August 13, 2019

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION
DEPARTMENT OF ADMINISTRATION

DIVISION OF PURCHASES BID NO. 7598901

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RHODE ISLAND CONTRACT NO.2019-CB-077

FEDERAL-AID PROJECT NO. FAP Nos: BRO-0257(003)

Bridge Group 12A - Sandy Bottom

200 feet east and 200 feet west of Sandy Bottom Bridge No. 257.

CITY/TOWN OF Coventry

COUNTY OF KENT

NOTICE TO PROSPECTIVE BIDDERS

ADDENDUM NO. 1 Prospective bidders and all concerned are hereby notified of the following changes in the Plans, Specifications, Proposal and Distribution of Quantities for this contract. These changes shall be incorporated in the Plans, Specifications, Proposal and Distribution of Quantities, and shall become an integral part of the Contract Documents.

A. Specification Change/Addition

1. Page CS-6

   Remove page CS-6 in its entirety and replace it with revised page CS-6 (R-1) and new page CS-6a attached to this Addendum No. 1. The Verizon work has been revised.

2. Page JS-ii

   Remove page JS-ii in its entirety and replace it with revised page JS-ii (R-1) attached to this Addendum No. 1. The index has been revised.

3. Pages JS-91 through JS-94

   Remove pages JS-91- JS-94 in their entirety and replace them with revised pages JS-91 (R-1) through JS-135 (R-1) attached to this Addendum No. 1. Item Code T01.9906 Verizon 12-4" PVC Conduit Duct Encased in Concrete and Item Code T01.9907 Verizon 12-4" Fiberglass Conduit Duct and Fiberglass Rack on Bridge have been added and the page numbering for Item Code T12.9903 Portable Traffic Control Signal System has been revised.

B. Distribution of Quantities

1. Table of Contents

   Remove Index pages 1 and 2 in their entirety and replace them with revised pages 1 and 2 and new page 3 (R-1) attached to this Addendum No. 1.

ADDENDUM NO. 1
ATTACHMENTS

2. Page 27

   Remove DOQ page 27 in its entirety and replace with revised pages 27 (R-1) and new page 28 attached to this Addendum No. 1. Item Code T01.9906 Verizon 12-4" PVC Conduit Duct Encased in Concrete and Item Code T01.9907 Verizon 12-4" Fiberglass Conduit Duct and Fiberglass Rack on Bridge have been added.

C. Drawings/Plans - Change/Addition

1. Plan Sheet 8 – Drainage and Utility Plan

   Remove Sheet No. 8 in its entirety and replace it with revised Sheet No. 8 (R-1) attached to this Addendum No. 1. The underground Verizon utility work and drainage has been revised.

2. Plan Sheet 10 - Sand Filter Profiles and Sections

   Remove Sheet No. 10 in its entirety and replace it with revised Sheet No. 10 (R-1) attached to this Addendum No. 1. Drainage pipe has been adjusted.

3. Plan Sheet 16 – Profile

   Remove Sheet No. 16 in its entirety and replace it with revised Sheet No. 16 (R-1) attached to this Addendum No. 1. The drainage has been revised.

4. Plan Sheet 17 – Maintenance and Protection of Traffic Plan No. 1

   Remove Sheet No. 17 in its entirety and replace it with revised Sheet No. 17 (R-1) attached to this Addendum No. 1. The phasing, sequence and timing chart has been revised.

5. Plan Sheet 22 – Cross Section No. 2

   Remove Sheet No. 22 in its entirety and replace it with revised Sheet No. 22 (R-1) attached to this Addendum No. 1. The drainage has been revised.

6. Plan Sheet 36 – South Abutment

   Remove Sheet No. 36 in its entirety and replace it with revised Sheet No. 36 (R-1) attached to this Addendum No. 1. The invert elevation for the storm water pipe has been revised.

7. Plan Sheet 41 – Diaphragm Details

   Remove Sheet No. 41 in its entirety and replace it with revised Sheet No. 41 (R-1) attached to this Addendum No. 1. The Utility Diaphragm D-3 detail has been revised as the (12) telephone conduits and rack are to be provided and installed by the Contractor.

8. Plan Sheet 46 – Joint Details

   Remove Sheet No. 46 in its entirety and replace it with revised Sheet No. 46 (R-1) attached to this Addendum No. 1. The references to waterproofing membrane have been revised.

D. Contract Dates

1. Bid-Opening Date

   Bid-Opening Date Updated To "08/30/2019".

RI Department of Transportation

Administrator, Division of Project Management

ATTACHMENTS

B. The estimated duration of activities is subject to change, however the total downtime listed below for each utility shall be used for construction scheduling. The following is a summary of the utility downtime:

Utility	Utility Work Time (Total Duration)
National Grid – Electric	18 weeks
Verizon	45 weeks Phase 1
	21 weeks Phase 2
Cox Communications	6 weeks

C. The following utility work is anticipated to be performed.

Verizon

Existing underground and overhead utilities and supporting communication lines will be temporarily relocated prior to bridge demolition and then permanently relocated at the completion of construction as shown on the plans.

Verizon will be responsible for the manhole break out and placement of the risers from the manhole on the north side of the bridge as well as the break out and placement of (12) new 4" PVC ducts concrete encased for up to 10' out of the same manhole to accommodate the permanent relocation. It will also be up to Verizon to place the new manhole over the existing duct bank on the south side of the bridge as well as do the break out for the risers and the break out and placement of (12) new 4" PVC ducts concrete encased for the permanent relocation. Permanent underground cables will be installed by the utility companies through new conduit and ducts installed by RIDOT's Contractor.

RIDOT's contractor will be responsible for; providing all materials and making the connection between the 10' stubs on each side of the manholes and the PVC ducts, installing the concrete encased PVC ducts, placing the fiberglass conduits through the bridge, bridge abutment backwall cut-outs, and fiberglass conduit rack supports on the bridge, all to Verizon's specifications.

National Grid (NGRID) – Electric

Existing overhead utilities and supporting lines will be temporarily relocated prior to bridge demolition and then permanently relocated at the completion of construction as shown on the plans.

CoxCom

Existing overhead utilities and supporting communication lines will be temporarily relocated prior to bridge demolition and then permanently relocated at the completion of construction as shown on the plans.

Unless noted otherwise above, the Contractor is to notify each utility no less than thirty (30) days in advance of the date and time that the Contractor intends to work in the vicinity of the utility's facility.

The Contractor shall provide all necessary temporary traffic control for utility work to be performed in advance of other construction.

D. Kent County Water Authority

The Contractor shall be aware that the Kent County Water Authority (KCWA) will have their improvement projects underway within the vicinity of the Sandy Bottom Road Bridge. Among them is the KCWA North and South 500 Foot Transmission Main project advertised in January 2019 which includes the Sandy Bottom Road Pipe Bridge proposed to be built to the west of the Sandy Bottom Road Bridge. That structure is required to be constructed by November 1, 2019.

CODE T01.9906 VERIZON 12-4" PVC CONDUIT DUCT ENCASED IN CONCRETE

CODE T01.9907 VERIZON 12-4" FIBERGLASS CONDUIT DUCT AND FIBERGLASS RACK ON BRIDGE

DESCRIPTION:

This work consists of furnishing and installing PVC and fiberglass conduits, of the size and arrangement specified, comprising the utility duct, at the locations indicated on the Plans or as directed by the Engineer, all in accordance with the RIDOT Standard Specifications. The work shall include

The work shall include but not be limited to; trench excavation and support, temporary stockpiling, backfilling and compaction, all necessary fittings, couplings, and duct expansion joints, making the connection between the stubs or manholes on each side of the bridge, installing the concrete encased PVC duct, providing bridge abutment backwall cut-outs or casting the backwall around the conduits, placing the fiberglass conduits through the bridge, filling bridge abutment backwall cut-outs around the conduits with concrete, providing and installing the fiberglass conduit rack supports and hardware on the bridge, all to Verizon's specifications.

MATERIALS:

All materials shall conform to the appropriate Sections of the RIDOT Standard Specifications and the following pages for additional material specifications for Verizon conduits.

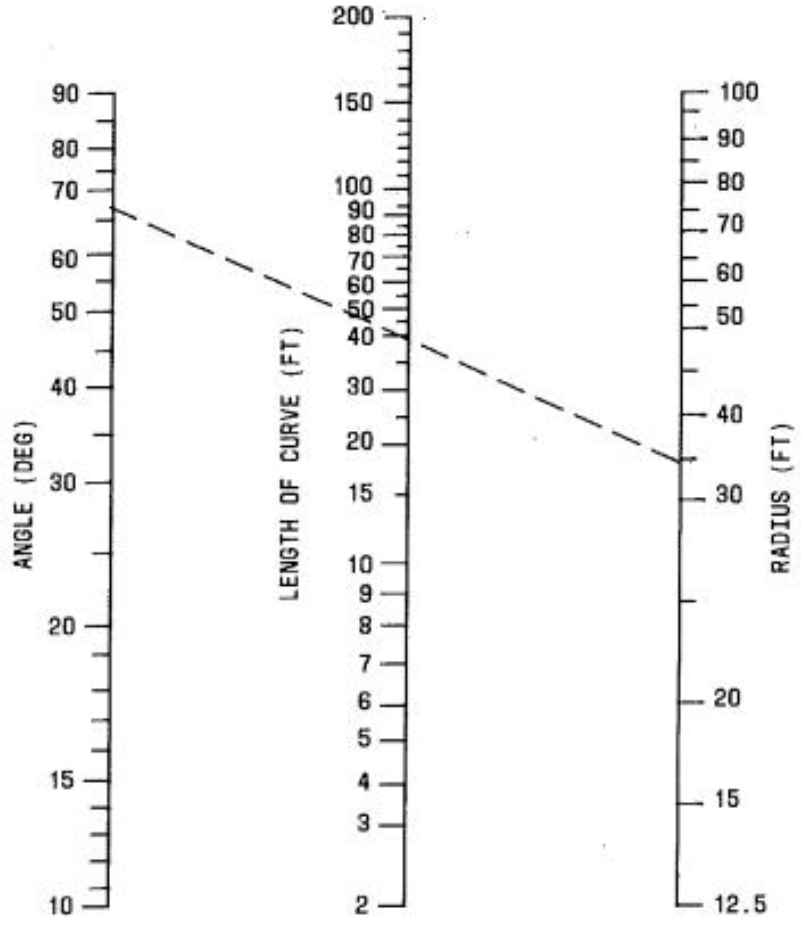
CONSTRUCTION METHODS:

Construction shall be as specified in the appropriate Sections of the RIDOT Standard Specifications and the following pages of construction methods for Verizon conduits.

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).

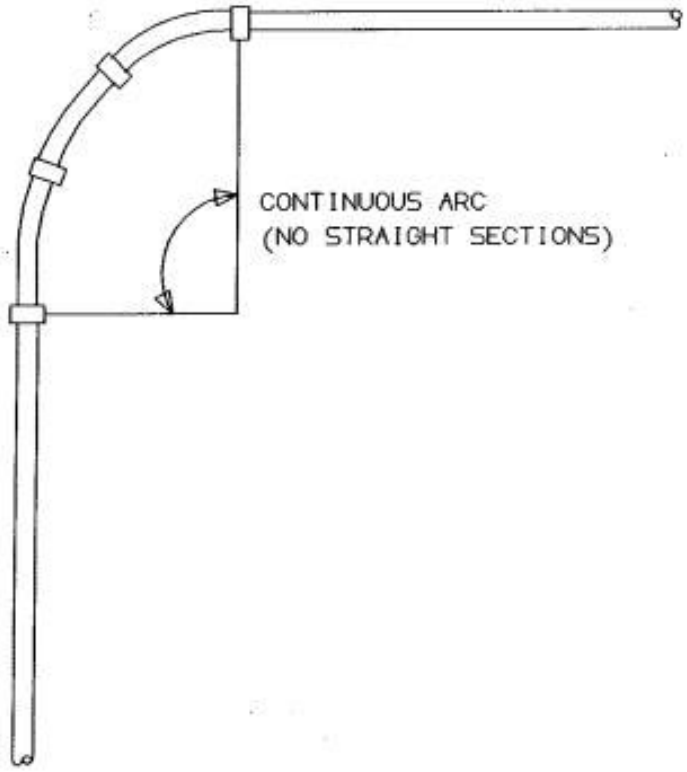
Single–Bore Conduit

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

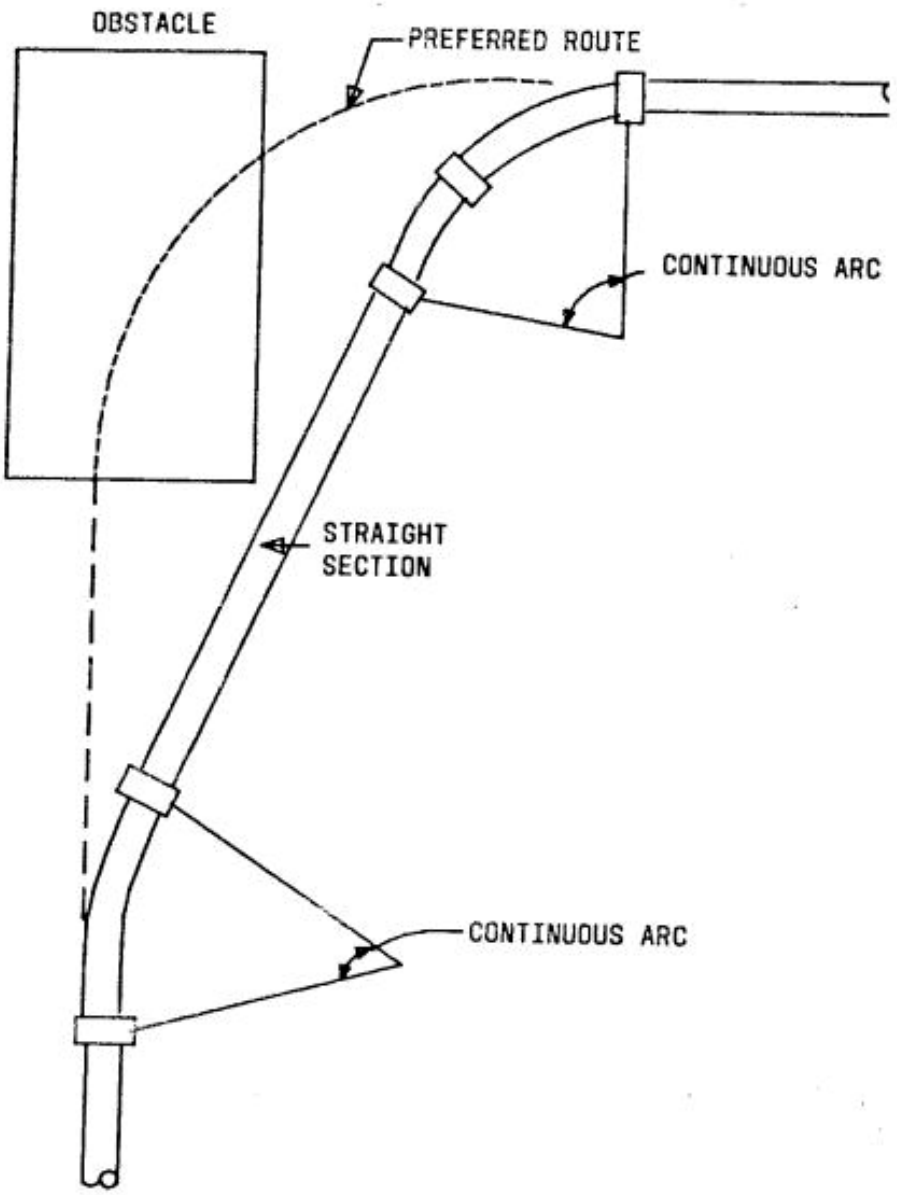
Construct curve in one continuous arc, if possible, using rigid bends without interspersed straight sections, as illustrated below.



