

SPECIFICATIONS

RAILROAD CROSSINGS

See General Provisions And Requirements, Section W-7.55-7

Water Or Sewer Pipe Lines 12" And Under Crossing A Railroad Right Of Way Will Be Placed In An Encasement Pipe Whose Diameter Shall Be At Least 2 Inches Greater Than The Largest Outside Diameter Of The Carrier Pipe But Shall Not Exceed 42" Inside Diameter. The Encasement Pipe Will Be Of Corrugated Metal Or Class II Wall B Reinforced Concrete Culvert Pipe, A.S.T.M. C-76-59 The Corrugated Pipe Shall Be 14 Gauge Metal Up To And Including 42" Diameter 24", 30" & 36" Shall Be 12" Gauge And 42" Pipe Shall Be 10 Gauge. The Encasement Pipe Will Be On A Minimum Of 0.025 Slope, And The Top Of Same Shall Be A Minimum Of 4'-6" Below The Base Of The Rails. The Length Of Encasement Pipe Shall Extend Each Side From The Center Line Of The Outside Track, Measured At Right Angles, A Minimum Distance Of 11 Feet Plus 18 Or 5 Feet (Where "D" Equals The Depth Of The Bottom Of The Casing Below Sub-Grade) The Encasement Pipe Will Be Tightly Jointed To Prevent Leakage. The Ends Of The Encasement Pipe Shall Be Plugged With A Clay Core To Prevent Entrance Of Excessive Ground Water But Would Allow Water To Leak Out In Case Of Pressure Leak In Carrier Pipe.

The Encasement Pipe May Be Installed By Boring, Jacking, Or Tunneling Regardless Of The Method Used. The Encasement Pipe Will Be Installed With Even Bearing Throughout Its Length And All Voids Between The Pipe And The Earth Or Rock Shall Be Filled With Pea Gravel Or Grout. Timber Support Will Not Be Permitted Where The Railroad Right Of Way Carries A Minor Volume Of Traffic And Permission Is Granted By The Railroad Company. Open Cut Method May Be Used To Install Encasement Pipe. The Backfill Shall Be Of Sand For Full Length Of Encasement Pipe To Natural Ground Level Or To Sub-Grade Of Railroad, Jettied Until All Settlement Causes Sub-Grade Material Will Be Replaced Thoroughly Compacted. Open Cut Will Normally Terminate 10 Feet From Center Line Of Outer Pair Of Rails.

The Carrier Pipe Shall Be Class 200 Cast Iron Water Pipe, Or Kind And Class Of Pipe Designed To Carry The Water And Sanitary Sewer With Joints Made Up In Place In The Encasement Pipe (If Same Or Sufficient Size) Or Made Up Outside And Pushed Through From The End If Insufficient Room Is Available. The A.T.&P.F. Ry. Co. Requires A.S.T.M. C-76 Class V Wall B Reinforced Concrete Pipe In Lieu Of Class II Wall B. Minimum Depth Below Base Of Rail To Top Of Casing 5 Feet 6 Inches Larger Than 12" Will Require A Special Design Along The Same General Method As Above.

STATE HIGHWAY CROSSINGS

All Excavations Within The Right Of Way And Not Under Surfacing Shall Be Backfilled By Tamping In Six (6) Inch Horizontal Layers. All Surplus Material Shall Be Removed From The Right Of Way And The Excavation Finish Flush With Surrounding Natural Ground. Where Siding Is Disturbed By Excavation Or Backfilling Operations, Such Areas Shall Be Replaced By Mutch Sodding On All Slopes Of Two (2%) Per-Cent Or Less All Slopes Over Two (2%) Percent Shall Be Replaced By Block Sodding.

Highway Crossings Of Water And Sewer Lines Under Surfaced Roads And Under Surfaced Cross Roads Within The Right Of Way May Be Placed By Open Cut, Boring, Tunneling, Or Jacking. A Combination May Be Specified On The Plans.

