DRAFT

Land Use Development Engineering Standards Catalog

City Planning Department
26 Kendrick Avenue
Waterbury, CT 06702
Phone (203) 574-6819
Fax (203) 346-3949

Prepared By:

WOODARD &CURRAN

Draft January 2009

TABLE OF CONTENTS

DRAFT

TABLE OF CONTENTS (Continued)

DRAFT

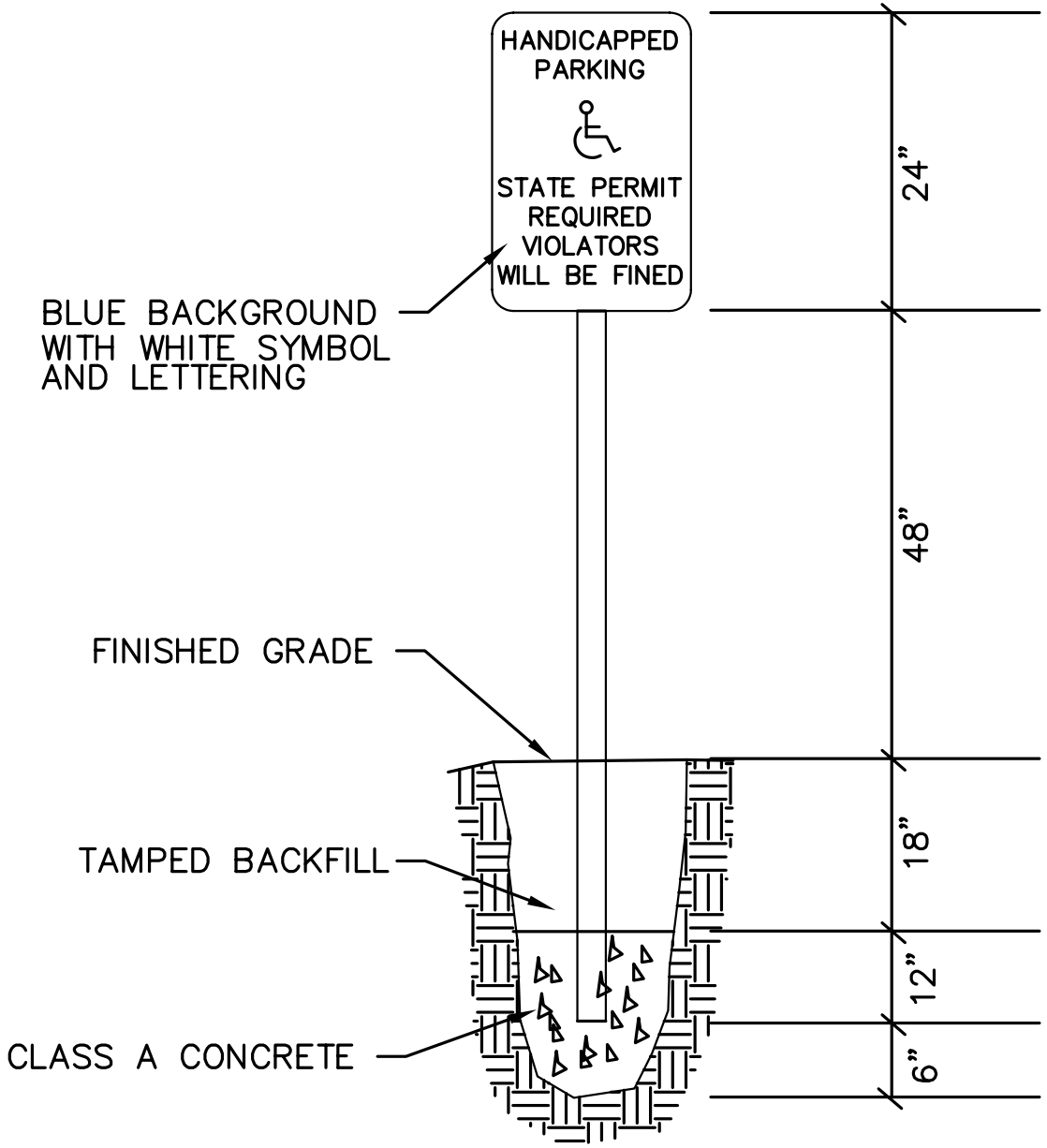
TABLE OF CONTENTS (Continued)

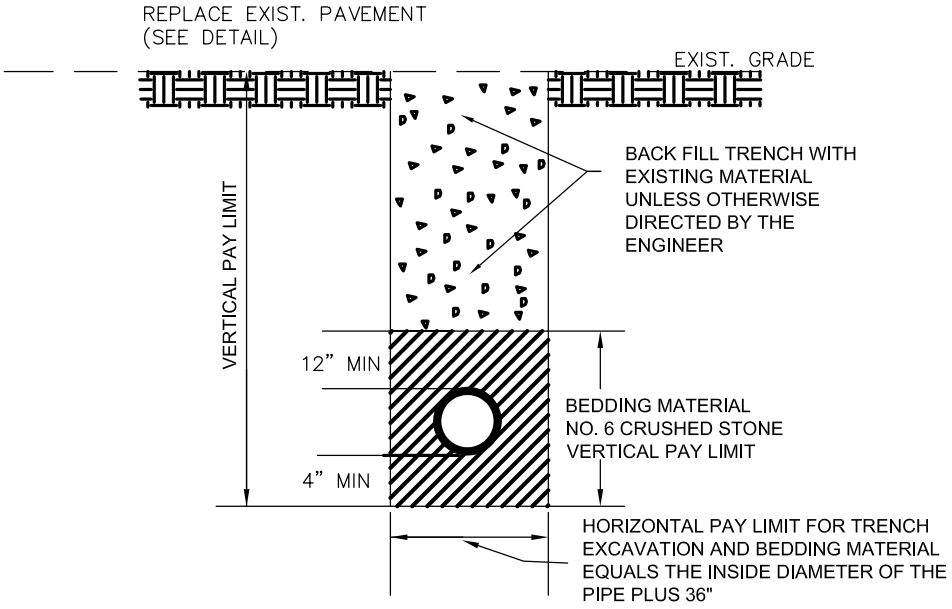
DRAFT

BLOCKS & NOTES

ZONE =	REQUIRED	PROVIDED
MIN. LOT AREA		
MIN. LOT WIDTH		
MIN. FRONT YARD		
MIN. REAR YARD		
MIN AGGREGATE SIDE YARD		
MIN. SIDE YARD		
MAX. BUILDING HEIGHT		
MAX. LOT COVERAGE		

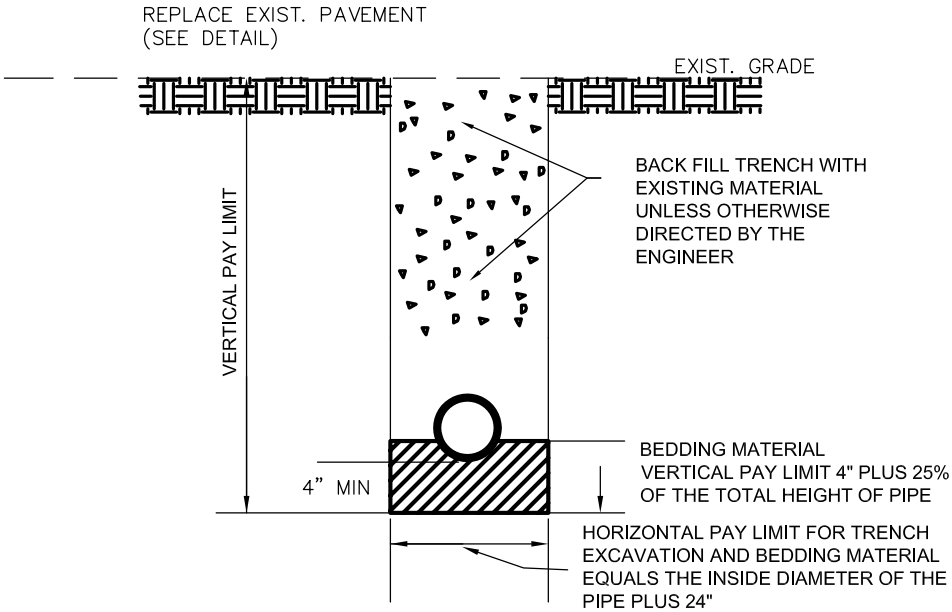
SITE


HANDICAPPED
PARKING
STATE PERMIT
REQUIRED
VIOLATORS
WILL BE FINED
BLUE BACKGROUND
WITH WHITE SYMBOL
AND LETTERING
FINISHED GRADE
TAMPED BACKFILL
CLASS A CONCRETE
24"
48"
18"
12"
6"



TRENCH DETAIL 54" PIPE

(N.T.S.)

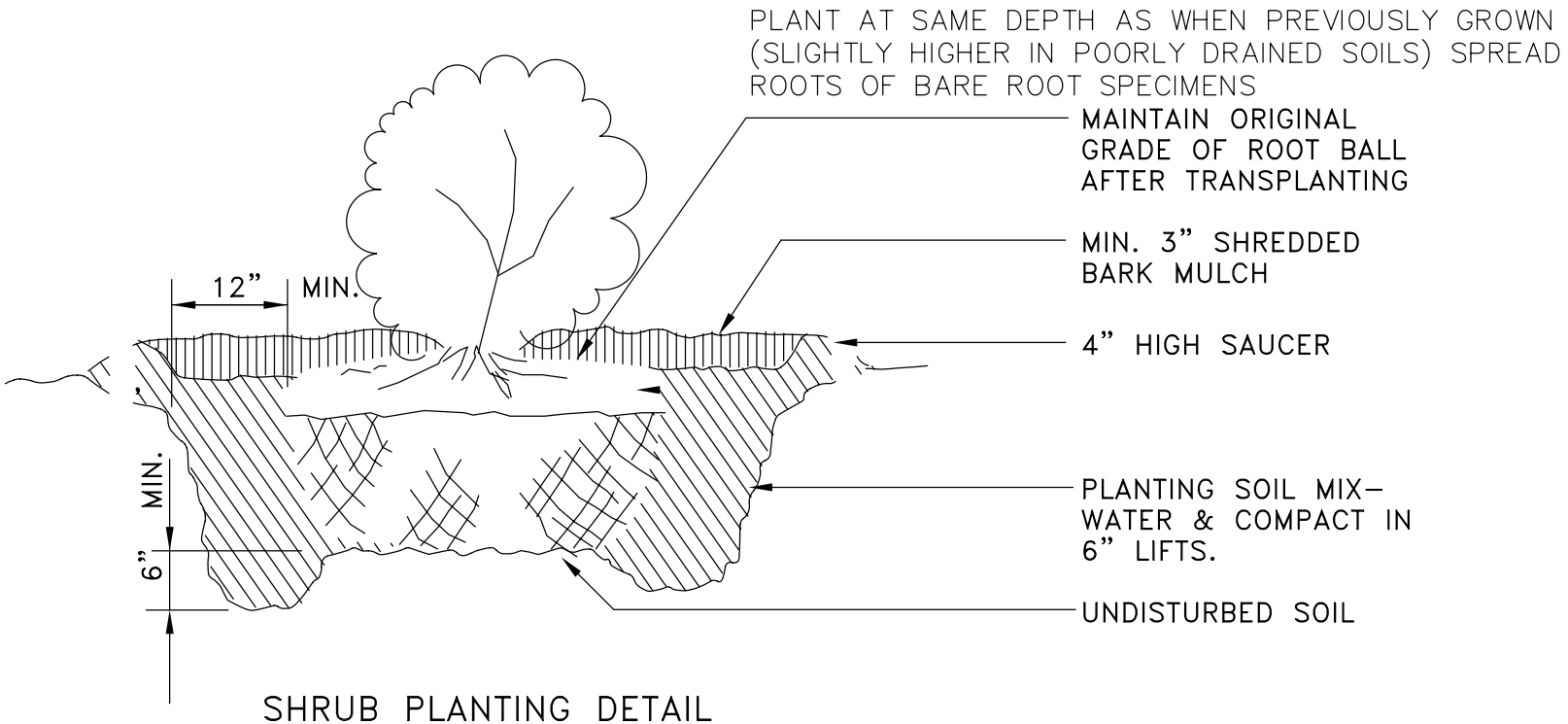


TRENCH DETAIL 30" DIA. PIPE OR LESS

(N.T.S.)

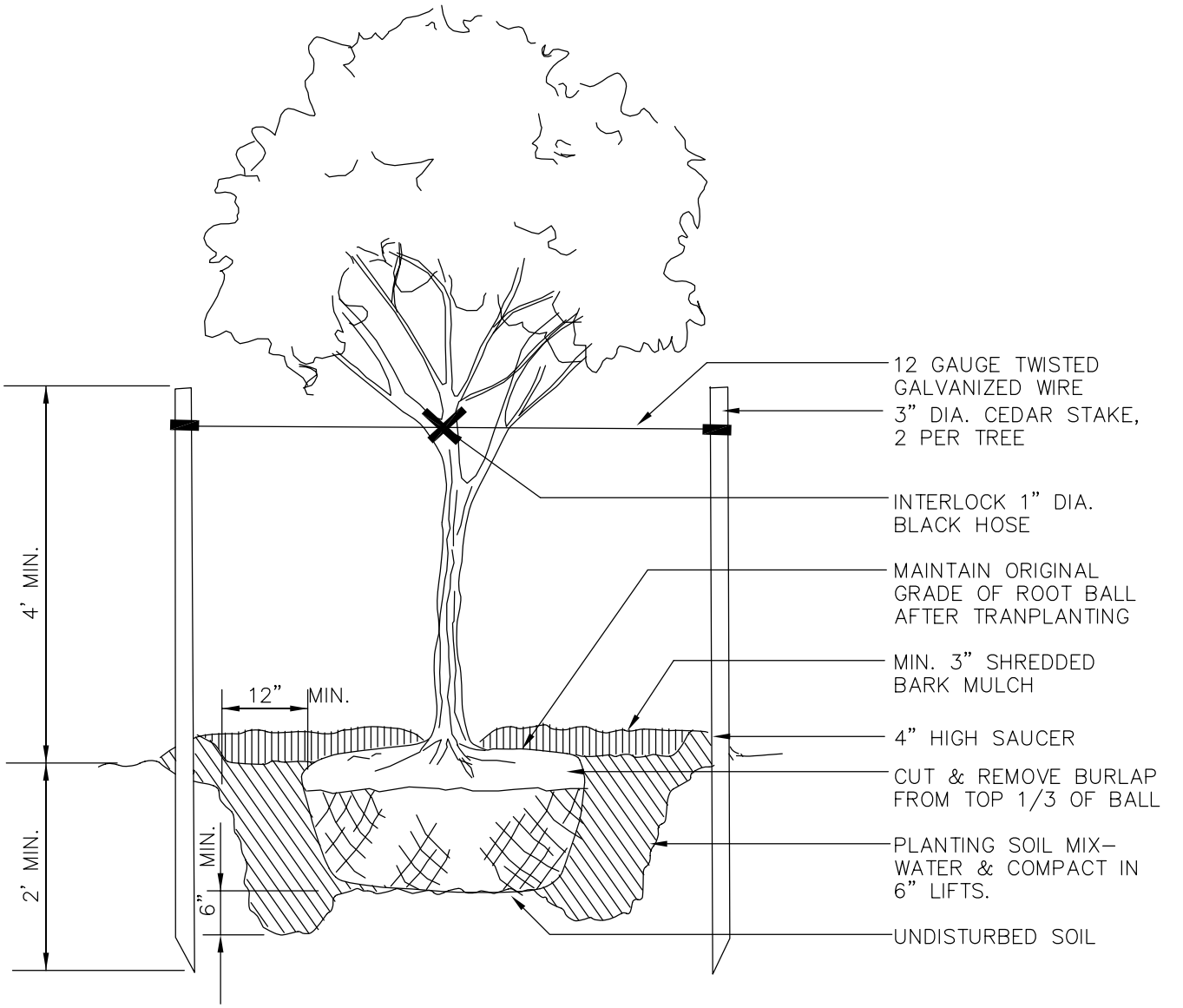
City of Waterbury
Bureau of Engineering
April 10, 2005
File: trench.dwg

LANDSCAPING



SHRUB PLANTING DETAIL
N.T.S.

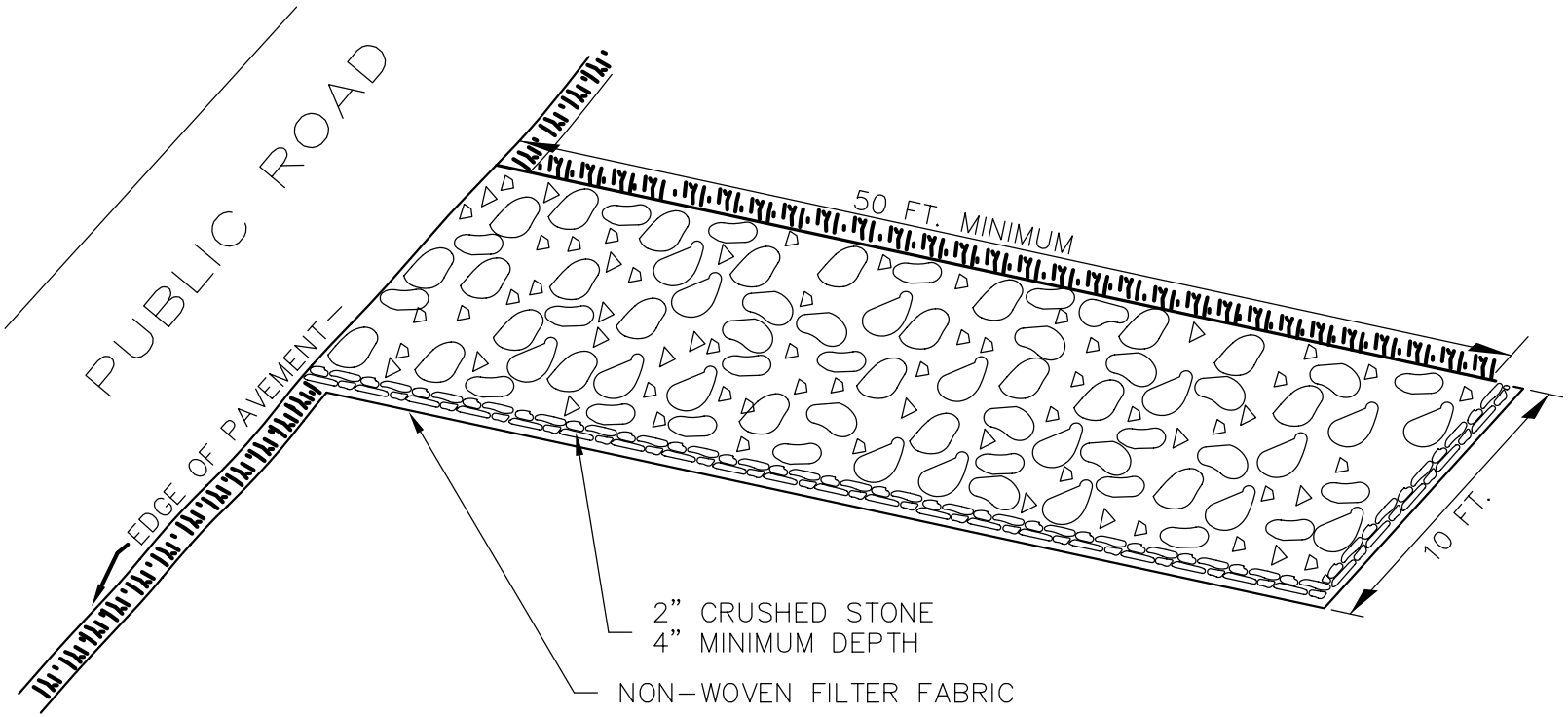
SHRUB PLANTING DETAIL (N.T.S.)



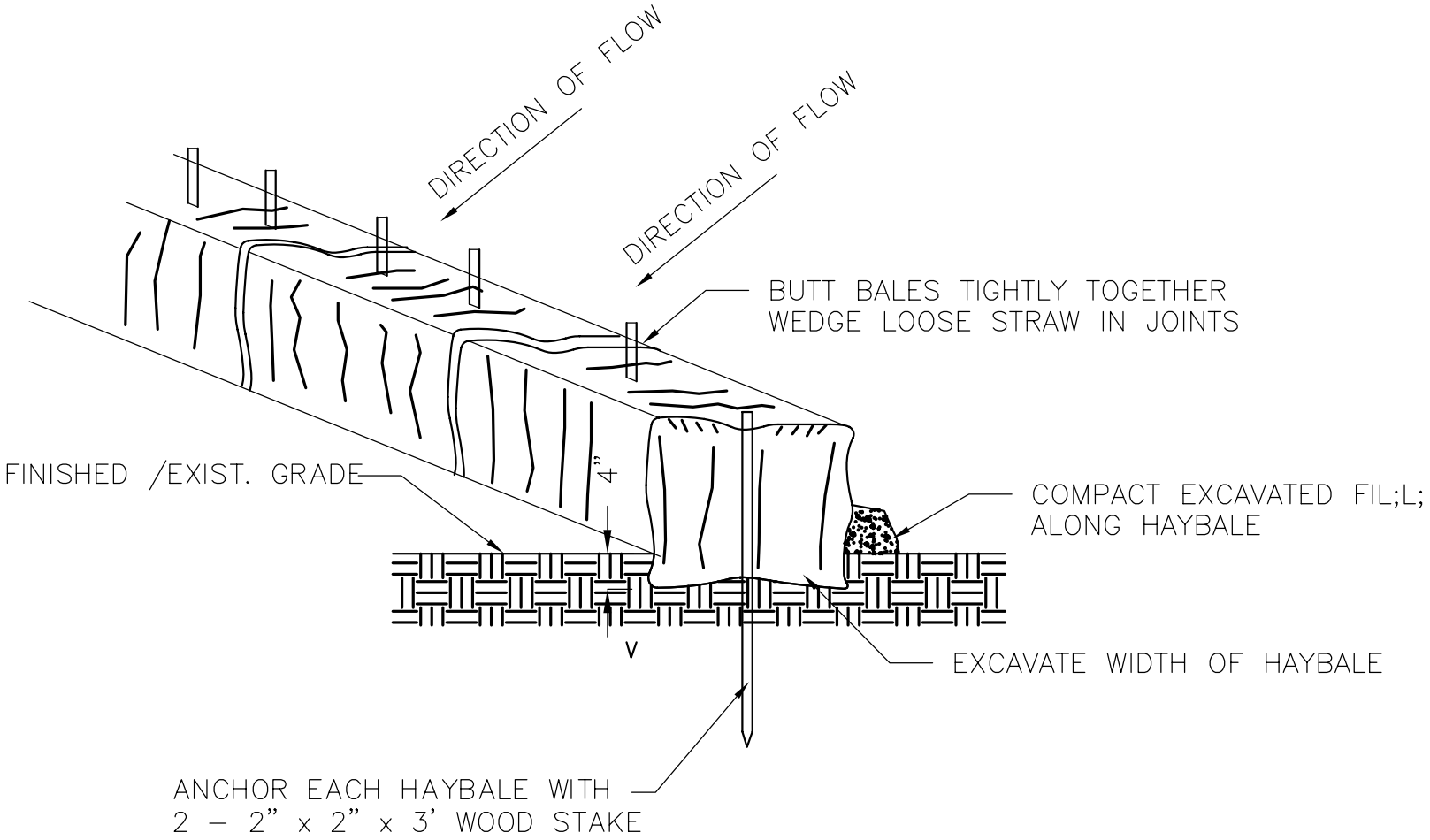
TREE PLANTING DETAIL

N.T.S.

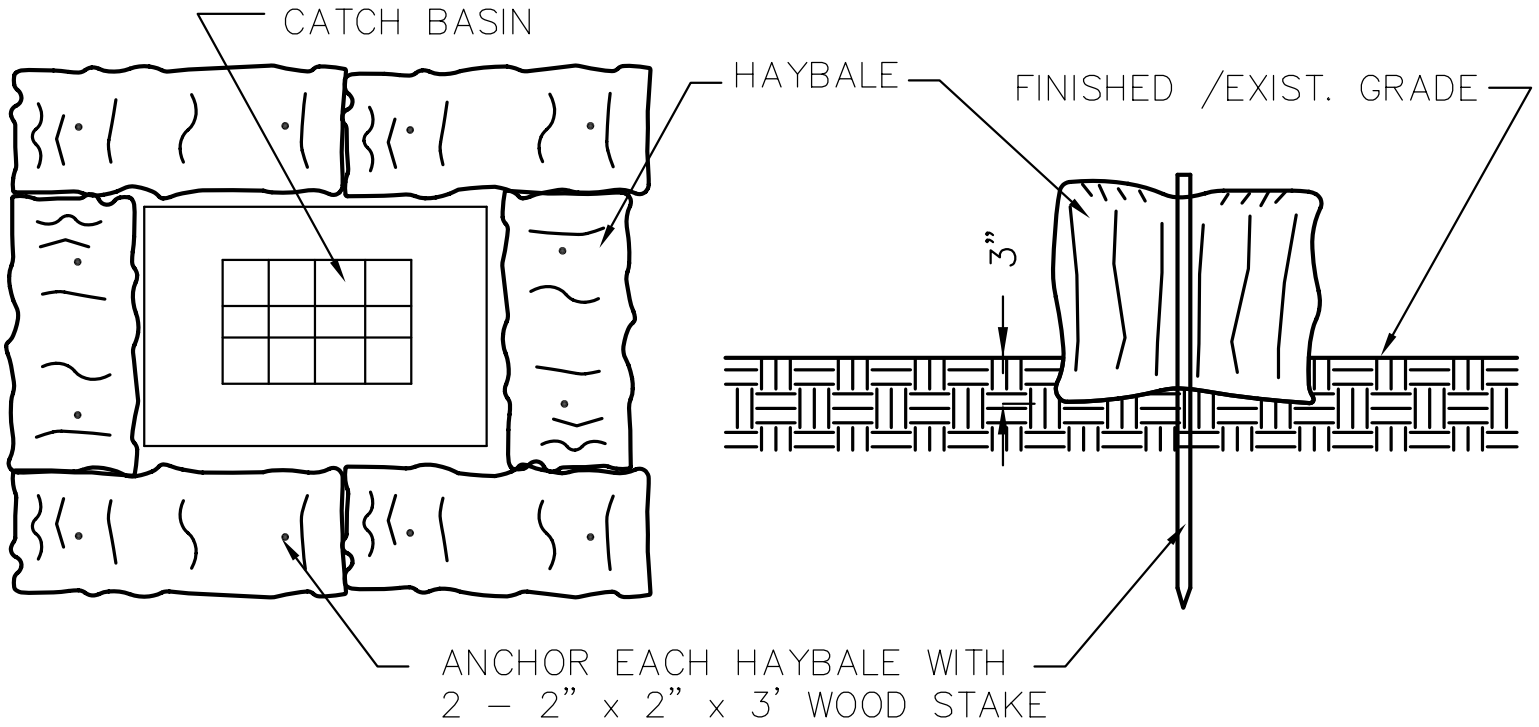
EROSION & SEDIMENTATION CONTROL



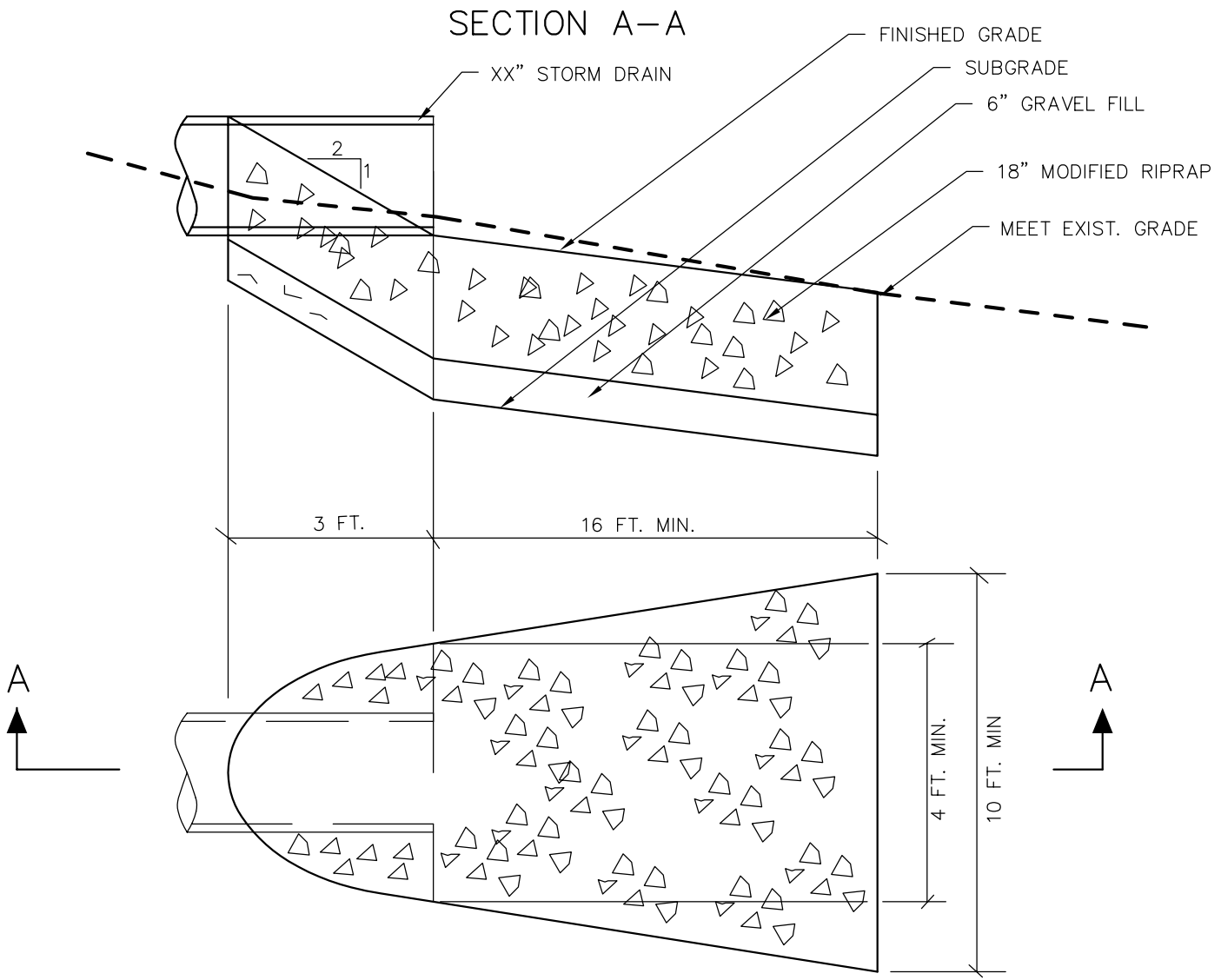
CONSTRUCTION ENTRANCE (CE)
DETAIL (N.T.S.)



STAKED HAYBALE
DETAIL



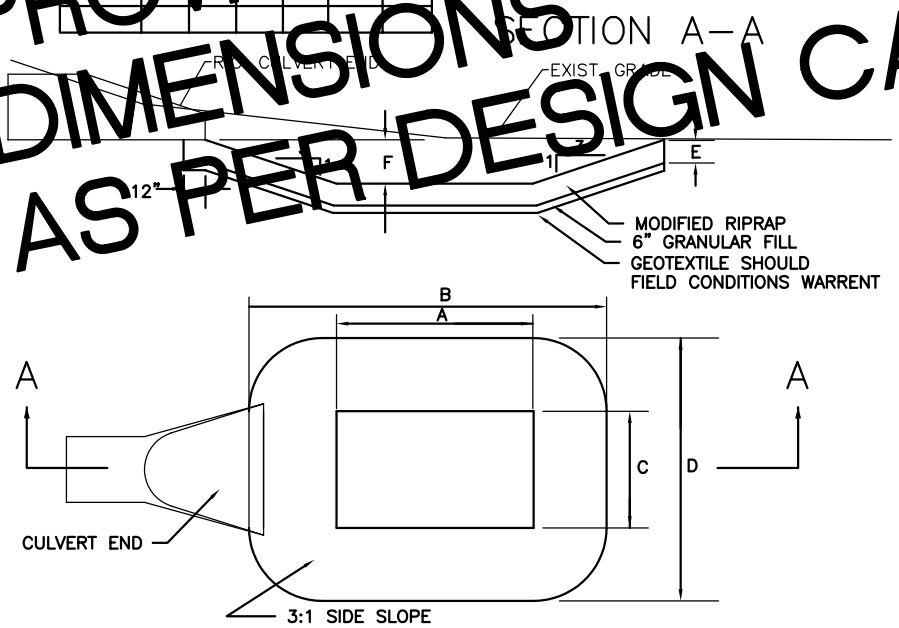
STAKED HAYBALE
DETAIL



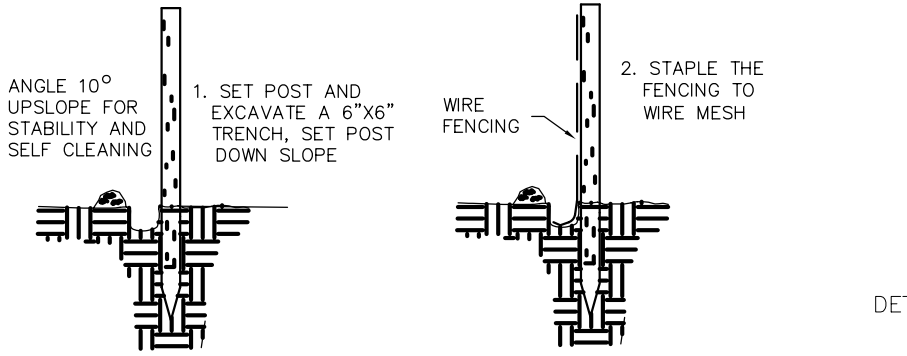
RIPRAP OUTLET DETAIL
(N.T.S.)

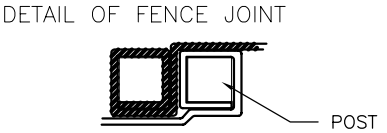
PROVIDE DIMENSIONS AS PER DESIGN CALCULATIONS

OUTLET	A	B	C	D	E	F



SCOUR HOLE DETAIL

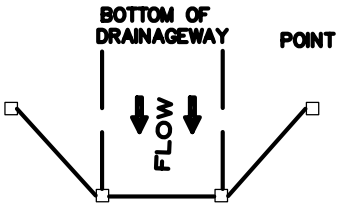




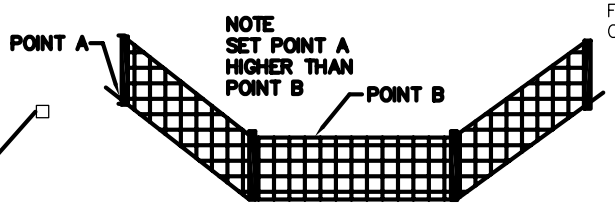
NOTES:

AT FENCE JOINTS POST SHALL OVERLAP AS SHOWN IN "DETAIL OF FENCE JOINT" ABOVE. FABRIC SHALL FOLD AROUND EACH POST AT LEAST ON TURN AND POST SHALL BE DRIVEN TIGHTLY TOGETHER WITH THE TOP OF THE POSTS SECURED TOGETHER WITH CORD OR WIRE.

GSF SHALL BE INSTALLED IN ACCORDANCE WITH PAGES 5-11-35 THROUGH 5-11-37 OF THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENTATION CONTROL.

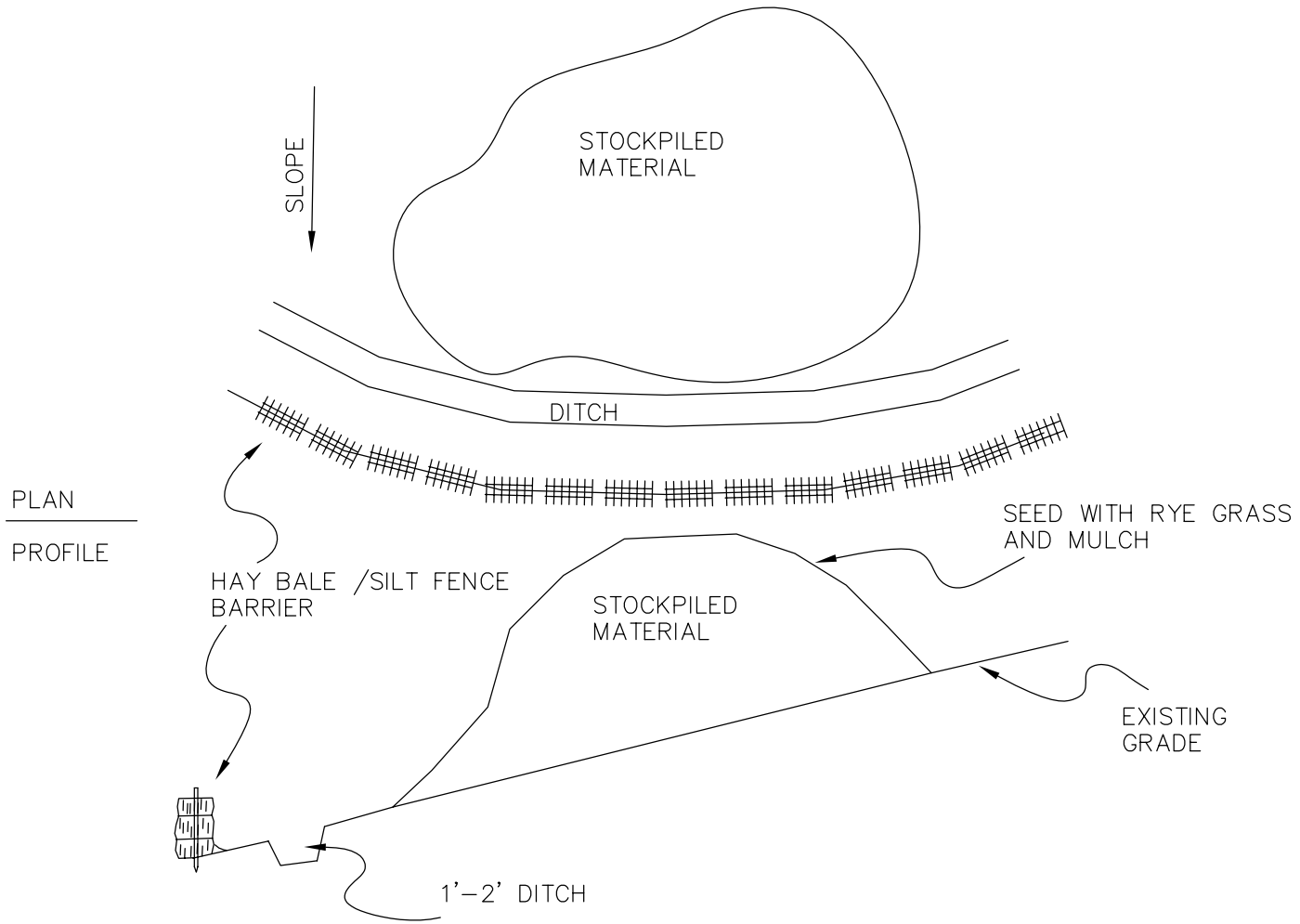


PLAN VIEW

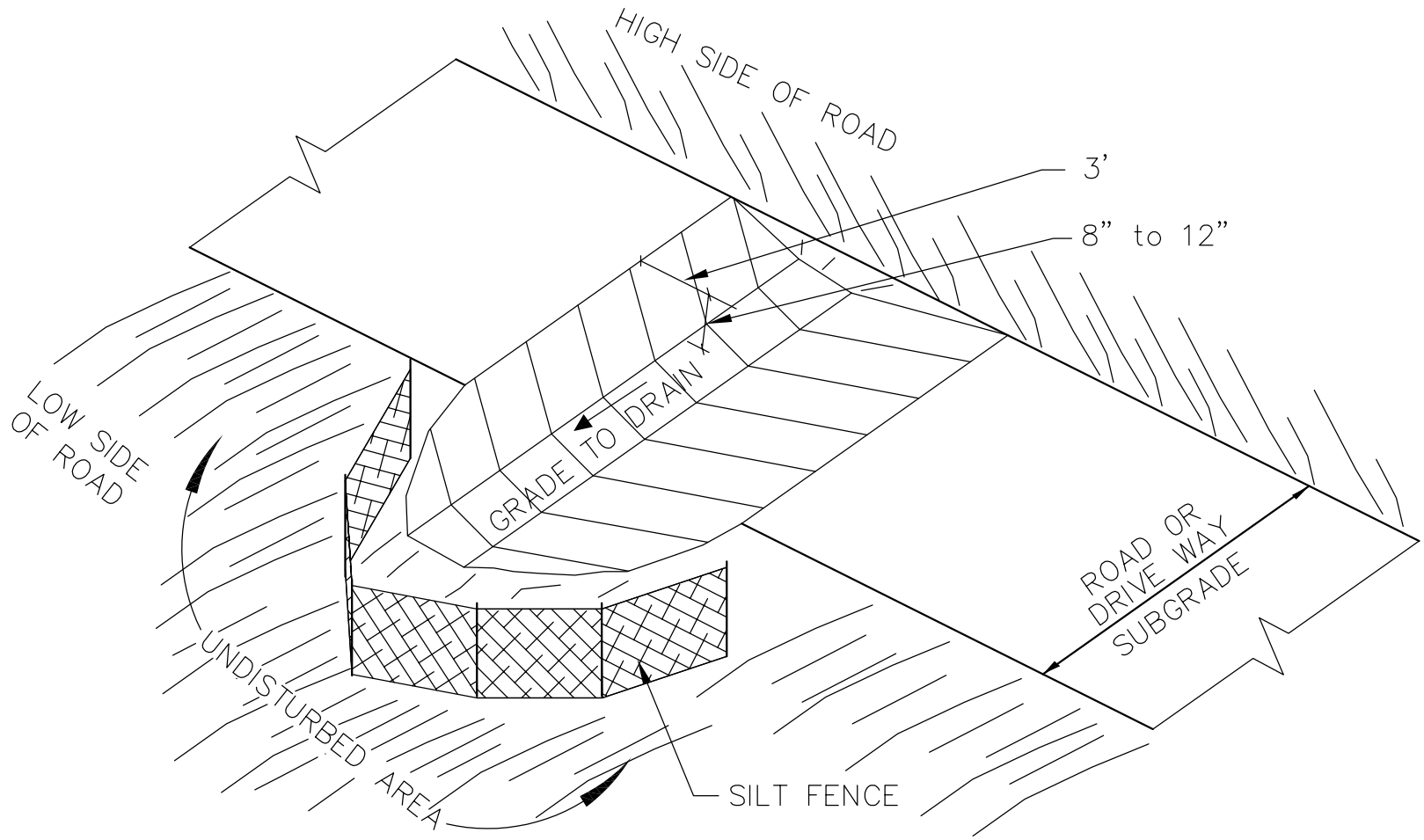


ELEVATION

GEOTEXTILE SILT FENCE DETAIL
(GSF)
(N.T.S.)

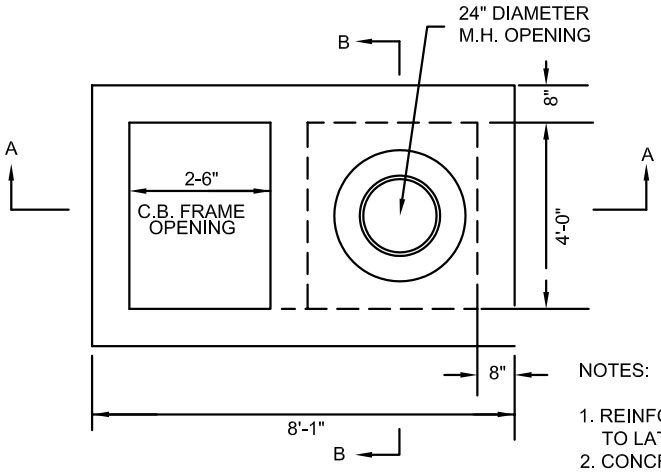


EROSION CONTROL FOR STOCKPILED MATERIAL (N.T.S.)



DIVERSION SWALE DETAIL
(N.T.S.)

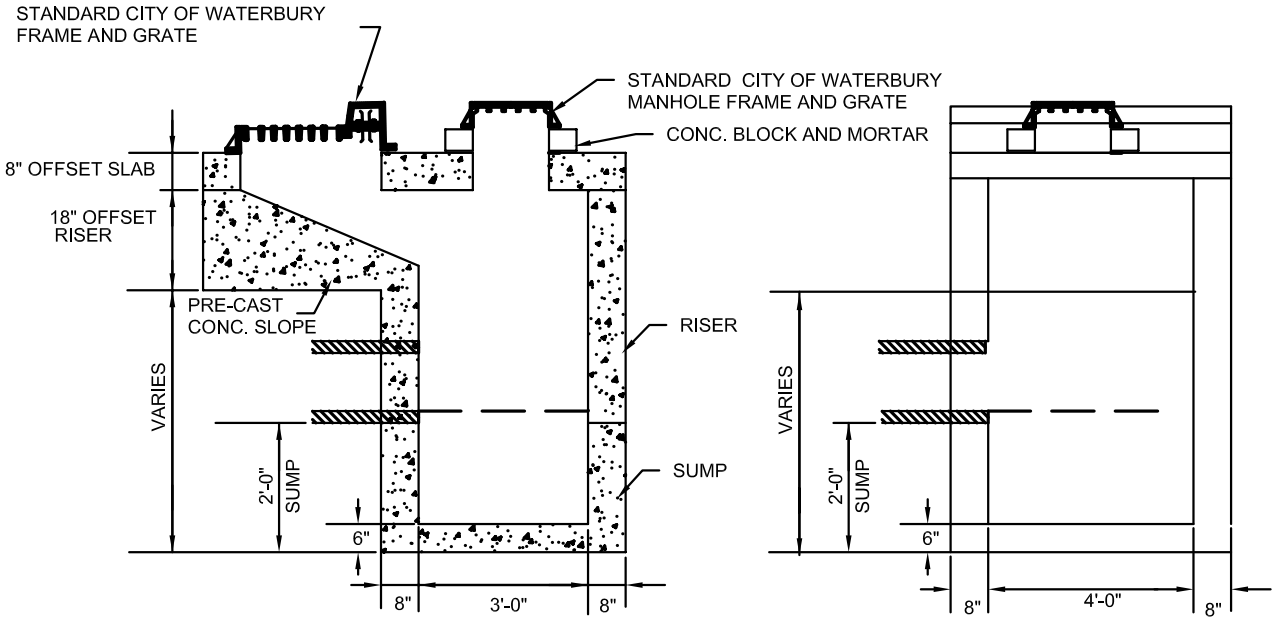
STORMWATER



PLAN

NOTES:

1. REINFORCING STEEL DEFORMS BAR SHALL CONFORM TO LATEST ASTM SPECIFICATION A615
2. CONCRETE COMPRESSIVE STRENGTH - 4000 P.S.I AT 28 DAYS
3 METHOD OF MANUFACTURE SHALL BE "WET CAST"
4. CATCH BASIN SHALL BE DESIGN FOR AASHTO HS-20 LOADING.

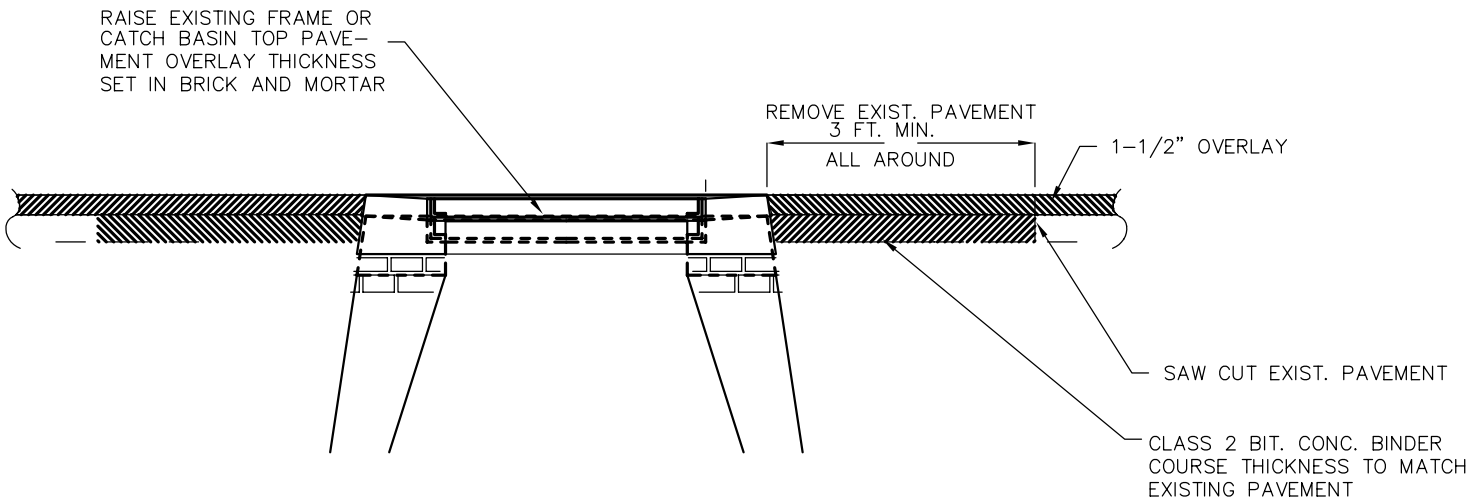


SECTION A–A

SECTION B–B

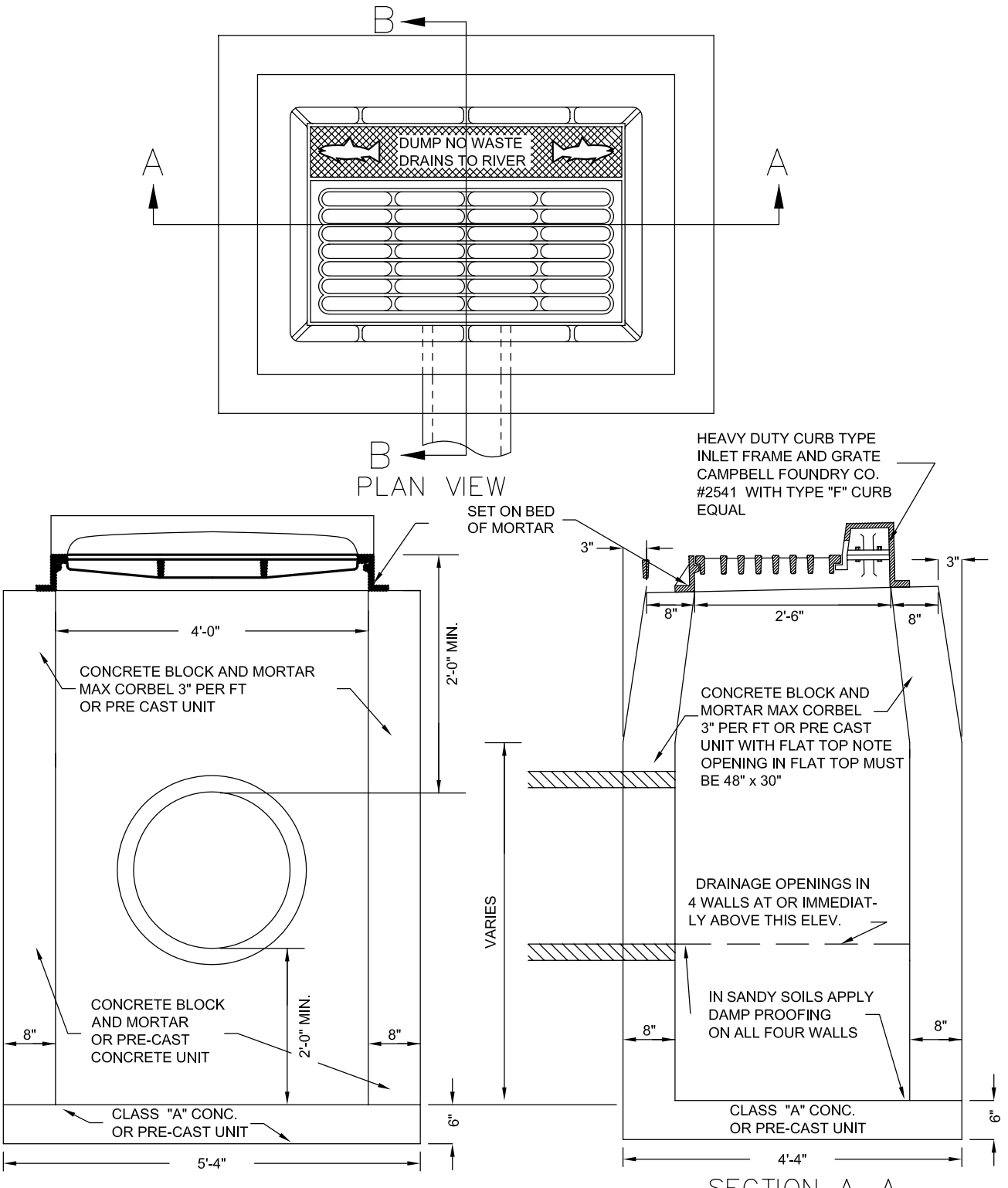
OFFSET CATCH BASIN DETAIL (NTS)

City of Waterbury
Bureau of Engineering
FEBRUARY 6, 2005
File: WTBYOFFSETCBDE.dwg

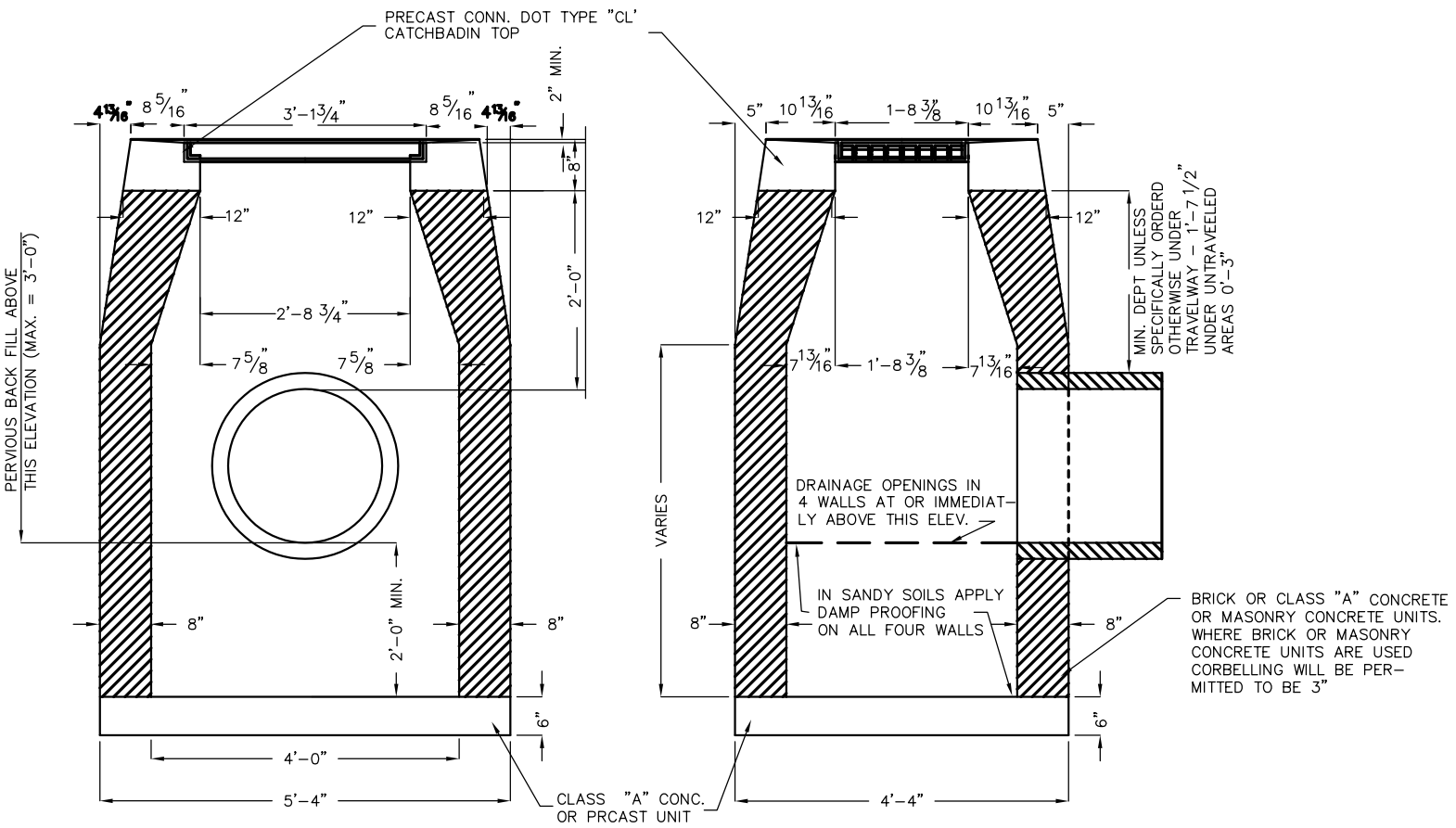


RAISE UTILITY CATCHBASIN TOP/ MANHOLE FRAME DETAIL

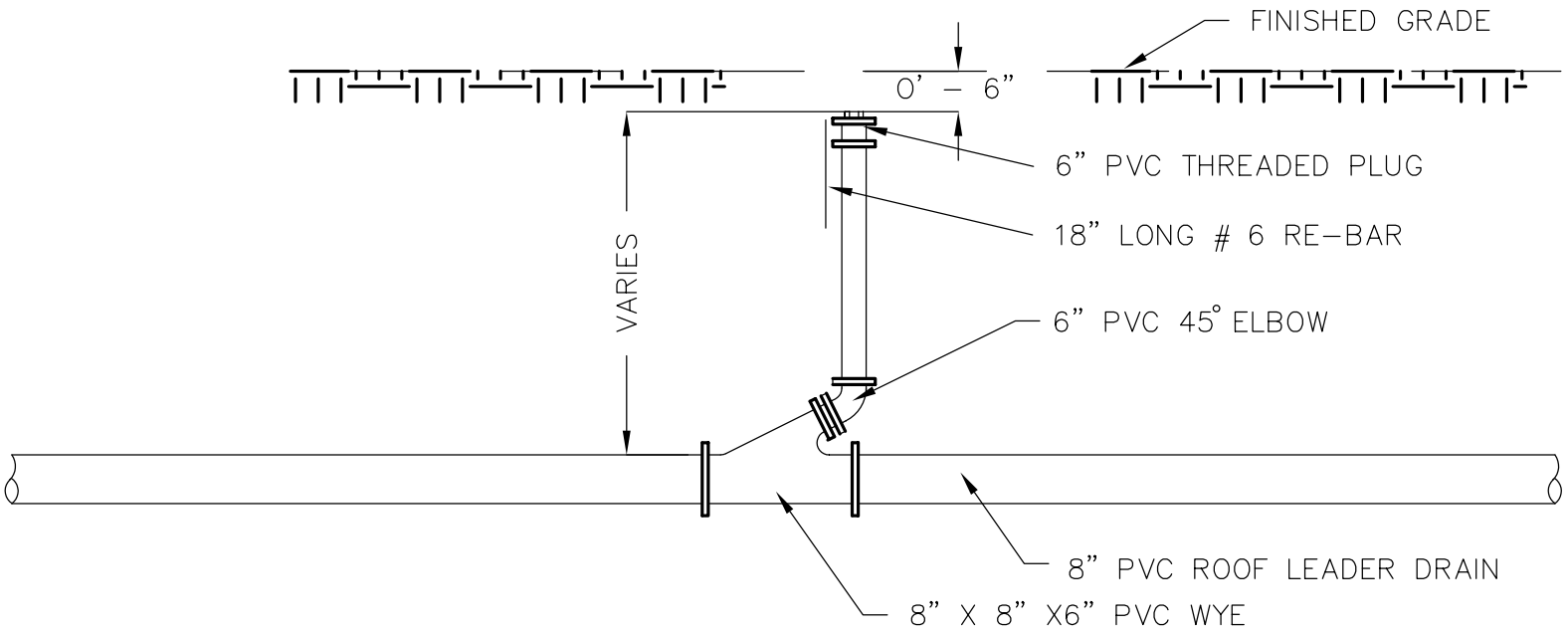
(NTS)



TYPE C CATCH BASIN DETAIL (NTS)



TYPE "CL" CATCHBASIN DETAIL (NTS)

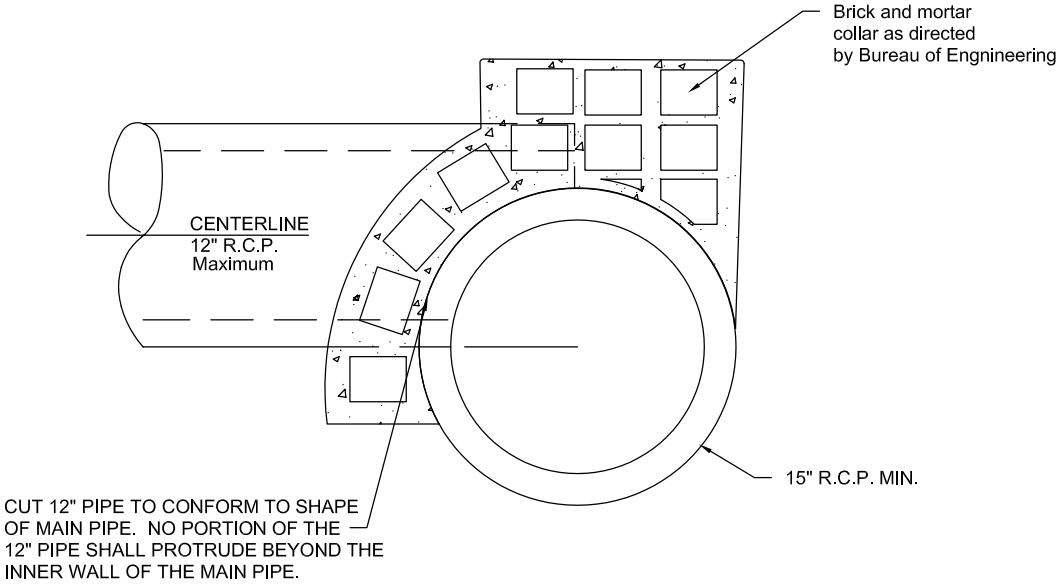


ROOF DRAIN CLEAN OUT DETAIL

(N.T.S.)