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

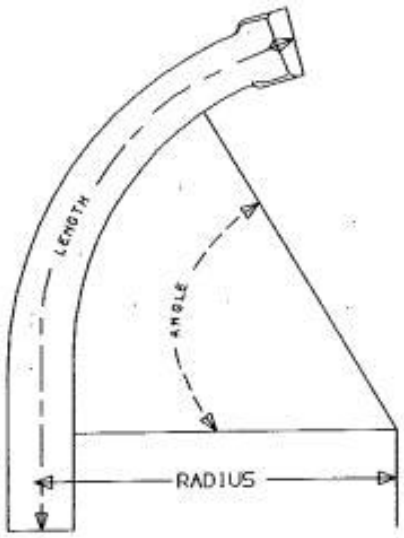
* Longer and shorter lengths available from manufacturer.

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:

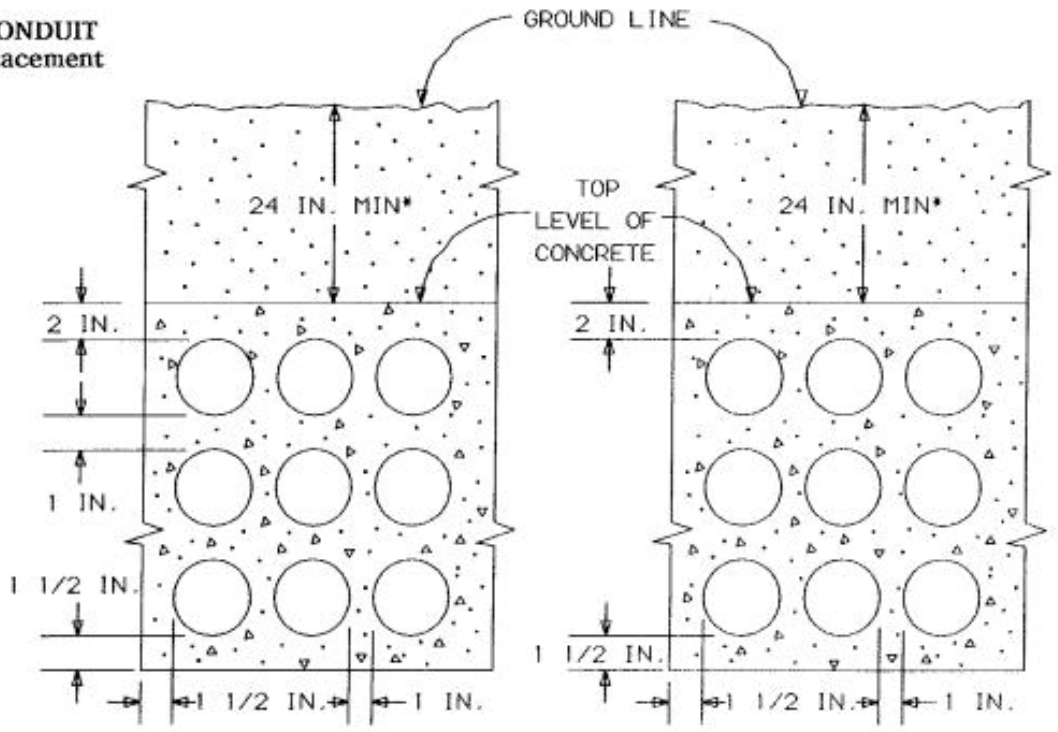
Structure	Minimum Separation
Power or other foreign conduit	3–inch concrete 4–inch masonry 12–inch earth
Pipes (gas, oil) water, etc.)	6 inches when crossing 12 inches when parallel
Power conduit terminated on poles	Separate poles, if possible. If same pole, preferably 180°, but, not less than 90° F.
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 and must be approved by the Engineer and Verizon.

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

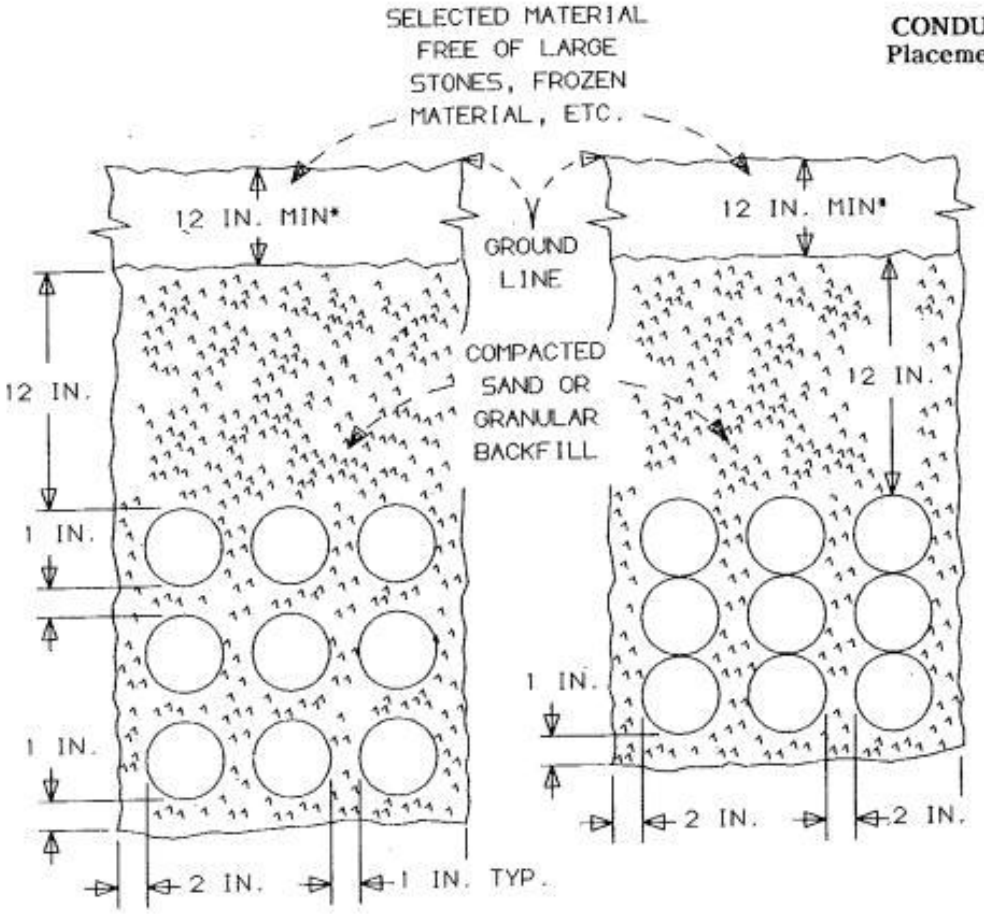
(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

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

OPTIONAL ARRANGEMENT FOR B PLASTIC CONDUIT

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:

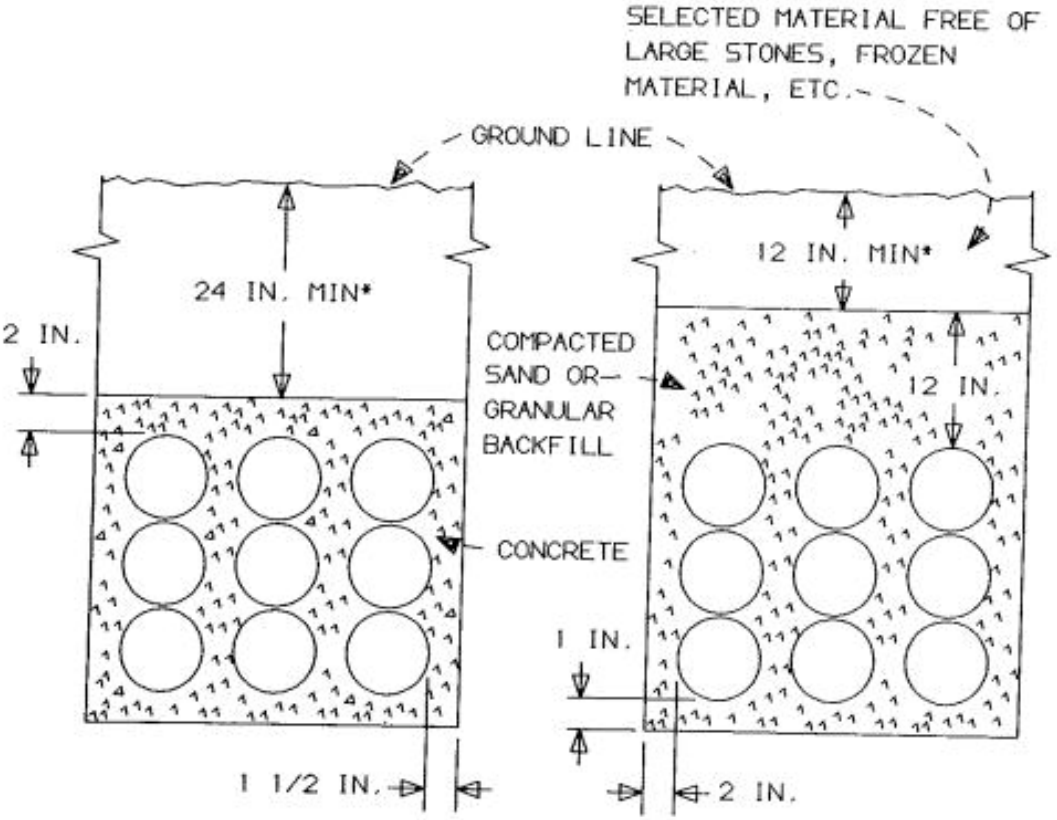
PLASTIC: .36WH + 2.3W + .2H + 7

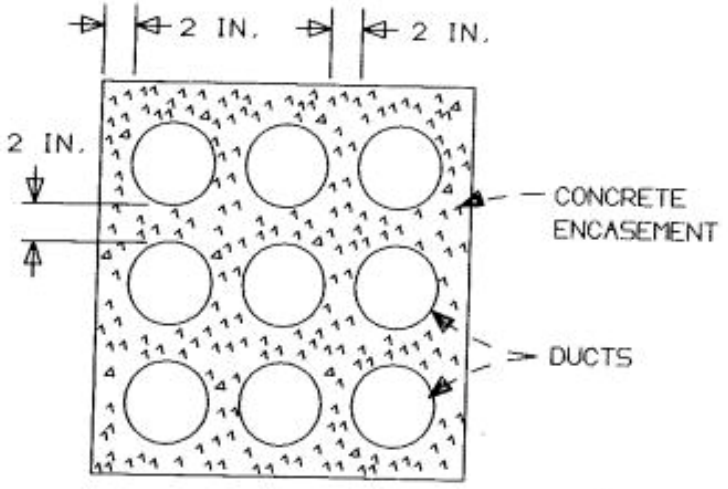
(W = NO. OF DUCTS WIDE, H = NO. OF DUCTS HIGH)

C PLASTIC CONDUIT, STRAIGHT RUNS, UP TO 4 TIERS

8-25

CONDUIT
Placement





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

8–26

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)	-	-

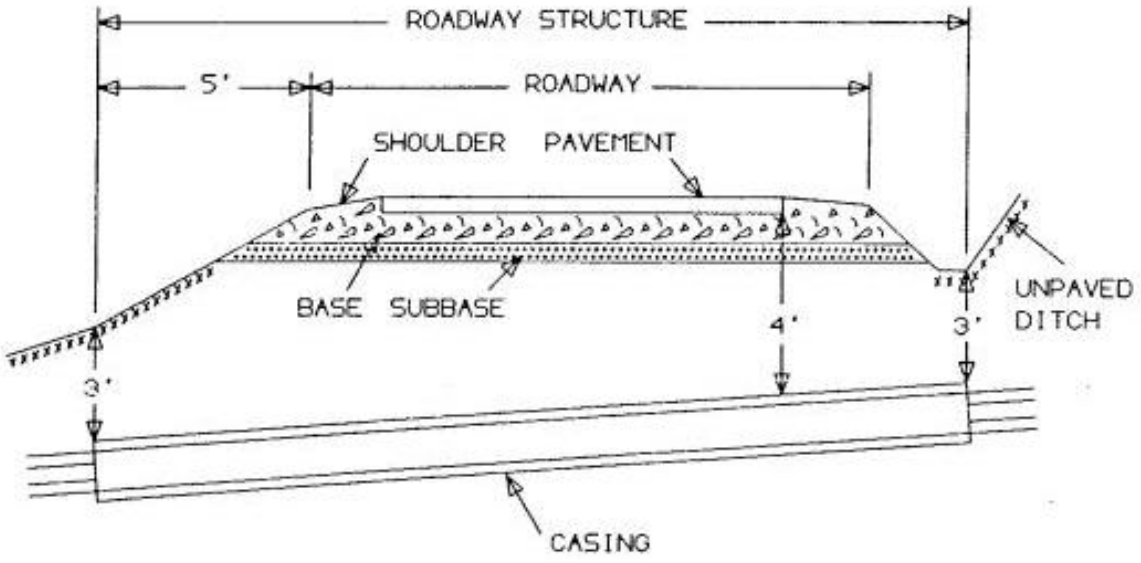
Note 1: Investigate center racking possibilities.
Note 2: 12-duct is available only in F and G concrete conduit.

CONDUIT
Placement

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.

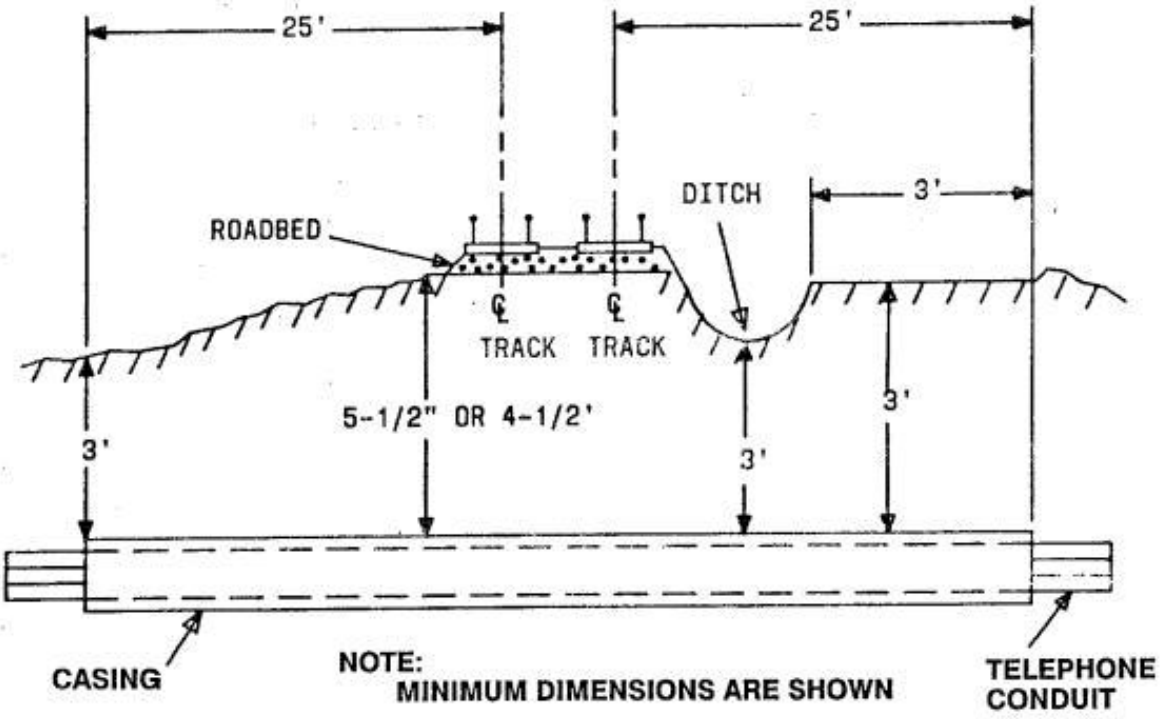


NOTE: MINIMUM DIMENSIONS ARE SHOWN

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.

