Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Phillip Eng, Interim MassDOT Secretary
Jonathan L. Gulliver, Undersecretary and Highway Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

October 31, 2025

Proposal No. 608742-132267

ADDENDUM NO. 1

To Prospective Bidders and Others on:

DENNIS-HARWICH
Federal Aid Project No. STP/CMQ/TAP/CRP-0035(066)X
Reconstruction & Related Work on Main Street (Route 28),
from Upper County Road to the Herring River Bridge

PROPOSAL TO BE OPENED AND READ: TUESDAY, NOVEMBER 4, 2025 at 2:00 P.M.

Transmitting changes to the Contract Documents as follows:

QUESTIONS AND RESPONSES
2 pages

DOCUMENT A00801
Revised pages 3, 80, 82, 86 & 87

DOCUMENT A00802
Revised pages 3 & 17
Inserted pages 17.1 through 17.4

DOCUMENT A00807
Revised pages 5, 11, 18, 29, 33 & 34

DOCUMENT A00809
Revised pages 3 through 48

DOCUMENT A00862
Revised page 79
Inserted pages 8.1 through 8.16

DOCUMENT B00420
Revised pages 8, 9, 10 & 26

PLAN SHEET REVISIONS
Revised Plan Sheets 3 & 6 of 105.

Take note of the above, substitute the revised pages and Plan Sheets for the originals, insert new pages in the proper order and acknowledge Addendum No. 1 in your Expedite Proposal file before submitting your bid.

Very truly yours,

Eric M. Cardone Digitally signed by Eric M. Cardone Date: 2025.10.31 21:25:34 -04'00'

Eric M. Cardone, P.E.
Construction Contracts Engineer

jb
cc T. Currier, Project Manager

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
mass.gov/massdot

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DENNIS-HARWICH
Federal Aid Project No. STP/CMQ/TAP/CRP-0035(066)X
Reconstruction & Related Work on Main Street (Route 28),
from Upper County Road to the Herring River Bridge

Questions and Responses Addendum No.1, October 31, 2025

Lawrence-Lynch Corp., E-mail dated October 15, 2025

Question 1)
Regarding the above referenced project and attached pages from Specs, can you please offer clarification on which is correct. The first attachment reads 0% DBE requirement. The second attachment reads that there are D/M/WBE requirements.

Response 1)
There are no DBE requirements for this project. See revised page A00862-79 issued via this Addendum.

Lawrence-Lynch Corp., E-mail dated October 24, 2025

Question 2)
Bid Item 811.121 TELEPHONE MANHOLE (3EA). Can MassDOT please confirm that the proposed precast telephone manhole that we should price is a:

Verizon Manhole with Inside Dimensions: 6'Wx12'Lx7'H as shown on the attached drawing. There is no detail in the bid documents that clearly identifies and or specifies the dimensions of the telephone manhole.

Response 2)
See revised pages A00809-3 & 4 issued via this addendum.

Dig It Construction, LLC., E-mail dated October 27, 2025

We are requesting information on the following pay items:

Question 3)
Item #403.2 Full Depth Reclaim –
The specifications state reclaiming is to be at a depth of 15". The asphalt cores taken on the existing roadway show pavement depths of 8.5 – 13.5". Since the intent of the contract is to produce an acceptable base through reclamation, please clarify how we are to proceed with a mixture that will be 57% - 90% asphalt and very little of the existing gravel base in the mixture? This will ultimately not produce a usable gravel product.

Response 3)
The 15" reclaim depth is a minimum and the depth may be set deeper in coordination with the Engineer, as noted in the special provision for Item 403.2. See revised pages A00801-82, 86 and 87 and Plan Sheet 6 of 105 issued via this addendum.

DENNIS-HARWICH
Federal Aid Project No. STP/CMQ/TAP/CRP-0035(066)X
Reconstruction & Related Work on Main Street (Route 28),
from Upper County Road to the Herring River Bridge

Dig It Construction, LLC., E-mail dated October 27, 2025 (Continued)

Question 4)
Items #348.075, #348.1, #348.15, and #348.2 Sewer Pipe Remove and Reset –
These items do not appear to be on the plans or quantified in the quantity sheets.
Please specify the locations of these Remove and Reset items.

Response 4)
These items are to be used for new water services and were mislabeled as sewer pipe remove & reset items. The locations and sizes of the water service pipes are called out on the utility plans.

See revised pages A00801-80 and B00420-9 & 10 and inserted pages A00802-17.1 through 17.3 issued via this addendum.

Dig It Construction, LLC., E-mail dated October 28, 2025

Question 5)
Item #303.06, #303.08, #303.12 - For these water items, the item descriptions reads "Mechanical Joint" for the water mains, but both the Dennis and Harwich specifications reference AWWA C111 which calls for Push-On Joint (Tyton) for the water main and Mechanical Joint (MJ) for valves, fittings, and connections.

Will all the water main pipe require mechanical joints?

Response 5)
No. The Ductile Iron Mechanical Joint piping has been revised to Ductile Iron Water Pipe (Rubber Gasket. See revised page B00420-9 issued via this addendum.

Question 6a. & b.)
Item #472. – Please clarify if this pay item will be used for the following:

6a. Widening Areas at 4” depth?

6b. Patching of Water, Sewer, and Drainage trenches at 4” depth (prior to reclamation phase)?

Response 6a.)
No.

Response 6b.)
Yes. This item will be used for temporary patching of sewer, water and drainage trenches in full depth pavement areas.

Item 451 is to be used for permanent patching in mill & overlay pavement areas.

①ADDENDUM NO. 1, OCTOBER 31, 2025

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION FILE NUMBER SIGN

This project is subject to Massachusetts General Laws, Chapter 131, Section 40 as amended. Signs shall be in accordance with the latest MassDOT Construction Standards. All costs for the manufacture, erection, maintenance, moving, and removal of the signs shall be absorbed by the Contractor with no additional compensation other than the contract unit prices.

For this project the Massachusetts Department of Environmental Protection File Number is #**SE32-2592**.

SECTION 7 COMPLIANCE

As part of compliance with Section 7 of the Endangered Species Act (ESA), all lighting and tree clearing activities for this project must adhere to the guidelines and appropriate time-of-year (TOY) restrictions for coastal Massachusetts that have been established to protect the Northern Long-eared Bat (NLEB), a threatened species that may occur within the project limits. Any additional lighting associated with this project must be downward facing and must not increase ambient lighting conditions within NLEB suitable summer habitat. For trees greater than or equal to 3" diameter at breast height (dbh), tree clearing is restricted to between November 1st and March 15th which falls outside of the NLEB's summer occupancy period (March 15th – September 30th), spring staging (March 15th – May 14th), and fall swarming (August 16th – October 31st). In addition, tree clearing must avoid known roosting trees and maternity colonies. Further guidance regarding Section 7 compliance can be found in resources available from the U.S. Fish and Wildlife Service (USFWS).

TOWN PERMITS

The Contractor shall contact the Towns of Dennis & Harwich to identify any Town-specific permits, license, or approvals may be required to complete the work. These approvals may include, for example, removal of trees greater than 2" at breast height may be subject to Tree Warden approval and/or a public hearing. The Towns may require additional permits to work within the Town right-of-way or may require road opening/trench permits with Town-owned roads.

① EQUIVALENT SINGLE AXLE LOADS (ESALS)

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is **2.7 Million** 18-kip (80-kn) ESALs.

①ADDENDUM NO. 1, OCTOBER 31, 2025

ITEM 251.0125	**1.25 INCH HDPE LOW PRESSURE SEWER SERVICE**	**FOOT**
ITEM 251.03	**3 INCH HDPE FORCEMAIN**	**FOOT**
ITEM 256.	**FORCEMAIN MANUAL AIR RELEASE VALVE - COMPLETE**	**EACH**
ITEM 257.	**FORCEMAIN FLUSHING ASSEMBLY - COMPLETE**	**EACH**

Work under these Items shall conform to the relevant provisions of the MassDOT Standard Specifications and the Town of Harwich specifications contained in Document A00807.

①	**ITEM 348.075**	**3/4 INCH POLYETHYLENE PIPE**	**FOOT**
①	**ITEM 348.1**	**1 INCH POLYETHYLENE PIPE**	**FOOT**
①	**ITEM 348.15**	**1-1/2 INCH POLYETHYLENE PIPE**	**FOOT**
①	**ITEM 348.2**	**2 INCH POLYETHYLENE PIPE**	**FOOT**
	ITEM 349.03	**3 INCH GATE VALVE**	**EACH**
	ITEM 357.03	**3 INCH GATE BOX**	**EACH**
	ITEM 371.06	**6 INCH COUPLING**	**EACH**
	ITEM 371.08	**8 INCH COUPLING**	**EACH**
	ITEM 371.12	**12 INCH COUPLING**	**EACH**
	ITEM 376.3	**HYDRANT - REMOVED AND STACKED**	**EACH**

Work under these Items shall conform to the relevant provisions of the MassDOT Standard Specifications and the Town of Harwich specifications contained in Document A00807.

①ADDENDUM NO. 1, OCTOBER 31, 2025

ITEM 403.2 FULL DEPTH RECLAMATION WITH EMULSIFIED ASPHALT STABILIZATION SQUARE YARD

The work under this Item shall conform to the Standard Specifications for Highways and Bridges and Supplemental Specifications for Section 403, these Special Provisions Item 403.2 and Special Provision Item 403.21 Emulsified Asphalt for Stabilization and the following.

All existing pavement areas within the project limits shall be reclaimed material for use as base and/or sub-base course on the project.

The work under this Item shall consist of development and submittal of Full Depth Reclamation (FDR) job mix formula with an emulsified asphalt stabilization, pulverizing the existing pavement structure and a portion of the existing roadway base material into a homogenous mass, grading, windrowing, excavating, compacting, performing multiple passes to blend emulsified asphalt stabilizer, and grading and compacting this material to the lines, grades, and dimensions shown on the plans or established by the Engineer. Note: Calcium chloride for dust control is prohibited for the reclamation operation with the emulsified asphalt stabilizer specified. Dust control as needed shall be water for dust control and controlled for the reclamation operation.

① The Contractor shall first use all on-site reclaimed material, which is suitable or has been supplemented with Crushed Stone for Blending to be made suitable, under roadways, sidewalks, driveways, or other locations for base and sub-base courses as indicated on the Drawings or as indicated by the Engineer. After on-site reclaimed material has been exhausted, the Contractor may use additional, suitable borrow material brought in from off-site. The Contractor shall schedule his operations such that the re-use of reclaimed material be well coordinated with the generation of the material. Existing surplus reclaimed material shall be used as gravel for base or sub-base, when available, at no additional compensation.

MATERIALS

Full Depth Reclamation: Reclaimed Pavement Borrow Material shall conform to the requirements of the latest Supplemental Specifications Subsection M1.09.0 of Division III Materials.

Emulsified Asphalt Stabilizer: The stabilizer shall be a emulsified asphalt, approved for full depth reclamation of asphalt pavements to provide adequate time of curing for full depth reclamation operation to grade and compact the sub-base and/or base course. Approved emulsions are: Grade MS-2, SS-1, SS-1h, CSS-1 or CSS-1h or approved equal.

Material Sampling and Testing: A minimum of twenty-eight (21) days prior to the start of construction, the Contractor shall sample and test the pavement layers to be reclaimed. The samples shall be taken randomly for the various areas of the work and based on location and variations in existing pavement material layers to be reclaimed. Samples of pavement shall consist of 6-inch diameter cores of the existing pavement and 50 lbs. of the underlying materials as required for development of the FDR job mix formulas. The composite materials shall be tested for gradation and development of job mix formulas.

ADDENDUM NO. 1, OCTOBER 31, 2025

ITEM 403.2 (Continued)

Traffic Control: Unless otherwise specified or as directed by the Engineer, the roadway shall be kept open to traffic at all times, with traffic discontinued on the lane being reclaimed. Controlled traffic may be permitted as soon as the base is stabilized and/or asphalt stabilization is cured adequately for opening to traffic while preventing tracking or pick up of asphalt emulsion.

Structures: All drainage and utility structures shall be lowered 6 inches below subgrade and plated in accordance with Subsection 403.62 of the Standard Specifications. Lowering and plating of structures shall be considered incidental to Item 403.2 Full Depth Reclamation with Asphalt Stabilization.

Because of pipe outlet elevations, some precast drainage structures cannot be lowered to this extent. For those drainage structures, the Contractor shall excavate around the precast units to avoid damaging the structures during reclaiming operations. Reclaimed base course shall be windrowed and compacted thoroughly around the structures. The cost of excavating windrowing and compacting around structures shall be considered incidental to Item 403.2 Full Depth Reclamation with Asphalt Stabilization.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Full Depth Reclamation with Emulsified Asphalt Stabilization will be measured by the SQUARE YARD of existing pavement area reclaimed for use on the project. No deductions will be made for surface structures.

Drainage structures raised from the plated depth to an intermediate depth of approximately 8 in. below finished grade, as determined by the Engineer, shall be plated and shall be measured by the unit each as a Drainage Structure Remodeled.

Drainage structures adjusted from the intermediate depth to finished grade shall be measured by the unit each as a Drainage Structure Adjusted.

Structures rebuilt shall be measured by the average height in feet and tenths of feet from the bottom of the deterioration to the plated depth. Structures damaged below the plated depth, due to the Contractors negligence, shall be measured and deducted from the depth measurement. Raising the structure from the plated depth will be measured as stated above for a remodeled unit.

The accepted quantity of Full Depth Reclamation with Emulsified Asphalt Stabilization, will be paid for at the contract unit price per SQUARE YARD, per the Specifications for Section 403. and including all sampling and testing and development of Reclaimed Pavement Borrow job mix formula (JMF), furnishing all equipment, material and labor for crushing, pulverizing, blending, adding asphalt stabilizer, spreading, grading, sawcutting the existing asphalt pavement at the direction of the Engineer, compacting, test section construction, blending with aggregate, moving the processed material to allow for modifications to the remaining sub-base and/or subgrade, windrowing, moving reclaimed material from one location to another within the project and any incurred costs resulting from the Contractor's decision to process off site and for all incidentals necessary to complete the work at the required depth and stabilization depth specified herein. Existing surplus reclaimed material shall be used, when available, at no additional compensation.

①ADDENDUM NO. 1, OCTOBER 31, 2025

ITEM 403.2 (Continued)

① The stabilizer agent, Emulsified Asphalt, for the full depth reclamation will be paid for at the contract unit price per gallon (GAL) per Item 403.21.

① Removal and disposal of unsuitable material, surplus reclaimed material, or any sub-base/subgrade material necessary for grade changes shall be paid for at the contract unit price per cubic yard for Item 120.1, Unclassified Excavation.

ITEM 403.21 EMULSIFIED ASPHALT FOR FULL DEPTH RECLAMATION GALLON

The work under this Item shall conform to the relevant provisions of Item 403.2 Full Depth Reclamation with Emulsified Asphalt Stabilization, and the Standard Specifications for Highways and Bridges and Supplemental Specifications, Section 403.

Emulsified asphalt for stabilization shall be in accordance with the special provisions found in Item 403.2 Full Depth Reclamation with Emulsified Asphalt Stabilization.

METHOD OF MEASUREMENT

Emulsifed Asphalt for Full Depth Reclamation shall be calculated by measuring the reclaimed pavement area and multiplying it by the application rate applied for the approved JMF.

BASIS OF PAYMENT

The accepted quantity of Emulsified Asphalt for full depth reclamation will be paid for at the contract unit price per gallon (GAL) complete in-place including addition of emulsified asphalt stabilizer into the Full Depth Reclamation operation and all sampling and testing and development of job mix formula (JMF) and all incidental work as required for the full depth reclamation with emulsified asphalt stabilization.

ITEM 470.2 HMA BERM, TYPE A - MODIFIED FOOT

The work under this Item shall conform to the relevant provisions of Subsection 470 of the Standard Specifications and the following:

Hot mix asphalt berm, type A - modified, shall be constructed by means of an approved extrusion machine in conformance with the dimensions and at the locations shown on the plans. Prior to placing the HMA berm, the surface shall be swept clean and RS-1 asphalt emulsion shall be applied to the surface.

METHOD OF MEASUREMENT

Item 470.2, HMA Berm, Type A - Modified will be measured for payment by the FOOT, complete in place, along the gutter line.

BASIS OF PAYMENT

Item 470.2, HMA Berm, Type A - Modified will be paid for at the Contract unit price per FOOT, which price shall be full compensation for all labor, materials, equipment, and incidental costs required to complete the work.

①ADDENDUM NO.1, OCTOBER 31, 2025

ESTIMATE OF QUANTITIES-DETAIL SHEET

TOWN-CITY: Dennis / Harwich **ROAD:** Main Street (Rt 28)
TYPE OF PROJECT: Roadway Reclamation **DATE:** August 1, 2025

Unclassified Excavation	6,000 CY
Class "B" Trench Excavation	4,390 CY ①
Class "B" Rock Excavation.	50 CY
Gravel Borrow	1,370 CY
Gravel Borrow – Type C	1,150 CY
Crushed Stone	260 TONS
Crushed Stone for Backing	7,027 TONS

PROPOSED FULL DEPTH PAVEMENT (IN RECLAIM AREAS) AREA = 12,338.3 SY

MAIN STREET STA 10+20 TO STA 47+00
UPPER COUNTY RD STA 4+12 TO STA 5+66

SURFACE: 2" SUPERPAVE SURFACE COURSE 12.5 POLYMER (SSC-12.5-P)
2½" SUPERPAVE INTERMEDIATE COUURSE 19.0 (SIC-19.0)

BASE: 5" SUPERPAVE BASE COURSE – 37.5 (SBC-37.5)

SUBBASE: 12" RECLAIMED PAVEMENT BORROW (M1.09.0)

PROPOSED FULL DEPTH PAVEMENT (IN WIDENING AREAS) AREA = 2,703.9 SY

MAIN STREET STA 11+58 TO STA 12+37, STA 11+79 TO STA 12+43, STA 12+61 TO STA 20+89, STA 12+66 TO STA 18+17, STA 18+39 TO STA 25+12, STA 21+44 TO STA 25+19, STA 25+64 TO STA 26+62, STA 30+50 TO STA 41+47, STA 32+23 TO STA 40+72, STA 41+09 TO STA 44+79, STA 41+68 TO STA 45+29
UPPER COUNTY RD STA 4+11 TO STA 4+34, STA 4+36 TO STA 5+27
DEPOT ROAD WEST STA 9+28 TO STA 9+54

SURFACE: 2" SUPERPAVE SURFACE COURSE 12.5 POLYMER (SSC-12.5-P)
2½" SUPERPAVE INTERMEDIATE COUURSE 19.0 (SIC-19.0)

BASE: 5" SUPERPAVE BASE COURSE – 37.5 (SBC-37.5)

SUBBASE: 12" GRAVEL BORROW, TYPE b OR
RECLAIMED PAVEMENT BORROW (M1.09.0)

①ADDENDUM NO. 1, OCTOBER 31, 2025

① ITEM 302.06 6 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)

To be used to relocate hydrants, install new water main and as required by the Engineer.

Starting Entity/Structure		Ending Entity/Structure	
4+96.00	exist main	5+46.00	exist main
11+94.00	exist main	11+94.00	prop hyd.
12+59.00	reducer	12+61.75	cap
12+61.00	tee	12+72.67	hydrant
12+92.25	tee	12+92.25	hydrant
17+14.11	tee	17+12.90	fire service
17+12.90	tee	17+17.18	hydrant
18+38.75	tee	18+38.75	cap
19+50.56	tee	19+49.99	hydrant
24+14.00	tee	24+14.00	hydrant
25+20.50	tee	25+20.50	cap
26+57.50	tee	26+57.50	hydrant
26+63.70	tee	26+63.70	fire service
29+32.75	tee	29+32.75	hydrant
31+62.00	tee	31+62.00	hydrant
36+65.50	tee	36+65.50	hydrant
40+98.00	tee	40+98.00	cap
41+15.00	tee	41+15.00	hydrant

① ITEM 302.08 8 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)

To be used to install new water main and as required by the Engineer.

Starting Entity/Structure		Ending Entity/Structure	
12+58.50	reducer	12+58.50	cap
25+35.50	tee	25+41.25	cap
31+72.20	tee	31+72.20	connection
34+96.90	tee	34+96.90	cap
41+53.25	tee	41+48.10	connection
44+87.55	tee	44+87.49	gate valve
44+87.49	gate valve	44+87.37	insertion valve

ITEM 302.12 12 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET)

To be used to install new water main and as required by the Engineer.

Starting Entity/Structure		Ending Entity/Structure	
12+58.80	reducer	12+58.8	reducer
12+58.80	TEE	12+64.1	GV
12+64.10	GV	12+92.7	TEE
12+92.70	TEE	18+33.8	GV
18+33.80	GV	18+38.4	TEE
18+38.40	TEE	18+44.1	GV
18+44.10	GV	19+50.5	TEE
19+50.50	TEE	24+15.1	TEE
24+15.10	TEE	25+13.4	GV
25+13.40	GV	25+20.4	TEE
25+20.40	TEE	25+30.9	GV
25+30.90	GV	25+36.1	TEE
25+36.10	TEE	25+44.1	GV
25+44.10	GV	26+57.5	TEE
26+57.50	TEE	29+33.8	TEE
29+33.80	TEE	31+55.6	GV
31+55.60	GV	31+61.9	TEE
31+61.90	TEE	31+71.6	TEE
31+71.60	TEE	31+77.1	GV
31+77.10	GV	34+97.3	TEE
34+97.30	TEE	36+65.5	TEE
36+65.50	TEE	40+91.9	GV
40+91.90	GV	40+97.5	TEE
40+97.50	TEE	41+15.3	TEE
41+15.30	TEE	41+48.1	GV
41+48.10	GV	41+53.8	TEE
41+53.80	TEE	41+67.5	TEE
41+67.50	TEE	41+67.5	CONNECTION
41+67.50	TEE	41+73.4	GV
41+73.40	GV	44+82.9	GV
44+82.90	GV	44+87.6	TEE
44+87.55	TEE	44+92.3	GV

ITEM 348.075 3/4 INCH POLYETHYLENE PIPE

To be used in the following locations and as required by the Engineer.

Station
13+60.8
17+24.6
34+67.0

ITEM 348.1 1 INCH POLYETHYLENE PIPE

To be used in the following locations and as required by the Engineer.

Station
12+58.5
12+78.8
13+33.3
14+02.6
15+05.3
16+25.3
17+56.8
19+08.9
19+38.3
19+81.8
20+11.2
21+19.0
22+51.8
23+09.1
25+09.6
26+32.9
27+19.2
28+20.5
30+28.4
30+49.4
31+79.5
32+50.1
34+46.7
35+01.5
35+46.8
36+34.1
36+57.1
37+74.9
39+58.4
40+13.0

ITEM 348.15 1-1/2 INCH POLYETHYLENE PIPE

To be used in the following locations and as required by the Engineer.

Station
14+34.2
22+08.5
27+13.5
29+15.9
33+51.1

ADDENDUM NO. 1, OCTOBER 31, 2025

ITEM 348.2 2 INCH POLYETHYLENE PIPE

To be used in the following locations and as required by the Engineer.

Station
22+13.5
28+67.8
44+62.8

ITEM 358. GATE BOX ADJUSTED

To be used as required by the Engineer.