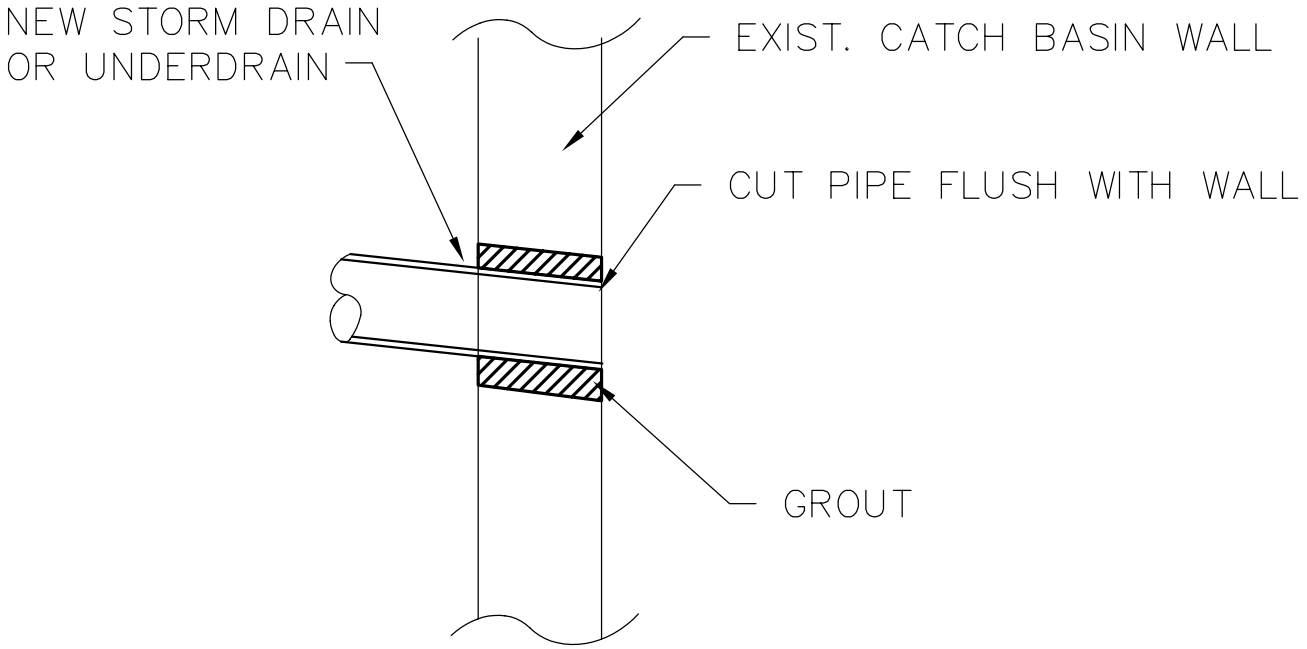
Note:

1. All work and materials shall conform to the latest addition of the State of Connecticut Department of Transportation Standard specifications for Roads Bridges and Incidental Construction.



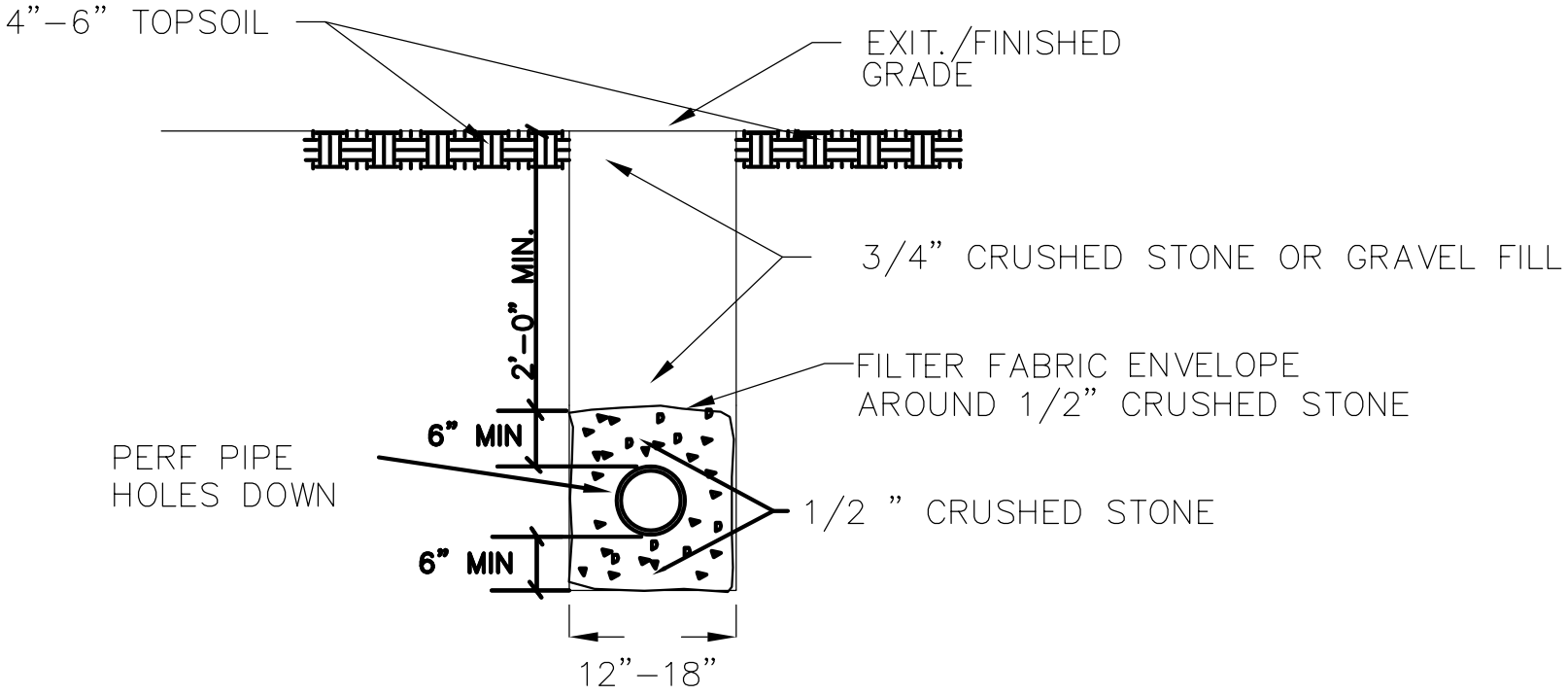
BLIND CONNECTION DETAIL (NTS)

City of Waterbury
Bureau of Engineering
February 17, 2007
File: BLINDCONNECTION.DWG



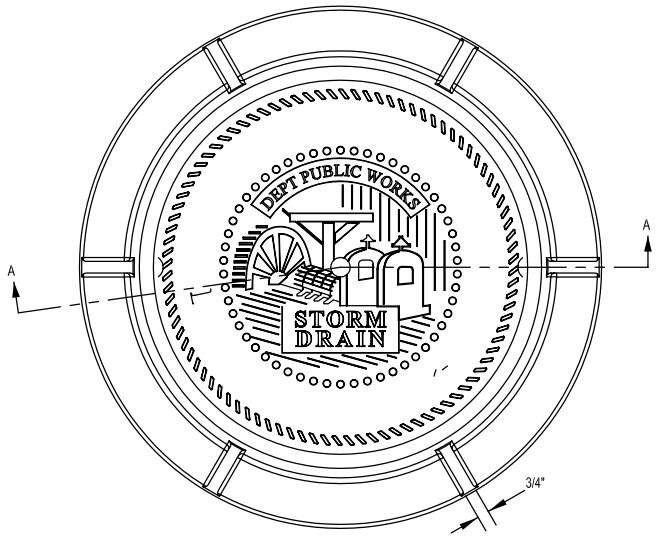
PIPE CONNECTION TO EXISTING CATCH BASIN DETAIL

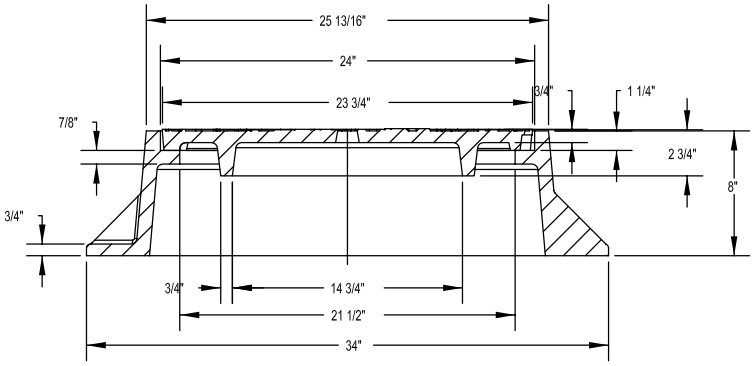
(N.T.S.)



CURTAIN DRAIN DETAIL

(N.T.S.)



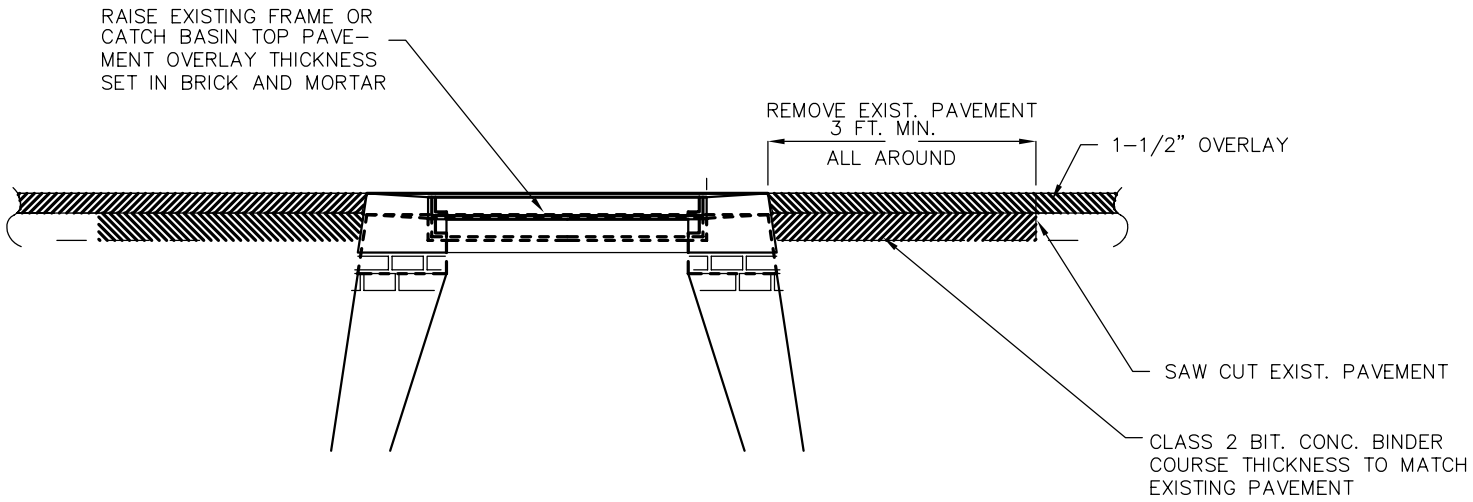


SECTION A-A
SCALE 1 : 8

STORM MANHOLE FRAME AND COVER DETAIL
CITY OF WATERBURY

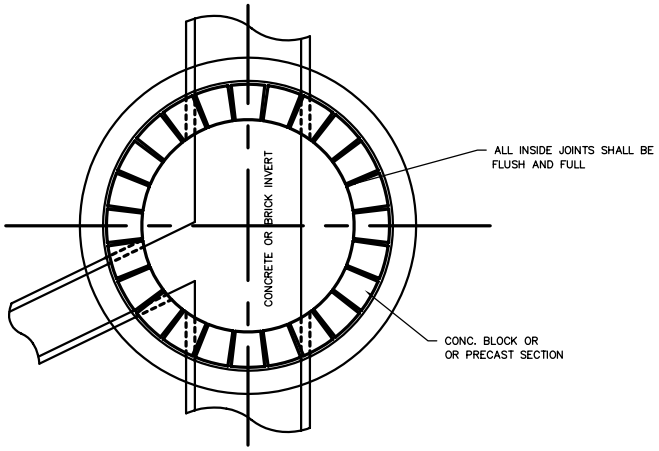
MATERIAL:
ASTM A48 CLASS 30 GRAY CAST IRON
AASHTO HS 20 LOAD RATED

TOLERANCES: ± 1/16 ON ALL DIMENSIONS
DIMENSIONS ARE IN INCHES ± 1/16"
FRACTIONAL
UP TO 12" AND AN ADDITIONAL
PER FOOT

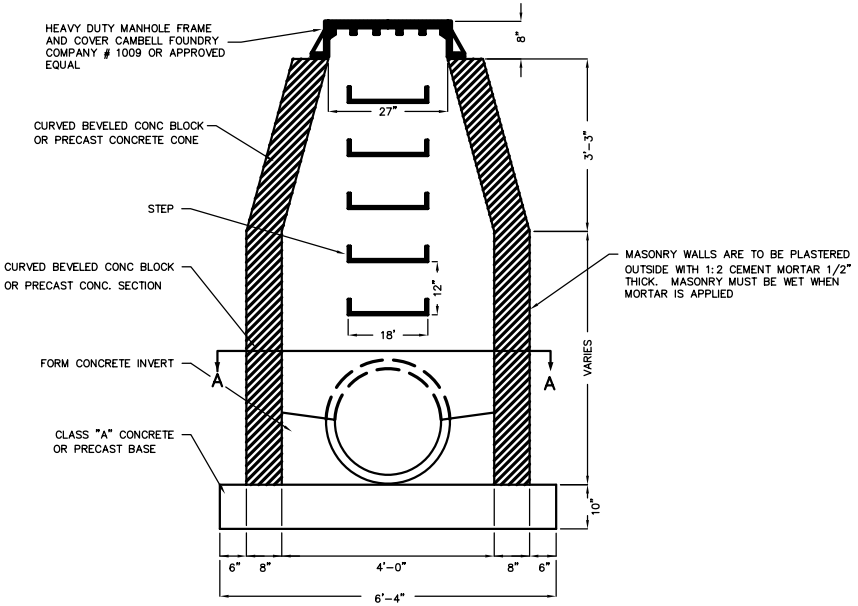


RAISE UTILITY CATCHBASIN TOP/ MANHOLE FRAME DETAIL

(NTS)

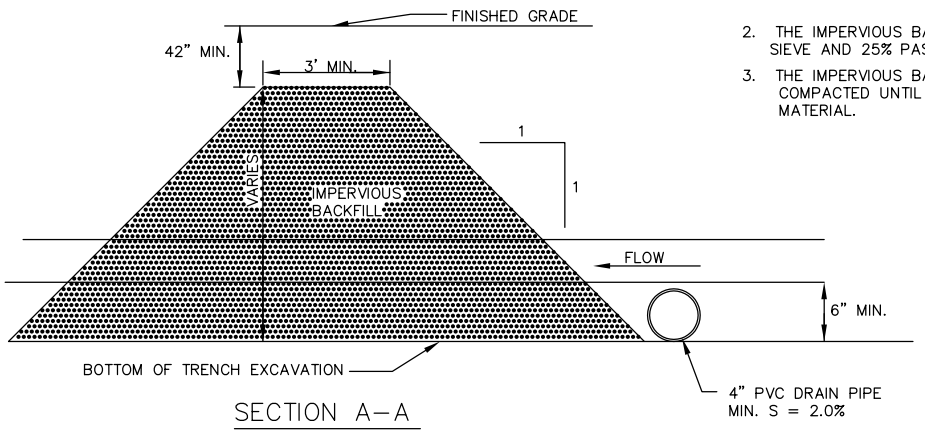


CROSS SECTION A–A

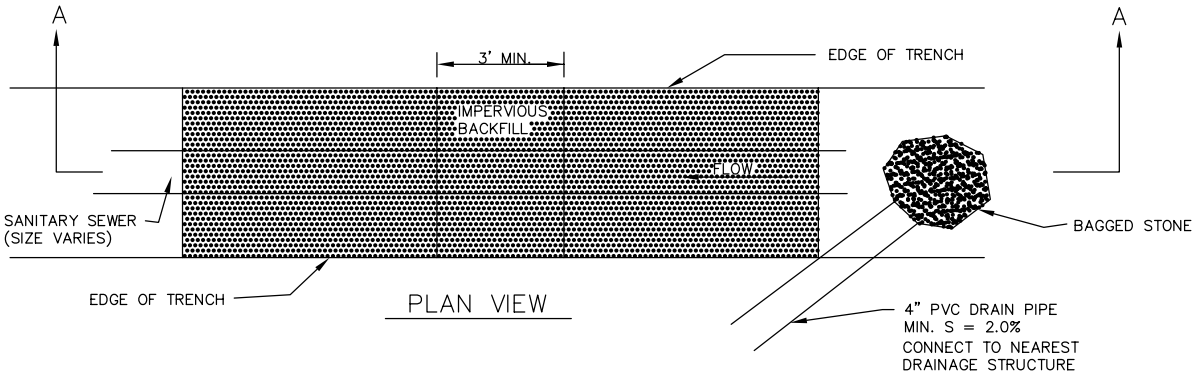


STORM MANHOLE DETAIL (NTS)

1. WATERSTOPS SHALL BE LOCATED AS SHOWN, OR AS DIRECTED BY THE ENGINEER.
2. THE IMPERVIOUS BACKFILL SHALL HAVE A MINIMUM OF 15% PASSING THE NO. 200 SIEVE AND 25% PASSING THE NO. 100 SIEVE BY WIEGHT.
3. THE IMPERVIOUS BACKFILL SHALL BE PLACED IN 6 INCH LIFTS AND THROUGHLY COMPACTED UNTIL EACH LAYER IS NOT LESS THAN 95% OF DRY DENSITY OF THE MATERIAL.



SECTION A–A

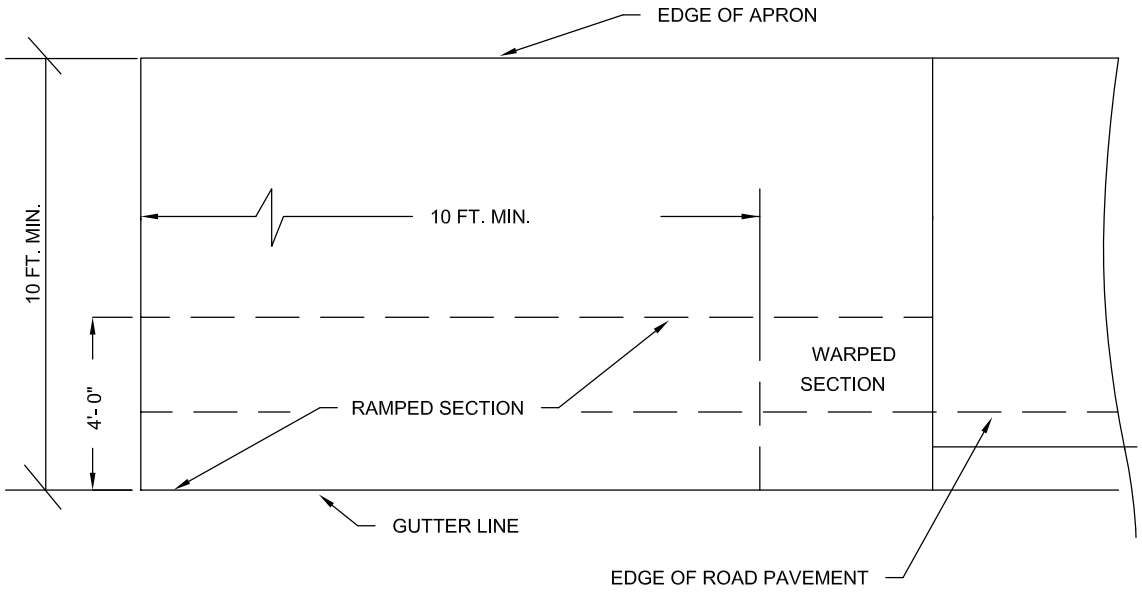


PLAN VIEW

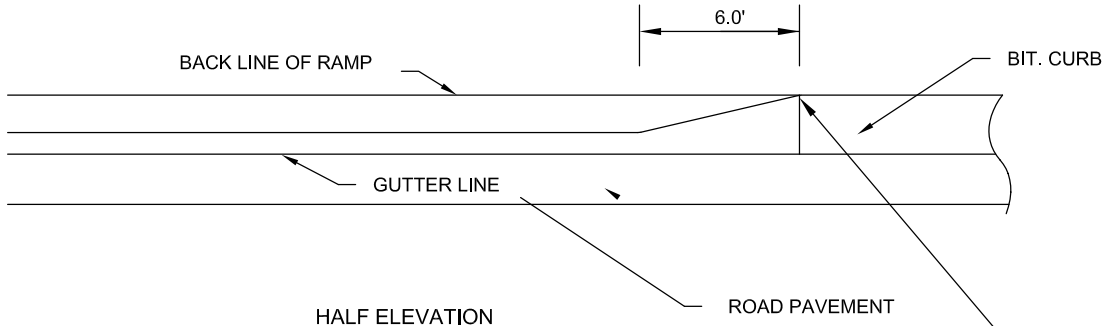
IMPERVIOUS WATERSTOP DETAIL (NTS)

ROAD

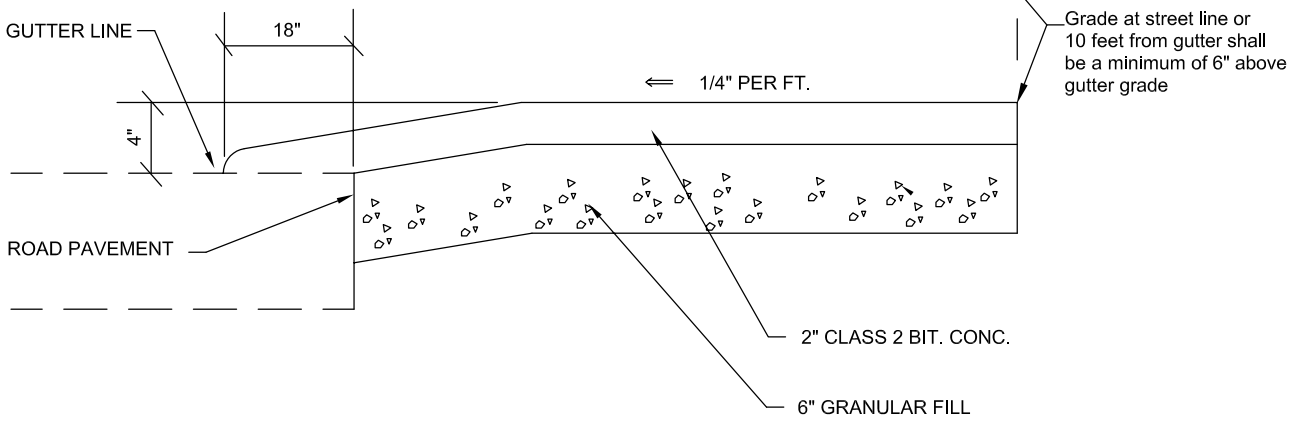
Notes:
1. The contractor shall obtain a street opening permit from the City of Waterbury Bureau of Engineering prior to construction
2. All work and materials shall conform to the latest addition of the State of Connecticut Department of Transportation Standard specifications for Roads Bridges and Incidental Construction.
3. The finished grade at the streetline along the entire parcel shall be a minimum of 6" above the edge of pavement.



HALF PLAN VIEW



HALF ELEVATION

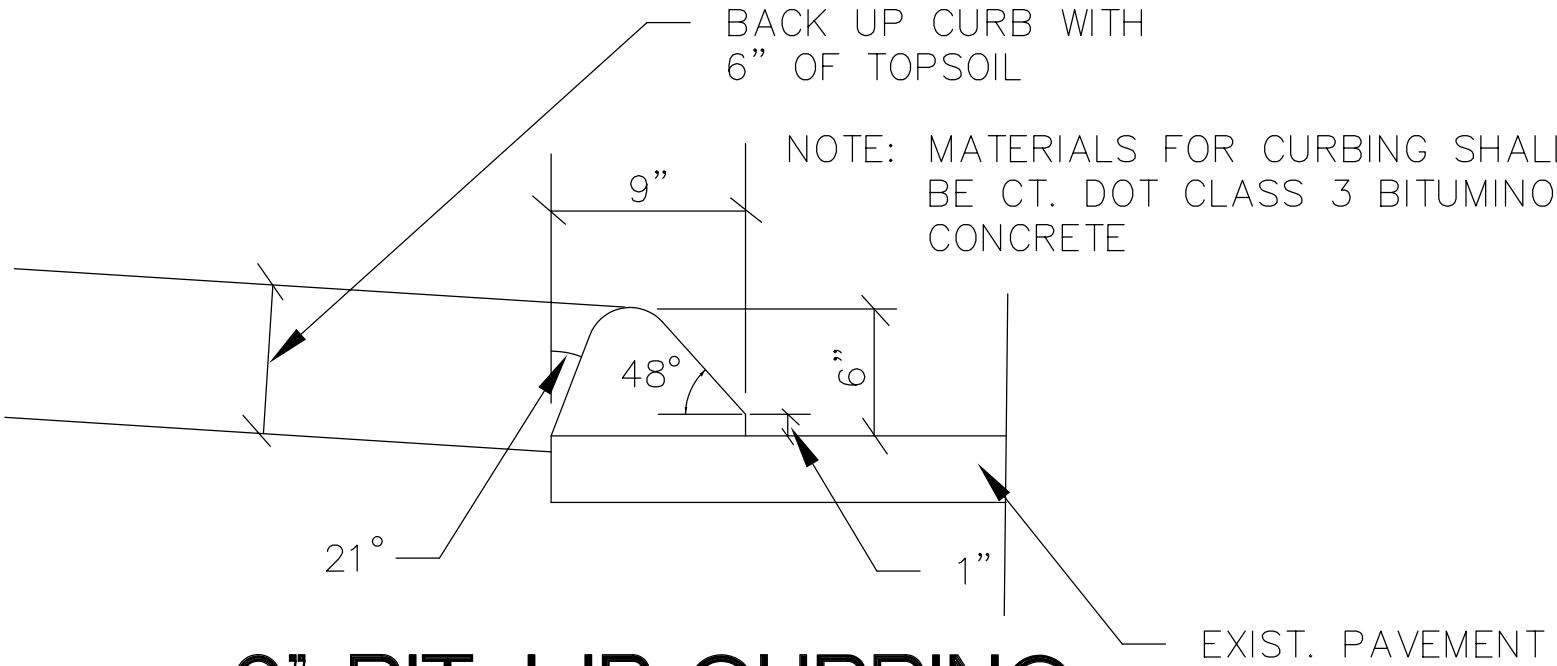


C.S. DETAIL

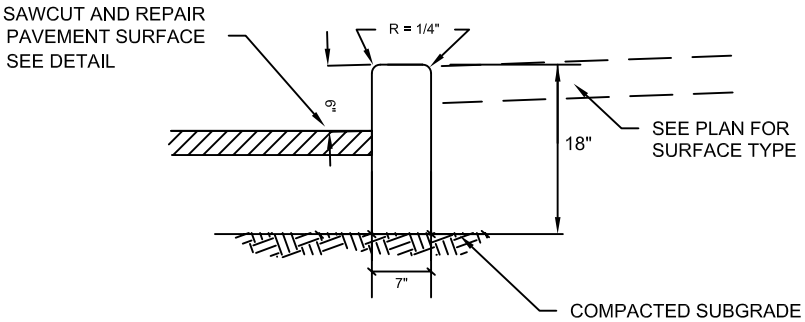
BITUMINOUS CONCRETE DRIVEWAY APRON WITH BIT. CURB DETAIL

(N.T.S.)

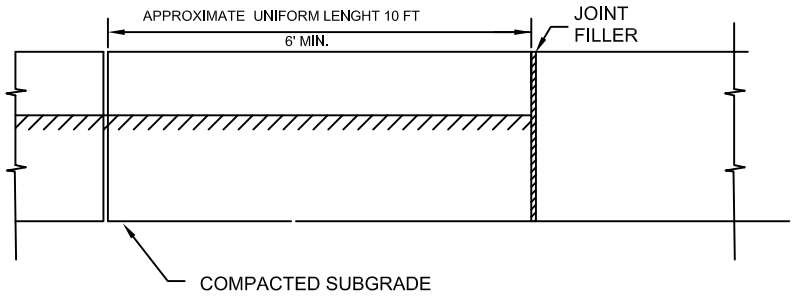
City of WaterburyBureau of Engineering
July 2, 2007
File: Driveway.dwg



6" BIT. LIP CURBING
(N.T.S.)



CROSS SECTION

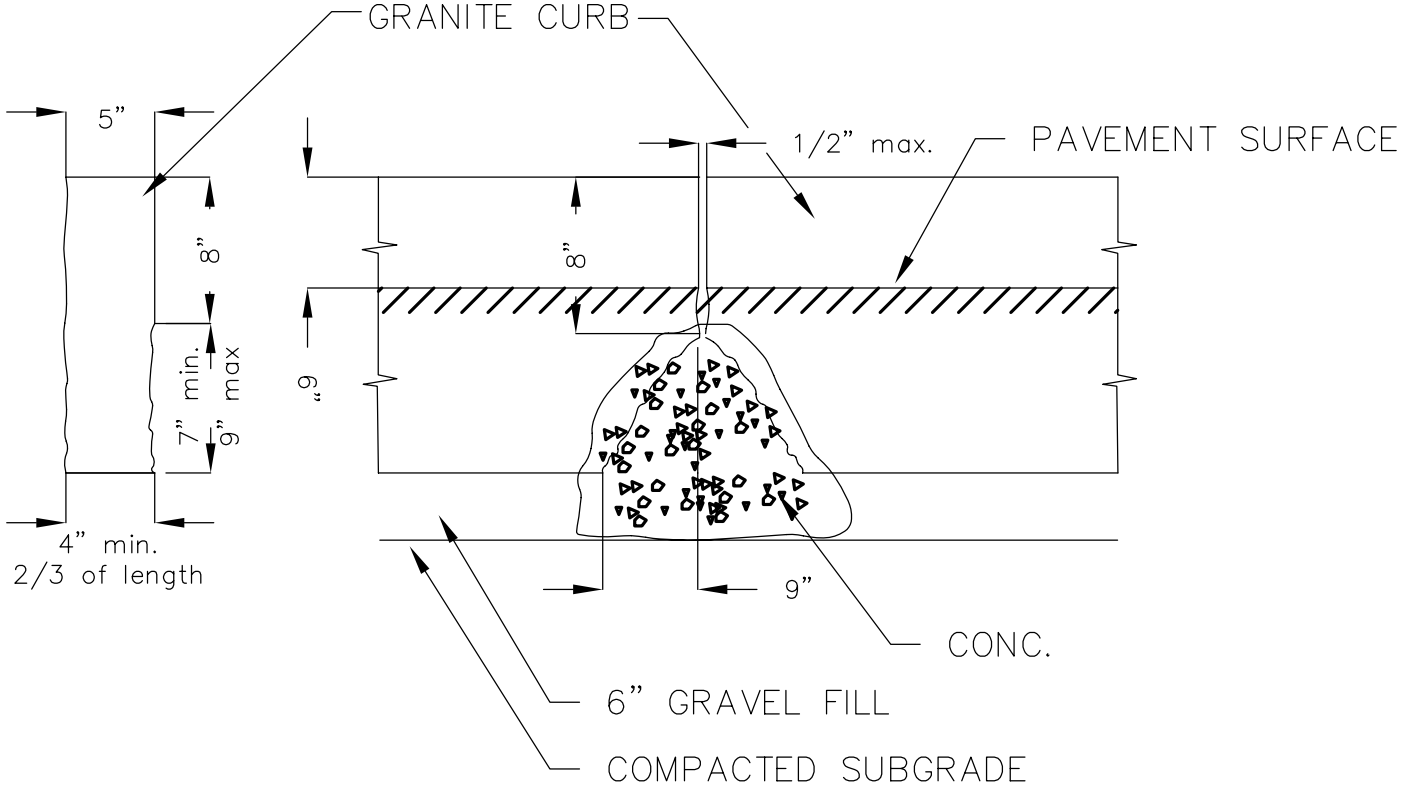


LONGITUDINAL SECTION

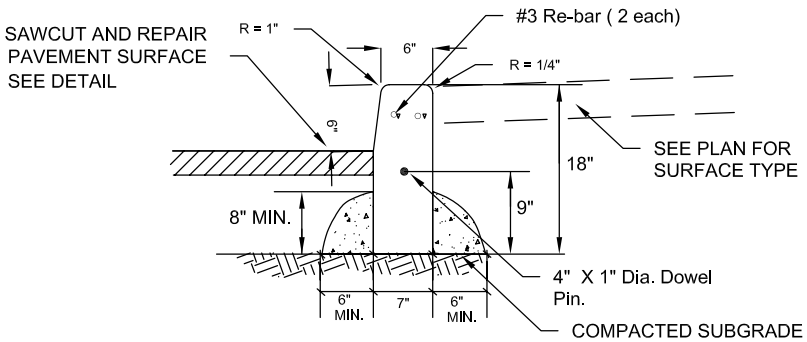
CAST IN PLACE CONCRETE CURB DETAIL (NTS)

City of Waterbury
Bureau of Engineering
February 17, 2006
File: C010 Conccurb.dwg

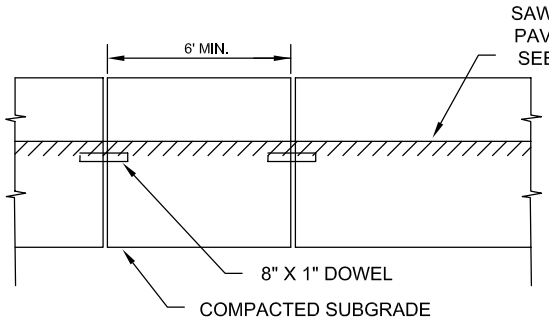
Detail 2



GRANITE CURB DETAIL
(N.T.S.)



CROSS SECTION



LONGITUDINAL SECTION

NOTES

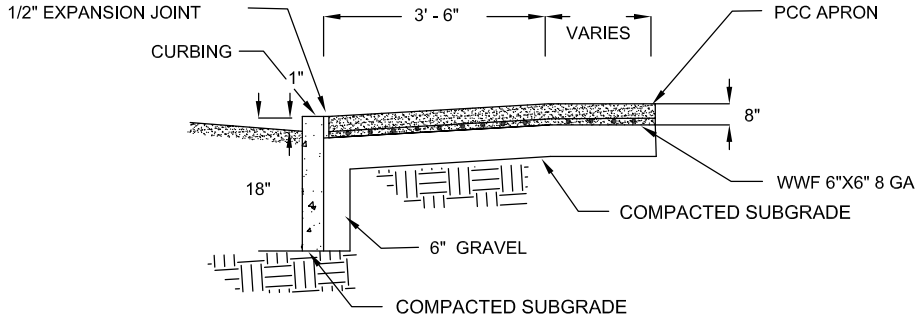
1. CONCRETE FOR CURB SHALL BE 6000 PSI WITH 6-7% AIR ENTRAINMENT
2. ALL GAPS AND JOINTS OF 1/2" OR GREATER SHALL BE FILLED WITH MORTAR.

PRE CAST CONCRETE CURB DETAIL (NTS)

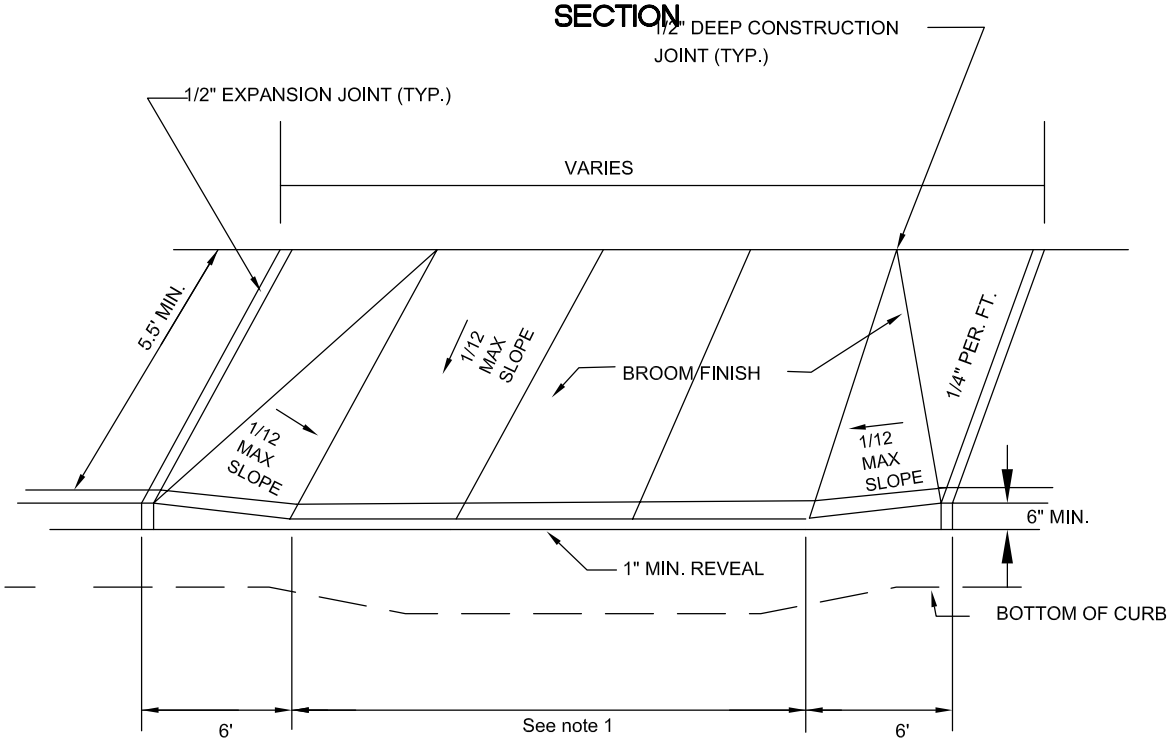
City of Waterbury
Bureau of Engineering
February 15, 2006
File: Pre cast Conccurb.dwg

Notes:

1. The contractor shall obtain a street opening permit from the City of Waterbury Bureau of Engineering prior to construction
2. All work and materials shall conform to the latest addition of the State of Connecticut Department of Transportation Standard specifications for Roads Bridges and Incidental Construction.
3. The finished grade at the streetline along the entire parcel shall be a minimum of 6" above the edge of pavement.



SECTION



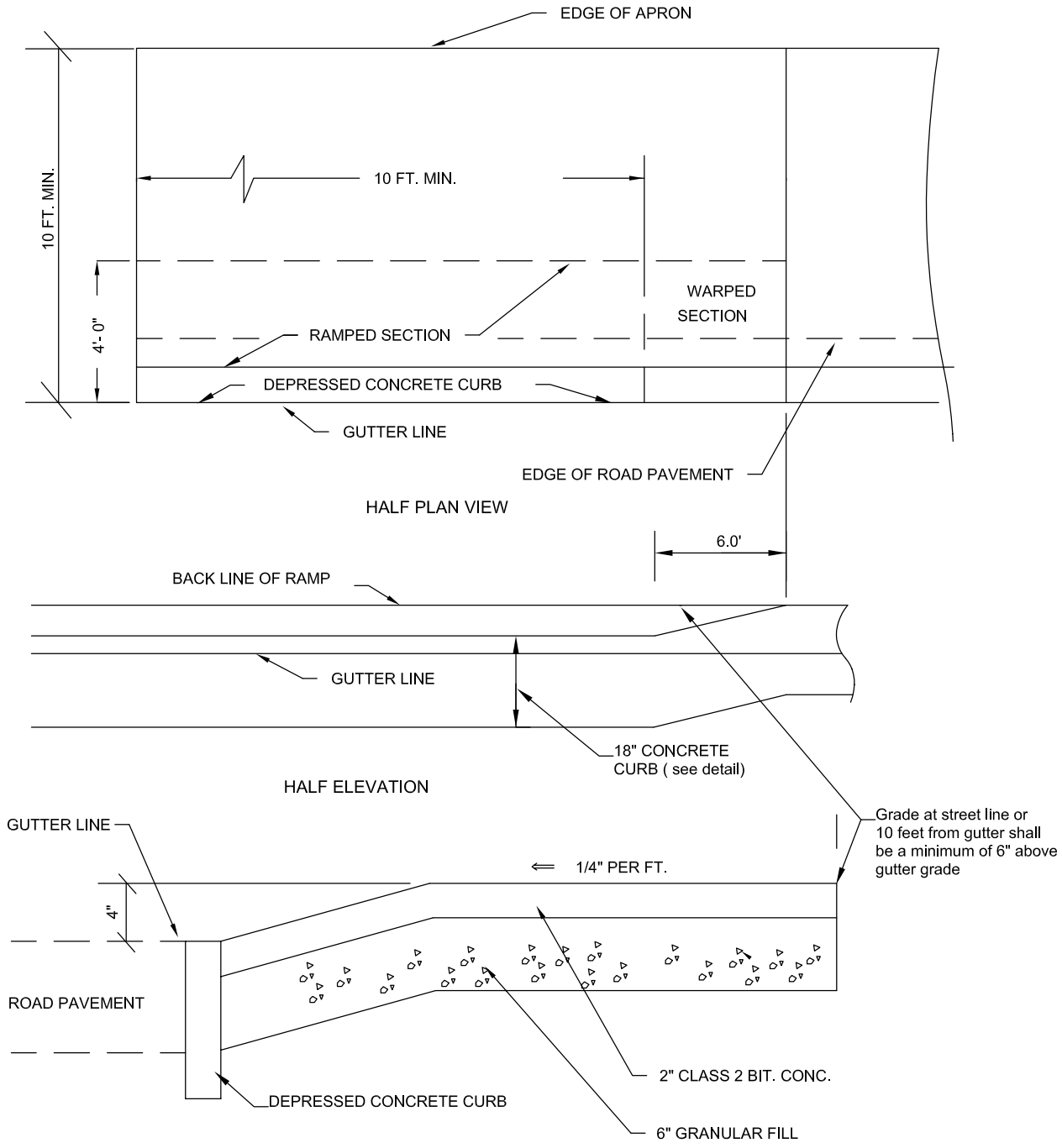
1. Single family and duplex residential max. width 18 feet, minimum width 10 feet. Multi family (3 or more units) residential maximum width 24 feet, minimum 12 feet. Commercial and all other uses 24 minimum 2 way traffic, 12 feet one way traffic or as directed by the Traffic Engineer

PLAN

8" PORTLAND CEMENT CONCRETE (PCC) DRIVEWAY APRON DETAIL (N.T.S.)

City of Waterbury
Bureau of Engineering
FEBRUARY 15, 2005
File: 8"PCCWIDEWALK.dwg

Notes:
1. The contractor shall obtain a street opening permit from the City of Waterbury Bureau of Engineering prior to construction
2. All work and materials shall conform to the latest addition of the State of Connecticut Department of Transportation Standard specifications for Roads Bridges and Incidental Construction.
3. The finished grade at the streetline along the entire parcel shall be a minimum of 6" above the edge of pavement.



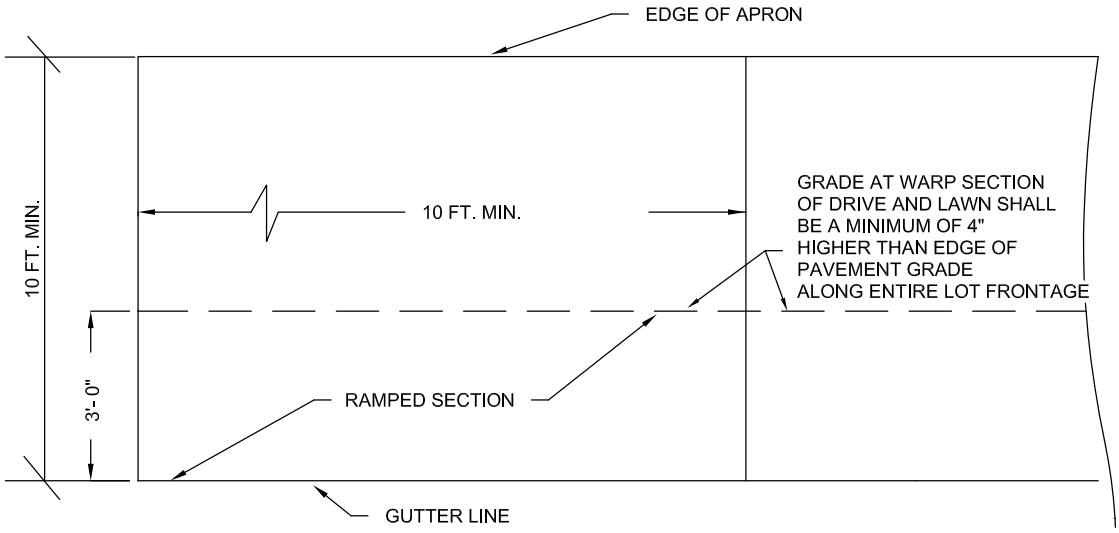
C.S. DETAIL

BITUMIOUS CONCRETE DRIVE WITH CONCRETE CURB

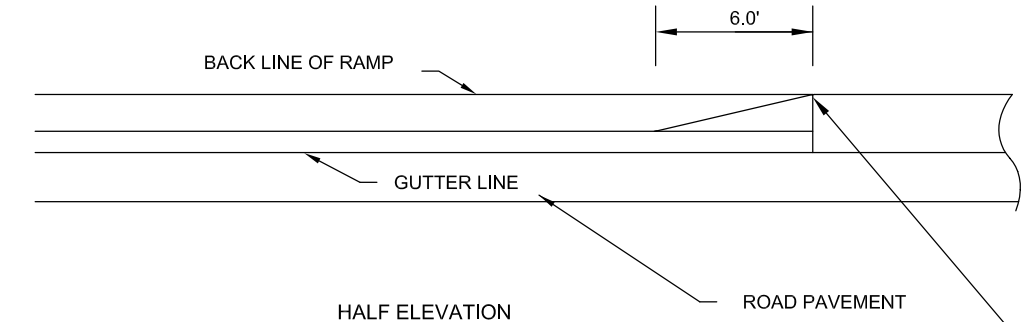
(N.T.S.)

City of WaterburyBureau of
Engineering
January 26, 2007
File: Driveway CONC CURB.dwg

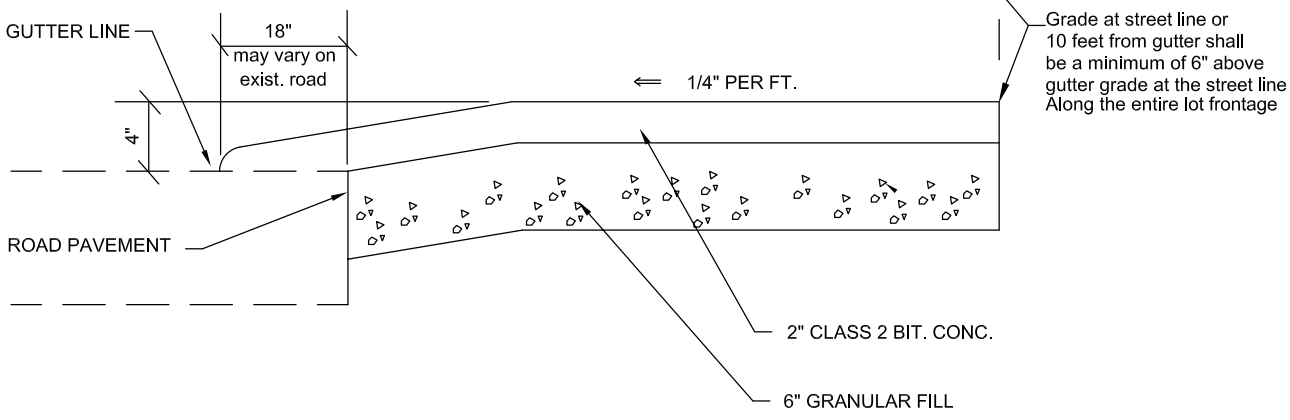
Notes:
1. The contractor shall obtain a street opening permit from the City of Waterbury Bureau of Engineering prior to construction
2. All work and materials shall conform to the latest addition of the State of Connecticut Department of Transportation Standard specifications for Roads Bridges and Incidental Construction.
3. The finished grade at the streetline along the entire parcel shall be a minimum of 6" above the edge of pavement.



HALF PLAN VIEW



HALF ELEVATION

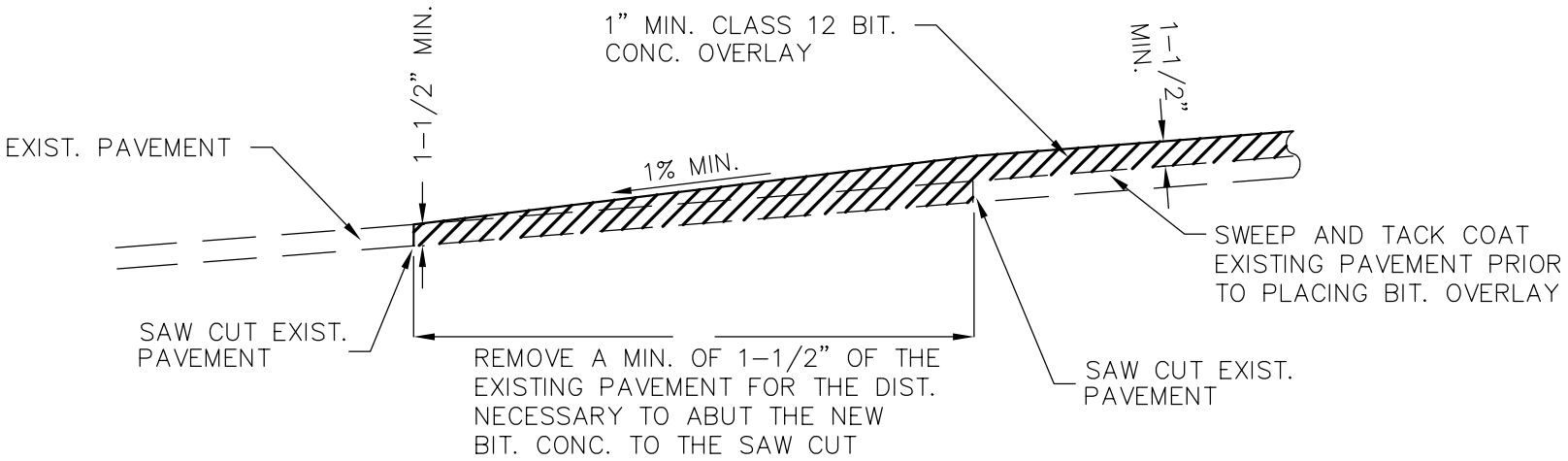


C.S. DETAIL

BITUMINOUS CONCRETE DRIVEWAY APRON WITH No CURB DETAIL

(N.T.S.)