8–29

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

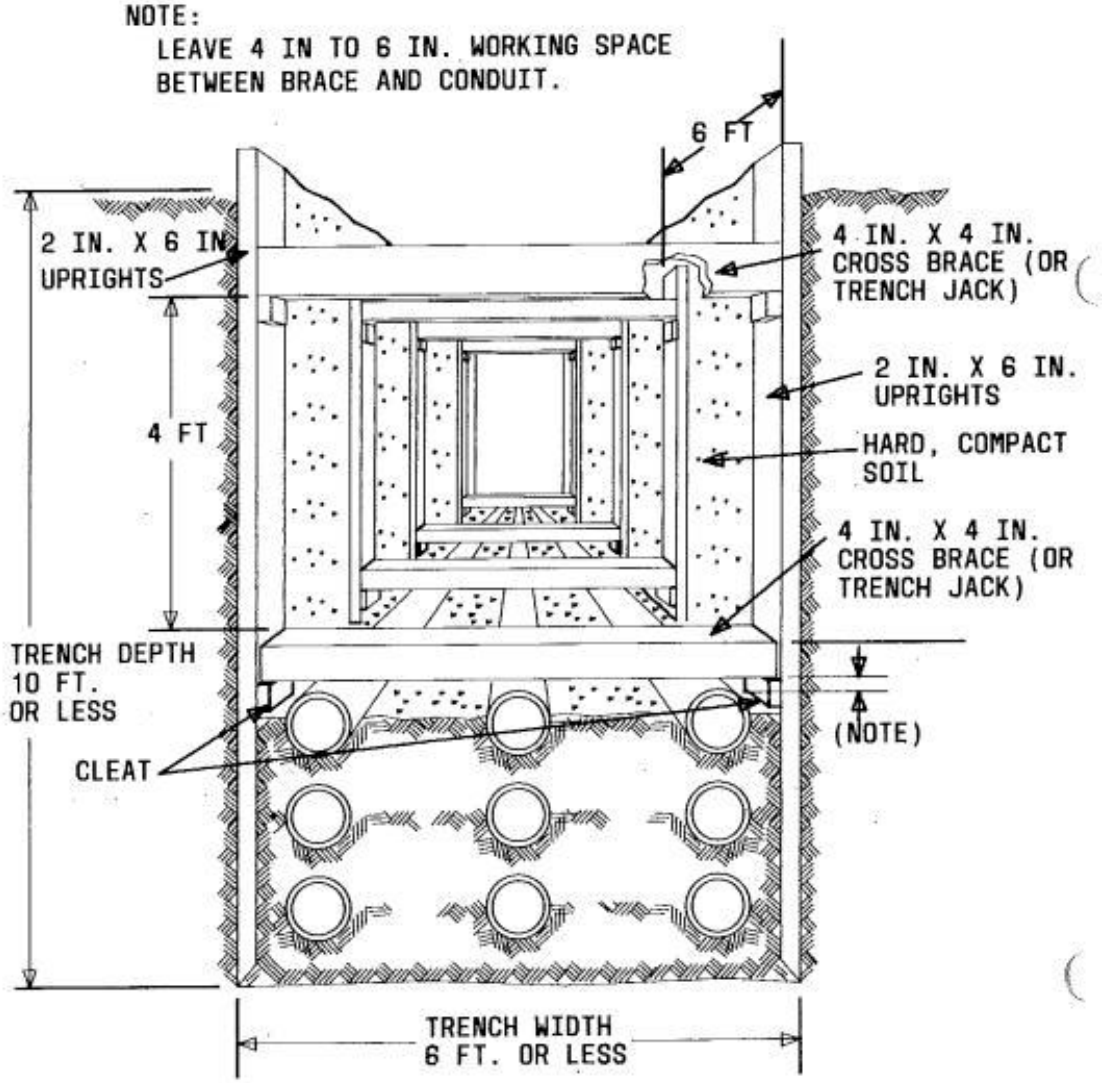
TRENCH WORK

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.



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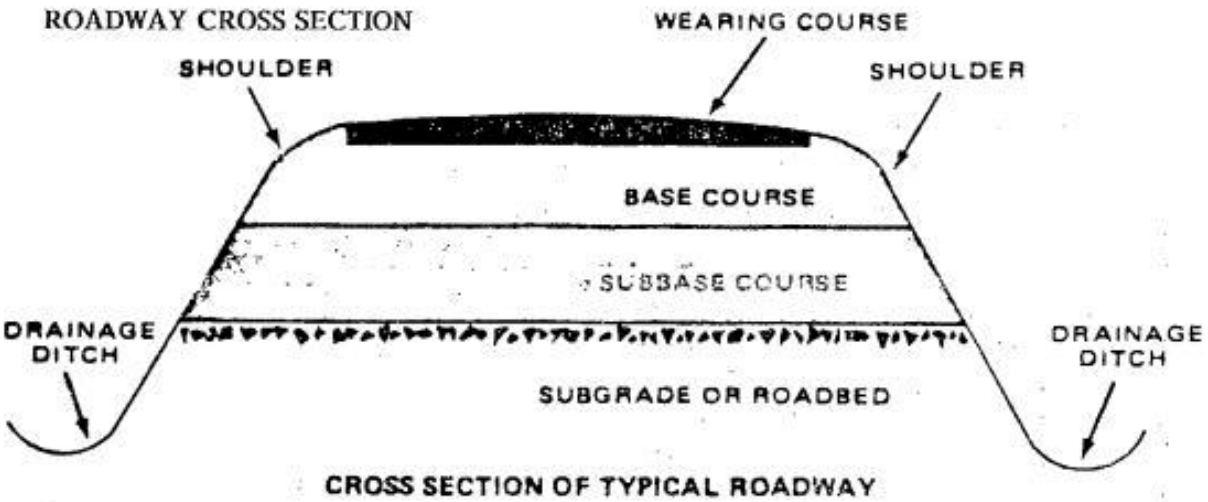
TRENCH SHORING — MINIMUM REQUIREMENTS
(Wood Member Dimensions in Inches)

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 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



Wearing Course

The top layer of material wears off a roadway. It provides a 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.).

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.

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		- INCH STONE -				
			ASPHALT	SAND	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

MANHOLES

Practices 622–500–011, 919–240–300

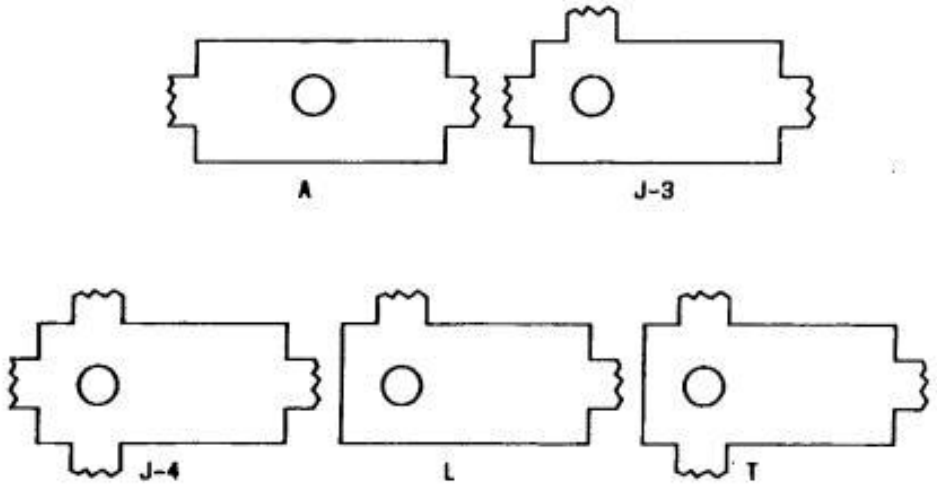
Planning and Design Considerations

- 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

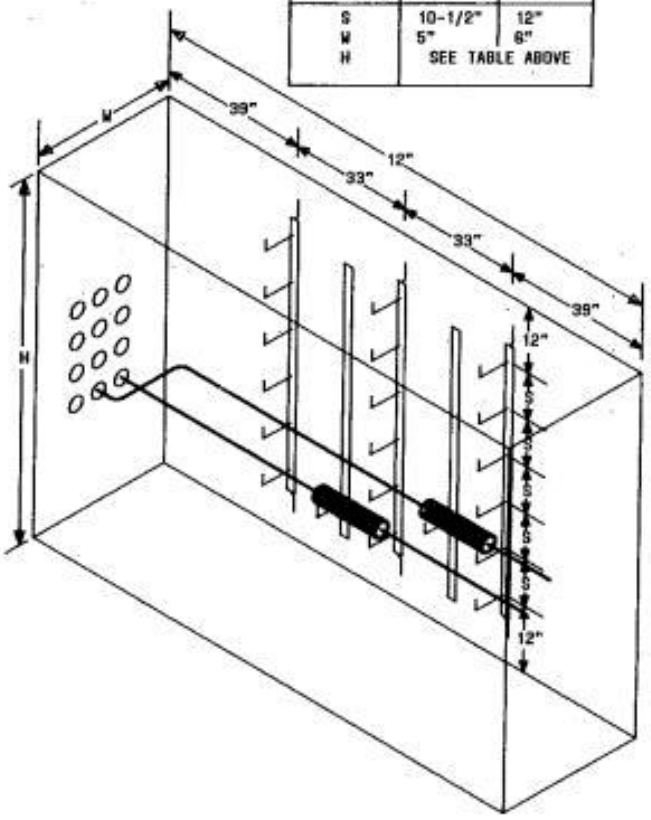
Recommended dimensions of basic manholes are shown below. These sizes allow racking space to accommodate one stub for every four main cables. The ultimate number of main cables must be distributed equally among all racking positions.

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) W	L	H	Carrier System	Capacity
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) W	L	H	Capacity (Number of Coil Cases) (Note)
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	38Y-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.

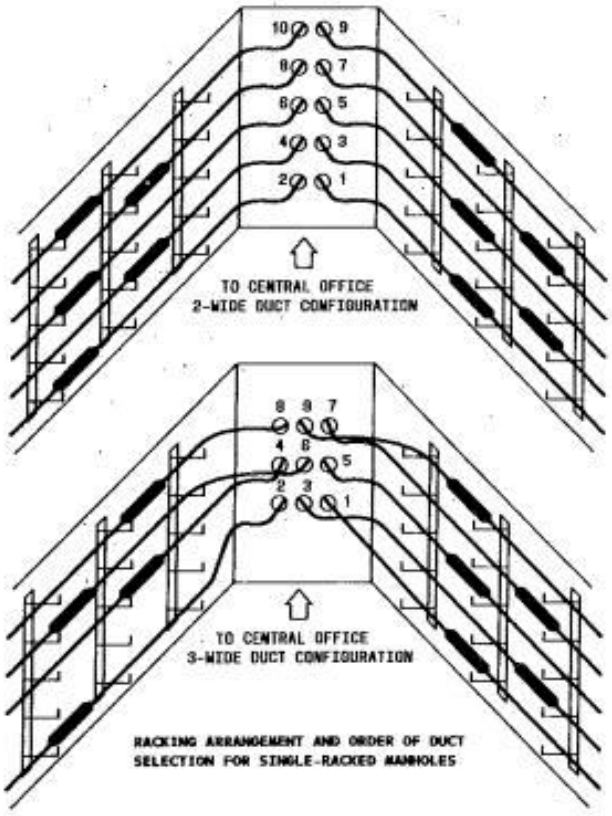
DUCT ASSIGNMENT AND CABLE RACKING

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.

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.

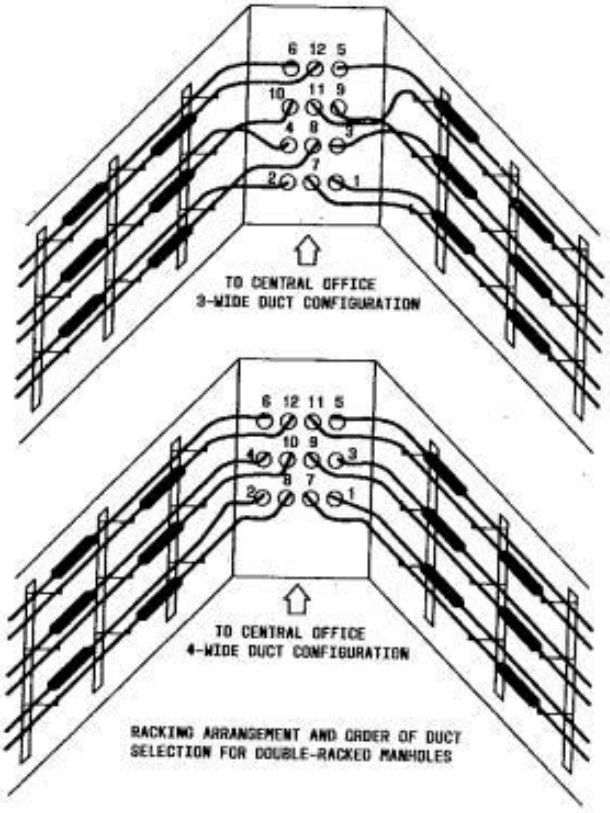


RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR SINGLE-RACKED MANHOLES

CONDUIT
Precast Manholes

CABLE RACKS

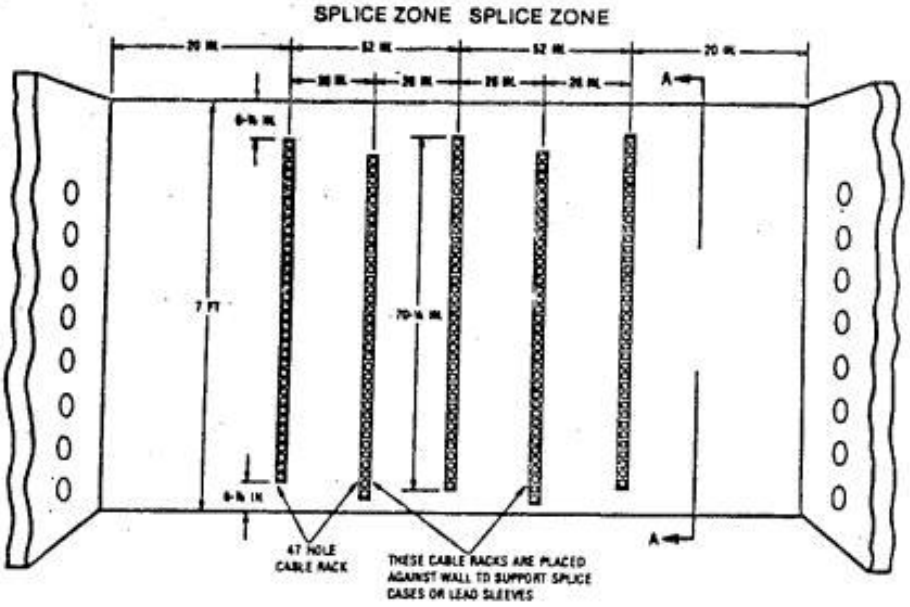
AT&T 622–520–100
919–240–300

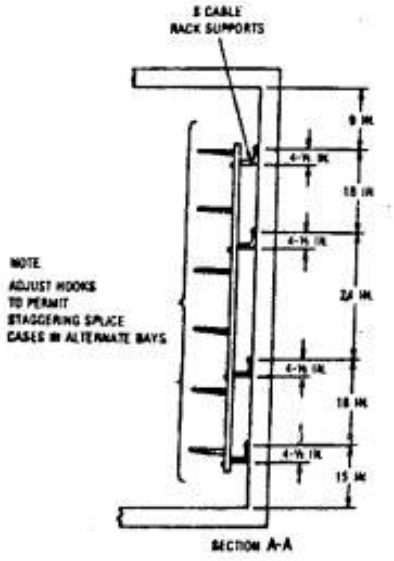


RACKING ARRANGEMENT AND ORDER OF DUCT SELECTION FOR DOUBLE-RACKED MANHOLES

8–46

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

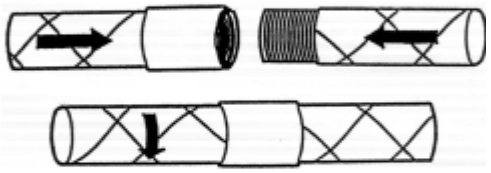
Cable Racks for

4” IPS TELEPHONE FIBERGLASS CONDUIT

THREADED CONDUIT

3,000 lbs. Unbonded Joint Pullout Strength

Part No.	IPS Size	Nominal O.D. (in.)	Nominal I.D. (in.)	Nominal Wall Thick. (in.)	Cross-Sectional Area (sq. in.)	Nominal Weight (lbs. sq/ft.)
12370	4	4.5	4.36	.07	14.93	.80