MAIN STREET

STATION		OFFSET	QUANTITY	
10+61	RT	31’	1	EA
11+14	LT	18’	1	EA
11+94	LT	17’	1	EA
12+24	LT	14’	1	EA

UPPER COUNTY ROAD

5+79	LT	9’	1	EA

ITEM 372.02 2 INCH TAPPING ASSEMBLY TO BLIND FLANGE

STATION	OFFSET		QUANTITY	
12+54	80’	LT	1	EA
12+61	63’	RT	1	EA

ITEM 375.06 6 INCH INSERTION VALVE AND BOX

STATION	OFFSET		QUANTITY	
4+99	12’	LT	1	EA
5+46	11’	LT	1	EA

ITEM 375.08 8 INCH INSERTION VALVE AND BOX

STATION	OFFSET		QUANTITY	
44+87	19’	RT	1	EA

ITEM 376.2 HYDRANT - REMOVED AND RESET

STATION		QUANTITY	
11+94	LT	1	EA

4. For Polyethylene (HDPE) piping installations, any required mechanical joint ductile iron fittings, couplings, and adapters shall be as specified in MassDOT Specifications.

B. Polyethylene (HDPE) Pipe

1. Materials used in the manufacture of the polyethylene pipe shall be PE 4710, high density polyethylene meeting the requirements of ASTM D 3350, cell classification of 445474C.

2. The material shall have a minimum hydrostatic design basis of 320 psi at 73 degrees Fahrenheit when tested in accordance with PPI TR-3 and shall be listed in the name of the pipe manufacturer in PPI TR-4.

3. Polyethylene pipe shall be manufactured in accordance with AWWA C901 for sizes 1/2 inches through 3 inches.

4. The pipe and fittings shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

5. All piping and tubing furnished for use for this item shall meet the following requirements, unless indicated otherwise on the Contract Drawings:

   a. Nominal 3-Inch HDPE: DR 11

6. Restrained joints for polyethylene piping shall be accomplished by completion of butt fusion joints.

7. Restrained polyethylene pipe connections to stainless steel or carbon steel mechanical joint fittings shall be accomplished by use of a HDPE adapter piece which must be butt fused to the plain end of the HDPE piping. The adapter piece shall be PE 4710, with the same DR rating as the HDPE piping which it will be fused to.

① 8. When transitioning from one pipe material to HDPE pipe flex-restraints are required, and an electrofusion flex restraint by Central Plastics shall be used with a concrete collar to prevent pull outs from expansion of HDPE pipe, or approved equal.

C. Butt Fusion Fittings:

1. Fittings shall be made of HDPE material with a minimum material designation of PE 4710 and with a minimum Cell Classification as noted in B.1. Fittings shall have a minimum pressure rating equal to or greater than the pipe to which they are joined unless otherwise specified on the plans or accepted by the OWNER/ENGINEER. All fittings shall meet the requirements of AWWA C901 or AWWA C906.

   a. Molded fittings shall comply with the requirements of ASTM D 3261

   b. All fabricated elbows, tees, reducing tees, and end caps shall be produced and meet the requirements of ASTM F 2206, holding an ISO 9001 quality system certificate. Each fitting will be marked per ASTM F 2206 Section 10 including nominal size and

4. The pipe and fittings shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

5. All piping and tubing furnished for use for this item shall meet the following requirements, unless indicated otherwise on the Contract Drawings:

   a. Nominal 1.25-Inch HDPE: DR 11

6. Restrained joints for polyethylene piping shall be accomplished by completion of butt fusion joints.

7. Restrained polyethylene pipe connections to stainless steel or carbon steel mechanical joint fittings shall be accomplished by use of a HDPE adapter piece which must be butt fused to the plain end of the HDPE piping. The adapter piece shall be PE 4710, with the same DR rating as the HDPE piping which it will be fused to.

8. When transitioning from one pipe material to HDPE pipe flex-restraints are required, and an electrofusion flex restraint by Central Plastics shall be used with a concrete collar to prevent pull outs from expansion of HDPE pipe, or approved equal.

①

D. Butt Fusion Fittings:

1. Fittings shall be made of HDPE material with a minimum material designation of PE 4710 and with a minimum Cell Classification as noted in C.1. Fittings shall have a minimum pressure rating equal to or greater than the pipe to which they are joined unless otherwise specified on the plans or accepted by the OWNER/ENGINEER. All fittings shall meet the requirements of AWWA C901.

   a. Molded fittings shall comply with the requirements of ASTM D 3261

   b. All fabricated elbows, tees, reducing tees, and end caps shall be produced and meet the requirements of ASTM F 2206, holding an ISO 9001 quality system certificate. Each fitting will be marked per ASTM F 2206 Section 10 including nominal size and fitting EDR, which will meet or exceed the pipe DR identification for the project. Fabricated fittings shall be manufactured using a McElroy DataLogger to record fusion pressure and temperature and shall be stamped with unique joint number that corresponds to the joint report. A graphic representation of the temperature and pressure data for all fusion joints made producing fittings shall be maintained for a minimum of 5 years as part of the quality control and will be available upon request of OWNER/ENGINEER. Test results validate ASTM section 7.3 and 9 shall be provided to OWNER/ENGINEER upon request.

   c. Socket fittings shall meet ASTM D 2683.

7. Restrained polyethylene pipe connections to stainless steel or carbon steel mechanical joint fittings shall be accomplished by use of a HDPE adapter piece which must be butt fused to the plain end of the HDPE piping. The adapter piece shall be PE 4710, with the same DR rating as the HDPE piping which it will be fused to.

8. When transitioning from one pipe material to HDPE pipe flex-restraints are required, and an electrofusion flex restraint by Central Plastics shall be used with a concrete collar to prevent pull outs from expansion of HDPE pipe, or approved equal.

①

B. Curb Stops and Boxes

1. Curb boxes shall be at least 2-1/4-inch shaft size two-piece slide type. They shall be adjustable from 42-inch to 66-inch. Curb boxes shall be constructed of cast iron and thoroughly coated with two coats of asphaltum varnish.

2. Curb box shall be as manufactured by Bibby-Ste-Croix 94E or 95E pending final bury depth, or approved equal.

3. Curb box top section shall include a cast iron sewer cover which shall be of the “Erie Style” with the word “sewer” cast into it and shall include a brass pentagon screw.

4. Curb boxes shall be completely and thoroughly coated with bitumastic paint.

5. Curb stops shall be PVC compression style with two rubberized O-ring seals to provide pressure-tight seal, as manufactured by Blair, or approved equal.

C. Solid Concrete Block

1. Solid Concrete Blocks shall be furnished and installed as described in MassDOT Item 903 - 3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE.

PART 3 EXECUTION

3.1 INSPECTION AND PREPARATION

A. During installation of all pipe, valves, stops, boxes, and caps, the CONTRACTOR shall verify that all items are clean and free of defects in material and workmanship and function properly.

B. All valves and stops shall be closed and kept closed until otherwise directed by the ENGINEER.

3.2 INSTALLATION

A. Install pipe, valves, stops, boxes, and caps as shown on the Drawings and in accordance with the manufacturer’s recommendations.

ITEM 349.03 – 3 INCH GATE VALVE **EA**

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Comply with applicable requirements of all governing agencies and State and local plumbing codes.

1.2 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Manufacturer's literature, catalog information and other data for products covered under this Section of Specifications.

2. Submit certificates of compliance with referenced standards.

PART 2 PRODUCTS

2.1 MATERIALS

A. Buried gate valves shall be resilient seated, non-rising stems, 2-inch operating nuts, O-ring seal and shall open counterclockwise (left).

1. Underground gate valves shall be of the iron body, bronze mounted type conforming to AWWA Standard C500.

2. Mechanical joint type designed for underground use at 250 psi.

① 3. Underground gate valves shall be Mueller, American Flow Control AFC, US Pipe or equal.

PART 3 EXECUTION

3.1 INSTALLATION – GENERAL

A. Valve details are shown on the Drawings.

B. Refer to drawings for locations of valves to be installed on this project.

C. Valves shall be open left.

D. After installation of valves, provide information on location of structures on red-line drawings. All structures shall be located via swing ties.

PART 4 METHOD OF MEASUREMENT

These items shall be measured on a per each basis.

ITEM 371.06 – 6 INCH COUPLING **EA**
ITEM 371.08 – 8 INCH COUPLING **EA**
ITEM 371.12 – 12 INCH COUPLING **EA**

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Comply with applicable requirements of all governing agencies and State and local plumbing codes.

1.2 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Manufacturer's literature, catalog information and other data for products covered under this Section of Specifications.

2. Submit certificates of compliance with referenced standards.

PART 2 PRODUCTS

2.1 MATERIALS

① A. Couplings to be ductile iron fittings, with stainless steel bolts and nuts.
The couplings shall receive two coats of coal tar epoxy paint on all exterior surfaces prior to installation.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

A. Install couplings as shown, specified and as recommended by the manufacturer.

B. Request instructions from the ENGINEER before proceeding if there is a conflict between the manufacturer's recommendations and the Contract Drawings or Specifications.

C. Pipe, fittings, and accessories that are cracked, damaged or in poor condition or with damaged linings will be rejected and shall be replaced at the CONTRACTOR’s expense.

PART 4 METHOD OF MEASUREMENT

These items shall be measured on a per each basis.

PART 5 PAYMENT

Payment for these items shall be made per the Contract unit price per each, including all labor, material, equipment, and other costs to furnish and install these items.

END OF SECTION

①ADDENDUM NO. 1, OCTOBER 31, 2025

ITEM 376.3 – HYDRANT - REMOVED AND STACKED EA

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Comply with applicable requirements of all governing agencies and State and local plumbing codes.

1.2 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Manufacturer's literature, catalog information and other data for products covered under this Section of Specifications.

2. Submit certificates of compliance with referenced standards.

PART 2 PRODUCTS

2.1 MATERIALS

A. All hydrants shall be of the compression or gate type conforming to the latest specifications of the ANSI/AWWA C502, and shall be of a make that has been adopted by the Owner as a standard.

B. Hydrants shall have a non-rising stem. Hydrants shall be of heavy, anti-freeze compression action type with positive automatic type drain.

C. All hydrants shall breakaway at ground level upon severe impact without flooding the area.

D. Hydrants shall be supplied with 6-inch mechanical joint inlet connection.

E. Hydrants shall have a minimum 5-1/4-inch diameter valve opening. They shall be equipped with two 2-1/2-inch hose nozzles and one 4-1/2-inch steamer nozzle. The pipe threads shall be National Standard Thread.

F. Hydrant barrels shall be painted red. Cap and bonnet to be painted reflective white.

G. Hydrants shall open counter-clockwise (left).

H. Hydrants shall be designed for 150 psig working pressure.

① I. Hydrants shall be American-Darling, Mueller Centurion, Clow Medallion or approved equal.

PART 3 EXECUTION

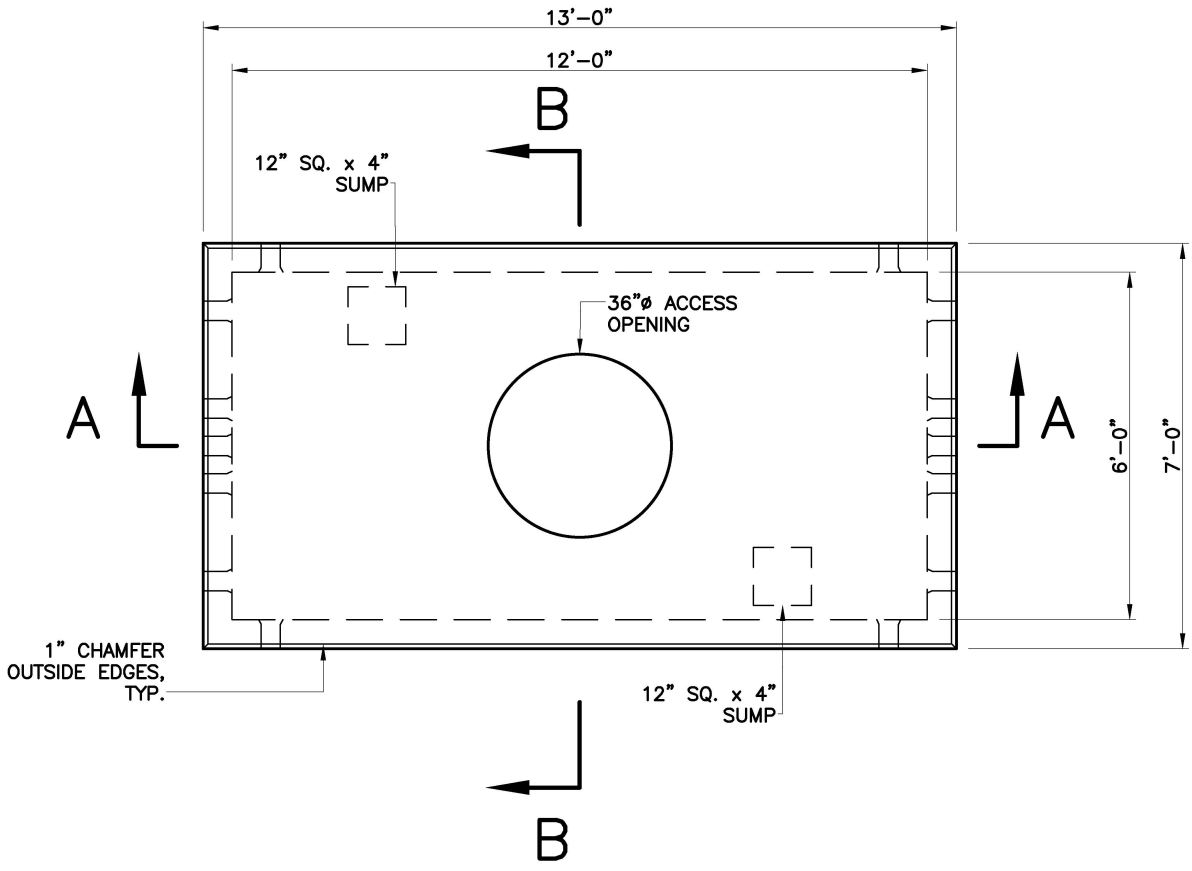
3.1 INSTALLATION - GENERAL

A. Hydrants shall be set at locations specified on the Contract Drawings and shall be of such length that, with the frost ring at the ground surface grade, there shall be 5 feet of cover over the connecting pipe.

B. Hydrants shall be set so that the barrel is truly vertical, and shall be properly backfilled so that the barrel will remain truly vertical.

SHEA CONCRETE PRODUCTS
New England's Premier Precaster
800–696–7432 (SHEA)
www.sheaconcrete.com
MAILING ADDRESS: 87 HAVERHILL RD AMESBURY, MA 01913

MANHOLE 6' X 12' X 7'



PLAN

NOTES:

1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN LOADING: AASHTO HS20–44, 0 TO 5 FEET COVER.
3. STEEL REINFORCEMENT CONFORMS TO ASTM A615, GRADE 60.
4. MINIMUM STEEL COVER 1".

SHEA PRODUCT ID: MH–6127	FILE NAME: MH 6X12X7			NPCA CERTIFIED PLANT
WEIGHT (LBS): 36880	DRAWN BY: L.P.	DATE: 2/6/2018	PAGE: I.C.11–1	

773 Salem Street–Wilmington, MA | 153 Cranberry Hwy–Rochester, MA | 87 Haverhill Road–Amesbury, MA | 160 Old Turnpike Rd–Nottingham, NH

Specifications subject to change without notice

SHEA CONCRETE PRODUCTS
New England's Premier Precaster
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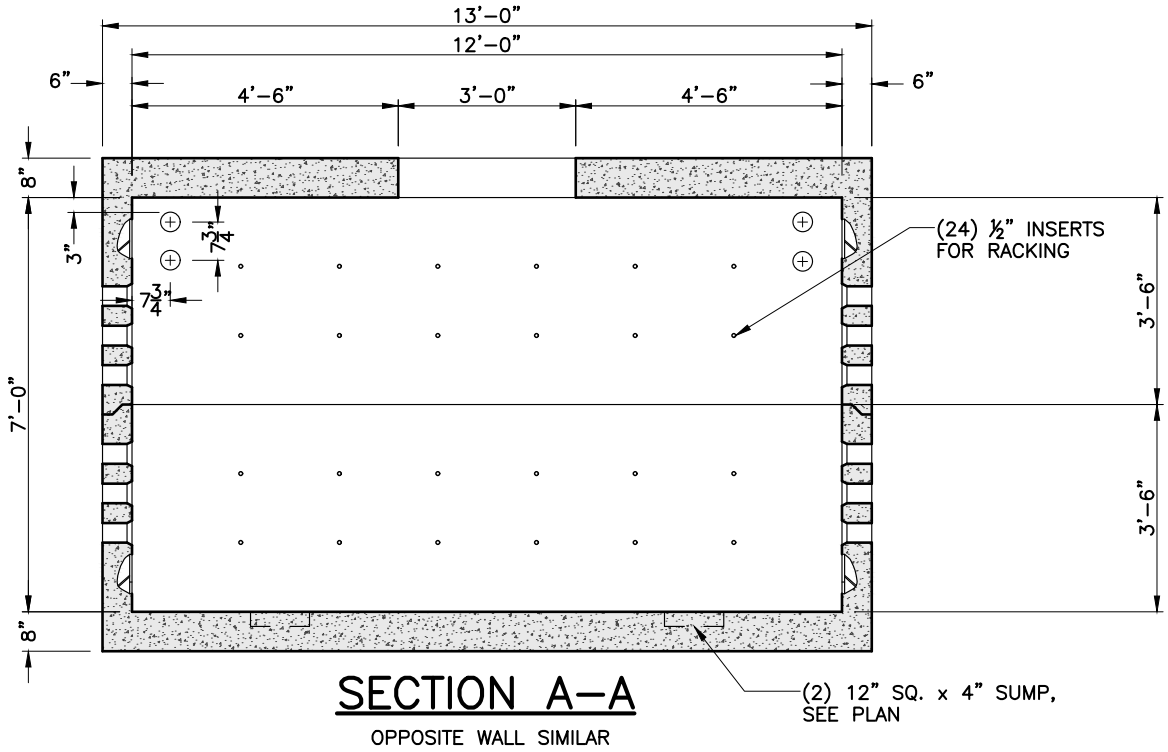
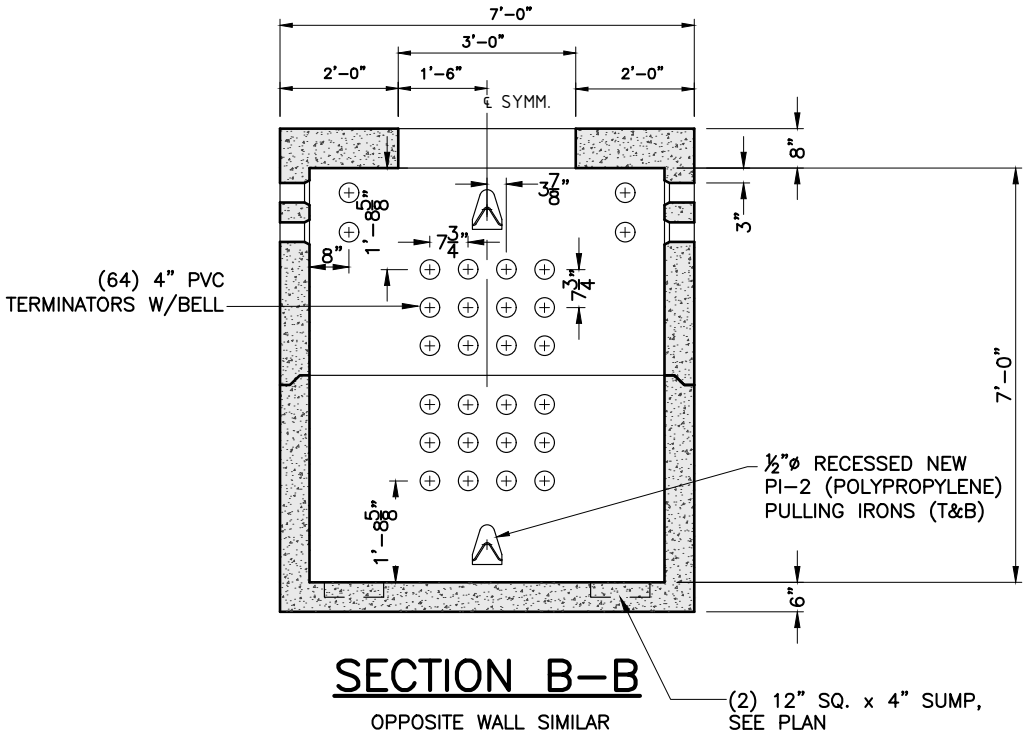
MANHOLE 6' X 12' X 7'



SECTION A-A

OPPOSITE WALL SIMILAR



SECTION B-B

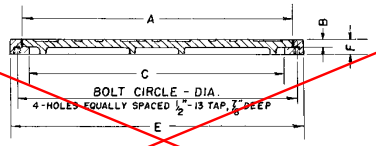
OPPOSITE WALL SIMILAR

SHEA PRODUCT ID: MH-6127	FILE NAME: MH 6X12X7			
WEIGHT (LBS): 36880	DRAWN BY: L.P.	DATE: 2/6/2018	PAGE: I.C.11-2	

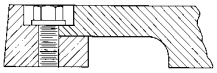
NPCA CERTIFIED PLANT

R-1749 Series
Telephone Design Large Manhole Frame, Solid Lid

Light Duty



Specify if security bolting required (2 per lid).



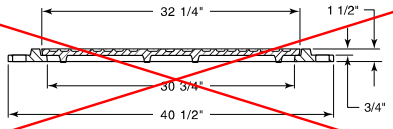
Dimensions in inches

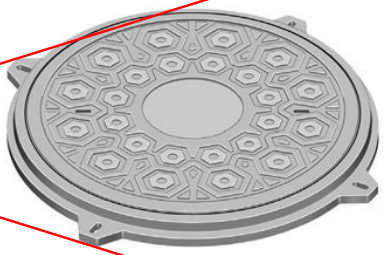
Catalog No.	A	B	C	E	F	Anchor Bolt Circle
R-1749-A	29 1/4	3/4	27 3/4	32	1 1/2	30-1/2
R-1749-B	32 1/4	3/4	30 3/4	35	1 1/2	33-1/2

R-1749-B1
Manhole Frame, Solid Lid

Light Duty

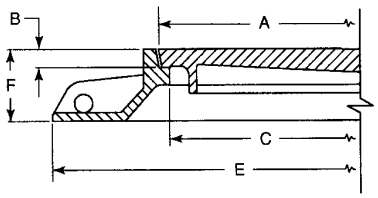
Furnished with four 3/4" x 1" anchor slots on 37" diameter bolt circle.





R-1750 Series
Telephone Design Large Manhole Frame, Solid Lid

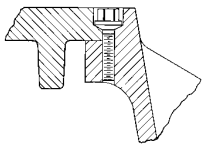
Heavy Duty



Illustrating R-1750-B

Furnished with machined horizontal and vertical bearing surfaces.

Covers can be bolted to frame with two pentagon head special monel security bolts upon request.