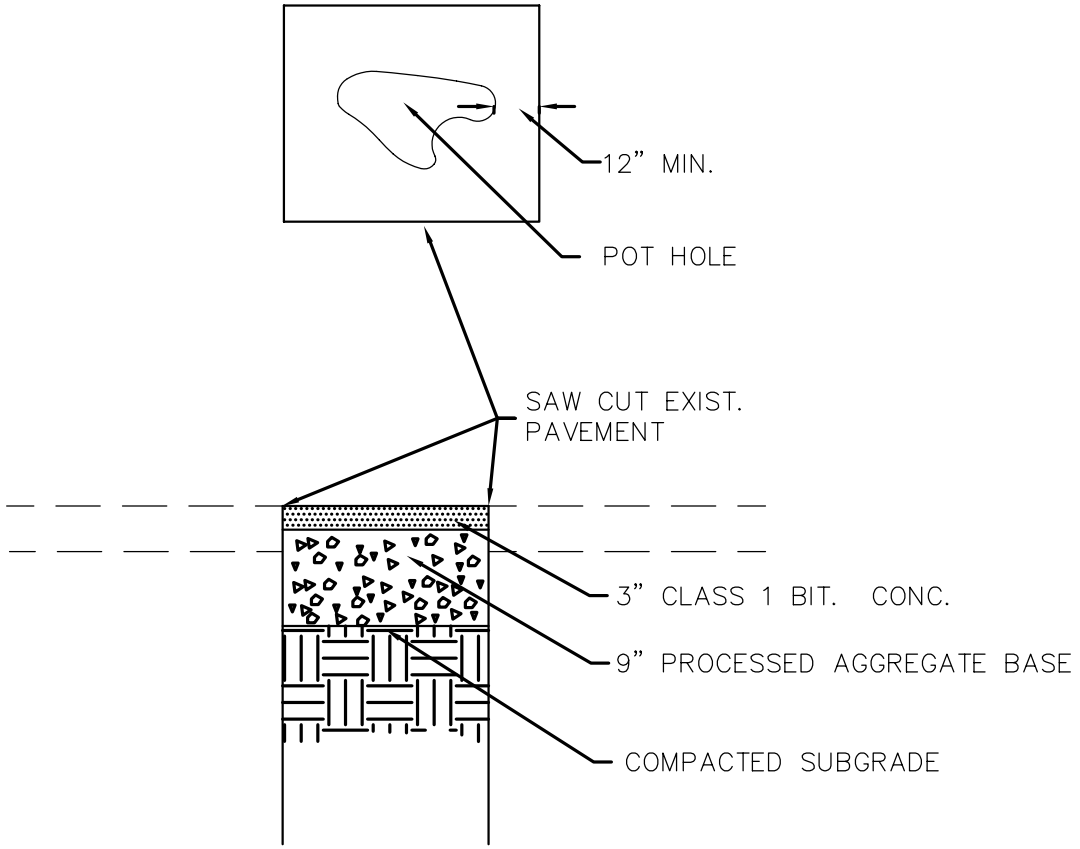
City of WaterburyBureau of Engineering
January 26, 2006
File: Driveway with no curb.dwg



PAVEMENT OVERLAY DETAIL

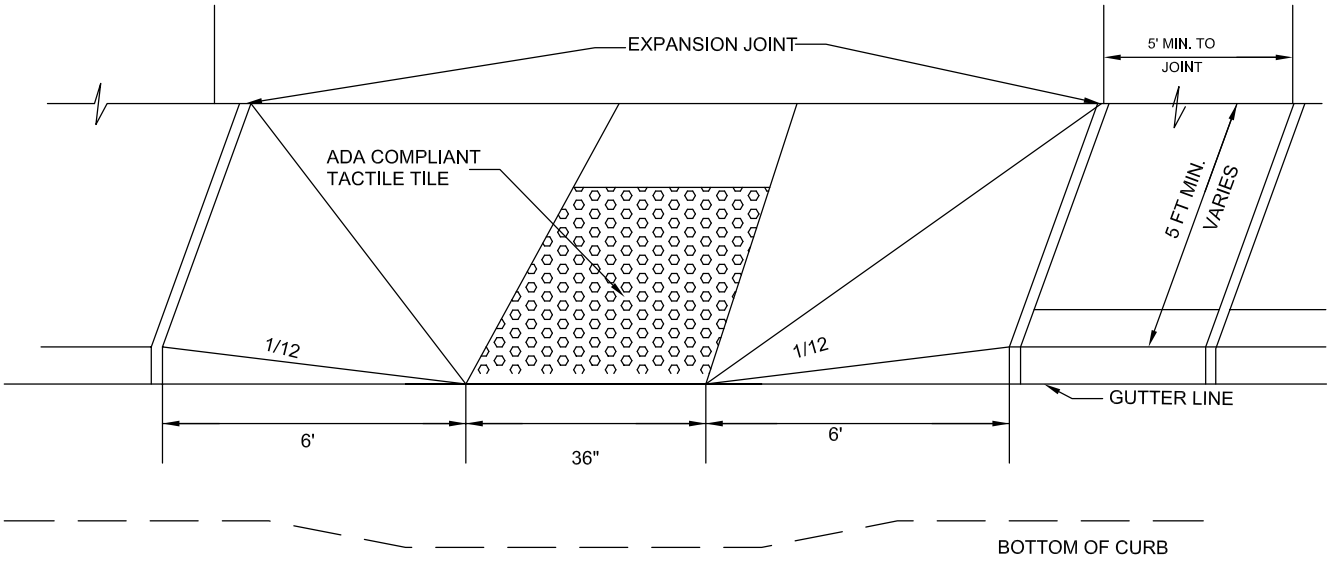
(N.T.S.)

PLAN VIEW

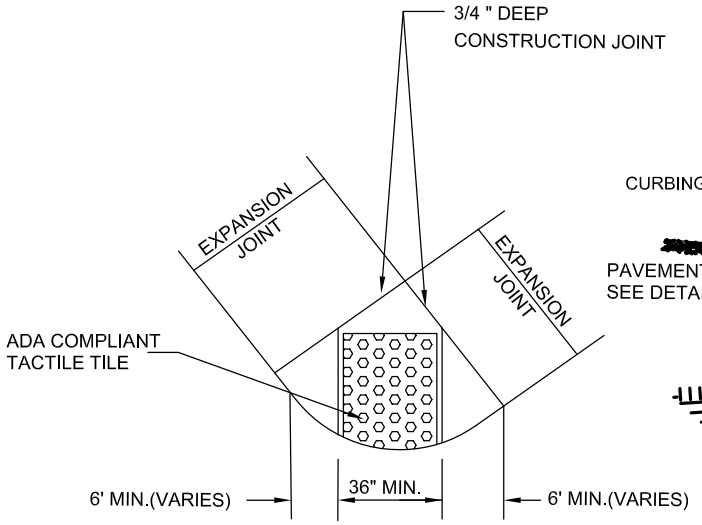


CROSS SECTION

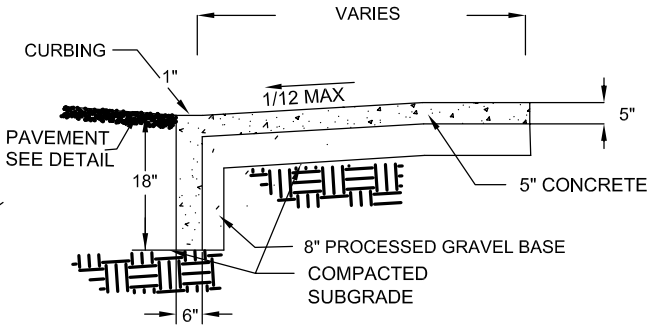
POT HOLE REPAIR DETAIL (N.T.S.)



TANGENT



RADIAL



CROSS SECTION

NOTES:

RADIAL

1.) WHEN COMBINED WITH CURB DETAIL, A MIN. 1" REVEAL IS REQUIRED AT GUTTER

2.) CURB AND WALK OR RAMP SHALL NOT BE POURED MONOLITHIC.

PORTLAND CEMENT CONCRETE (PCC) PEDESTRIAN RAMP DETAIL (N.T.S.)

City of Waterbury
Bureau of Engineering
February 17, 2006
File: HDCRAMP.dwg

NOTES:

1. ALL MATERIALS SHALL CONFORM TO THE LATEST ADDITION OF THE STATE OF CONNECTICUT STANDARD SPECIFICATIONS FOR ROADS BRIDGES AND INCIDENTAL CONSTRUCTION.

2. PAVEMENT RESTORATION SHALL BE COMPLETED AT THE END OF EVERY DAY OF WORK ON ARTERIAL AND COLLECTOR ROADS. UNLESS APPROVED IN WRITING BY THE BUREAU OF ENGINEERING AT THE TIME THE PERMIT IS ISSUED.

3. PAVEMENT RESTORATION SHALL BE COMPLETED WITHIN TWENTY-FOUR HOURS OF THE PREVIOUS DAYS EXCAVATION ON LOCAL ROADS.

4. A TEMPORARY PATCH OF 2" OF CLASS 2 BITUMINOUS PATCH MAY BE ALLOWED WITH WRITTEN PERMISSION OF THE BUREAU OF ENGINEERING. TEMPORARY PATCHES SHALL BE COMPLETED THE SAME DAY THE TRENCH IS OPENED.

5. THE PERMITEE SHALL REPAIR ALL DEFICIENT PAVEMENT RESTOREATIONS WITHIN 48 HOURS OF RECEIVING VERBAL NOTICE FROM THE BUREAU OF ENGINEERING.

6. ALL TRENCHES WITHIN THE CITY RIGHT OF WAY AT A MINIMUM SHALL BE FILLED AND PATCHED WITH 2" OF TEMPORARY PAVE MENT AT THE END OF EACH DAY UNLESS OTHERWISE APPROVED BY THE BUREAU OF ENGINEERING

7. ALL TEMPORARY PATCHES SHALL BE REPLACED WITH PERMANENT PAVEMENT RESTORATION WITH 60 DAY OF THE PLACEMENT OF THE TEMPORARY PATCH UNLESS APPROVED BY THE BUREAU OF ENGINEERING.

8. FAILURE OF THE PERMITEE TO RESPOND WITHIN 48 HOURS TO THE BUREAU OF ENGINEERING ORDERS WILL AT THE DISCRETION OF THE BUREAU OF ENGINEERING RESULT IN THE CALLING OF THE PERMITEE'S BOND.

ACKNOWLEDGMENT OF RECEIPT

_____

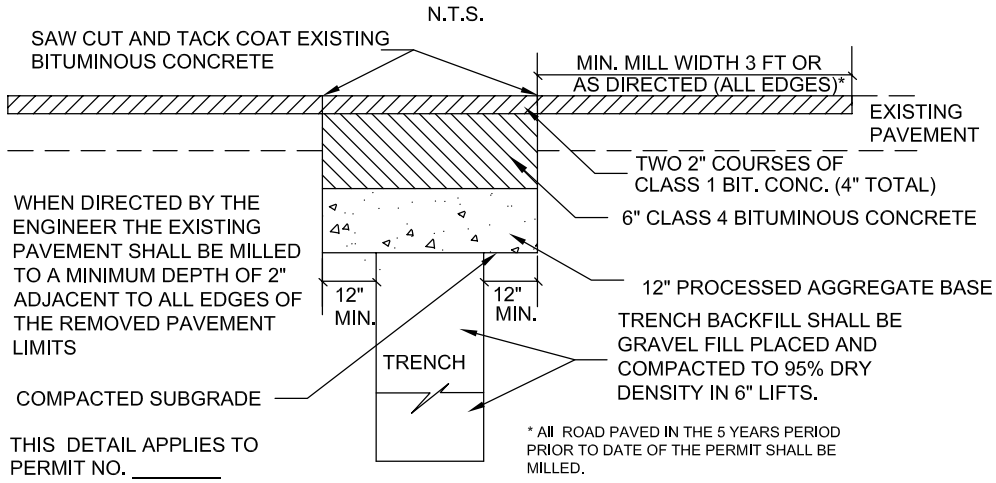
CONTRACTOR'S SIGNATURE

DATE: _____

CITY OF WATERBURY
BUREAU OF ENGINEERING
235 GRAND STREET
203-574-6871

ARTERIAL ROADS
PAVEMENT RESTORATION DETAIL

N.T.S.

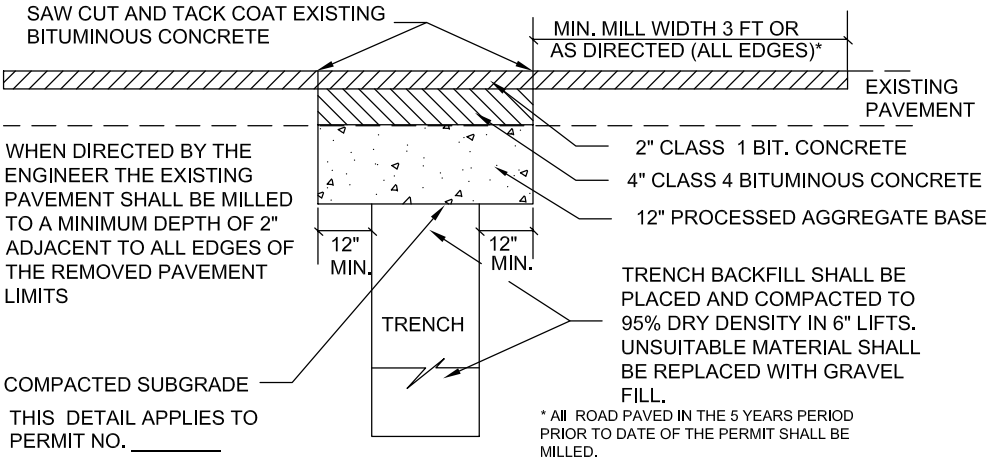


THIS DETAIL APPLIES TO PERMIT NO. _____

* All ROAD PAVED IN THE 5 YEARS PERIOD PRIOR TO DATE OF THE PERMIT SHALL BE MILLED.

COLLECTOR ROADS
PAVEMENT RESTORATION DETAIL

N.T.S.

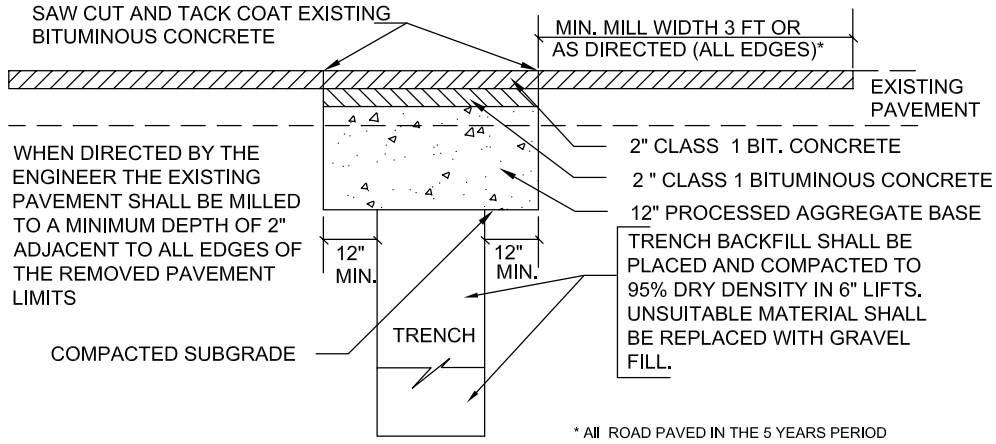


THIS DETAIL APPLIES TO PERMIT NO. _____

* All ROAD PAVED IN THE 5 YEARS PERIOD PRIOR TO DATE OF THE PERMIT SHALL BE MILLED.

LOCAL ROADS
PAVEMENT RESTORATION DETAIL

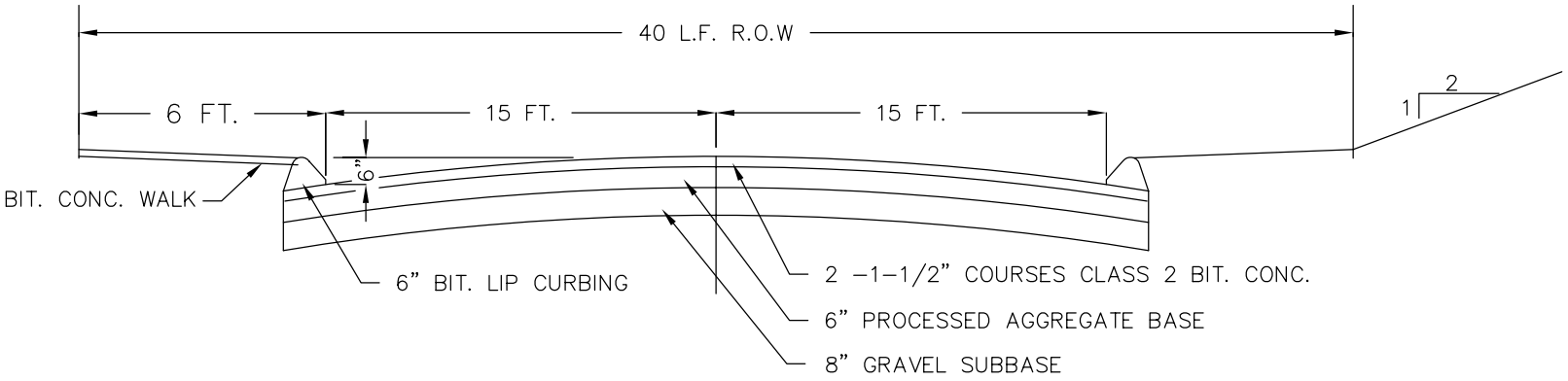
N.T.S.



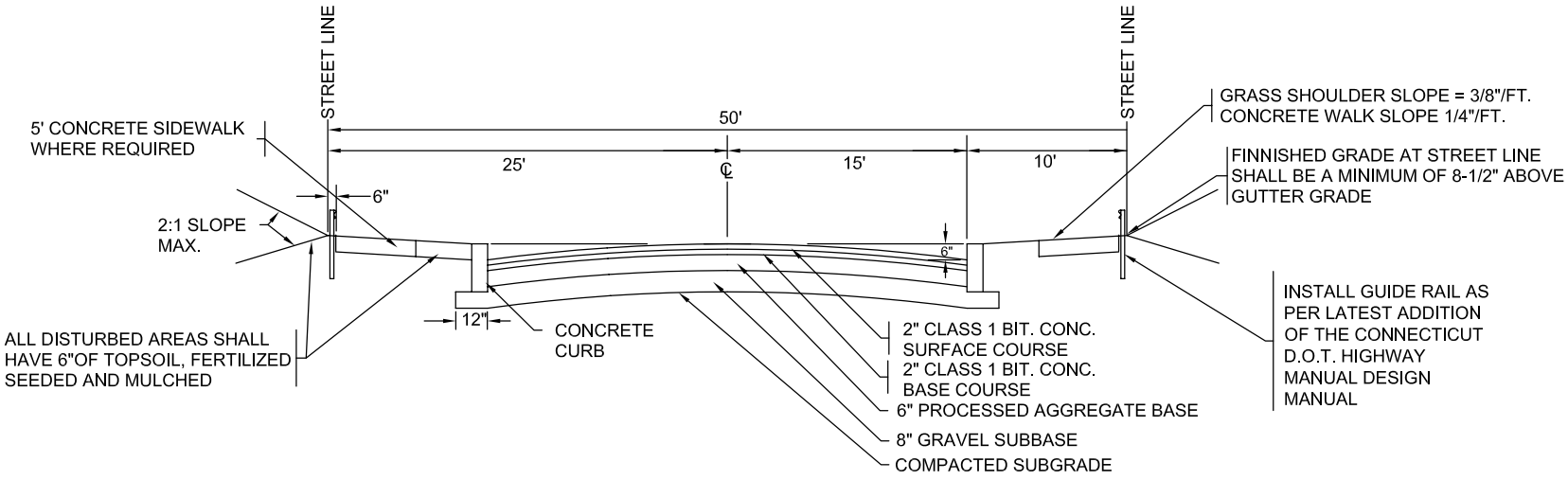
THIS DETAIL APPIES TO PERMIT NO. _____

* All ROAD PAVED IN THE 5 YEARS PERIOD PRIOR TO DATE OF THE PERMIT SHALL BE MILLED.

Revised 03-22-07 - by mjp



ROAD CROSS SECTION

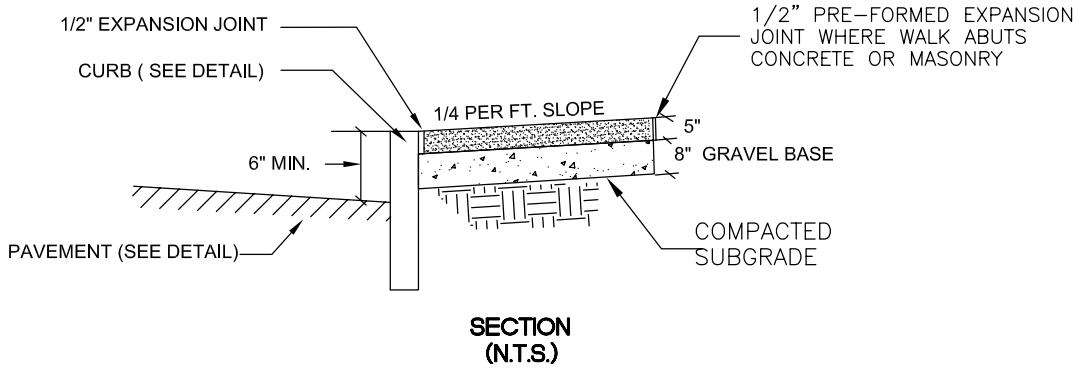


Notes:

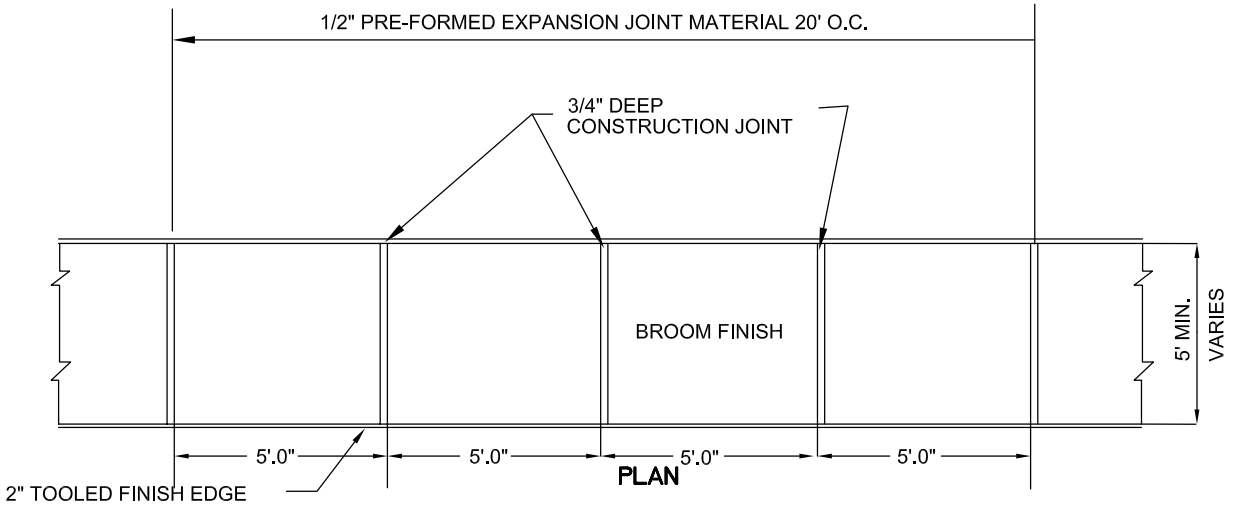
1. All work and materials shall conform to the latest addition of the State of Connecticut Department of Transportation Standard specifications for Roads Bridges and Incidental Construction.
2. 8" Gravel subbase maybe subsituted with and additional 6 inched of processed aggregate base for a total of 12" of processed aggregate with the approval of the Bureau of Engineering.
3. The concrete curbing shall be installed prior to paving.

LOCAL ROAD CROSS SECTION
(NTS)

City of Waterbury
Bureau of Engineering
January 31, 2006
File: Rdcswtby.dwg
rev: 3-9-07



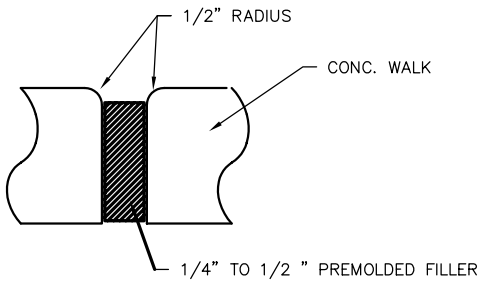
SECTION
(N.T.S.)



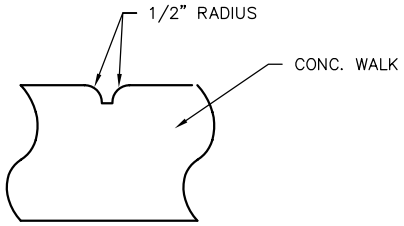
PLAN

5" PORTLAND CEMENT CONCRETE (PCC) WALK DETAIL (N.T.S.)

City of Waterbury
Bureau of Engineering
February 17, 2006
File: sidewalks.dwg



CONCRETE WALK EXPANSION JOINT DETAIL
(N.T.S.)



CONCRETE WALK DUMMY JOINT DETAIL
(N.T.S.)

WATER

FOR WATER AND SEWER APPROVAL

DEVELOPER _____ DATE _____

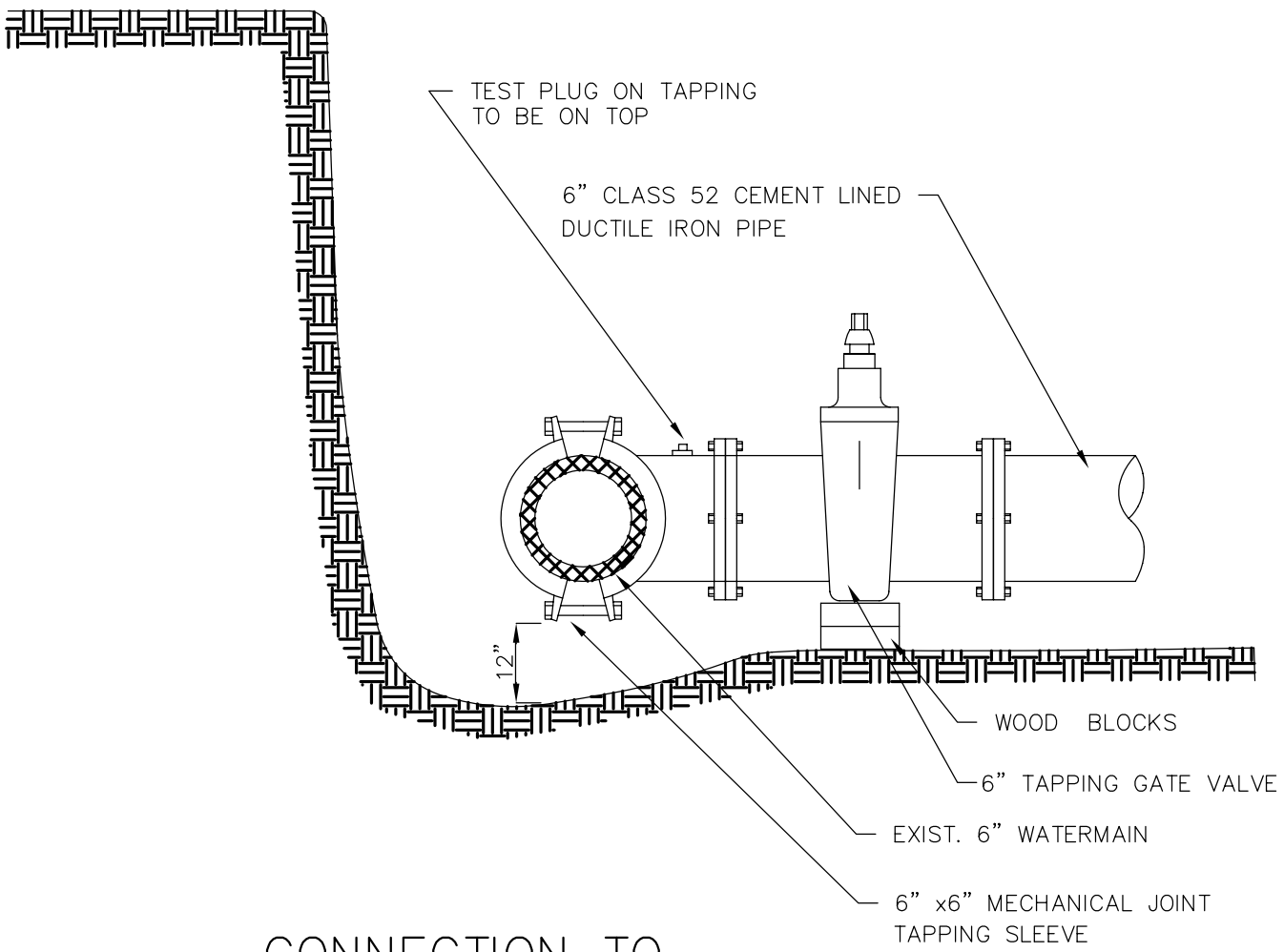
TOWN ENGINEERING _____ DATE _____

FOR HYDRANT APPROVAL

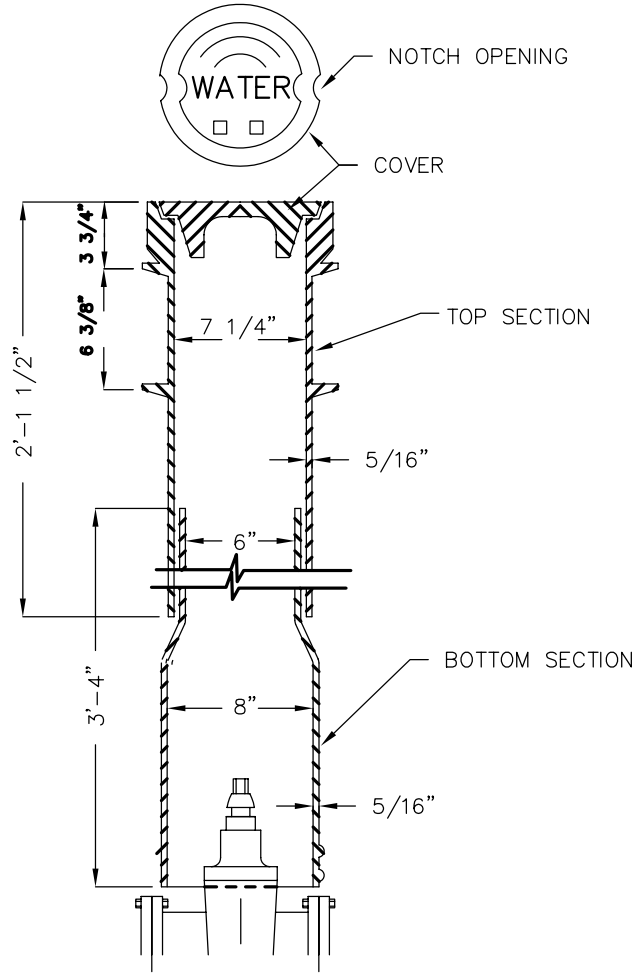
FIRE MARSHAL _____ DATE _____

FIRE MARSHAL TO DENOTE IF HYDRANTS
ARE TO BE PUBLIC OR PRIVATE
(CHECK APPROPRIATE BOX)

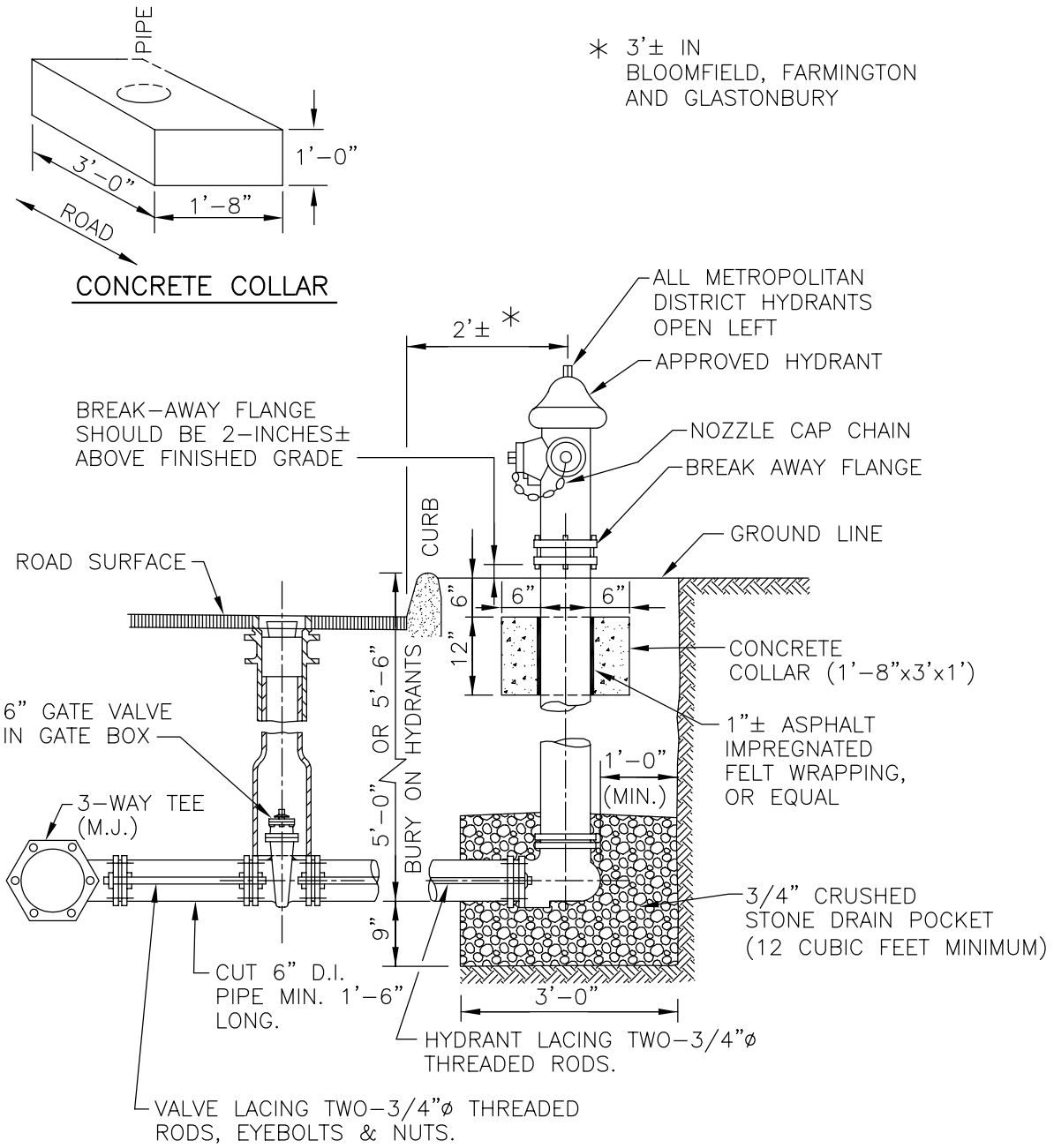
☐ PUBLIC ☐ PRIVATE



CONNECTION TO EXISTING WATER MAIN DETAIL NTS



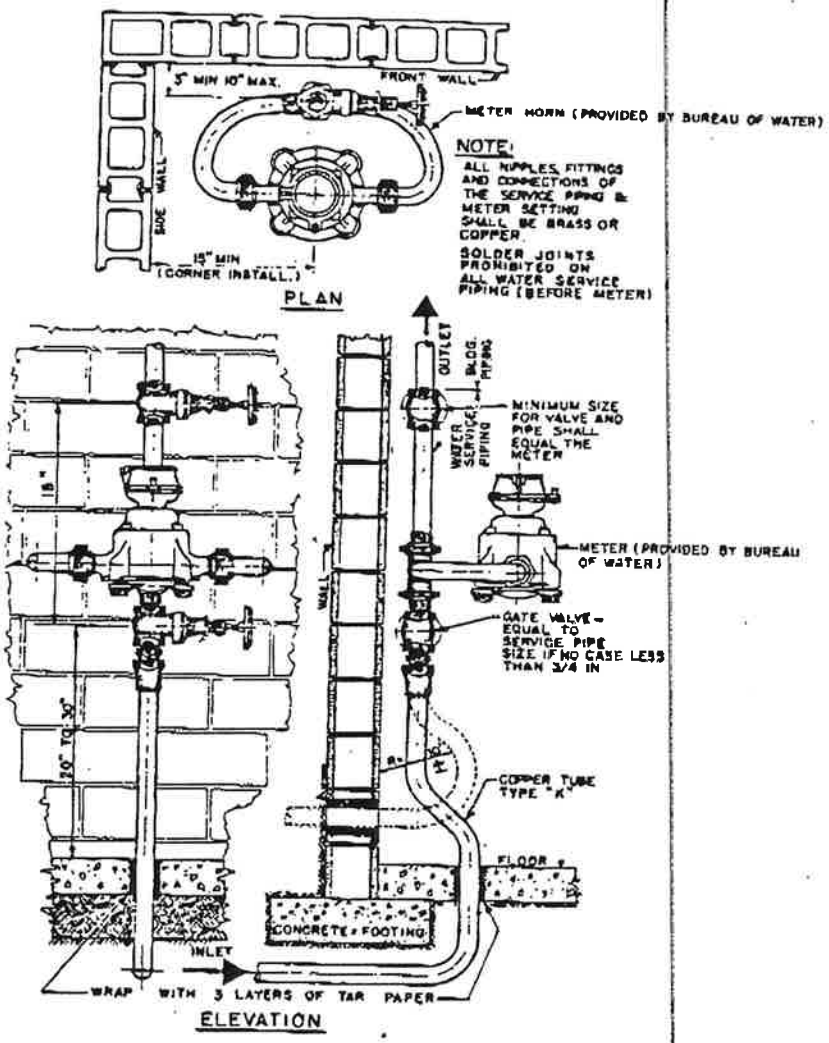
GATE BOX DETAIL
NTS



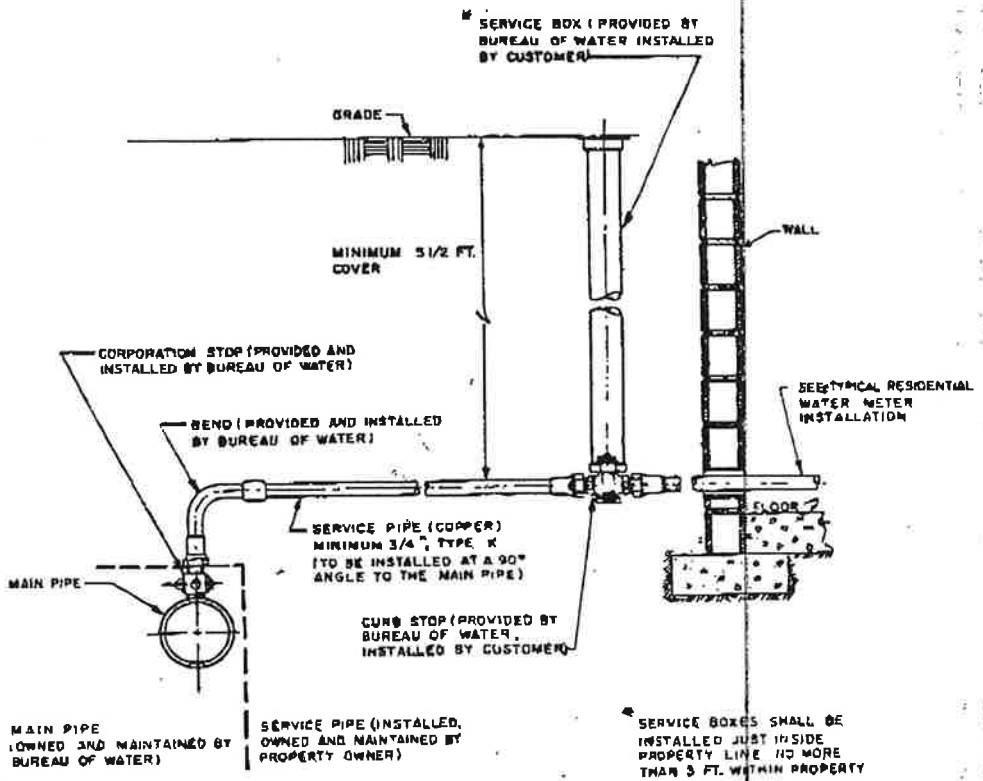
FIRE HYDRANT ASSEMBLY

TYPICAL RODDING INSTALLATION

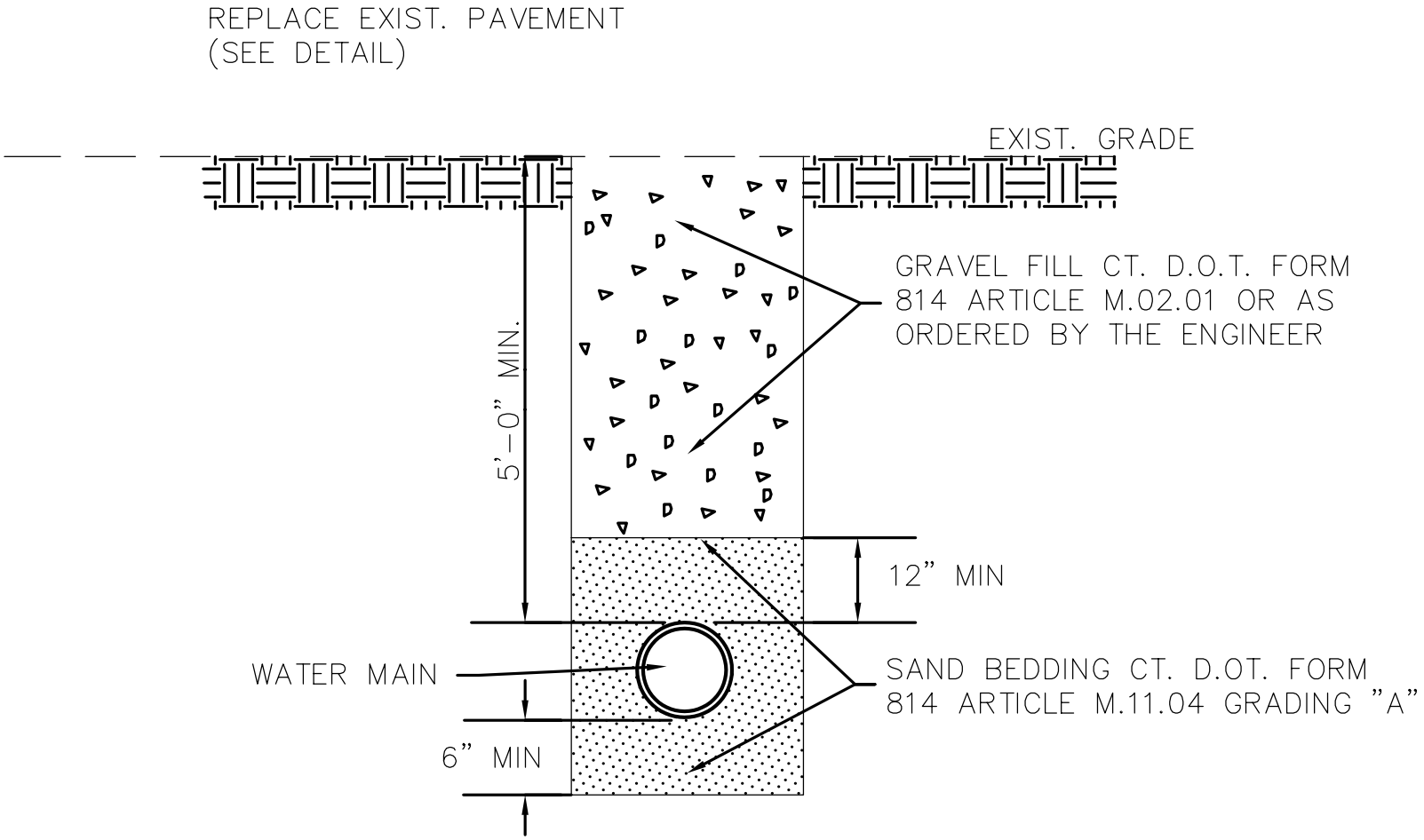
FIGURE – 24



TYPICAL RESIDENTIAL WATER METER INSTALLATION



TYPICAL RESIDENTIAL SERVICE PIPE INSTALLATION



WATER MAIN TRENCH DETAIL
(N.T.S.)

SANITARY SEWER

SUSAN REICHENBACH
ENGINEERING TECH. II

TEL: (203) 574-8265 *Main*
FAX: (203) 574-8269

WATER POLLUTION CONTROL
210 MUNICIPAL ROAD, WATERBURY, CT 06708

June 6, 2008

Contractors,

For your information, effective January of 2008, WPC is the Department responsible for Sanitary Sewer Permits, requests for sanitary sewer information, and providing necessary approvals regarding sanitary sewer issues, including, but not limited to sanitary sewer issues included in Building Permits & Certificates of Use and Occupancy. Enclosed for your use are the following documents: 1) Notice: w/new hours & payment type; 2) Application for Sanitary Sewer Connection/Modification Permit; 3) Request for Sanitary Sewer map and/or permit. If you have any comments or questions, please call @ 203-574-8265.

Thank-you
Susan Reichenbach
Engineering Tech. II

NOW IN EFFECT

All Sanitary Sewer Connection Permits & Request for Records will be issued from
Water Pollution Control
210 Municipal Road, Waterbury

8:00 am – Noon Monday – Friday

For questions, or availability of Staff to provide WPC approval on permits or certificates of occupancy, please call (203) 574-8265 between the hours of **8am-12pm (M-F)** to schedule an appointment. **Now that WPC has a security gate, access may not be granted to the WPC site beyond NOON if you arrive without an appointment and staff is not available to meet with you**. In that case, you will be asked for your contact information and an appointment will be scheduled as soon as possible. Thank you for your cooperation.

AS OF JULY 1, 2008 WPC, WILL ONLY ACCEPT MONEY ORDERS OR BANK CHECKS FOR FACILITY CONNECTION FEES!
CHECKS PAYABLE TO CITY OF WATERBURY - WPC

ATTACHMENT #11

Application #_____

THE CITY OF WATERBURY

Water Pollution Control (WPC)

Application for Sanitary Sewer Connection/Modification Permit

210 Municipal Road, Waterbury, CT 06708
(203) 574-8265

Applicant's Name _____ **Date of Application** __/__/__
Applicant's Address _____ Telephone #_____
_____

Connection Address_____
(If different than Applicant's Address)

Contractor's Name _____ Telephone #_____
Contractor's Address _____
(Installer) _____

NOTE: APPLICATIONS WILL NOT BE PROCESSED UNTIL (1) SANITARY SEWER CONNECTION FEE IS PAID IN FULL(See attached – Fee Schedule), & (2) A COPY OF THE APPLICABLE STREET OPENING PERMIT (*which is obtained thru the Public Works Dept. - located at 26 Kendrick Ave. 2nd floor – phone# 574-6851*) **IS PRESENTED TO WATER POLLUTION CONTROL. *Money orders or Bank Checks are only acceptable for connection fees, no Business or Personal checks excepted.**

1. Attach complete plans and specifications for the proposed sanitary sewer connection/modifications.

2. Provide the following information and check off all that apply:

Building Type:
- ☐ Commercial
- ☐ Industrial
- ☐ School
- ☐ Place of Worship
- ☐ Hospital
- ☐ Residential
  - ☐ Single Family_____
  - ☐ Condo/Apts. # units_____
  - ☐ Multi Family # units_____
- ☐ Restaurant(FOG)
  - ☐ Bar/Café, etc. _____
- ☐ Recreational (e.g. Clubhouse, Campground, Park)

Job Type:
- ☐ Remodel
- ☐ Addition
- ☐ Repairs Only
- ☐ New Construction
- ☐ Other – Explain (Disconnection?)

In consideration of granting this permit, the Applicant and Owner agree:

(1) Sewer connection/modification applications are valid for one (1) year from date of application. Applications not renewed will be voided.
(2) To accept and abide by all provisions of the Waterbury Charter and Code of Ordinances.
(3) To accept and abide by Water Pollution Control minimum requirements.
(4) To maintain the building sewer lateral (from building foundation to connection at City Sanitary Sewer Line) at no cost to the City of Waterbury.
(5) **That all construction must be left uncovered until WPC inspection is complete (24–Hour notice required).**

(6) **Facility Connection Charge must be paid before a permit can be issued.**
(7) As Built Plans need to be supplied to WPC at completion of project. Items to be on plans include: a) Location of all utilities, b) Invert elevations of nearest Storm Water & Sanitary Sewer Manholes, c) Sanitary Sewer Lateral with Invert elevation at foundation, **& d) Copy of "Certificate of Occupancy"**
(8) Sewer Use Charges commence the date Certificate of Occupancy is issued.

_____ __/__/__ _____ ___/___/_____
Applicant's Signature Date Owner's Signature Date

Facility Connection Fee paid _____/__/____ Amt. _____
Connection Completed _____/__/____
As Built received _____/__/____
Certificate of Occupancy issued by City _____/__/____

Permit Issued by _____ _____/__/____
Signature/Title Date

DATE RECEIVED: _____
DATE COMPLETED: _____

City of Waterbury
Water Pollution Control
210 Municipal Road
Waterbury, CT 06708
Phone: 203-574-8265
Fax: 203-574-8269

REQUEST FOR SANITARY SEWER MAP AND/OR PERMIT

APPLICANT NAME: _____
BUSINESS NAME: _____
ADDRESS: _____
PHONE: _____
FAX: _____

LOCATION OF INTEREST: (PROVIDE AS MUCH INFORMATION AS YOU HAVE)

ADDRESS/STREET: _____
ASSESSOR'S MAP/BLOCK/LOT: _____
SUBDIVISION LOT #: _____
NEAREST INTERSECTION (STREET): _____

A RESOLUTION MAKING APPROPRIATIONS FOR OPERATING DEPARTMENTS OF THE CITY OF WATERBURY FOR THE ENSUING FISCAL YEAR PURSUANT TO §9B-3(c) OF THE CHARTER OF THE CITY OF WATERBURY.

BE IT RESOLVED by the Board of Aldermen of the City of Waterbury that the sums hereinafter enumerated are hereby appropriated for the operating expenses of the departments, boards, agencies and commissions of the City of Waterbury for the period July, 1, 2008 through June 30, 2009, as follows:

BUDGET SUBCOMMITTEE. FAVORABLE. SCHEDULE OF FEES AND CHARGES

RESOLUTION #5

A RESOLUTION ADOPTING THE SCHEDULE OF FEES AND CHARGES FOR SERVICES, LICENSES AND OTHER PURPOSES OF THE CITY OF WATERBURY FOR THE ENSUING FISCAL YEAR

Fine If Annual Fee For Barbershop/Hairdresser Is Not Paid Within Seven Days Of Due Date	$100
Department Of Public Works	
Storm Sewer Hook-Up Permit	$25
Street Opening Permit	$50
Dumpster Permit	$20
Scaffolding Permit	$5
GIS Tile Disk Copies	$50
GIS Topography Print of Mylar	$10
GIS Color Original Maps	$40
GIS Data	$2,500 and up
Map Copies	$5
Recycling Leaf Bag Sales (3 for $1)	$0.33
Mattress/box spring disposal fee	$20.00
Refuse NEDA Disposal Fee*	$115 per ton
*Fee assessed on residents after first two dumps; on commercial entities and on non-residents for every dump	
Water Pollution Control	
Sewer Hook-Up Permit - Per Residential Unit*	$1,050
Sewer Hook-Up Permit - Commercial $0.25 per Square Foot	$0.25
Sewer Hook-Up Permit - Hotel $200 per Room	$200
Sanitary Sewer Permit Application Fee	$100
Map Copies (Full Size)	$5
Map Copies (8"x11")	$0.50
Disposal of Grease	$0.10/gallon
Disposal of Septage	$0.08/gallon
Disposal of industrial or 454 waste stream	$0.10/gallon
Sale of Sewer Vent Covers	$25
*Additional Site connection fee for multi-unit connections (Example: 60 unit complex = 60 units @1,050 each plus 1 site connection fee of $1,050)	$1,050

Here are WPC's FYE 2009 Fees:

Water Pollution Control	
Sewer Hook-Up Permit - Per Residential Unit*	$1,050
Sewer Hook-Up Permit - Commercial $0.25 per Square Foot	$0.25
Sewer Hook-Up Permit - Hotel $200 per Room	$200
Sanitary Sewer Permit Application Fee	$100
Map Copies (Full Size)	$5
Map Copies (8"x11")	$0.50
Disposal of Grease	$0.10/gallon
Disposal of Septage	$0.08/gallon
Disposal of industrial or 454 waste stream	$0.10/gallon
Sale of Sewer Vent Covers	$25
*Additional Site connection fee for multi-unit connections (Example: 60 unit complex = 60 units @1,050 each plus 1 site connection fee of $1,050)	$1,050

Additional Standards and Procedures

- **As of January 01, 2008, Sewer Connection Permit procedures**

  Fill out permit application as required
  Submit copy of Street opening permit
  Submit copy of site plot plan
  Submit payment (money order or bank check) for application fee and sewer connection fee per fee schedule
  Inspections by WPC prior to backfilling
  Submit As-built drawings to WPC (for multiple connections or sub-divisions) upon completion of project, or prior to Certificate of Occupancy

- **No sewer lateral connections directly into manholes without prior review and approval by WPC**
- **No outside drops into manholes without prior review and approval by WPC**

- **Ductile iron pipe or heavy duty cast iron sewer pipe will be used on all sanitary sewer lateral connections, from the connection at the main to the edge of the street right of way**

- **All right of ways and or easements accepted by WPC will be required to have a 12' wide access road over the center line of the sewer line, constructed with 12" of compacted gravel with a top coat of 4" of compacted bituminous. Any exceptions or modifications must be reviewed and authorized by WPC**

DESIGN & CONSTRUCTION STANDARDS
for
SUBMERSIBLE STYLE WASTEWATER PUMPING STATIONS

City of Waterbury, Connecticut

DEPARTMENT OF WATER POLLUTION CONTROL

WASTEWATER COLLECTION SYSTEMS
210 Municipal Road
Waterbury, CT 06708

June 2007

DRAFT REVISION MAY 2008

PART 1 - GENERAL

1.01 INTENT:

A. This document provides minimum construction and design standards for any wastewater pumping station facilities that are to be constructed by others, but conveyed to the City of Waterbury Wastewater Collection Systems Department (Department).

B. This document describes the minimum standards for site facilities, equipment, structures, and control systems. The Department reserves the right to modify these minimum requirements as may be required to suit any particular installation, as may be in the best interest of the Department. Failure to conform to these or any other requirements dictated by the Department for a particular installation may result in the rejection of the installation by the Department.

C. The document also describes the minimum testing and acceptance standards that must be provided, demonstrated, and accepted by the Department prior to conveyance of the facility to the Department.

D. It is intended that all components provided in the pumping station be of top quality, suitable for municipal installation and long-term use, and that all systems, trim, fittings, be complete in every way, whether or not specifically described in these minimum standards.

E. It is the Developer's sole responsibility to design all systems in accordance with applicable codes, including obtaining all local and state permits that may be required. Department will not consider acceptance of the facility until Developer demonstrates that all such requirements have been met. Developer's attention is called to the requirement that all community wastewater collection systems, regardless of private ownership, must be reviewed and approved by CT DEP.

1.02 GENERAL SYSTEM DESCRIPTION:

A. Submersible pumping stations shall consist of at least two submersible non-clog wastewater pumps mounted within a precast concrete wetwell structure, electrical controls, level controls, flow meter, pump guide rail system, access hatch and frame, concrete valve vault, piping, fittings, valves, telemetry system, and all associated equipment and accessories required to make a complete system.

1.03 WARRANTY:

A. The equipment, apparatus, and parts furnished shall be warranted for a period of one (1) year from the date of acceptance by the Department, excepting only those items that are normally consumed in service, such as oil, grease, packing, gaskets, O-rings, etc. The station's developer shall be solely responsible for the warranty of the station and all components.