Support Spacing for Interior Spans at 75°F

At 100°F apply factor of .96 - Based on Midspan Deflection not exceeding 5/8”

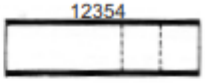
Conduit IPS Size	Cable Wt. Lbs. per ft.	Moment/Inertia	Span in feet
4 inch	3 8	2.374	21.2 17.2

4" IPS TELEPHONE FIBERGLASS FITTINGS

EXPANSION JOINTS

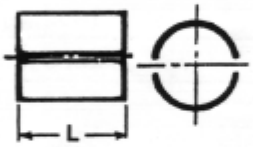
Gasketed
12365

Sleeve Type
12354



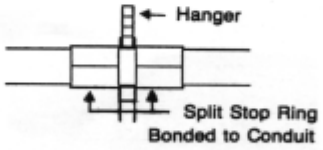
Our Fiberglass conduit has a low thermal expansion coefficient for non-metallic conduit. 100 ft. of conduit will expand approximately 1.6 inches per 100°F increase in temperature. Recommended placement of gasketed expansion joints is no further than 300 feet apart. Non-gasketed expansion joints may be spaced 200 feet apart.

SPLIT ANCHOR RING



12351

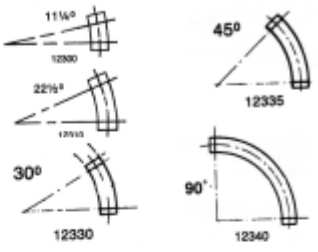
ANCHOR



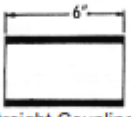
When using more than one expansion joint an anchor must positively restrain the movement of the against all applied forces. Anchoring is done by bonding split stop rings on the exterior of the conduit on both sides of the support hanger that ends or covers the distance or length of conduit for that particular expansion joint.

SWEEP ELBOWS - 42" Radius

Angle	Part No.
11¼°	12300
22½°	12310
30°	12330
45°	12335
90°	12340



*Both ends are spigot (plain end). Couplings are ordered separately.

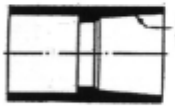


Straight Coupling
12348

ADHESIVE KIT

12358 - Approx 10 joints of 4"

ADAPTERS



4" Threaded Steel to
4" Plain End Fiberglass

Bell X Female
12349

PVC ADAPTERS TO FIBERGLASS

4" tel to 4½ OD FRP
(both ends belled)
12357

SPECIALS

- ***Split & Hinged Fiberglass Repair Conduit***
- ***Cable Trays - Fiberglass***
- ***Bullet Resistant Fiberglass Conduit***

GENERAL SPECIFICATIONS AT 75°F (24°C)

IPS Size	Max. Tensile Load (lbs.)	Max Comp. Load (lbs.)	Min. Bending Radius (ft.)	Max. Torque Ft. - Lbs.	Stiffness Factor at 5% Deflection $in.^3$ - $lbs./in.^2$
4	2260	3110	120	370	70

American U-Tel reinforced epoxy conduit combines the strength characteristics of IMC steel with the weight and corrosion-free characteristics of thermoplastics to provide the ideal conduit system.

LIGHTWEIGHT - One tenth the weight of steel, lighter than Sch. 40 PVC.
CORROSION-FREE - Cannot rust or rot.
CHEMICAL RESISTANCE to all road chemicals.
LOW COEFFICIENT of thermal expansion - about twice that of steel and ½ that of PVC.
HIGH LONGITUDINAL modulus of elasticity compared to thermoplastic, means fewer hangers.
HIGH TEMPERATURE performance. Longitudinal tensile strength at 75°F is 11,400 psi and at 150°F it is 8,500 psi. Heat distortion temperature is 217°F at 264 psi.
BEAM STRENGTH exceeds that of thermoplastic materials.
LOW COEFFICIENT OF FRICTION - cable pull-through forces are lower.
LARGER INSIDE DIAMETER allows more cable.
RESISTANT TO DEGRADATION from weather and ultraviolet radiation.
JOINT PULL-OUT STRENGTH of unbonded threaded joint is in excess of 3,000 lbs.

Property - Physical	Test Method	Value at 75°F	Value at 24°C
Ultimate Tensile Strength	ASTM-D2105	10,500 psi	72.4 MPa
Design Tensile Stress	-	2,625 psi	18.1 MPa
Tensile Modus of Elasticity	ASTM-D2105	1.77 X 10^6 psi	12203.7 MPa
Ultimate Compressive Strength	ASTM-D695	17,800 psi	122.7 MPa
Design Compressive Stress	-	4,450 psi	30.7 MPa
Compressive Modus of Elasticity	ASTM-D695	1.4 X 10^6 psi	9652.7 MPa
Ultimate Beam Bending Strength	AOSI-TM	16,700 psi	115.1 MPa
Design Beam Bending Strength	-	5,000 psi	34.5 MPa
Coefficient of Thermal Expansion	AOSI-TM 16-3	1.12 X 10^5 in/in/°F	2.02 X 10^5 mm/mm/°C
Thermal Conductivity	AOSI-TM 16-15	2.6 Btu•in/ft^2•°F•hr	0.37 W/m•°K
Specific Gravity	ASTM-D792	1.85	1.85

Property - Electrical	Test Method	Value at 75°F	Value at 24°C
Volume Resistivity	ASTM-D150	7.6 X 10^{15} ohm-cm	7.6 X 10^{15} ohm-cm
Surface Resistivity	ASTM-D257	2.4 X 10^8 megohm	2.4 X 10^8 megohm
Dielectric Constant	ASTM-D150	4.2 (at 10^3 cps)	4.2 (at 10^3 cps)
Dissipation Factor	ASTM-D150	0.06 (at 10^3 cps)	0.06 (at 10^3 cps)
Dielectric Strength	ASTM-D348	440 volts/mil	1800 volts/mil

4" IPS SUPPORT HANGERS

FOR 4.50 O.D. X 4.36 I.D. FIBERGLASS DUCT - IPS SIZE

HARDWARE: Specify if Zinc Plated or Hot Dip Galvanized.

STANDARD HANGING

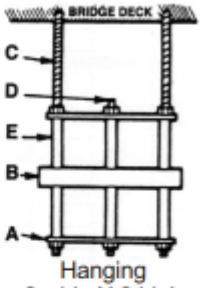
Dimensions in Inches

NUMBER OF DUCTS HIGH	NUMBER OF DUCTS WIDE	Part	1 No. Req'd.	1 Length	2 No. Req'd.	2 Length	3 No. Req'd.	3 Length	4 No. Req'd.	4 Length	5 No. Req'd.	5 Length	6 No. Req'd.	6 Length
1		A	1	7.69	1	13.38	1	19.06	1	24.75	1	30.43	1	36.13
		B	1	11.69	1	17.38	1	23.06	1	28.75	1	34.43	1	40.13
		C	2	26.00	2	26.00	2	26.00	2	26.00	3	26.00	3	26.00
		D	0	—	1	9.18	2	9.18	3	9.18	4	9.18	4	9.18
		E	2	4.69	3	4.69	4	4.69	5	4.69	6	4.69	7	4.69
	Weight Lbs.		9.2		11.5		13.9		16.5		18.9		23.8	
2		A	2	7.69	2	13.38	2	19.06	2	24.75	2	30.43	2	36.13
		B	1	11.69	1	17.38	1	23.06	1	28.75	1	34.43	1	40.13
		C	2	31.18	2	31.18	2	31.18	2	31.18	3	31.18	3	31.18
		D	0	—	1	14.50	2	14.50	3	14.50	4	14.50	4	14.50
		E	4	4.69	6	4.69	8	4.69	10	4.69	12	4.69	14	4.69
	Weight Lbs.		11.1		14.6		18.2		21.9		25.5		28.9	
3		A	3	7.69	3	13.38	3	19.06	3	24.75	3	30.43	3	36.13
		B	1	11.69	1	17.38	1	23.06	1	28.75	1	34.43	1	40.13
		C	2	36.31	2	36.31	2	36.31	2	36.31	3	36.31	3	36.31
		D	0	—	1	19.62	2	19.62	3	19.62	4	19.62	4	19.62
		E	6	4.69	9	4.69	12	4.69	15	4.69	18	4.69	21	4.69
	Weight Lbs.		13.1		17.6		22.5		27.3		32.9		36.9	
4		A	4	7.69	4	13.38	4	19.06	4	24.75	4	30.43	4	36.13
		B	1	11.69	1	17.38	1	23.06	1	28.75	1	34.43	1	40.13
		C	2	41.43	2	41.43	2	41.43	2	41.43	3	41.43	3	41.43
		D	0	—	1	24.75	2	24.75	3	24.75	4	24.75	4	24.75
		E	8	4.69	12	4.69	16	4.69	20	4.69	24	4.69	28	4.69
	Weight Lbs.		15.5		21.1		26.9		32.9		38.8		44.8	

STANDARD BASE MOUNT

Dimensions in Inches

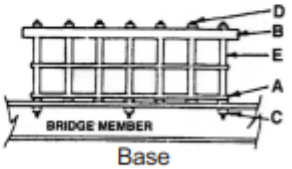
NUMBER OF DUCTS HIGH	NUMBER OF DUCTS WIDE	Part	1 No. Req'd.	1 Length	2 No. Req'd.	2 Length	3 No. Req'd.	3 Length	4 No. Req'd.	4 Length	5 No. Req'd.	5 Length	6 No. Req'd.	6 Length
1		A	2	7.69	2	13.38	2	19.06	2	24.75	2	30.43	2	36.13
		B	0	—	0	—	0	—	0	—	0	—	0	—
		C	2	10.56	2	10.56	2	10.56	2	10.56	3	10.56	3	10.56
		D	0	—	1	7.75	2	7.75	3	7.75	3	7.75	4	7.75
		E	2	4.69	3	4.69	4	4.69	5	4.69	6	4.69	7	4.69
	Weight Lbs.		4.5		6.8		8.9		10.9		13.1		15.8	
2		A	2	7.69	2	13.38	2	19.06	2	24.75	2	30.43	2	36.13
		B	1	11.69	1	17.38	1	23.06	1	28.75	1	34.43	1	40.13
		C	2	17.18	2	17.18	2	17.18	2	17.18	3	17.08	3	17.18
		D	0	—	1	14.38	2	14.38	3	14.38	3	14.38	4	14.38
		E	4	4.69	6	4.69	8	4.69	10	4.69	12	4.69	14	4.69
	Weight Lbs.		7.9		11.8		15.0		19.0		22.7		23.8	
3		A	3	7.69	3	13.38	3	19.06	3	24.75	3	30.43	3	36.13
		B	1	11.69	1	17.38	1	23.06	1	28.75	1	34.43	1	40.13
		C	2	22.97	2	22.97	2	22.97	2	22.97	3	22.97	3	22.97
		D	0	—	1	19.97	2	19.97	3	19.97	3	19.97	4	19.97
		E	6	4.69	9	4.69	12	4.69	15	4.69	18	4.69	21	4.69
	Weight Lbs.		9.6		14.6		19.4		26.6		28.6		33.8	
4		A	4	7.69	4	13.38	4	19.06	4	24.75	4	30.43	4	36.13
		B	1	11.69	1	17.38	1	23.06	1	28.75	1	34.43	1	40.13
		C	2	28.16	2	28.16	2	28.16	2	28.16	3	28.16	3	28.16
		D	0	—	1	25.16	2	25.16	3	25.16	3	25.16	4	25.16
		E	8	4.69	12	4.69	16	4.69	20	4.69	24	4.69	28	4.69
	Weight Lbs.		11.9		17.6		23.3		29.5		34.8		41.0	



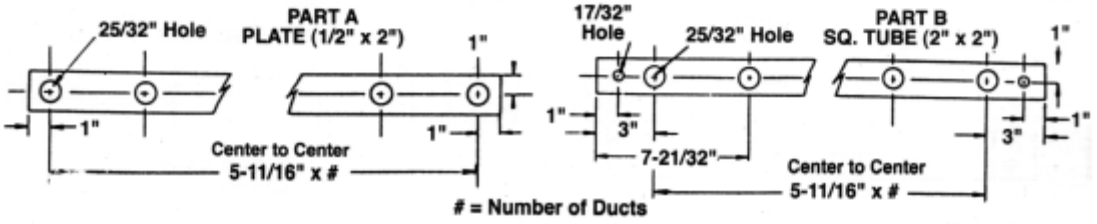
Hanging
2 wide X 2 high

FIBERGLASS HANGER

Part (A) ½" X 2" fiberglass plate
Part (B) 2" X 2" fiberglass square tubing
Part (C) ¾" 10NC threaded steel attachment rods, nuts and washers (plated)
Part (D) Spacer rods: ¾" 10NC threaded steel rods, nuts and washers (plated)
Part (E) ¾" fiberglass spacer tubes (1.0" O.D. X .755" I.D. X 4.69" long)



Base
6 wide X 2 high



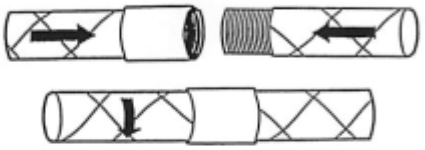
 # = Number of Ducts

4" TELEPHONE FIBERGLASS CONDUIT

Dimensional Data

4" TELEPHONE

Part No.	IPS Size	Nominal O.D. (in.)	Nominal I.D. (in.)	Nominal Wall Thick. (in.)	Cross-Sectional Area (sq. in.)	Nominal Weight (lbs. sq/ft.)
12370	4	4.5	4.36	.07	14.93	.80



General Specifications at 75°F (24°C)

Allowable Operating Loads

IPS Size	Max. Tensile Load (lbs.)	Max. Comp. Load (lbs.)	Min. Bending Radius (ft.)	Max. Torque Ft. • Lbs.	Stiffness Factor at 5% Deflection $in.^3 \cdot lbs./in.^2$
4	2260	3110	120	370	70

American U-Tel reinforced epoxy conduit combines the strength characteristics of IMC steel with the weight and corrosion-free characteristics of thermoplastics to provide the ideal conduit system.