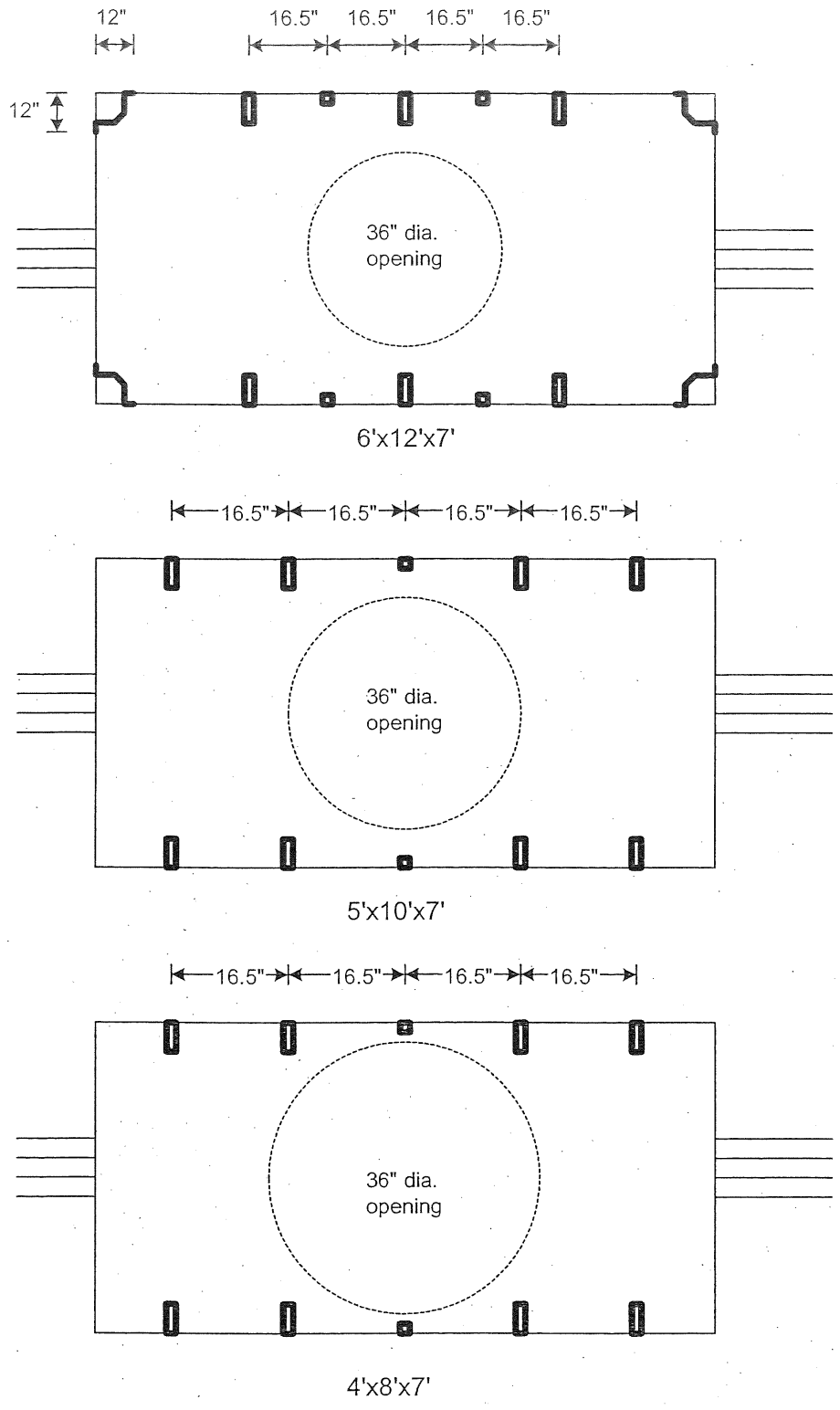


Wrenches available to fit special bolt at extra cost. Advise quantity required.

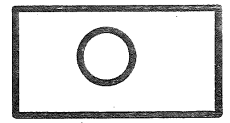
Dimensions in inches

Catalog No. Standard	Catalog No. Security Bolted	A	B	C	E	F	Anchor Bolt Circle*	Grate Alt.
R-1750-A	R-1750-AB	26	1 3/8	24	43	10		R-2300
R-1750-B	R-1750-BB	29	1 3/8	27	46	10	43-1/2	R-2290
R-1750-B1	R-1750-B1B	29	1 3/8	27	46	5 5/8	43-1/2	R-2290-A
R-1750-B2	R-1750-B2B	29	1 3/8	27	46	2 1/2	43-1/2	
R-1750-C	R-1750-CB	32	1 3/8	30	49	10	43-1/2	
R-1750-C1	R-1750-C1B	32	1 3/8	30	49	5 5/8	43-1/2	
R-1750-C1S	R-1750-C1SB	32	1 3/8	30	46	5 5/8	43-1/2	R-2750
R-1750-CS	R-1750-CSB	32	1 3/8	30	46	10	43-1/2	R-2255

* Furnished standard with four 1" diameter holes in base flange, equally spaced.



PLAN LEGEND



MH 1
W'xL'xH'

Manhole dimensions as given on plans are inside dimensions. Typical sizes are:
6'x12'x7'
5'x10'x7'
4'x8'x7'
(Size is dictated by cable sizes and amount of splicing expected at the location)

B cable rack support

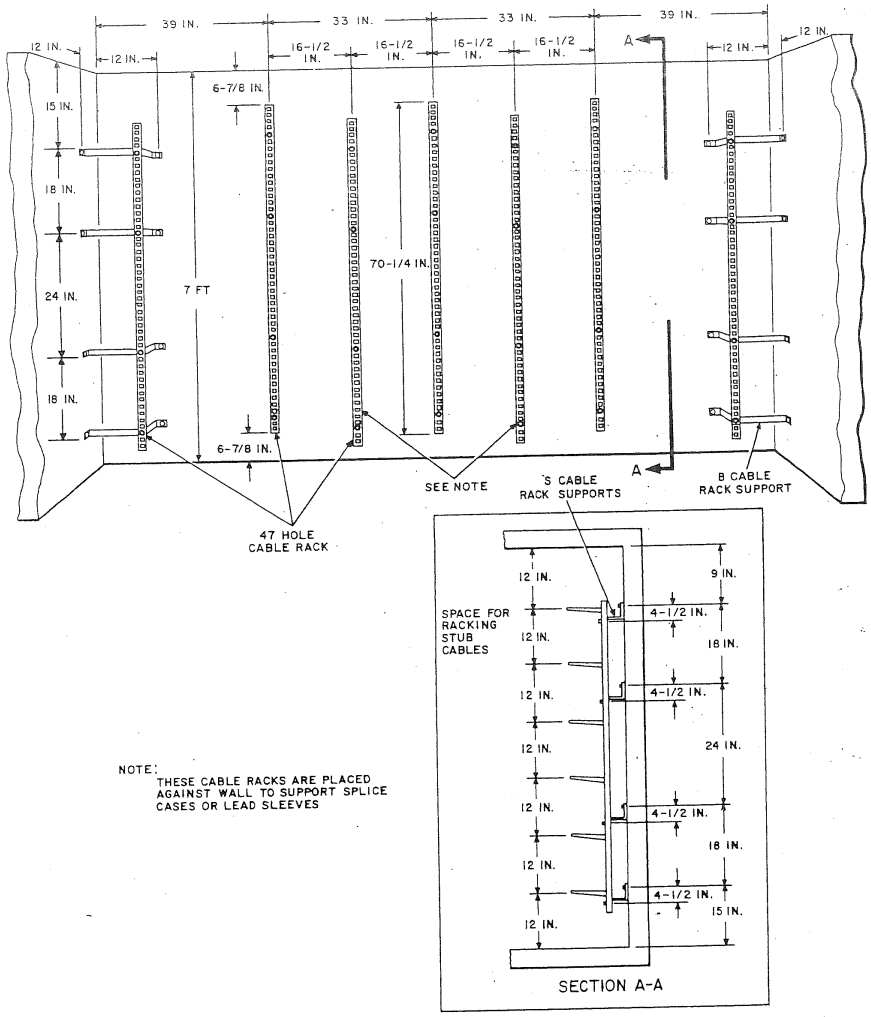
cable racks secured to S cable rack support

cable racks attached directly to wall

(See included practices for description of cable racking hardware.)

MANHOLE DETAILS

Proposal No. 608742-132267
ADDENDUM NO. 1, OCTOBER 31, 2025



NOTE:
THESE CABLE RACKS ARE PLACED AGAINST WALL TO SUPPORT SPLICE CASES OR LEAD SLEEVES

Fig. 9—Location of Cable Racks and Hooks in Typical Double Bay, Double Rack A-Type Manhole

Verizon Telecommunications Specifications

1. Manholes

1.1. Applications

All Verizon communication manhole locations.

1.2. Type

Standard two piece 38Y-1 (6′-0″ x 12′-0″ x 7′-0″ inside dimensions) telephone company communications vault with 24-4″ termaducts, 26-½″ racking inserts, pulling eyes, sumps and bonding connections.

1.3. Installation

Manholes to be installed level and plumb with a 24″ cover on a 12″ bed of ¾″ gravel. Joint to be sealed with a butyl rubber gasket or equivalent. Installation includes 24″ masonry chimney capped with Verizon specific frame and cover on a grout seal. Galvanized steel loop to be placed in the chimney near top for ladder hooks. Galvanized racking and ladder may be left in manholes for telephone company to assemble.

1.4. Accessories

1.4.1. Racking

Verizon standard steel cable racking with support arms galvanized hot dipped to ASTM A153 or mechanical to B695-91.

1.4.2. Ladder

Verizon standard 8′ hooked steel ladder galvanized hot dipped to ASTM A153 or mechanical to B695-91.

1.4.3. Frame & Cover

Verizon specific frame with 30″ logo cover.

1.5. Providers

The following companies are familiar with Verizon requirements but suppliers are not limited to:

Manholes and Racking:

Chase Precast East Brookfield Rd. 70 N. Brookfield, MA 01535 508-967-8312	Rotundo Precast 41 Almeida Ave Rehoboth, MA 02769 508-336-7600	Utility Precast PO Box 157 153 Cranberry Hwy West Wareham, MA 02576 508-291-1314

Frames & Covers:

East Jordan Iron Works P.O. Box 439 East Jordan, MI 49727 800-874-4100	LeBaron Foundry P.O. Box 746 14 East Union St. Brockton, MA 02303 508-586-3130

03/04/22

Verizon Telecommunications Specifications

2. Conduit

2.1. Applications

All Verizon communication conduit.

2.2. Type

Industry standard type "C" 4 inch Heavy Wall PVC to conform to GTS 8342 or AT&T 8546 or PTS-77 or NEMA TC 10 requirements. Minimum wall thickness to be 0.149 inches. Use only preformed bends and couplings. No hot bending allowed.

2.3. Installation

2.3.1. Duct formation, including concrete encasement, to have 24" minimum cover.

2.3.2. Ducts to be placed on spacers to provide 1" separation between conduits and a 2" envelope around duct bank for concrete encasement. Spacers lock vertically and horizontally. Spacers shall not exceed 8 ft. intervals and shall be placed at each coupling. Intermediate spacers to be used as a cap on the top tier of the duct bank to prevent floating during the pour.

2.3.3. Concrete to be minimum 2000 psi. Vibrator to be used during placement to eliminate gaps between ducts.

2.3.4. Pole sweeps and ducts capped in dirt will not have encasement the last 4' to facilitate relocation and/or future extension. Ducts terminating at pole bases and in dirt for future to have 4" universal plugs.

2.3.5. All ducts terminated in vaults or at base of poles to be roped pneumatically or mechanically for identification and continuity verification.

2.3.6. Minimum 4' radius for all sweeps, including pole sweeps.

2.4. Accessories

2.4.1. Pull Rope

Pull rope to be mule tape, 1500 pound test or greater.

2.4.2. Spacers

Standard 4" spacers to provide at least 1" separation between ducts

2.4.3. Caps

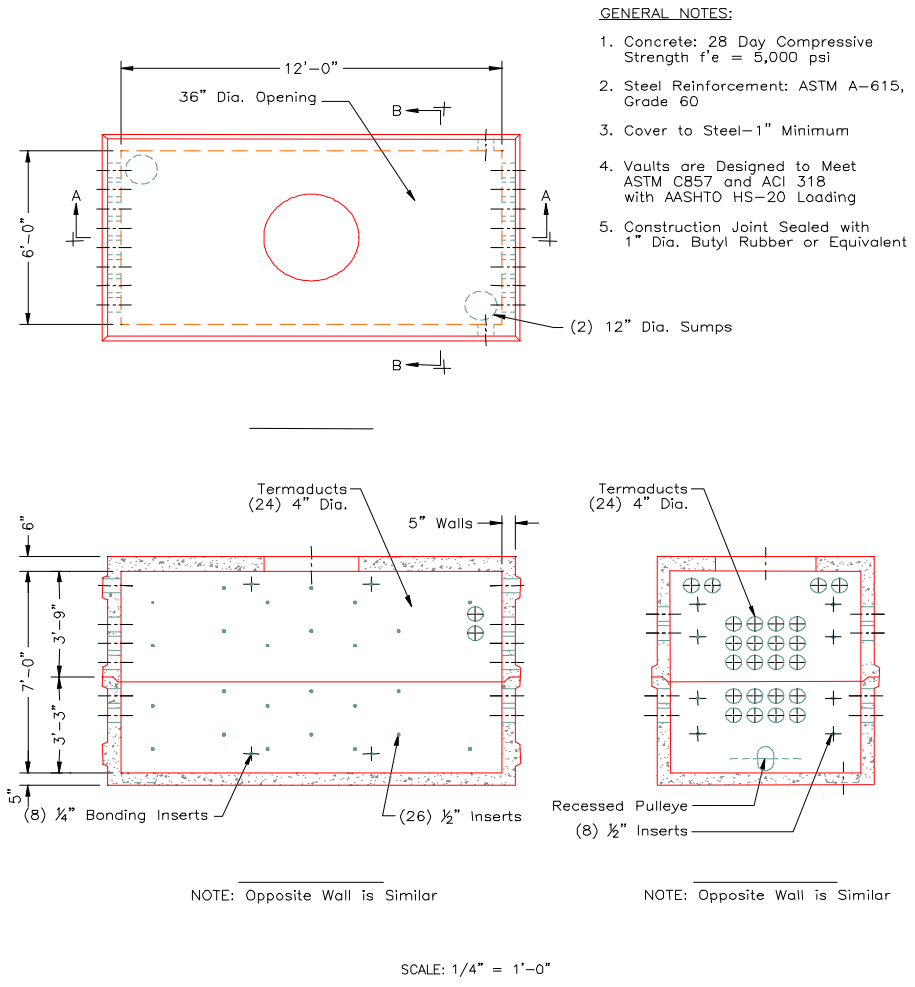
Standard Universal Plugs with rings to tie pull ropes and provide protection and support to unterminated ducts.

03/04/22

Verizon Telecommunications Specifications

3. Drawings/Attachments

3.1. 38Y-1 Manhole



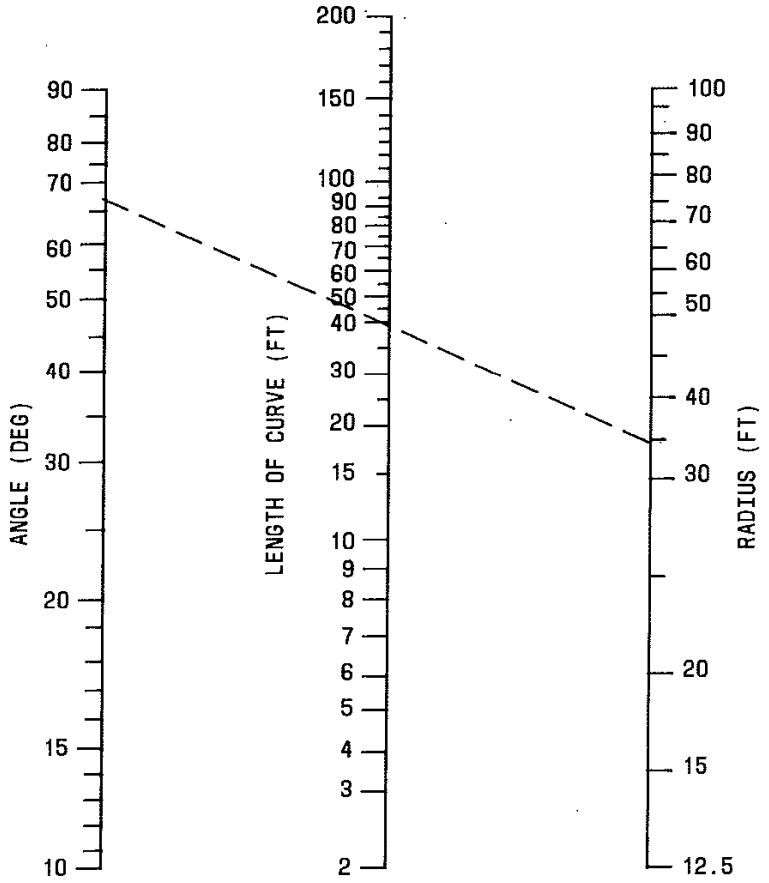
03/04/22

CONDUIT
Curve Design

CURVE DESIGN

Practice 919–240–100

The length of a curve can be found using the following nomogram. (Example: The length of a 64–degree, 35–foot radius curve is 40 feet.)



Subsidiary Conduit

Plastic Conduit. Curves are formed using rigid bends (see Pages 8–21).

Steel Pipe. Bends are formed on the job site using a portable pipe bender (see Practice 622–315–200).

CONDUIT
Curve Design

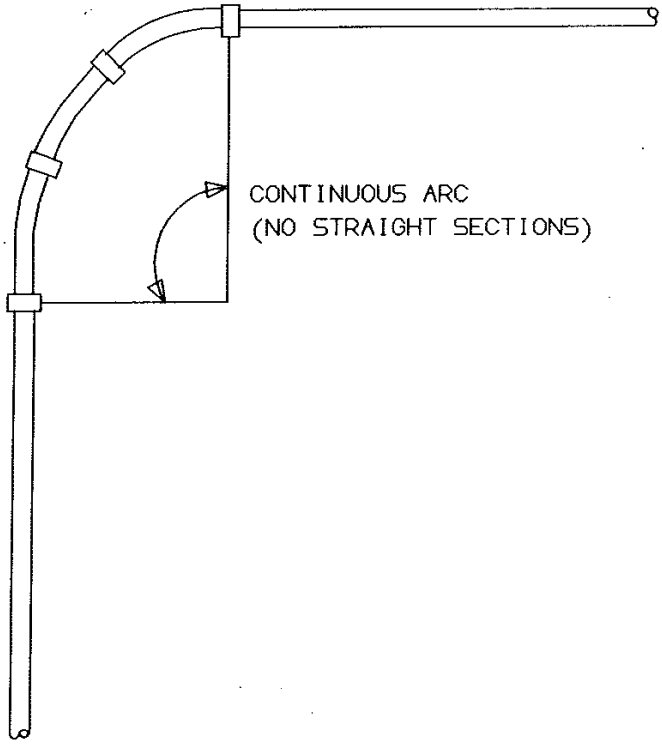
Single–Bore Conduit

Curve Radius 40 Feet or More

Plastic Conduit – Manually bend straight conduit. Conduit must be firmly anchored in trench.

Curve Radius Less Than 40 Feet

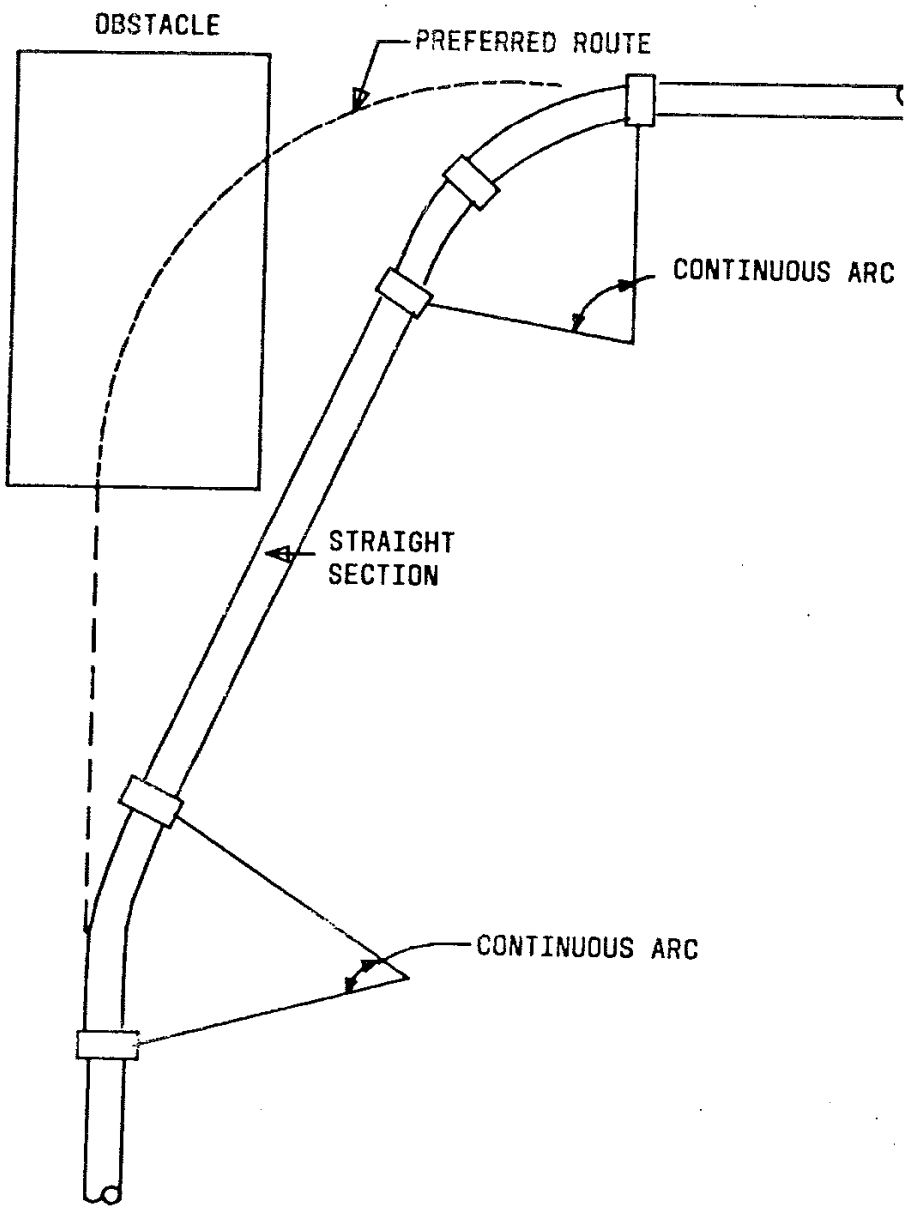
Construct curve in one continuous arc, if possible, using rigid bends without interspersed straight sections, as illustrated below.



For plastic conduit use 15–foot radius bends (7 or 30 degrees, as required. Rigid bends are described on Pages 8–20.

If an obstacle prevents construction of the curve in a single arc, use two arcs connected by a single straight section, as illustrated on Page 8–18.

CONDUIT
Curve Design



8–18

CONDUIT AND PIPE

Practice 919–240–400

Factors to Consider in Selecting Type of Conduit

- Material cost and local availability
- Ease of handling
- Ease of joining
- Concrete encasement and backfill requirements
- Soil conditions
- Special conditions (e.g., heat, gas, heavy loads, limited cover).

Advantages of Single–Bore Conduit:

- Lightweight: mechanical handling equipment not required
- Good joint integrity
- Strong, stable structure (if concrete–encased)
- Easily rearranged to avoid obstacles
- Can be pneumatically rodded.

Advantages of Multiple–Bore Conduit

- Long trench openings not required
- Select backfill not required
- Ready–mixed concrete not required.

CONDUIT
Conduit and Pipe

Single–Bore Conduit

Practices 622–020–100, 919–240–400

Straight lengths of single–bore conduit are available as follows:

Material	Length (Ft)	Weight (Lb/Ft		
		Type B	Type C	Type D
Plastic	20*	0.6–1.0	1.0–1.5	1.2–1.7

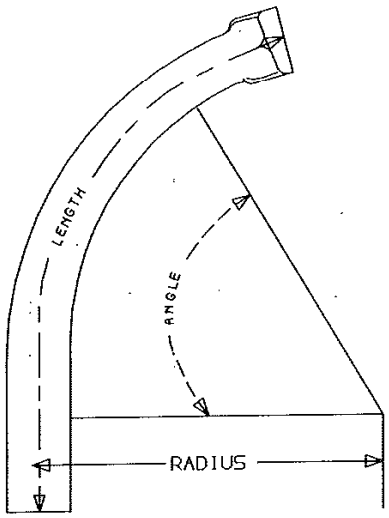
* Longer and shorter lengths available from manufacturer.