B. Components failing to perform as intended or as represented by the manufacturer, or proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the developer or equipment manufacturer without cost of parts or labor to the Department.

1.04 ACCEPTANCE TESTS:

A. Prior to acceptance of pumping station facility by the Department, the station's developer shall, in the presence of the Department's designated personnel, operate all pumping station components and systems to demonstrate proper operation of individual components and the station's overall ability to operate and pump wastewater at the required flow rates and pressures.

B. The system's developer shall arrange for and provide sufficient quantities of clean water for testing of the pumping system. All gauges and flow meters shall be properly calibrated prior to conducting any testing. Calibration reports shall be provided for City's review at the time of the system testing. The system's developer shall furnish all labor and materials necessary to conduct all testing.

C. The system's developer shall arrange for and provide sufficient fuel for operational testing of the standby generator system. Generator system shall be load bank tested to full electrical output for a period of 2 hours. Load bank test results shall be provided by the generator system manufacturer and provided to the Department.

D. All defects or defective equipment shall be corrected or replaced to the full satisfaction of the Department prior to acceptance by the Department.

PART 2 - COMPONENT REQUIREMENTS

2.01 SUBMERSIBLE WASTEWATER PUMPS:

A. Pumps shall be submersible type, single stage, non-clog type centrifugal pumps, appropriately sized to convey all anticipated flows with one of the pumps out of service.

B. Each pump shall be arranged to automatically clamp the pump discharge to the discharge connection when lowered along guides.

C. Pump discharge connections shall be of cast iron construction rigidly bolted to floor with stainless steel cinch anchors; machined to receive yoke and face of the pump discharge; discharge connection also shall hold the lower ends of the guides.

D. Shaft seals shall consist of not less than two mechanical seals mounted in tandem, with an oil chamber between the seals. The rotating faces of the seals shall be carbon or tungsten-carbide and the stationary faces shall be ceramic or tungsten-carbide.

E. Submersible motor windings shall be open type with Class F insulation designed for Class 1, Division 1, Group C and D installations. Winding housing shall be filled with air for cooling windings and seals and lubricating bearings.

F. Non-clog pump impellers shall be cast iron, closed, single or multi-vaned.

G. Provide moisture sensor probes in oil filled seal chamber.

H. Each pump shall be provided with a stainless steel guide rail system with stainless steel lifting cable or chain.

2.02 WETWELL AND VALVE VAULT STRUCTURES:

A. All wetwell and valve vault structures shall be constructed of reinforced precast concrete. Precast concrete structures shall be provided by a reputable precast concrete manufacturer, who shall provide calculations stamped and signed by a Connecticut licensed Professional Engineer that structures are designed to resist buoyant forces with groundwater conditions to the top slab of the structure.

B. All concrete structures shall be provided with dampproofing on all exterior underground surfaces.

C. Each structure shall be equipped with gravity ventilation, consisting of 4-inch Schedule 80 PVC piping with 316 stainless steel insect screen. Ventilation piping shall connect to the concrete structure with a cast-iron flanged wall pipe cast directly into the top slab of the structure.

D. Valve vault shall be provided with a sloped floor that terminates at a 12" x 12" x 12" deep sump, equipped with a duckbill type check valve and drain piping that flows to the wetwell. Drain piping shall enter the wetwell and extend down to within 12 inches of the wetwell invert, so that discharge remains submerged to eliminate gas migration into the valve vault.

E. Valve vault shall be provided with aluminum access ladder bolted to the vault wall, centered below the personnel access hatch.

2.03 ACCESS AND EQUIPMENT HATCHES:

A. All personnel access hatches shall be minimum size of 30" by 30", unless otherwise required to accommodate special circumstances as directed by the Department.

B. All equipment removal hatches shall be sized to accommodate the equipment to be removed, with adequate clearance on all sides.

C. Each hatch shall be provided with a fall-through prevention system, consisting of removable high-strength net / webbing mounted on a frame system that is integral to the hatch frame.

D. All hatches shall be designed to withstand HS-20 loading, without reliance on the fall-through prevention system to provide the HS-20 load rating. Hatches shall be spring assisted with enclosure tubes on the springs. All hatch hardware shall be stainless steel.

E. All hatches shall be equipped with padlock hasps and no locking hardware. Department will supply padlocks upon facility acceptance.

2.04 CONTROLS:

A. Pumps shall be controlled by a pump control system housed in a NEMA Type 12 enclosure equipped with quick-release latches.

B. Control system shall be PLC-based, and shall react to wetwell liquid levels sensed and transmitted by an ultrasonic level transducer. All control system settings shall be adjustable through the use of an operator interface panel mounted on the exterior of the pump control enclosure. Major control system components shall be as follows:

1. PLC: Allen-Bradley SLC-500 with SLC 5/05 Ethernet CPU
2. Operator Interface: Allen-Bradley PanelView 1000
3. Ultrasonic Level Transducer: Siemens (Miltronics) HydroRanger 200
4. Flow Meter Display that shall display instantaneous flow, total daily flow, and total flow.

C. Control panel shall be equipped with external selector switch that controls duty pump operation (Pump 1 / Pump 2) or automatic (Auto) alternation of pumps after each cycle.

D. Control system shall include a float-based backup override system that shall activate both pumps upon reaching the high level float, and which shall stop operation of both pumps upon reaching the low level float.

E. Control system shall monitor the following conditions, and shall be provided with a dry contact output for each:

1. Pump Failure (each pump)
2. Control System Failure
3. Loss of Power
4. Generator Run
5. Generator Alarm
6. Wetwell High Level
7. Wetwell Low Level
8. Motor Overload (each pump)
9. Seal Leak (each pump)

F. Each pump motor shall be controlled via a solid-state, microcomputer controlled motor starter, furnished at the required horsepower, voltage, and phase. The controller shall provide three modes of motor starting, including "soft-start mode," "current limit mode," and "full-voltage mode."

2.05 MAGNETIC FLOW METERS:

A. Each pumping station shall be provided with a flanged-body magnetic flow meter, installed within the valve vault, with appropriate upstream and downstream separation from fittings and valves to minimize flow disturbance per manufacturer's recommendations. A spool piece that matches the flow meter's lay length and bolt pattern shall be provided at each station.

B. Flow meter overall construction shall satisfy the requirements of NEMA Type 4X watertight construction. Flow elements shall also be designed to withstand temporary submergence (up to 48 hours) to a depth up to 30 feet of water (NEMA 6).

2.06 PIPE AND FITTINGS:

A. All pumping station interior pipe and fittings shall be sized to provide flow velocities that exceed THREE (3) feet per second at the pumps' normal operating condition, but that do not cause excessive headless in the system, at the District's sole discretion.

1. All piping shall be flanged ductile iron pipe with double thickness cement mortar lining. Flanged union bolts and nuts shall be of Type 316 stainless steel. Gasket seals between flange faces shall be Viton full flat-faced gasket 1/8-inch thick. All ductile iron interior piping (within valve vault and wetwell) shall be painted with zinc rich primer and two coats of polyamide epoxy.

B. All buried forcemain piping and fittings shall be sized to provide flow velocities that exceed THREE (3) feet per second at the pumps' normal operating condition, but that do not cause excessive headless in the system, at the District's sole discretion.

1. All forcemain piping shall consist of Class 52 or Pressure Class 350 ductile iron pipe, mechanical joint with restrained joint fittings, finished with an asphaltic exterior coating and double thickness cement mortar lining.

2.07 CHECK VALVES:

A. Check valves shall be flanged, cast iron body, bronze seat ring, with continuous stainless steel shaft connected to an external lever and weight. Check valves shall be rated for 125 PSI.

2.08 PLUG VALVES:

A. Plug valves shall be of the non-lubricated, eccentric type with neoprene faced plugs and shall be furnished with flanged joint ends. Valve bodies and plugs shall be made of ASTM A 126, Class B cast-iron. Resilient plug facings shall be neoprene suitable for use with sewage. Valves shall be furnished with corrosion resistant seats, which comply with AWWA Standard C507 and with AWWA Standard C504. Valve shaft seals shall comply with AWWA Standard C507, and with AWWA C504 and shall be replaceable without valve disassembly. Valves shall provide drip-tight shutoff up to the full pressure rating. All valves shall be hydrostatically pressure tested at 175 psi by the manufacturer.

2.09 BYPASS CONNECTION:

A. Pump discharge piping within the valve vault shall be provided with a pump bypass connection that shall permit the Department to utilize temporary pumps to bypass the station's pumping system.

B. The bypass connection shall consist of a branch fitting with plug valve, terminating with a threaded pipe nipple and cap of the same pipe diameter as the station's discharge forcemain. Connection shall be coordinated with access hatch location to permit unimpeded connection of temporary pump discharge hoses to the connection.

C. Connection shall also be equipped with a 2-inch drain connection between the isolation plug valve and the threaded cap, allowing the connected hoses and pumps to be drained at the end of pumping operations. The drain connection shall be piped to and terminate at the valve vault's sump. Drain piping shall be Schedule 80 PVC.

2.10 PRESSURE GAUGES:

A. Pressure gauges shall be installed on each pump discharge pipe within the valve vault. Each gauge shall be removable, installed with a shutoff cock with filter/snubber, with gauge located so as to provide easy readability from the access hatch of the valve vault. Gauges shall have 4-inch dials with an ABS/Acrylic case and window, respectively. Gauges shall have a glycerin filled case and lower connection. Gauges shall display pressures in PSI, and shall be provided with appropriate pressure ratings and ranges for the application.

2.11 TELEMETRY SYSTEM:

A. The pump station shall be provided with a radio-based telemetry system that shall conform to specification listed herein.

B. In general, the telemetry system shall receive alarm signals from the station's control system, and transmit them via the Department's radio frequency to the Collection Systems Office at the Waterbury Wastewater Treatment Plant on Municipal Road.

C. Evaluation and design of the radio transmitter system between the pumping station and the Department's radio system shall be sole responsibility of the Developer. Should the radio path require the installation of a new repeater or tail-end link(s) to support the station, the Department reserves the right to either require the installation of new radio equipment, at the developer's sole cost and effort, or to allow the use of alternative communication means, at the sole discretion of the Department.

D. The Developer shall pay all costs for the Department to modify the existing receiving equipment as required to accept and display alarm conditions from the Developer's pumping station.

E. REMOTE TERMINAL UNIT (RTU):

1. Each pumping station control panel shall be equipped with an RF based Ethernet RTU with antenna system. The RTU shall include, but shall not be limited to, the following components:

   a. NEMA 12 wall-mounted RTU enclosure with battery backup power supply, surge protector, terminal strips, etc.

   b. MDS iNET wireless Ethernet 400 MHz or 900 MHz Frequency Hopping Spread Spectrum Ethernet radio transceiver as manufactured by GE MDS, Rochester, NY or equivalent. The exact frequency and band shall be determined by the Department.

   c. Molded Cat5e Ethernet cable connecting the Ethernet radio transceiver to the Ethernet switch in the pumping station control panel.

   d. Clearwave™ 6-element 10-dB gain directional "yagi" antenna as manufactured by GE MDS, Rochester, NY, equivalent by Decibel Products, or equivalent.

   e. Heliax ultra low-loss coaxial antenna cable with connectors as manufactured by Andrew Corporation, Westchester, Illinois, or equivalent.

   f. Lightning protectors at the mast top and building entry as manufactured by Andrew Corporation, Westchester, Illinois, or equivalent

   g. Antenna mast, wall brackets, grounding system, etc. as approved by the Department.

   h. The Heliax antenna cable shall be routed on the building exterior back to the RTU and shall be attached with stainless-steel cable clamps and stainless-steel fasteners. The antenna cable shall have a drip-loop near the building penetration and the penetration to the building interior shall be sealed with GE silicone caulking.

2. The Ethernet radio transceiver shall be connected to the pumping station control panel PLC via an Ethernet switch.

2.12 CONTROL BUILDING:

A. Each facility shall be provided with a precast concrete, prefabricated Control Building that shall house the station's standby electrical generator system, the pumping station control panel, the pumping station telemetry system, and the electrical service entrance and distribution equipment for the electrical service to the facility.

B. The Control Building shall be fabricated by a reputable manufacturer of such facilities, and shall be sized to accommodate all required equipment, along with sufficient space around equipment to promote easy maintenance and to provide all clearances required by the various applicable building and electrical codes.

C. The Control Building shall be equipped with the following equipment and systems:

1. Electrical service entrance equipment with meter
2. Electrical distribution
3. Lighting
4. Access door with padlock hasp (no locking hardware)
5. Electric unit heater
6. Ventilation system
7. Generator intake and exhaust louvers with electric actuated dampers (fail open)

D. Building interior and exterior walls shall be finish painted. Interior walls to be gloss white. Exterior walls to be tan. Interior floors to be sealed only.

2.13 ELECTRICAL SERVICE:

A. Each facility shall be provided with a 3-phase electrical service from the electrical utility provider. Single-phase primary electrical systems will not be permitted.

B. Electrical service and metering equipment shall conform to all applicable electrical and utility company codes.

2.14 STANDBY ELECTRICAL GENERATOR SYSTEM:

A. Each facility shall be provided with a standby electrical generator system, including engine driven electrical generator, automatic transfer switch, and fuel system, all of sufficient size and capacity as required to operate all station facilities and systems, including all sewage pump motors in simultaneous operation (non-simultaneous starting), in the event of power failure.

B. Whenever possible, generator set engine shall be natural gas fueled. Where natural gas is not available, generator set engine shall be diesel fueled, and system shall be provided with an integral sub-base mounted double-walled diesel fuel storage tank. Fuel tanks shall provide a minimum run time of 24 hours with the engine running at ½ load.

C. Standby generator systems with automatic transfer switch shall be as manufactured by Onan.

2.15 ODOR CONTROL:

A. Department shall monitor operation of any pumping station for a period of one (1) year following acceptance by Department. Should Department observe, experience, or receive complaint(s) regarding odorous conditions at the pumping station, the pumping station developer / builder shall provide, install, and make operational an odor control system that shall mitigate odorous conditions to the full satisfaction of Department. Systems shall consist of carbon scrubber or chemical feed type, although other types may be considered, and shall be submitted to Department for review and approval prior to installation.

2.16 SITE IMPROVEMENTS:

A. Access to the pumping station site shall be provided by a bituminous concrete driveway. Access shall extend up to the station's valve vault and wetwell to permit unimpeded access to these structures by the Department's maintenance vehicles.

B. Each site shall be provided with a pole-mounted maintenance lighting fixture that shall be controlled manually by an on-off switch within the station's Control Building. Light shall not be activated by photocell control. Light shall be minimum of 500 watt mounted on a 15-foot high aluminum light pole mounted upon a precast concrete pole base.

C. Each site shall be surrounded by chain link fencing, 6-foot high, black PVC coated. Access gate shall be provided for vehicular access. Gate shall be double leaf, 12-foot wide, with padlock hasp.

D. Where not paved with bituminous concrete, ground surface shall be provided with six inches of loam, and seeded. Establishment of turf shall be the sole responsibility of the Developer.

2.17 SANITARY SEWERS:

A. All sanitary sewer components, including manholes, manhole frames and covers, and sanitary sewer piping, shall conform in all aspects to the Department's standards.

END OF SECTION

TECHNICAL SPECIFICATION TEN

MANHOLES

Technical Specification Ten

MANHOLES

10.01 DESCRIPTION

10.01.01 Work under this item shall consist of the furnishing of all labor, materials and equipment necessary to construct precast concrete manholes as shown and specified. All necessary excavation, backfill, sheeting and shoring, dewatering and similar work related to excavation are included in this item. All work related to manholes is included in this item except for cast iron frames and covers which are included under Technical Specification Seven. The description of required excavation is included in Technical Specification One. Payment of excavation for precast manhole structures is included in this item and no payment shall be made for that portion of the pipe trench which passes through the cylinder of excavation for the manhole.

10.02 SUBDIVISION OF TECHNICAL ITEM 10

10.02.01 The subdivisions of Technical Item Ten are as follows:

10A. Manholes 0-10 Vertical Feet Depth

10B. Manholes 10 + Vertical Feet Depth

10.03 GENERAL

10.03.01 Manholes shall be constructed of precast sections specially designed for manhole construction. Manholes shall be constructed to the form and dimensions as shown on the plans.

10.04 PRECAST MANHOLES

10.04.01 Manhole sections shall be of the size indicated on the plans and shall conform to requirements of ASTM C478 except as modified herein or on the drawings. The sections shall be precast from concrete having a minimum compressive strength at 28 days of 4,500 psi and shall be reinforced with ASTM A615, Grade 50 Steel. Tops shall be eccentric cone sections or flat slab where ordered by the Engineer.

10.04.02 A precast cone or precast slab, where ordered by the Engineer, shall be provided at the top of the manhole to receive the cast iron frame and cover. The slab or cone shall be of acceptable design and of sufficient strength to safely support H20 traffic loading. Concrete slabs shall be not less than six inches (6") thick. All lifting holes shall be sealed tight with a solid rubber plug driven into the hole and the remaining void filled with cement mortar.

10.04.03 The precast base shall be set on a suitable foundation that is equivalent to the foundation provided for the pipe. The precast base shall be set to the proper grade and carefully leveled and aligned

10.04.04 Designs of precast manholes shall be submitted for approval to the Engineer. Sanitary sewer manholes shall be coated with an approved bituminous sealer.

10.05 CHANNELS

10.05.01 Channels through sanitary manholes, including the shelf, shall be built of approved, hard burned sewer brick. Where side channels and curved sections occur, the channels within the manholes shall be formed of
sewer brick (ASTM C32-67 Grade MA). Unless otherwise noted, no channels are required for storm water manholes.

10.06 BRICK STACKS

10.06.01 Unless otherwise shown on the plans, all precast manholes shall have a brick masonry stack not over twelve inches (12") in height. The stack shall be constructed on the roof slab or on the cone section upon which the manhole frame and cover will be placed. The height of the stack shall be such as to bring the manhole frame to the proper grade,

10.06.02 Brickwork shall be constructed of sewer brick conforming to the requirements of the Standard Specifications for Clay Sewer Brick of the ASTM Serial Designation C32-67, Grade MA. All mortar shall conform to the requirements of Article M11.04 of the State of Connecticut Department of Transportation Form 814A. Mortar shall be mixed in a suitable box or on a tight platform. The cement and sand shall be thoroughly mixed in a dry state until the mixture has a uniform color. Water shall then be added and the mass worked until a mortar which is uniform and of the required consistency is produced. The mortar shall be mixed in no greater a quantity than is required for the work at hand, Any mortar that sets sufficiently to require retempering shall not be used.

10.06.03 Brick shall be satisfactorily wet when being laid and each brick shall be laid in mortar so as to force a full bed with side and end joints in one operation. The joint shall not be wider than 3/8". When bricks are laid radially the narrowest part of the joint shall not be less then 1/4". The brick shall be laid in a workmanlike manner, true to line. The joint shall be carefully struck and pointed on the inside. Brickwork shall be laid with a satisfactory bond and shall be raked back in course as it progresses unless otherwise permitted. The proportions of batts permitted will be determined according to the character and the location of the work in which they are to be used. The outside of the brickwork shall be neatly plastered with 1/2" cement mortar as the work progresses.

10.06.04 All fresh brickwork shall be carefully protected from freezing and from the drying effects of the sun and wind. If required, the brickwork shall be sprinkled with water at such intervals, and at such times, as may be directed. Brickwork shall be protected from damage of all sorts. Any portions which may become damaged, or may be found to be defective, shall be repaired or, if directed, removed and rebuilt. In freezing weather, when so directed, bricks shall be heated sufficiently to remove all ice and snow.

10.07 DROP CONNECTIONS

10.07.01 Drop connections at sanitary manholes shall be built where shown on the drawings and shall conform to the design shown on the plans. Materials used for drop connections shall be of DIP pipe and fittings conforming to the requirements of ASTM.

10.08 LEAKAGE

10.08.01 All manholes shall be free of visible leakage. Each manhole will be inspected and any leaks found shall be repaired in a satisfactory manner.

10.09 PIPE CONNECTION TO MANHOLE

10.09.01 Sanitary pipe connections to manholes shall be as shown on the contract drawings. Generally the connection shall be flexible and watertight.

10.09.02 Storm water pipe connections to manholes shall be as shown on the contract drawings and made through "box-outs" provided by the precast manhole producer. The void around the pipe at the

manhole wall shall be closed with non-shrink watertight grout equal in thickness to the manhole wall. All pipe joints shall be similar to the regular pipe joints. The joint leading into the manhole base shall be as shown on the plans.

10.09.03 Contract drawings may require the coring into or breaking into a proposed or existing manhole; or the blocking up of an existing manhole outlet or inlet. All of this work shall be included in the price bid for this item.

10.10 STUBS FOR FUTURE CONNECTIONS

10.10.01 Where required for future connections, bell end pipe stubs with approved tight plugs shall be installed in manholes at the proper location.

10.11 MANHOLE STEPS

10.11.01 All manhole steps shall be furnished and installed under this item. Either cast iron or forged aluminum steps with a bituminous coating, as shown on the contract plans, shall be installed in precast manholes.

10.12 MEASUREMENT

10.12.01 The quantity to be paid for under Technical Specification Ten shall be the actual number of vertical feet of manhole installed. Measurement shall be from the ordered invert of the manhole to the bottom of the cast iron frame with no deduction for the brick stack. Drops in manholes will not be measured but shall be included in the price bid for this item.

10.13 PAYMENT

10.12.01 The unit price bid per vertical foot under Technical Specification Ten shall include full compensation for furnishing all materials, excavation, associated labor, tools and equipment necessary to complete the installation of manholes. Installation shall include all precast sections, all brick masonry, steps, drop connections, pipe connections, miscellaneous coring, necessary blocking, bedding material and all concrete used for bases and inverts, as shown and specified.

	PAY ITEM	PAY UNIT
10A.	Manholes 0-10'	Vertical Foot
10B.	Manholes 10'+	Vertical Foot

TECHNICAL SPECIFICATION TWENTY ONE

SANITARY SEWER LATERALS

Technical Specification Twenty One

SANITARY SEWER LATERALS

21.01 DESCRIPTION

21.01.01 Work under this item shall consist of the reconnection of existing sanitary sewer connections or sanitary sewer vent gratings that must be relocated or replaced due to new construction. Work under this item shall be executed with the least inconvenience to the affected property owner(s) and as detailed in the Contract Plans or as directed by the Engineer.

21.02 SUBDIVISION OF TECHNICAL ITEM 21

21.02.01 The subdivisions of Technical Item Twenty-One are as follows:

21A. Reconnect Sanitary Sewer Lateral

21B. Repair Sanitary Sewer Vent

21.03 MATERIALS

21.03.01 The reconnection(s) shall be made with cast iron soil pipe of the same diameter as the existing connection(s) with a minimum diameter of four inches (4"). The pipe shall conform to U.S.A. Standard A40.1, latest revision, extra heavy grade. Joints shall be caulked with oakum and made with poured lead. Rubber gasket push-on type joints may be used with the Engineer's approval.

21.03.02 Sanitary sewer gratings shall conform either to Campbell Foundry No. 4160; to Waterbury Foundry "Sidewalk Sewer Box" as modified to City of Waterbury standards or as approved by the Engineer.

21.04 CONSTRUCTION

21.04.01 Repair Sanitary Sewer Vent construction shall include the excavation and location of any existing sewer vent. The vent shall be raised to the proposed grade as indicated on the plans or as directed by the Engineer. The existing vent shall be replaced with a new cast iron vent as described in section 21.03.02 unless in the opinion of the Engineer it is in a condition which will allow its reuse. Also included in this construction is the replacement of up to thirty-six vertical inches (36") of sanitary sewer vent standpipe. The vertical standpipe shall conform to section 21.03.01, or shall be an Engineer approved equal.

21.04.02 Reconnect Sanitary Sewer Laterals construction shall occur when, in the

opinion of the Engineer, such repair is warranted. This work includes all of that which is described in section 21.04.01 with this specification; the replacement of the standpipe shall extend beyond the thirty-six inch depth to the point at which the horizontal lateral is located. The existing trap shall be removed with a section of straight pipe, a wye shall be installed allowing the standpipe to rise vertically to meet the finished grade at the sidewalk, where a new sewer vent cover shall be installed.

21.05 MEASUREMENT

21.05.01 The work under this section shall be measured by each reconnection complete and in place or by each grating replaced.

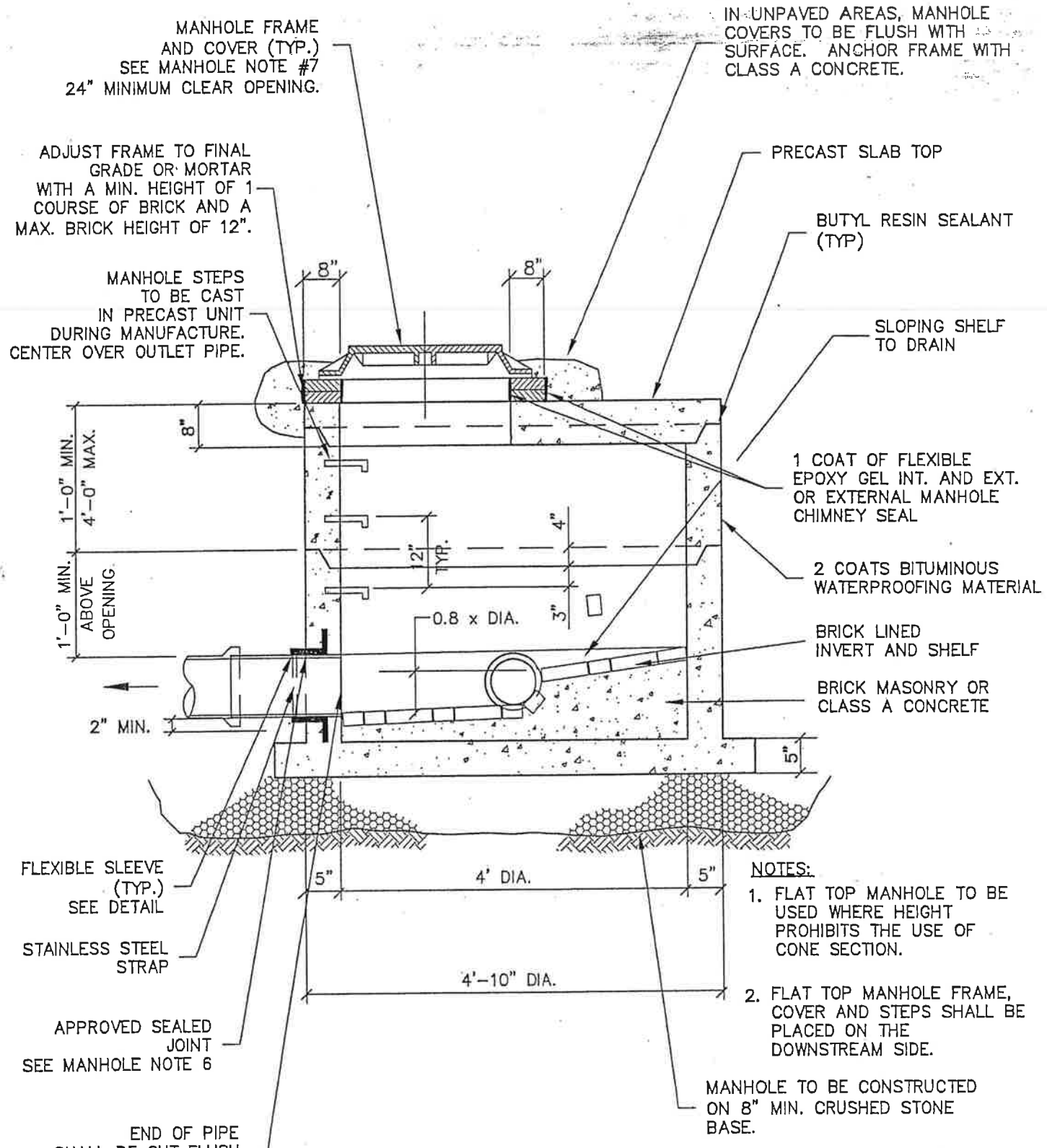
21.06 PAYMENT

21.05.01 The price bid under Technical Specification 21 shall include all labor; materials; equipment; tools and any incidentals thereto necessary to complete the reconnection of sanitary sewer lateral or the repair of the sanitary sewer vent.

PAY ITEM	PAY UNIT
Reconnect Sanitary Sewer Lateral	Each
Repair Sanitary Sewer Vent	Each

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



NOTES:

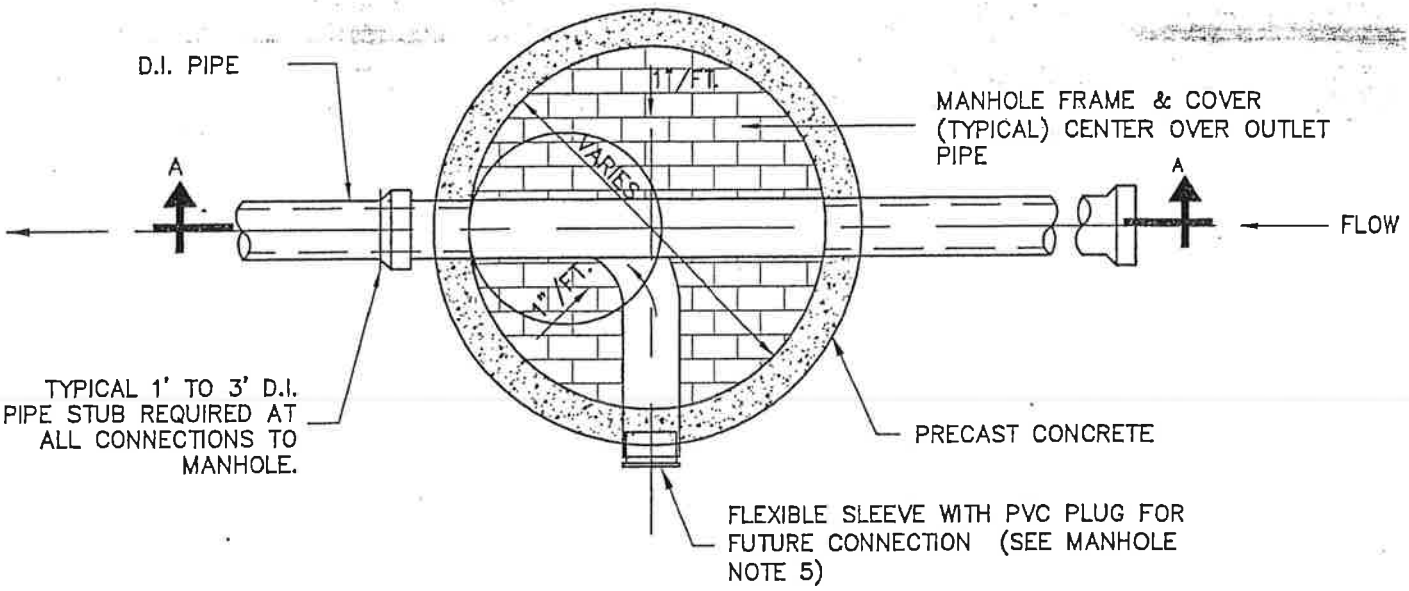
1. FLAT TOP MANHOLE TO BE USED WHERE HEIGHT PROHIBITS THE USE OF CONE SECTION.
2. FLAT TOP MANHOLE FRAME, COVER AND STEPS SHALL BE PLACED ON THE DOWNSTREAM SIDE.

FLAT TOP MANHOLE

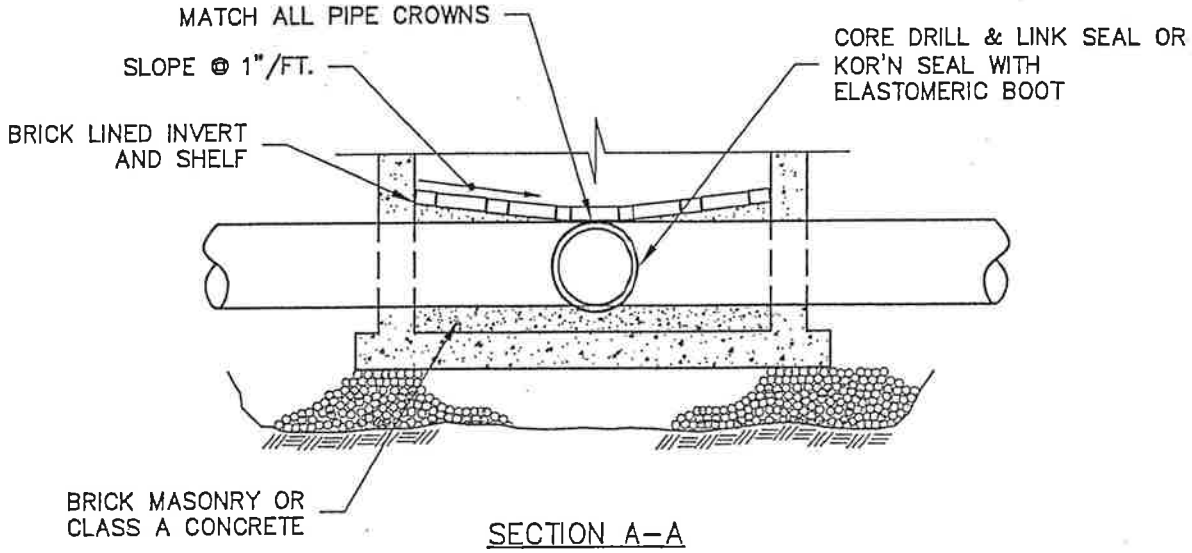
N.T.S.

FIGURE 01

:07693A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:41 AM User: OBezhenova
File Path: J:\DWG\P2005\07693A13\E
CTB:
LMAN:
UCS:



PLAN VIEW



SECTION A–A

NOTES:

BUILDING CONNECTIONS SHALL NOT BE CONNECTED DIRECTLY TO MANHOLE STRUCTURES. SEE DETAIL FOR NEW BUILDING CONNECTION ADJACENT TO EXISTING MANHOLE FOR NEW CONNECTIONS.

SEWER MAIN NEW CONNECTION TO MANHOLE PLAN VIEW AND SECTION

N.T.S.

FIGURE 02

0768A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:44 AM User: OBazhanova
File Path: J:\DWG\P2005\0769\A13\D
CTB:
LMAN:
UCS:

0769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:44 AM User: OBazhenova
File Path: J:\DWG\P2005\0769A13D
CTB:
LMAN:
UCS:

MANHOLE NOTES

1.) ALL PIPES SHALL BE CUT FLUSH WITH INSIDE WALL OF STRUCTURE

2.) MANHOLES SHALL BE PLACED ON 8" MINIMUM CRUSHED STONE BASE.

3.) MORTAR IN LIFTING HOLES AFTER INSTALLING RUBBER PLUGS.

4.) MANHOLES SHALL RECEIVE A BITUMINOUS DAMP PROOFING PRIOR TO DELIVERY TO THE SITE.

5.) PROVIDE WATERTIGHT PLUG FOR FLEXIBLE SLEEVE AS NOTED ON THE DRAWING OR AS DIRECTED BY THE ENGINEER.

6.) PIPE TO MANHOLE JOINTS SHALL BE SEALED WATERTIGHT BY USE OF PRE MOLDED ELASTOMERIC SEALED JOINTS CAST INTO CONCRETE MANHOLE BASE AND SHALL CONFORM TO ASTM C 443 AND ASTM C 923M.

7.) MANHOLE FRAME AND COVERS SHALL BE OF THE TYPE INDICATED BELOW OR APPROVED EQUAL , UNLESS OTHERWISE SPECIFIED.

LOCATION	TYPE	
GUTTERS, LOW LYING, WET UNPAVED AREAS	24"X 8" WATERBURY FRAME & COVER WITH #6 LOCKS AND SEAL TIGHT GASKET*	(BOLTS SHALL BE 1/2" STAINLESS STEEL.)
NORMALLY DRY UNPAVED AND PAVED AREAS	24" X 8" WATERBURY FRAME & COVER*	

8.) MANHOLE STEPS SHALL BE STEEL REINFORCED POLYPROPYLENE OR ALUMINUM.

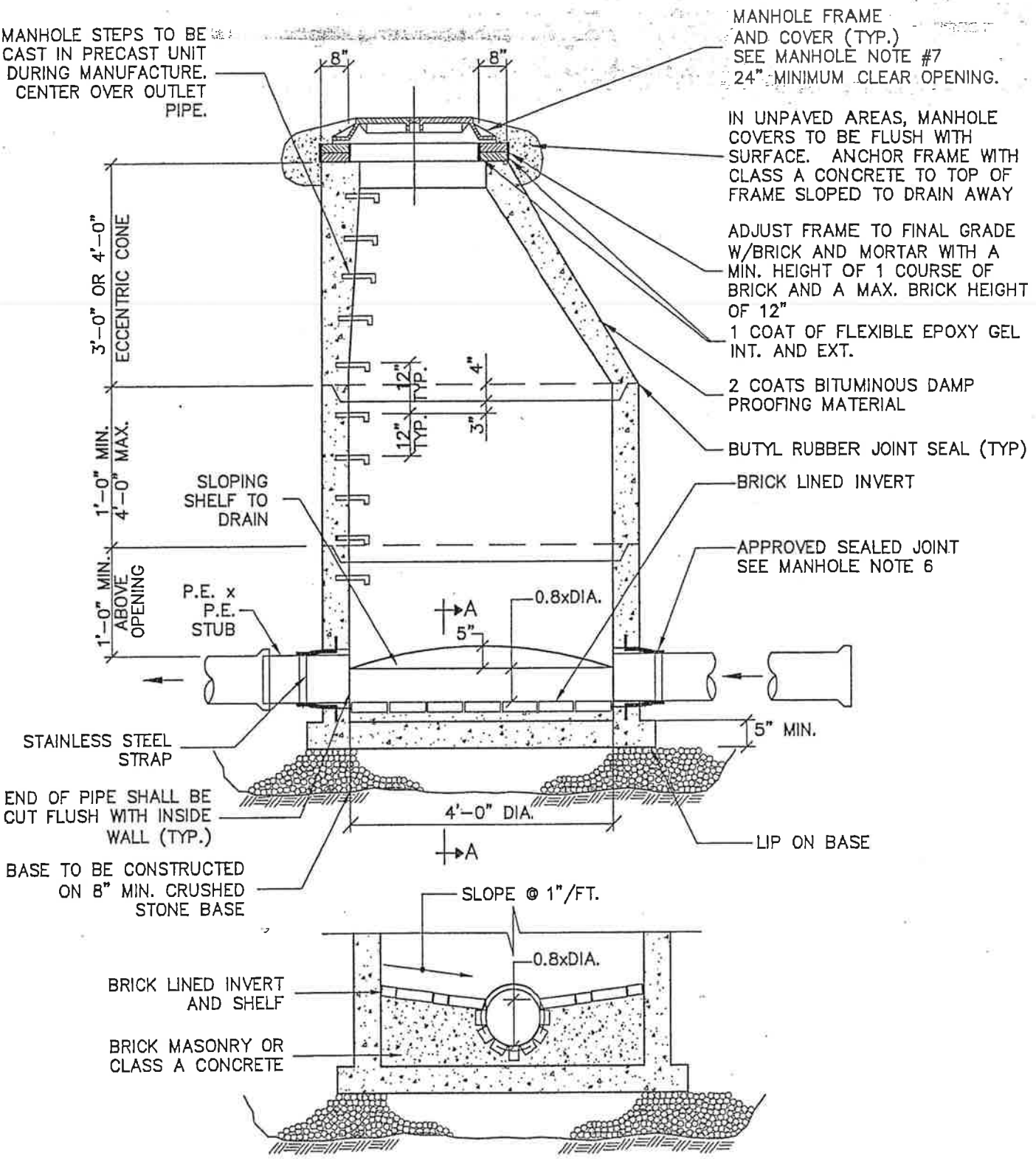
9.) WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE INCOMING SEWER AND THE MANHOLE INVERT IS LESS THAN 24", THE INVERT SHALL BE FILLETED.

* OR AS OTHERWISE DIRECTED BY WPC.

FIGURE 03

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



SECTION A–A

4' PRECAST MANHOLE

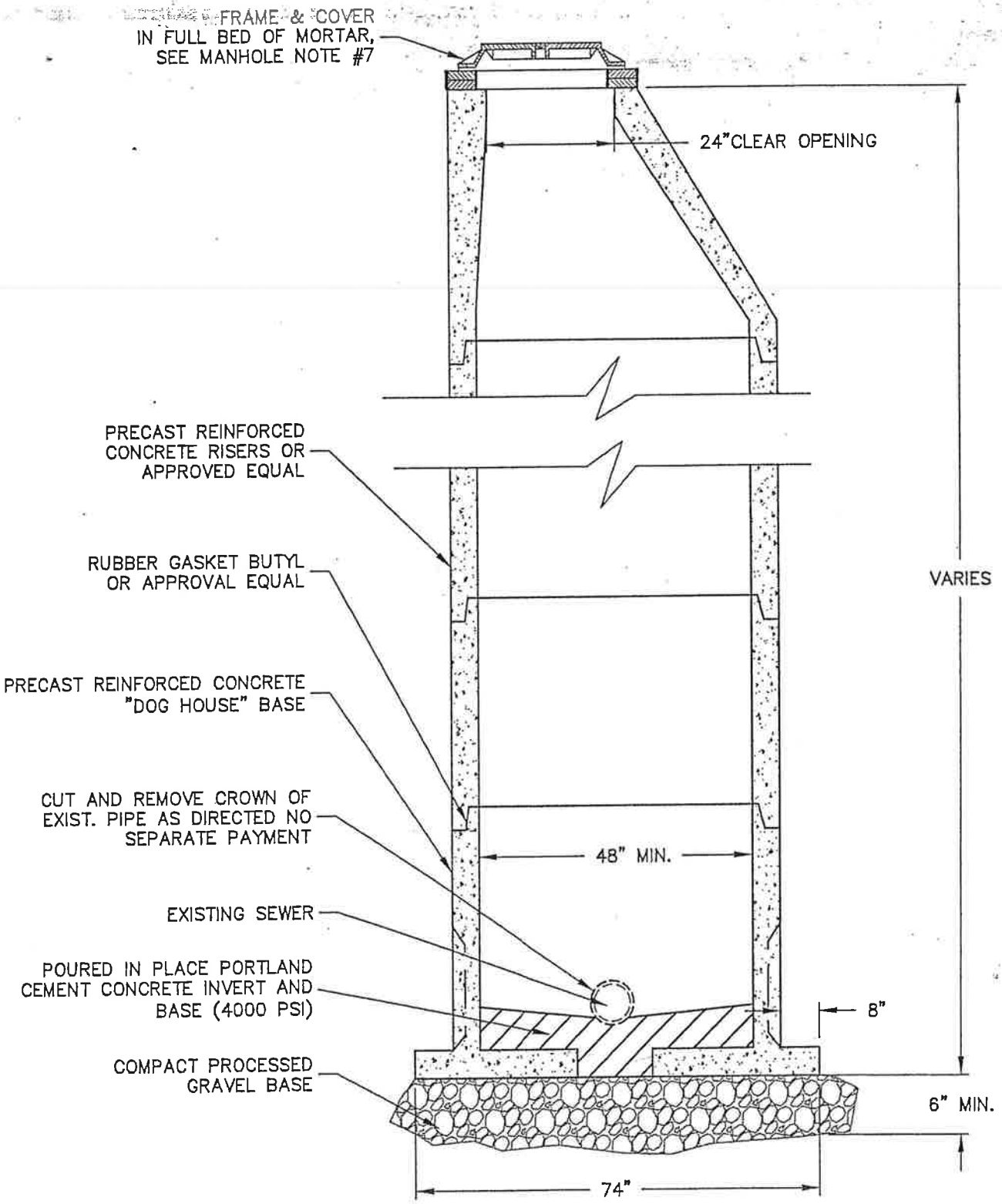
N.T.S.

FIGURE 04

File Path: J:\DWG\P2005\07691A13\D 0769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:45 AM User: OBazhenova
CTB:
LMAN:
UCS:

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



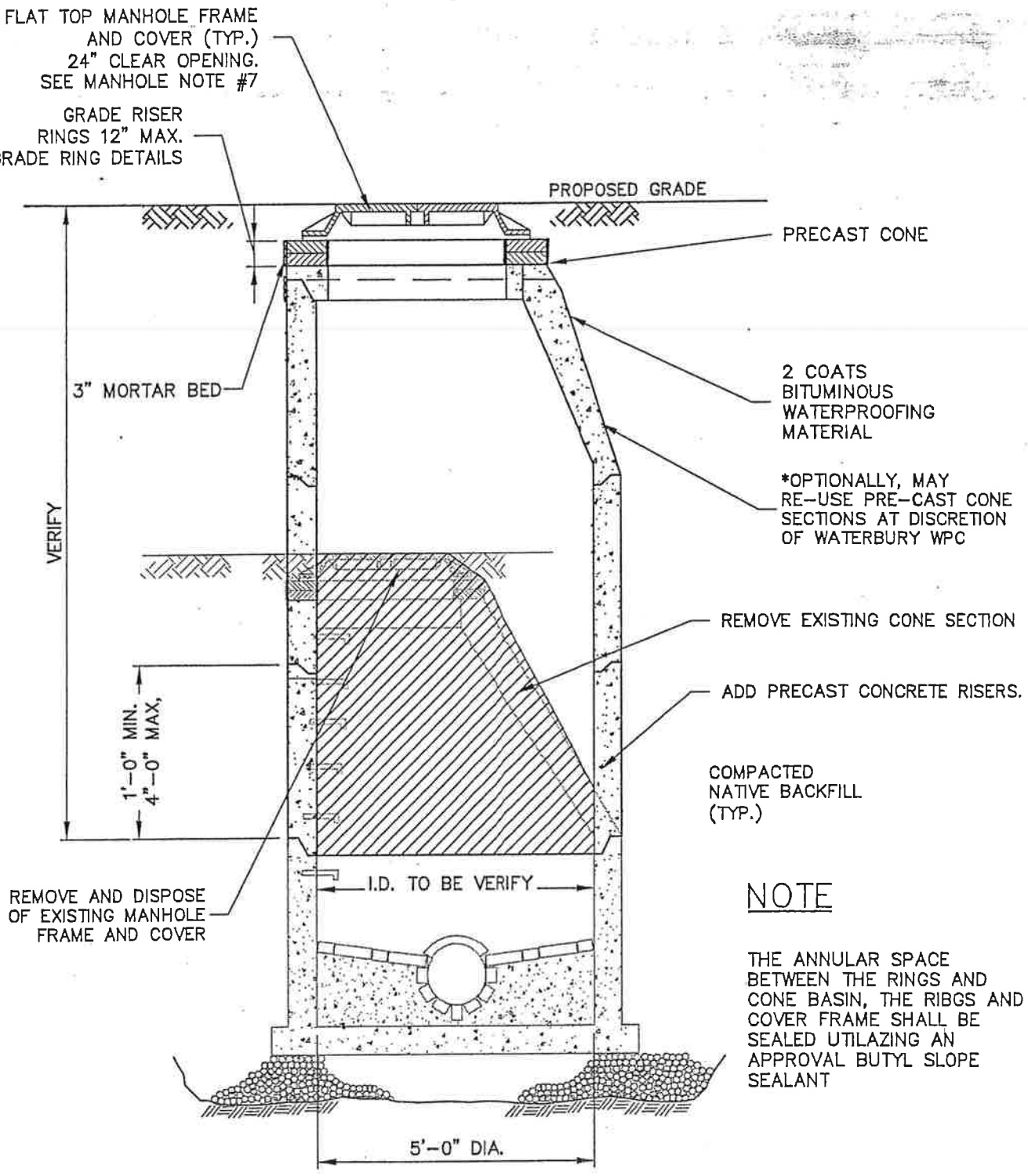
DOG HOUSE MANHOLE DETAIL

N.T.S.

FIGURE 05

3769A13\DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:45 AM User: OBazhenova
File Path: J:\DWG\P2005\07769\A13\D
CTB:
LMAN:
UCS:

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



NOTE

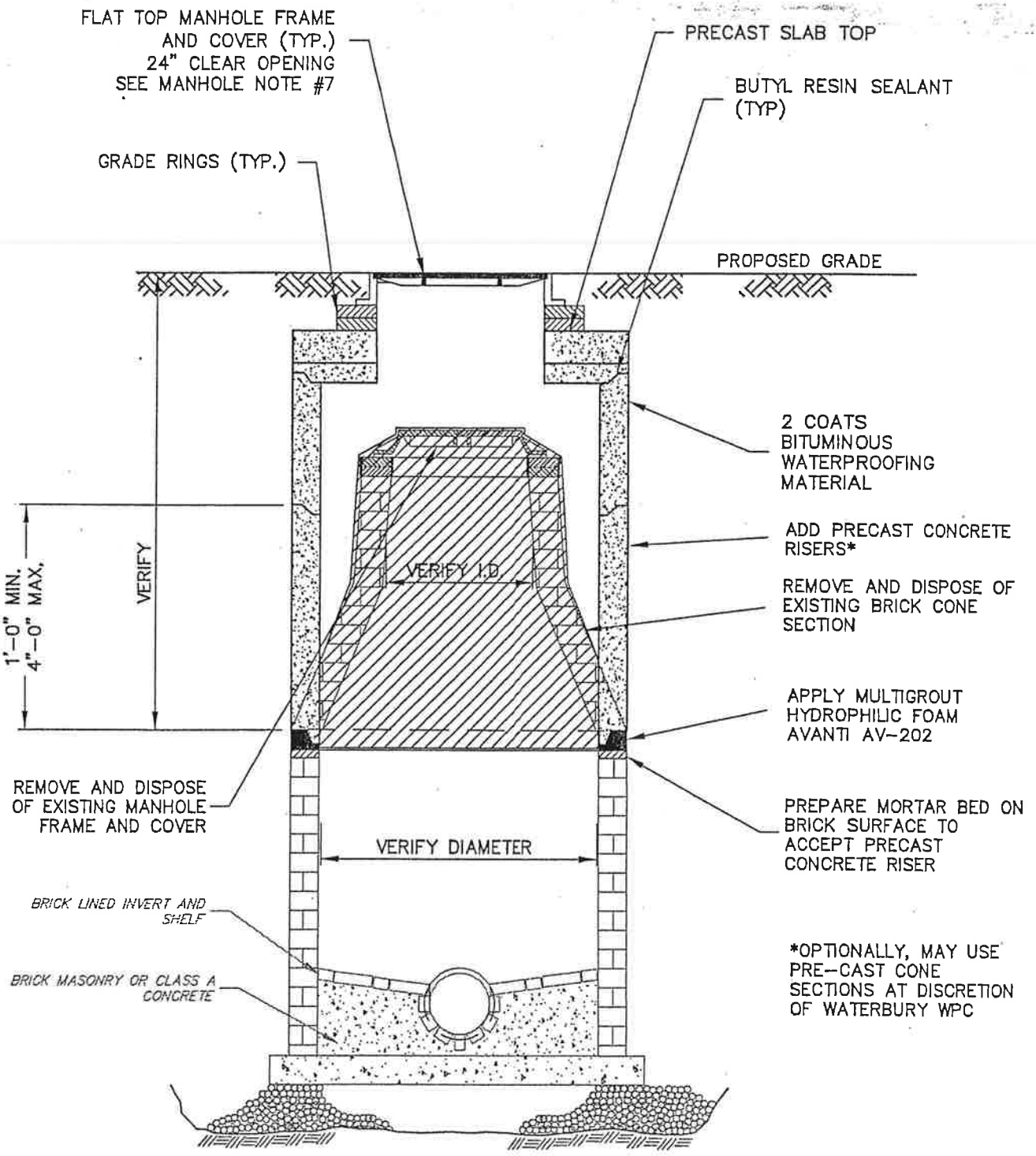
THE ANNULAR SPACE BETWEEN THE RINGS AND CONE BASIN, THE RIBGS AND COVER FRAME SHALL BE SEALED UTILAZING AN APPROVAL BUTYL SLOPE SEALANT

PRECAST OR BRICK MANHOLE RISER WITH PRE-CAST CONE SECTION

N.T.S.

FIGURE 06

D769A13DET001.dwg, Layout 8.5x11-P-DET Thu, Jun 08, 2006 - 9:45 AM User: OBazhenova
File Path: J:\DWG\P2005\07769\A13\D
CTB:
LMAN:
UCS:

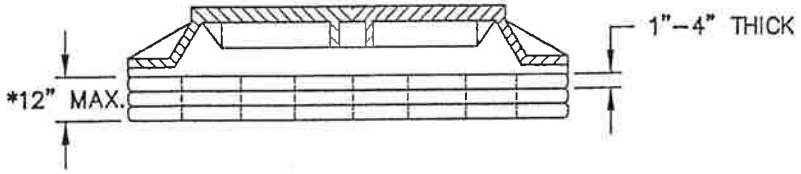


RAISING BRICK MANHOLE

N.T.S.

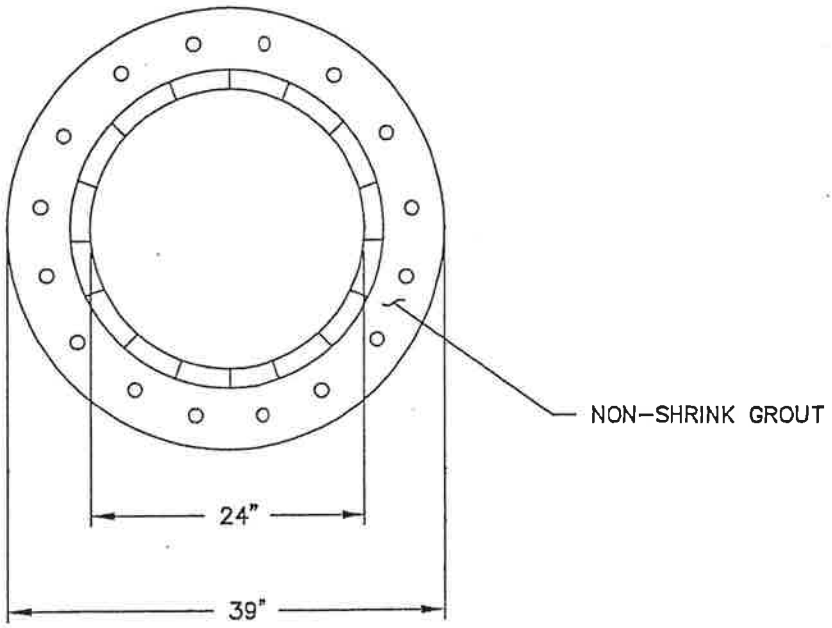
FIGURE 07

769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:48 AM User: OBazhenova
File Path: J:\DWG\P2005\07769\A13\De
CTB:
LMAN:
UCS:



NOTE:

IN AREAS WITH ROAD CROWN
USE ECCENTRIC GRADE RINGS



NOTE:

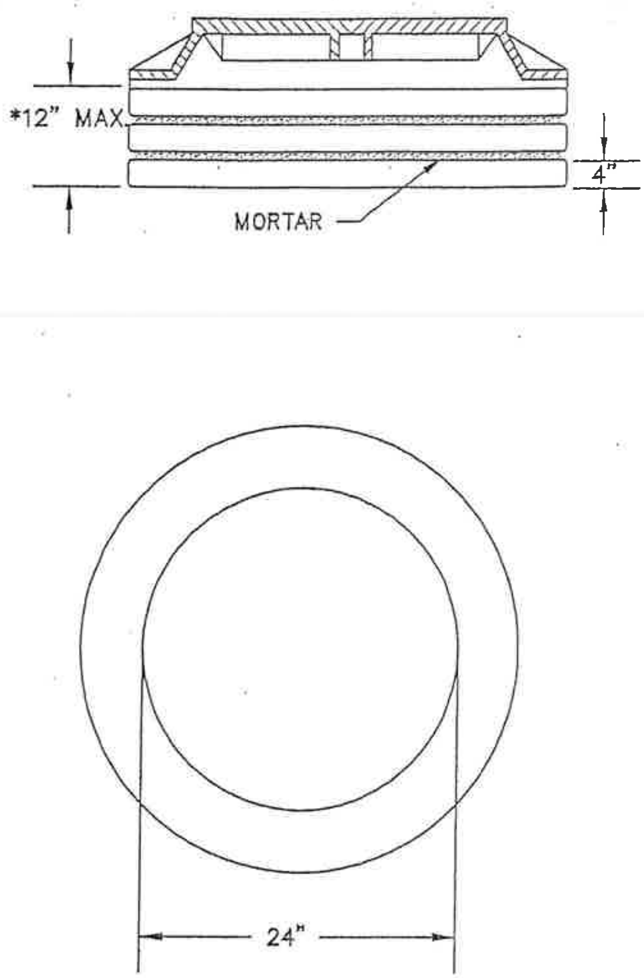
TO RAISE FRAME & COVER
GREATER THAN 12" USE
MANHOLE DIAMETER PRECAST
CONCRETE RISERS

MANHOLE ADJUSTABLE HDPE GRADE RINGS

N.T.S.