LENGTH – STANDARD IS 30 FEET PLUS OR MINUS 6"

LIGHTWEIGHT. One tenth the weight of steel, lighter than Sch. 40 PVC.

CORROSION-FREE. Cannot rust or rot.

CHEMICAL RESISTANCE to all road chemicals.

LOW COEFFICIENT of thermal expansion – about twice that of steel and 1/2 that of PVC.

HIGH LONGITUDINAL modulus of elasticity compared to thermoplastic, means fewer hangers.

HIGH TEMPERATURE performance. Longitudinal tensile strength at 75°F is 11,400 psi and at 150°F it is 8,500 psi. Heat distortion temperature is 217°F at 264 psi.

BEAM STRENGTH exceeds that of thermoplastic materials.

LOW COEFFICIENT OF FRICTION - cable pull-through forces are lower.

LARGER INSIDE DIAMETER allows more cable.

FIRE RESISTANCE exceeds the requirements of U.L. 651-Section 17.

RESISTANT TO DEGRADATION from weather and ultraviolet radiation.

JOINT PULL-OUT STRENGTH of unbonded threaded joint is in excess of 3,000 lbs. for all sizes.

4" TELEPHONE FIBERGLASS CONDUIT

Property – Physical	Test Method	Value at 75°F	Value at 24°C
Ultimate Tensile Strength	ASTM-D2105	10,500 psi	72.4 MPa
Design Tensile Stress	–	2,625 psi	18.1 MPa
Tensile Modulus of Elasticity	ASTM-D2105	1.77 x 10^6 psi	12203.7 MPa
Ultimate Compressive Strength	ASTM-D695	17,800 psi	122.7 MPa
Design Compressive Stress	–	4,450 psi	30.7 MPa
Compressive Modulus of Elasticity	ASTM-D695	1.4 x 10^6 psi	9652.7 MPa
Ultimate Beam Bending Strength	AOSI-TM	16,700 psi	115.1 MPa
Design Beam Bending Stress	–	5,000 psi	34.5 MPa
Coefficient of Thermal Expansion	AOSI-TM 16-3	1.12 x 10^5 in/in°F	2.02 x 10^5 mm/mm/°C
Thermal Conductivity	AOSI-TM 16-15	2.6 Btu•in/ft²•°F•hr	0.37 W/m • °K
Specific Gravity	ASTM-D792	1.85	1.85

Property – Electrical	Test Method	Value at 75°F	Value at 24°C
Volume Resistivity	ASTM-D150	7.6 x 10^{13} ohm-cm	7.6 x 10^{11} ohm-cm
Surface Resistivity	ASTM-D257	2.4 X 10^6 megohm	2.4 X 10^4 megohm
Dielectric Constant	ASTM-D150	4.2 (at 10^3 cps)	4.2 (at 10^3 cps)
Dissipation Factor	ASTM-D150	0.06 (at 10^3 cps)	0.06 (at 10^3 cps)
Dielectric Strength	ASTM-D348	440 volts/mil	1800 volts/mm

METHOD OF MEASUREMENT:

"ITEM CODE T01.9906 VERIZON 12-4" PVC CONDUIT DUCT ENCASED IN CONCRETE" and "ITEM CODE T01.9907 VERIZON 12-4" FIBERGLASS CONDUIT DUCT AND FIBERGLASS RACK ON BRIDGE" will each be measured by the "Linear Foot" of conduit duct actually furnished and installed accordance with this Special Provision and elsewhere in the Contract Documents and/or as directed by the Engineer.

BASIS OF PAYMENT:

The accepted quantity of “ITEM CODE T01.9906 VERIZON 12-4” PVC CONDUIT DUCT ENCASED IN CONCRETE” and “ITEM CODE T01.9907 VERIZON 12-4” FIBERGLASS CONDUIT DUCT AND FIBERGLASS RACK ON BRIDGE” will each be paid for at the contract unit price per "Linear Foot” as listed in the Proposal. The price so-stated will constitute full and complete compensation for all labor, materials, tools, equipment, and all incidentals required to finish the work as described in this Special Provision and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

CODE T12.9903
PORTABLE TRAFFIC CONTROL SIGNAL SYSTEM

DESCRIPTION:

This work consists of furnishing two (2) Portable Traffic Control Signal units (PTS) to the Engineer and maintaining an operational traffic control signal system during the duration of the staged construction at Sandy Bottom Road (Route 33) Bridge No. 257.

This item of work shall conform to the applicable requirements of Section T.10 of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction, 2004 Edition, (Amended March 2018), with all revisions and following additions:

The PTS units shall comply with the requirements for Portable Traffic Control Signals as defined in Chapter 4D of the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition, including all revisions.

Requirements include, but are not limited to**,** the requirements pertaining to signal heads, lamps, spacing of signal heads, clearance, number and size of signal faces and intercommunication. The PTS units shall utilize LED traffic signal indications that comply with the Institute of Traffic Engineers (ITE) specifications for "Vehicle Traffic Control Signal Heads".

MATERIALS:

Each unit shall consist of:

- Trailer with an attached level indicator on each axis to ensure the PTS is level in both directions;
- Structural support system;
- Mast-arm assembly;
- Lift mechanism;
- Regulated power supply;
- Solar powered with battery backup;
- 12" LED Signal Heads (one on the arm as well as one on the pole). Black backboard with yellow heads;
- Adjustable overhead mast arm;
- Pre-Emption System;
- Advanced Remote Monitoring;
- Clearance Time Extender;
- Radio/GPS communication to allow units to communicate with one another;
- Detection capability utilizing video detectors;

- “Countdown to Green” display;
- Lumination kit to light temporary signal intersection areas;
- All necessary wire, cable and ancillary equipment.

The unit(s) shall be of the following manufacture (or approved equal):

Horizon Signal
5 Corporate Boulevard
Reading, PA 19608
1-800-852-8796

Tower Sign and Signal Inc.
24838 Hettick Scottville Road
Hettick, IL 62649
1-888-882-1919

North America Traffic
7 Petersburge Circle
Port Colborne, Ontario L3K5V5
1-877-695-1646

TRAILER:

The trailer shall be designed for safe transport at normal highway speeds of 55 mph. Lights, reflectors, and splash guards shall be provided to comply with Rhode Island Motor Vehicle Regulations. The PTS System shall be delivered with reflective tape, installed on all four (4) sides of the trailer. Each side of the trailer shall have the minimum equivalent of 72 square inches (465 square centimeters) of reflective tape.

STRUCTURAL SUPPORT:

The deployed structure shall supply adequate support to allow complete traffic signal operation, including raising and lowering of the mast arm, and shall remain stable during wind gusts of 80 mph when stationary.

LIFT MECHANISM:

A. The lift mechanism shall be an electric or electrically-assisted hydraulic or mechanically assisted manual mechanism capable of raising and lowering the mast arm.
B. The mechanism shall be capable of being raised and lowered manually.
C. A safety feature shall be provided to prevent the mast arm from lowering once in the raised position. If a safety bolt is used, a self-locking mechanism shall be incorporated into the safety bolt which prevents it from being inadvertently dislodged.

D. The mast arm of the unit shall extend a minimum of 9 feet (2.7 m) from the road side of the trailer, and provide a minimum clearance of 17 feet (5.2 m) over the baseline established by the jacks.

ELECTRICAL:

This system shall consist of a solar/battery power system and shall be capable of operating the PTS System for at least 14 consecutive days on batteries alone at 70ºF (17.7ºC). The system shall be designed to operate continuously within the State of Rhode Island, January through December. The PTS System shall be equipped with an on-board auxiliary charging system to enable the batteries to be recharged with a power generator in the event of a solar system failure or emergency situation. The Contractor shall provide 24-hour emergency service with a maximum 1-hour response time to insure that the signals are operating properly in the event of an emergency or signal equipment power failure. A 24-hour contact shall be provided to the Engineer prior to temporary signal use.

OTHER:

The PTS units shall have the necessary equipment required to accommodate a strobe based pre-emption request which provides a priority green phase in the direction of approaching emergency vehicles.

The PTS units shall have the necessary equipment required to detect traffic and coordinate between the two (2) PTS system and existing signal system at the intersections of Tiogue Avenue (Route 3)/Arnold Road and Sandy Bottom Road (Route 33) and Main Street (Route 117) and Sandy Bottom Road (Route 33).

The PTS units shall be constructed or equipped for legal and easy transport on public highway system.

The PTS units shall be equipped with stabilizing and leveling devices.

At the end of phase 1, the Contractor shall carefully remove the PTS units and load and haul them to the State's Jefferson Boulevard stockpile located on Jefferson Boulevard in Warwick. The RIDOT Highway and Bridge Maintenance Division, 360 Lincoln Avenue, Warwick, RI 02888 (401) 222-2378 shall be contacted in advance to approve the transfer and schedule. The Contractor shall then unload the PTS units at a location designated by the Maintenance representative within the Jefferson Boulevard site. Upon delivery the Contractor shall transfer ownership of the PTS units to the RIDOT including all warrantees and purchase documentation.

METHOD OF MEASUREMENT:

This item of work will not be measured for payment.

BASIS OF PAYMENT:

The accepted quantity of “ITEM CODE T12.9903 PORTABLE TRAFFIC CONTROL SIGNAL SYSTEM” will be paid for at the contract bid price per “LUMP SUM” with 50% payment upon completion of installation and operational and 50% paid upon complete removal of the PTS units as listed in the Proposal. The price so-stated shall constitute full and complete compensation for all labor, materials, tools, equipment, including delivery and installation of all PTS units, maintenance of said PTS units, maintaining an operational traffic control signal system during the entire duration of staged construction; portable power generator in the event of an emergency condition or signal equipment power failure, moving or relocating each PTS unit at the direction of the Engineer or for break-down and set-up of various construction phasing, and all incidentals required to finish the work as described in this Special Provision and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

Table of Contents - Distribution of Quantities

Project Name - Bridge Group 12A - Sandy Bottom
Estimate Name - Addendum to Sandy Bottom Road Bridge No. 257
R.I. Contract No. - 2019-CB-077
FAP Nos: BRO-0257(003)

Table of Contents - Distribution of Quantities

Project Name - Bridge Group 12A - Sandy Bottom
Estimate Name - Addendum to Sandy Bottom Road Bridge No. 257
R.I. Contract No. - 2019-CB-077
FAP Nos: BRO-0257(003)

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Estimate Name - Addendum to Sandy Bottom Road Bridge No. 257
R.I. Contract No. - 2019-CB-077
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Distribution of Quantities

Project Name - Bridge Group 12A - Sandy Bottom
Estimate Name - Addendum to Sandy Bottom Road Bridge No. 257
R.I. Contract No. - 2019-CB-077
FAP Nos: BRO-0257(003)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
S088	**T20.2804 Cont.**	**PAVEMENT MARKINGS**				
		SANDY BOTTOM ROAD BRIDGE 257				
		STA 762+70 TO 770+30		1,520.00	0011	01
		Item T20.2804 Total:		**1,520.00**		
S089	**T20.4506**	**REMOVE PAVEMENT MARKING LINE - LESS THAN OR EQUAL TO 6 INCHES WIDE**	**LF**			
		SANDY BOTTOM ROAD BRIDGE 257				
		MPT PLAN 1		1,005.00	0011	01
		MPT PLAN 2		3,040.00	0011	01
		Item T20.4506 Total:		**4,045.00**		
S090	**T20.4508**	**REMOVE PAVEMENT MARKING LINE - GREATER THAN 6 INCHES WIDE**	**LF**			
		MPT PLAN NO. 1				
		CROSSWALK PAVEMENT MARKING		160.00	0011	01
		NORTHWEST DRIVEWAY		15.00	0011	01
		SOUTHEAST DRIVEWAY		25.00	0011	01
		VIDEO DETECTION ZONE 1		15.00	0011	01
		VIDEO DETECTION ZONE 2		15.00	0011	01
		MPT PLAN NO. 2				
		CROSSWALK PAVEMENT MARKING		160.00	0011	01
		Item T20.4508 Total:		**390.00**		
091	**T01.9906**	**VERIZON 12-4" PVC CONDUIT DUCT ENCASED IN CONCRETE**	**LF**			
		SANDY BOTTOM ROAD				
		764+70 RT 10' EAST OF EXISTING VERIZON MH TO BRIDGE BACKWALL		145.00	0011	01
		768+10 RT 10' NORTH OF NEW VERIZON MH TO BRIDGE BACKWALL		115.00	0011	01

Distribution of Quantities

Project Name - Bridge Group 12A - Sandy Bottom
Estimate Name - Addendum to Sandy Bottom Road Bridge No. 257
R.I. Contract No. - 2019-CB-077
FAP Nos: BRO-0257(003)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
091	**T01.9906 Cont.**	**Item T01.9906 Total:**		**260.00**		
092	**T01.9907**	**VERIZON 12–4″ FIBERGLASS CONDUIT**	**LF**			
		DUCT AND FIBERGLASS RACK ON BRIDGE				
		SANDY BOTTOM BR 257				
		SANDY BOTTOM BR 257		90.00	0011	01
		Item T01.9907 Total:		**90.00**		

COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

REVISIONS		
NO.	DATE	BY
1	8/14/19	EK

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF
SANDY BOTTOM BRIDGE No. 257

COVENTRY, RHODE ISLAND

DRAINAGE & UTILITY PLAN

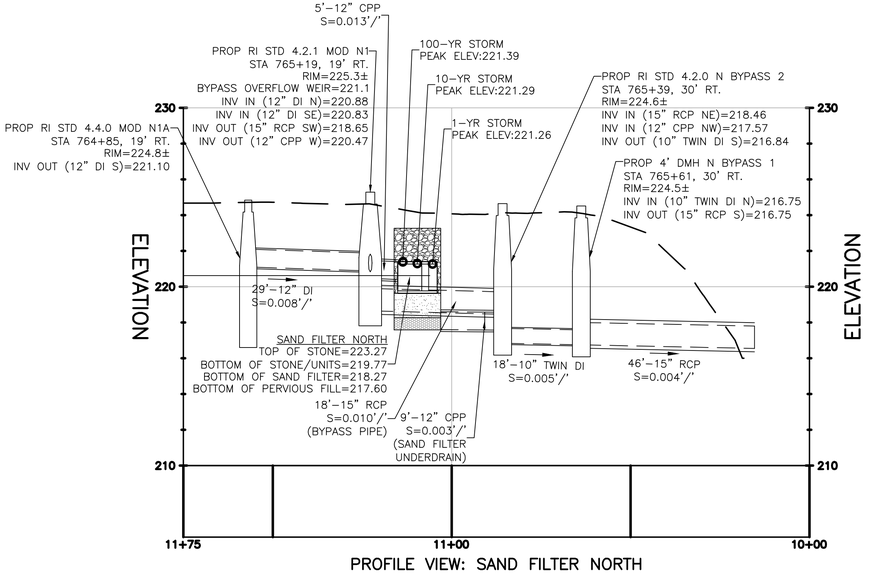
CHECKED BY ________ DATE ________ SCALE 1"=20'