Type B (thin wall) requires concrete encasement.

Type C (thick wall) may be buried with selected backfill in straight runs.

Type D is ultraviolet (sunlight) and flame–resistant.

Rigid bends for single–bore conduit are illustrated and listed below.



PLASTIC

RIGID BENDS FOR 4-INCH SINGLE-BORE CONDUIT

Material	Angle (Degrees)	Radius (Feet)	Length (Feet-Inches)
B, C, or D Plastic	7	15	2-4
	30	15	8-4
	30	12	6-9
	45	9	7-7
	45	6	5-3
	45	3	2-10
	90	3	5-3
E Plastic*	90†	3	6-0
	64	3	3-10

* Replaces cast iron for subsidiary conduit.

† Also available in split form for repairs.

For adapters and couplings, see Practices 622-020-100 and 919-240-400.

CONDUIT
Conduit and Pipe

STEEL PIPE

Practice 919–240–400

Steel pipe is used where conduit must be pushed or jacked, where environment is too severe for other conduit, and for submarine crossings. Standard weight pipe is available in the following sizes:

Nominal Size	Plain End		Bell End	
	OD (In.)	ID (In.)	OD (In.)	ID (In.)
1	1.315	1.048	—	—
1-1/2	1.900	1.610	—	—
2	2.375	2.068	—	—
3	3.500	3.068	3.50	3.06
3-1/2	4.000	3.548	4.00	3.54
4	4.500	4.026	4.50	4.02

PLACEMENT

Duct Arrangements

Duct Arrangements are subject to trench width and/or depth constraints imposed by terrain, the presence of other structures, required workman space, etc. The arrangement of ducts in a conduit run should be compatible with the manhole cable racking arrangement. (Refer to "Manholes" later in this section.) Generally, 2–, 3–, or 4–wide arrangements are preferred for single– or double–wall racking. Where a large number of ducts or other circumstances require center racking as well as wall racking, wider duct arrangements may be appropriate.

Separation From Other Structures
Practices 622–100–010, 622–300–205, NESC Rule 320, 919–000–100

The following separations are required for safety of personnel and for protection of telephone equipment:

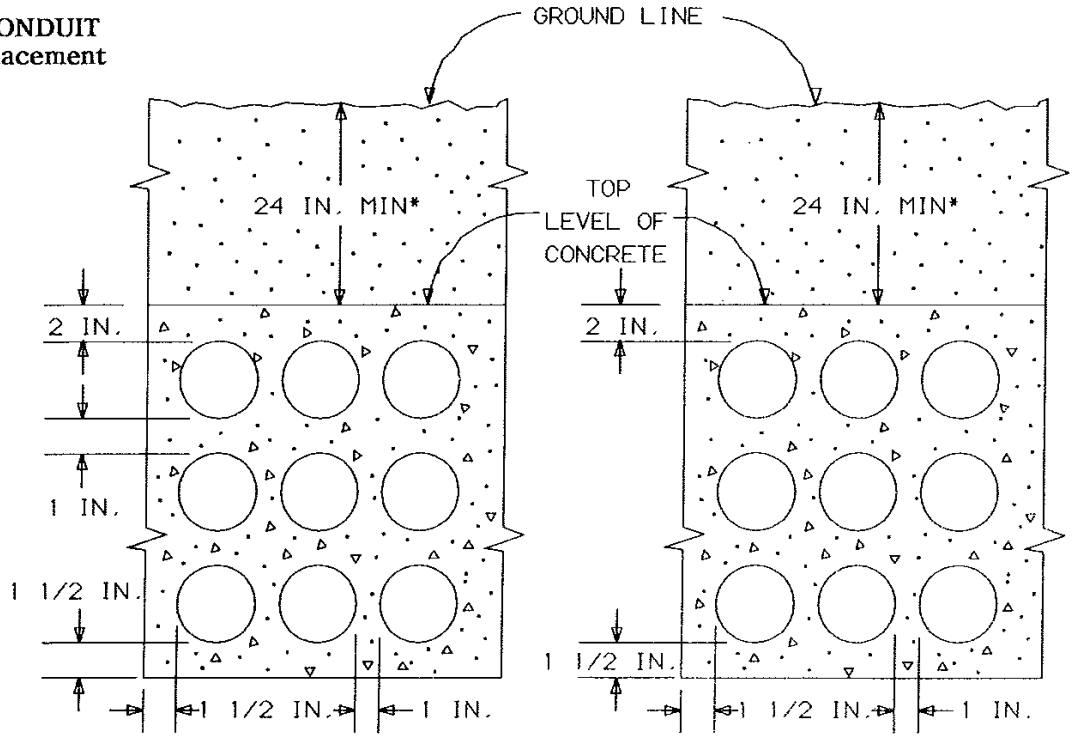
Structure	Minimum Separation
Power or other foreign conduit	3–inch concrete 4–inch masonry 12–inch earth
Pipes (gas, oil) water, etc.)	6 inches when crossing 12 inches when parallel
Power conduit terminated on poles	Separate poles, if possible. If same pole, preferably 180°, but, not less than 90° F.
Railroads (except street railways)	Crossing: 5 feet below top of rail.* Terminating on poles: 12 feet from nearest rail, except 7 feet as sidings
Street railways	3 feet below top of rail.*

*Exception: Where impractical, or for other reasons, these clearances may be reduced; however, the top of the conduit or conduit protection shall in no case extend above the bottom of the ballast section which is subject to working or cleaning. Local requirements will prevail.

Spacing and Backfill Requirements
622–020–020
914–240–100
Practice 919–240–400

The next three pages show spacing and backfill requirements for single–bore conduit. The volume of concrete or granular backfill will vary with the trench width and the degree of irregularity of the trench surfaces. Volumes given for each arrangement are for the minimum trench width consistent with the specified clearances. Volumes for sand or granular backfill include an allowance of about 1/12 for compaction.

CONDUIT
Placement



*18 IN. PERMITTED UNDER DRIVEWAYS, SIDEWALKS

CUBIC YARDS OF CONCRETE PER 100 FEET OF TRENCH

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.8	4.9
3-HIGH	5.2	6.6
4-HIGH	6.5	8.3

FOR LARGER FORMATIONS USE:

PLASTIC: .35WH + .35W + .28H

NOTE-OPTIONAL FOR STRAIGHT RUNS OF B PLASTIC.

SINGLE-BORE CONDUIT (ALL TYPES) ON CURVES

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.4	4.3
3-HIGH	4.2	5.4
4-HIGH	5.1	6.5

FOR LARGER FORMATIONS USE:

PLASTIC: 22WH + .48W + .23H

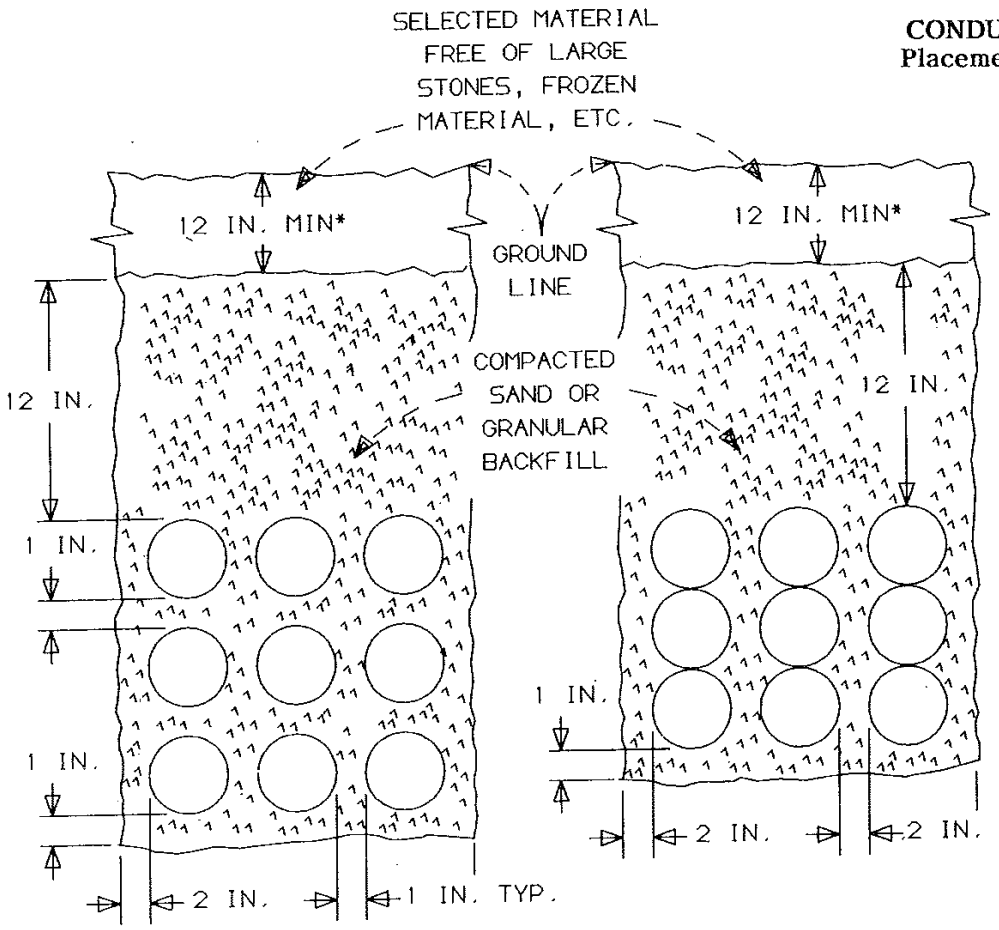
NOTE-LIMITED TO 3 TIERS PER POUR. REQUIRES LESS CONCRETE THAN METHOD USING VERT. SEPARATIONS

OPTIONAL ARRANGEMENT FOR B PLASTIC CONDUIT

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

8-24

CONDUIT
Placement



CUBIC YARDS OF SAND OR GRANULAR BACKFILL PER 100 FEET OF TRENCH

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	12
3-HIGH	11	14
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .38WH + 1.8W + 4H + 1

C PLASTIC CONDUIT,
STRAIGHT RUNS, ANY
NUMBER OF TIERS

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	13
3-HIGH	12	15
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

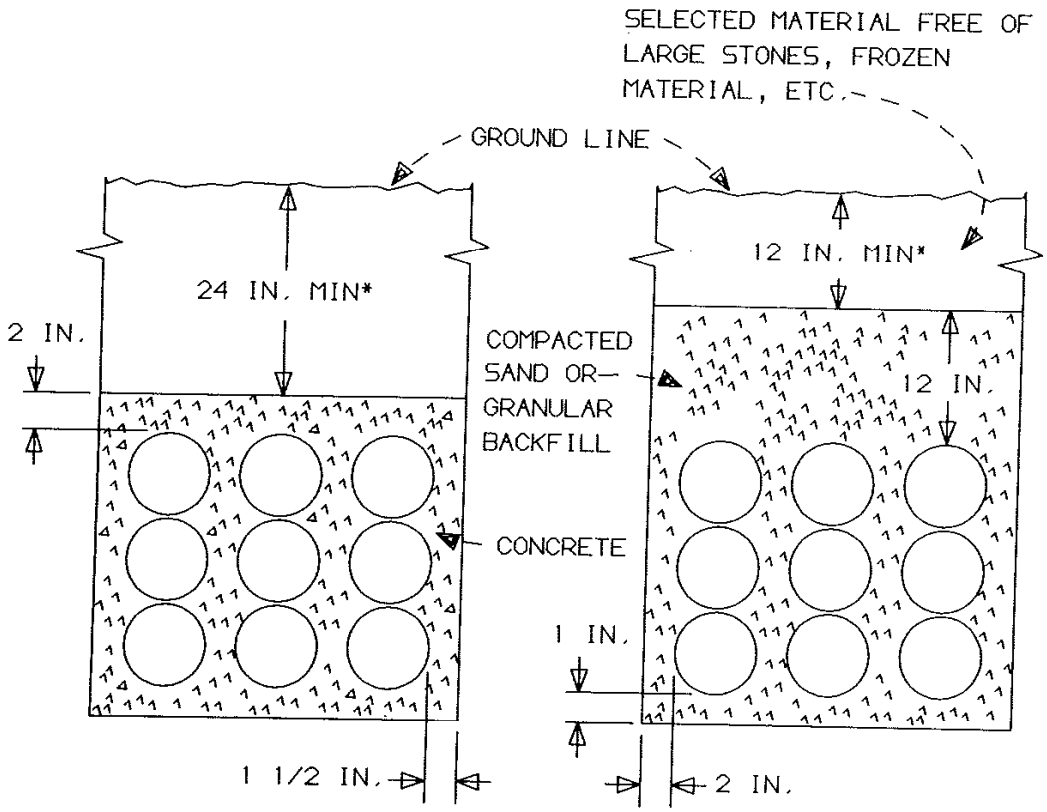
PLASTIC: .36WH + 2.3W + .2H + 7

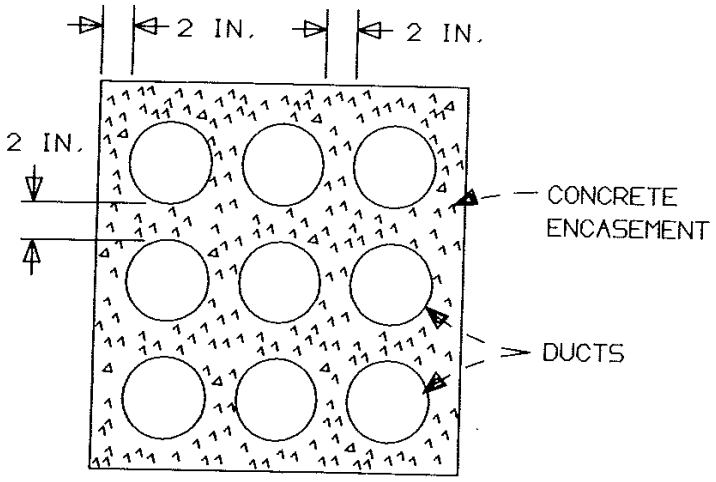
C PLASTIC CONDUIT,
STRAIGHT RUNS,
UP TO 4 TIERS

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

8-25

CONDUIT
Placement





SINGLE-BORE CONDUIT (ALL TYPES)
AT MANHOLE AND VAULT ENTRANCES

CONDUIT FORMATION

AT&T 622–020–020
914–240–100

CONDUIT FORMATIONS

No. Of DUCTS	Single Bore	Multiple Duct
4	2 Wide x 2 High	One, 4-duct
6	3 Wide x 2 High	One, 6-duct
8	4 Wide x 2 High	Two, 4-duct
9	3 Wide x 3 High	One, 9-duct
10	-	One, 6- duct and One, 4-duct
12	4 Wide x 2 High	Two, 6-duct or One, 12-duct (2)
15	-	One, 9-duct and One, 6-duct
16	4 Wide x 4 High	Four, 4-duct
18	-	Two, 9- duct
20	4 Wide x 5 High	Two, 6-duct and Two, 4-duct
24	4 Wide x 6 High	Four, 6-duct or Two, 12-duct (2)
28	4 Wide x 7 High	-
30	-	Five, 6-duct
32	4 Wide x 8 High	-
36	4 Wide x 9 High	Four, 9-duct (3 wide) and three, 12-duct (2)
40	4 Wide x 10 High	Four, 9-duct (3 wide) and One, 4-duct
Over 40 (1)	-	-

Note 1: Investigate center racking possibilities.
Note 2: 12-duct is available only in F and G concrete conduit.

CONDUIT
Placement

Subsidiary Conduit

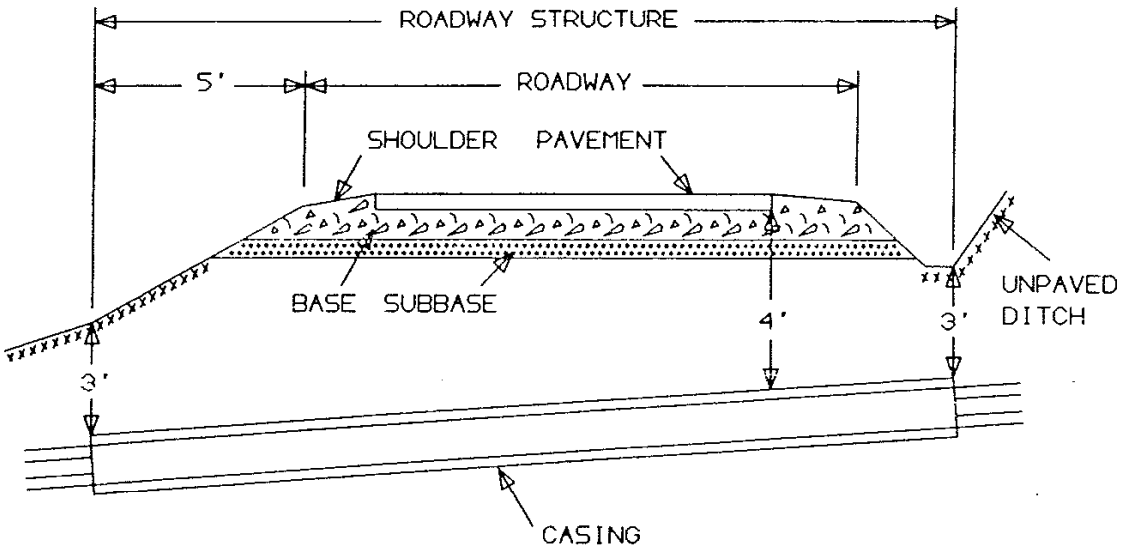
Practice 919–240–400

- Coordinate with builder regarding termination of conduit in a building.
- Use steel pipe or plastic conduit.
- Place in same trench with main conduit, if practicable, and on top of main formation.

Conduit Casings

Practices 919–000–100, 919–240–510

Steel casing pipe is recommended for housing underground conduit under railway and highway crossings. The casings are bored under the crossing to eliminate interference with traffic. Steel casings are also recommended as a supporting structure for conduit placed in unstable soil. Typical installations under a highway and railroad are shown below and on Page 8–29.

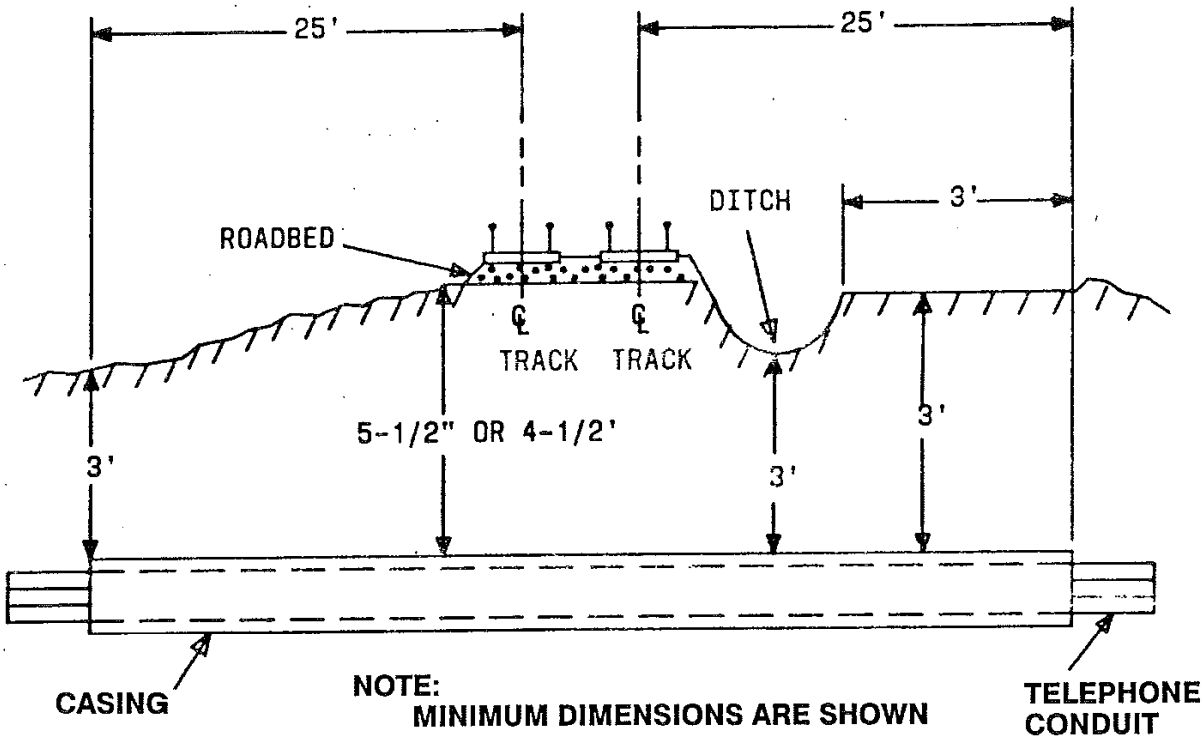


NOTE: MINIMUM DIMENSIONS ARE SHOWN

8–28

Conduit Casings Under Highways

CONDUIT
Placement
Casings



Conduit Casings Under Railroads

Note: Design runs to avoid conduit failure due to shearing at junction between casing and regular conduit run, which may result from a difference in settlement rates between casing and regular conduit. Local requirements will prevail.

CONDUIT
Placement
Casings

The table below lists the duct capacity of standard size casings.

STEEL CASING PIPE — DUCT CAPACITY

Standard Casing OD (Note 1)	Duct Capacity (Max)	
	Bundled Formation (Note 2)	Spaced Formation
12	3	3
16	4	4
18	7	4
20	7	7
24	10	10
30	19	19
36	—	24
42	—	37
48	—	44

Notes:

1. Casings with 22-, 26-, 28-, 34-, and 38-inch diameters are nonstandard sizes and should be avoided.
2. More than 19 ducts in the bundled formation are not recommended and may result in severe deflection of the bottom ducts when top ducts are filled.

The wall thickness of the casing pipe is dependent on several factors such as the live or dynamic load from vehicular traffic, the dead or earth load, and the diameter of the casing used (see table on Page 8–31). The dynamic load is dependent on the type and weight of the vehicle, the type of roadbed, and the depth of the casing. The earth load is dependent on the composition of the soil and the depth of the casing. Dynamic loads decrease and earth loads increase with casing depth.

STEEL CASING WALL THICKNESS	
Nominal Wall Thickness (Inches)	**Nominal Casing Diameter (Inches)**
0.188	under 14
0.219	14 to 16
0.250	18
0.281	20
0.312	22
0.344	24
0.375	26
0.406	28 to 30
0.438	32
0.469	34 to 36
0.500	38 to 48

Bridge Crossings

Practice 919–240–520

The diversity of bridge designs makes it impractical to prescribe a standard method of designing conduit on bridges. However, there are certain fundamentals which must be considered. These are covered in the above practice.

