic yard of concrete must be used for thrust blocks.

The Contractor shall see to it that all water mains and services are kept water-tight by the use of appropriate testing method as outlined in the A.W.W.A. Standards. A bacteria test must be taken and tested by an accepted agency before the City will supply water.

When new main line is installed all laterals will be installed to the roadway sideline for all unconnected homes or available lots.

S4.04 Water Service

When installing or renewing water services, one inch Type K Copper shall be used. Taps into the main for services shall be made at a 45-degree angle using an approved method. Threads shall conform to the latest A.W.W.A Standard. Contractor is responsible for a flared fitting and approved ball valve within the building. Buffalo curb boxes shall be 95-E type.

S4.04 Water Service-continued

When the length of a new service warrants the use of plastic water pipe, copper must be used a minimum of 30' off the main and 30' into the dwelling. A tracer must be used to locate the pipe in case future problems occur. If necessary, this wire or tape will be connected to the gate box. Method will be decided by the inspector.

In any new water main installation or renewal of water service, a Buffalo Service Gate Box and 12" centering rod is required on the water main tap. A service box and 12" centering rod will be installed in the tree lawn at the stop and waste valve. In New Road Construction the elevation of the service box will be at the base course of pavement.

All brass goods used will be McDonald, Ford, Mueller or equal. No thin walled fittings will be allowed.

A curb stop located on the owner's property is required for all water services. A block or flat stone must be placed under the curb stop to secure it in position. Underground copper tube ends shall be compression type fittings and curb stop shall have a drain.

Water meters will be located in an accessible place so they can be easily worked on. Meters shall not be located under stairs, but if there is no other alternative approval must be given by the City Inspector.

Water meters larger than 2" will be supplied by the owner and approved by the City of Leominster, Meter Division. **The City Installer must install this meter or water will not be supplied to the building.**

S5.00 S5.05 Miscellaneous

Any proposed utility easements are required to be marked with concrete bounds (6"x6"x3') for the ease of location and to serve as notice to property owners.

Any city owned tree disturbed during private contractor work will be replaced, all determinations will be done by the City Tree Warden.

All as-built information submitted to the city for new roadway acceptance will also be done so on disk in the most current version of AutoCAD software.

Any addition or new construction proposed, where existing utilities are encountered, must submit a plan drawn by a civil engineer to show proper method for relocation of utility. The relocation must be approved by the Department.

When an addition to an existing building is proposed and an existing water, sewer, or drain line is encountered, the utility must be relocated around the proposed construction in a method satisfactory to the department.

December 12, 2006

Water, Sewer, Drainage, Clearance Plan

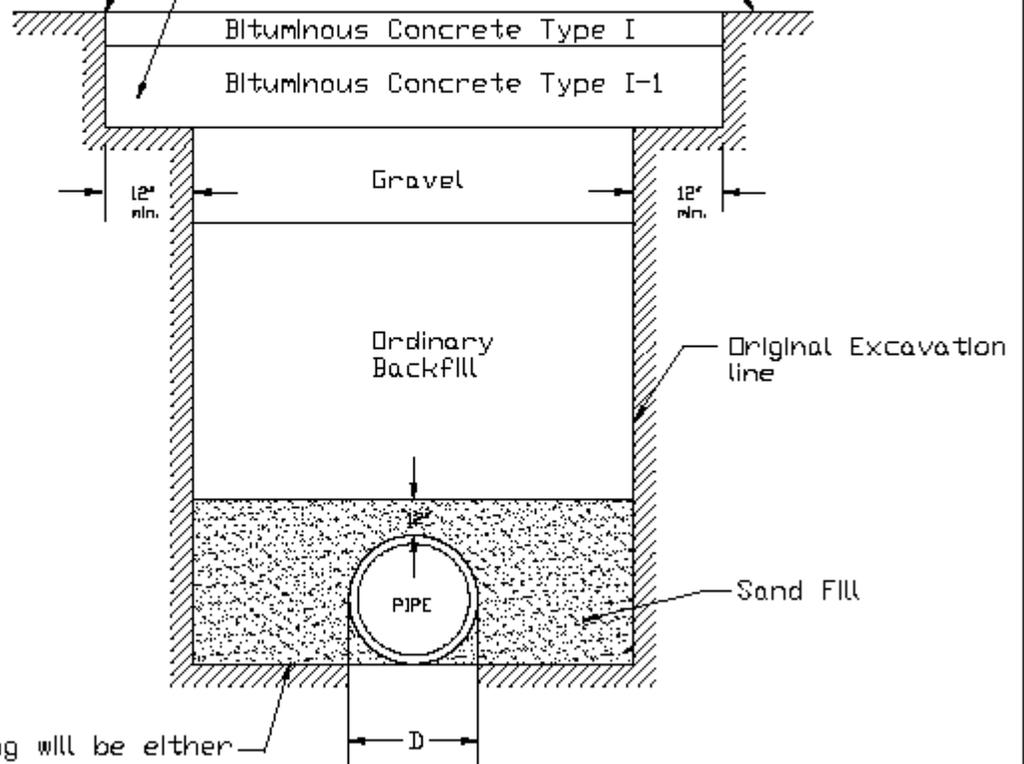
Effective immediately, before any Water, Sewer, Drainage, Clearances will be issued a Water, Sewer, and Drainage plan must be submitted for each lot showing the following:

1. All invert elevations of proposed connection at house and street.
2. Street centerline elevation.
3. House sill elevation.
4. Plan stamped by a Registered Professional Civil Engineer with Mass Certification.
5. All connections showing any water, sewer, drainage connections.
6. House or building location on lot.
7. All wetlands shown if applicable. If not applicable, submit written statement noting that no wetlands exist on this lot.
8. Building set back distances shown from each lot line.
9. Driveway location centerline grades indicating pitch of driveway.
10. Scale: 1" = 40' Plan size 8½" x 11" only.
11. Any drainage connection that may be required must be shown. Any perimeter drain is not allowed to transmit, by any means, water onto City Streets. It will be shown on the clearance plan where the perimeter drain will discharge.
12. Water pressure, which will service the building, must be designated on the plan.
13. Sewer flow calculation must be shown on all commercial and industrial connections based on Title V regulations.
14. All residential submittals must show and verify number of bedrooms to be constructed per dwelling.

Existing Pavement edge to be coated with asphalt before application of permanent patch

Additional excavation required for placing of permanent patch

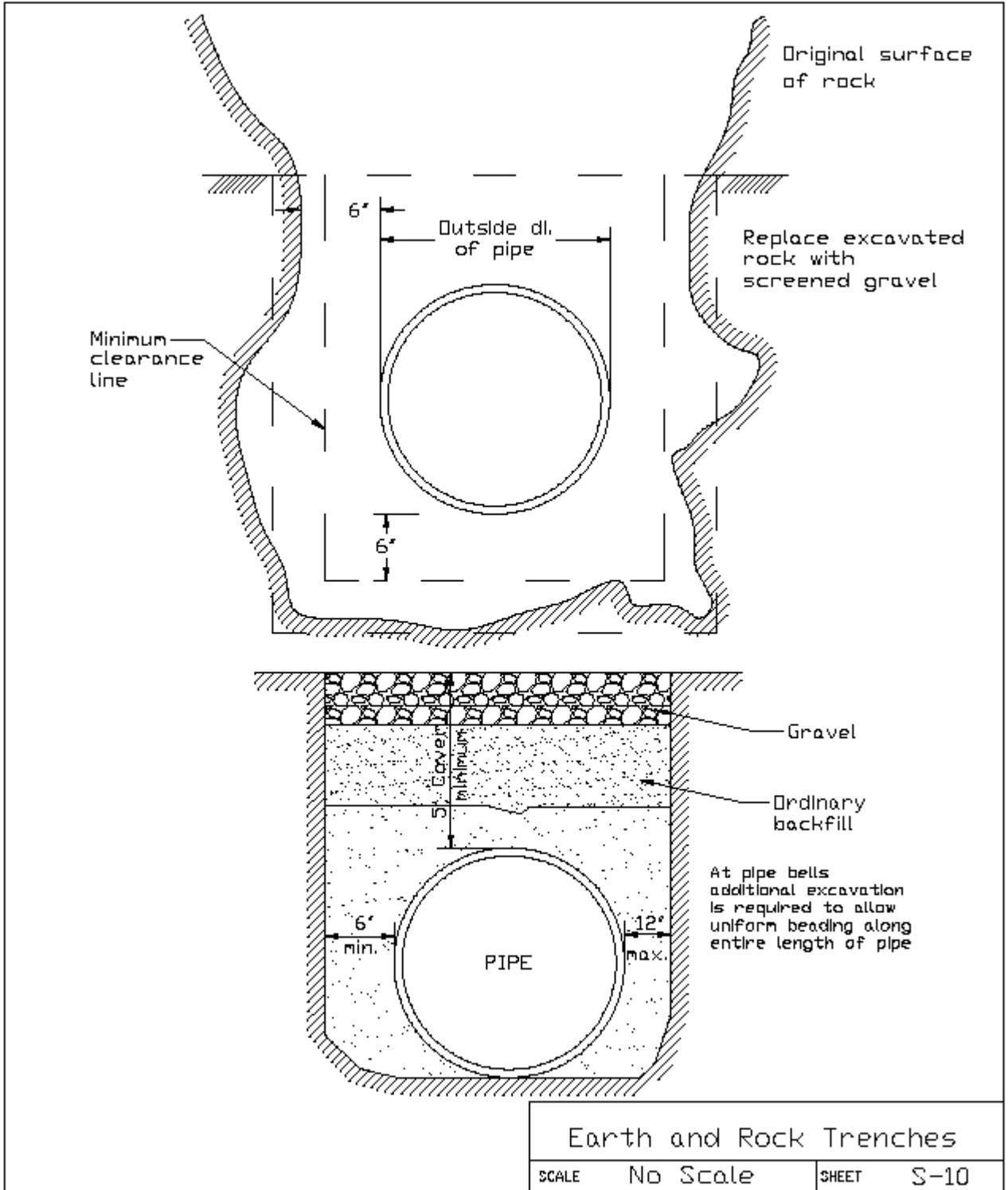
Ground Surface

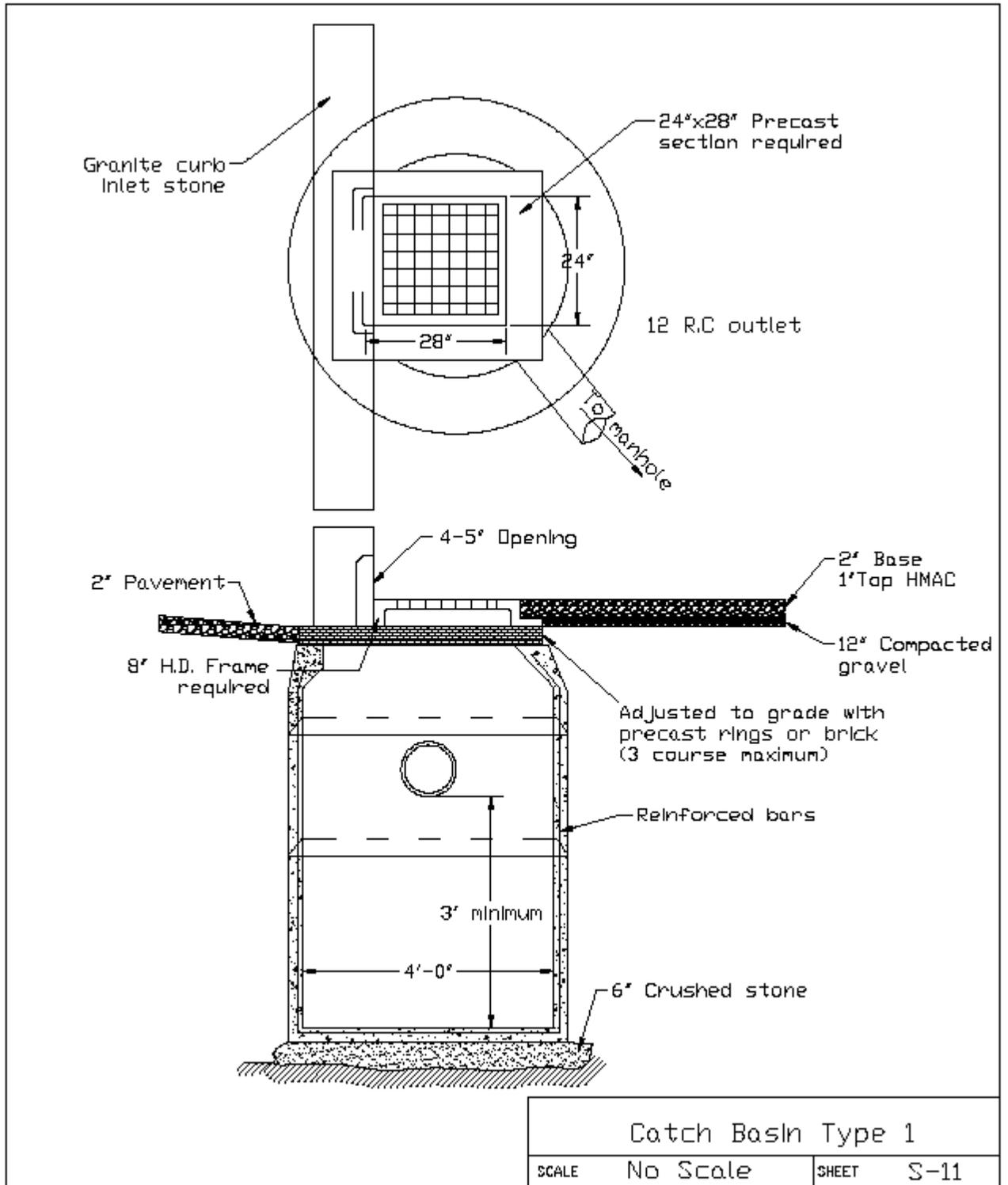


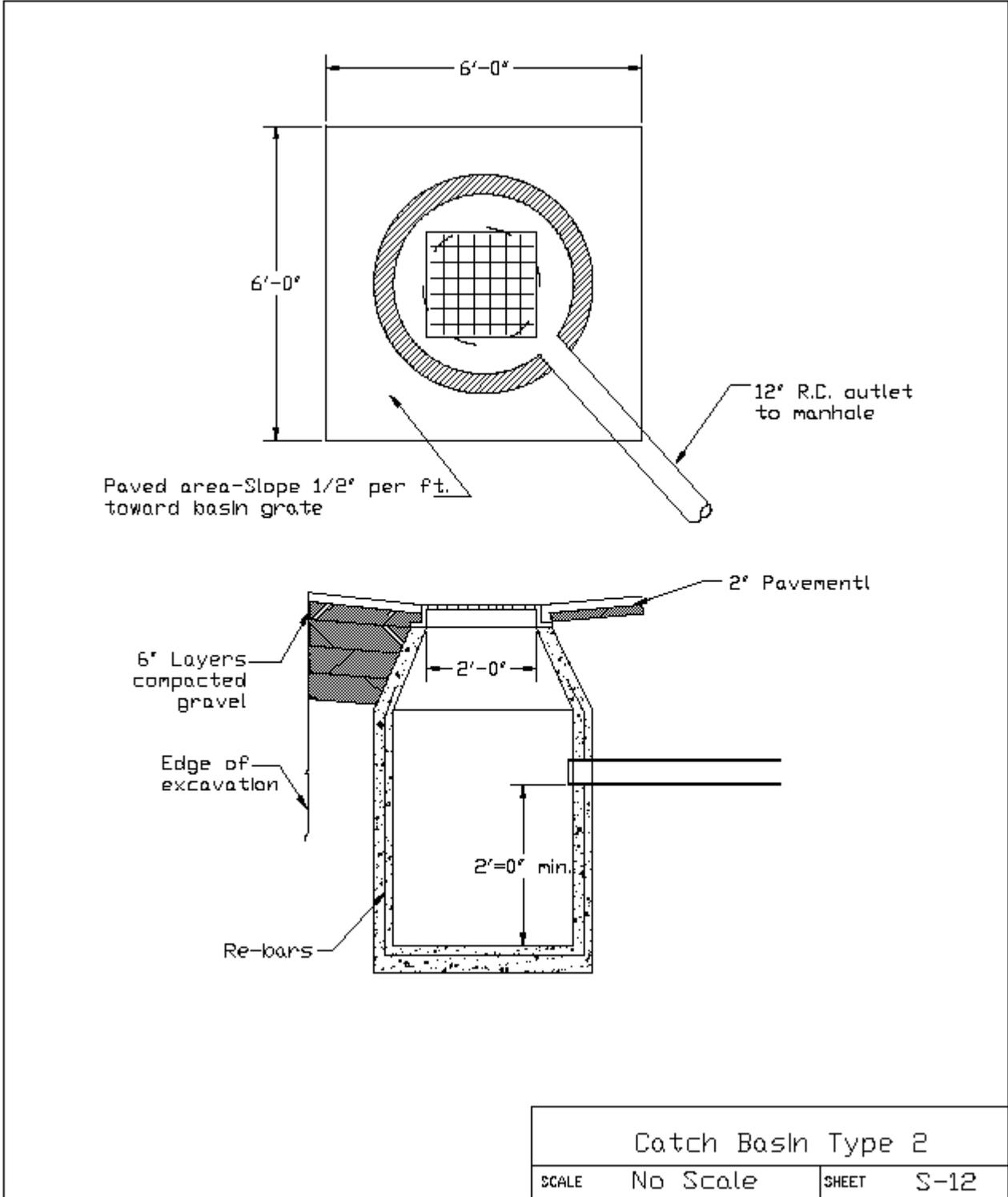
Pipe bedding will be either undisturbed or screened gravel depending if earth or rock trench respectively