Primary Highway Or Expressway Crossings Will Require An Encasement Pipe At Least Two (2) Inches Greater Than The Largest Outside Diameter Of The Carrier Pipe For Sewer Pipes 12" And Under The Encasement Pipe Will Be Corrugated Metal Or Class III Wall B Reinforced Concrete Culvert Pipe A.S.T.M. C-76-59 The Corrugated Pipe Shall Be 14 Gauge Metal Up To And Including 30" Diameter 36" And 42" Corrugated Pipe Shall Be 12 Gauge. Larger Encasement Pipes Or Tubes Shall Be Specially Designed To Withstand 4-20 Loading Plus Dead Load. The Tubes Will Be Of Corrugated Metal Pipe, Sectional Corrugated Plate Line Pipe Or Reinforced Concrete To Suit Conditions Of Crossing. The Encasement Pipe Will Be On A Minimum Of 0.025 Slope With A Length Sufficient To Clear Each Paving Strip By 10 Feet. Pipes Over 42" In Size Shall Be Plugged With Concrete With Manhole For Entrance. Encasement Pipes Will Be Plugged With A Clay Core To Prevent Entrance Of Excessive Ground Water But Which Will Allow Water To Leak Out In Case Of Pressure Leak In Carrier Pipe Where Conditions Are Favorable A Drain Will Lead Out Of The Encasement Pipe Or Tube To A Free Outfall Regardless Of The Method Used In Installing The Encasement Pipe Or Tube, It Will Be Installed With Even Bearing Throughout Its Length And All Voids Between The Pipe And The Earth Or Rock Shall Be Filled With Pea Gravel Or Grout. Timber Supports Will Not Be Permitted. Open Cut Ditch Will Normally Terminate Ten (10) Feet From Edge Of Paving. The Carrier Pipe Will Be The Kind And Class Of Pipe Designed To Carry The Sewer Or Water.

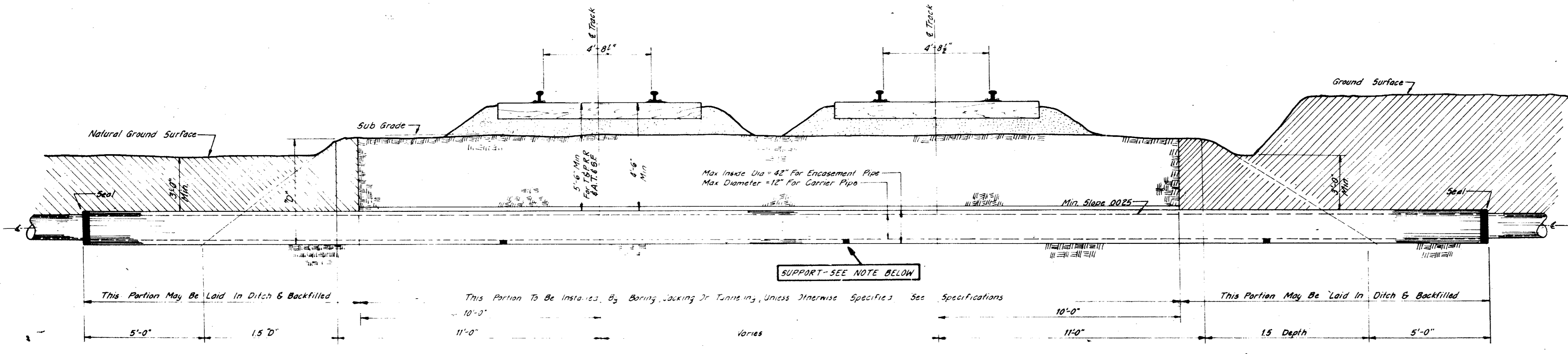
Secondary Highway Crossings Will Not Require An Encasement Pipe. But It Will Be Used If Jacking Or Tunneling Methods Are Used To Cross All Or Any Portion Of The Highway. If The Carrier Pipe Is Other Than Cast Iron It Must Be Wrapped With 2000# Concrete Equivalent In Design To Class G Embedment, And Must Extend From Ditch Line To Ditch Line. In The Event Of An Open Cut The Following Conditions Will Govern.

(a) CONCRETE PAVEMENT

Backfill Shall Be Stabilized By The Addition Of Two (2) Sacks Of Cement Per Cubic Yard Of Material. The Backfill Material May Be 4 1/2" Run Gravel Or Sandy Soil Free From Lumps Or Clods All Material Shall Be Mixed With Cement In A Concrete Mixer Or Transit Mix. Backfill May Be Mechanically Tamped In A Moist Condition Or Water Added To Provide A Free Flowing Mixture. Backfill Shall Be Brought Up To A Level Six (6) Inches Below The Bottom Of The Pavement. The Pavement Shall Be Cut Back A Distance Of Twelve (12) Inches On Each Side Of The Edge Of The Excavation And The Area From The Top Of The Backfill To Finished Pavement Gravel In Those Cases Where There Is An Asphalt Surface On Top Of The Concrete. The concrete base shall be finished off only to the top of the concrete, and the asphalt replaced and finished off to provide a smooth rising surface.

(b) ASPHALT SURFACING

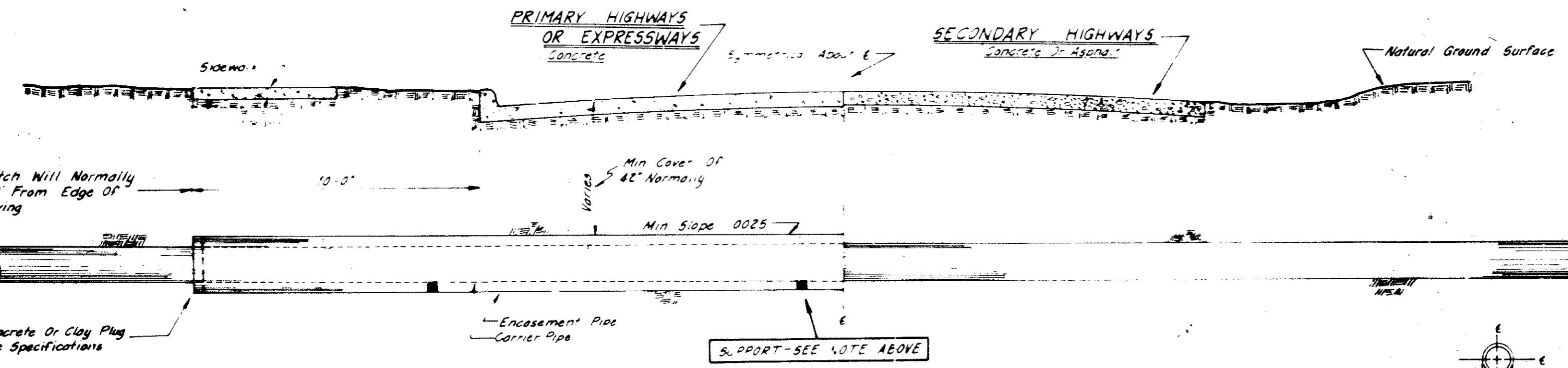
Excavation Shall Be Backfilled As Specified Above For Concrete Pavement Except That Backfill Shall Be Finished Off At The Bottom Of The Asphalt Surfacing. Asphalt Shall Be Cut Back Twelve (12) Inches From The Edge Of The Excavation And Replaced To Form A Smooth Finished Surface.



TYPICAL DETAILS FOR WATER & SEWER LINES 12" & UNDER CROSSING A RAILROAD R.O.W.