CONDUIT
Trench Work

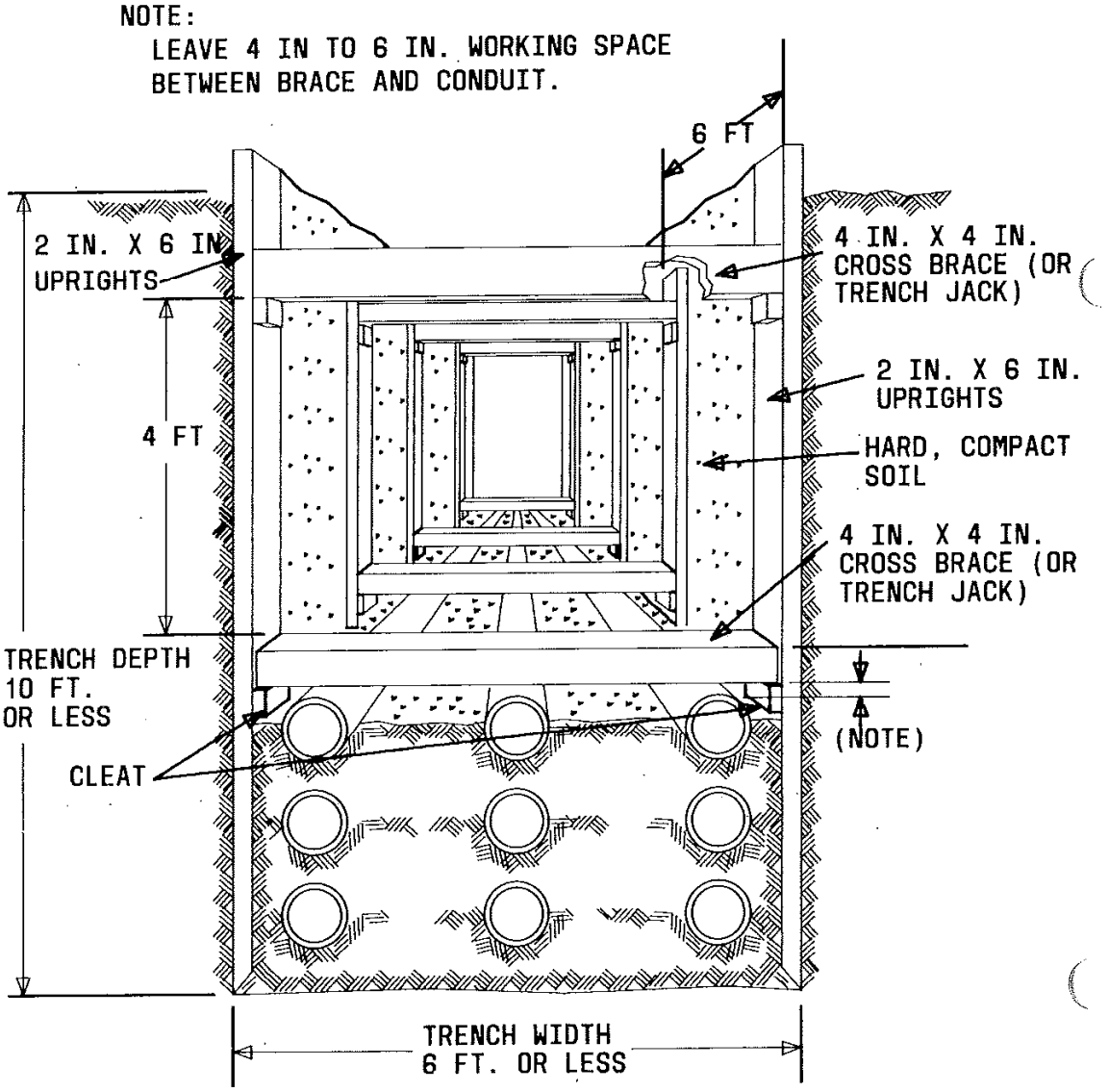
TRENCH WORK

Practice 622–020–020

The Occupational Safety and Health Act (OSHA) requires that all excavations deeper than 5 feet, wherein a craft person is required to enter and work shall have walls shored, sheeted, braced, or otherwise supported unless the excavation is in solid rock, hard shale, hard slag, or where the sidewalls are cut to a slope of 1 foot horizontally for each 2 feet or rise. Typical shoring arrangements are shown as follows.

Trenches less than 5 feet deep should be shored if they constitute a hazardous work location. Someone shall be stationed on the surface to keep the persons in the excavation in sight at all times.

Minimum shoring requirements are shown on the next page.



CONDUIT
Trench Work

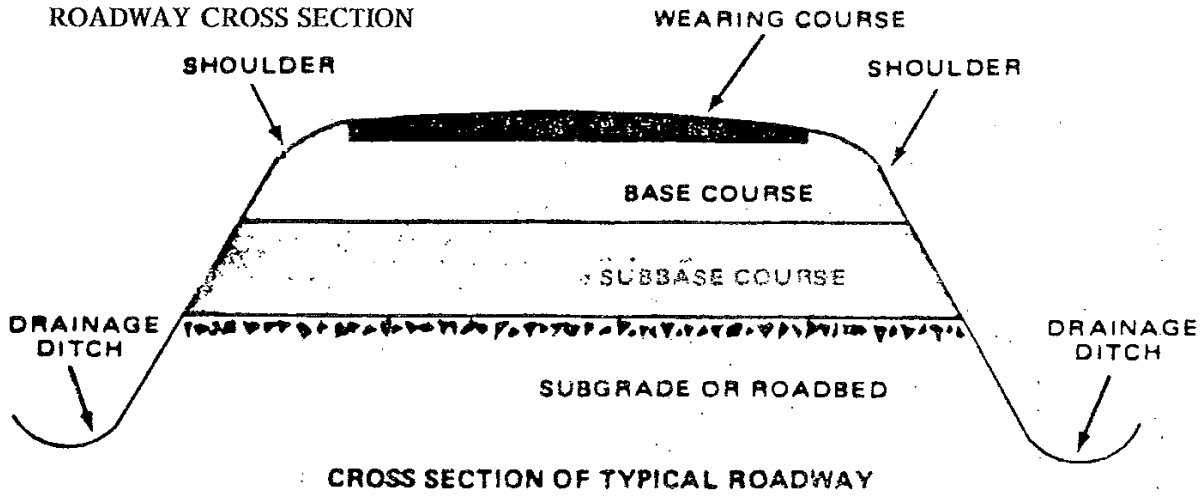
TRENCH SHORING — MINIMUM REQUIREMENTS
(Wood Member Dimensions in Inches)

Trench Depth (Ft)	Soil (Note 1)	Uprights		Stringers (Note 2)	Cross Braces for Trench Width up to: (Note 3)			
		Size	Spacing (Ft)		6 Ft	9 Ft	12 Ft	15 Ft
5 to 10	A	3 × 4 or 2 × 6	6	None	4 × 4	4 × 6	6 × 6	6 × 8
	B		3	4 × 6				
	C		Tight	4 × 6	4 × 6	6 × 6	6 × 8	8 × 8
	D		Tight	6 × 8				
10 to 15	A	3 × 4 or 2 × 6 or 3 × 6	4	4 × 6	4 × 6	6 × 6	6 × 8	8 × 8
	B		2	4 × 6				
	C		Tight	4 × 6	6 × 6	6 × 8	8 × 8	8 × 10
	D		Tight	8 × 10				
15 to 20	All	3 × 6	Tight	4 × 12	6 × 8	8 × 8	8 × 10	10 × 10
>20	All	3 × 6	Tight	6 × 8	8 × 8	8 × 10	10 × 10	10 × 12

Notes:

1. Soil type or condition: A — Hard, compact
   B — Likely to crack
   C — Soft, sandy, or filled
   D — Hydrostatic pressure.
2. Stringer spacing = 4 ft.
3. Cross braces spaced 4 ft vertically, 6 ft horizontally. Trench jacks may be used in lieu of, or in combination with, cross braces.

CONDUIT
Roadway Cross Section



CROSS SECTION OF TYPICAL ROADWAY

NOTE: ROADWAY MAY HAVE ANY COMBINATION OF THE ABOVE COURSES.

Wearing Course

The top layer of material wears off a roadway. It provides a waterproof surface to improve surface drainage and afford protection for the underlying layers against weathering and the abrasive action of traffic. Wearing courses can be classified into two categories:

A. Flexible Type: This type has little "beam" strength. It does not distribute load over the subgrade by its flexural resistance but depends upon the sheer strength of the base and surfacing. Flexible wearing courses may be further classified as follows:

- Intermediate Types: Those in which liquid bituminous materials are used as the binder.
- High Types: Which use asphalt cements and the heaviest grades of tar.

Flexural Type pavement mats are made up of a combination of the following types of coats:

- Prime Coat: A light application of liquid bituminous material used to bind together surface particles and to furnish a bond between the foundation surface and the applied bituminous mat.
- Tack Coat: A light application of liquid bituminous material used as the initial surface treatment to provide a thorough bond between two courses (i.e., the new bituminous mat and concrete pavements, old brick roads, previously treated bituminous surfaces, etc.).

CONDUIT
Roadway Cross Section

Wearing Course –

- Bituminous Mat: Describes such application or construction which increases the thickness of the wearing course one inch or more.

- Seal Coat: An application of bituminous material followed by a cover of sand or stone chips applied to a new or old pavement which will improve visibility and skid resistance.

B. Rigid Type: This type of pavement includes plain and reinforced Portland cement concrete slabs. With relatively small depths, this type of pavement can transmit wheel loads upon the subgrade by virtue of its flexural strength and load transfer capacity in shear.

Rigid Type pavements are usually made from a cement paste called Portland Cement which combines with water in a chemical reaction called hydration. The resulting paste hardens over a considerable period of time. The adhesive qualities of the past form a strong bond with the aggregate particles to bind them firmly together forming the rock–like structure called concrete. This structure may or may not contain reinforcing such as rebars and/or wire mesh. The hydration of Portland cement can be accelerated (Rapid Curing) by the addition of about 2% calcium chloride by weight of cement. This acceleration is important where concrete is placed in cold weather or where high early strength is required. Agents are also available which will retard the hardening of concrete. This is important in hot weather when the curing is accelerated.

BASE COURSE

The strata of material directly beneath the wearing course. Its purpose is to provide a uniform and non–yielding support for the wearing course and to transfer and distribute traffic wheel loads evenly upon the subgrade. Thickness of this course is generally 5 to 8 inches and is generally made up of the following types of materials: gravel, crushed gravel, crushed rock.

SUB–BASE COURSE

The strata of material found directly beneath the base course and above the subgrade material. Its purpose is to bring the sub–grade material to fairly uniform strength characteristics so that the thickness of the more costly base course can be reduced. It is important that the sub–base have greater stability and bearing power than the sub–grade material that it is to protect.

SUB–GRADE

The bottom layer of material usually composed of existing surface top soil. This course provides for adequate foundation support of the roadway and loads.

8–35

CONDUIT
Roadway – Definitions

ROADWAY DEFINITIONS

Gravel

The coarse granular material, larger than sand, resulting from the natural erosion of rock.

Sand

The fine granular material (usually less than ¼" in diameter) resulting from the natural disintegration of rock, or from the crushing of friable sandstone rocks.

Silt

A soft impalpable sediment such as that commonly found in streams or lakes that not only has a fineness of texture but also is weak and unstable as a construction material.

Clay

A material which has a finer particle size than silt and is extremely cohesive and plastic. As indicated above in silts, clay is also weak and unstable as a construction material.

Mixed Soils

A soil composed of two or more of the above 4 classifications.

Washed Aggregate

Natural deposits of sand and gravel usually contain some clay or silt plus injurious amounts of organic coatings on the individual particles which will reduce their usefulness as a construction material. This extraneous material can usually be removed by a process of screening (passing through selves) and washing.

Slump Test

A test designed to measure the consistency of a concrete mix by placing a representative sample into a standardize cone in three equal layers. Each layer is rodded 25 times each. The surface of the top layer is struck off so that the cone is exactly filled. The mold is removed in a vertical direction and the slump (in inches) is measured.

Plant Mix

Asphalt pavement mixed at a mixing plant.

ROADWAY DEFINITIONS – (Cont'd)

Road Mix

Asphalt pavement which can be mixed and placed on the roadway.

Hot Mix, Hot Laid, Cold Mix, Cold Laid

Hot laid mixtures are both mixed and laid hot, whereas the cold laid mixtures may be mixed either hot or cold, but are placed at atmospheric temperatures.

MIX CHARTS

LAY DOWN THICKNESS	MIX NAME	USE	- CONTENTS % - LIQUID ASPHALT	SAND	- INCH STONE - 1/4	3/8	5/8	3/4	FILLER
4"-6"	PLANT MIX	BASE	2.8	5.8	5.8	7.8		77.8	
2"-6"	STABLIZED BASE	BASE	4.5	34.4	8.6	11.4		38.2	2.9
2"-6"	BINDER	INTERMEDIATE COURSE	4.5	34.4	8.6	13.4		38.2	0.9
2"-4"	MABC	TOP	5.2	36.1	8.5	33.2	14.2		2.8
1"-3"	FABC	TOP	5.7	42.4	17.0	32.1			2.8
1"	S.P.	FINE TOP	7.5	65.7	25.0				1.8
1/2"	SHEET	EXTRA FINE TOP	10.0	85.0					5.0
2"	WINTER MIX	TEMP. PVMT.	6.0	42.1	17.0	32.1			2.8

CONDUIT
Manholes

MANHOLES

Practices 622–500–011, 919–240–300

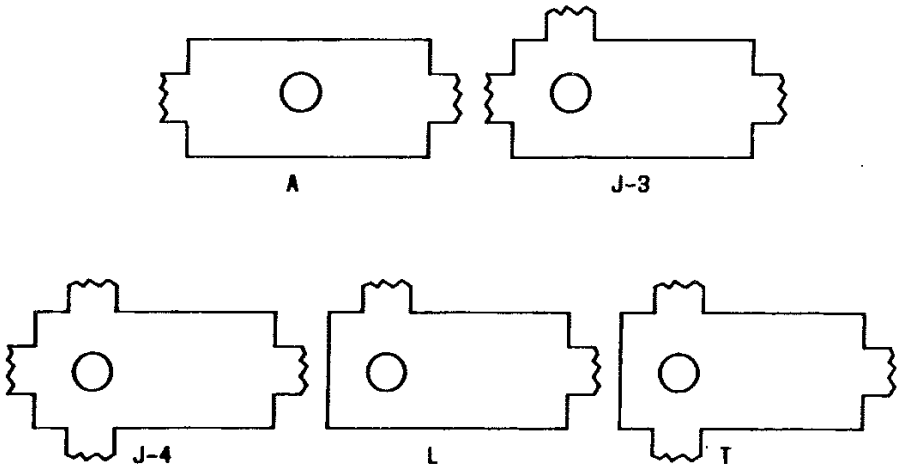
Planning and Design Considerations

- Locate manhole to make optimum use of the connecting conduit structure for cable–placing operations.
- Use precast manholes wherever possible for economy, uniformity, quality control, and quick installation.
- Use cast–in–place construction when: (a) required manhole size exceeds range of precast manholes, (b) obstructions prevent use of precast manholes, (c) manhole is to be rebuilt, or (d) nonstandard designs are required.
- Size manhole for ultimate duct requirements.
- Plug all ducts to minimize entry of water into manholes.

Sizes and Types of Manholes

Basic Manholes

Basic manholes are designated A, J–3, J–4, L, and T, according to the directions in which ducts enter and leave the manhole, as illustrated below.



Sizes

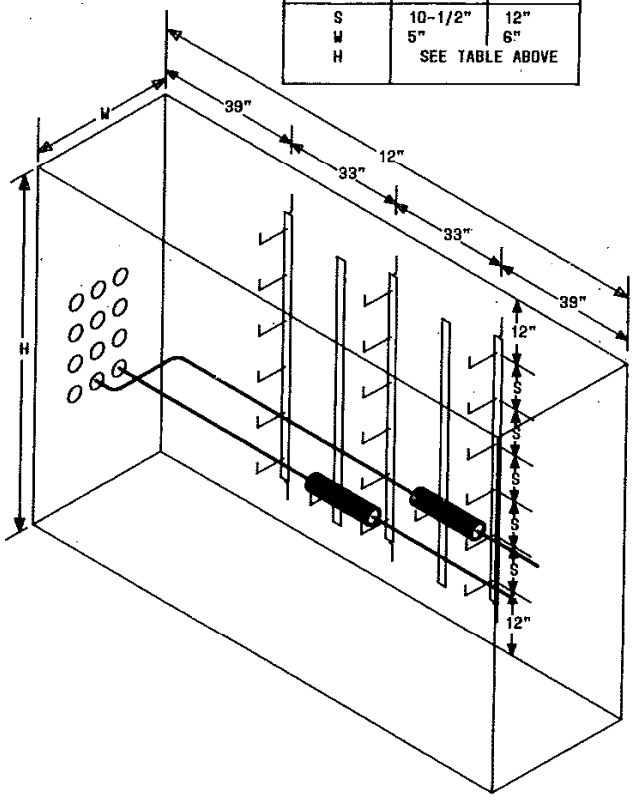
Recommended dimensions of basic manholes are shown below. These sizes allow racking space to accommodate one stub for every four main cables. The ultimate number of main cables must be distributed equally among all racking positions.

BASIC MANHOLE INSIDE DIMENSIONS

Type of Racking	Ultimate No. of Main Cables	Width (Ft)	Length (Ft)	Headroom (Ft)
Single	Any	5	12	7 plus one for every two cables in excess of 20
Double	Up to 20	6	12	7
	>20	6	12	7 plus one for every tier of ducts in excess of 20

CONDUIT
Manholes

DIMENSION	SINGLE-RACK	DOUBLE-RACK
S	10-1/2"	12"
W	5"	6"
H	SEE TABLE ABOVE	



Center Rack Manholes

When the planned cable capacity calls for a manhole of impractical or uneconomical depth, a wider and shallower cast-in-place manhole may be built and arranged for center racking as well as wall racking. A center rack manhole is essentially a double-width manhole with a center cable racking frame.

For the same depth and type of racking, a center rack manhole is twice as wide as a basic manhole and can accommodate twice as many main cables.

Precast Manhole

Practices 622–506–100, 919–24–300

Precast manholes are available with cast–in single or multiple plastic duct terminators to accept single–bore conduit. Thin concrete knockout sections may also be provided for terminating multiple–bore concrete conduit. The top section contains knockouts for subsidiary or lateral ducts.

Precast manholes for general use are listed below. Manholes for loading and carrier apparatus are listed below and on the next page.

PRECAST GENERAL USE MANHOLES

Basic Manhole Designation	Midsection Designation	Config-uration	Number of Sections	Inside Dimensions (Ft)			Capacity (Number of Main Cables)
				W	L	H	
38Y-4046-1 38Y-4046-3	— —	A J, L, T	2	6	12	7	20
38Y-4046-1 38Y-4046-3	38Y-4049-1 38Y-4049-3	A J, L, T	3*	6	12	10*	28
38Y-4046-1 38Y-4046-3	38Y-4050-1 38Y-4050-3	A J, L, T	3*	6	12	12*	36
38Y-4052	—	A	2	4	8	6	4†

*Including midsection.
†For splicing on light, secondary conduit runs or buried cable runs.

CONDUIT
Manholes

PRECAST CARRIER APPARATUS MANHOLES

Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions (Ft)			Carrier System	Capacity
				W	L	H		
38Y-4036-6	—	A	2	6	12	6-1/2	T2	2 dual-cable systems using 52-pair cables, or one dual-cable system using 104-pair cables
38Y-4036-7	—	Single-ended						
38Y-4046-1	—	A	2	6	12	7	T1, T1C	Dual 600-pair cables
38Y-4046-1	38Y-4049-1	A	3*	6	12	10*	T1, T1C	Dual 900-pair cables
38Y-4046-1	38Y-4050-1	A	3*	6	12	12*	T1, T1C	Dual 1200-pair cables
38Y-4046-4	—	A	2	6	12	7	T4M	One 22-tube coaxial cable
38Y-4046-4	38Y-4049-4	A	3*	6	12	10*	T4M	Two 22-tube coaxial cables
38Y-4052	—	A	2	4	8	6	T1, T1C	Four 475- or 479-type apparatus cases

*Including midsection.

PRECAST LOADING MANHOLES

Basic Manhole Designation	Midsection Designation	Configuration	Number of Sections	Inside Dimensions (Ft)			Capacity (Number of Coil Cases) (Note)
				W	L	H	
38Y-4046-1	—	A	2	6	12	7	4
38Y-4046-1	38Y-4050-1	A	3*	6	12	12*	10
38Y-4048	—	A	3	6	15	9	20
38Y-4048	36Y-4051	A	4*	6	15	12*	28

Note: Can vary depending on local practice
*Including midsection.

Seperation from other Structures:

Practice 622–100–100

Minimum reccommended speperation between telephone manholes and outside surfaces of foreign structures are as fellows: Electrical light, power or ther conduits, 3 inches. Pipes such as gas, water, oil mains; 6 inches when crossing and 12 inches when in parrallel.

FRAMES, COVERS, AND COLLARS

Practices 622–520–100, 919–240–300

For frames and covers, the 30–inch size is recommended for all applications and should be specified for use with precast manholes. Although 27–inch frames and covers are available, their use is not generally recommended, particularly where only one manhole opening is provided. It is easier to get into and out of the 30–inch size, especially with a blower or pump hose in the opening, and there is more room for placing apparatus into the manhole. **The 24–inch frame and cover should not be used in new construction.** Available frames and covers are listed below.

MANHOLE FRAMES AND COVERS

Type	Opening Dia. (In.)	Height of Frame (In.)	Remarks
A	27, 30	11	Has inner cover and sealing gasket; recommended for central office, carrier-equipped, loading, and critical junction manholes, or wherever a watertight or secured cover is required
SA	27, 30	5-5/8	Shallow version of A type
G	27, 30	10	Has 4 equally spaced 1-inch diameter holes in the frame flange to permit securing the frame to concrete collars and to 38Y manhole roofs. Used with both the G (nonlocking) and H (locking) covers.
SG	27, 30	5-5/8	Shallow version of G type. Same remarks as G type
R	27, 30	1-1/2	Used where not subject to vehicular traffic
D	30	1-1/2	Modified R with pentagonal head locking bolts
H	30	—	Covers only are equipped with two captive bolts with attached locking plates that engage the rim of either the G or the SG frame.

Caution: **For safety, use only one size frame on manholes with more than one opening.**

CONDUIT
Frames, Covers, and Collars
Duct Assignment and Cable Racking

A manhole collar provides a means for raising the manhole frame and cover to grade. Brick–and–mortar collars and concrete collars may be constructed to any height. Alternatively, the following precast concrete collars can be used, either alone or in combination, to attain the desired height for up to 10 feet of cover.

38Y PRECAST COLLARS		
TYPE	Height (in.)	Use
38Y-4039-1	5-1/2	Not a normal collar, but an apron designed to fit around the manhole cover at grade in unpaved areas to provide a solid, ground level work area.
38Y-4039-3 38Y-4039-9 38Y-4039-15	3 9 15	Used with any of the frames listed on table on page 8-40 except for D and R types. Can also be used under 38Y-4039-15R collar.
38Y-4039-15R	15	Includes a 30-inch R-type frame fabricated into collar. For use with R and D covers.

The above collars can be used with precast or cast–in–place manholes. At least one opening should be provided for manholes up to 12 feet in length, two openings beyond 12 feet in length, and three openings beyond 20 feet in length. The number of manhole openings required is doubled for center racked manholes.

Manhole Extension Rings

Practice 622–520–201

Pavement resurfacing operations sometimes necessitate the raising of manhole covers. This may be conveniently accomplished with manhole extension rings.

DUCT ASSIGNMENT AND CABLE RACKING

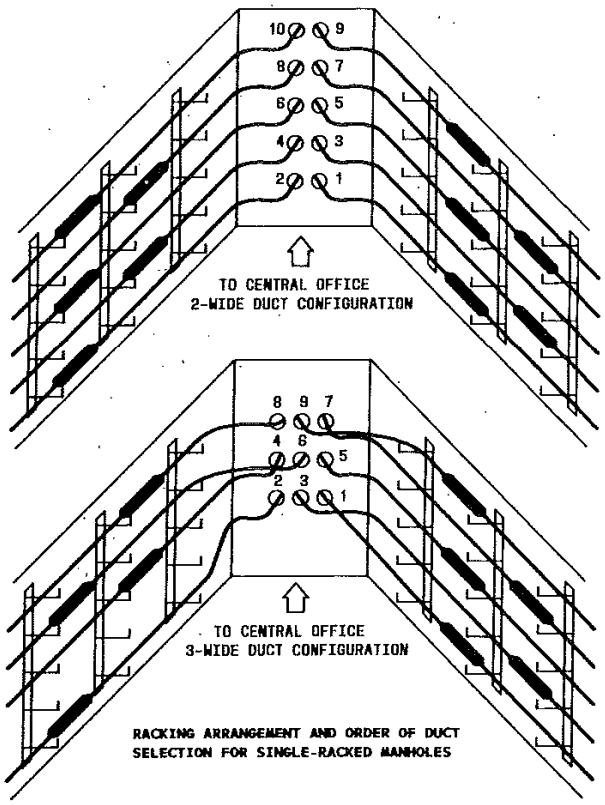
Practices 632–305–215, 919–240–300

Cable rack space should be used in the specified sequence to permit work on cables after placement and to preserve work space for splicing additional cables.

CONDUIT
Duct Assignment and Cable Racking

With double–racking arrangements, it is better to use all the outer (against the wall) rack spaces before using any inner (toward the center of the manhole) spaces. With either single or double racking, spaces should be used from the bottom up.

Ducts should be selected to avoid: (1) cable crossovers between the duct entrance and the cable rack, and (2) blockage of future access to vacant ducts. Racking arrangements and order of duct selection for line manholes are shown in the next two illustrations. For A–, L–, and T–type manholes, see referenced practices.

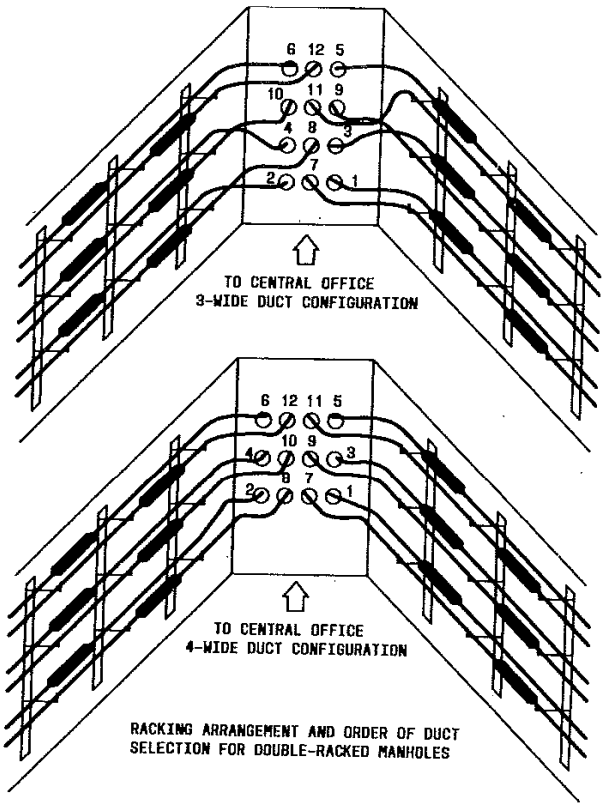


RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR SINGLE-RACKED MANHOLES

CONDUIT
Precast Manholes

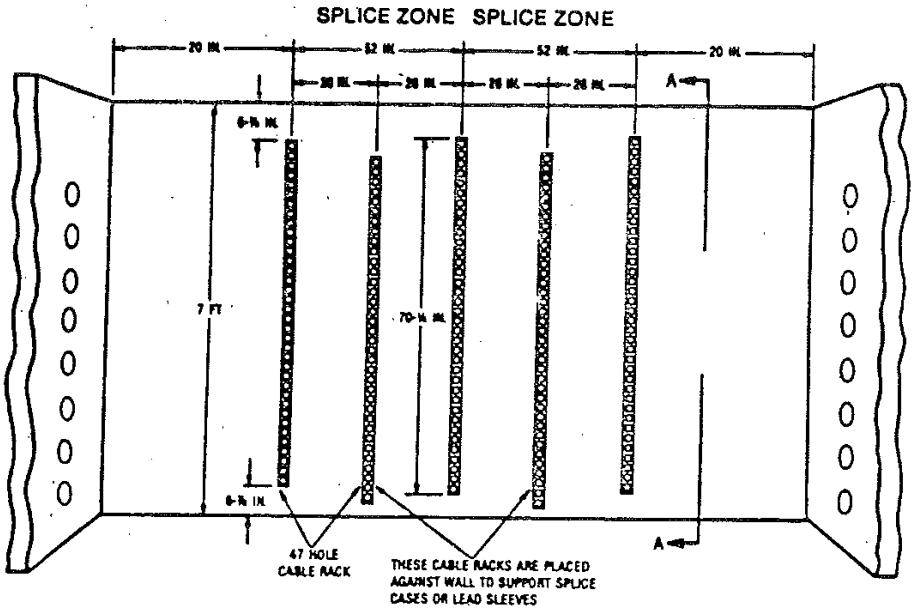
CABLE RACKS

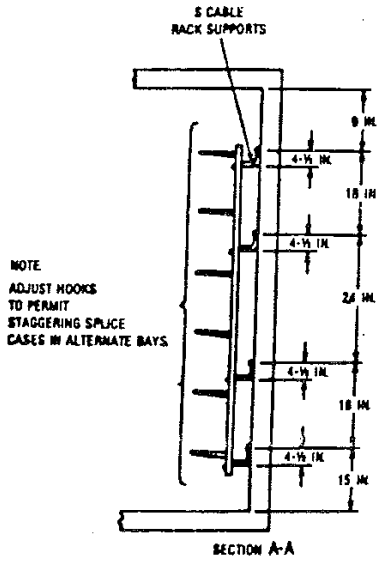
AT&T 622–520–100
919–240–300



RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR DOUBLE-RACKED MANHOLES

CABLE RACKS





NUMBER OF CABLE RACKS PER VERTICAL STRIP OF RACKS

HEAD ROOM	NUMBER OF RACKS			
	14 HOLE RACK	18 HOLE RACK	37 HOLE RACK	47 HOLE RACK
6 ft 6 in.				1
7 ft 0 in.				1
7 ft 6 in.		1	1	
8 ft 0 in.		1	1	
8 ft 6 in.		1		1
9 ft 0 in.		1		1
9 ft 6 in.	2		1	
10 ft 0 in.	2			1
10 ft 6 in.		2	1	
11 ft 0 in.		2		1

SIZE OF RACK	DISTANCE BETWEEN BOLT HOLES
8 Hook Holes	13-½ inches
14 Hook Holes	22 ½ inches
18 Hook Holes	28-½ inches
37 Hook Holes	18 and 24 inches
47 Hook Holes	18 and 24 inches

Cable Racks for

PLACEMENT

Duct Arrangements

Duct Arrangements are subject to trench width and/or depth constraints imposed by terrain, the presence of other structures, required workman space, etc. The arrangement of ducts in a conduit run should be compatible with the manhole cable racking arrangement. (Refer to "Manholes" later in this section.) Generally, 2–, 3–, or 4–wide arrangements are preferred for single– or double–wall racking. Where a large number of ducts or other circumstances require center racking as well as wall racking, wider duct arrangements may be appropriate.

Separation From Other Structures

Practices 622–100–010, 622–300–205, NESC Rule 320, 919–000–100

The following separations are required for safety of personnel and for protection of telephone equipment:

Structure	Minimum Separation
Power or other foreign conduit	3–inch concrete 4–inch masonry 12–inch earth
Pipes (gas, oil) water, etc.)	6 inches when crossing 12 inches when parallel
Power conduit terminated on poles	Separate poles, if possible. If same pole, preferably 180°, but, not less than 90° F.
Railroads (except street railways)	Crossing: 5 feet below top of rail.* Terminating on poles: 12 feet from nearest rail, except 7 feet as sidings
Street railways	3 feet below top of rail.*

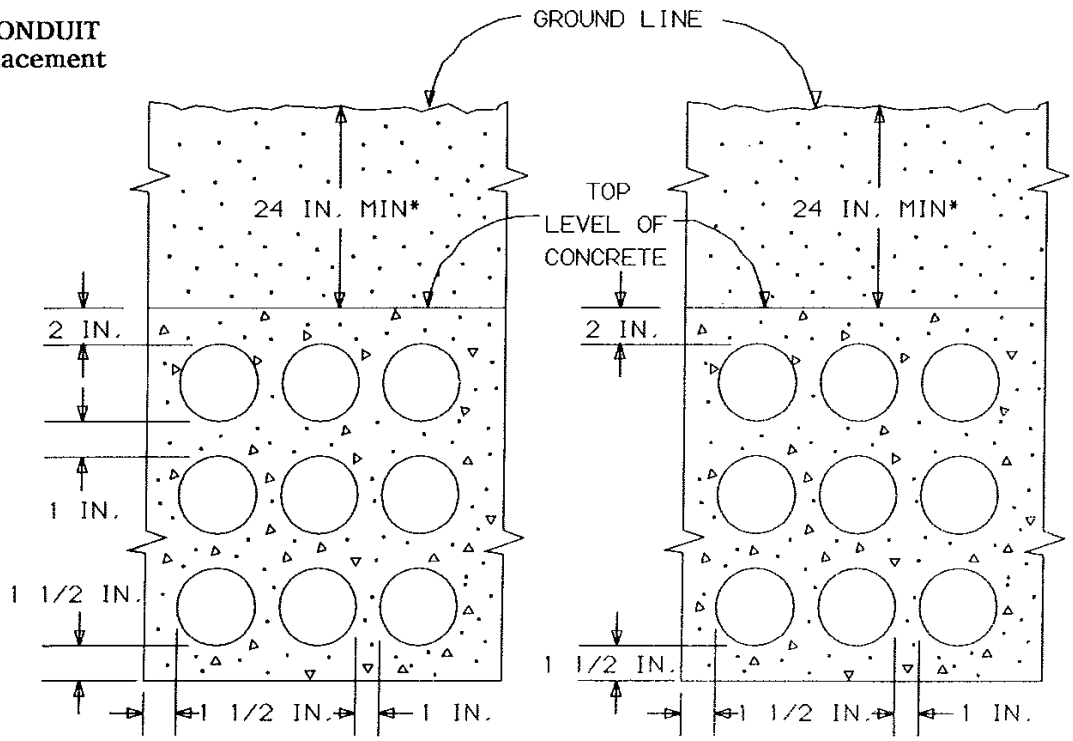
*Exception: Where impractical, or for other reasons, these clearances may be reduced; however, the top of the conduit or conduit protection shall in no case extend above the bottom of the ballast section which is subject to working or cleaning. Local requirements will prevail.

Spacing and Backfill Requirements

622–020–020
914–240–100
Practice 919–240–400

The next three pages show spacing and backfill requirements for single–bore conduit. The volume of concrete or granular backfill will vary with the trench width and the degree of irregularity of the trench surfaces. Volumes given for each arrangement are for the minimum trench width consistent with the specified clearances. Volumes for sand or granular backfill include an allowance of about 1/12 for compaction.

CONDUIT
Placement



*18 IN. PERMITTED UNDER DRIVEWAYS, SIDEWALKS

CUBIC YARDS OF CONCRETE PER 100 FEET OF TRENCH

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.8	4.9
3-HIGH	5.2	6.6
4-HIGH	6.5	8.3

FOR LARGER FORMATIONS USE:

PLASTIC: .35WH + .35W + .28H

NOTE-OPTIONAL FOR STRAIGHT RUNS OF B PLASTIC.

SINGLE-BORE CONDUIT (ALL TYPES) ON CURVES

	B PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	3.4	4.3
3-HIGH	4.2	5.4
4-HIGH	5.1	6.5

FOR LARGER FORMATIONS USE:

PLASTIC: 22WH + .48W + .23H

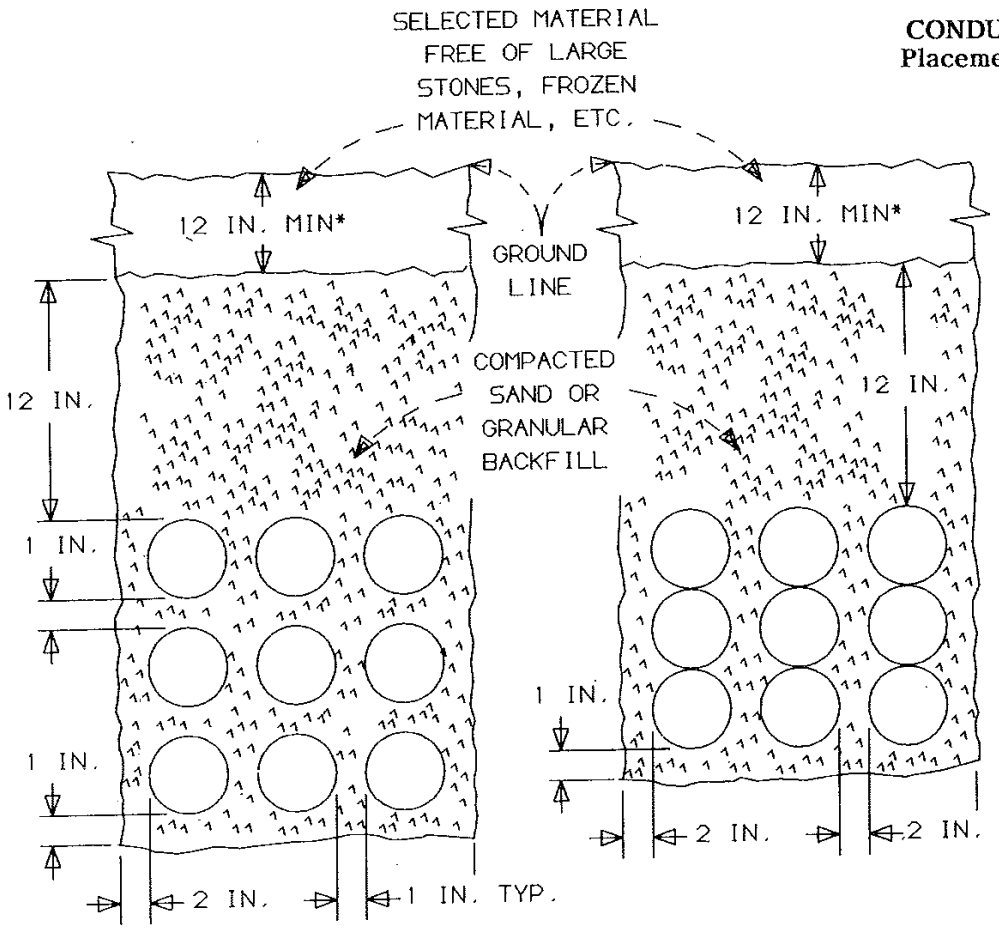
NOTE-LIMITED TO 3 TIERS PER POUR. REQUIRES LESS CONCRETE THAN METHOD USING VERT. SEPARATIONS

OPTIONAL ARRANGEMENT FOR B PLASTIC CONDUIT

(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

8-24

CONDUIT
Placement



CUBIC YARDS OF SAND OR GRANULAR BACKFILL PER 100 FEET OF TRENCH

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	12
3-HIGH	11	14
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .38WH + 1.8W + 4H + 1

C PLASTIC CONDUIT,
STRAIGHT RUNS, ANY
NUMBER OF TIERS

	C PLASTIC	
	3-WIDE	4-WIDE
2-HIGH	10	13
3-HIGH	12	15
4-HIGH	13	16

FOR LARGER FORMATIONS USE:

PLASTIC: .36WH + 2.3W + .2H + 7

C PLASTIC CONDUIT,
STRAIGHT RUNS,
UP TO 4 TIERS

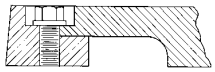
(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

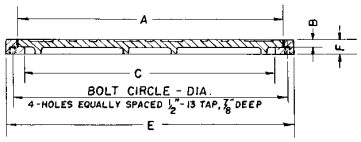
8-25

R-1749 Series
Telephone Design Large Manhole Frame, Solid Lid

Light Duty

Specify if security bolting required (2 per lid).





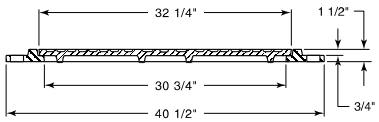
Dimensions in inches

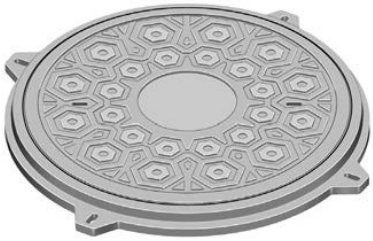
Catalog No.	A	B	C	E	F	Anchor Bolt Circle
R-1749-A	29 1/4	3/4	27 3/4	32	1 1/2	30-1/2
R-1749-B	32 1/4	3/4	30 3/4	35	1 1/2	33-1/2

R-1749-B1
Manhole Frame, Solid Lid

Light Duty

Furnished with four 3/4" x 1" anchor slots on 37" diameter bolt circle.





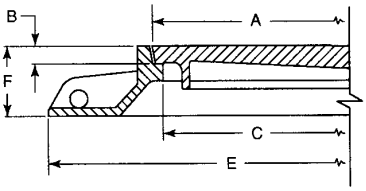
R-1750 Series
Telephone Design Large Manhole Frame, Solid Lid

Heavy Duty

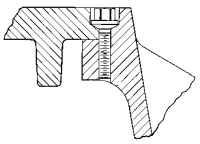
Furnished with machined horizontal and vertical bearing surfaces.

Covers can be bolted to frame with two pentagon head special monel security bolts upon request.

Wrenches available to fit special bolt at extra cost. Advise quantity required.



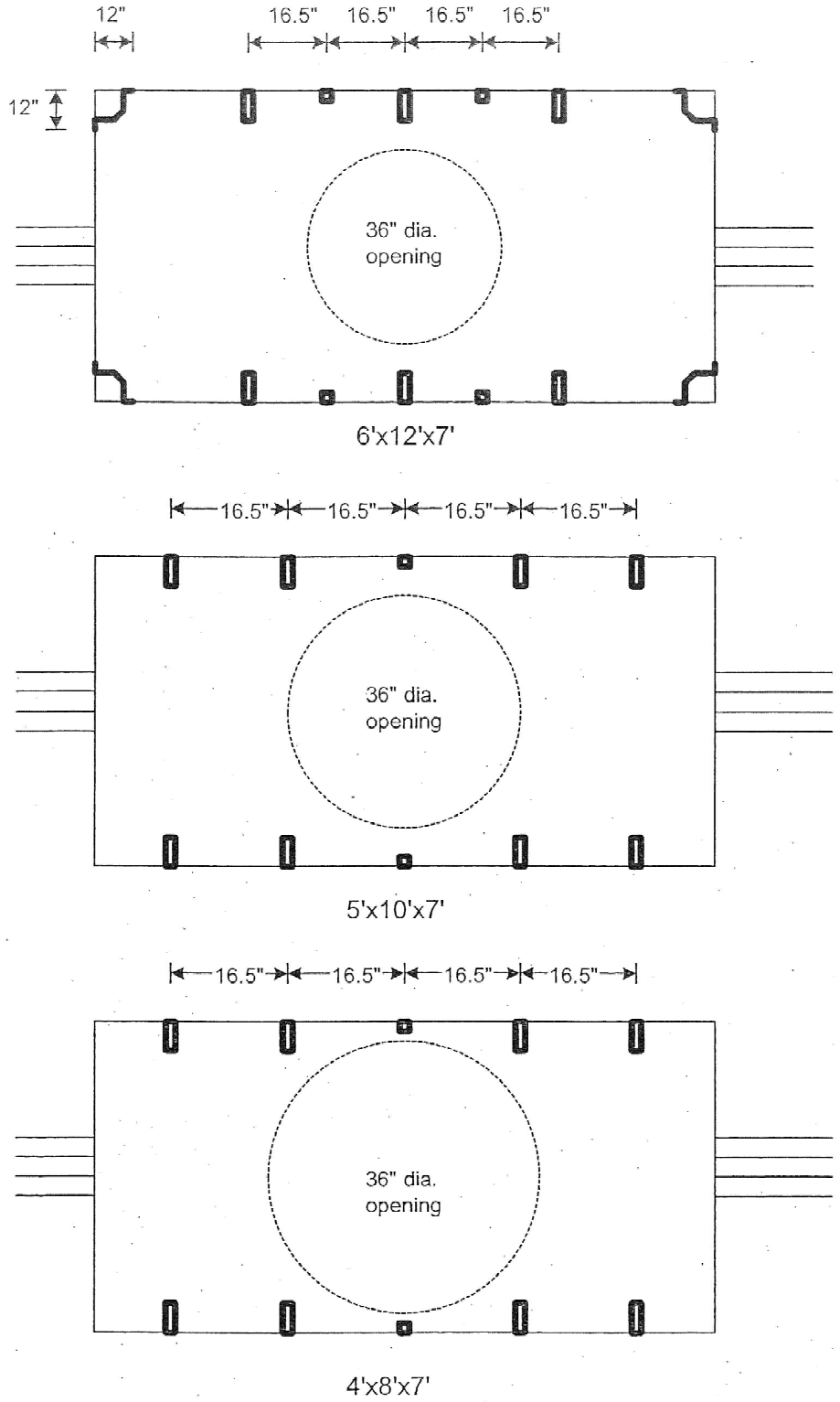
Illustrating R-1750-B



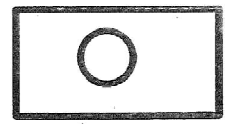
Dimensions in inches

Catalog No. Standard	Catalog No. Security Bolted	A	B	C	E	F	Anchor Bolt Circle*	Grate Alt.
R-1750-A	R-1750-AB	26	1 3/8	24	43	10		R-2300
R-1750-B	R-1750-BB	29	1 3/8	27	46	10	43-1/2	R-2290
R-1750-B1	R-1750-B1B	29	1 3/8	27	46	5 5/8	43-1/2	R-2290-A
R-1750-B2	R-1750-B2B	29	1 3/8	27	46	3 1/2	43-1/2	
R-1750-C	R-1750-CB	32	1 3/8	30	49	10	43-1/2	
R-1750-C1	R-1750-C1B	32	1 3/8	30	49	5 5/8	43-1/2	
R-1750-C1S	R-1750-C1SB	32	1 3/8	30	46	5 5/8	43-1/2	R-2750
R-1750-CS	R-1750-CSB	32	1 3/8	30	46	10	43-1/2	R-2255

* Furnished standard with four 1" diameter holes in base flange, equally spaced.