FIGURE 08

07693A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:46 AM User: OBazhenova
File Path: J:\DWG\P2005\07693A13D
CTB:
LMAN:
UCS:



NOTE:

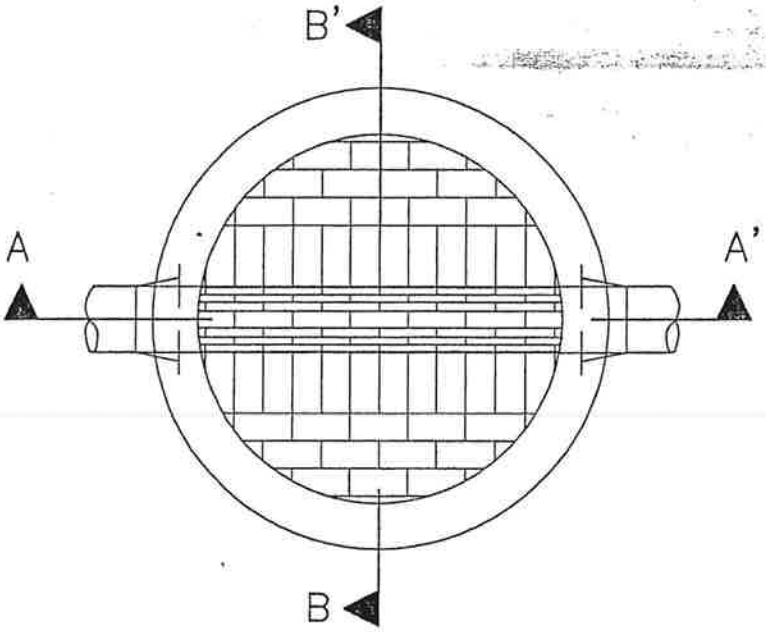
TO RAISE FRAME & COVER GREATER THAN 12" USE PRECAST CONCRETE RISERS

MANHOLE ADJUSTABLE CONCRETE GRADE RINGS

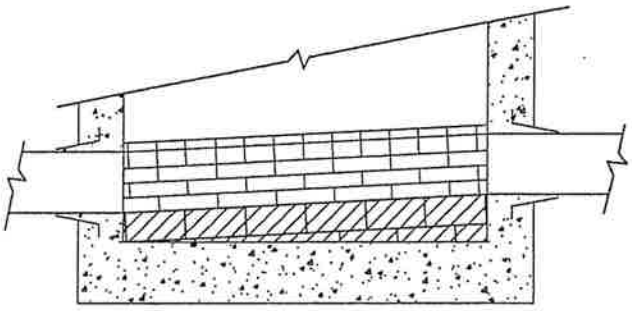
N.T.S.

FIGURE 09

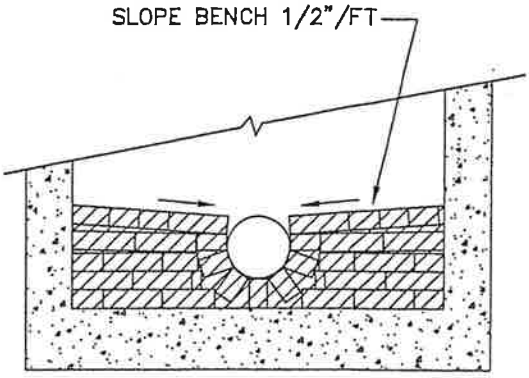
File Path: J:\DWG\P2005\0769\A\...0050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:35 AM User: Olbazhenova
UCS: | VIEW: | LMAN: | CTB:



PLAN



SECTION A–A'



SECTION B–B'

NOTES:

- TOOL ALL JOINTS IN CHANNEL AND ON BENCHES.
- FILL UNDER BENCH WITH MORTAR–BEDDED BRICK.
- SLOPE CHANNEL DOWN FROM INLET TO OUTLET.
- MAKE CHANGES IN FLOW DIRECTION BY CIRCULAR CHANNEL CONSTRUCTION WITH MAXIMUM RADIUS POSSIBLE.
- FOR DEAD–END MANHOLES, BUILD CHANNEL AS DIRECTED BY ENGINEER.
- CONTRACTOR MAY INSTALL CONCRETE (4000 PSI) BENCHES AS AN ALTERNATIVE TO BRICK BENCHES

PP WPC

STANDARD MANHOLE BRICK INVERT DETAIL

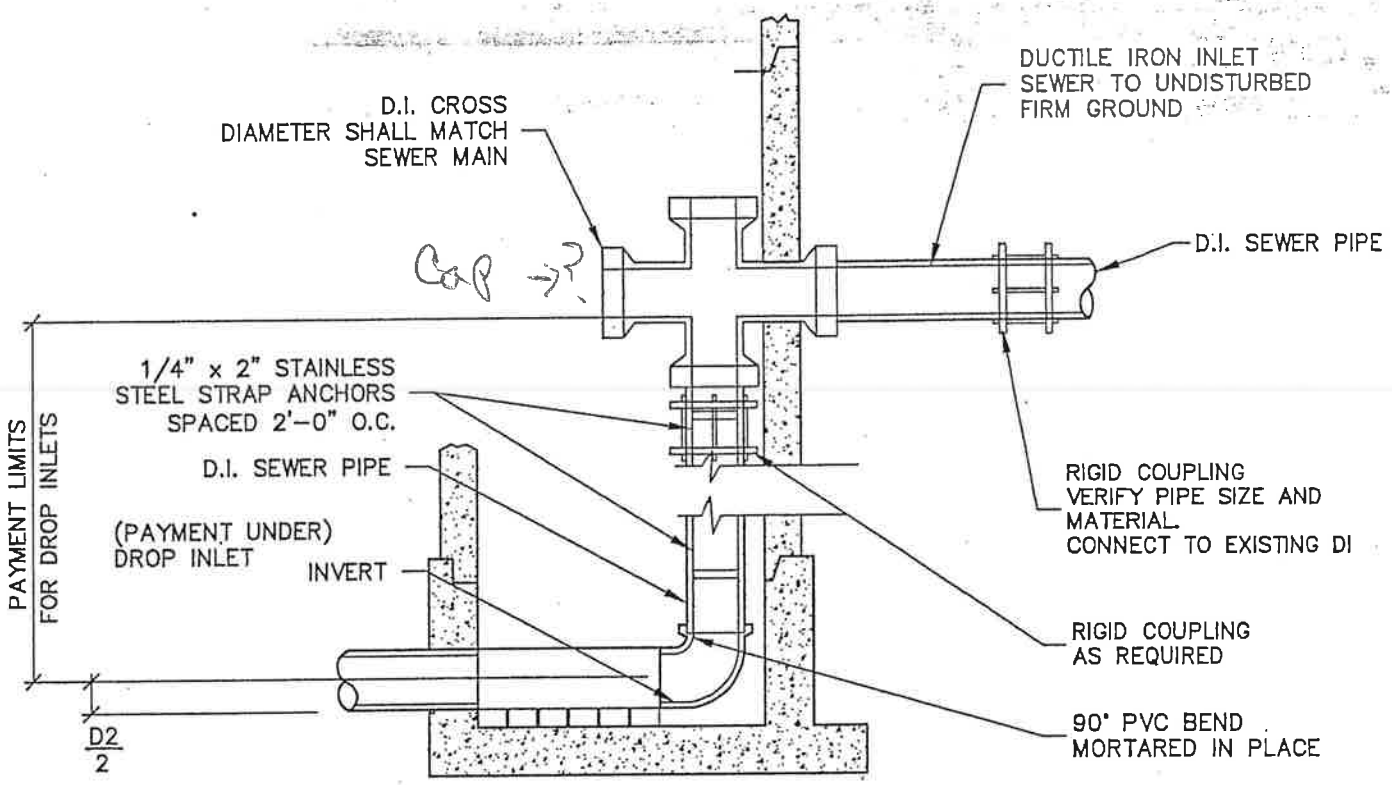
N.T.S.

FIGURE 10

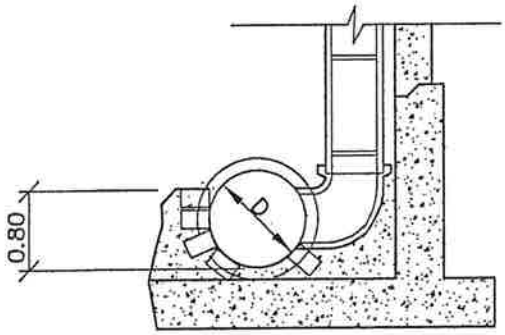
'0050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:36 AM User: OBozhenova
File Path: J:\DWG\P2005\0769A\
CTB:
LMAN:
EW:
UCS:

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



INVERT DETAIL AT MAIN RUN DROPS



INVERT DETAIL AT SIDE DROPS

INSIDE DROP INLET FOR SEWERS

NOTES:

1. DIMENSIONS AND CONSTRUCTION OF DROP MANHOLE TO BE SIMILAR TO TYPICAL MANHOLE EXCEPT AS SHOWN.
2. DROP PIPE SHALL BE SAME DIAMETER AS MAINLINE PIPE UNLESS OTHERWISE DIRECTED BY THE WPC.
3. ALL DROPS SHALL BE CONSTRUCTED WITHIN 5' MIN. DIAMETER MANHOLES

Approved by WPC

INSIDE DROP INLET

N.T.S.

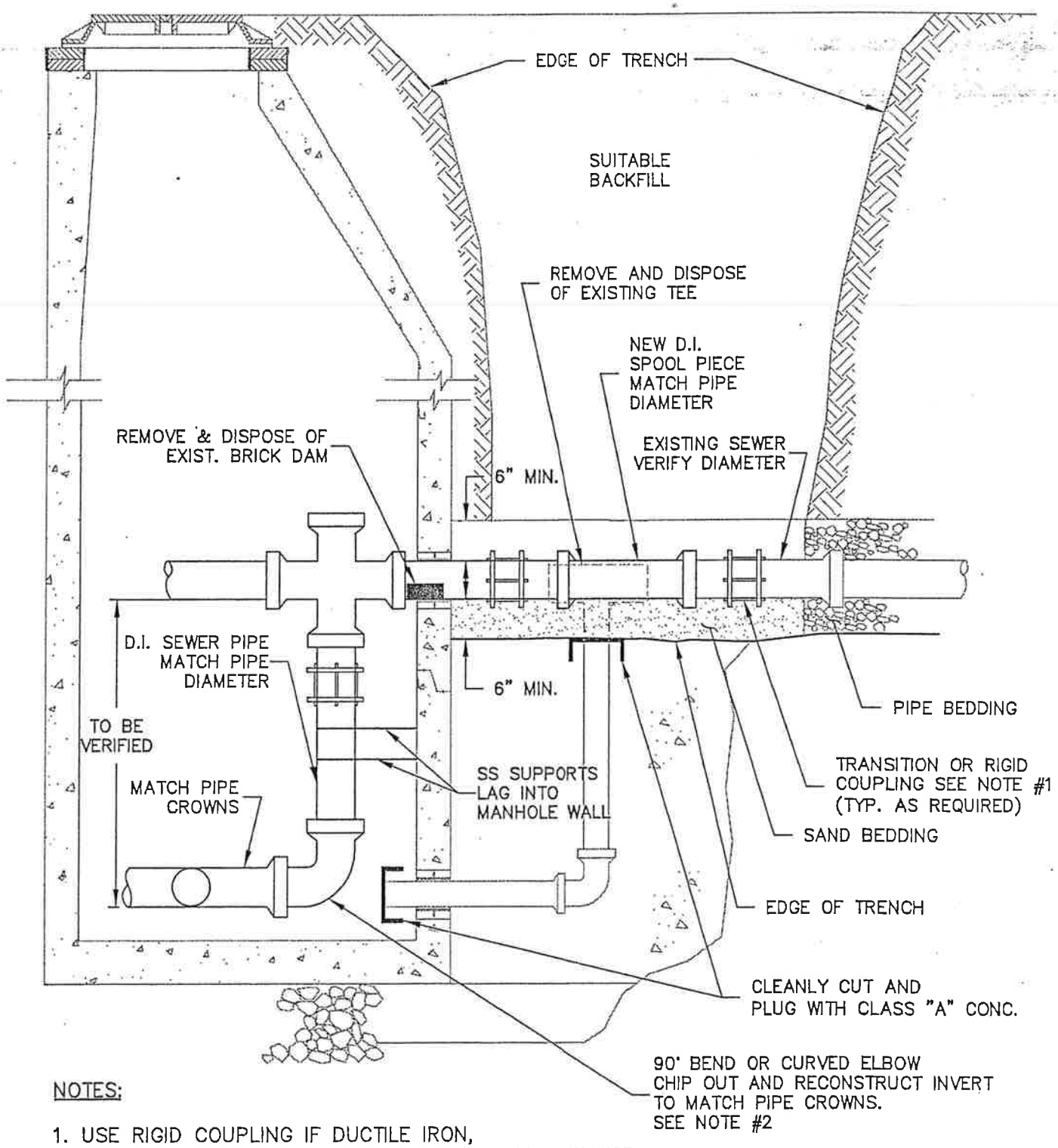
FIGURE 11

*69A13DET00T.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:47 AM User: OSazhenova
File Path: J:\DWGS\P2005\07\69A13\Del
LMAN:
CTB:
CS:
N

CITY OF WATERBURY

WATER POLLUTION CONTROL

SANITARY SEWER DETAILS



NOTES:

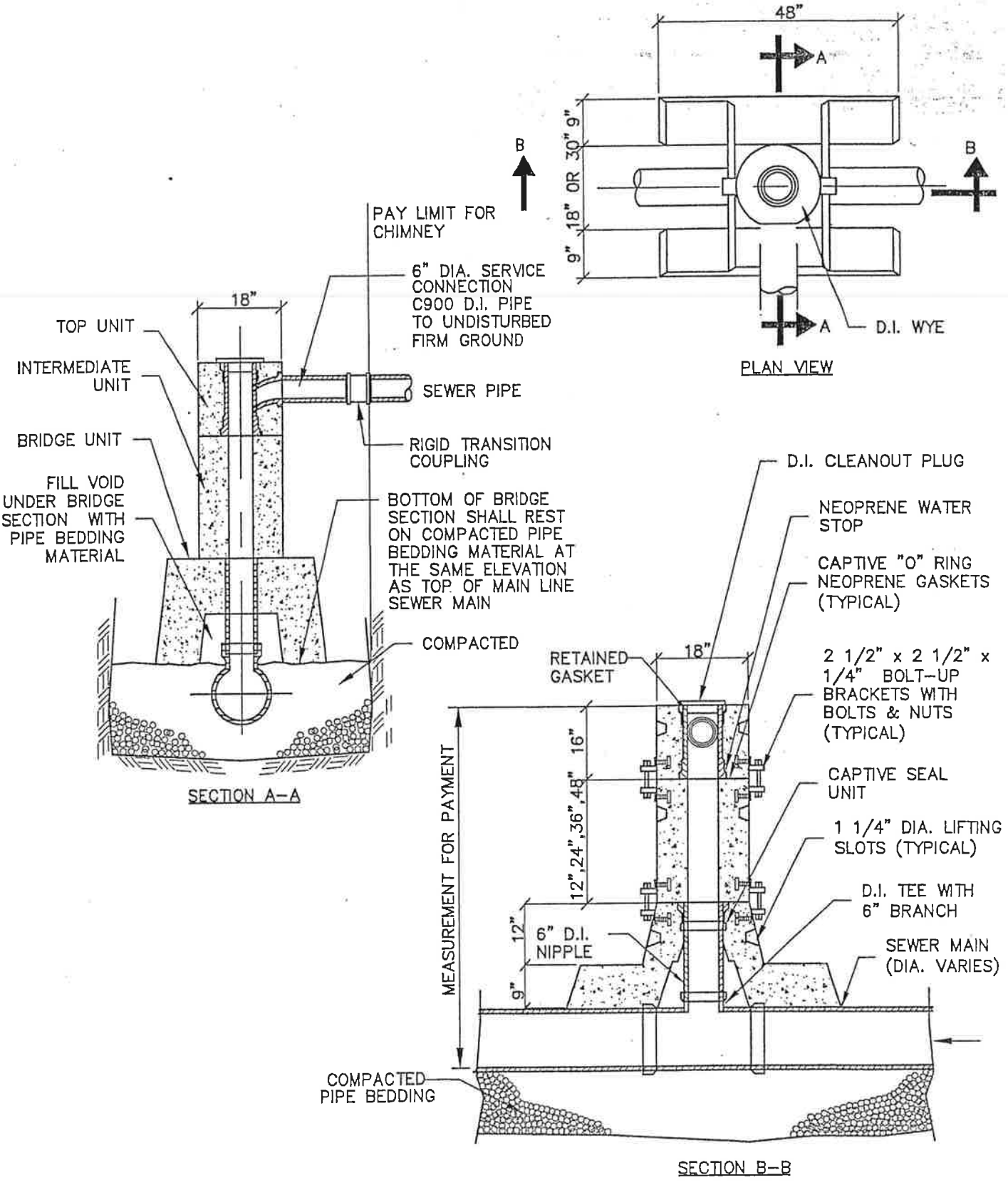
1. USE RIGID COUPLING IF DUCTILE IRON, OR FLEXIBLE ELASTOMERIC TRANSITION COUPLING IF VCP
2. PIPES SHALL NOT BE INSTALLED ON MANHOLE SHELF

MANHOLE DROP MODIFICATION DETAIL

N.T.S.

FIGURE 12

950769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 10:32 AM User: Obazhenova
File Path: J:\DWG\P2005\0769A13\
W:
LMAN:
CTB:
UCS:

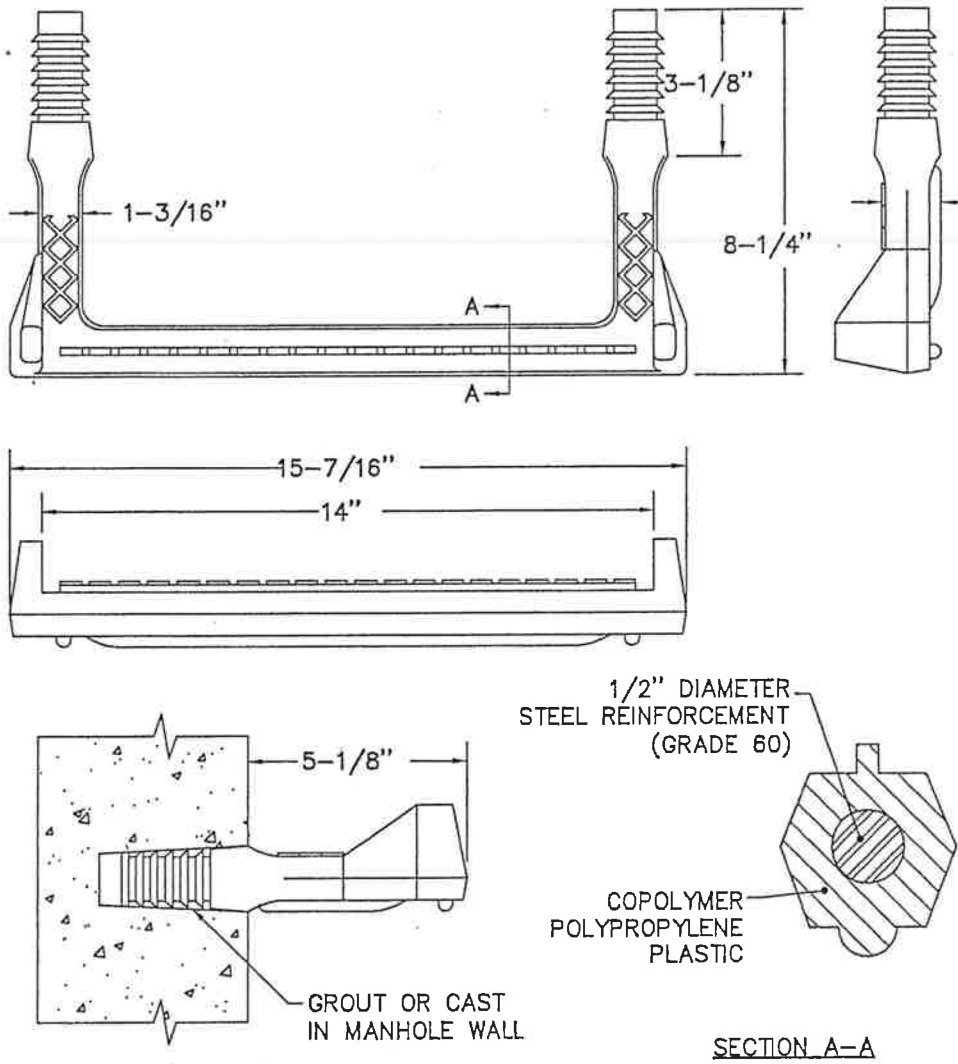


PRECAST SANITARY SEWER CHIMNEY

N.T.S.

FIGURE 13

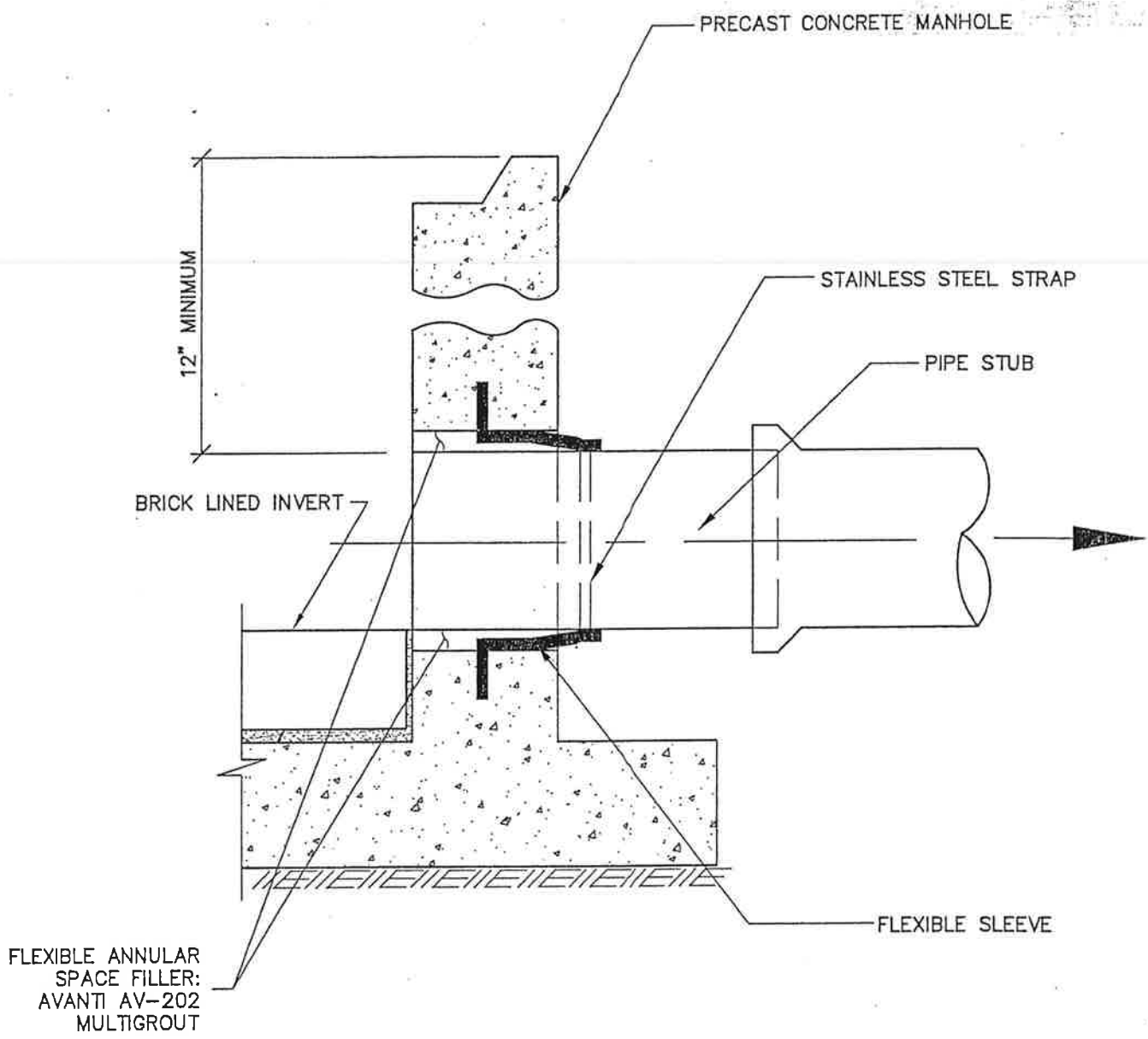
File Path: J:\DWG\P2005\07691A\13\Dr 7691A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:48 AM User: OBazhenova
CTB:
LMAN:
JCS:



MANHOLE STEP DETAIL

N.T.S.

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS

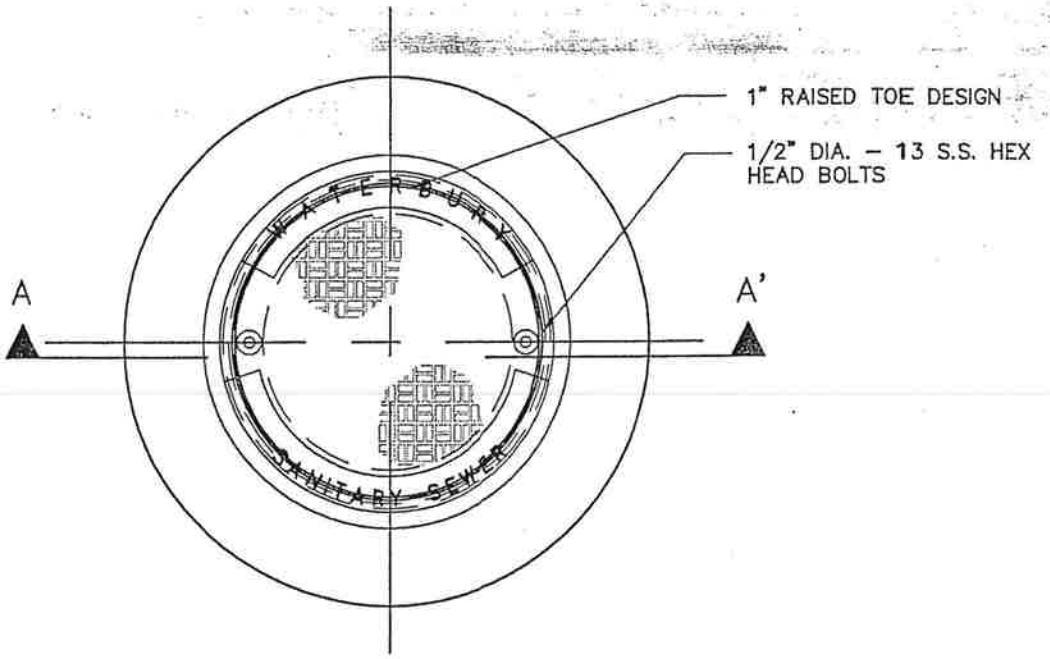


FLEXIBLE SLEEVE

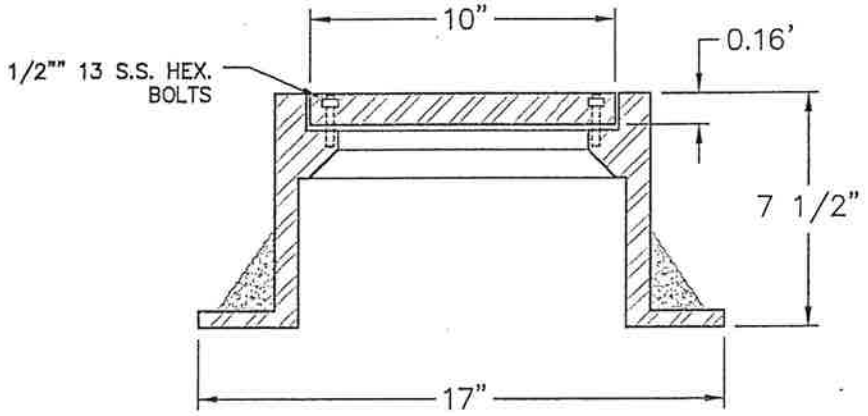
N.T.S.

FIGURE 15

File Path: J:\DWG\P2005\07769A\20050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:41 AM User: OBazhenova
VIEW: LMAN: CTB: UCS:



PLAN



SECTION A–A'

NOTE:

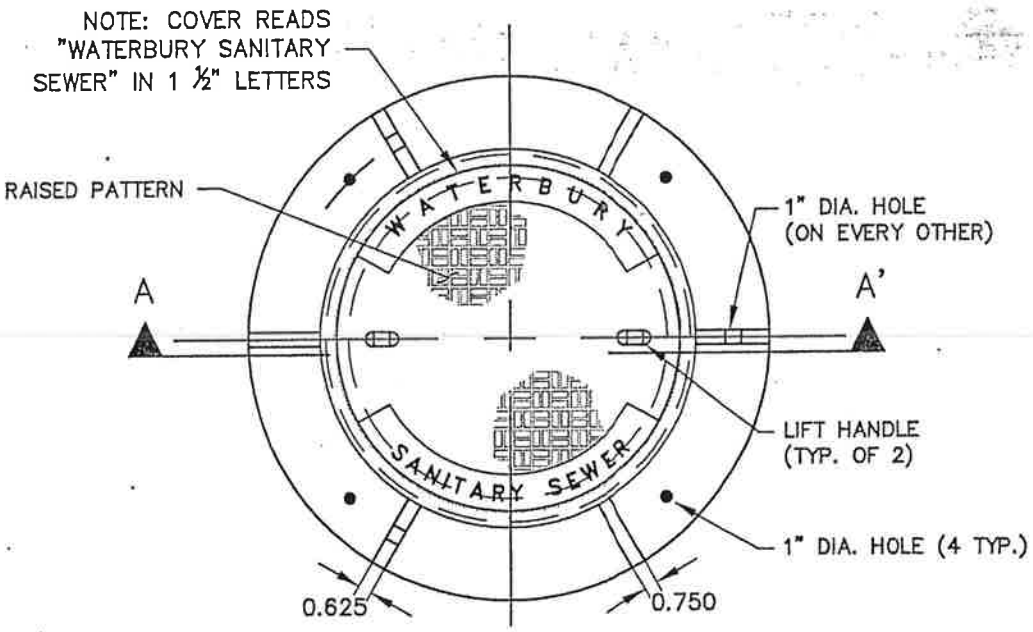
1. MATERIAL – GRAY CAST IRON ASTM A48–83, CLASS 30B
2. COVER BOLTED TO FRAME WITH TWO RECESSED, 1/2" – 13 S.S. HEX HEAD BOLTS.
3. CASTING SUPPLIED WITHOUT SURFACE COATING.
4. AASH 40 HS20–44 HIGHWAY LOADING.

SEWER CLEANOUT FRAME & COVER

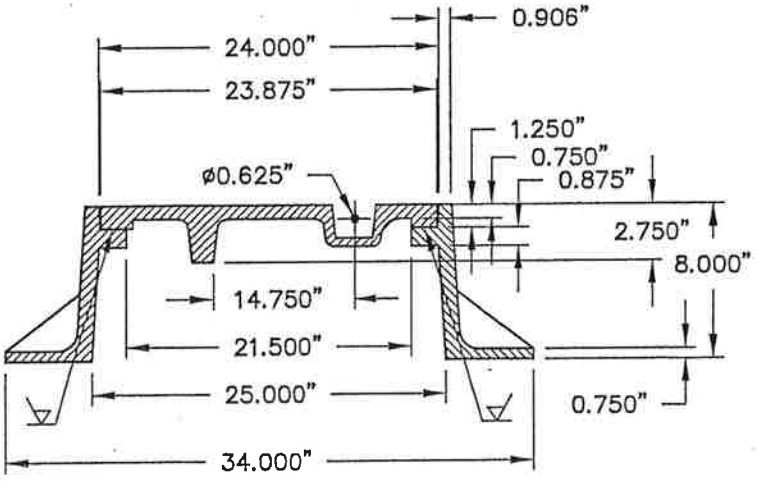
N.T.S.

FIGURE 16

File Path: J:\DWG\P2005\07691A1\2050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:41 AM User: OBazhenova
SW: LMAR: CTB: UCS:



PLAN



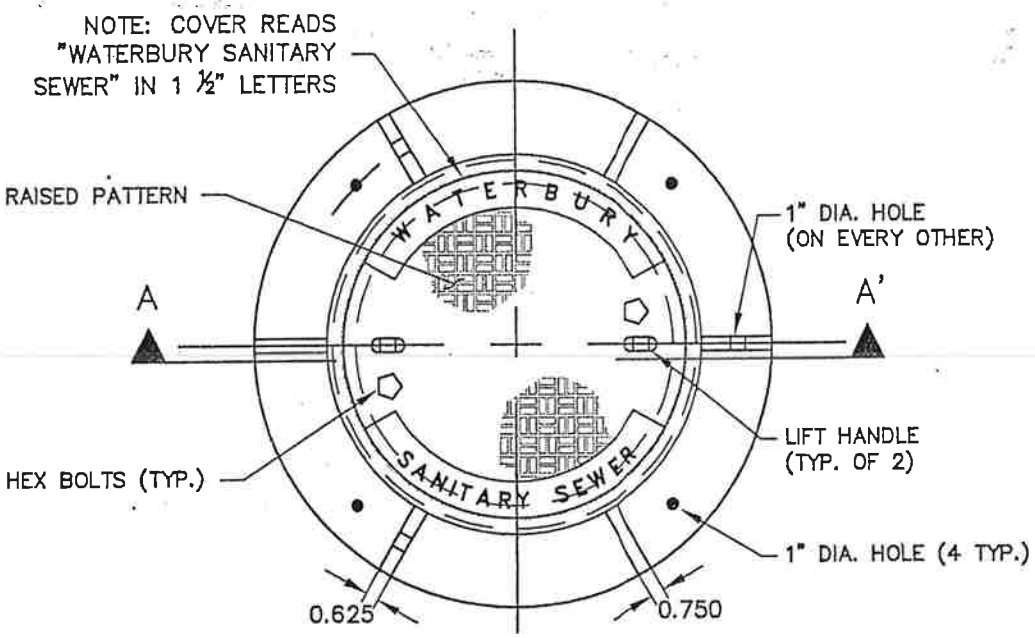
SECTION A–A'

24"X8" WATERBURY STANDARD FRAME AND COVER

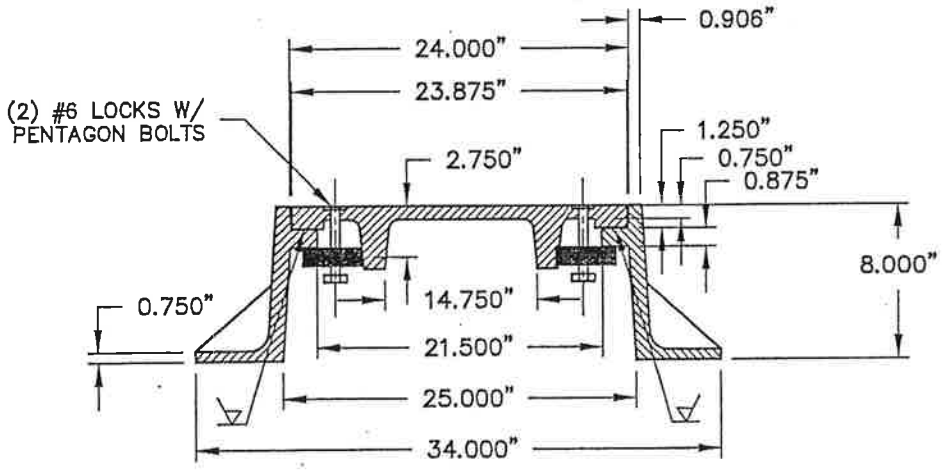
N.T.S.

FIGURE 17

I769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:49 AM User: OBazhenova
File Path: J:\DWG\P2005\0769\A13\D
LMAN:
CTB:
ICS:



PLAN



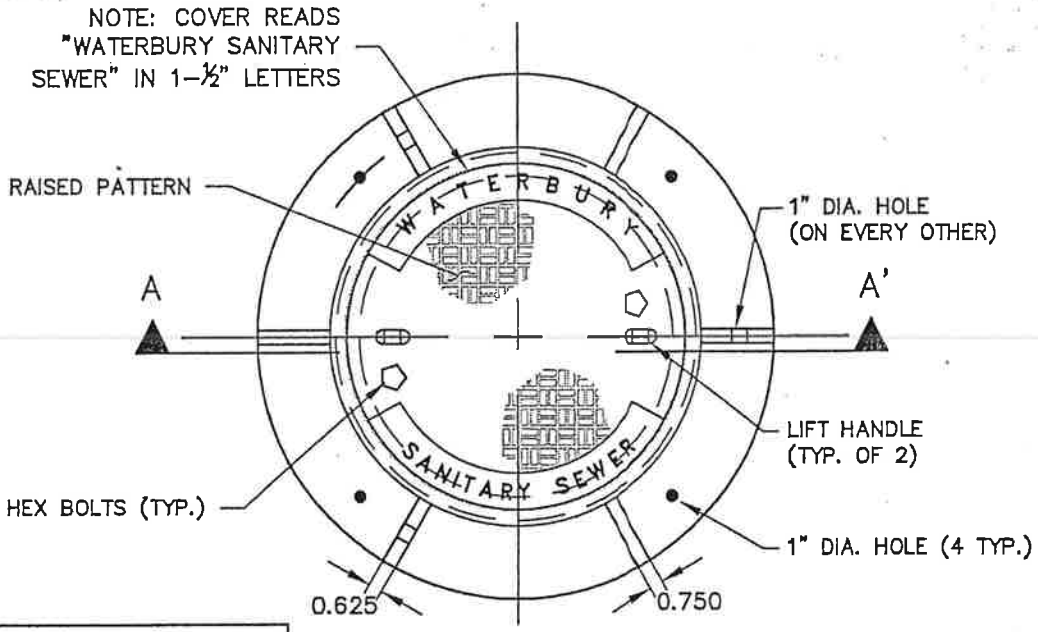
SECTION A–A'

24"X8" WATERBURY STANDARD FRAME AND COVER WITH #6 LOCKS

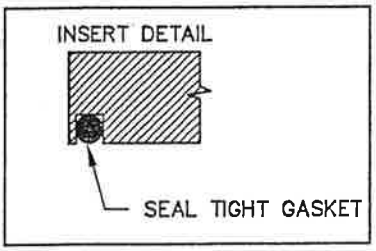
N.T.S.

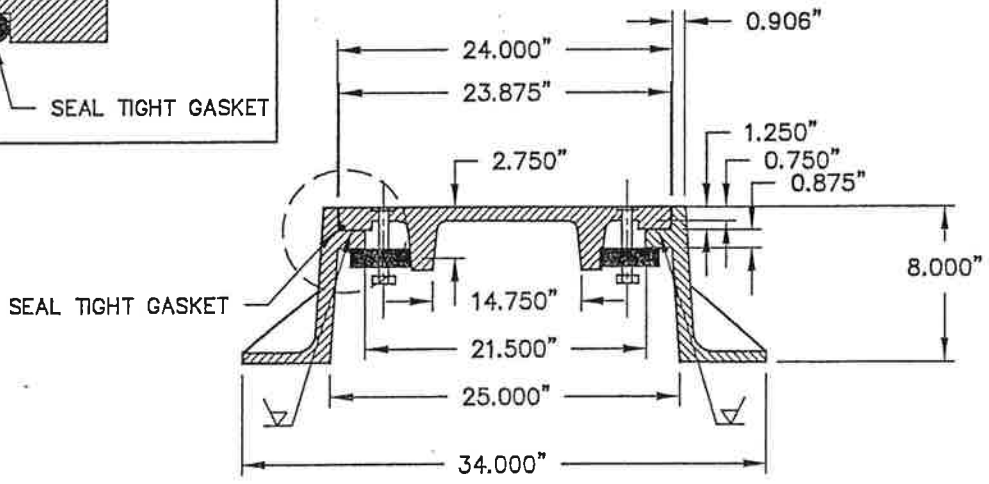
FIGURE 18

0769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:49 AM User: OBazhenova
File Path: J:\DWG\P2005\07\0769A13\D
CTB:
LMAN:
UCS:



PLAN





SECTION A–A'

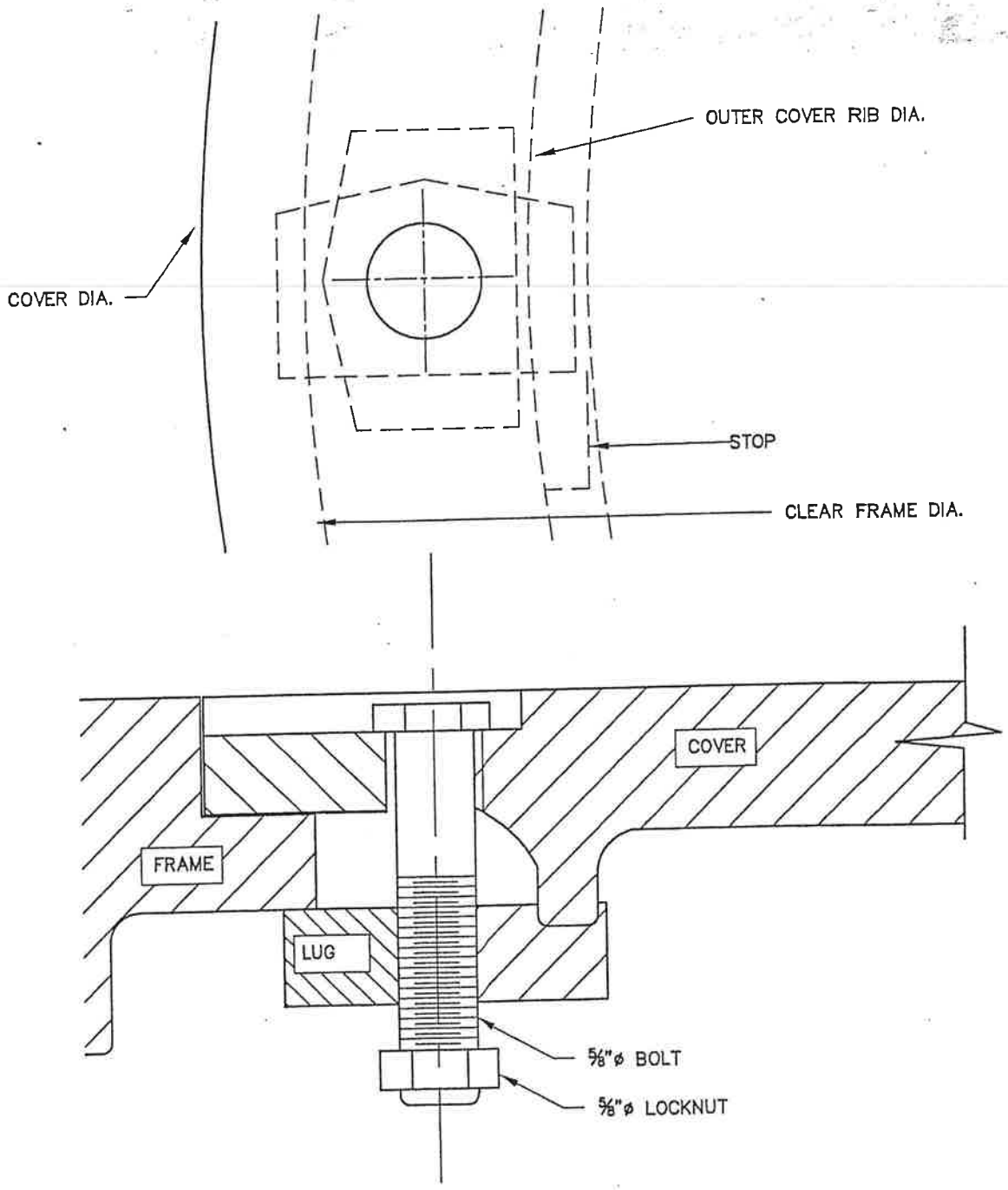
24"X8" WATERBURY STANDARD FRAME AND COVER WITH #6 LOCKS AND SEAL TIGHT GASKET

N.T.S.

FIGURE 18A

I769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 2:00 PM User: OBazhenova
File Path: J:\DWG\P2005\0769\A13D\
CTB:
LMAN:
XCS:

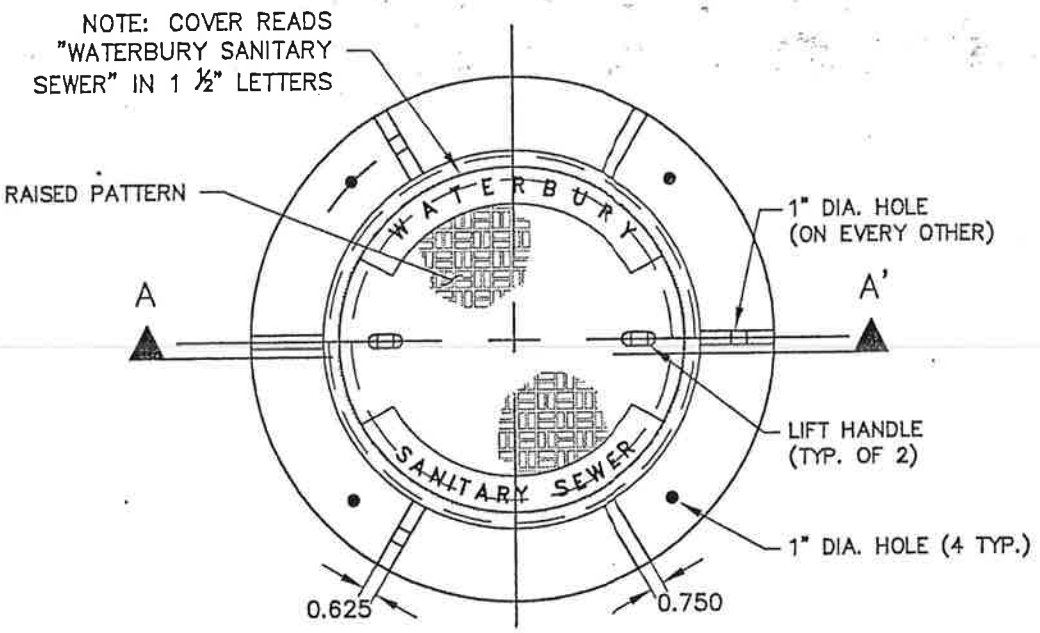
0769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:50 AM User: OBazhenova
File Path: J:\DWG\P2005\0769A13\D
LMAN:
CTB:
PS:



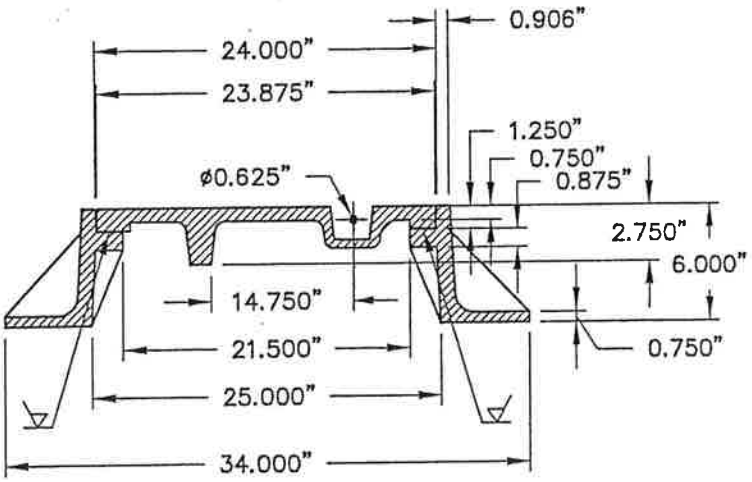
RATTLE PROOF # 6 LOCK

N.T.S.

FIGURE 18B



PLAN



SECTION A–A'

24"X 6" WATERBURY STANDARD FRAME AND COVER

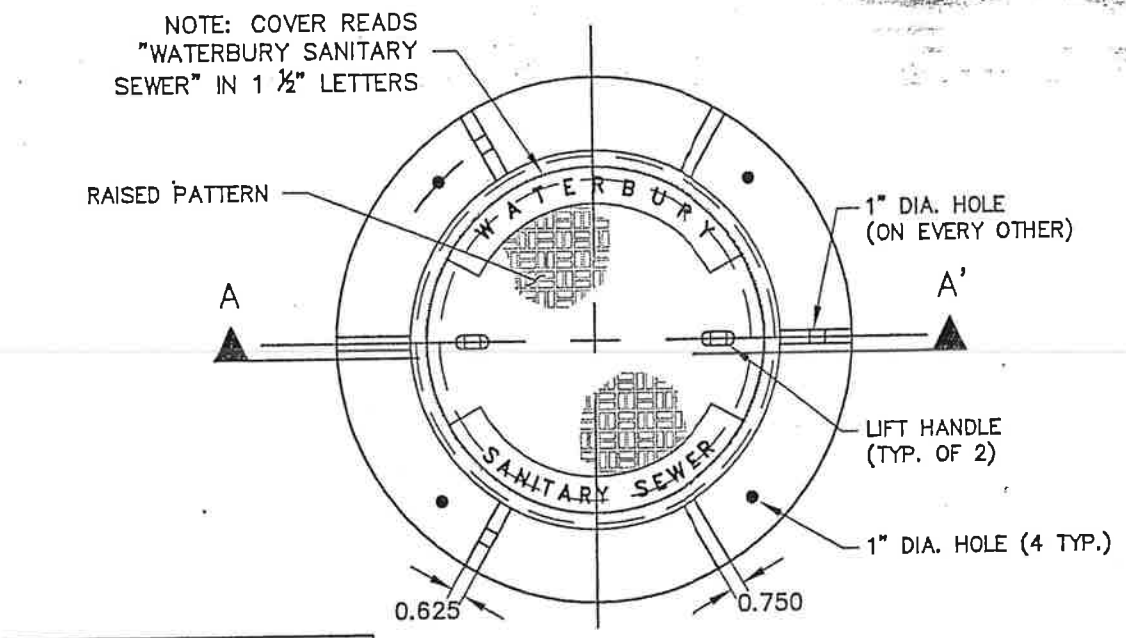
N.T.S.

FIGURE 18C

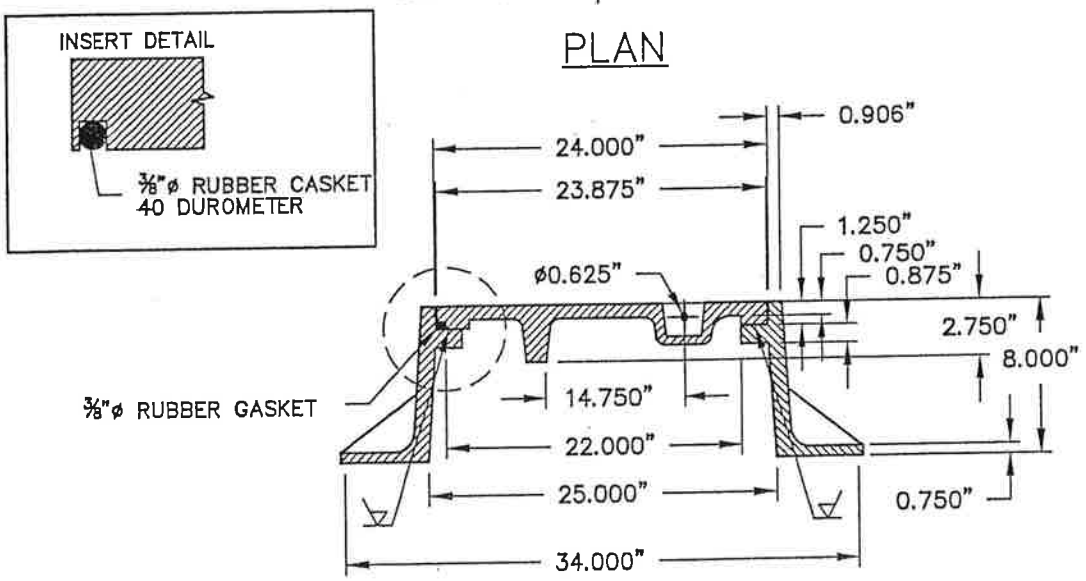
0769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:51 AM User: OBazhenova
File Path: J:\DWG\P2005\0769\A13\E
CTB:
LMAN:
ICS:

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



PLAN



SECTION A–A'

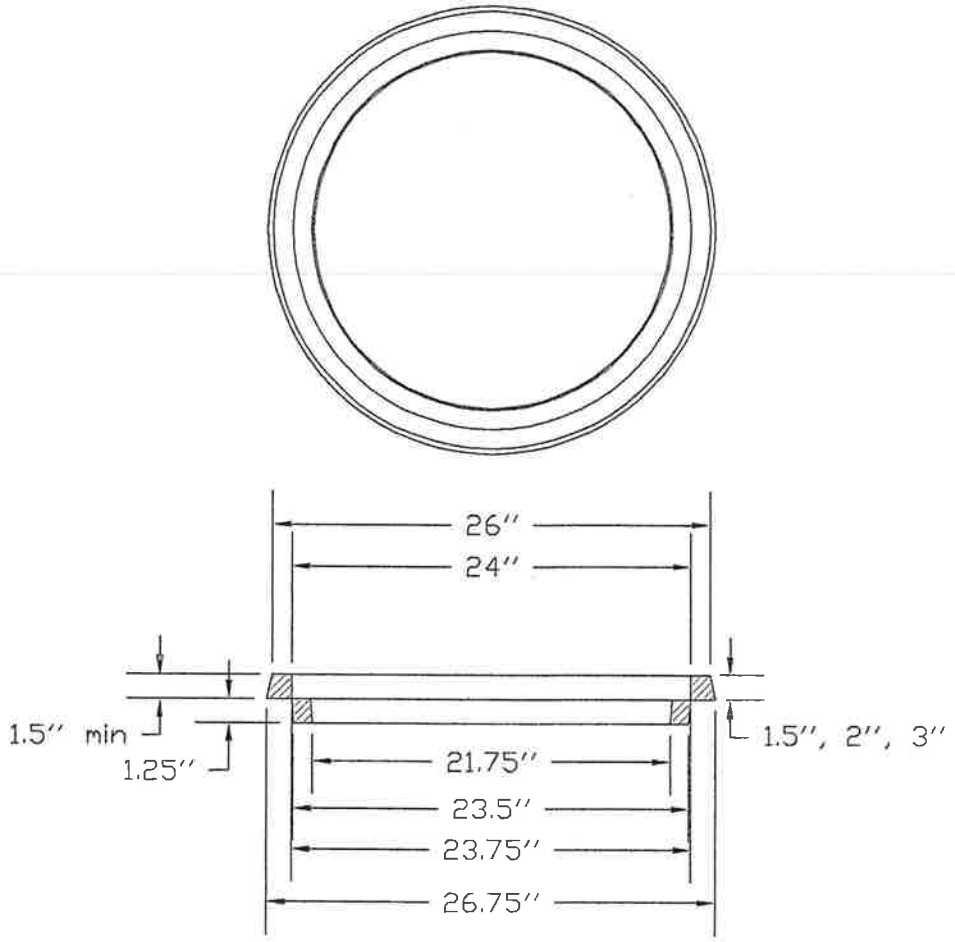
24"X8" WATERBURY STANDARD FRAME AND SEALTITE COVER

N.T.S.