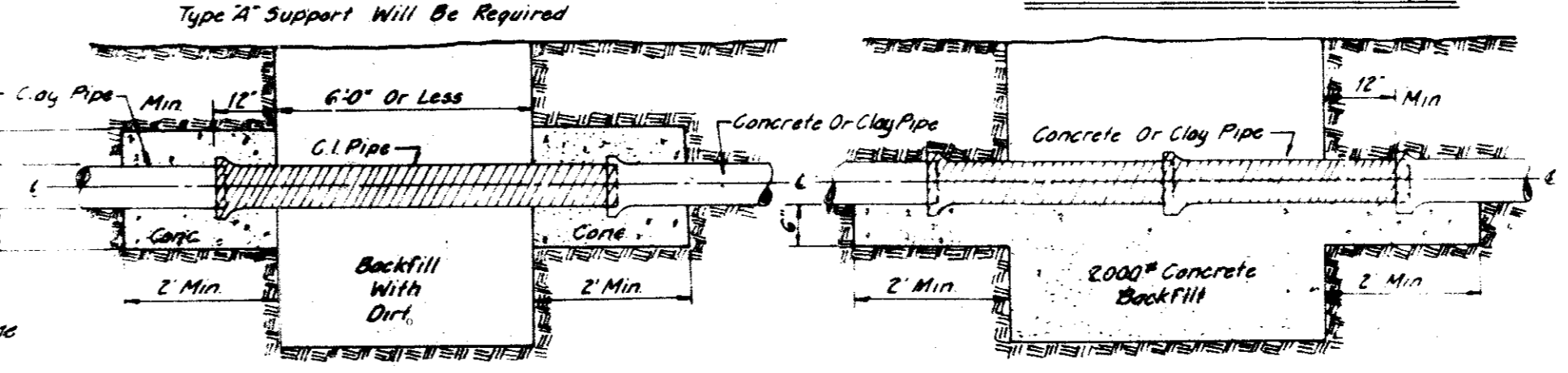
WATER AND SANITARY SEWER ENCASEMENT REQUIREMENTS

- NOTE! Support Will Vary With Method Of Installation And With Type Of Carrier Pipe Used Where An Encasement Pipe Is Placed By Boring, The Carrier Pipe Will Be Made Up And Pushed Thru With Bells Of Pipe Resting On The Encasement Pipe Where Standards Pipe Is Made Up Inside A Large Encasement Pipe. The Carrier Pipe Shall Be Laid To Grade On A 2000# Concrete Embankment Which Shall Extend To The 1/2 Point Of The Carrier Pipe When A Mechanical Joint Pipe Is Used As A Carrier Pipe To Facilitate Its Removal. As A Unit Precast Concrete Bricks Will Be Placed Back Of Each Bell Each Block Will Be A Minimum Of 3" Thick, Sufficient Height To Clear Bells From Flange Of Encasement Pipe And Boring Carrier Pipe To Grass And Shall Be At Least 28 1/2" In Breadth Where 2' Is The External Diameter Of The Carrier Pipe.
- Where Carrier Pipe Consists Of Concrete, Clay, Or Reinforced Concrete, The Pipe Shall Be Placed On Shims Prior To Being Pushed Thru To Prevent Damage To Bells.
 - In Placing Encasement Pipe By Boring, Jacking Or Tunneling, All Voids Between The Encasement Pipe And Earth Or Rock Shall Be Filled With 17 Grout, Including 5% To 40% Air Entrained.
 - For Sanitary Sewer Mains, The Space Between The Encasement Pipe And The Carrier Pipe Shall Be Filled With 17 Grout Including 5% To 40% Air Entrained.
 - For Sanitary Sewer Mains 12" And Smaller Prior To Placing Grout, The Carrier Pipe Shall Be Filled With Water To Prevent The Carrier Pipe From Floating. Other Methods To Prevent Floating May Be Used If Approved By Construction Engineer.
 - For Sanitary Sewer Mains 15" & Larger Prior To Placing Grout, The Carrier Pipe Shall Be Backed Down Or Held In Place In A Manner To Be Approved By The Construction Engineer.
 - The Ends Of All Of Grout Spd. Be By Pressure Injection, Unless Otherwise Approved By The Construction Engineer.
 - The Encasement Pipe For Water Mains Shall Be Plugged At The Joint End With Concrete & The Sewer End With A Clay Plug.



TYPICAL DETAILS FOR WATER & SEWER LINES CROSSING UNDER STATE HIGHWAYS

ALTERNATE-CLAY OR CONCRETE PIPE HOUSE LATERALS



TYPE "D" SUPPORT

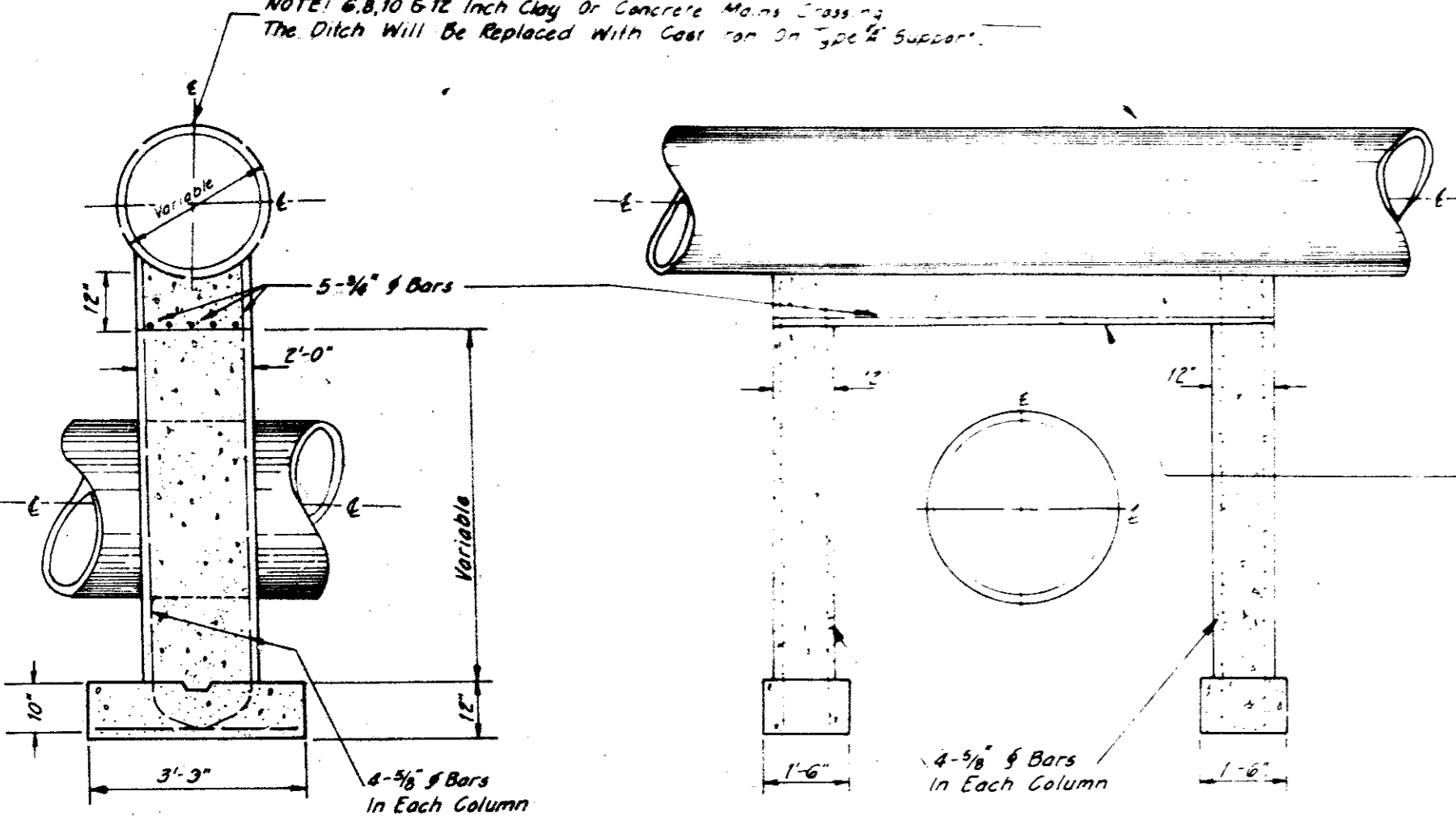
NOTE! Where B&S C.I. Pipe Is Used, The Bell Shall Be Filled With Clay Or Conc. Pipe And The Spigot Shall Be Filled With A Conc. Or Clay Bell. The Joint Shall Be Made With Mortar And Then Wrapped In 2000# Concrete For A Distance Of 12" Each Side Of The Joint. Where S&S C.I. Pipe Is Used, A Solid C.I. Sleeve Shall Be Used On Point Where Bell Is Needed On The C.I. Pipe, And Joints Made As Above. Where Bell Will Not Fit Over The Conc. Or Clay Pipe, A Block Of 2000# Conc. Core Be Placed Around The Joint After Careful Alignment The Block Shall Be A Min Of 24" In Length Centered At The Joint And Shall Be At Least 12" Thick Around The Pipe.

TYPE "E" SUPPORT

NOTE! As An Alternative 6" 64" Joints Can Be Used With Concrete Or Clay Pipe Using Premolded Joints Or The Use Of Sliding Plastic Couplings With Stainless Steel Bands. The Replaced Pipe And Couplings Shall Be Laid In 2000# Conc. Backfill In Ditch And 24" On Each Side Of Ditch For A Depth Of 6".

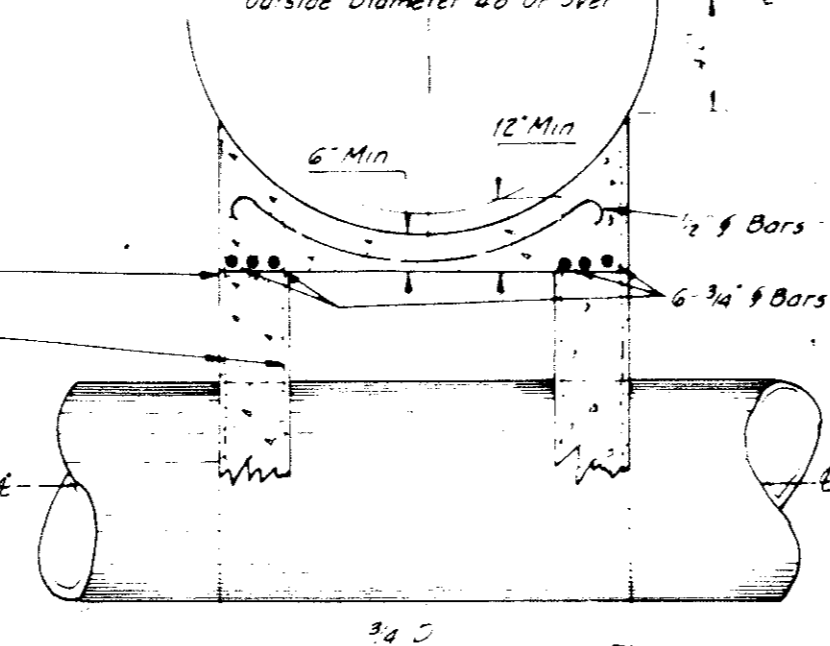
3000# CONCRETE REQUIRED FOR TYPICAL TYPE "A" SUPPORT

PARTS	CU YDS	EXTRA FOR 1 FT DEPTH	EXTRA FOR 1 FT WIDTH
2 Footings	416		
2 Piers Each 3' Long	445	148	
1 Beam 6 Ft Long	445		074
Total	1,306		



TYPE "A" SUPPORT

As Detailed Above



TYPE "B" SUPPORT

Beam As Designed & Columns 12" x 12" & Footings 1'-6" x 3'-0" x 12" Deep

TYPE "C" SUPPORT

No Beam Required & Columns - 12" x 12" & Footings 1'-6" x 3'-0" x 12" Deep

DETAILS FOR UTILITY SUPPORTS

11-6-70 TYPE "E" SUPPORT Halcomb

DATE	REVISION	BY

STANDARD APPURTENANCE SHEET
WATER & SEWER CROSSINGS FOR
RAILROADS AND STATE HIGHWAYS
DALLAS WATER UTILITIES DEPARTMENT
CITY OF DALLAS, TEXAS

DESIGN	CONTRACT NO.	SHEET NO.
RE. MORRIS		Attch
DRAWN JON A. MALLEY JR. (Redrawn)		2
TRACED	FILE NO.	
CHECKED J.D. CAMPBELL & J.L. ROGERS	414D-5	
DATE SEPTEMBER 9, 1970		