0114W_V1_008_DRAINUTL001_ADD01

P:\16000\16044.57 Sandy Bottom Bridge No. 257\1 Drawings\Transportation_Current_Drawings\0114W_V1_008_DRAINUTL001_ADD01.dwg, 8/13/2019 9:56:02 AM, RMM

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI		2019	10	52

R-1

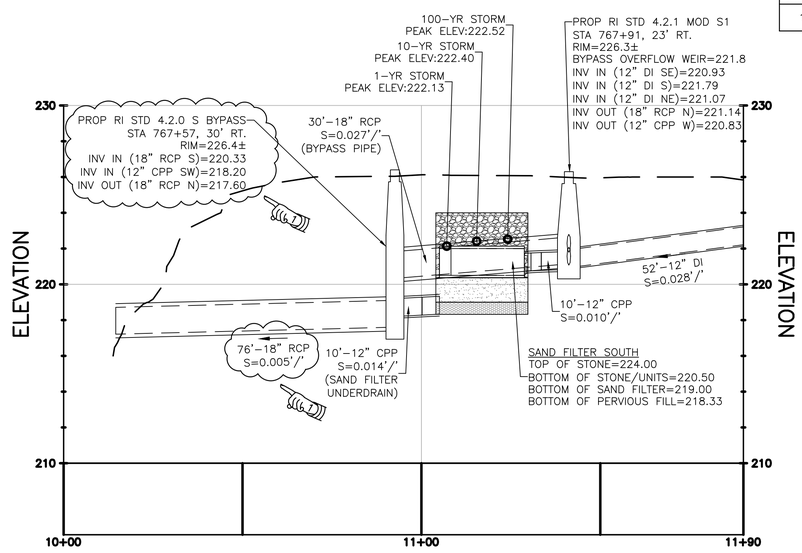


PROFILE VIEW: SAND FILTER NORTH

GRAPHIC SCALE

20 0 10 20 40 80

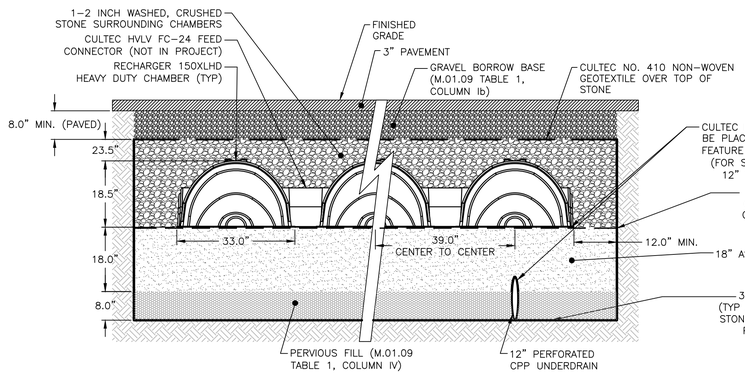
(IN FEET)
1 inch = 20 ft.



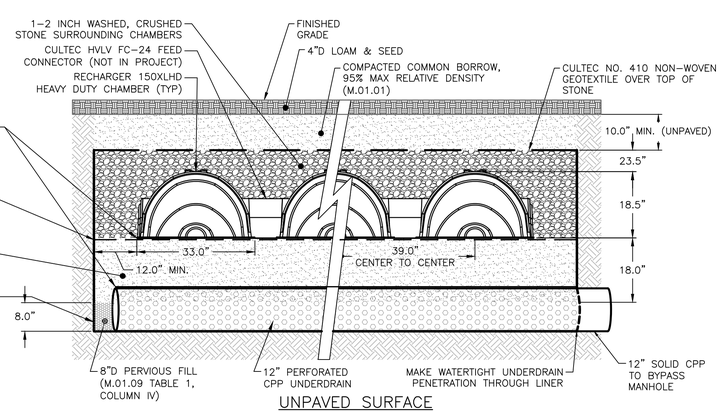
PROFILE VIEW: SAND FILTER SOUTH

SAND FILTER PROFILE VIEWS

SCALE: 1"=20'H/1"=4'V



PAVED SURFACE
(APPLICABLE TO SAND FILTER NORTH)



UNPAVED SURFACE
(APPLICABLE TO SAND FILTER SOUTH)

UNIT TYPE NOTE

SAND FILTER SOUTH SHALL CONSIST OF TWO (2) ROWS, EACH CONSISTING OF ONE STARTER UNIT AND ONE END UNIT

SAND FILTER TYPICAL SECTIONS

NOT TO SCALE

PROPRIETARY PRODUCT NOTE

SECTIONS DEPICT CULTEC RECHARGER 150XLHD UNITS ABOVE SAND FILTER; ALTERNATE SUBSURFACE STORAGE UNIT MANUFACTURERS/PRODUCTS MAY BE ALLOWED, PROVIDED THAT THE UNITS ARE DEEMED TO BE EQUAL TO THE DEPICTED CULTEC UNITS. RIDOT SHALL BE THE SOLE JUDGE OF WHETHER AN ALTERNATIVE UNIT IS A SUITABLE EQUAL.

ADDENDUM No. 1

REVISIONS		
NO.	DATE	BY
1	8/14/19	EK

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF
SANDY BOTTOM BRIDGE No. 257

COVENTRY, RHODE ISLAND

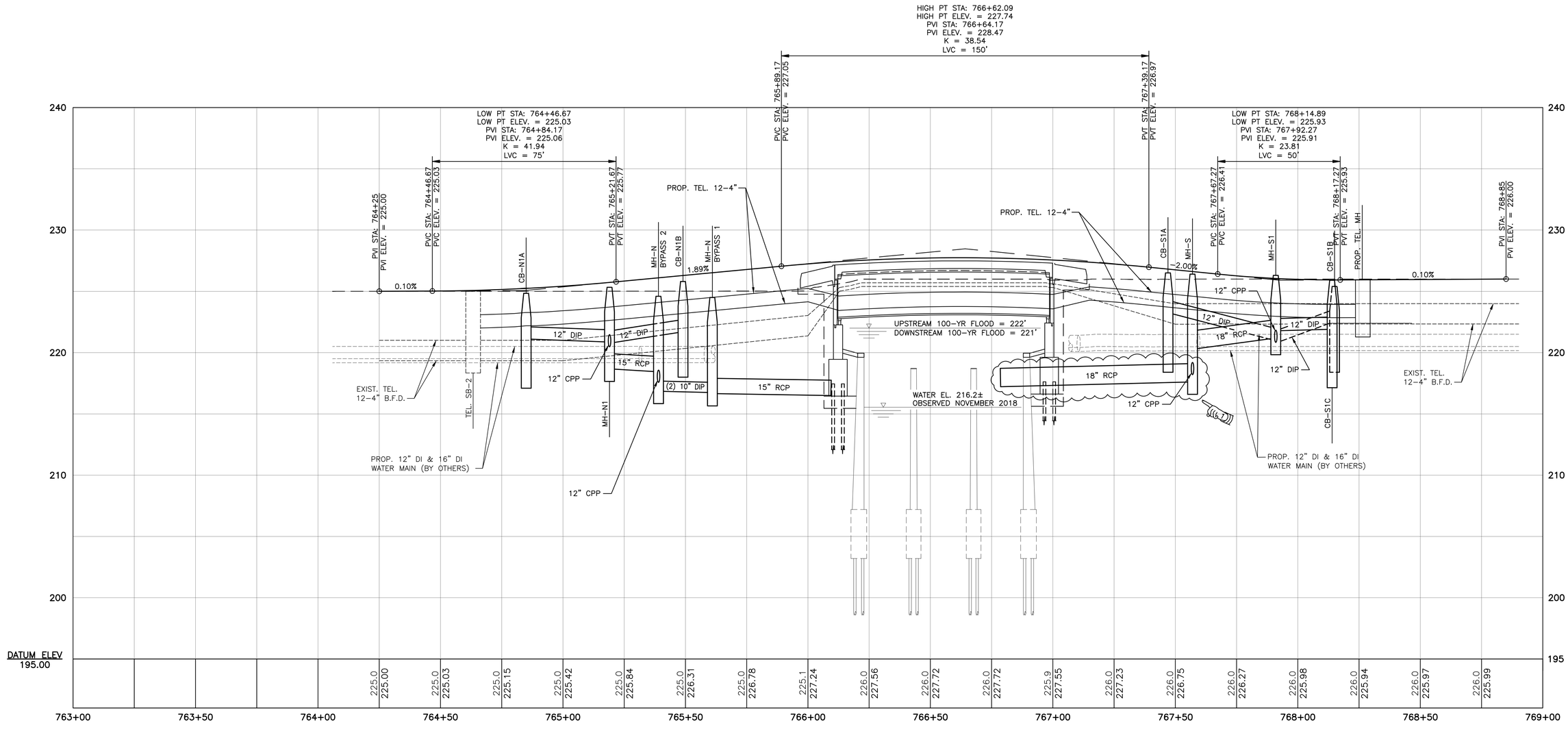
SAND FILTER PROFILES AND SECTIONS

CHECKED BY _____ DATE _____ SCALE AS NOTED

0114W_V1_010_DRAINUTL003_ADD01

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI		2019	16	52

R-1



SANDY BOTTOM ROAD

HOR. SCALE IN FEET
0 20 40 60 100
0 4 8 12 20
VERT. SCALE IN FEET

ADDENDUM No. 1

REVISIONS		
NO.	DATE	BY
1	8/14/19	EK

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF
SANDY BOTTOM BRIDGE No. 257

COVENTRY, RHODE ISLAND

PROFILE
SANDY BOTTOM ROAD
STA. 763+00 TO 769+00

CHECKED BY _____ DATE _____ SCALE AS SHOWN

0114W_V1_016_PROFILE_ADD01

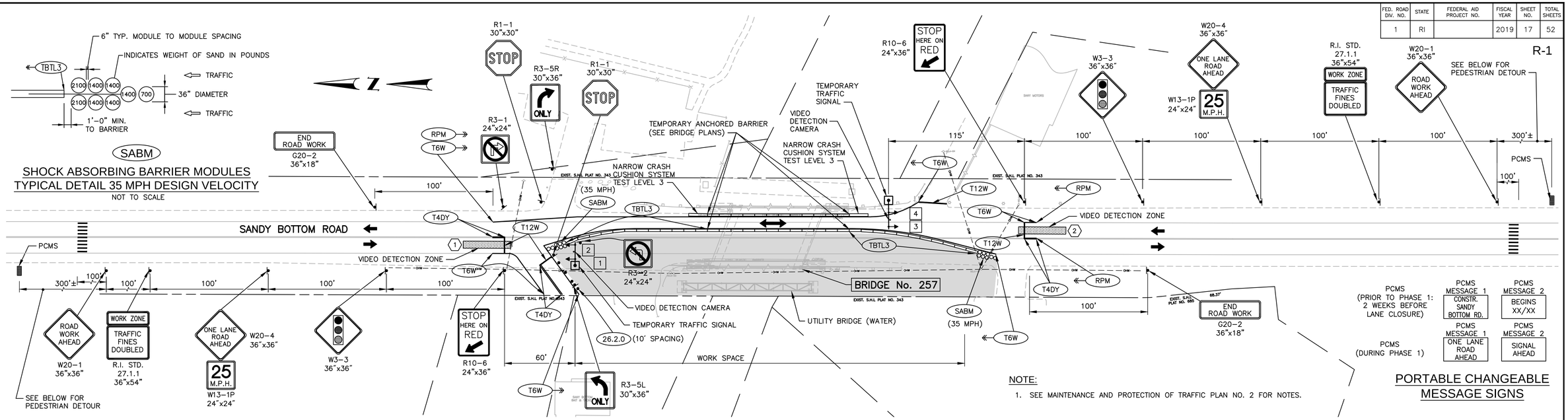
FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI		2019	17	52

R-1

SABM

SHOCK ABSORBING BARRIER MODULES TYPICAL DETAIL 35 MPH DESIGN VELOCITY

NOT TO SCALE



SANDY BOTTOM ROAD ONE LANE ALTERNATING TRAFFIC WITH TEMPORARY SIGNAL (PHASE 1)

SCALE: 1"=40'

NOTE:

1. SEE MAINTENANCE AND PROTECTION OF TRAFFIC PLAN NO. 2 FOR NOTES.

PCMS (PRIOR TO PHASE 1: 2 WEEKS BEFORE LANE CLOSURE)

PCMS MESSAGE 1: CONSTR. SANDY BOTTOM RD.

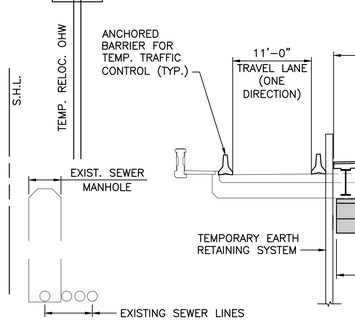
PCMS MESSAGE 2: BEGINS XX/XX

PCMS (DURING PHASE 1)

PCMS MESSAGE 1: ONE LANE ROAD AHEAD

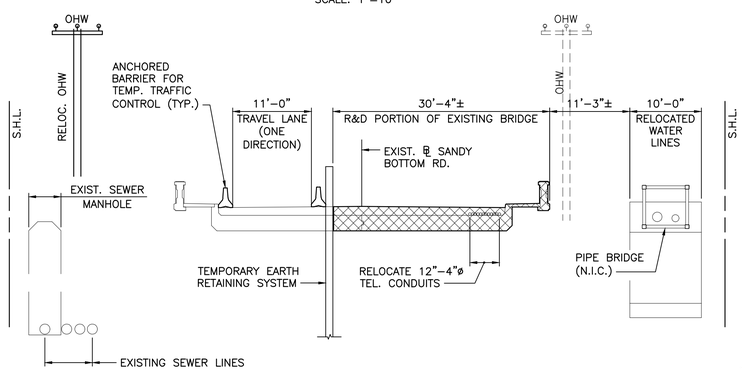
PCMS MESSAGE 2: SIGNAL AHEAD

PORTABLE CHANGEABLE MESSAGE SIGNS



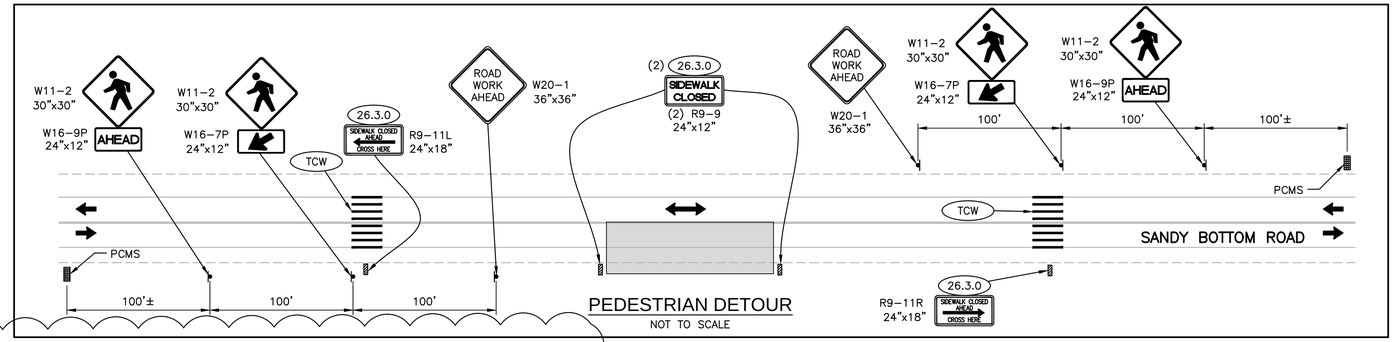
PHASE 1A TRANSVERSE CROSS SECTION

SCALE: 1"=10'



PHASE 1 TRANSVERSE CROSS SECTION

SCALE: 1"=10'



PEDESTRIAN DETOUR

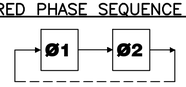
NOT TO SCALE

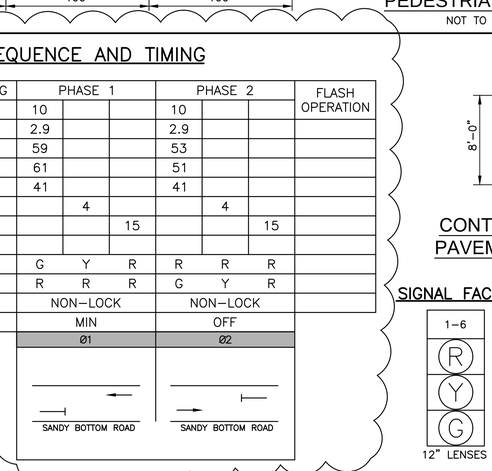
PHASING, SEQUENCE AND TIMING

APPROACH	DIRECTION	HOUSING	PHASE 1			PHASE 2			FLASH OPERATION
MINIMUM INTERVAL			10			10			
VEHICLE EXTENSION			2.9			2.9			
MAXIMUM 1			59			53			
MAXIMUM 2			61			51			
MAXIMUM 3			41			41			
YELLOW CLEARANCE				4			4		
RED CLEARANCE					15			15	
SANDY BOTTOM ROAD	NB	3,4	G	Y	R	R	R	R	
SANDY BOTTOM ROAD	SB	1,2	R	R	R	G	Y	R	
DETECTOR			NON-LOCK			NON-LOCK			
RECALL			MIN			OFF			
			Ø1			Ø2			

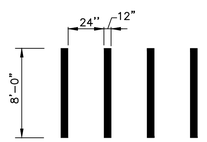
MAXIMUM 1 = MON.-FRI. 9AM-12PM
MAXIMUM 2 = MON.-FRI. 3PM-6PM
MAXIMUM 3 = NORMAL OPERATION

PREFERRED PHASE SEQUENCE DIAGRAM





ADDENDUM No. 1



CONTINENTAL CROSSWALK PAVEMENT MARKING DETAIL (TCW)

NOT TO SCALE

SIGNAL FACES:

LEGEND:

WORK SPACE IN THIS PHASE

DETECTOR DATA

DETECTOR NO.	SIZE	DELAY (SEC.)	CALL PHASE	REMARKS
1	6'X40'	3	1	TEMPORARY
2	6'X40'	3	2	TEMPORARY

REVISIONS		
NO.	DATE	BY
1	8/14/19	NS

COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF
SANDY BOTTOM BRIDGE No. 257

COVENTRY, RHODE ISLAND

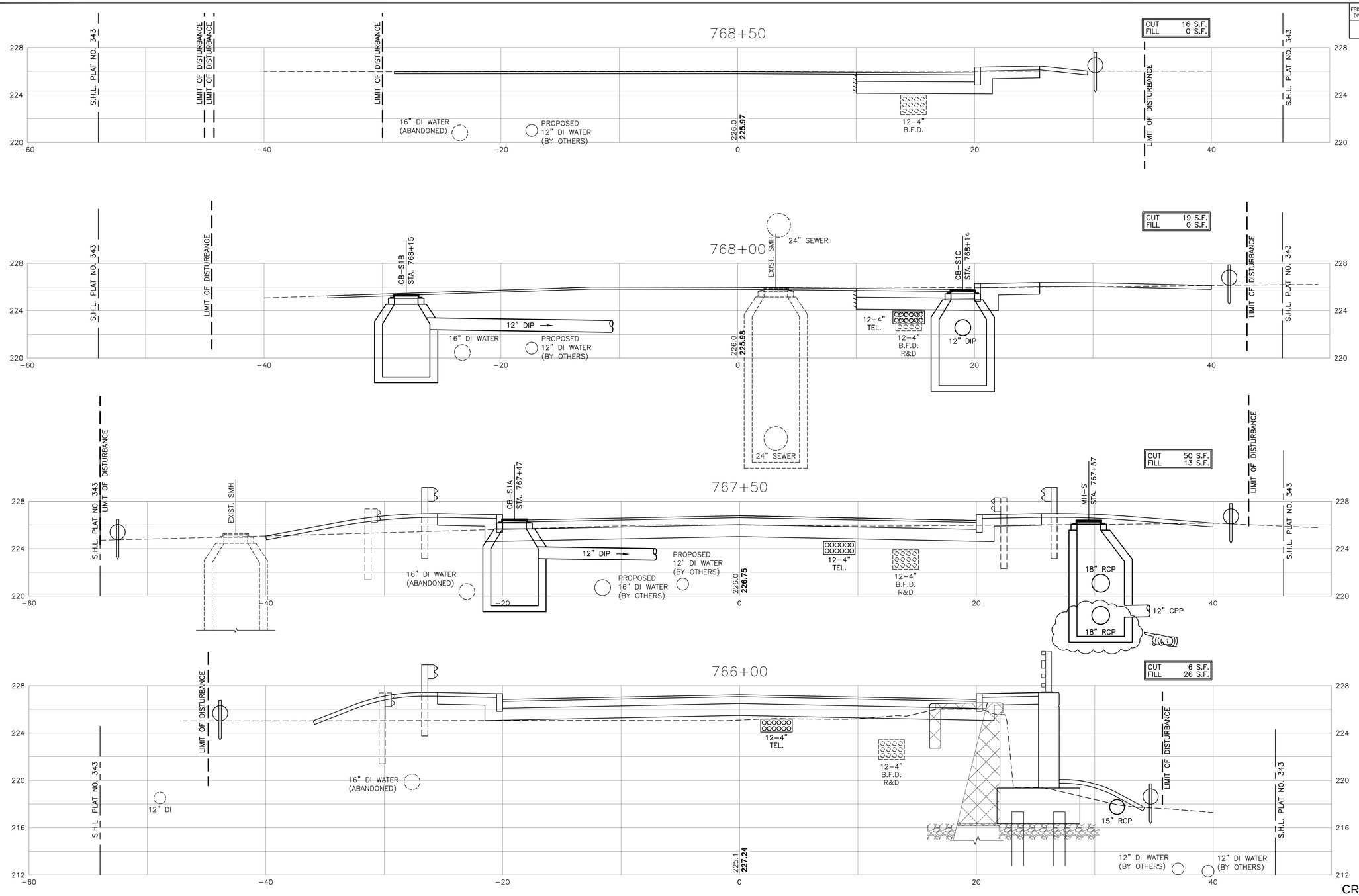
MAINTENANCE & PROTECTION OF TRAFFIC PLAN NO. 1

CHECKED BY _____ DATE _____ SCALE N.T.S.

0114W_V1_017_TCONTROL001_ADD01

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI		2019	22	52

R-1



CROSS SECTION NO. 2

REVISIONS		
NO.	DATE	BY
1	8/14/19	EK

ADDENDUM No. 1

COMMONWEALTH
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400 SMITH STREET
PROVIDENCE, RI 02908

REPLACEMENT OF SANDY BOTTOM BRIDGE No. 257

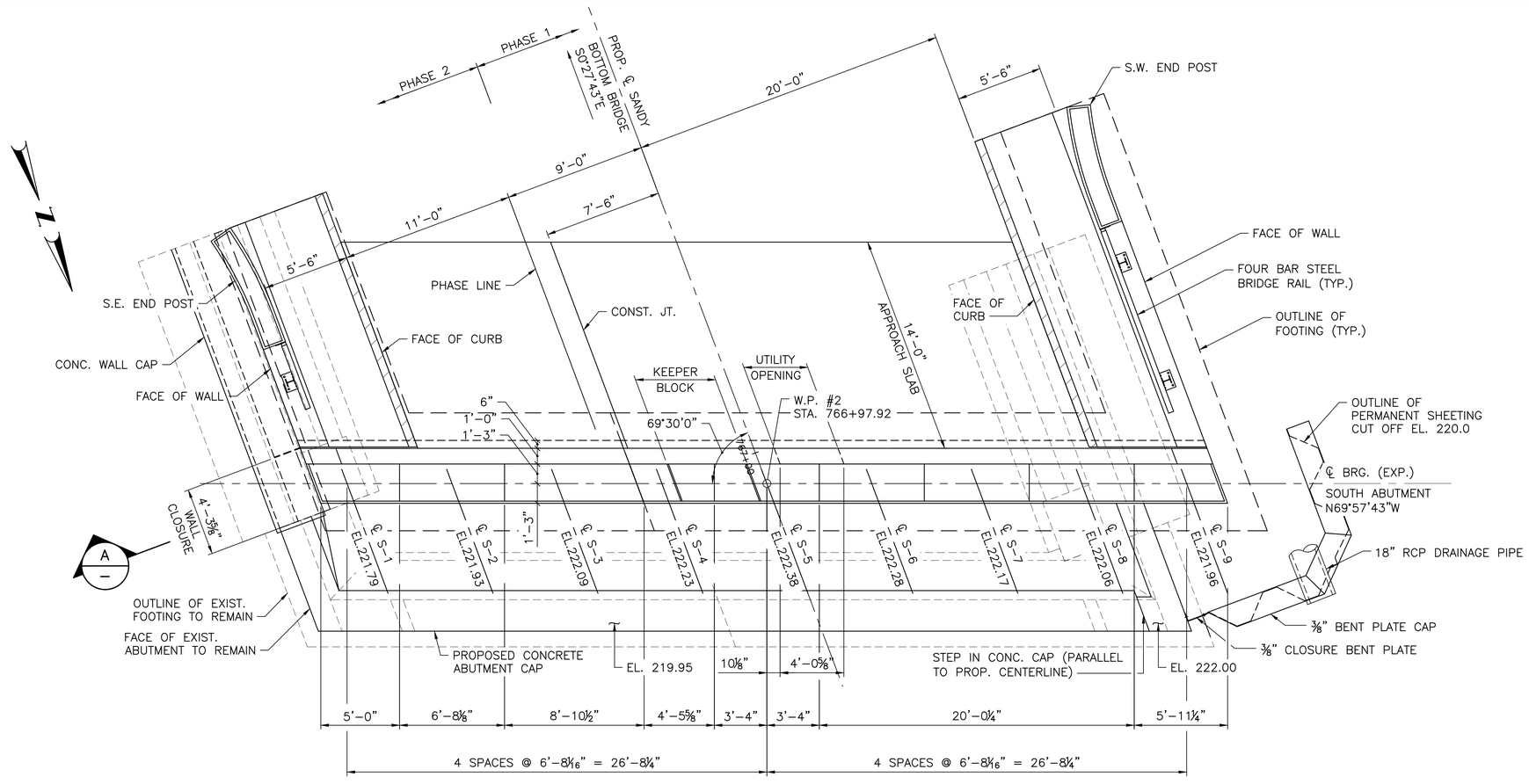
COVENTRY, RHODE ISLAND

CHECKED BY _____ DATE _____ SCALE 1"=4'

0114W_V1_022_XSECTION002_ADD01

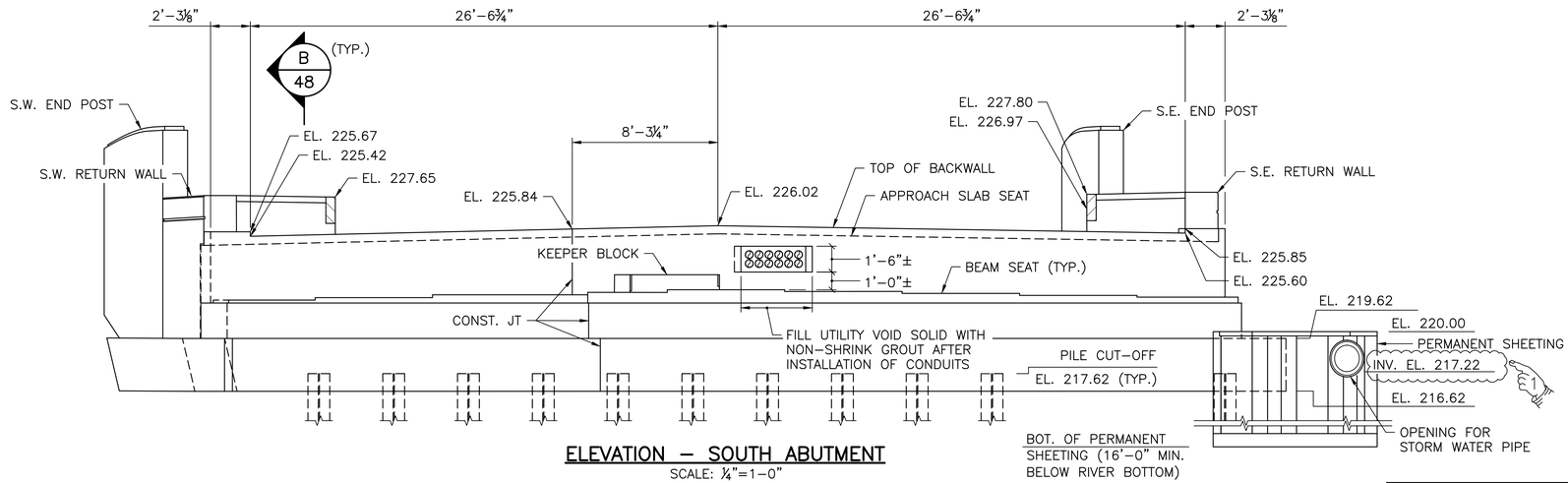
FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI		2019	36	52

R-1



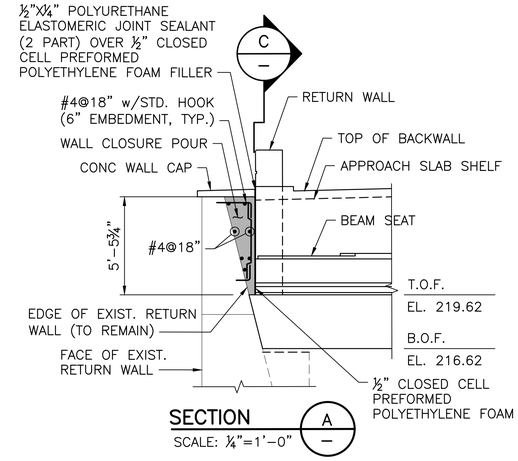
PLAN – SOUTH ABUTMENT

SCALE: ¼"=1'-0"



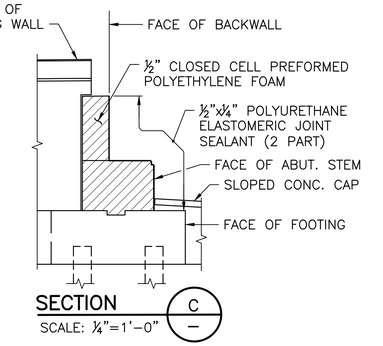
ELEVATION – SOUTH ABUTMENT

SCALE: ¼"=1'-0"



SECTION A

SCALE: ¼"=1'-0"



SECTION C

SCALE: ¼"=1'-0"

NOTES:

1. EXISTING ABUTMENT NOT SHOWN IN ELEVATION FOR CLARITY.
2. PILES NOTE NOT SHOWN IN PLAN VIEW FOR CLARITY.
3. REFER TO "MISCELLANEOUS DETAILS" SHEET FOR PERMANENT SHEETING DETAILS.
4. COST OF PERMANENT SHEETING, COMPLETE IN PLACE SHALL BE INCLUDED IN THE LUMP SUM COST OF THE BRIDGE.
5. BACKWALL ELEVATIONS GIVEN AT FACE OF BACKWALL

ADDENDUM No. 1

REVISIONS		
NO.	DATE	BY
1	8/14/19	BS

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF
SANDY BOTTOM BRIDGE No. 257

COVENTRY, RHODE ISLAND

SOUTH ABUTMENT

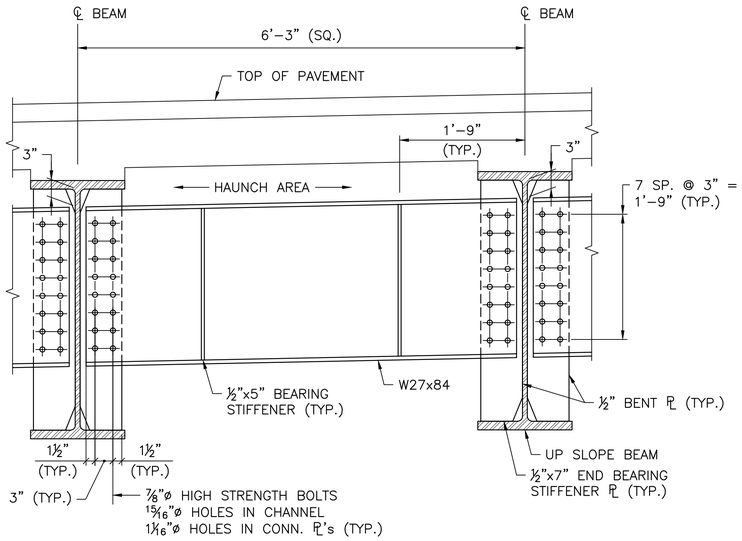
CHECKED BY _____ DATE _____ SCALE AS SHOWN

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

0114W_V1_036_ABUTPLAN002_ADD01

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI		2019	41	52

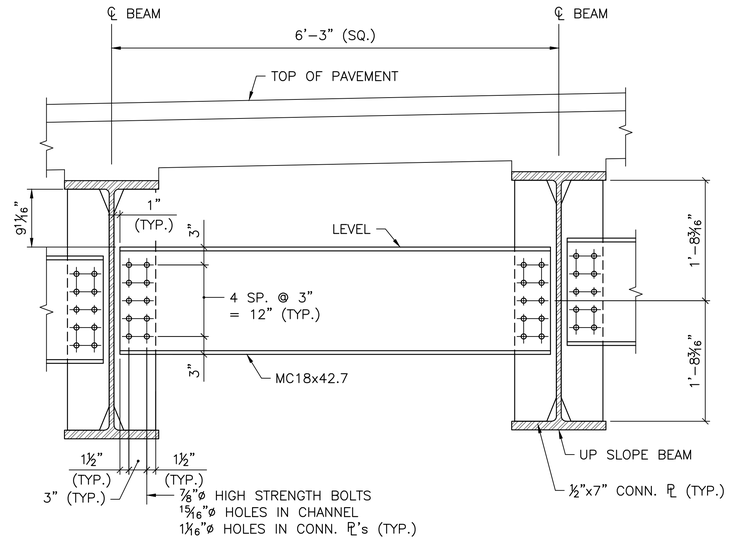
R-1



ELEVATION

END DIAPHRAGM D-1

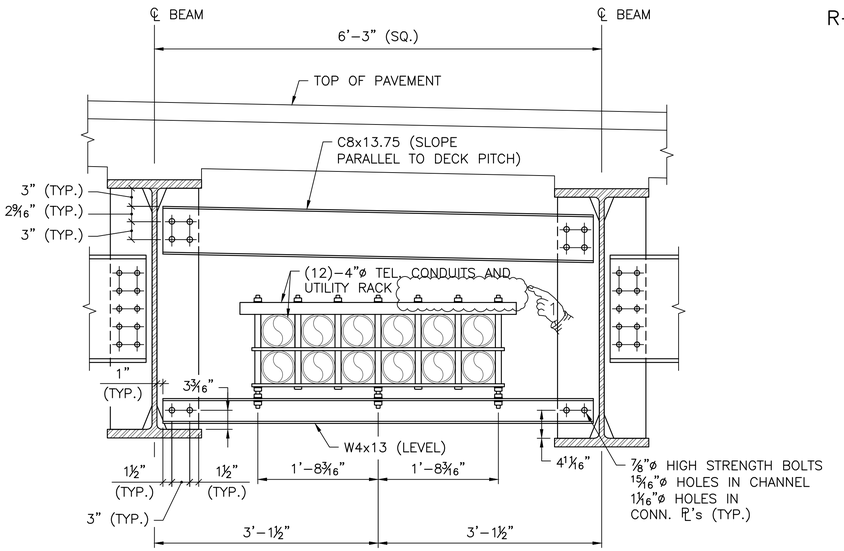
SCALE: 1"=1'-0"



ELEVATION

INTERMEDIATE DIAPHRAGM D-2

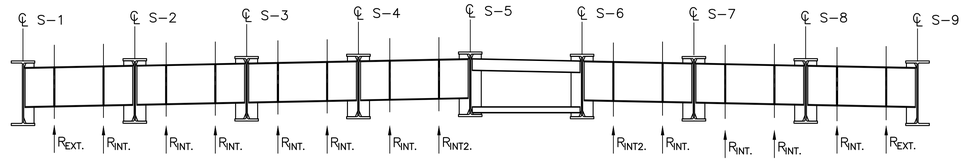
SCALE: 1"=1'-0"



ELEVATION

UTILITY DIAPHRAGM D-3

SCALE: 1"=1'-0"



JACKING LOAD DISTRIBUTION

NOT TO SCALE

JACKING DESIGN DATA (SERVICE LOADS) KIPS						
SUPPORT	DL			LL+I		
	REXT.	RINT.	RINT2.	REXT.	RINT.	RINT2.
ABUTMENT	86	33	66	65	43	86

JACKING NOTES:

1. JACKING DETAILS PROVIDED FOR BEARING ADJUSTMENT DURING CONSTRUCTION AND FOR FUTURE BEARING REPLACEMENT.
2. ALL STRINGERS SHALL BE JACKED SIMULTANEOUSLY TO A HEIGHT SUFFICIENT FOR THE INTENDED WORK, NOT TO EXCEED 1⁄16" MAXIMUM.
3. JACKING LOADS ASSUMES ALL STRINGERS JACKED SIMULTANEOUSLY.
4. THE CONTRACTOR SHALL PROVIDE A SEQUENCE OF CONSTRUCTION FOR THE JACKING OPERATION AND SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE COMMENCEMENT OF JACKING.
5. JACKS SHALL HAVE A RATED CAPACITY OF AT LEAST 1.5 (DL + (LL+I)) AND BE FITTED WITH A 6" MINIMUM LOAD PLATE DIAMETER.

NOTE:
OMIT CONN. ℙ AT OUTSIDE FASCIA OF BEAM S-1 AND S-9.

INTERMEDIATE DIAPHRAGM CONNECTION PLATE

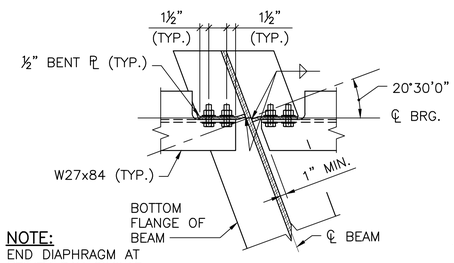
SCALE: 1"=1'-0"

END DIAPHRAGM CONNECTION PLATE

SCALE: 1"=1'-0"

DETAIL 1/–

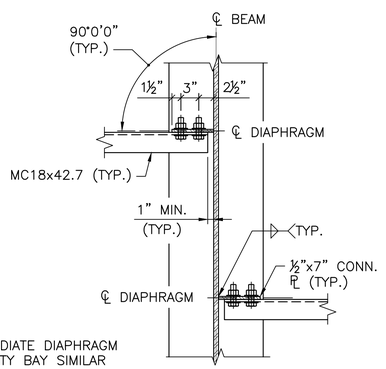
SCALE: 3"=1'-0"



NOTE:
END DIAPHRAGM AT UTILITY BAY SIMILAR

END DIAPHRAGM D-1

SCALE: 1"=1'-0"



NOTE:
INTERMEDIATE DIAPHRAGM AT UTILITY BAY SIMILAR

INTERMEDIATE DIAPHRAGM D-2

SCALE: 1"=1'-0"

NOTES:

1. THE END DIAPHRAGMS ARE TO FOLLOW THE CROSS PITCH OF THE ROADWAY.
2. THE LOCATIONS OF HOLES IN CONNECTION PLATES SHALL BE DETERMINED BY THE FABRICATOR.
3. CONNECTION FAYING SURFACES SHALL SATISFY CLASS B SURFACE CONDITIONS.

REVISIONS		
NO.	DATE	BY
1	8/14/19	BS

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF
SANDY BOTTOM BRIDGE No. 257

COVENTRY, RHODE ISLAND

DIAPHRAGM DETAILS

CHECKED BY _____ DATE _____ SCALE AS SHOWN

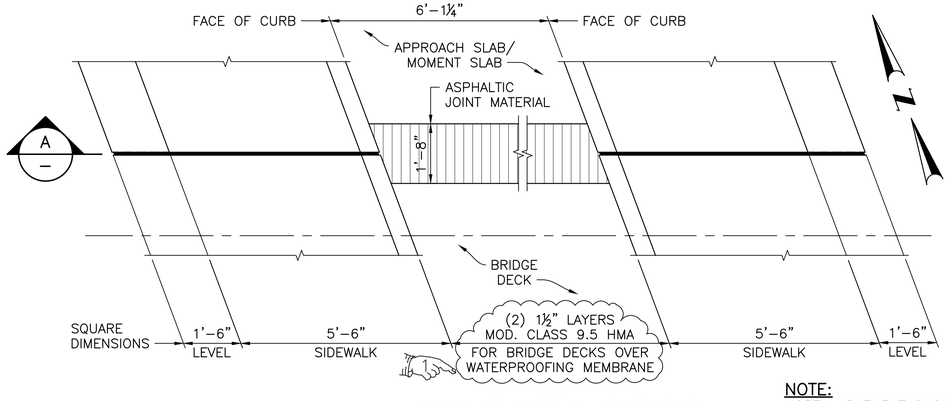
COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

ADDENDUM No. 1

0114W_V1_041_DIAPDETL_ADD01

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI		2019	46	52

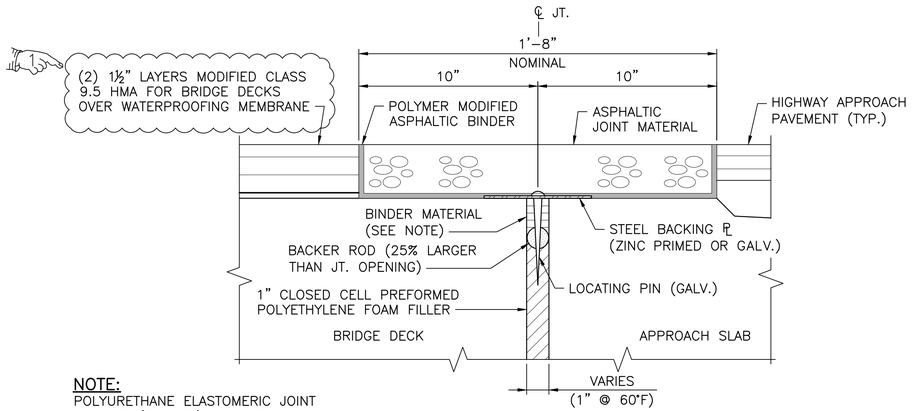
R-1



PLAN AT NORTH ABUTMENT

SCALE: ½"=1'–0"

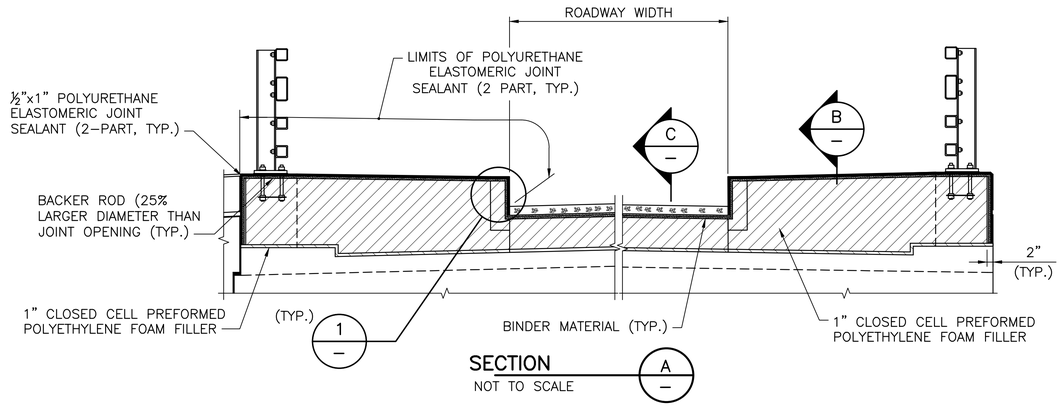
NOTE:
NORTH ABUTMENT SHOWN, SOUTH ABUTMENT SIMILAR



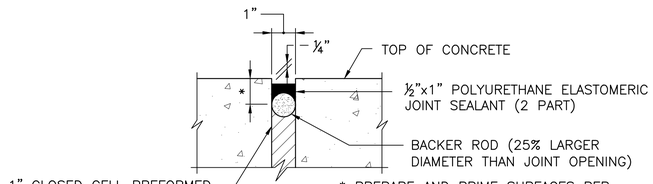
NOTE:
POLYURETHANE ELASTOMERIC JOINT SEALANT (2–PART) MAY BE SUBSTITUTED FOR BINDER MATERIAL (½" THICK WITH A 3 DAY MIN. CURE)

ASPHALTIC EXPANSION JOINT

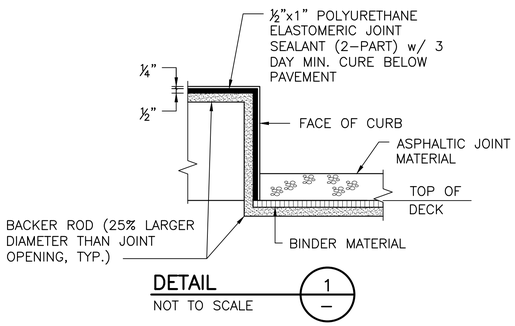
SECTION C
NOT TO SCALE



SECTION A
NOT TO SCALE



SECTION B
SCALE:3"=1'–0"



DETAIL 1
NOT TO SCALE

ADDENDUM No. 1

REVISIONS		
NO.	DATE	BY
1	8/14/19	BS

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF
SANDY BOTTOM BRIDGE No. 257

COVENTRY, RHODE ISLAND

JOINT DETAILS

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

CHECKED BY _____ DATE _____ SCALE AS SHOWN

0114W_V1_046_JNTDETL_ADD01