FIGURE 18D

I:\050769A13\DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:39 AM User: OBazhenova
File Path: J:\DWG\P2005\050769A13\
CTB:
LMAN:
XW:
UCS:

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



NOTE:
1.) PROVIDE IN GREY CAST IRON FOR EXTENSIONS > 1"
2.) GREY CAST IRON CASTINGS SHALL CONFORM TO LATEST REVISION ASTM A48 CLASS 30B
3.) AVAILABLE IN REPAVING HEIGHTS RANGING FROM 1.5" TO 3"
4.) CASTINGS SHALL BE SUPPLIED WITHOUT SURFACE COATING
5.) CERTIFICATE OF COMPLIANCE IS REQUIRED

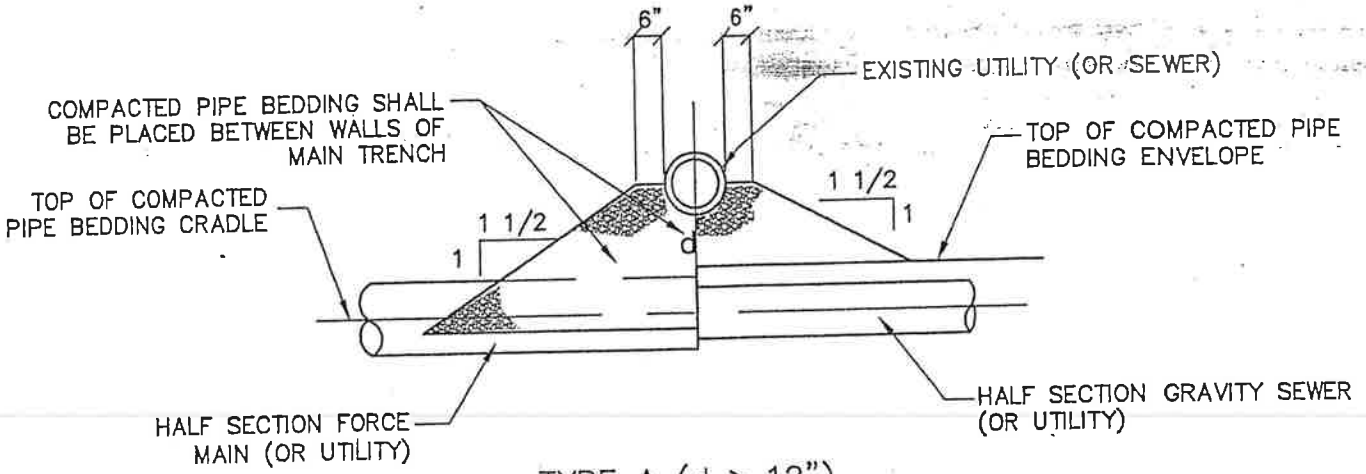
MANHOLE EXTENSION RINGS

N.T.S.

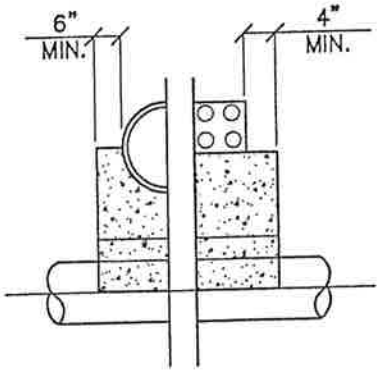
FIGURE 18E

REV. DATE 5/20/08

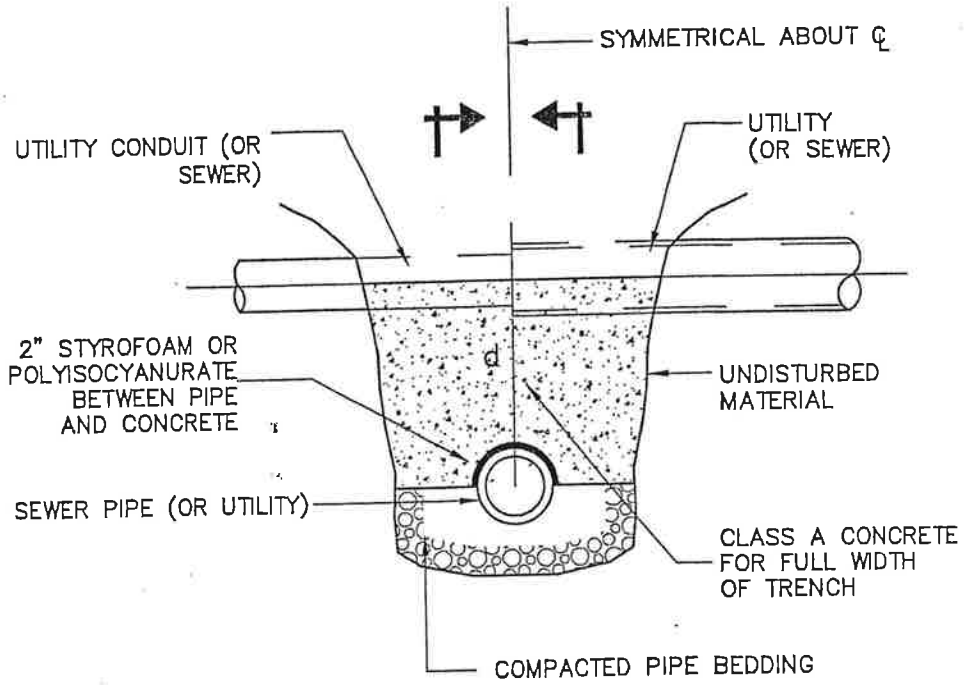
File Path: G:\P2005\07\05\830\Task 300 - Standards Specifications and Details\WH EXTENSION RINGS.dwg, Layout: 08.5x11-P-DET Thu, May 22, 2008 - 11:56 AM User: OBezhenova
UCS: | MS VIEW: | LMAN: | CTB:



TYPE A (d > 12")



HALF SECTION



TYPE B (d < 12")

UTILITY SUPPORT NOTES:

1.) d= DISTANCE FROM TOP OF SEWER PIPE TO THE BOTTOM OF THE UTILITY PIPE.

2.) SUPPORTS TO BE LOCATED AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.

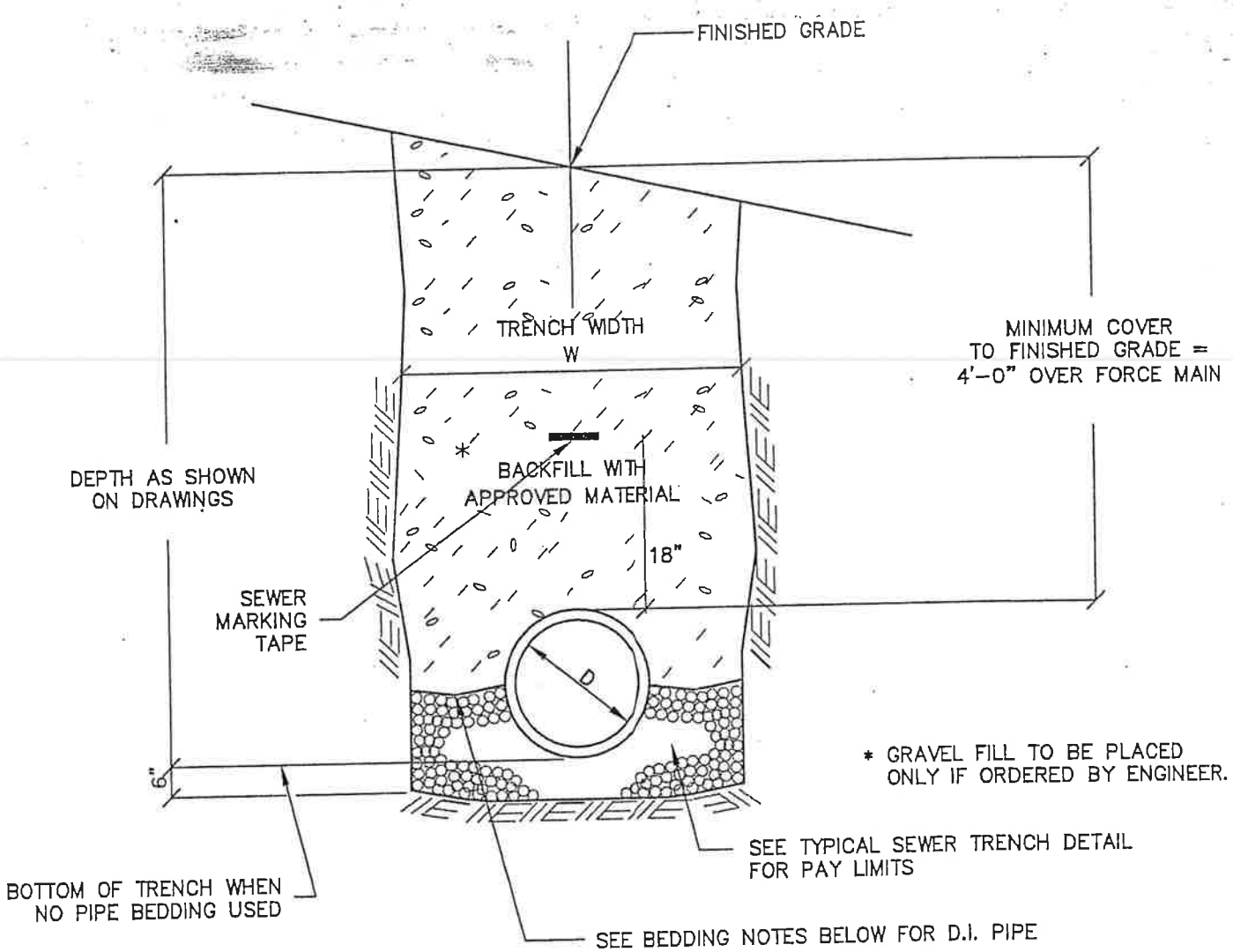
TYPICAL SUPPORT FOR UTILITIES

N.T.S.

FIGURE 19

3050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:42 AM User: OBazhenova
File Path: J:\DWG\P2005\0769\A1
XW:
LMAN:
CTB:
UCS:

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



FORCE MAIN BEDDING NOTES:

1.) D.I. PIPE:

- NORMALLY NO PIPE BEDDING USED
- WHERE TRENCH IN ROCK, WHERE WET OR WHERE ORDERED BY THE ENGINEER PIPE BEDDING SHALL BE USED TO SPRING LINE OF PIPE

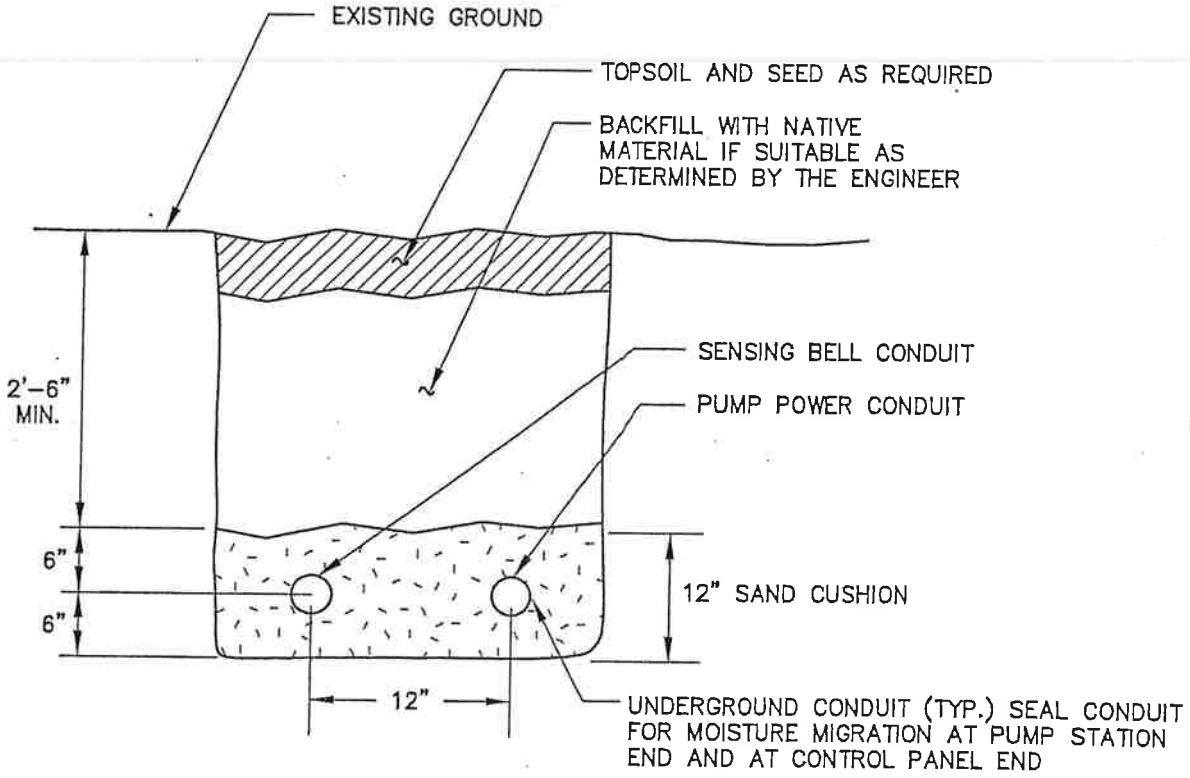
FORCE MAIN SEWER TRENCH

N.T.S.

FIGURE 20

J:\050769A13\DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:43 AM User: OBazhenova
File Path: J:\DWG\P2005\0769A1\
CTB:
LMAN:
XW:
UCS:

1050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:43 AM User: OBazhenova
File Path: J:\DWG\P2005\0769A1\
CTB:
LMAN:
XW:
UCS:



UNDERGROUND CONDUIT TRENCH DETAIL

N.T.S.

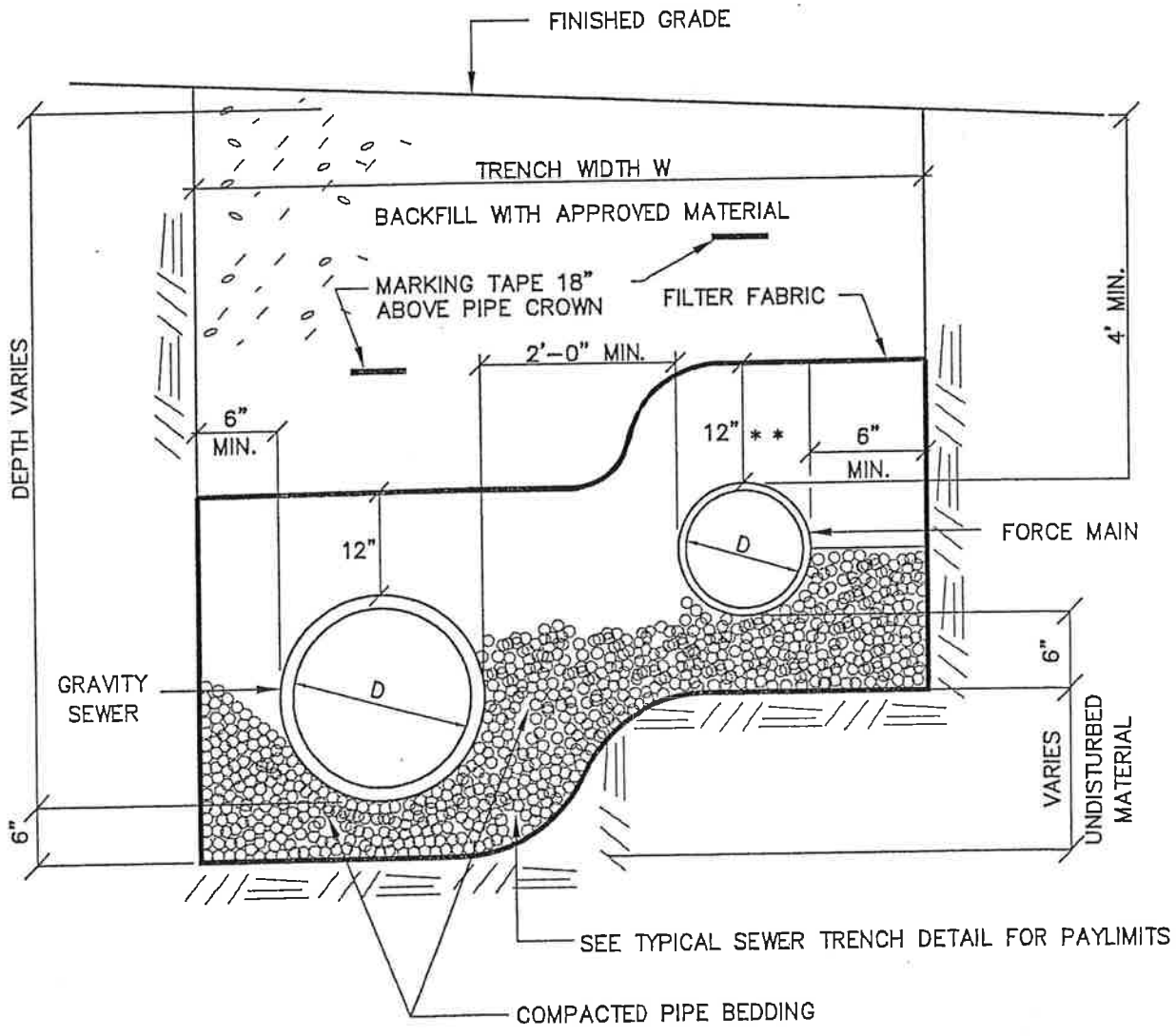
FIGURE 21

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS

GRAVITY SEWER AND FORCE MAIN TRENCH WIDTH AND PAYMENT LIMITS SHALL BE AS FOLLOWS:

DIA. OF GRAVITY PIPE	TRENCH WIDTH W	PAYMENT LIMIT
12" AND SMALLER	7'-0"	7'-0"
15"	7'-3"	7'-3"
18"	7'-6"	7'-6"
21"	7'-6"	7'-6"
24"	7'-9"	7'-9"
27"	7'-9"	7'-9"
30"	8'-0"	8'-0"



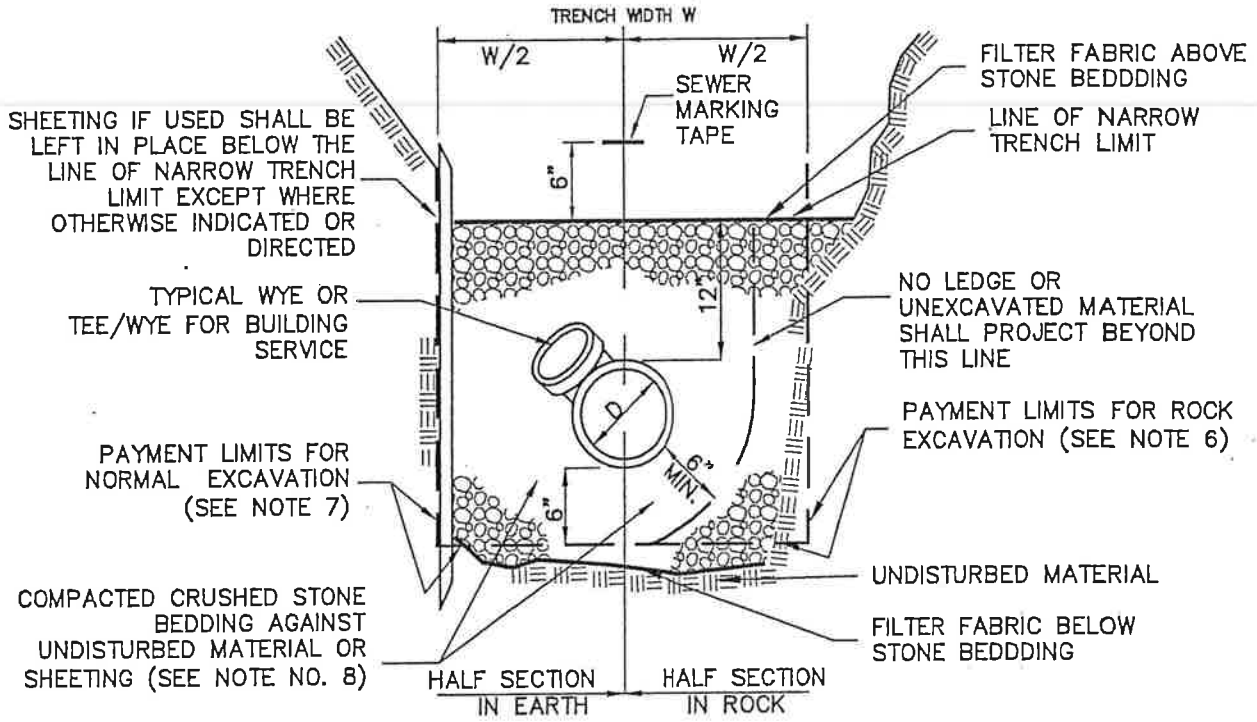
* SEE BEDDING NOTES IN FORCE MAIN TRENCH DETAIL

GRAVITY SEWER AND FORCE MAIN TRENCH

N.T.S.

FIGURE 22

\507698A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:53 AM User: OBezhenova
File Path: J:\DWG\P2005\07898A13\
CTB:
LMAN:
V:
CS:



TYPICAL GRAVITY SEWER TRENCH

N.T.S.

FIGURE 23

1050769\A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:44 AM User: OBazhenova
File Path: J:\DWG\P2005\0769\A1:
CTB:
LMAN:
XW:
UCS:

SANITARY SEWER PIPE OR FORCE MAIN TRENCH NOTES

1. DEPTH OF SEWER SHALL BE AS SHOWN ON DRAWINGS.

2. SEWER TRENCHES MAY BE EXCAVATED WIDER THAN TRENCH WIDTH W ABOVE THE "LINE OF NARROW TRENCH LIMIT." AT THE CONTRACTORS EXPENSE.

3. BELOW THE "LINE OF NARROW TRENCH LIMIT" THE TRENCH SHALL NOT BE EXCAVATED BEYOND THE TRENCH WIDTH W.

4. THE ENGINEER MAY ORDER SHEETING IF EXCAVATION AND BACKFILL BELOW THE NORMAL DEPTH IS REQUIRED.

5. IF USED,SHEETING SHALL BE LEFT IN PLACE BELOW A LINE 1'–0" ABOVE THE TOP OF THE SEWER PIPE, UNLESS OTHERWISE INDICATED OR DIRECTED BY THE ENGINEER.

6. REMOVE ALL ROCK WITHIN 3'–0" HORIZONTALLY OF THE ENDS OF SERVICE CONNECTIONS, BRANCHES AND STUBS, AND DOWN TO A HORIZONTAL PLANE 6" BELOW THE BOTTOMS OF SUCH ITEMS.

7. THE FOLLOWING TRENCH WIDTH AND PAYMENT LIMIT SHALL APPLY:

DIAMETER OF PIPE "D"	TRENCH WIDTH "W"	PAYMENT LIMIT
12" AND SMALLER	4'–0"	4'–0"
12" –18"	7'–0"	7'–0"
18" –24"	7'–6"	7'–6"
>24"	8'–0"	8'–0"

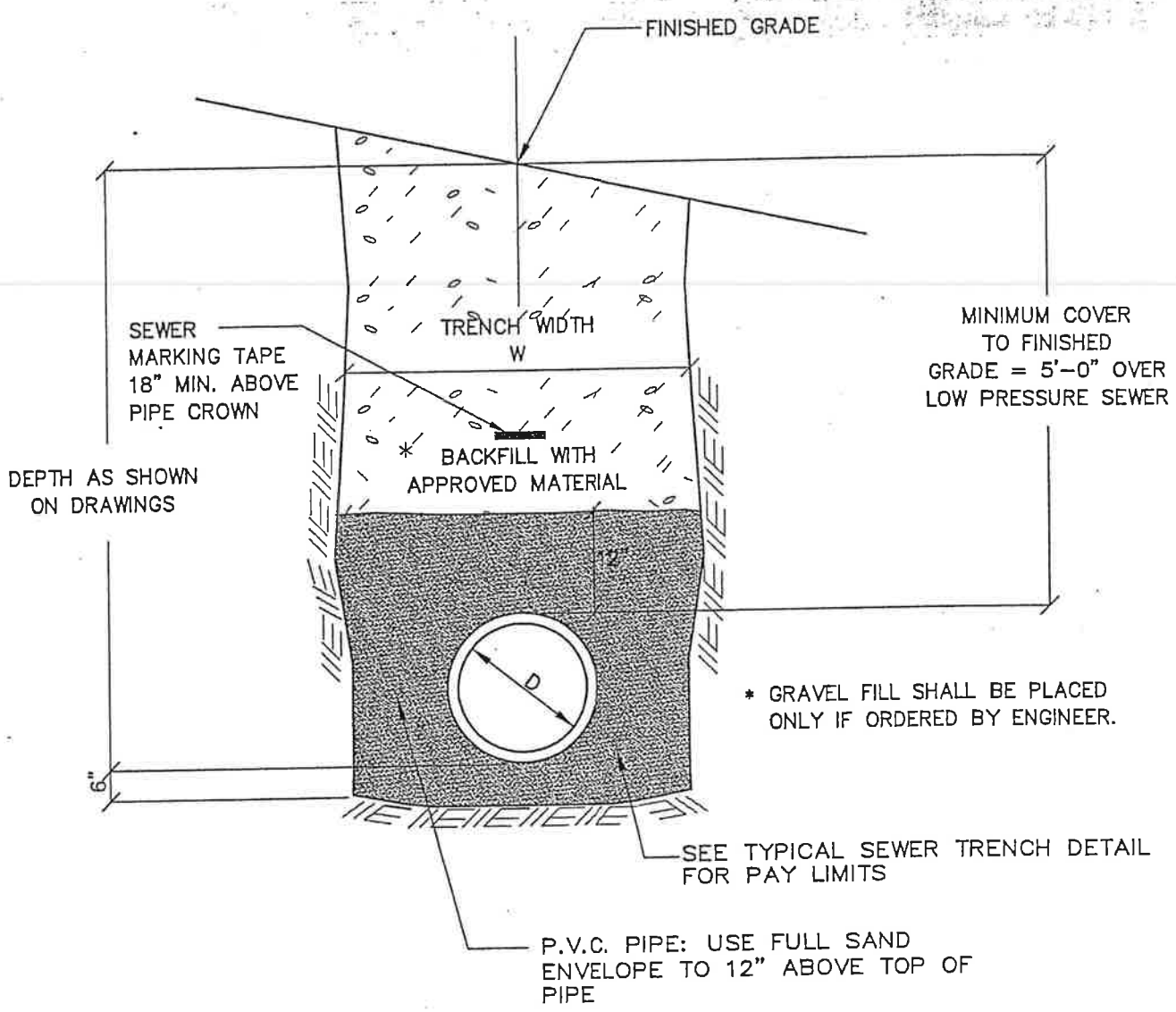
8. REPLACE PIPE BEDDING AND TRENCH BACKFILL WITH 2' LONG IMPERVIOUS DAM WHERE CALLED FOR ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER. UNDER DRAIN SHALL BE INSTALLED WHERE CALLED FOR ON DRAWINGS OR AS DIRECTED BY THE ENGINEER.

9. WHERE CONCRETE ENCASEMENT IS CALLED FOR BY THE PLANS, OR WHEN DIRECTED BY THE ENGINEER, REPLACE BEDDING AND BACKFILL BELOW THE "LINE OF NARROW TRENCH LIMIT" WITH CLASS "A" CONCRETE.

10. SEWER MARKING TAPE SHALL BE INSTALLED A MINIMUM OF 18" ABOVE THE SANITARY SEWER, FORCE MAIN, AND SERVICE CONNECTION PIPE.

11. SANITARY SEWER PIPE AND SERVICE CONNECTION PIPE SHALL HAVE FILTER FABRIC INSTALLED BELOW AND ABOVE STONE BEDDING.

050769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:53 AM User: OBazhenova
File Path: J:\DWG\P2005\050769\A13
CTB:
LMAN:
XR:
UCS:



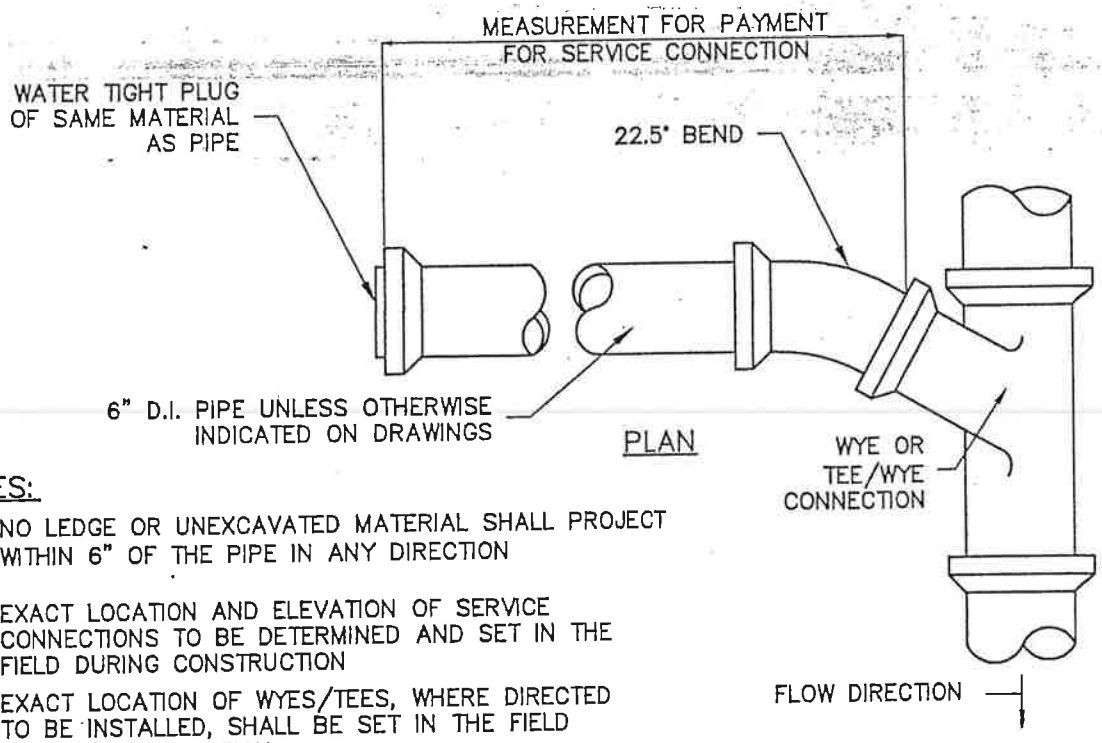
LOW PRESSURE SEWER TRENCH

N.T.S.

FIGURE 25

File Path: J:\DWG\P2005\0769A\00507769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:44 AM User: OBazhenova
EW: LMAN: CTB: UCS:

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS

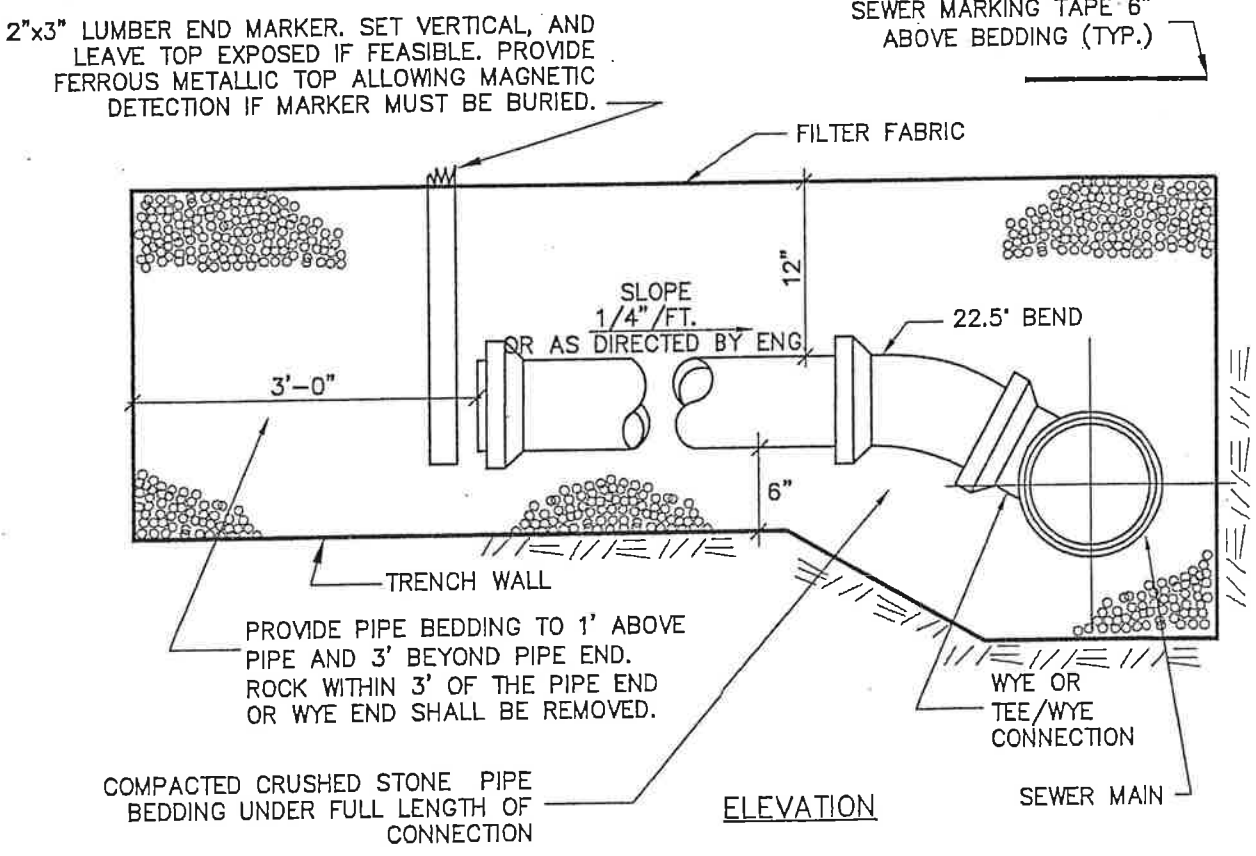


NOTES:

1.) NO LEDGE OR UNEXCAVATED MATERIAL SHALL PROJECT WITHIN 6" OF THE PIPE IN ANY DIRECTION

2.) EXACT LOCATION AND ELEVATION OF SERVICE CONNECTIONS TO BE DETERMINED AND SET IN THE FIELD DURING CONSTRUCTION

3.) EXACT LOCATION OF WYES/TEES, WHERE DIRECTED TO BE INSTALLED, SHALL BE SET IN THE FIELD DURING CONSTRUCTION.

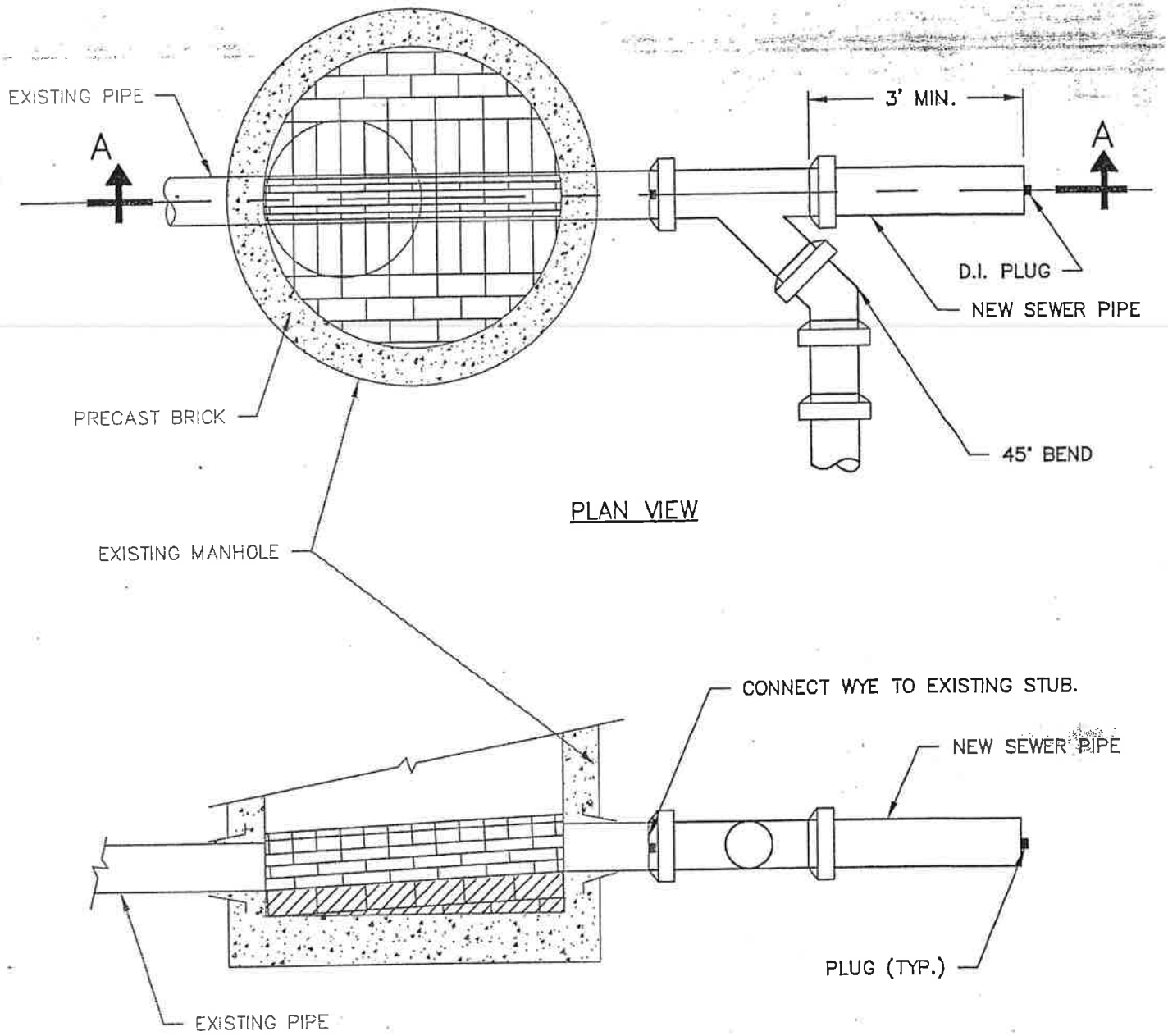


TYPICAL GRAVITY SERVICE CONNECTIONS

N.T.S.

FIGURE 26

)050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:45 AM User: OBezhenova
File Path: J:\DWG\P2005\0769\A1
CTB:
LMAN:
XW:
UCS:



NOTE:

IF STUB DOESN'T EXIST, PROVIDE CORE DRILL, AND LINK SEAL OR PROVIDE FLEX. ELASTOMERIC BOOT TO EXISTING MANHOLE WITH MIN. 2' STUB, CHIP OUT INVERT AS NECESSARY TO MATCH PIPE CROWNS.

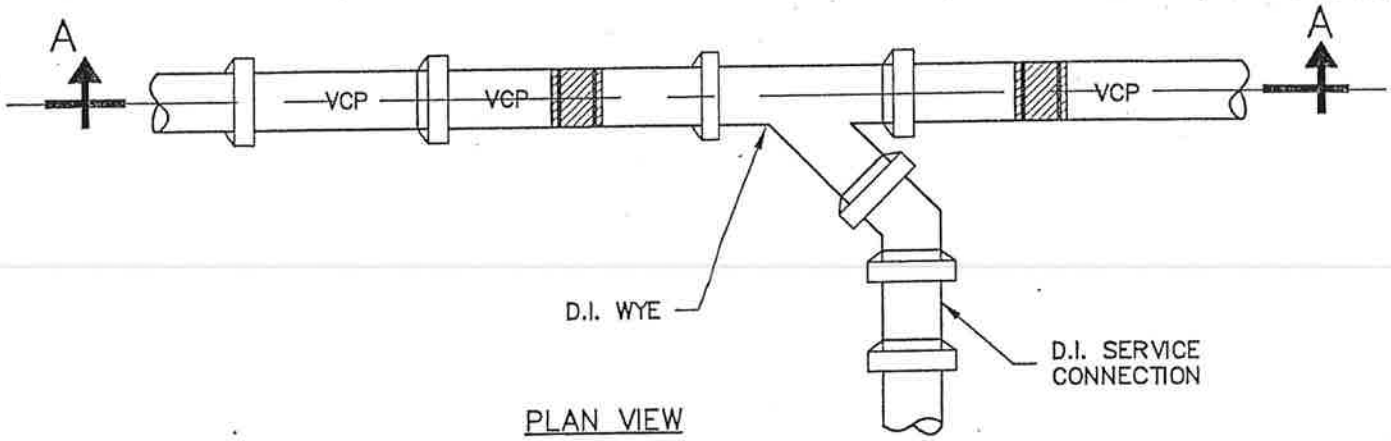
SECTION A–A'

NEW SERVICE CONNECTION ADJACENT TO EXISTING MANHOLE WITH STUB

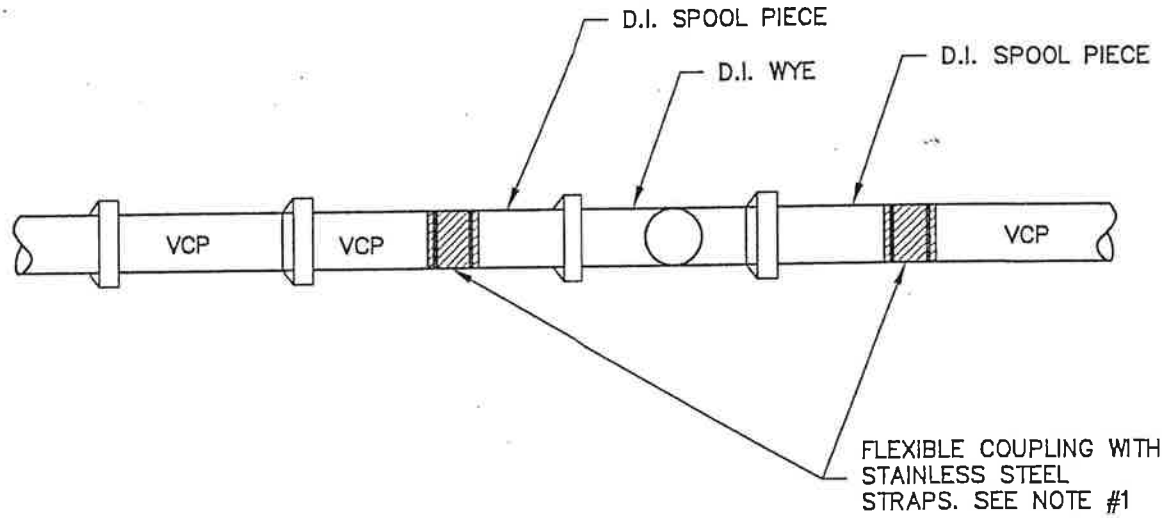
N.T.S.

FIGURE 27

507693A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 10:02 AM User: OBazhenova
File Path: J:\DWG\P2005\07693A13\
CTB:
LMAN:
V:
UCS:



PLAN VIEW



NOTE:

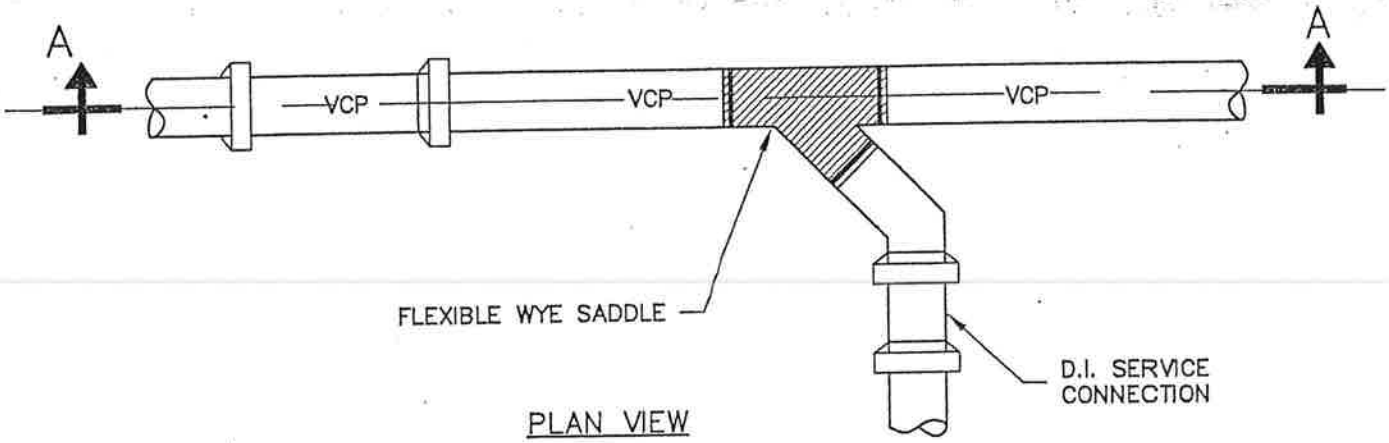
1. USE RIGID COUPLING IF MAINLINE SEWER IS DUCTILE IRON

SECTION A–A

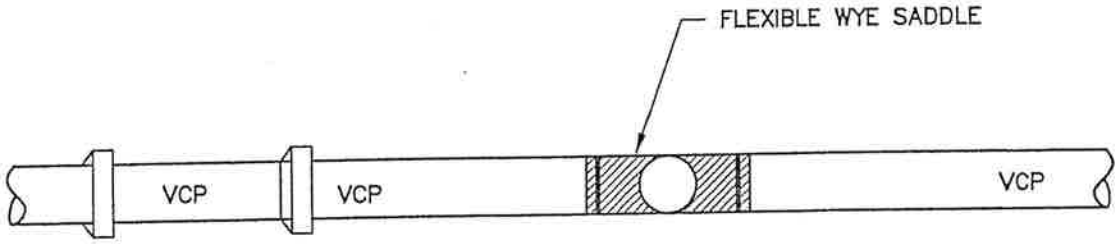
NEW SERVICE CONNECTION TO EXISTING SEWER MAIN DETAIL

N.T.S.

050769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:30 AM User: OBazhenova
File Path: J:\DW\SP2005\07691A13
CTB:
LMAN:
W:
UCS:



PLAN VIEW



NOTE:

1. REMOVE & DISPOSE OF PIPE COUPON.
2. MATCH DIFFERENT PIPE OUTSIDE DIAMETERS WITH SADDLE SIZES AS APPROPRIATE.

SECTION A–A

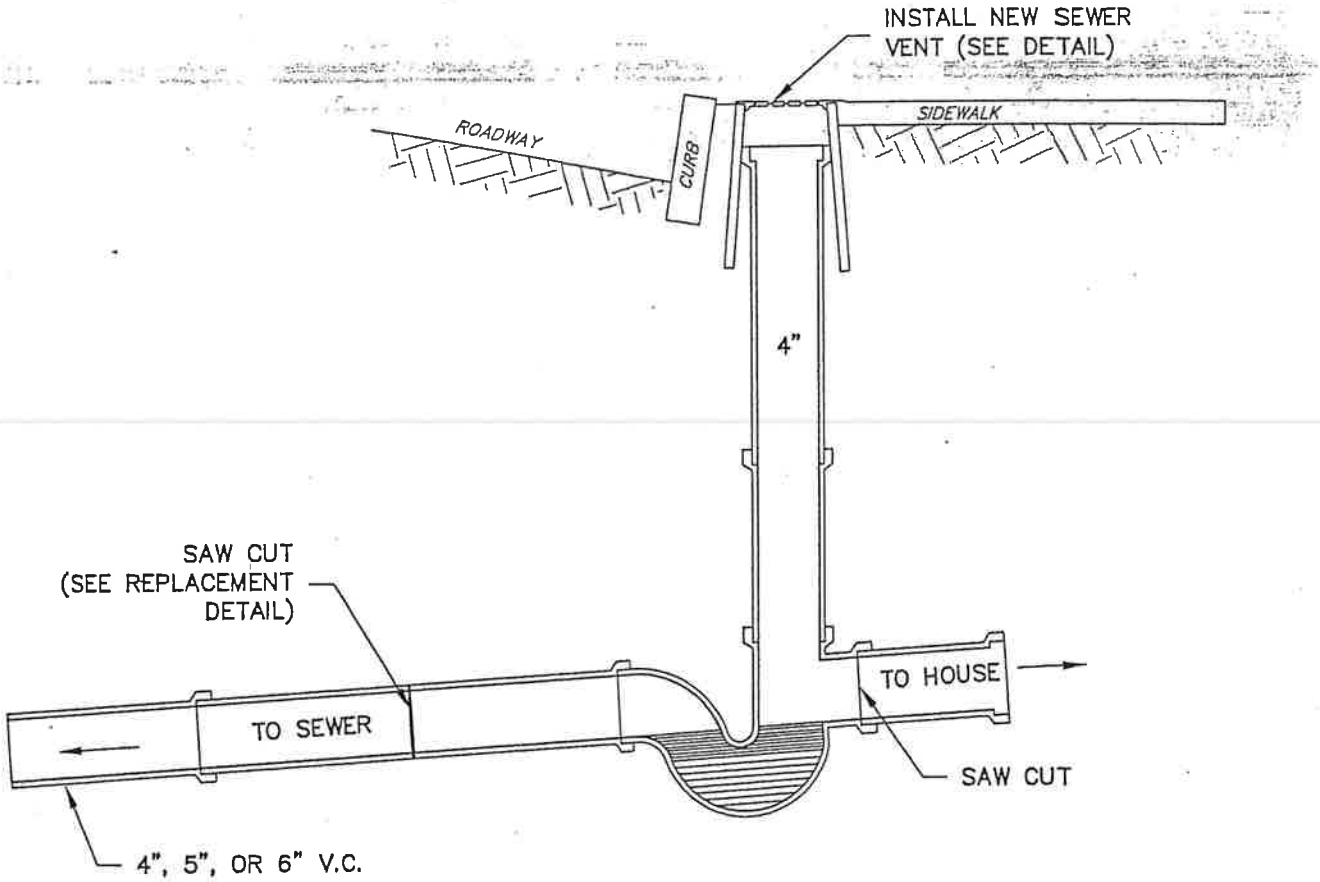
NEW SERVICE CONNECTION SADDLE DETAIL

N.T.S.

FIGURE 27B

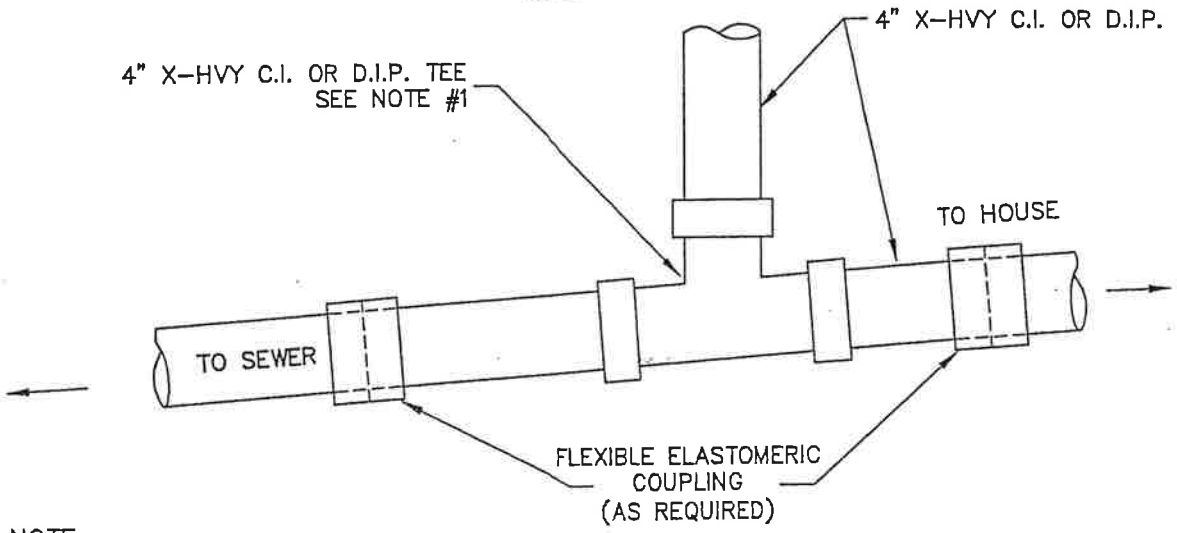
50769A13DET001.dwg, Layout: 8.5x11-P-DET Wed, Jun 14, 2006 - 11:46 AM User: OBazhenova
File Path: J:\DWG\P2005\07\69A13\
CTB:
LMAN:
XR:
UCS:

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



EXIST. FRESH AIR INLET & TRAP FOR BUILDING SEWER

N.T.S.



NOTE:

1. SEWER VENT REMOVAL ONLY ALLOWABLE IF BUILDING HAS SUITABLE VENT STACK INSTALLED. OTHERWISE SEE REPAIR SANITARY SEWER VENT DETAIL.

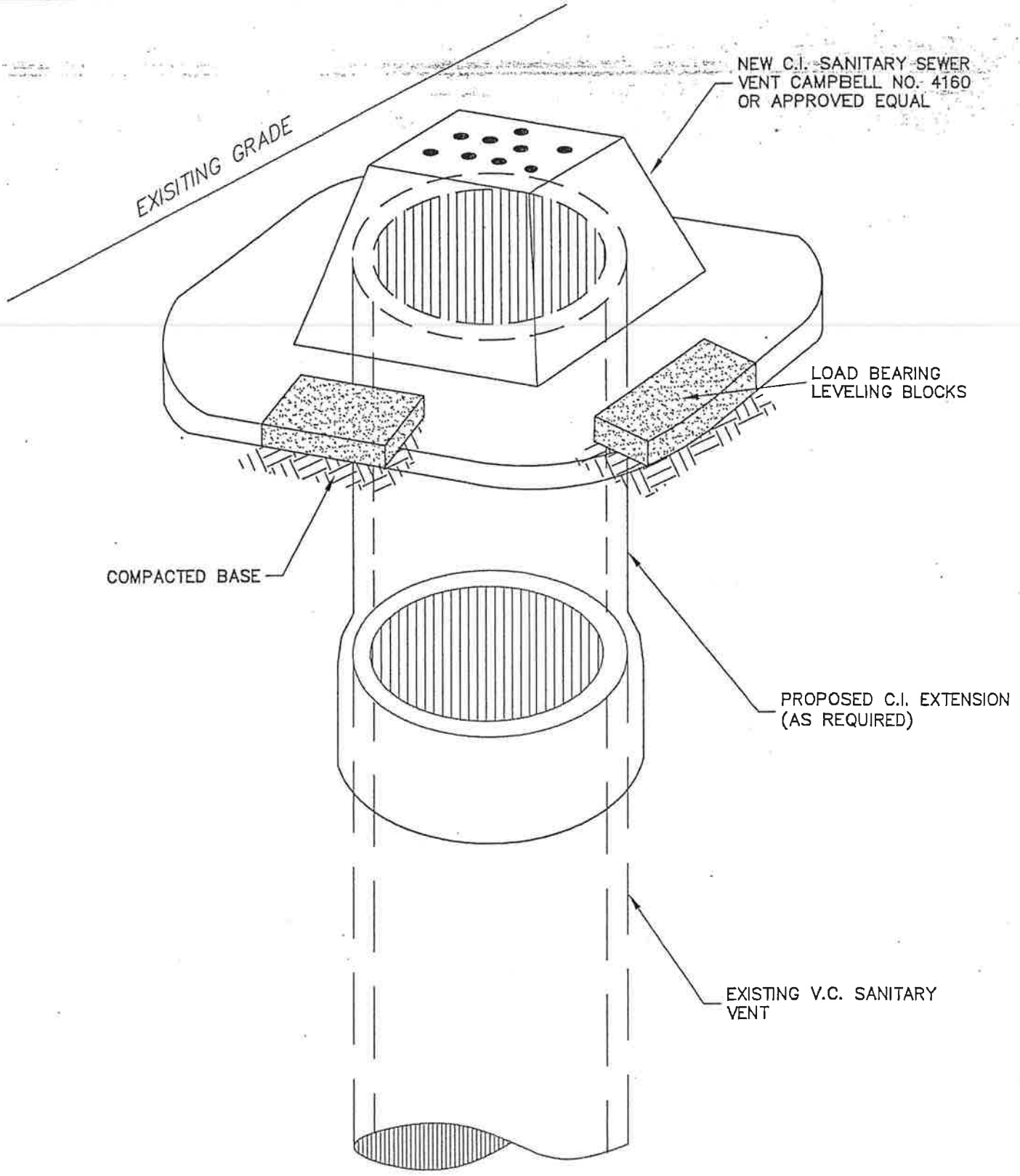
RECONNECT SANITARY SEWER LATERAL DETAIL

N.T.S.