PLAN LEGEND



MH 1
W'xL'xH'

Manhole dimensions as given on plans are inside dimensions. Typical sizes are:
6'x12'x7'
5'x10'x7'
4'x8'x7'
(Size is dictated by cable sizes and amount of splicing expected at the location)

B cable rack support

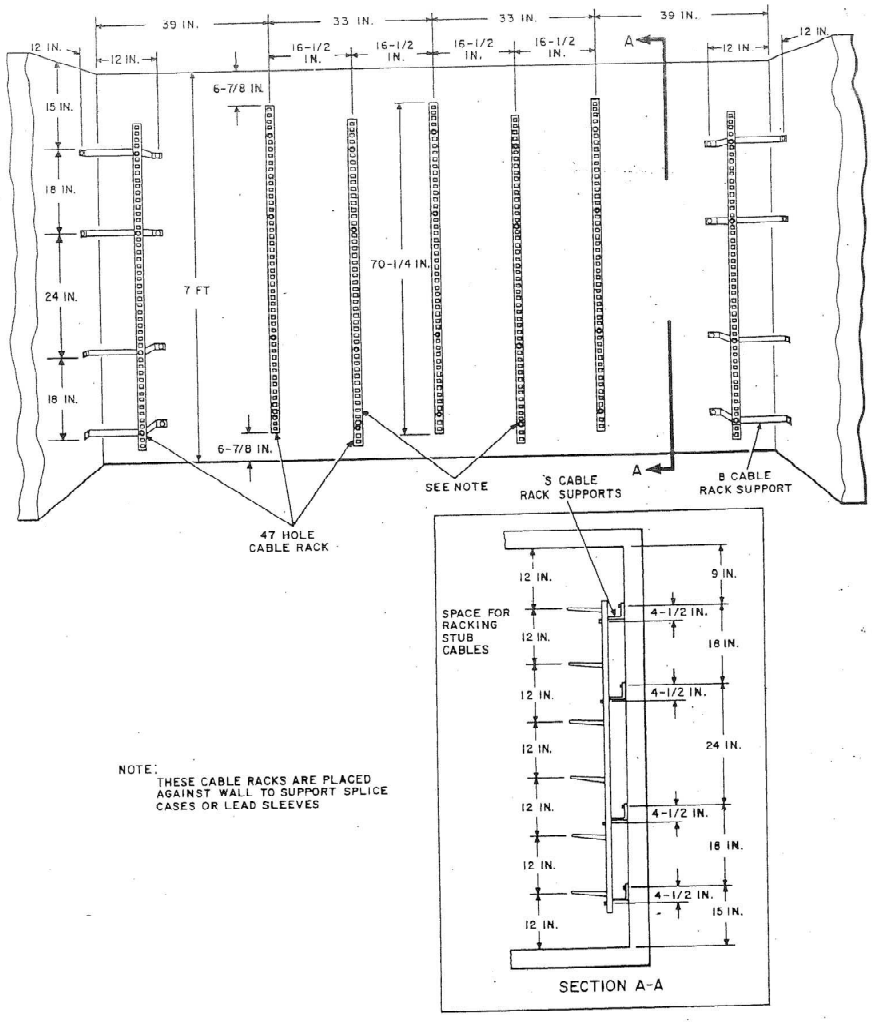
cable racks secured to S cable rack support

cable racks attached directly to wall

(See included practices for description of cable racking hardware.)

MANHOLE DETAILS

Proposal No. 608742-132267
ADDENDUM NO. 1, OCTOBER 31, 2025



NOTE:
THESE CABLE RACKS ARE PLACED AGAINST WALL TO SUPPORT SPLICE CASES OR LEAD SLEEVES

Fig. 9—Location of Cable Racks and Hooks in Typical Double Bay, Double Rack A-Type Manhole

Supplement 2 to

Route 28 Reconstruction Project; DOT Project Number 608742

The following items are required by Massachusetts DEP State Revolving Fund program and apply to the sewer construction aspects of this project. Add the following as follows:

1.

   a. For Sewer Work: “Procurement Considerations - Six Good Faith Efforts. 40 CFR, Part 33, Subpart C: Pursuant to 40 CFR Section 33.301, the sub-recipient agrees to make good faith efforts whenever procuring construction, equipment, services, and supplies under an EPA financial assistance agreement, and to require that sub-recipients, loan recipients, and prime contractors also comply. Records documenting compliance with the six good faith efforts shall be retained. The specific six good faith efforts can be found at: 40 CFR Section 33.301 (a)-(f).”

1. Section A00862

   a. Add the following to Part 2. For additions to the Bid Proposal:

      ii. “a. SRF Project Number Designation: CWSRF 16674.
      b. A Labor and Material or Payment Bond in the amount of 100% of the total contract price must be provided by the general contractor.
      g. A Performance Bond in the amount of 100% of the total contract price must be provided by the general contractor.
      h. Liquidated damages specified in this contract are bid dependent per Division 1 of the MassDOT Standard Specifications Table 8.11-1 per day for each calendar day beyond the contract completion date that work remains uncompleted.

i. The time period for holding bids, where Federal approval is not required is 30 days, Saturdays, Sundays and legal holidays excluded, after the opening of bids and where Federal approval is required, the time period for holding bids is 30 days, Saturdays, Sundays and holidays excluded after Federal approval.
j. The undersigned bidder hereby certifies he/she will comply with the (a) the Civil Rights Act of 1964, 42 USC s.2000(1) et seq., as amended, Section 13 of the Federal Water Pollution Control Act (FWPCA) of 1972; Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and (b) shall make a good faith efforts to comply with 40 CFR Part 33. The undersigned bidder shall also comply with Executive Order 592 and Mass General Laws c 151B, §4.1.
k. The following Diesel Retrofit Program Form shall be executed with the Bid Proposal. Please see Attachment D – Diesel Retrofit Program Form."

ii. Attachment D – Diesel Retrofit Program Form

b. Delete the following: Paragraph 3.a.

c. Add the following to Part 3. For additions to the Contract:

i. "a. Procurement Considerations - Six Good Faith Efforts. 40 CFR, Part 33, Subpart C: Pursuant to 40 CFR Section 33.301, the sub-recipient agrees to make good faith efforts whenever procuring construction, equipment, services, and supplies under an EPA financial assistance agreement, and to require that sub-recipients, loan recipients, and prime contractors also comply. Records documenting compliance with the six good faith efforts shall be retained. The specific six good faith efforts can be found at: 40 CFR Section 33.301 (a)-(f).
d. Liquidated damages specified in this contract are bid dependent per Division 1 of the MassDOT Standard Specifications Table 8.11-1 per day for each calendar day beyond the contract completion date that work remains uncompleted.
e. The amendments to the Clean Water Act, as part of WRRDA, apply the American Iron and Steel (AIS) requirements to all treatment works projects. Furthermore, IIJA extends this

procurement requirement to all SRF construction projects going forward with the inclusion of the Build America, Buy America Act (BABA). Starting on May 14, 2022, all steel, iron, manufactured products, non-ferrous metals, plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables), glass (including optic glass), lumber, and drywall used in infrastructure projects for federal financial assistance programs must be produced in the United States. MassDEP ensures that the required procurement language is included in contracts and conducts field verifications of project compliance.

f. The Contractor acknowledges to and for the benefit of the City/Town of Harwich ("Purchaser") and the Commonwealth of Massachusetts (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/ or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the

Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

g. During the performance of this contract, the contractor agrees as follows: 1. The contractor will comply with the (a) the Civil Rights Act of 1964, 42 USC s.2000(1) et seq., as amended, Section 13 of the Federal Water Pollution Control Act (FWPCA) of 1972; Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and (b) will also comply with Executive Order 592 and the Mass General Laws c 151B, §4.1.

h. As per MassDEP's Policy Memorandum #10 – the agreed upon DIRECT LABOR MARKUP (percentage) for Change Orders on this project shall be _____ percent. Contractor shall use section MassDOT Division 1 Standard Specifications Section 9.03.B to calculate this percentage."

d. Delete the following attachment: "4.a. Attachment D – The Construction Bid Specifications SPECIAL PROVISIONS FOR DISADVANTAGED BUSINESS ENTERPRISES & The Department of Environmental Protection Division of Municipal Services" and Attachment D.

e. Delete the following: "4.b. Attachment F – Project Signage Guidelines" and replace with the following "4.b. Attachment F - Guidelines for Enhanced Public Awareness of SRF Assistance Agreements".

f. Add the following to Part 4. For additions to the General/Supplementary Conditions:

i. c. Prohibitions Relating to Violators of the Clean Air Act and the Clean Water Act with Respect to Federal Contracts, Grants, or Loans Executive Order No. 11738 (1973) Section 306 of the Clean Air Act, 42 U.S.C. § 7606, and Section 508 of the Clean Water Act, 33 U.S.C § 1368

d. Demonstration Cities and Metropolitan Development Act Pub. L. No. 89-754 (1966), as amended 42 U.S.C. § 3331 et. Seq.

e. Uniform Relocation Assistance and Real Property Acquisition Policies Act Pub. L. No. 91-646 (1971), as amended 42 U.S.C. §§ 4601-4655
f. Preservation of Open Competition and Government Neutrality Towards Government Contractors' Labor Relations on Federal and Federally Funded Construction Projects Executive Order No. 13202 (2001), as amended by Executive Order No. 13208 (2001)
g. Section 13 of the Federal Water Pollution Control Act Amendments of 1972 33 U.S.C. § 1251
h. Effective August 13, 2020, recipients and subrecipients of EPA funded assistance agreements, including borrowers under EPA funded revolving loan funds, must comply with regulations at 2 CFR 200.216, Prohibition on certain telecommunication and video surveillance services or equipment, implementing section 889 of Public Law 115-232. The regulation prohibits the use of Federal funds to procure (enter into, extend, or renew contracts) or obtain equipment, systems, or services that use "covered telecommunications equipment or services" identified in the regulation as a substantial or essential component of any system, or as critical technology as part of any system. Prohibitions extend to the use of Federal funds by recipients and subrecipients to enter into a contract with an entity that "uses any equipment, system, or service that uses covered telecommunications equipment or services" as a substantial or essential component of any system, or as critical technology as part of any system. Certain equipment, systems, or services, including equipment, systems, or services produced or provided by entities subject to the prohibition are recorded in the System for Award Management exclusion list.
i. Workman's Compensation and Employer's Liability Insurance in Worker's Compensation $100,000. Employer's Liability $500,000. Each accident $500,000. Disease per employee
j. Commercial General Liability Insurance with the following limits: Bodily Injury & Property Damage $1,000,000. Each occurrence $1,000,000. General aggregate
k. Vehicle Liability Insurance Bodily Injury & Property Damage $1,000,000. Each person $1,000,000. Each accident
l. Owner's Protective Liability equal to Contractor's required coverage stated in B if the project involves blasting.
m. Builder's Risk (Fire Insurance) in an amount equal to the insurable value of the Contract.

n. SRF requires loan recipients to create and maintain a list of all subcontractors on the project. Within 90 days of the contract award, the LGU must submit an initial subcontractor list to MassDEP. A final updated subcontractor list will be submitted with the final payment request to MassDEP.
o. This project is subject to the American Iron and Steel and the Build America, Buy America Act (BABA). The amendments to the Clean Water Act, as part of WRRDA, apply the American Iron and Steel (AIS) requirements to all treatment works projects. Furthermore, IIJA extends this procurement requirement to all SRF construction projects going forward with the inclusion of the Build America, Buy America Act (BABA). Starting on May 14, 2022, all steel, iron, manufactured products, non-ferrous metals, plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables), glass (including optic glass), lumber, and drywall used in infrastructure projects for federal financial assistance programs must be produced in the United States. MassDEP ensures that the required procurement language is included in contracts and conducts field verifications of project compliance."
p. "Project signs or other means of publicizing the project to comply with the "Guidelines for Enhanced Public Awareness of SRF Assistance Agreements" issued by the United States Environmental Protection Agency on June 3, 2015." See Attachment F.
q. "BABA implementation is not required for this project as the project is not receiving federal assistance based on EPA's Build America, Buy America Act Implementation Procedures for EPA Office of Water Federal Financial Assistance Programs Memorandum issued November 3, 2022."

g. Delete the following: Attachment F - Project Signage Guidelines and replace with new Attachment F – Guidelines for Enhanced Public Awareness of SRF Assistance Agreements.

Attachment D
Diesel Retrofit Program Form

DIESEL RETROFIT PROGRAM

STATEMENT OF INTENT TO COMPLY

This form must be signed and submitted by the bidder as part of the bid.

Local Governmental Unit _____ **SRF Project No.** _____

Contract No. _____ **Contact Title** _____

Bidder _____

The undersigned, on behalf of the above-named Bidder, agrees that, if awarded the Contract:

1. **the Bidder shall comply with the Massachusetts Department of Environmental Protection's ("MassDEP") Diesel Retrofit Program by ensuring that all diesel powered non-road construction equipment and vehicles greater than 50 brake horsepower which will be used in the performance of the work under the Contract are equipped or retrofitted with a pollution control device in accordance with the Diesel Retrofit Program Standard;**
2. **the Bidder shall require all Subcontractors to comply with MassDEP's Diesel Retrofit Program by ensuring all diesel powered non-road construction equipment and vehicles greater than 50 brake horsepower which will be used in the performance of the work under the Contract are equipped or retrofitted with a pollution control device in accordance with the Diesel Retrofit Program Standard; and**

3. **The Bidder shall submit and shall require each Subcontractor to submit a Diesel Retrofit Program Contractor Certification (form attached) with a Diesel Retrofit List to MassDEP Municipal Services and the Bidder within 10 days of the bidder being notified that it has been awarded the Contract. The Bidder shall require each Subcontractor to update such Certification and List within 2 days of using additional Diesel Construction Equipment on the project under the Contract.**

_____

(Signature of Bidder's Authorized Representative) **(Date)**

Attachment F
Guidelines for Enhanced Public Awareness of SRF Assistance Agreements

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN - 3 2015

OFFICE OF WATER

MEMORANDUM

SUBJECT: Guidelines for Enhancing Public Awareness of SRF Assistance Agreements

FROM: Andrew D. Sawyers, Ph.D., Director
Office of Wastewater Management (4201M)

Peter C. Grevatt, Director
Office of Ground Water and Drinking Water (4601M)

TO: Water Management Division Directors
Regions I-X

Last year, the Environmental Protection Agency (EPA) implemented an agency-wide initiative to enhance public awareness of EPA assistance agreements nationwide. The Office of Water has developed guidelines to inform states how this initiative should be implemented in the State Revolving Fund (SRF) Programs.

The guidelines were developed with input from EPA and state SRF staff. The guidelines recognize that each of the state SRF programs and the projects they fund are different and that one implementation method will not work for everyone. Therefore, as a result of input from the states, the guidelines offer a number of options that can be used to enhance public awareness of SRF assistance agreements.

Implementation of these guidelines will begin with the awarding of the FY 2015 SRF capitalization grants. A term and condition on compliance with the guidelines is to be included in all new SRF grants.

Please have your staff provide copies of the guidelines to your states. Questions regarding the guidelines should be directed to Sheila Platt (202/564-0686) or Howard Rubin (202/564-2051).

Attachment

Enhancing Public Awareness of SRF Assistance Agreements

Introduction

The Environmental Protection Agency (EPA) is currently implementing an agency-wide initiative focused on signage to enhance public awareness of EPA assistance agreements nationwide. The intention of this effort is to communicate the positive impact and benefits of EPA funding around the country and increase awareness surrounding the improvements communities receive as a result of State Revolving Fund (SRF) assistance. Projects implemented with Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) monies are included in this initiative, as many CWSRF and DWSRF assistance agreements have direct and tangible benefits to populations around the country.

EPA's Office of Water developed these guidelines as a way to inform states of this directive and how it should be implemented in the SRF programs. The primary objective is to enhance public understanding of the positive benefits of CWSRF and DWSRF funding to towns, cities, municipalities and water systems. To that end, states are presented with a range of options for implementing these guidelines. All of these options achieve the ultimate goal of communicating to a broad audience the positive role EPA funding of the state CWSRF and DWSRF programs plays in communities across the country.

The information in the guidelines was developed with input from EPA and state staff across the country as well as the members of the State-EPA Workgroup. The guidelines recognize the wide range of project types, varied locations and different institutional approaches among states and communities. Therefore, providing states and SRF assistance recipients maximum flexibility is optimal. The guidelines allow selection of the implementation method which best balances two goals. First, it should satisfy the overall objective of communicating EPA's role in funding assistance agreements that achieve positive benefit. Second, the implementation method should be practically and financially viable for states and communities and avoid any overly burdensome investment of time and resources. In some cases, it might be appropriate for a state to select a combination of options listed below, provided this does not result in excessive cost to communities.

Project Selection Requirements

Signage requirements will not be required to apply to all SRF projects. Signage will be considered an equivalency requirement for SRF programs. States should select a set of borrowers and/or projects totaling a funding amount equivalent to the amount of their federal capitalization grant to satisfy the signage requirement. There are no other requirements or restrictions on which projects should or should not participate in this initiative. Therefore, it is at the discretion of the state SRF program to select projects most able to efficiently and effectively comply in a way that

meets the intention to enhance public awareness without significant financial hardship to the state or its borrowers. This can be done either through the selection of specific projects or borrowers, or by setting a threshold within the state for which projects will be requested to meet signage requirements. States should note that they have the option of selecting different implementation options for different borrowers depending on the location, project type and available resources. Borrowers and/or projects complying with the signage requirement must ensure limited English proficient individuals have meaningful access to activities receiving EPA funds, consistent with Executive Order 13166 and EPA Order 1000.32.

In this regard, to increase public awareness of projects serving communities where English is not the predominant language, States should encourage recipients when implementing a particular signage option to translate the language used (excluding the EPA logo or seal) into the appropriate non-English language(s). The costs of such translation are allowable, provided the costs are reasonable.

Although the signage requirement does not apply to all SRF projects, we recommend that states encourage all borrowers/projects to notify the public of the benefits of the projects and the role of the SRF, using one of the options below.

Summary of Options

The guidelines present a number of options which communities can explore to implement EPA's signage policy. The option selected should meet all of the above basic requirements while remaining cost-effective and accessible to a broad audience. The guidelines describe the following strategies as acceptable options for communities to follow:

- Standard signage
- Posters or wall signage in a public building or location
- Newspaper or periodical advertisement for project construction, groundbreaking ceremony, or operation of the new or improved facility
- Online signage placed on community website or social media outlet
- Press release

Each of these options is described in more detail in the sections below.

Implementation Option: Standard Signage

EPA recommends that large projects that involve significant expansion or construction of a new facility elect to publicize through standard signage. This option should be selected for projects where the sign would be near a major road or thoroughfare or where the facility is in a location at which this would effectively publicize the upgrades. Some facilities will not find this an appropriate or cost-effective solution. For example, investing in a large road sign for a facility that is located in a rural area or where access is limited to a smaller service road would likely not be an optimal solution.

Signs can also be located away from the project site if there is another reasonable alternative. For example, a community may elect to place a sign advertising the project near a body of water that receives discharge from a particular facility.

States selecting projects that will implement this requirement through use of a traditional sign should ensure the following are included:

- The name of the facility, project and community
- Project cost
- The State Agency/SRF administering the program
- The EPA and State Agency logos (EPA logo may only be used on a sign)

If the EPA logo is displayed along with logos of other participating entities, the EPA logo must not be displayed in a manner that implies that EPA itself is conducting the project. Instead, the EPA logo must be accompanied with a statement indicating that the recipient received financial assistance from EPA for the project. As provided in the sign specifications from the EPA Office of Public Affairs (OPA), the EPA logo is the identifier for assistance agreement projects. States are required to ensure that recipients comply with the sign specifications provided by the OPA, available at http://www.epa.gov/ogd/tc/epa_logo_seal_specifications for_infrastructure grants.pdf. To obtain the appropriate EPA logo graphic file, the recipient should send a request directly to OPA and include the EPA Project Officer in the communication.

Implementation Option: Posters or Brochures

Smaller projects, projects located in rural areas, and other efforts may find that it is more cost-effective and practical to advertise efforts through creation of a poster or smaller sign. If the project involves nonpoint source or green infrastructure components, those can be described at the discretion of the state or community.

The poster or brochure and acknowledgement should be visible, as well as a website or other source of information for individuals that may be curious about the SRF program. The community could also implement this option as a short pamphlet or brochure that is placed in one of these locations for community members to read.

Posters or brochures should be placed in a public location that is accessible to a wide audience of community members. This can include, but is not limited to:

- Town or City Hall
- Community Center
- Locally owned or operated park or recreational facility
- Public Library
- County/municipal government facilities
- Court house or other public meeting space

Given the low cost for producing multiple copies of the same poster, pamphlet, or brochure, communities can explore options for displaying these posters in several locations simultaneously. This would achieve the overall objective of reaching a broad audience and publicizing the project.

States have the option of creating a template verbiage and layout to provide to borrowers, particularly smaller or disadvantaged communities. This could reduce the burden on small municipalities which may or may not have the staffing capacity to meet signage requirements on their own.

States selecting projects that will implement this requirement through use of posters or brochures should ensure the following are included:

- Name of facility, project and community
- State SRF administering the program
- Project is wholly or partially funded with EPA funding
- Brief description of project
- Brief description of the water quality benefits the project will achieve

Implementation Option: Newsletter, Periodical or Press Release

For communities where there is no suitable public space or where advertisement through signage is unlikely to reach community members effectively, projects can be advertised in a community newsletter or similar periodical. States can use guidelines from their standard public notice practices. For new construction, if a groundbreaking ceremony is to be held, an announcement could publicize or accompany publicity for this event.

In some cases, it may be appropriate for the state agency to issue a formal press release announcing construction of a new facility. Distributing a single prepared statement concisely summarizing the project purpose and the joint funding from EPA and state resources can reach a wide audience as the statement goes through multiple news outlets. Programs should consider whether or not this is an option that is likely to effectively publicize the CWSRF or DWSRF program in local news sources.

If a recipient decides on a public or media event to publicize the accomplishment of significant events related to construction as a result of EPA support, EPA must be provided with at least a ten working day notice of the event and provided the opportunity to attend and participate in the event.

States selecting projects that will implement this requirement through use of a newsletter, periodical or press release should ensure the following are included:

- Name of facility, project and community
- State SRF administering the program

- Project is wholly or partially funded with EPA funding
- Brief description of the project
- Brief listing of water quality benefits to be achieved

Implementation Option: Insert or Pamphlet in Water/Sewer Bill
Utilities can consider including a single-page insert within water and sewer bills that are mailed to residents and users in the area. This approach would effectively publicize the project to those individuals directly benefitting from the project. The flyer or insert could emphasize the interest rate and financial savings that the community achieved by taking advantage of SRF funds as well as the environmental and public health benefits to the community.

States selecting projects that will implement this requirement through use of an insert or pamphlet in water/sewer bill should ensure the following are included:

- Name of facility, project and community
- State SRF administering the program
- Project is wholly or partially funded with EPA funding
- Brief description of the project
- Brief listing of water quality benefits to be achieved

Implementation Option: Online & Social Media Publicity
Many communities are increasingly finding that the online forum is the most cost-effective approach to publicizing their SRF programs and reaching a broad audience of stakeholders. Online "signage" should follow the minimum information guidelines above and may appear on the town, community or facility website if available. In some cases, communities may be active on social media sites such as Facebook or Twitter. These can be used as an opportunity for publicizing projects and information about how SRF funds are being used in the community. These online announcements/notices may be appropriate for settings where physical signage would not be visible to a wide audience. They can be a more cost-effective option than traditional signs or publicity in print media outlets. This option may be most useful where the community's website is a well-recognized source of information for its residents.

In the case of some projects, such as nonpoint source or sponsorship projects, there might be additional opportunities for online publicity through partner agencies or organizations. This could take place either on the organization's website or again through social media outlets.

States selecting projects that will implement this requirement through use of online & social media publicity should ensure the following are included:

- Name of facility, project and community
- State SRF administering the program
- Project was wholly or partially funded with EPA funding
- Brief description of the project

- Brief listing of water quality benefits to be achieved

Suggested Language for Alternate Options

For any of the alternate implementation options listed above, SRF programs have discretion to structure their signage as they see appropriate. The language below is offered as an option for use in posters, pamphlets, brochures, press releases, or online materials. States may consider using the following:

> "Construction of upgrades and improvements to the [Name of Facility, Project Location, or WWTP] were financed by the [Clean Water/Drinking Water] State Revolving Fund. The [CWSRF/DWSRF] program is administered by [State Agency] with joint funding from the U.S. Environmental Protection Agency and [State Name]. This project will (description of project) and will provide water quality benefits [details specifying particular benefits] for community residents and businesses in and near [name of town, city, and/or water body or watershed to benefit from project.] [CWSRF/DWSRF] programs operate around the country to provide states and communities the resources necessary to maintain and improve the infrastructure that protects our valuable water resources nationwide. "

For projects in certain areas, states should consider whether or not it is appropriate to include additional details about the projects. Specific benefits, such as reduction of CSO events, lessening of nutrient pollution, reducing contaminant levels or water pumping costs, or improvements to a particular water body, may be of interest to community residents. In these cases, including them would further serve to showcase positive efforts financed by the SRF programs. Additionally, for projects with components that meet Green Project Reserve (GPR) criteria, States may elect to detail these particular improvements. For example, the state could include quantitative improvements in energy efficiency or water conservation achieved by project upgrades. If the project includes green infrastructure components such as rain gardens and green roofs that have environmental and aesthetic benefits to the community, these can be described briefly as well. Again, this additional information can be included at the discretion of the state when it is appropriate, given the project type, location, and the type of signage or publicity effort selected.

APPENDIX E
CONSTRUCTION BID SPECIFICATIONS
SPECIAL PROVISIONS FOR DISADVANTAGED BUSINESS ENTERPRISES
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF MUNICIPAL SERVICES

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM BACKGROUND

In May 2008 a United States Environmental Protection Agency (EPA) rule became effective that changed the Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) Program to a Disadvantaged Business Enterprise (DBE) Program.

For firms to qualify under the old MBE/WBE program they needed to be socially disadvantaged and had to be certified by the Supplier Diversity Office (SDO). Under the new DBE rule, the firms must be both **socially** and **economically** disadvantaged, **citizens of the United States**, and certified as a DBE. Women and certain minorities are presumed to be socially disadvantaged. The economic disadvantage is measured by the owner's initial and continuing personal net worth of less than $1,320,000.

Because the Clean Water Act requires the use of MBEs and WBEs, these firms will still be utilized in the State Revolving Fund (SRF) Loan Program, but they must also be certified as DBEs.

SDO will continue to be the certifying agency for the SRF program. SDO certifies firms under the federal Department of Transportation program, which is acceptable for use in the SRF program. An additional form has been added to the DBE package to verify that DBEs are owned or controlled by United States citizens.

BID SPECIFICATIONS

I. In this contract, the percentage of business activity to be performed by disadvantaged business enterprise(s) (DBE) shall not be less than the following percentages of the total contract price or the percentage submitted by the contractor in the Schedule of Participation, whichever is greater:

① Disadvantaged MBE (D/MBE) _____ Disadvantaged WBE (D/WBE) _____

①ADDENDUM NO. 1, OCTOBER 31, 2025

Project # 608742	Contract # 132267			
Location : DENNIS - HARWICH				
Description : Reconstruction & Related Work on Main Street (Route 28), from Upper County Road to the Herring River Bridge				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
238.12	35	12 INCH DUCTILE IRON PIPE AT _____ PER FOOT		
241.12	1,075	12 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
241.15	420	15 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
① 241.18	380	18 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
241.24	1,280	24 INCH REINFORCED CONCRETE PIPE CLASS III AT _____ PER FOOT		
243.12	205	12 INCH REINFORCED CONCRETE PIPE CLASS IV AT _____ PER FOOT		
243.18	380	18 INCH REINFORCED CONCRETE PIPE CLASS IV AT _____ PER FOOT		
244.12	320	12 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		
251.0125	1,087	1.25 INCH HDPE LOW PRESSURE SEWER SERVICE AT _____ PER FOOT		

	Project # 608742	**Contract # 132267**			
	Location : DENNIS - HARWICH				
	Description : Reconstruction & Related Work on Main Street (Route 28), from Upper County Road to the Herring River Bridge				
	ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
	251.03	3,950	3 INCH HDPE FORCEMAIN AT _____ PER FOOT		
	256.	2	FORCEMAIN MANUAL AIR RELEASE VALVE - COMPLETE AT _____ EACH		
	257.	2	FORCEMAIN FLUSHING ASSEMBLY - COMPLETE AT _____ EACH		
①	302.06	395	6 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) AT _____ PER FOOT		
①	302.08	230	8 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) AT _____ PER FOOT		
①	302.12	3,282	12 INCH DUCTILE IRON WATER PIPE (RUBBER GASKET) AT _____ PER FOOT		
	309.	6,670	DUCTILE IRON FITTINGS FOR WATER PIPE AT _____ PER POUND		
	347.2	30	2 INCH COPPER TUBING TYPE K AT _____ PER FOOT		
①	348.075	90	3/4 INCH POLYETHYLENE PIPE AT _____ PER FOOT		

Project # 608742	Contract # 132267			
Location : DENNIS - HARWICH				
Description : Reconstruction & Related Work on Main Street (Route 28), from Upper County Road to the Herring River Bridge				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
① 348.1	720	1 INCH POLYETHYLENE PIPE AT _____ PER FOOT		
① 348.15	170	1-1/2 INCH POLYETHYLENE PIPE AT _____ PER FOOT		
① 348.2	120	2 INCH POLYETHYLENE PIPE AT _____ PER FOOT		
349.03	36	3 INCH GATE VALVE AT _____ EACH		
349.06	14	6 INCH GATE VALVE AT _____ EACH		
349.08	4	8 INCH GATE VALVE AT _____ EACH		
349.12	16	12 INCH GATE VALVE AT _____ EACH		
357.03	36	3 INCH GATE BOX AT _____ EACH		
357.06	14	6 INCH GATE BOX AT _____ EACH		

Project # 608742	Contract # 132267			
Location : DENNIS - HARWICH				
Description : Reconstruction & Related Work on Main Street (Route 28), from Upper County Road to the Herring River Bridge				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
903.	32	3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE AT _____ PER CUBIC YARD		
① **Total Qty:**	382,690.2			

DENNIS/HARWICH
MAIN STREET (ROUTE 28)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP/CRP-0035(066)X	3	105
PROJECT FILE NO.	608742		

LEGEND & ABBREVIATIONS

GENERAL ABBREVIATIONS

ABAN	ABANDON
ADJ	ADJUST
APPROX	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS / CONTINUED
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DIA	DIAMETER
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EXIST (or EX)	EXISTING
EXC	EXCAVATION
FDN.	FOUNDATION
FDP	FULL DEPTH PAVEMENT
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HWY	HIGHWAY
JCT	JUNCTION
LOAM	LOAM BORROW
LSA	LANDSCAPED AREA
LT	LEFT
MAHWL	MEAN AVERAGE HIGH WATER LINE
MAX	MAXIMUM
MB	MAILBOX
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
MOD	MODIFIED
MSE	MECHANICALLY STABILIZED EARTH
NERR	NEW ENGLAND RAILROAD
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
PCR	PEDESTRIAN CURB RAMP
P.G.L.	PROFILE GRADE LINE
PREV	PREVIOUS/PREVIOUSLY
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PVMT	PAVEMENT
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RD	ROAD
RDWY	ROADWAY
REB	REBUILD
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SHLO/S.H.L.O.	STATE HIGHWAY LAYOUT LINE

GENERAL ABBREVIATIONS (CONT)

ST	STREET
STA	STATION
STD	STANDARD
SW	SIDEWALK
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TRANS	TRANSITION
TRM	TURF REINFORCING MAT
TYP	TYPICAL
VAR	VARIES
VERT	VERTICAL
WP	WORKING POINT
X-SECT	CROSS SECTION

UTILITY ABBREVIATIONS

CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
DS	DRAINAGE STRUCTURE
FA	FLUSHING ASSEMBLY
FES	FLARED END SECTION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HDW	HEADWALL
HYD	HYDRANT
INV	INVERT
LB	LEACH BASIN
LP	LIGHT POLE
LPS	LOW PRESSURE SEWER
LPSL	LOW PRESSURE SEWER LATERAL
MH	MANHOLE
MR	MANUAL AIR RELEASE
MW	MONITORING WELL
OHW	OVERHEAD WIRE
PVC	POLYVINYLCHLORIDE PIPE
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE
REC	RECORD
SMH	SEWER MANHOLE
TSV&B	TAPPING SLEEVE VALVE & BOX
UP	UTILITY POLE
VC	VITRIFIED CLAY
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
WS	WATER SERVICE

ALIGNMENT & GRADING ABBREVIATIONS

CC	CENTER OF CURVE
HP	HIGH POINT
I.T.	INTERSECTION OF TANGENT
LP	LOW POINT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION
PNT	POINT
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
∠PT	ANGLE POINT
R	RADIUS OF CURVATURE
T	TANGENT DISTANCE OF CURVE
TAN	TANGENT
25.45	SPOT ELEVATION

PROFILE ABBREVIATIONS

AD	ALGEBRAIC DIFFERENCE IN RATES OF GRADE
HSD	HORIZONTAL SIGHT DISTANCE
K	RATE OF VERTICAL CURVATURE
L	LENGTH OF CURVE
PVC	POINT OF VERTICAL CURVATURE
PVCC	POINT OF VERTICAL COMPOUND CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVRC	POINT OF VERTICAL REVERSE CURVATURE
PVT	POINT OF VERTICAL TANGENCY
SSD	STOPPING SIGHT DISTANCE
VC	VERTICAL CURVE

TRAFFIC & SIGNAL ABBREVIATIONS

AADT	ANNUAL AVERAGE DAILY TRAFFIC
CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
COND	CONDUIT
CW	CROSS WALK
DW	STEADY DON'T WALK - PORTLAND ORANGE
DHV	DESIGN HOURLY VOLUME
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR AMBER
FYL	FLASHING AMBER LEFT ARROW
FYR	FLASHING AMBER RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
HH	HAND HOLE
OL	OVERLAP
PB	PULL BOX
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
SL	STOP LINE
T	TRUCK %
TS OR TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW

GENERAL NOTES:

1. EXISTING CONDITIONS AND TOPOGRAPHICAL INFORMATION FROM AN ACTUAL FIELD SURVEY CONDUCTED BY J.M. O'REILLY & ASSOCIATES, INC., BREWSTER, MASSACHUSETTS IN JANUARY, FEBRUARY AND MARCH 2018. FIELD INFORMATION CONTAINED IN J.M. O'REILLY & ASSOCIATES, INC. FIELD BOOKS DATED JANUARY THROUGH MARCH 2018. THE SURVEY WAS SUPPLEMENTED BY VHB IN MAY 2023.
2. THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATION IS US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND GRADES IN THE FIELD BEFORE COMMENCING WORK AND PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
4. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
5. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.
6. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH PROPOSED CONDUIT AND SIGNAL EQUIPMENT. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER.
7. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
8. THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE AND SEWER STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK.
9. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
10. EXISTING UTILITY POLES WILL BE RELOCATED BY OTHERS IF REQUIRED.
11. TREES AND SHRUBS WITHIN THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON APPROVAL OF THE ENGINEER.
12. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
13. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
14. JOINTS BETWEEN NEW ASPHALT CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH HMA JOINT SEALER AND BACKSANDED.
15. AFTER MILLING OPERATIONS AND PRIOR TO PAVING THE SUPERPAVE INTERMEDIATE OR SURFACES COURSES THE ENGINEER SHALL EVALUATE THE MILLED SURFACE AND SHALL APPLY THE APPROPRIATE REPAIR METHOD IF REQUIRED.
16. EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
17. IF SUITABLE, EXISTING GRANITE CURB & EDGING SHALL BE RE-USED IN THE PROPOSED WORK, EXCEPT CURVED STONES OF A DIFFERENT RADIUS THAN PROPOSED CURB.
18. EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
19. PROPOSED BOUNDS SHALL BE PLACED BY A LICENSED PROFESSIONAL SURVEYOR. THE CONTRACTOR SHALL EXERCISE DUE CARE WHEN WORKING AROUND ALL PROPERTY BOUNDS WHICH ARE TO REMAIN. SHOULD ANY DAMAGE TO A BOUND RESULT FROM THE ACTIONS OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE THE BOUND REPLACED AND/OR REALIGNED BY A LICENSED PROFESSIONAL SURVEYOR AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
20. DISPOSAL OF ALL SURPLUS MATERIAL SHALL BE AS APPROVED BY THE ENGINEER AND OWNER.
21. LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE PLANS.
22. INSTALLATION, TESTING AND DISINFECTION OF WATERMAINS SHALL BE IN ACCORDANCE WITH MASSDOT STANDARD SPECIFICATION SECTION 300 - WATER SYSTEMS UNLESS SPECIFIED OTHERWISE IN TOWN OF HARWICH OR TOWN OF DENNIS WATER RULES AND REGULATIONS, WHICH GOVERNS.
23. THE SEWER PORTION OF THIS PROJECT IS FUNDED THROUGH SRF PROJECT NUMBER CWSRF 16674.

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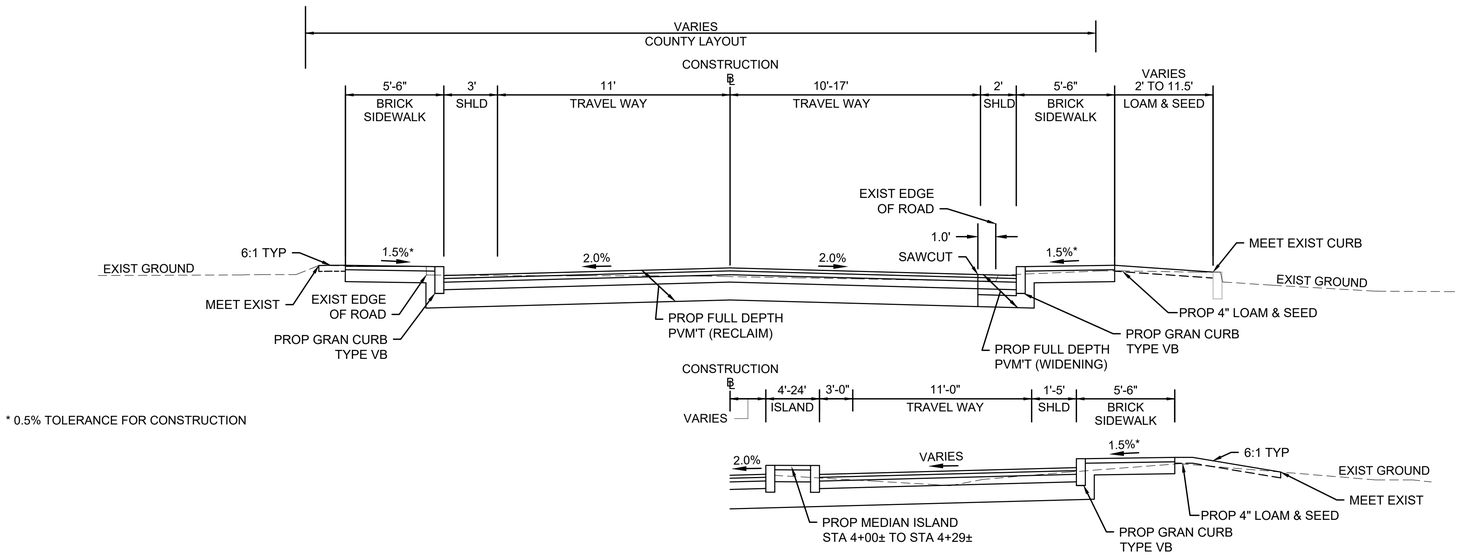
DENNIS/HARWICH
MAIN STREET (ROUTE 28)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP/CMQ/TAP/CRP-0035(066)X	6	105
PROJECT FILE NO.	608742		

TYPICAL SECTIONS

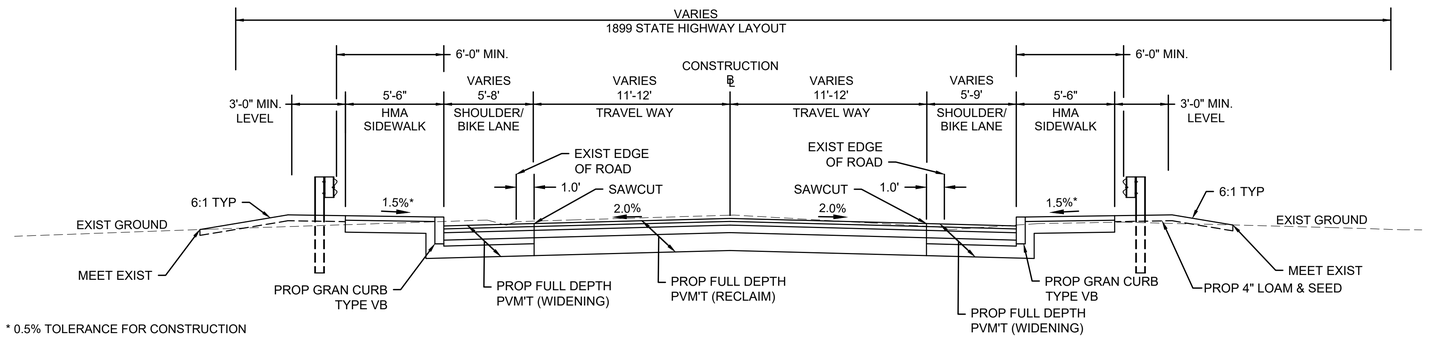
608742_HD(TYP).DWG Plotted on 30-Oct-2025 11:58 AM



* 0.5% TOLERANCE FOR CONSTRUCTION

UPPER COUNTY ROAD

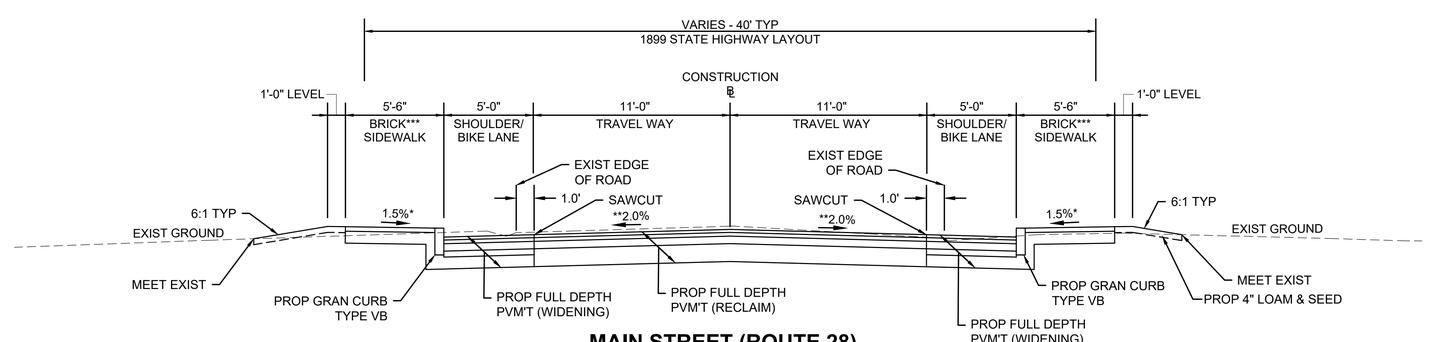
STA 4+00± TO STA 5+65±
NTS



* 0.5% TOLERANCE FOR CONSTRUCTION

MAIN STREET (ROUTE 28)

STA 44+78± TO STA 47+26±
NTS



* 0.5% TOLERANCE FOR CONSTRUCTION

MAIN STREET (ROUTE 28)

STA 10+00± TO STA 44+78±
NTS

** 2% TYPICAL, SEE CROSS SECTIONS FOR VARYING SLOPE FROM STA 10+77± TO STA 12+07±

*** HMA SIDEWALK STA 28+56± TO STA 44+78±

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT (IN RECLAIM AREAS)

SURFACE:	2"	SUPERPAVE SURFACE COURSE 12.5 POLYMER (SSC-12.5-P) OVER
	2.5"	SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER
BASE:	5"	SUPERPAVE BASE COURSE 37.5 (SBC-37.5) OVER
SUBBASE:	12"	RECLAIMED PAVEMENT BORROW (M1.09.0)
1 RECLAIM:		EXISTING PAVEMENT SHALL BE RECLAIMED TO A DEPTH OF 15" MIN. AND AS DIRECTED BY THE ENGINEER

PROPOSED FULL DEPTH PAVEMENT (IN WIDENING AREAS)

SURFACE:	2"	SUPERPAVE SURFACE COURSE 12.5 POLYMER (SSC-12.5-P) OVER
	2.5"	SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER
BASE:	5"	SUPERPAVE BASE COURSE 37.5 (SBC-37.5) OVER
++ SUBBASE:	12"	GRAVEL BORROW, TYPE b OR RECLAIMED PAVEMENT BORROW (M1.09.0)

PROPOSED PAVEMENT MILLING & OVERLAY

SURFACE:	2"	SUPERPAVE SURFACE COURSE 12.5 POLYMER (SSC-12.5-P) OVER
	2"	MAXIMUM PAVEMENT MILLING

PROPOSED HOT MIX ASPHALT DRIVEWAY

SURFACE:	1.5"	SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
	2.5"	SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5)
++ SUBBASE:	8"	GRAVEL BORROW, TYPE b OR RECLAIMED PAVEMENT BORROW (M1.09.0)

PROPOSED HOT MIX ASPHALT SIDEWALK

SURFACE:	1.25"	SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
	1.75"	SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5)
++ SUBBASE:	8"	GRAVEL BORROW, TYPE b OR RECLAIMED PAVEMENT BORROW (M1.09.0)

PROPOSED BRICK SIDEWALK

SURFACE:	2.25"	WIRE CUT BRICK PAVER OVER NEOPRENE-MODIFIED ASPHALT OVER BITUMINOUS SETTING BED
BASE:	4"	CEMENT CONCRETE AIR ENTRAINED 4000 PSI, 3/4", 610
++ SUBBASE:	8"	GRAVEL BORROW, TYPE b OR RECLAIMED PAVEMENT BORROW (M1.09.0)

PROPOSED CEMENT CONCRETE PEDESTRIAN CURB RAMP & SIDEWALK

SURFACE:	4"	CEMENT CONCRETE AIR ENTRAINED 4000 PSI, 3/4", 610
++ SUBBASE:	8"	GRAVEL BORROW, TYPE b OR RECLAIMED PAVEMENT BORROW (M1.09.0)

PROPOSED CEMENT CONCRETE DRIVEWAY

SURFACE:	6"	CEMENT CONCRETE AIR ENTRAINED 4000 PSI, 3/4", 610
++ SUBBASE:	8"	GRAVEL BORROW, TYPE b OR RECLAIMED PAVEMENT BORROW (M1.09.0)

++ PER SECTION 170.60, WHERE GRAVEL BORROW FOR SUBBASE IS SPECIFIED, IF THE EXISTING MATERIAL, AFTER TESTING, IS FOUND TO COMPLY WITH THE REQUIREMENTS OF M1.03.0: GRAVEL BORROW, THE MATERIAL SHALL REMAIN IN PLACE OR REUSED IN OTHER LOCATIONS IF APPROVED BY THE ENGINEER.

GENERAL NOTES:

1. ALL HOT MIX ASPHALT PAVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE SECTION 450 QUALITY ASSURANCE FOR HMA.
2. ASPHALT EMULSION FOR TACK COAT (ITEM 452.), SHALL BE APPLIED FOR TRIPLE COVERAGE IN ACCORDANCE WITH SUBSECTION 450.43 (G) OF THE STANDARD SPECIFICATIONS.
3. HMA JOINT ADHESIVE (ITEM 453.) SHALL BE APPLIED IN SURFACE COURSE AT ALL VERTICAL COLD JOINTS PRIOR TO HMA PAVING.
4. ALL HOT MIX ASPHALT WALKS AND DRIVEWAYS SHALL BE ESTIMATED AND PAID FOR UNDER ITEM 702 OF STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
5. SURFACE PAVING TO BE COMPLETED AT THE END OF THE PROJECT AND AS DIRECTED WHEN IT CAN BE PLACED IN ITS ENTIRETY.
6. ALL FRAMES AND SERVICE BOXES SHALL BE ADJUSTED TO INTERMEDIATE COURSE AND ADJUSTED LEVEL WITH SURFACE COURSE PRIOR TO PAVING WITH HMA JOINT SEALANT.