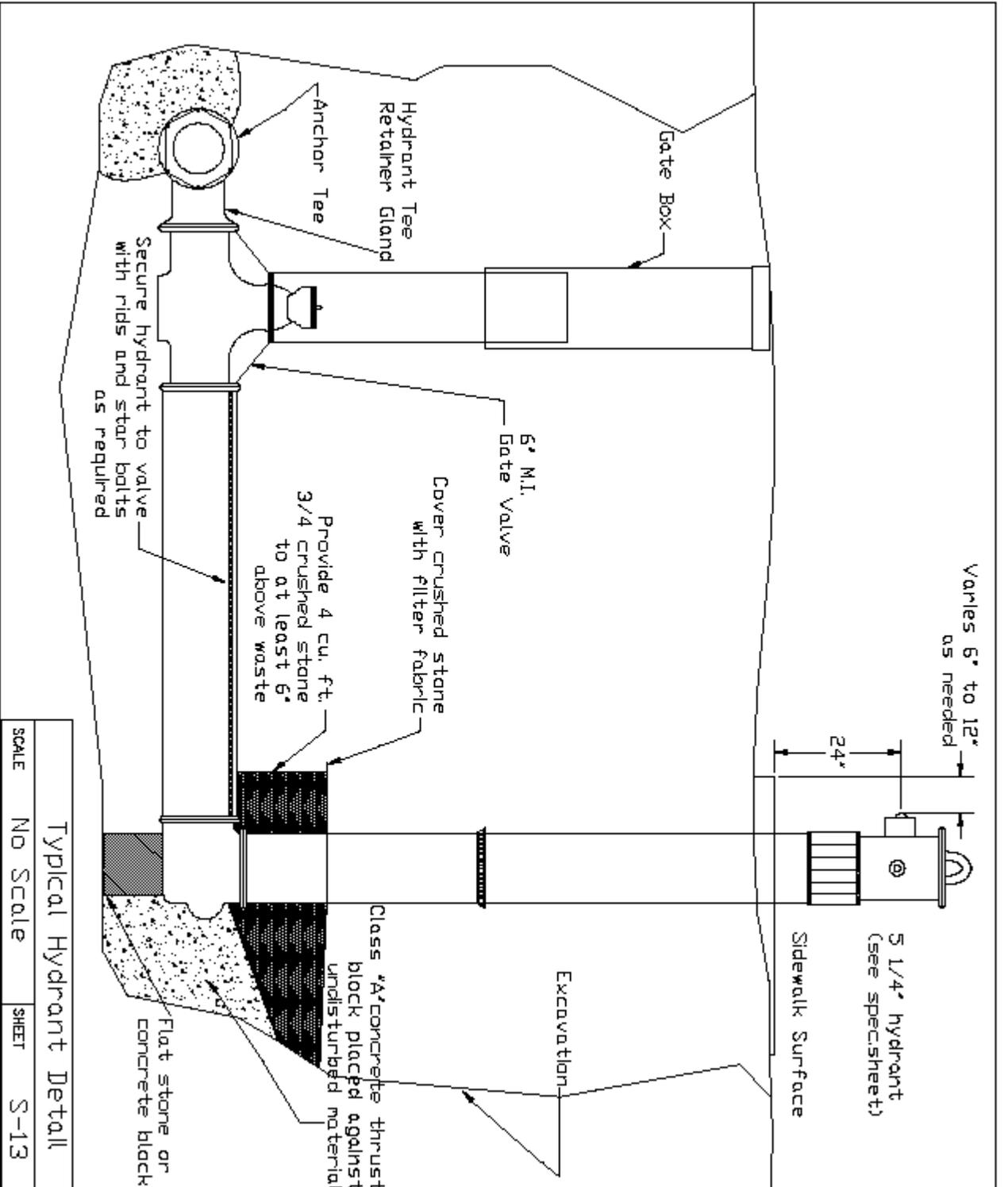
Typical Resurfacing of Trench

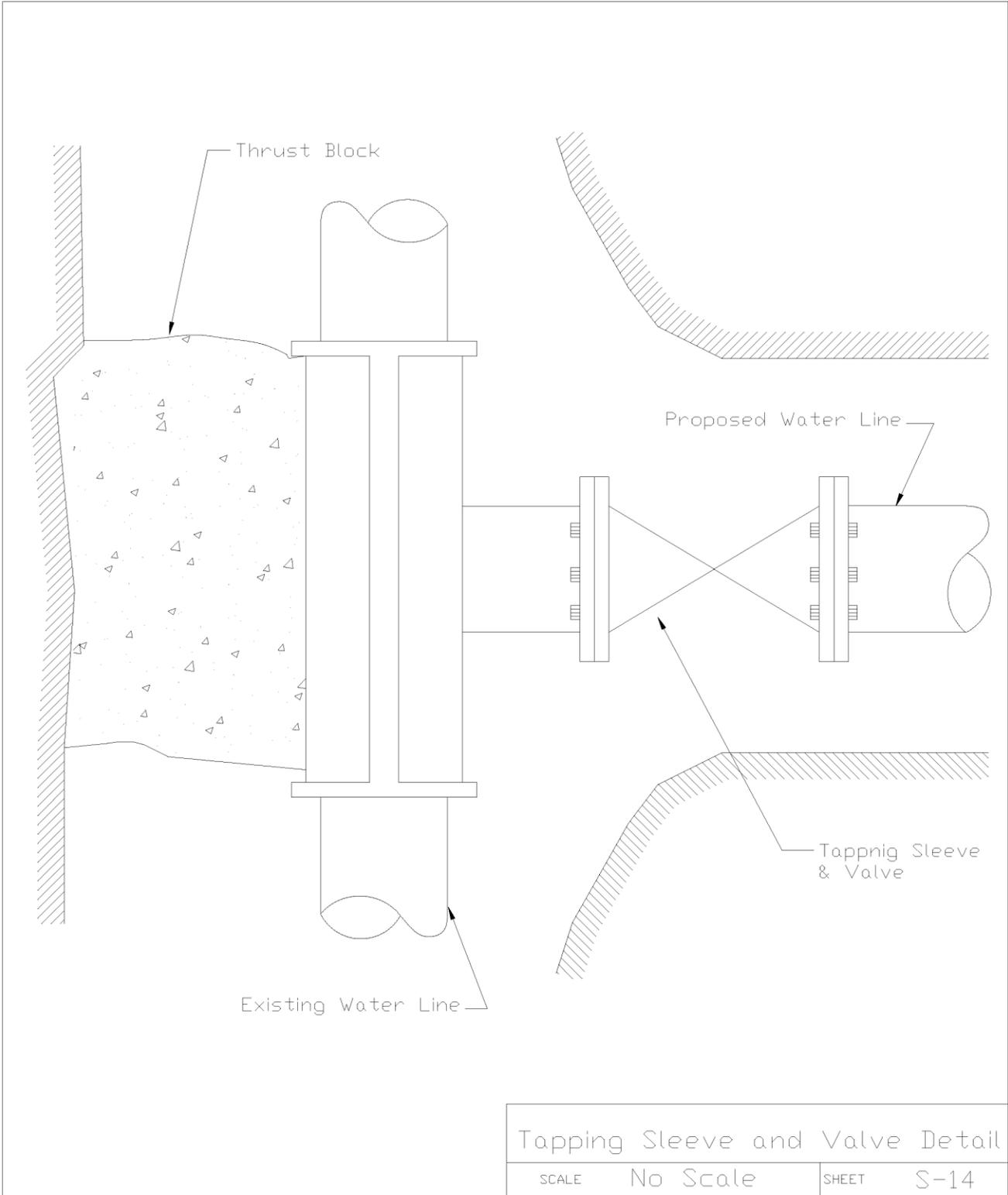
SCALE	No Scale	SHEET	S-9
-------	----------	-------	-----

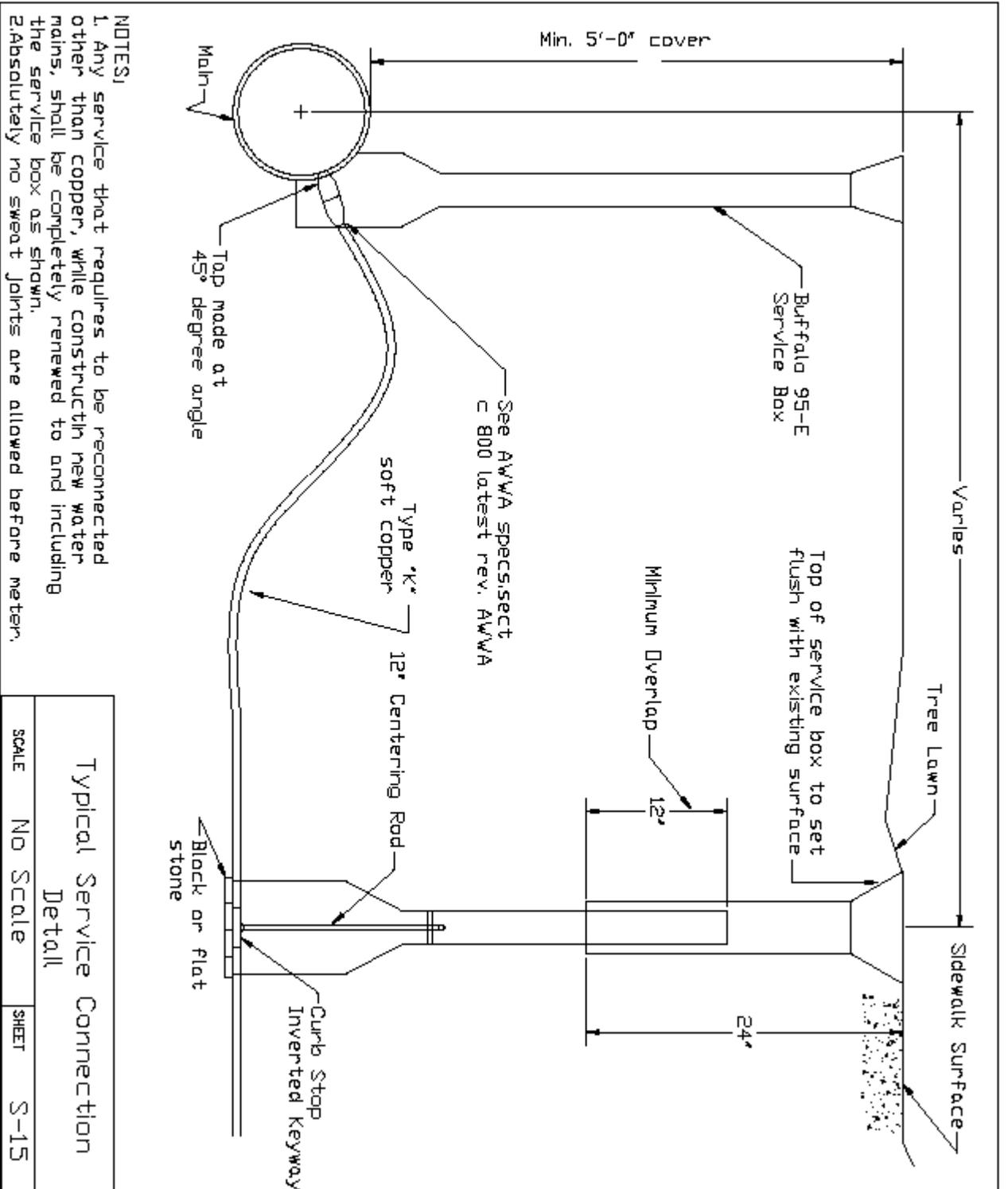












Typical Service Connection Detail

SCALE	NO SCALE	SHEET	S-15
-------	----------	-------	------