FIGURE 28

950769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:31 AM User: OBazhenova
File Path: J:\DWG\P2005\07\769\A13
W:
LMAN:
CTB:
UCS:

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS

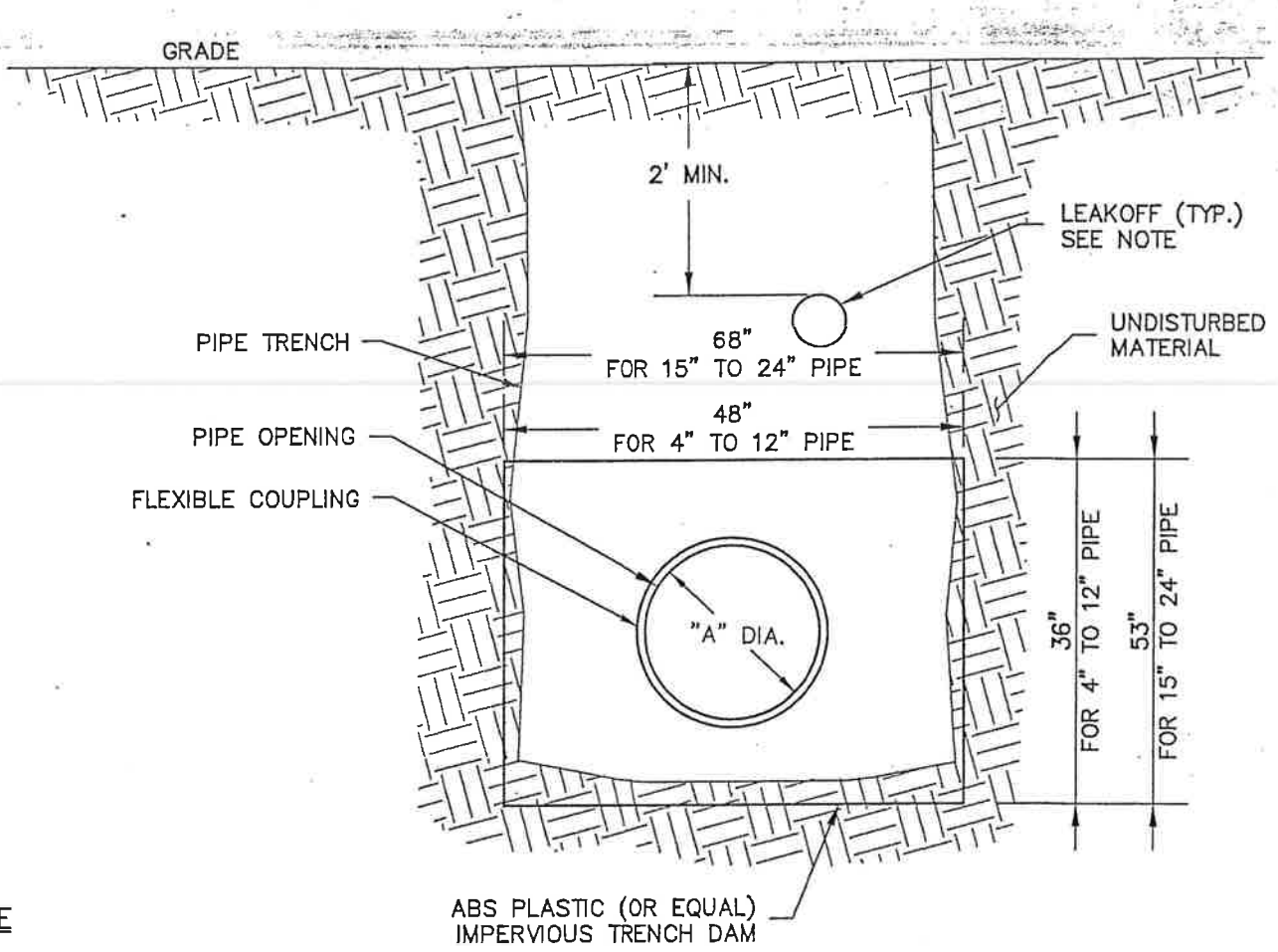


REPAIR SANITARY SEWER VENT DETAIL

N.T.S.

FIGURE 29

0507694A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:46 AM User: OBazhenova
File Path: J:\DWG\P2005\0507694A13
W: LMAN: CTB:
UCS:



NOTE

LEAKOFF OR UNDERDRAIN PROVISIONS
AS DIRECTED BY WPC

PIPE DIA. (INCHES)	DAM HOLE SIZE "A"
4	9.5"
6	9.5"
8	9.5"
10	13.5"
12	13.5"
15	17.65"
16	17.65"
18	21.50"
21	25.00"
24	28.00"

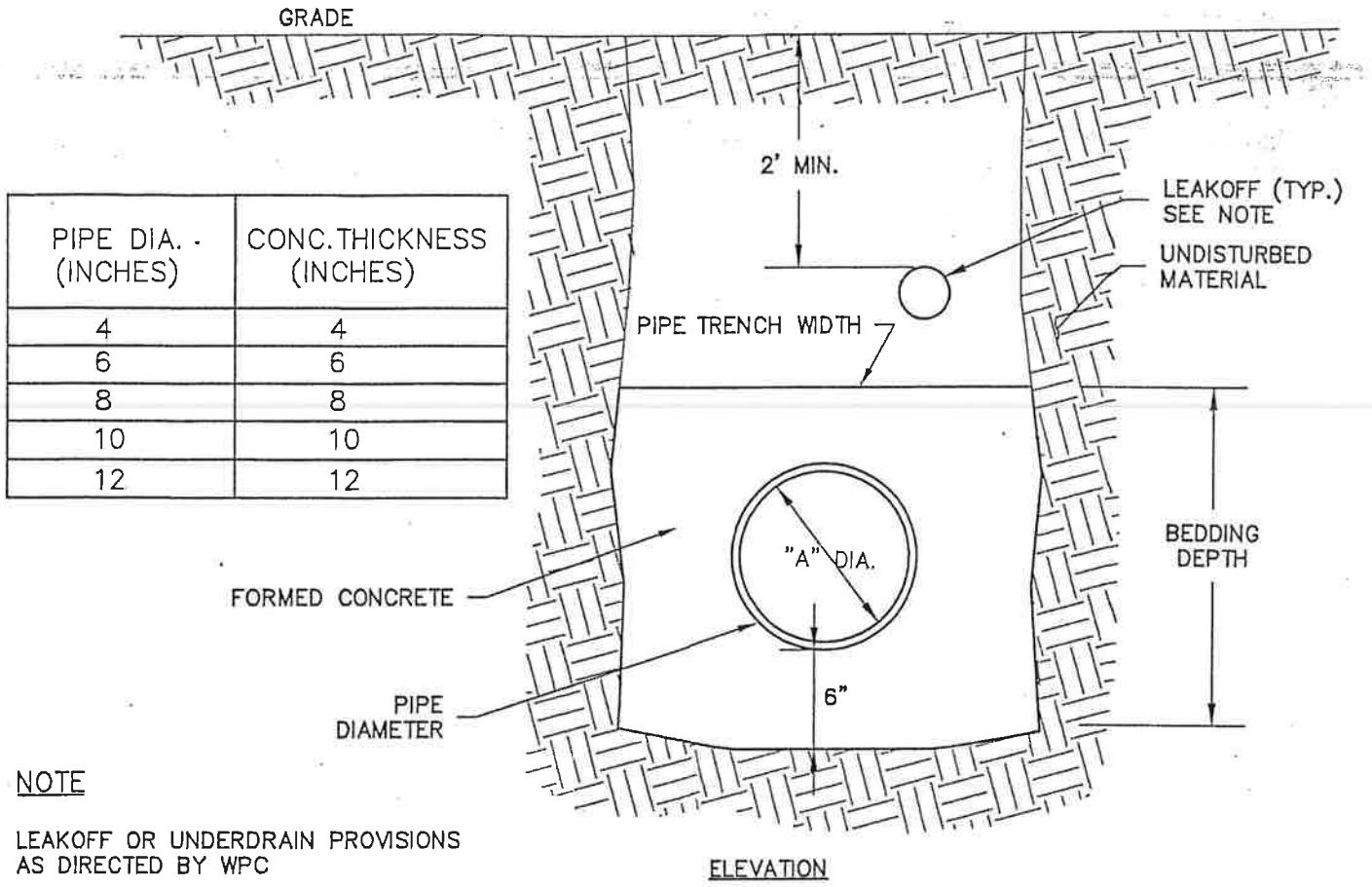
IMPERVIOUS TRENCH DAM

N.T.S.

FIGURE 30

20050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:47 AM User: OBazhenova
File Path: J:\DWG\P2005\07691A
XREF:
LMAN:
CTB:
UCS:

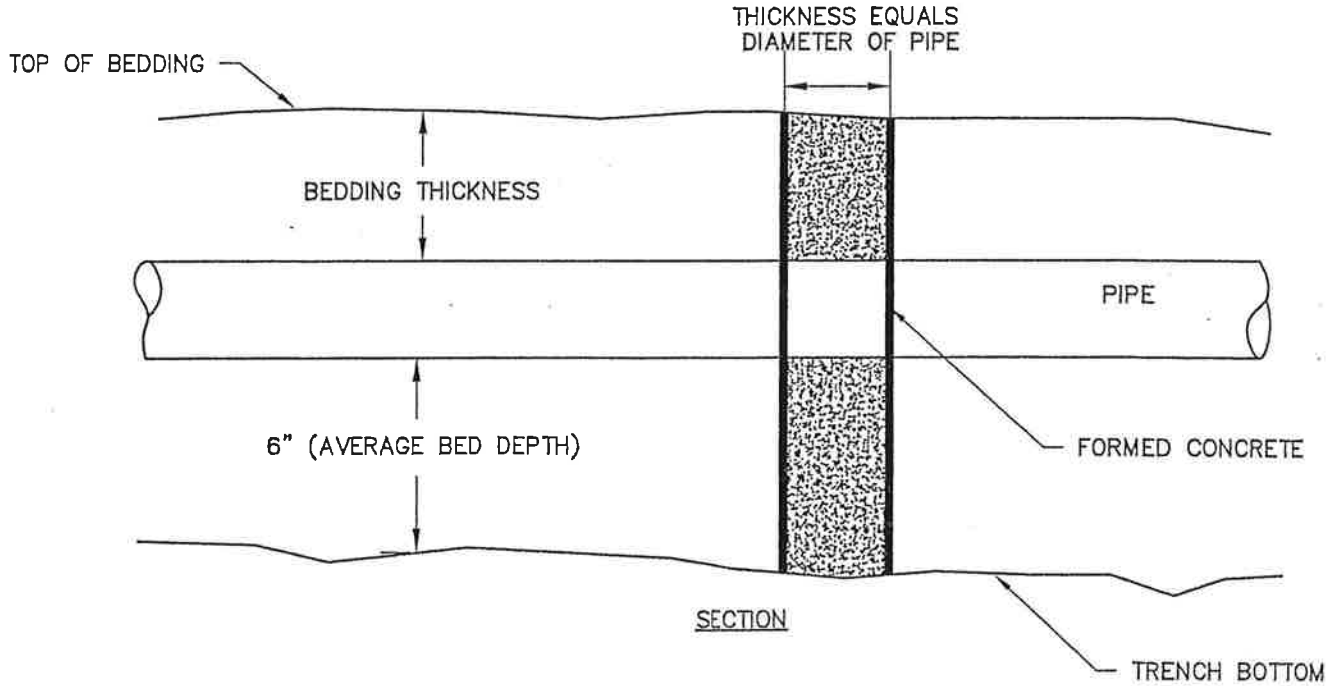
PIPE DIA. - (INCHES)	CONC. THICKNESS (INCHES)
4	4
6	6
8	8
10	10
12	12



NOTE

LEAKOFF OR UNDERDRAIN PROVISIONS AS DIRECTED BY WPC

ELEVATION



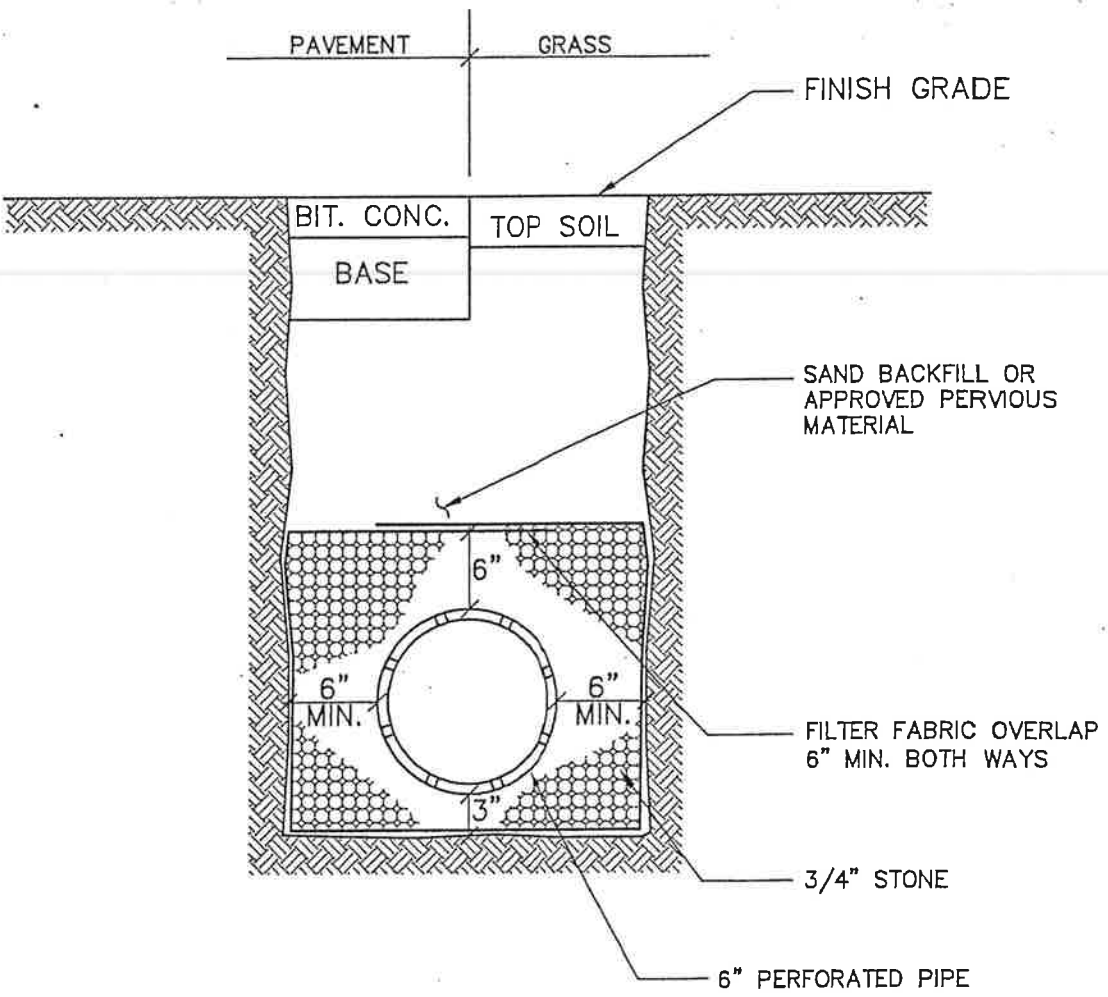
SECTION

IMPERVIOUS CONCRETE TRENCH DAM

N.T.S.

FIGURE 31

File Path: J:\DWG\P2005\07691A1\7050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:47 AM User: OBazhenova
DW: LMAN: CTB: UCS:

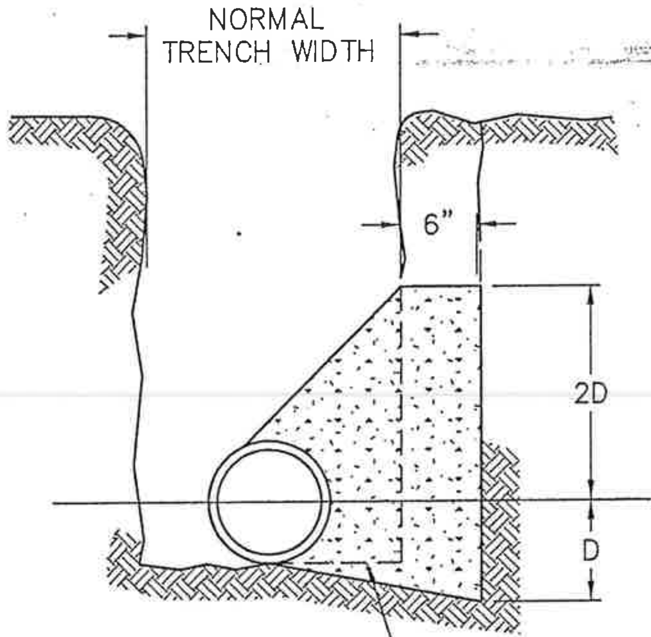


UNDERDRAIN

N.T.S.

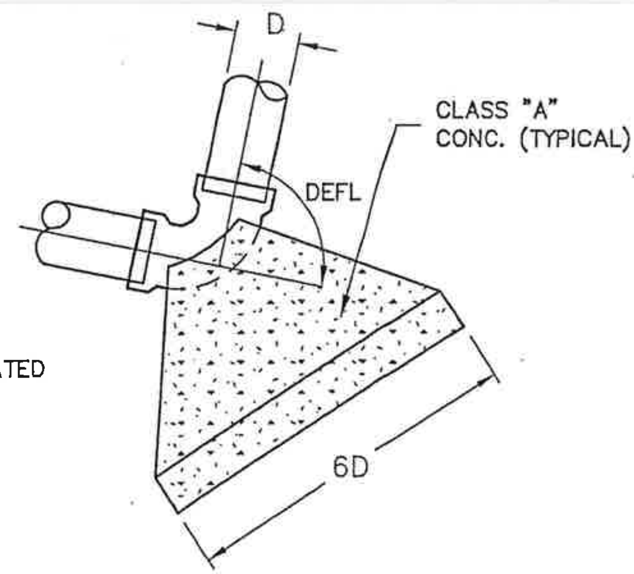
FIGURE 32

W: LMAN: CTB:
UCS:
File Path: J:\DWG\P2005\0769\A13\050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:58 AM User: OBazhenova

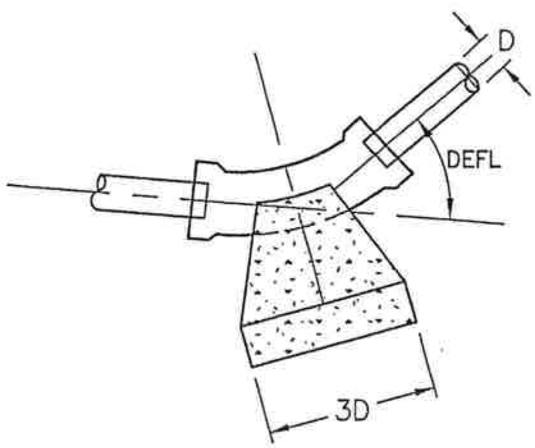


SECTION

PIPE DIA. (INCHES)	MINIMUM THRUST BLOCK VOLUME (CUBIC YARDS)
4	0.25
6	0.3
8	0.5
10	0.7
12	1.0
16	1.6



PLAN ELBOW – DEFL.
MORE THAN 50



PLAN ELBOW – DEFL.
LESS THAN 50

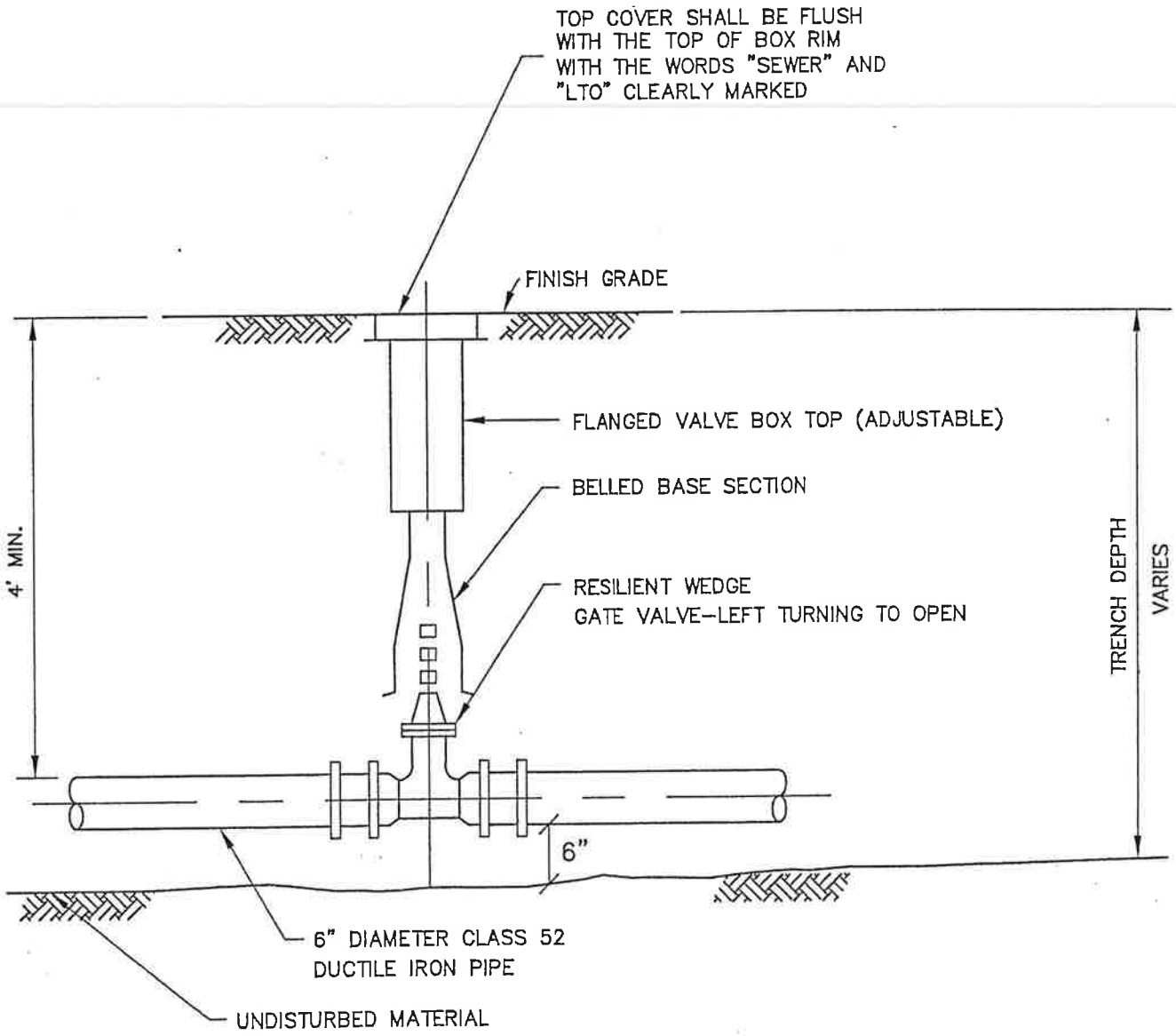
PIPE DIA. (INCHES)	MINIMUM THRUST BLOCK VOLUME (CUBIC YARDS)
4	0.2
6	0.25
8	0.3
10	0.35
12	0.4
16	0.7

CONCRETE THRUST BLOCKS

N.T.S.

FIGURE 33

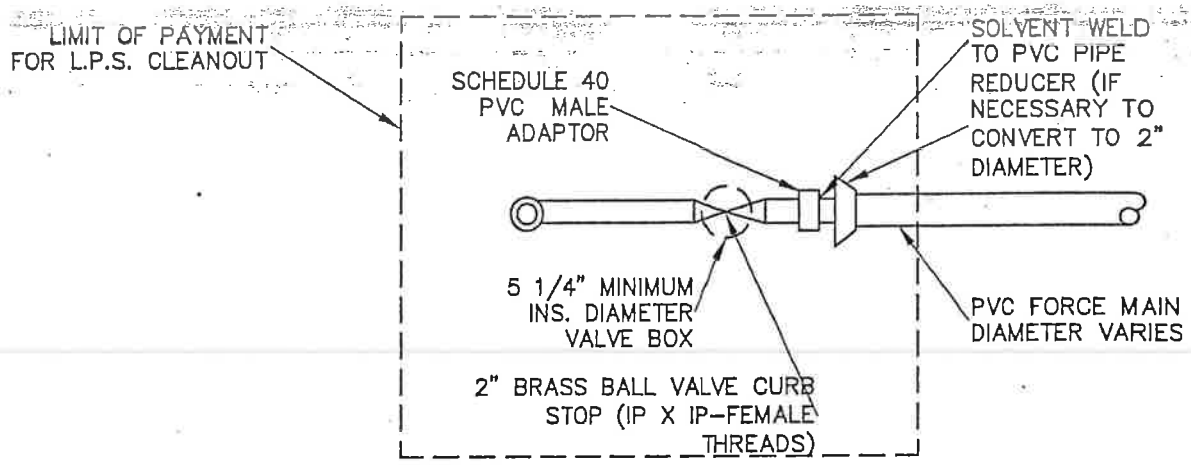
File Path: J:\DWG\P2005\0769A13\50769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 11:58 AM User: OBazhenova
W: LMAN: CTB: UCS:



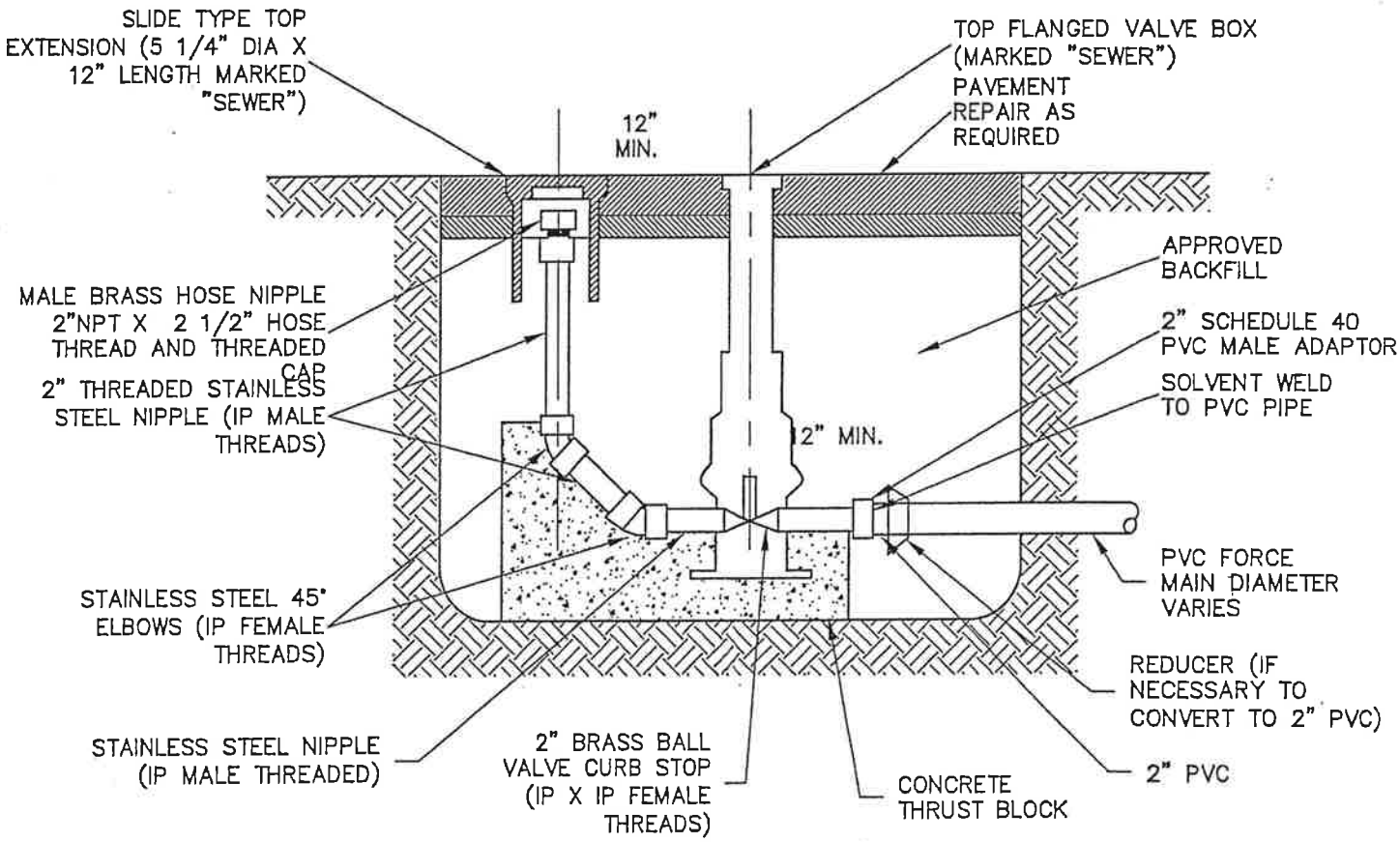
ISOLATION GATE VALVE

N.T.S.

FIGURE 34



PLAN



CROSS-SECTION

L.P.S. CLEANOUT

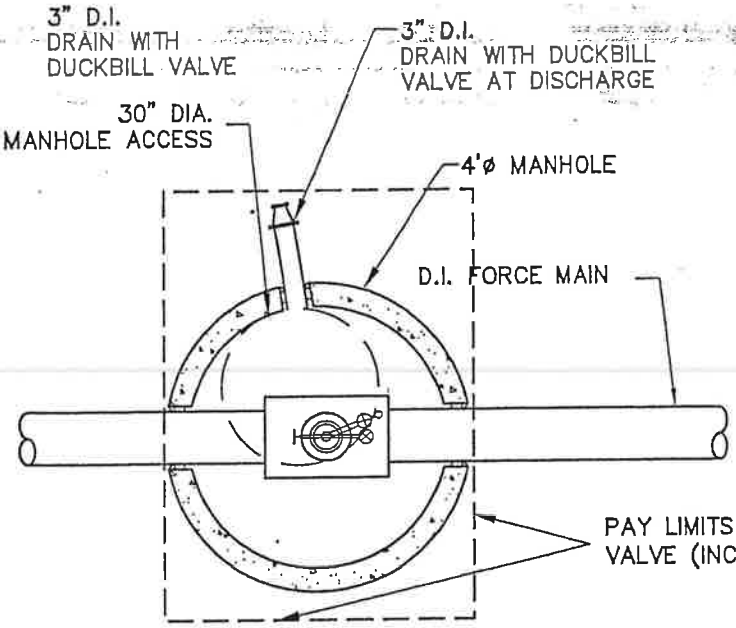
N.T.S.

FIGURE 35

File Path: J:\DWG\P2005\07691A1\050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 12:00 PM User: OBazhenova
CTB:
LMAN:
XW:
UCS:

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



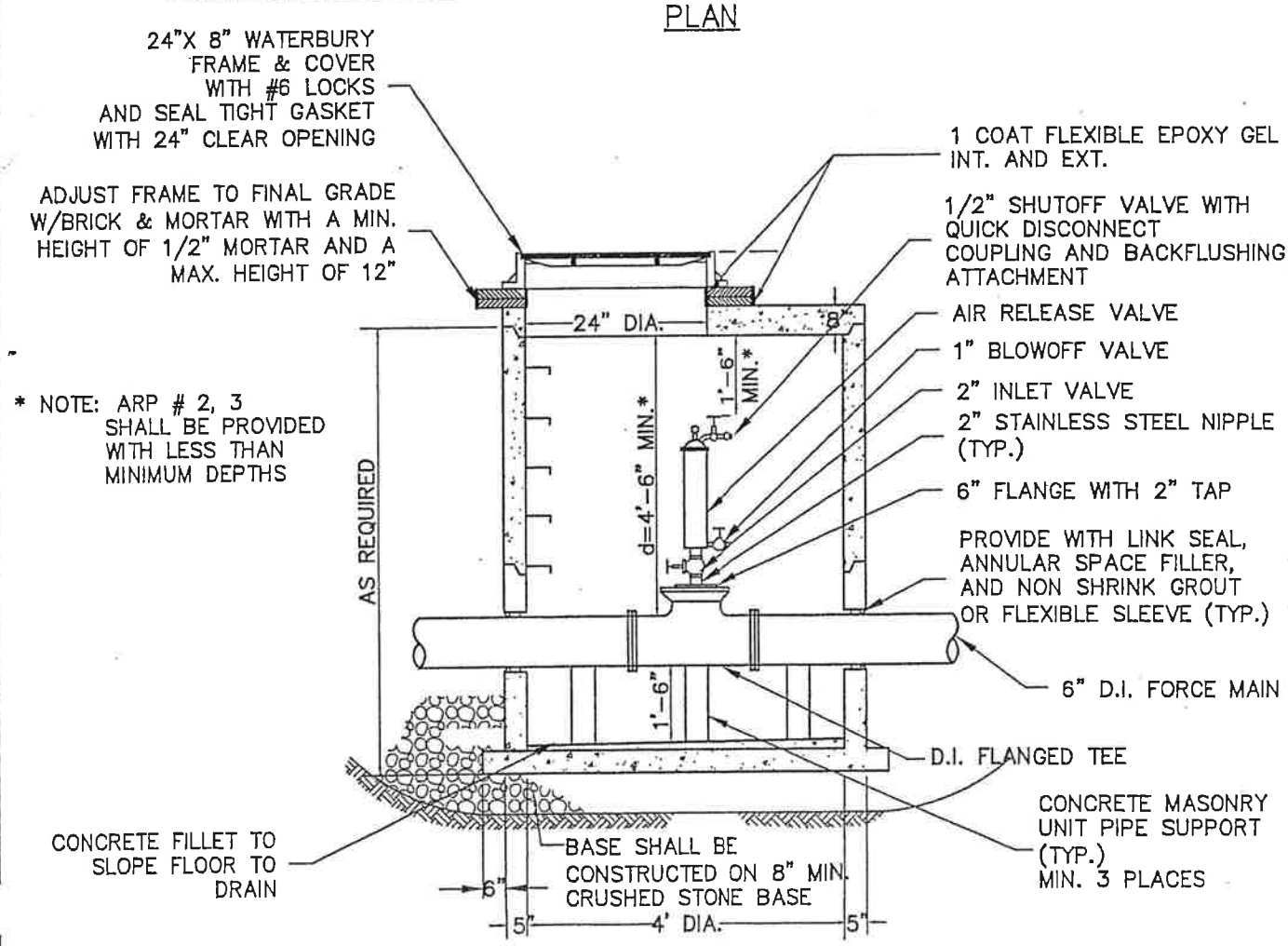
PLAN

AIR RELEASE VALVE AND CLEANOUT STRUCTURE NOTES:

1.) REFER TO FLAT TOP MANHOLE DETAIL AND GENERAL NOTES REGARDING MANHOLE STRUCTURE

2.) CONTRACTOR SHALL ADJUST FORCE MAIN ELEVATION TO ACCOMMODATE AIR RELEASE VALVE IN MANHOLE SET TO GRADE.

3.) MJ FITTINGS SHALL BE RESTRAINED PER MANUFACTURERS RECOMMENDATIONS

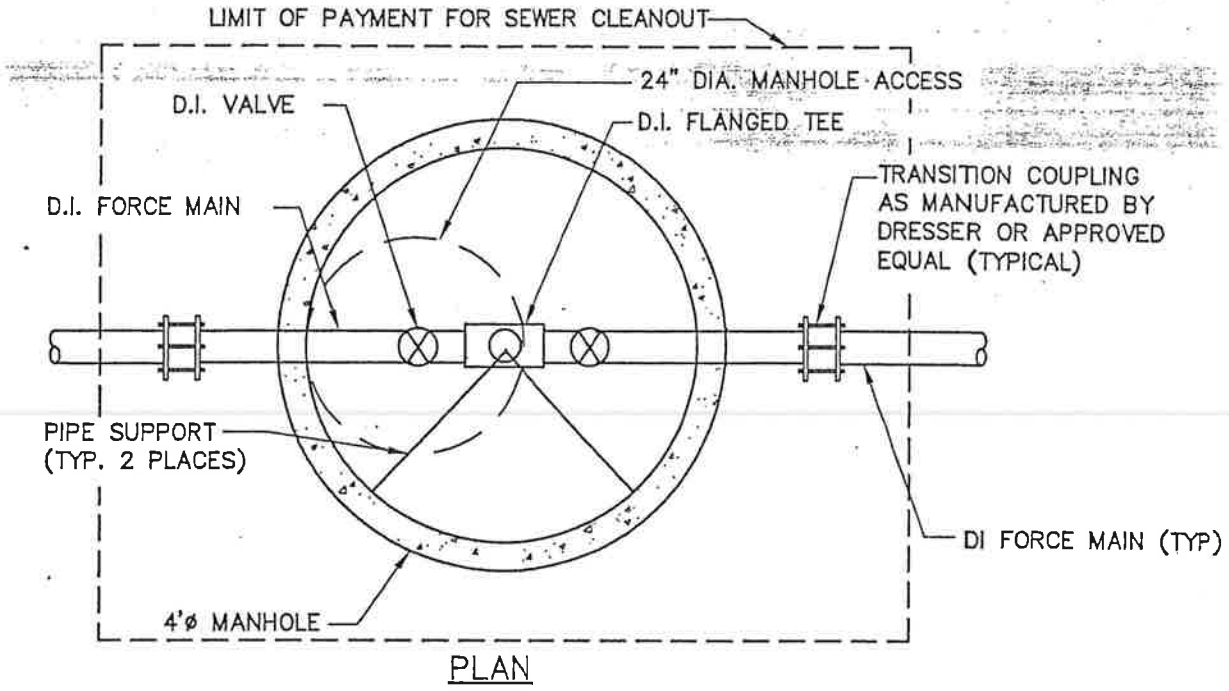


ELEVATION

AIR RELEASE/VACUUM VALVE

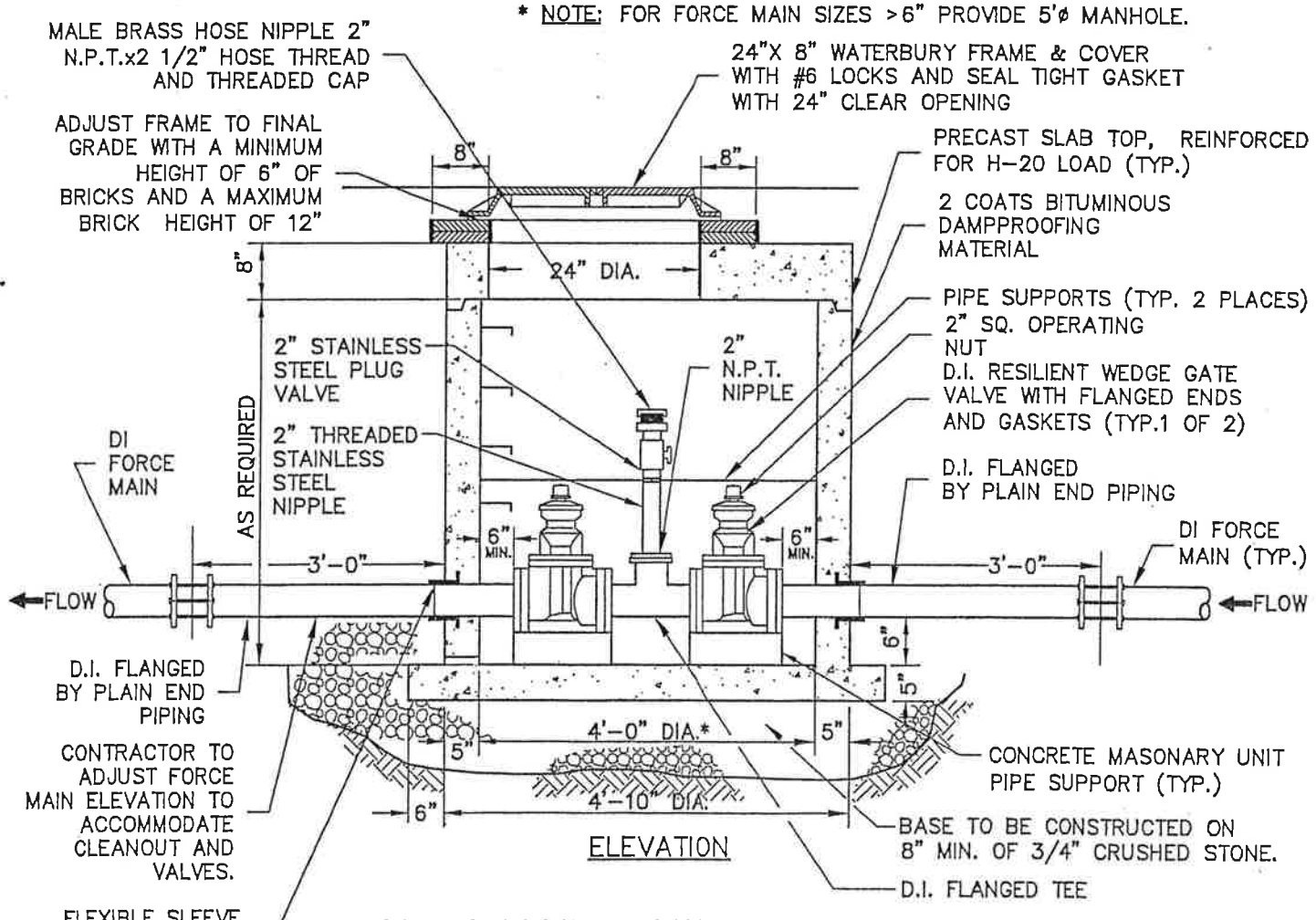
N.T.S.

FIGURE 36



PLAN

* NOTE: FOR FORCE MAIN SIZES >6" PROVIDE 5'ø MANHOLE.

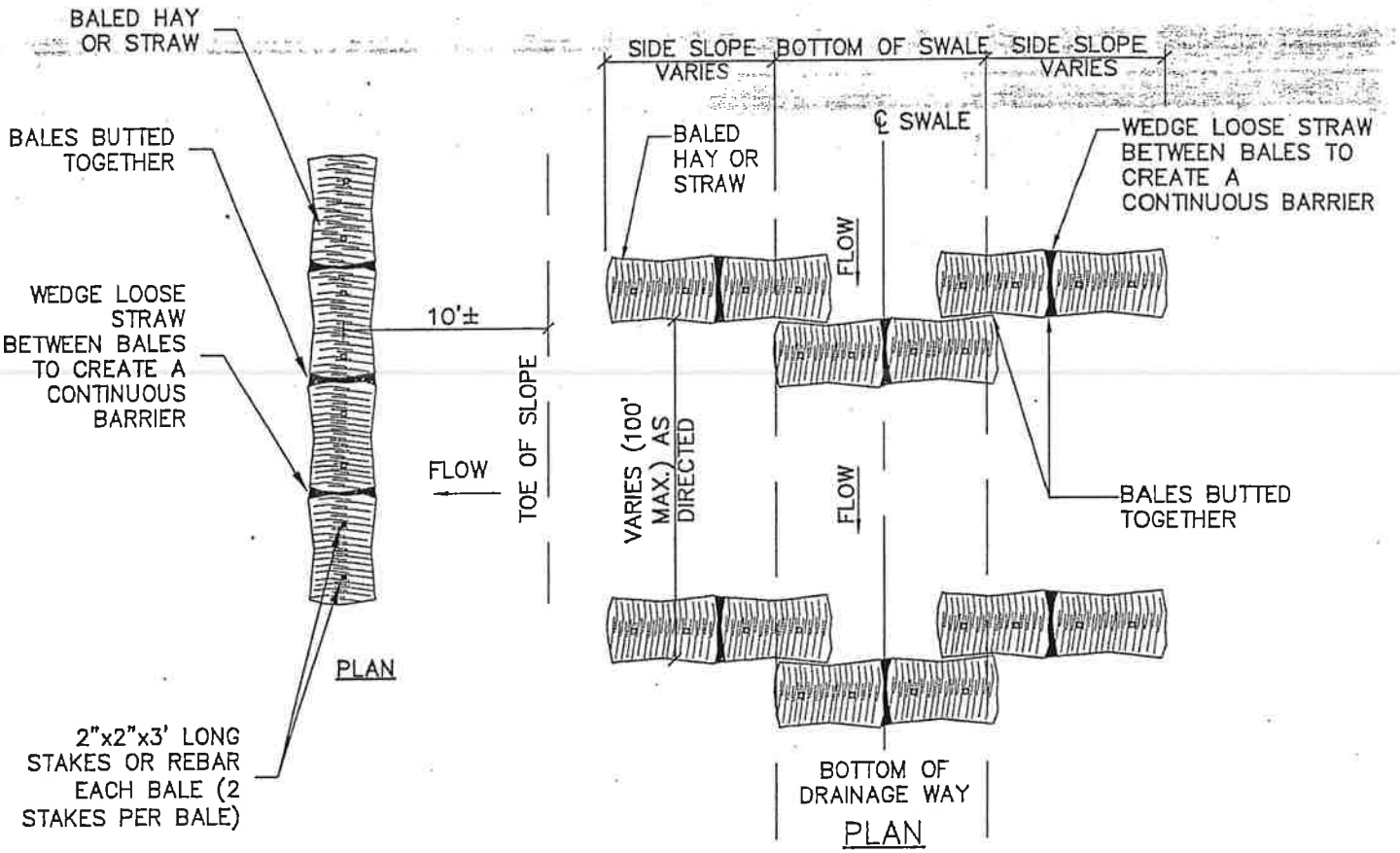


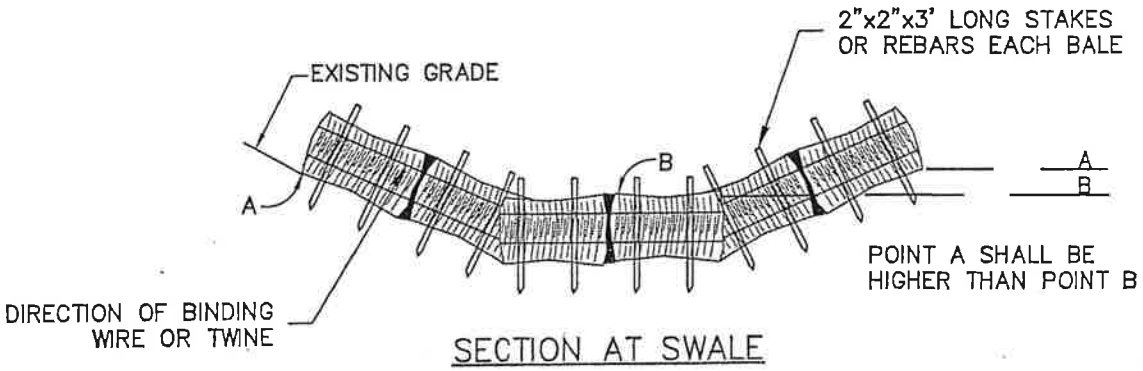
FORCE MAIN SEWER CLEANOUT

N.T.S.

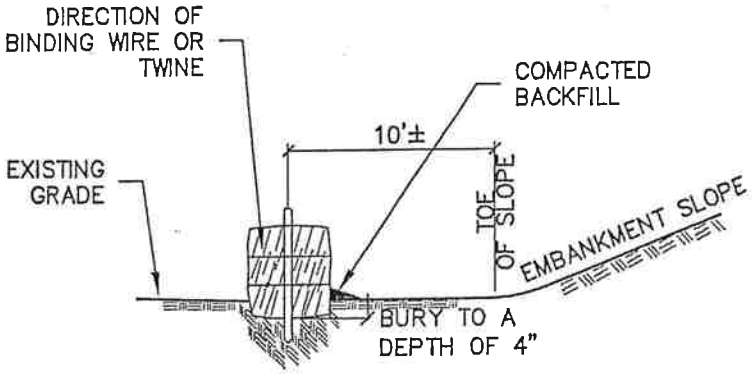
FIGURE 37

9769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 08, 2006 - 9:55 AM User: OBazhenova
File Path: J:\DWG\P2005\0769\A13D\
CTB:
LMAN:
UCS:





SECTION AT SWALE



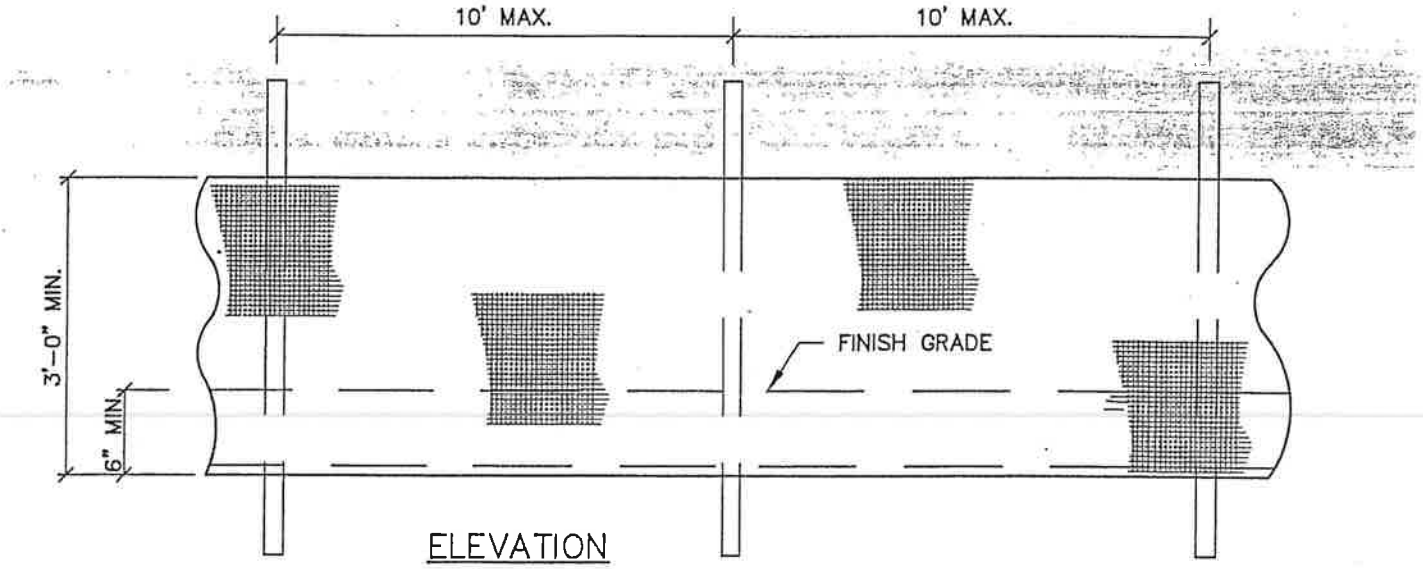
SECTION AT TOE OF SLOPE

HAY BALES

N.T.S.

FIGURE 38

1050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 1:11 PM User: OBazhenova
File Path: J:\DWG\P2005\07691A1\
CTB:
LMAN:
XW:
UCS:



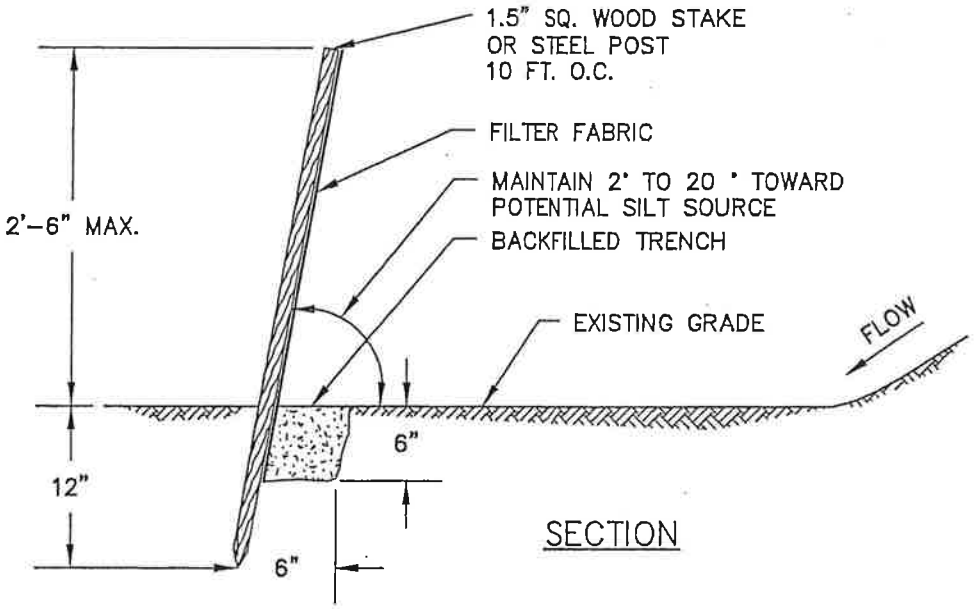
ELEVATION

NOTES:

1.) INSTALL SILT FENCE & WOOD STAKES AS RECOMMENDED BY MANUFACTURER.

2.) SYNTHETIC FILTER FABRIC SHALL BE A PERVIOUS SHEET OF PROPYLENE , NYLON, POLYESTER OR ETHYLENE FILAMENTS AND SHALL BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE FOLLOWING REQUIREMENTS:

PHYSICAL PROPERTY	REQUIREMENTS
FILTERING EFFICIENCY	75% (MIN.)
TENSILE STRENGTH AT 20% (MAX.) ELONGATION	EXTRA STRENGTH 50 lbs. / LIN. IN.
	STANDARD STRENGTH 30 lbs. / LIN. IN. (MIN.)
FLOW RATE	0.3 GAL. / SQ. FT. / MIN. (MIN.)



SECTION

SILT FENCE

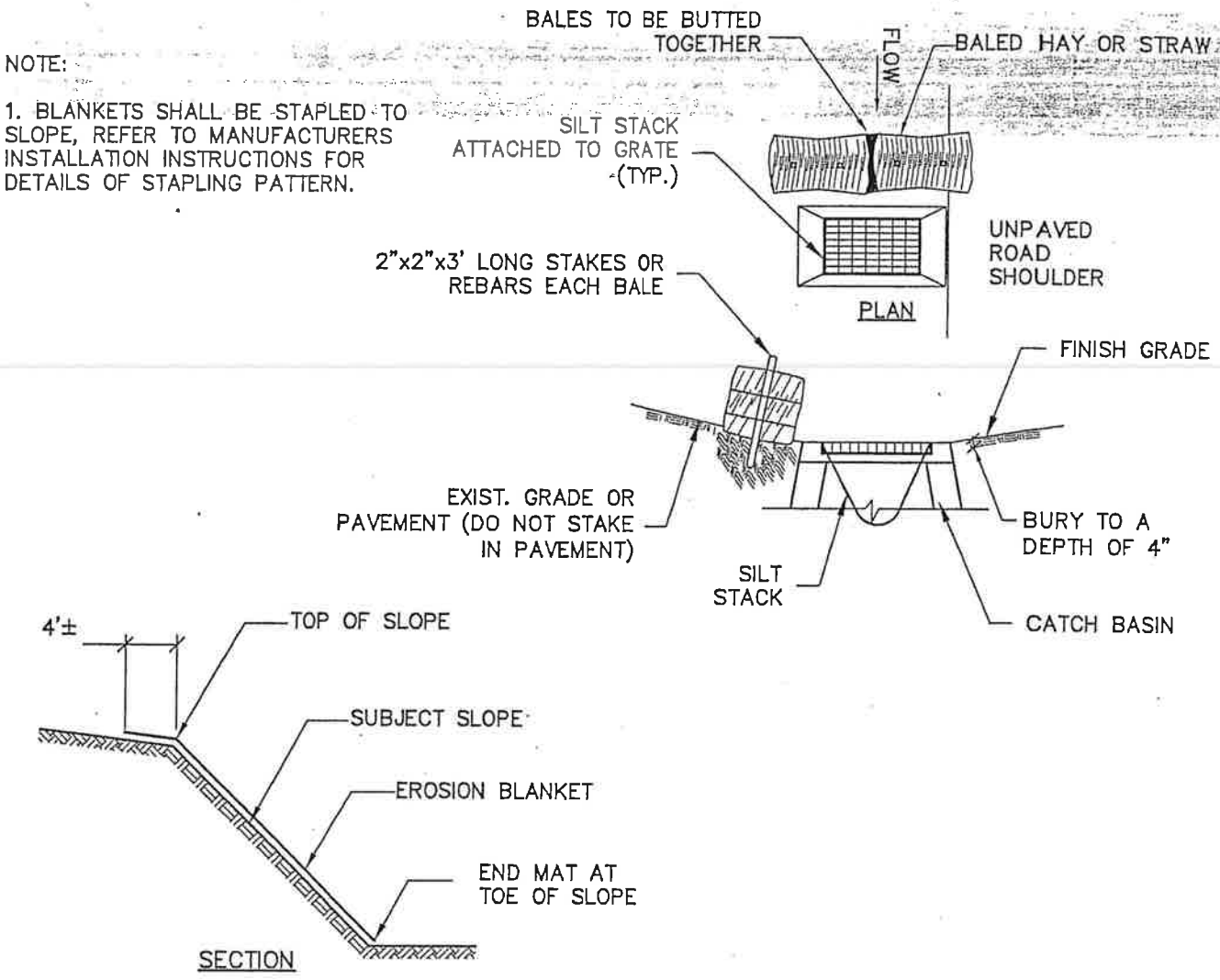
N.T.S.

FIGURE 39

File Path: J:\DWG\P2005\0769\A1\050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 1:12 PM User: OBazhenova
XW: LMAN: CTB: UCS:

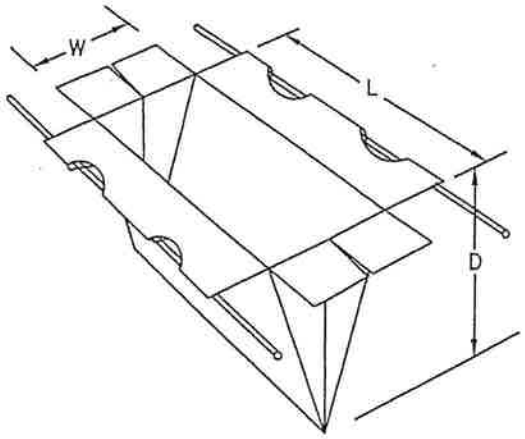
NOTE:

1. BLANKETS SHALL BE STAPLED TO SLOPE, REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR DETAILS OF STAPLING PATTERN.



CATCH BASIN PROTECTION

N.T.S.



NOTES:

1) SIZED TO FIT ANY SIZE OR SHAPE CATCH BASIN.

2) ALL SEAMS DOUBLE STITCHED.

3) PERMEABILITY –
REGULAR FLOW SILTSACK – 40 gal./min./sq. ft.
HI – FLOW SILTSACK – 200 gal./min./sq. ft.

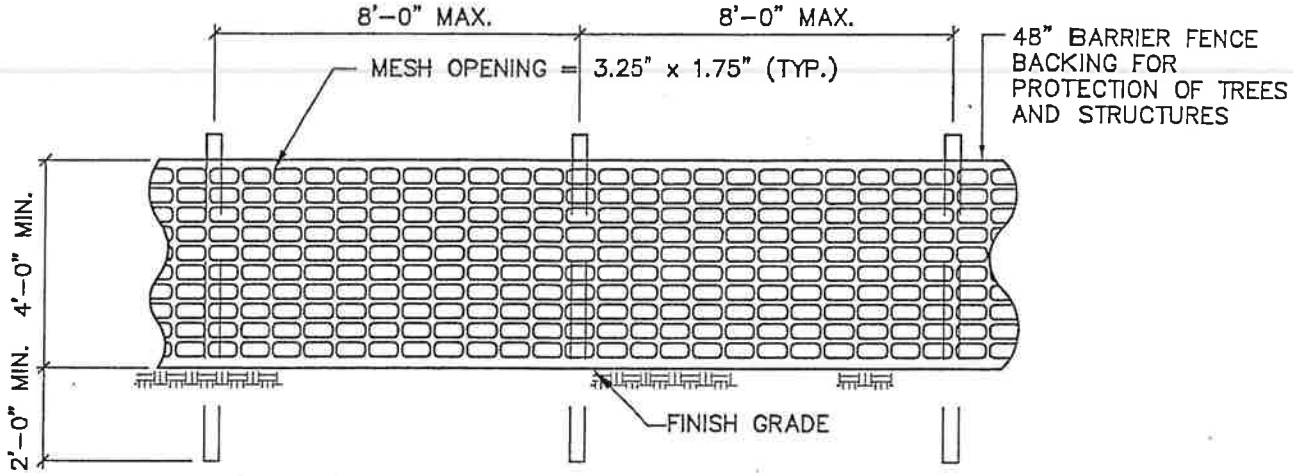
SILTSACK DETAIL

N.T.S.

FIGURE 40

0507769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 1:12 PM User: OBazhenova
File Path: J:\DWG\P2005\07769\A1;
XW:
LMAN:
CTB:
UCS:

100507769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 1:15 PM User: OBashenova
File Path: J:\DWG\P2005\07769A\
VIEW: LMAN: CTB:
UCS:



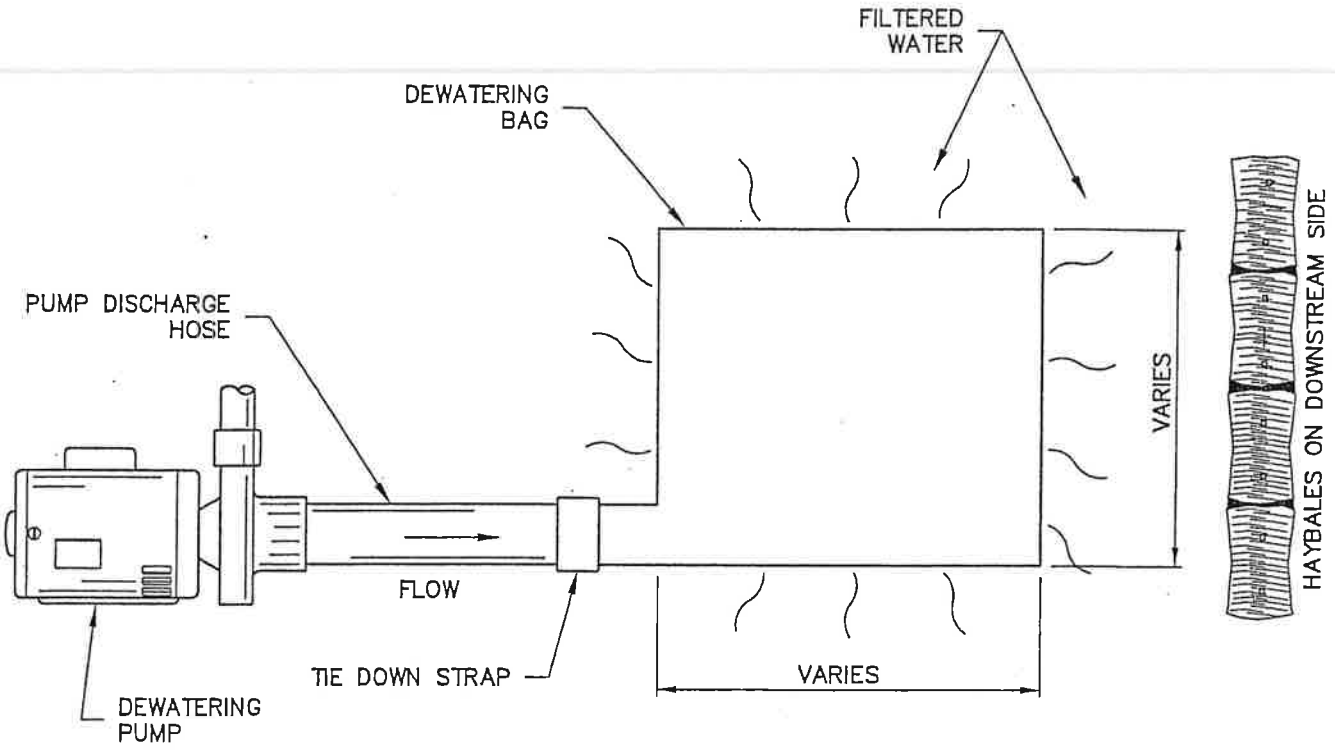
ELEVATION

NOTES:

1. BARRIER FENCE SHALL BE PLACED BENEATH DRIPLINE OF TREES TO BE PRESERVED UNLESS OTHERWISE ORDERED BY THE ENGINEER.

BARRIER FENCE

N.T.S.



DEWATERING BAG

N.T.S.

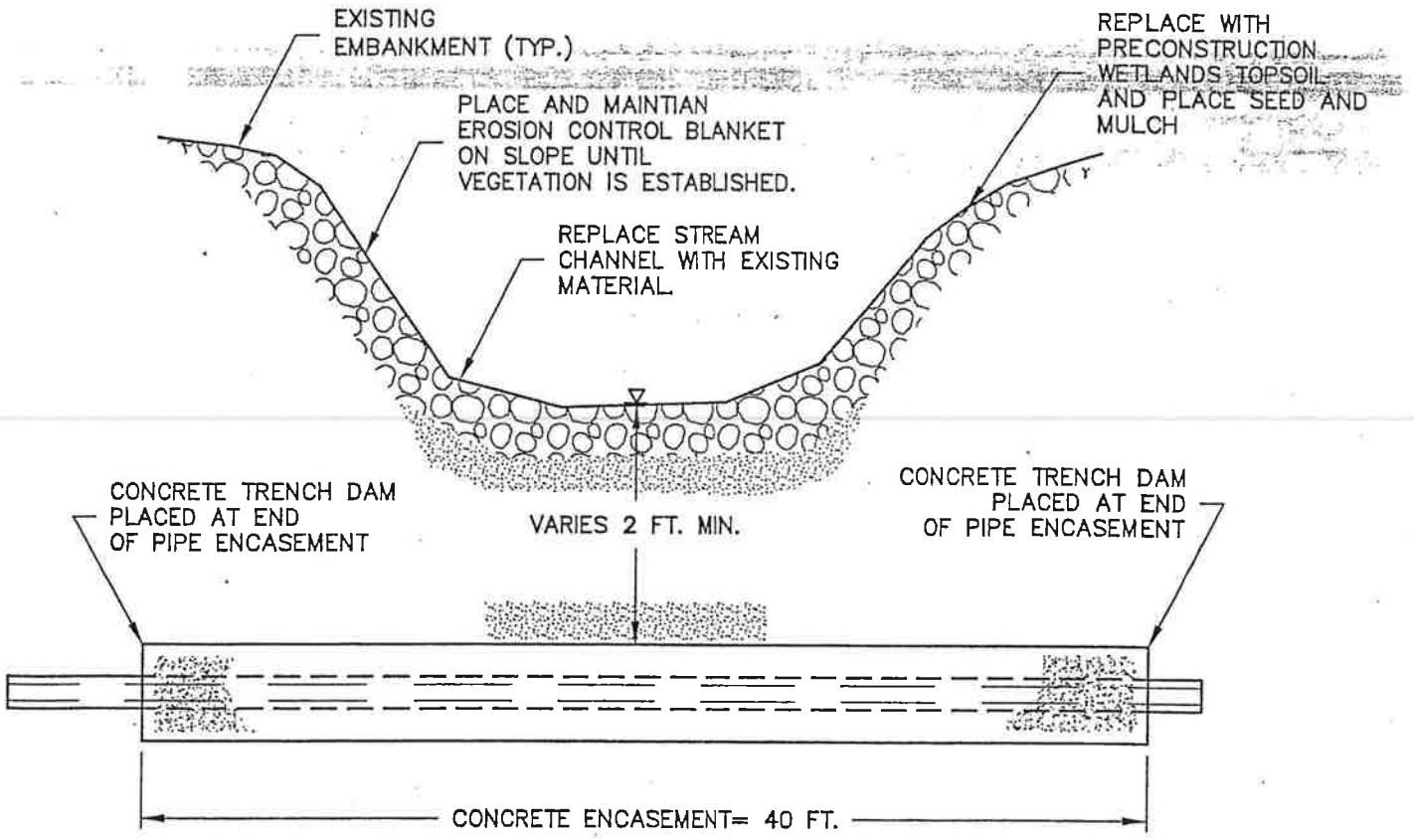
FIGURE 42

0550769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 1:15 PM User: OBazhenova
File Path: J:\DWG\P2005\0769A1
EW:
LMAN:
CTB:
UCS:

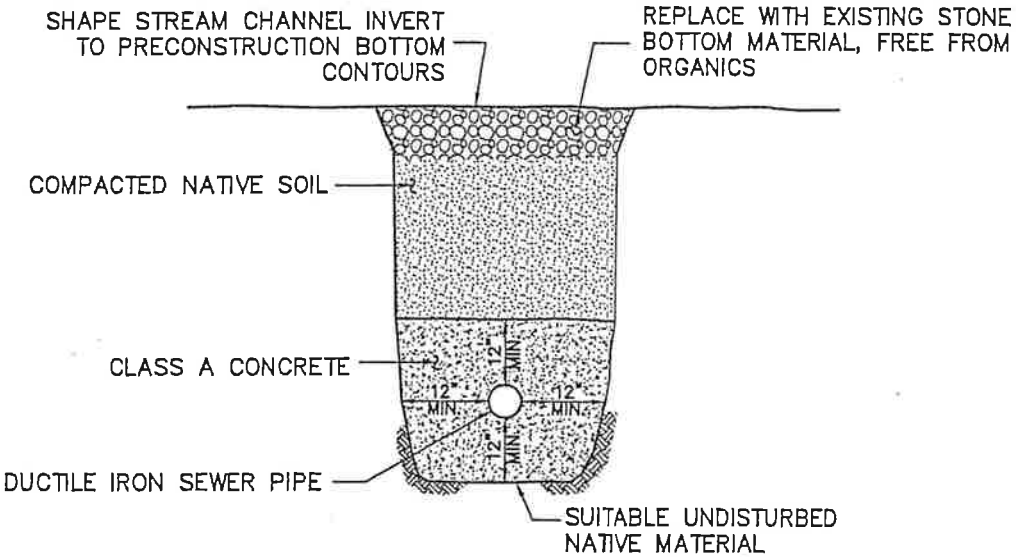
CITY OF WATERBURY

WATER POLLUTION CONTROL

SANITARY SEWER DETAILS



ELEVATION



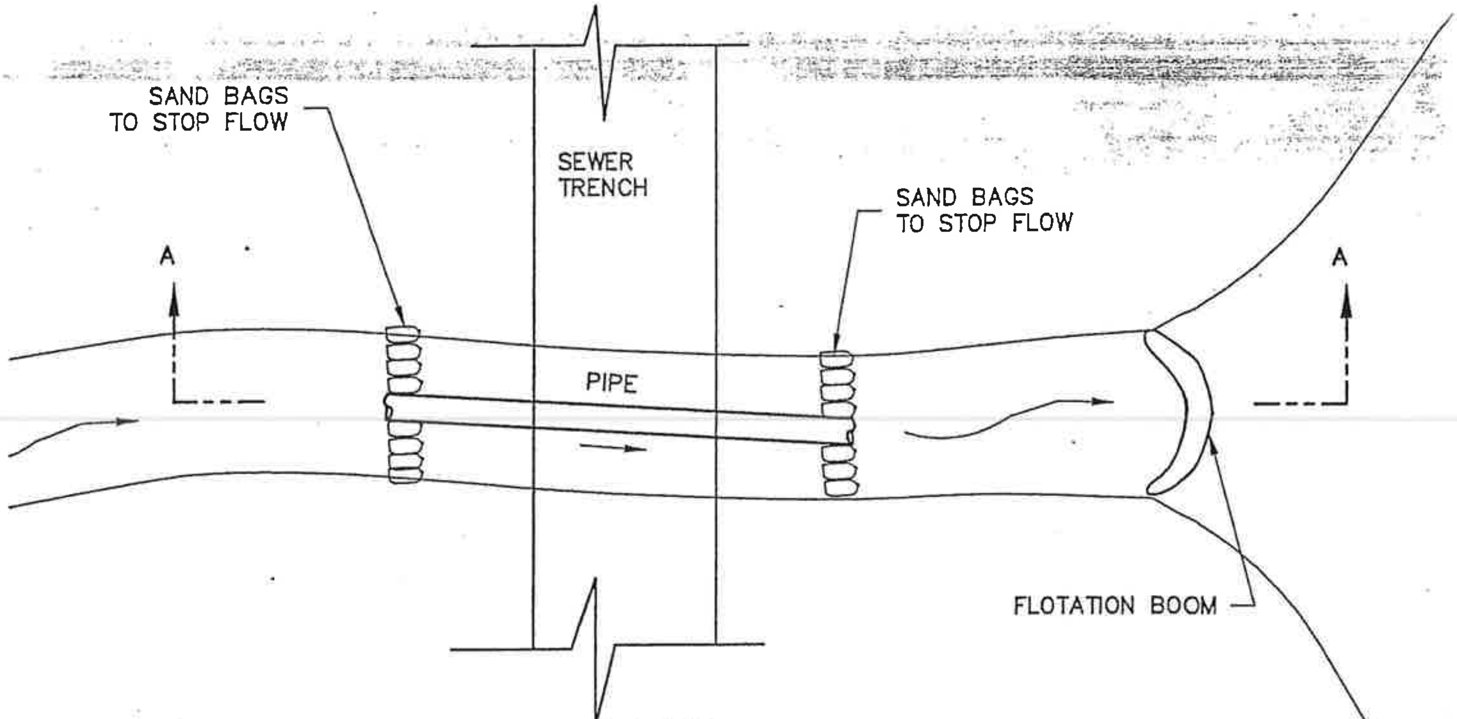
SECTION ACROSS TRENCH

STREAM CROSSING

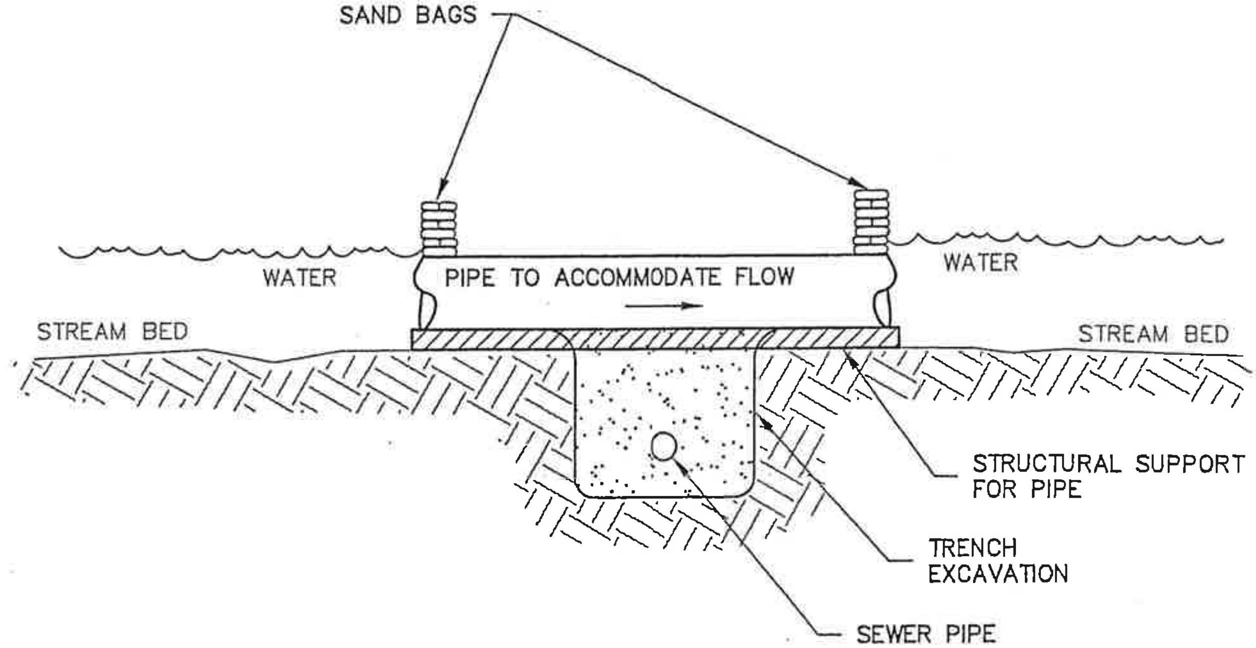
N.T.S.

FIGURE 43

050769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:52 AM User: OBazhenova
File Path: J:\DWG\P2005\050769A13
CTB:
LMAN:
W:
UCS:



PLAN



SECTION A–A

STREAM CROSSING PIPE OPTION

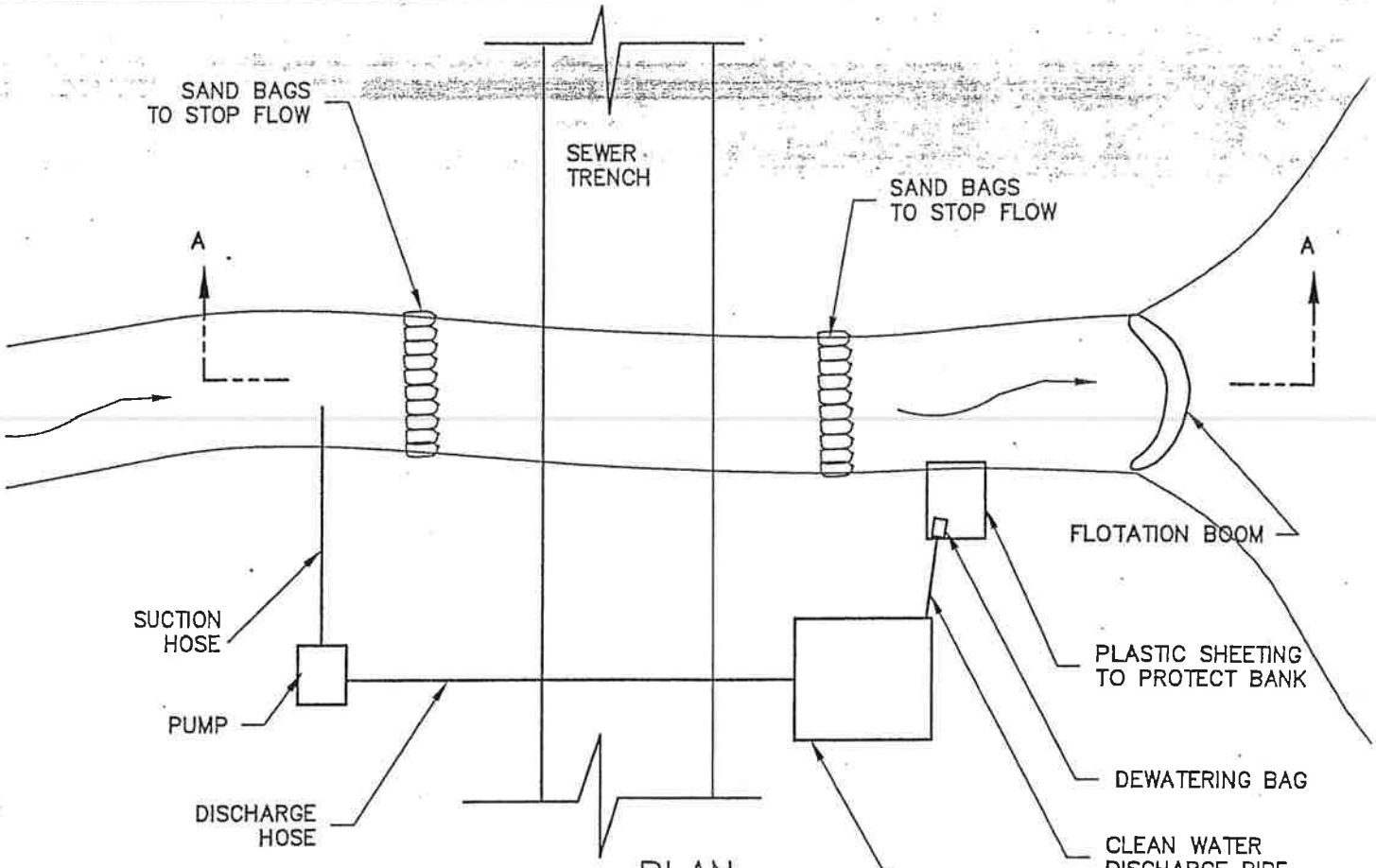
N.T.S.

FIGURE 44

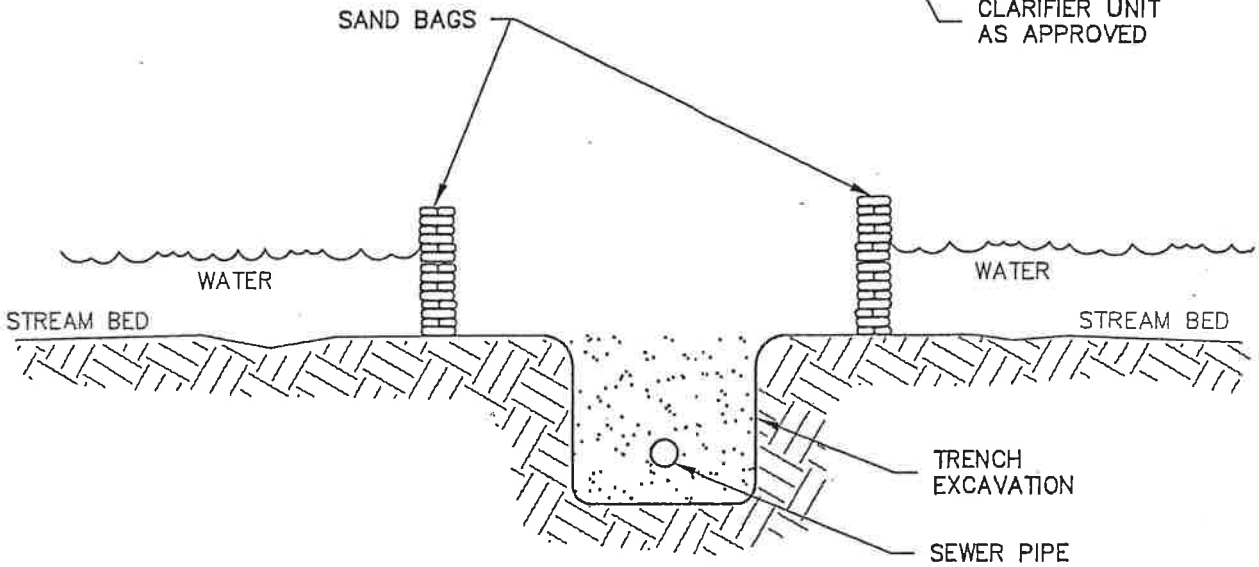
File Path: J:\DWG\P2005\0769A1\...050769A13DET001.dwg, Layout: 8.5X11-P-DET Tue, May 23, 2006 - 1:16 PM User: OBazhenova
UCS: | EW: | LMAN: | CTB:

CITY OF WATERBURY

WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



PLAN



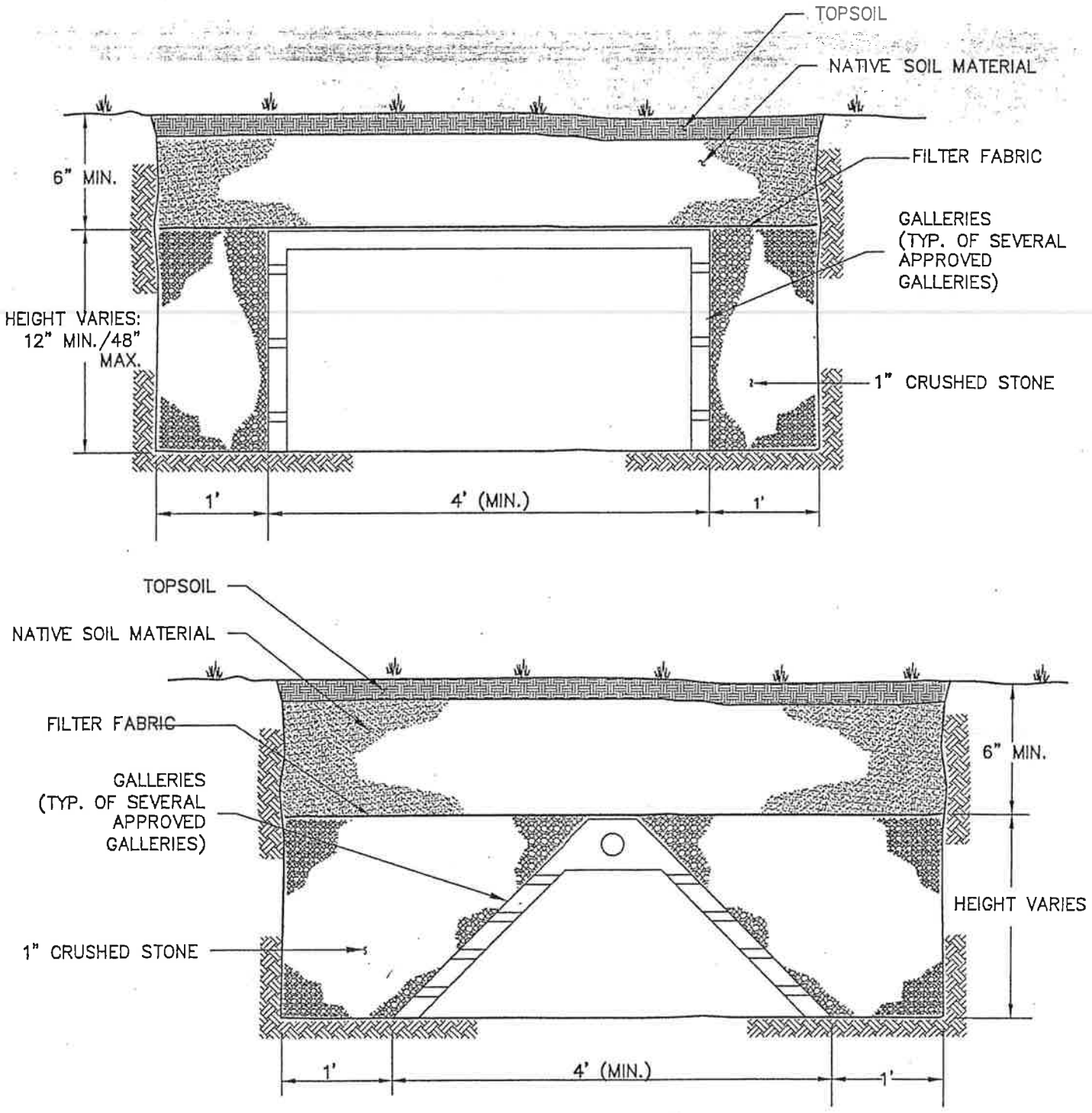
SECTION A–A

STREAM CROSSING PUMPING OPTION

N.T.S.

FIGURE 45

0507694A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:51 AM User: OBazhenova
File Path: J:\DWG\P2005\0507694A13
CTB:
LMAN:
W:
UCS:



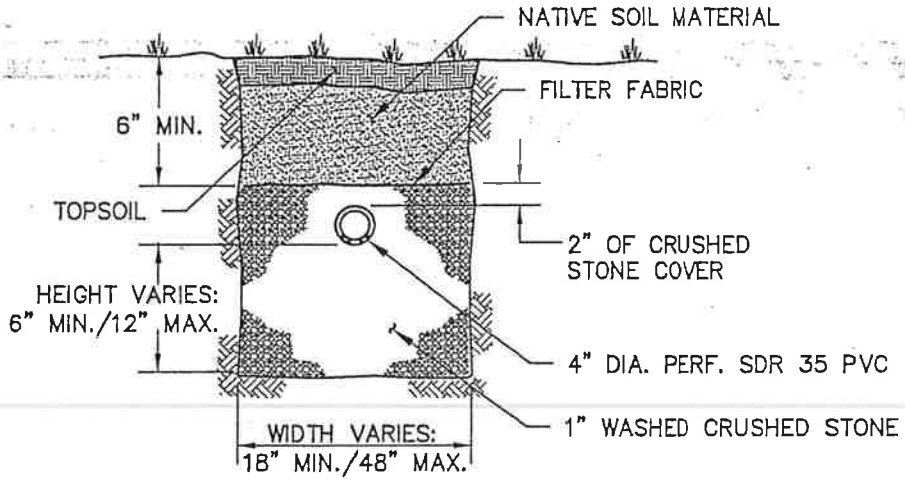
TYPICAL LEACHING GALLERIES

LEACHING FACILITY REPAIR DETAILS (1)

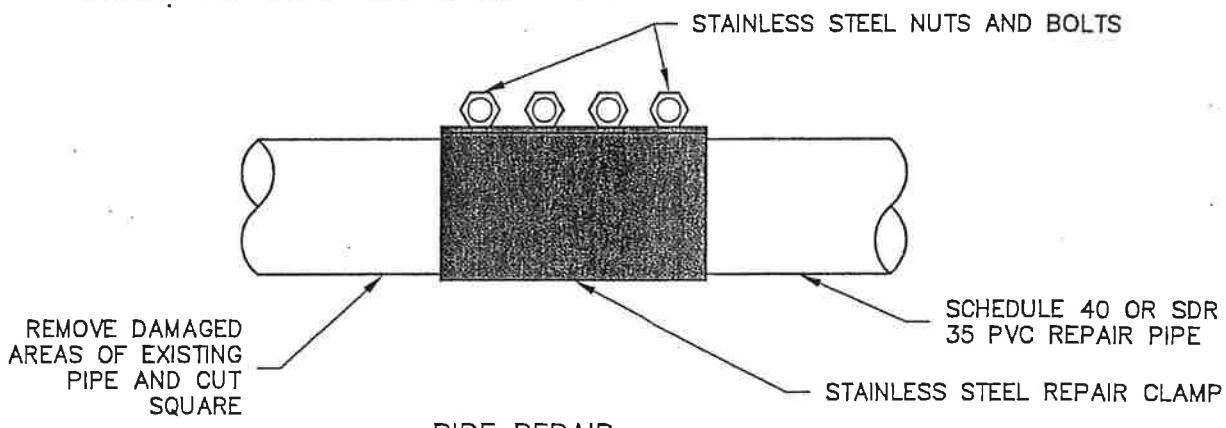
N.T.S.

FIGURE 46

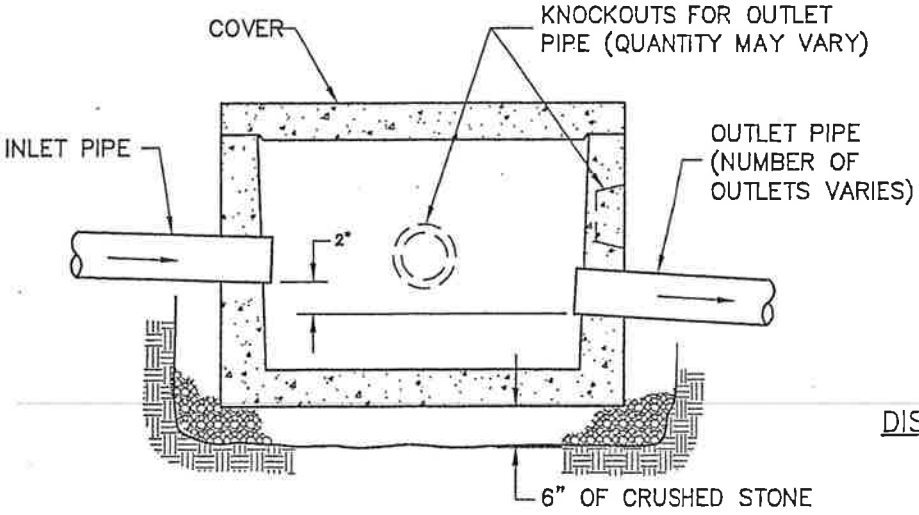
3050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 1:16 PM User: OBazhenova
File Path: J:\DWG\P2005\07769A1
DWN: LMAN: CTB: UCS:



TYPICAL LEACHING TRENCH REPAIR



PIPE REPAIR



DISTRIBUTION BOX REPAIR

LEACHING FACILITY REPAIR DETAILS (2)

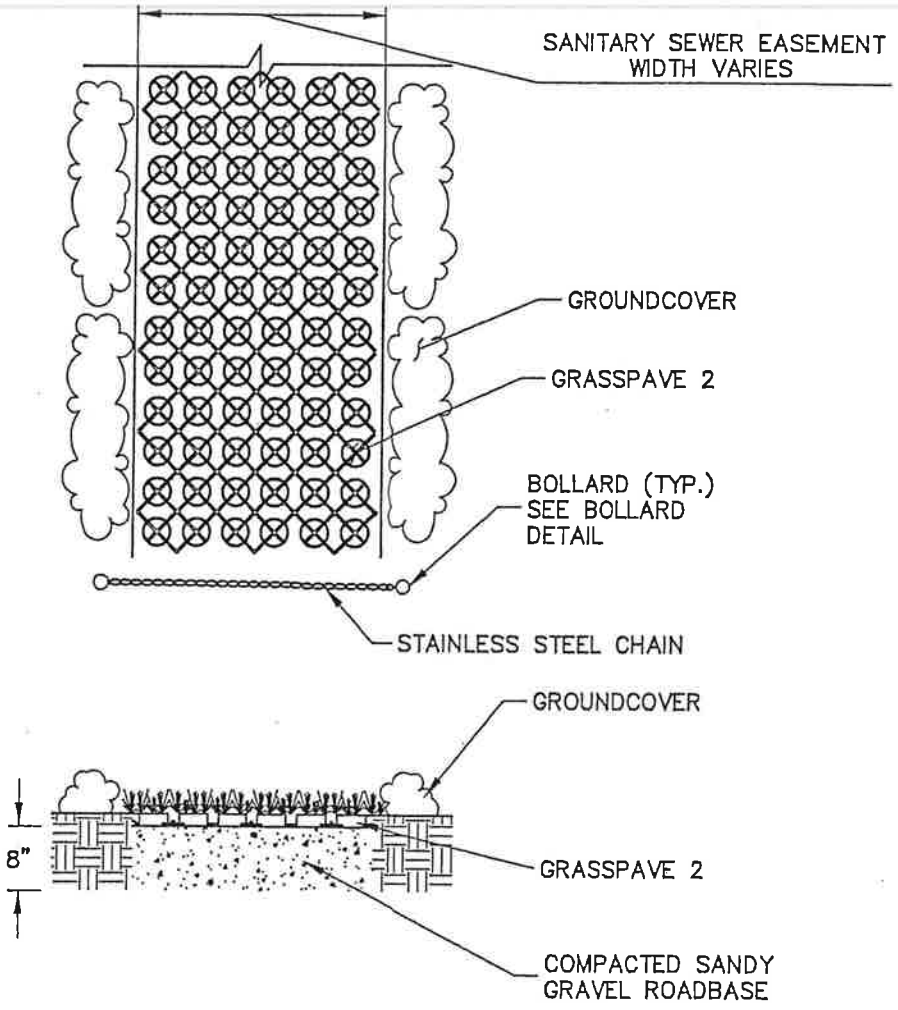
N.T.S.

FIGURE 47

1050769A13DET001.dwg, Layout: 8.5x11-P-DET Tue, May 23, 2006 - 1:16 PM User: OBazhenova
File Path: J:\DWG\P2005\0769\A1
DW: LMAN: CTB:
UCS:

NOTE:

THIS DETAIL IS SCHEMATIC IN NATURE. DESIGNER SHALL SPECIFY SPACING AND DESIGN OF EDGE TREATMENTS. SPACING WILL VARY WITH TURF TYPE, SLOPE, WPC REQUIREMENTS, ETC..



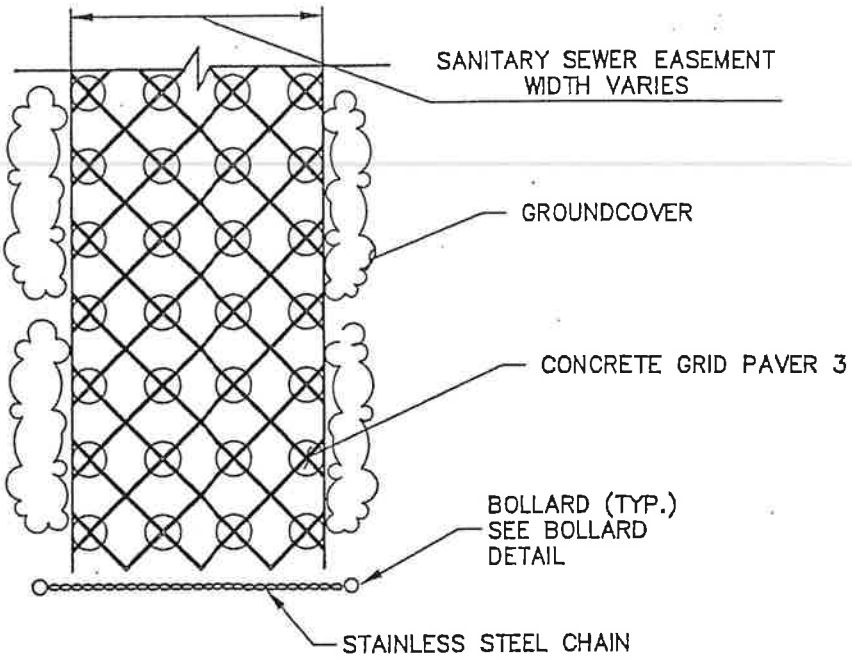
FRP GRASSPAVE DETAIL

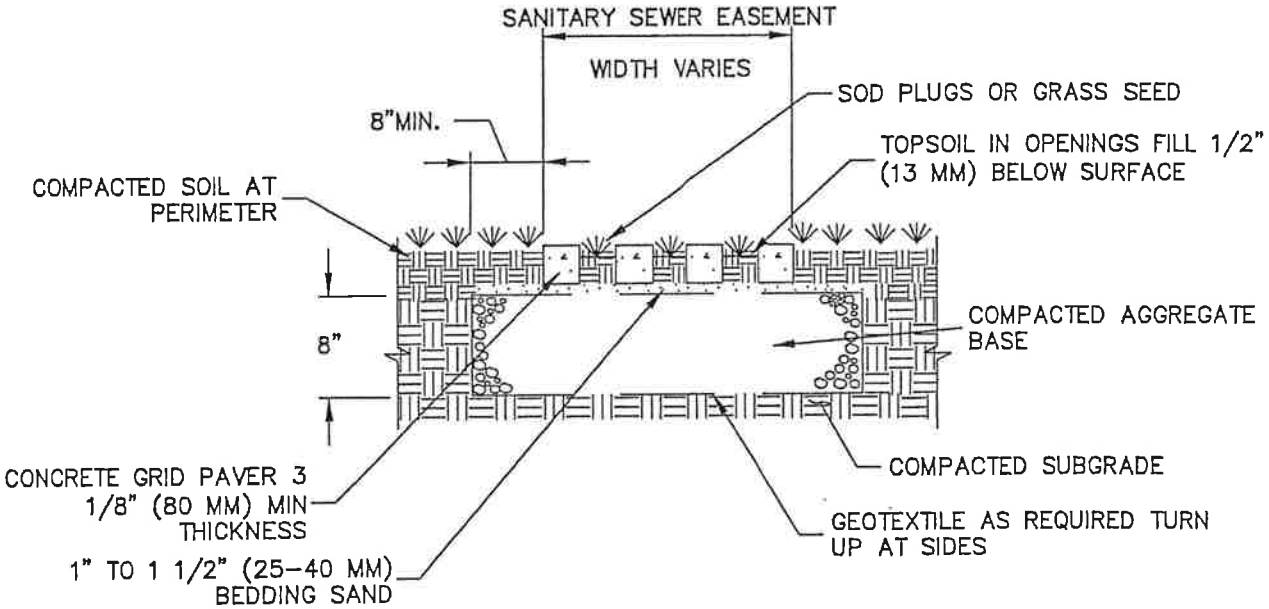
N.T.S.

FIGURE 48

NOTES:

1. BASE THICKNESS VARIES WITH CLIMATE, AND SUBGRADE. 2. MINIMUM BASE THICKNESS: 6" (150 MM) RESIDENTIAL DRIVEWAYS, 8" FIRELANES, SEWER EASEMENTS & PARKING LOTS.



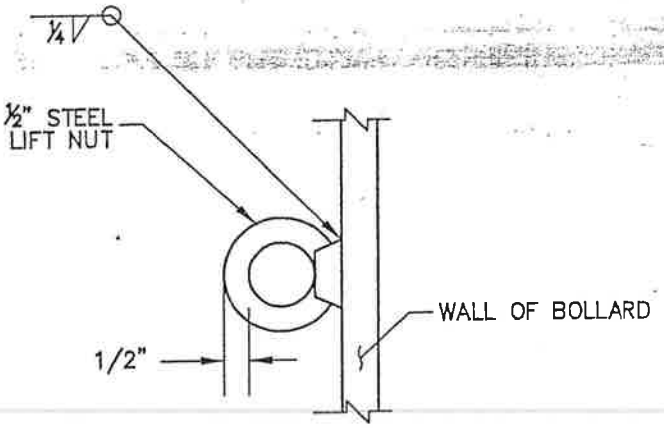


CONCRETE GRID PAVERS DETAIL

N.T.S.

FIGURE 49

W: LMAN: CTB: File Path: J:\DWG\P2005\07769A13\DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 9:50 AM User: OBazhanova
UCS:



NOTES:

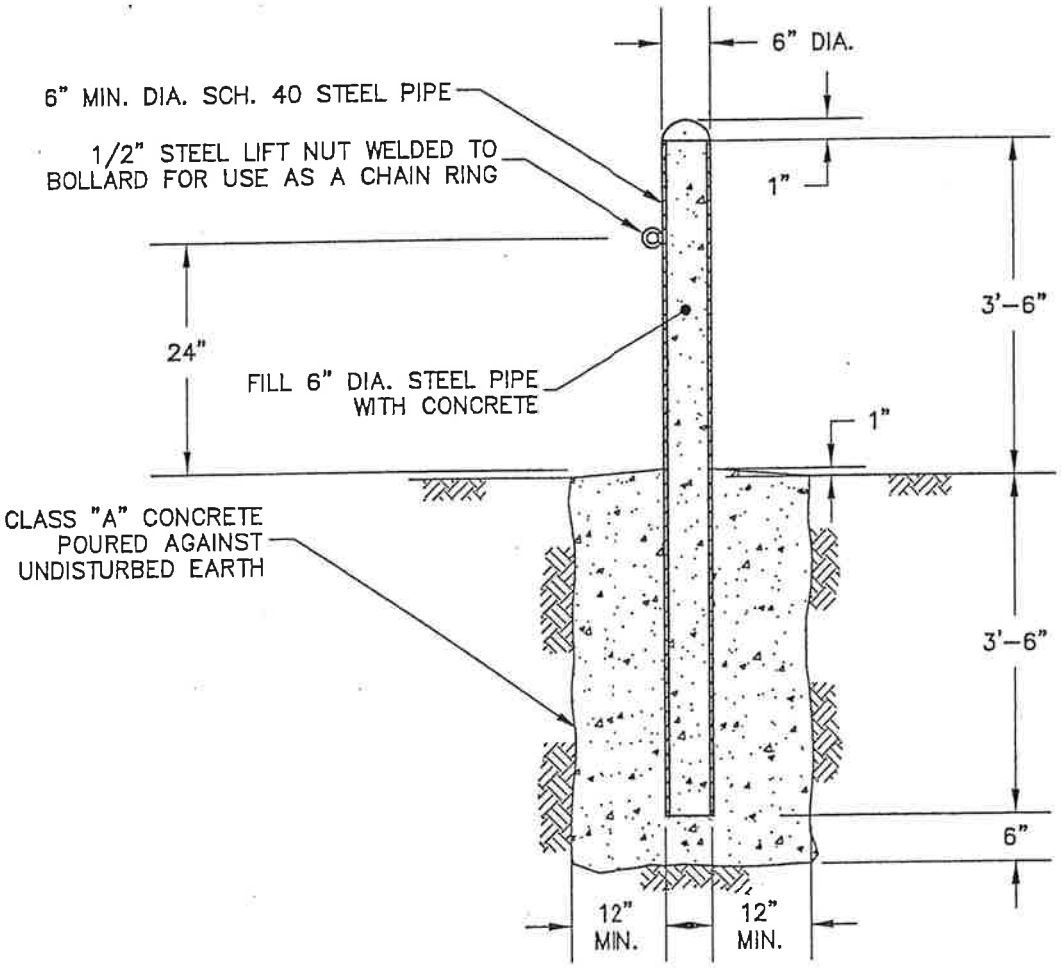
WELD LIFT NUT TO BOLLARD PRIOR TO GALVANIZING BOLLARD.

GALVANIZE BOLLARD IN ACCORDANCE WITH ASTM A123.

BOLLARD SHALL BE ASTM A500 GRADE A STEEL.

CHAIN RING

N.T.S.

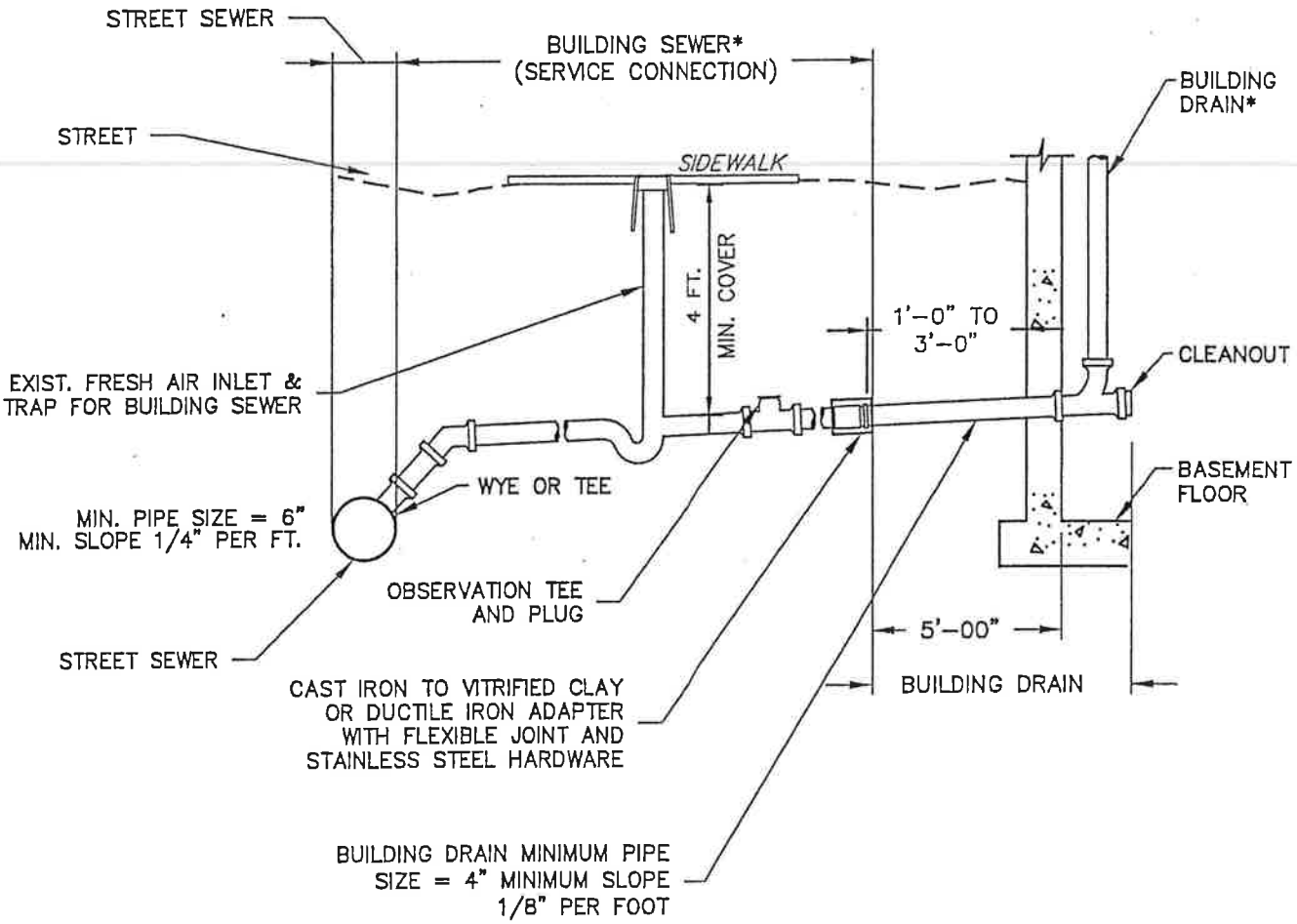


BOLLARD DETAIL

N.T.S.

FIGURE 50

250769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, May 25, 2006 - 8:26 AM User: OBazhenova
File Path: J:\DWG\P2005\0769\A13
W: LMAN: CTB:
UCS:



NOTE:
BUILDING DRAIN MAY ALSO BE LOCATED BELOW BASEMENT FLOOR WHEN EQUIRED.

*NOTE:
BUILDING DRAIN AND SERVICE CONNECTION MAINTENANCE IS RESPONSIBILITY OF THE PROPERTY OWNER.

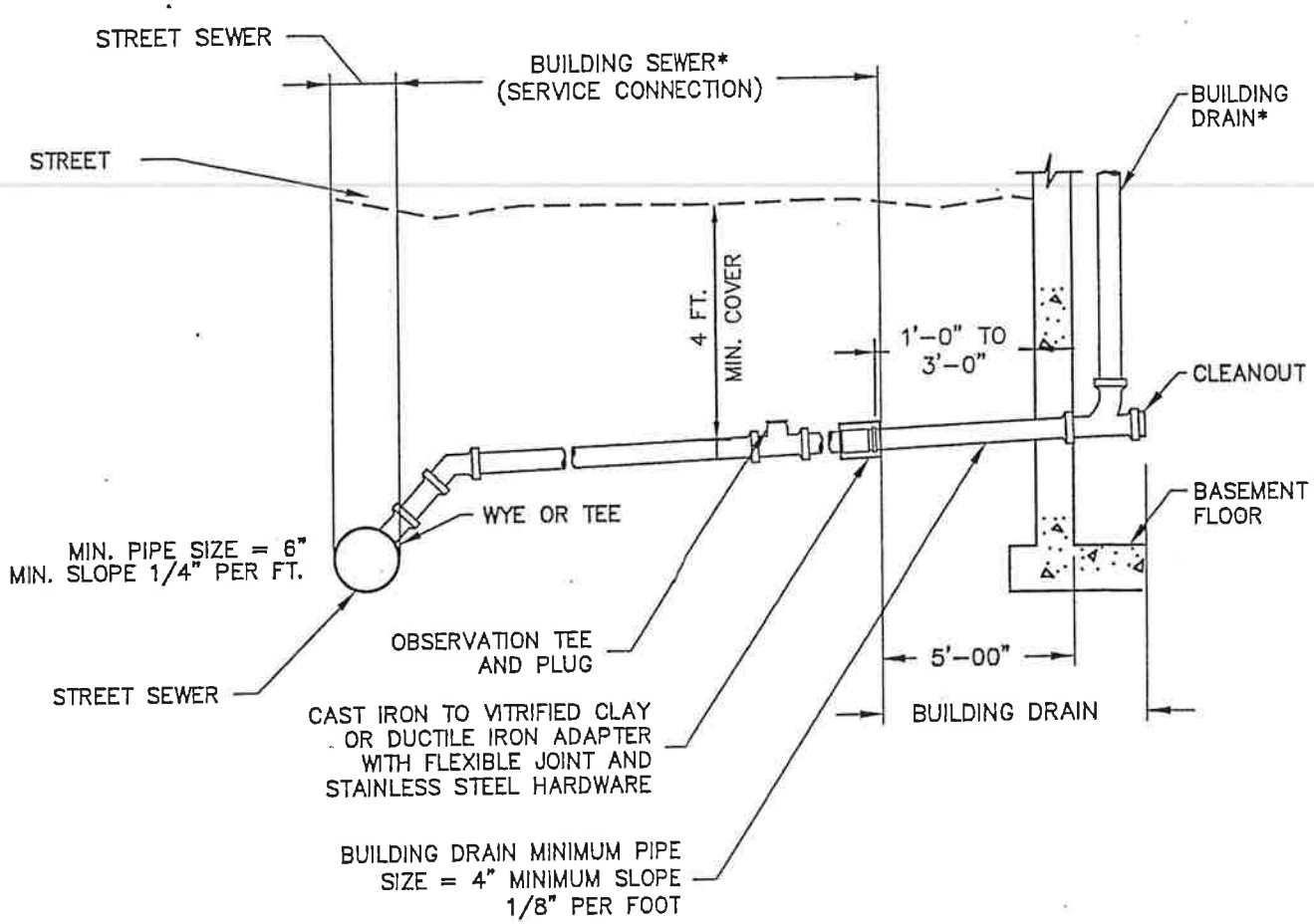
TYPICAL SERVICE CONNECTION DETAIL WITH VENT

N.T.S.

FIGURE 56

T:\0769A13\DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 10:30 AM User: OBazhenova
File Path: J:\DWG\P2005\0769\A13
W: LMAN: CTB:
UCS:

CITY OF WATERBURY
WATER POLLUTION CONTROL
SANITARY SEWER DETAILS



NOTE:
BUILDING DRAIN MAY ALSO BE LOCATED BELOW BASEMENT FLOOR WHEN EQUIRED.

*NOTE:
BUILDING DRAIN AND SERVICE CONNECTION MAINTENANCE IS RESPONSIBILITY OF THE PROPERTY OWNER.

TYPICAL SERVICE CONNECTION DETAIL

N.T.S.

FIGURE 56A

\\050769A13DET001.dwg, Layout: 8.5x11-P-DET Thu, Jun 22, 2006 - 10:31 AM User: OBazhenova
File Path: J:\DWG\P2005\050769\A1.
XW:
LMAN:
CTB:
UCS: