



TrueNorth Steel[®]



STRUCTURAL



TANKS



**CORRUGATED
PIPE**



BRIDGES



LOGISTICS

<http://truenorthsteel.com>

Introductions

- **Presenter**
 - Brandon Scherber, CMP Sales Engineer
 - Roger Arenz, Territory Sales Manager

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History of TrueNorth Steel

- TrueNorth Steel has been in the steel business since 1945.
- In 2011, Ole Rommesmo Jr. aligned his Tank, Structural Steel, and Corrugated Steel Pipe locations under the TrueNorth Steel name.
- TrueNorth Steel demonstrates its ability to consistently provide products that meet customer requirements and aims to enhance customer satisfaction by adhering to a policy of “continuous improvement.”
- TrueNorth Steel locations are certified to a QMS.
 - ISO 9001:2015 for Corrugated Steel Pipe
 - AISC for Steel Building Structures and Bridge Fabrication
 - API Q1, STI, and UL for Tanks



Locations





Site Solutions Portfolio



STRUCTURAL



TANKS



**CORRUGATED
PIPE**



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LOGISTICS

<http://truenorthsteel.com>

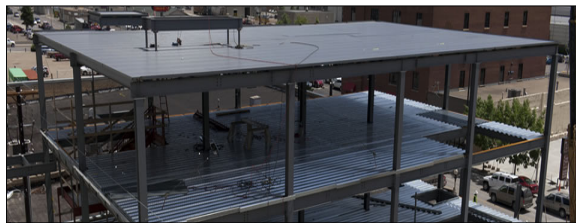
Structural Steel

Industrial



STRUCTURAL

Commercial



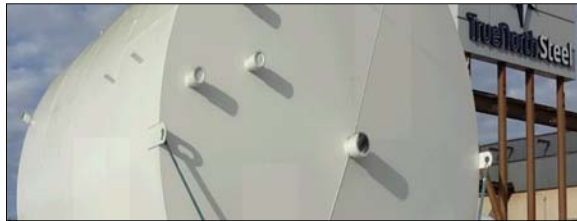
Tanks

Water Tanks
Portable Fuel
Ag/Commercial



TANKS

Fuel/Oil
Containment
Storage



Corrugated Steel Pipe

Stormwater
Drainage
Rehabilitation






CORRUGATED
PIPE


Flood Control
SSPP
Box Culverts




Bridges

Vehicular
Modular




BRIDGES

Pedestrian
Abutments & Footings

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Construction Products



BioClean
A Forterra Company



Tensor



Flexamat[®]
PERMANENT EROSION CONTROL



Propex[™]



SnapTite[®]



PRESTO

GEOSYSTEMS[™]
GLOBAL LEADER • GLOBAL PARTNER



MACCAFERRI



NORTH AMERICAN GREEN



Waterman



AquaShield[™]
WATER TREATMENT SOLUTIONS



FRESNO
Water & Sewer, Inc.



CETCO[®]

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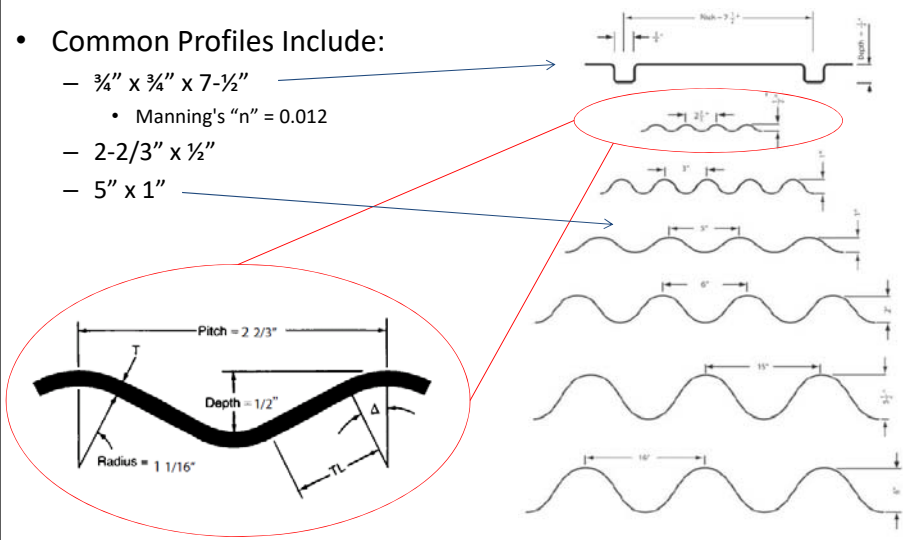
Corrugated Steel Pipe Design Factors

<http://truenorthsteel.com>

Corrugation Profiles

• Common Profiles Include:

- $\frac{3}{4}$ " x $\frac{3}{4}$ " x 7- $\frac{1}{2}$ "
 - Manning's "n" = 0.012
- 2- $\frac{2}{3}$ " x $\frac{1}{2}$ "
- 5" x 1"

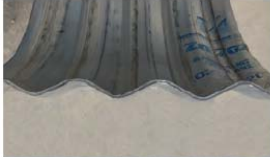








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Corrugation Profiles

		
		
<p>2-2/3" x 1/2" Corrugation</p>	<p>5" x 1" Corrugation</p>	<p>7-1/2" x 3/4" Spiral Rib Corrugation</p>

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Annular vs. Helical

	
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Joins & Connections

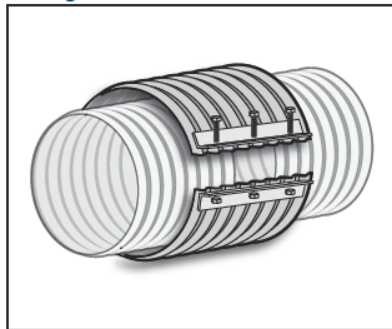
Purpose of Joining Systems—The purpose of joining systems is to connect adjacent pipe sections, to maintain the alignment of the pipeline, to transfer shear loads across the joint, to prevent pipe from separating and to provide the means for drainage flow to pass from one pipe section to another until the flow reaches the point of final discharge.

Joining systems are classified as:

- Soil Tight
- Silt Tight
- Water Tight
- Special Design

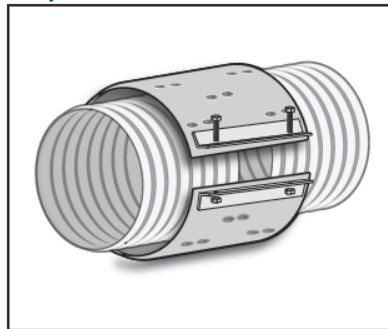
Joins & Connections

Corrugated Bands



Annular corrugated bands are available in nominal widths of 7", 12" and 24".

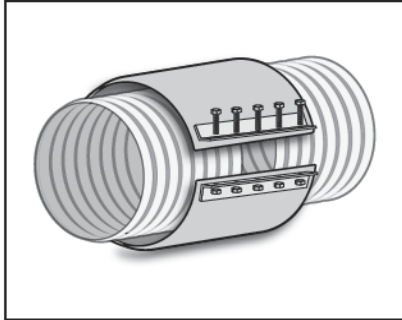
Dimple Bands



Dimple bands are bands with dimple projections in annular rows. As with flat bands they may be used on pipe with helical ends (i.e., ends that have not been reformed with annular corrugations). Dimple bands are available for 12"-96" CSP. Dimple bands come in widths of 10" or 16".

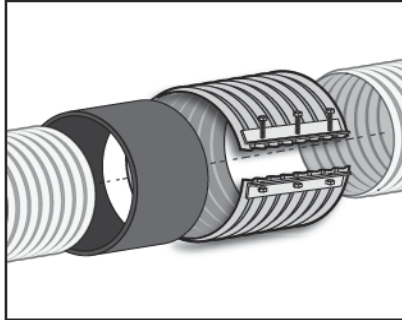
Joins & Connections

Flat Bands



Bands with no corrugations or projections are available in nominal varying widths.

Sleeve Gaskets

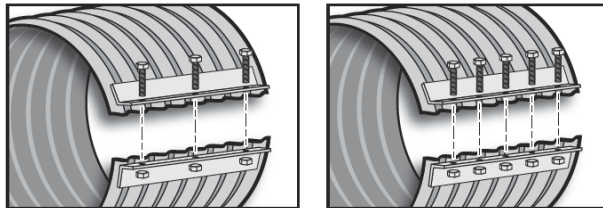


Gaskets are typically made of a 3/8" thick neoprene material to enhance the leak resistance quality of the joint. The sleeve gaskets slide over the pipe ends and underlay the connecting band available in 12" or 24" widths. O-ring gaskets are also available

Joins & Connections

Angle Connector

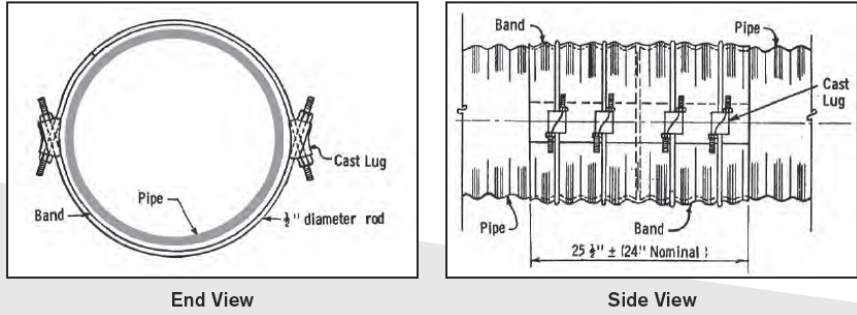
The angle connector assembly uses the three-bolt configuration for 12" wide bands and a five-bolt configuration for 24" wide bands. Bands can be supplied as galvanized, Aluminized Type 2 steel or polymer coated steel to match the associated pipe coating.



Joins & Connections

Rod & Lug

This assembly typically consists of dual rod configuration (left) and may be used on corrugated and partially corrugated bands. The multiple rod configuration (right) is used for 24" corrugated bands only.



Joins & Connections



Joints & Connections

Soil Tight or Water Tight

The diagrams illustrate four types of CSP band connections. The top row shows 'Standard CSP Band Types' with 'Reformed Pipe End' and 'Reformed Pipe End with Flange'. The bottom row shows 'Semi-Corrugated' with an 'O-Ring' and 'Corrugated' with a 'Sleeve Gasket'.

Standard CSP Band Types

Semi-Corrugated Corrugated

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Joints & Connections

The photo on the right illustrates a common procedure used when there will be groundwater on the outside of the system. Here the joints have been wrapped with a geotextile – this will prevent any soil migration that could occur during a rapid draw down of the groundwater. It is a very inexpensive insurance policy.



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Joins & Connections

Tying it all together...



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Corrugated Steel Pipe Installation

<http://truenorthsteel.com>

CSP Installation Outline

- Trench Construction
- Handling of CSP
- Soil Preparations
- Ring Compression
- Backfilling and Compaction
- Jobsite Inspection

Trench Construction

- The trench should be constructed according to appropriate pipe detail.
- Separation fabric often specified and recommended where marginal subgrades are present.
- Bedding materials should be placed in a loose fashion and not compacted to conform to the corrugation.



Handling of CSP

- One of the many benefits of corrugated steel pipe is its long length.
 - Up to 44' with 16 gauge steel
 - Up to 60' with 12 gauge steel
- Straps or lifting hooks are always recommended to ensure that damage to the coating is minimized.
- If coating damage is identified, approved touch up coating is available.



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Handling of CSP



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Soil Preparations

- Preparation of the foundation material is critical in all building projects.
- Foundation soils may need to be scarified¹ prior to installation so that moisture can be added or removed to ensure proper compaction is achieved.

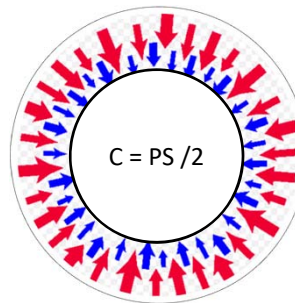
¹ To scarify soil is to break up and loosen the soil to a shallow depth.

It is a good practice to test the soils to ensure they meet or exceed project requirements



Ring Compression

- Ring Compression (C) = The principal stress in a confined thin circular ring subjected to external pressure.
- **Proper fill and placement is essential to achieve ring compression**
 - You have to pack them!!!!!!
 - All types of conduit rely on proper fill and compaction



$C = P_v(S/2)$
 where
 C = Ring compression, lbs/ft
 P_v = Vertical design pressure, psf
 S = Span, ft

Backfilling and Compaction

- Vibratory compaction in **6" lift thicknesses** is recommended
- Well compacted fill around the pipe helps to:
 - Support the pipe load
 - Reduce settlement which can result in deflection in of the pipe



Backfilling and Compaction

- Fill directly over the pipe should be free of any rocks that may cause point loading on the pipe
- Minimum fill height is 12" for AASHTO H-25 loading for 24" diameter CSP
- Additional moisture may need to be added to lubricate soil particles.

QUESTION: *What do you see wrong with this picture?*

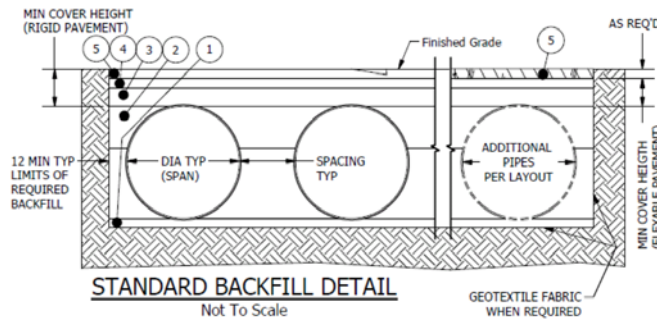
ANSWER: *The soil is too dry and lacks the proper moisture content to achieve adequate compaction.*



Backfilling and Compaction

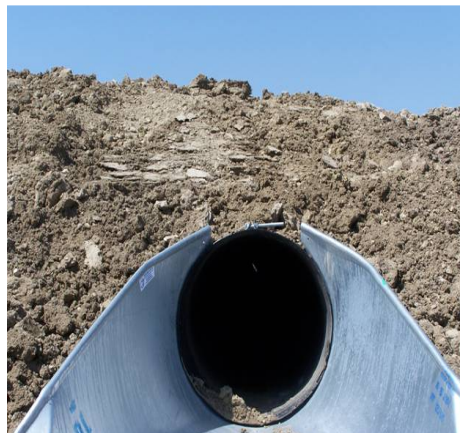
SHOP MARK	DESCRIPTION	CONSTRUCTION TYP	REMARKS
1	Granular Bedding		Roughly shaped to Bottom of pipe, 4" to 6" depth U.O.N.
2	Select Granular Backfill or Washed Angular Stone Per Engineer of Record and Specs.		Per AASHTO M145 A1, A2, A3 or approved equal Placed in 8" loose lifts compacted to min 90% standard density per AASHTO T99
3	Backfill Crown to Min required cover		12" Min for diameters thru 96" 18" Min for diameters 102"+ From top of rigid pavement or bottom of flexible pavement U.O.N.
4	Granular Road Base		Per Project Engineer
5	Flexible or Rigid Pavement		Per Project Engineer

NOTE: THESE DETAILS ARE GENERAL IN NATURE. CONTRACTOR SHOULD COORDINATE BACKFILL MATERIALS AND PRACTICES WITH ENGINEER OF RECORD FOR LOCAL CONDITIONS



Backfilling and Compaction

- A key component to a successful installation is keeping the backfill protected.
- A compacted clay collar near both ends of the pipe is critical to seal off water migration past the outside of the pipe.
- Also flared end sections, anti seep collars, head and wing walls with fabric and rip rap do the job and minimize water from wicking along the outside of the pipe.



Jobsite Inspection



With the right pre-cautions, this type of failure can easily be avoided

Interactive Exercise



Sandbox 101



Corrugated Steel Pipe Service Life

<http://truenorthsteel.com>

How Long Does CSP Last?

Our group is asked this question all the time...

ANSWER...

- It depends on:
 - Native Soils
 - Backfill Materials Used
 - **CSP Material and Coating** Characteristics
 - Installation Methods
 - Size, Shape, Hardness, and Volume of Bedload
 - Anticipated changes in the upstream watershed (i.e. development, mining, or logging)



How Long Does CSP Last?

Corrugated Steel Pipe Material Selection **IS NOT** a “One Size Fits All” Proposition...

What is the Project’s Design Life?

- 25 years
- 50 years
- 75 years
- 100 years

It is important to realize that culverts are not assumed to be at or near the point of collapse at the end of their design service life. Rather, it is the period of little to no rehabilitative maintenance.

Service Life Estimates

Table 9.1
Estimated Material Service Life for CSP

CSP Material	Estimated Service Life	Site Environmental Conditions	Maximum FHWA Abrasion Level
GALVANIZED CSP	AVERAGE 50 YEARS	6.0 ≤ pH ≤ 10.0 2000 ≤ r ≤ 10,000 (ohm-cm) Water Hardness (> 50 ppm CaCO ₃)	LEVEL #2
ALUMINIZED TYPE 2 CSP	MINIMUM 75 YEARS	5.0 ≤ pH ≤ 9.0 r > 1500 ohm-cm	LEVEL #2
POLYMER COATED CSP*	MINIMUM 100 YEARS	5.0 ≤ pH ≤ 9.0 r > 1500 ohm-cm	LEVEL #3
	MINIMUM 75 YEARS	4.0 ≤ pH ≤ 9.0 r ≥ 750 ohm-cm	
	MINIMUM 50 YEARS	3.0 ≤ pH ≤ 12.0 r ≥ 250 ohm-cm	

NOTE: Refer to Table 9.3 for definition of FHWA abrasion levels.
* Polymer coating is 0.010 in. on each side.

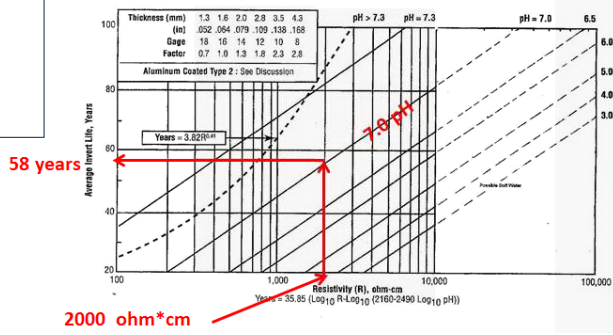
Service Life Prediction Charts

- The American Iron and Steel Institute (AISI) assisted our industry in developing this chart for Estimating average invert life for **16 gauge galvanized** CSP.
- **Resistivity (R, ohm-cm) & pH** of the native soil and water is required to determine the **Average Invert Life for Galvanized CSP**

Example

Soil Resistivity = **2000 ohm*cm**
 Soil pH = **7.0**
 THEN
 Average Invert Life 16g = **58 years**
 Average Invert Life 14g = **75 years**
 Average Invert Life 12g = **104 years**

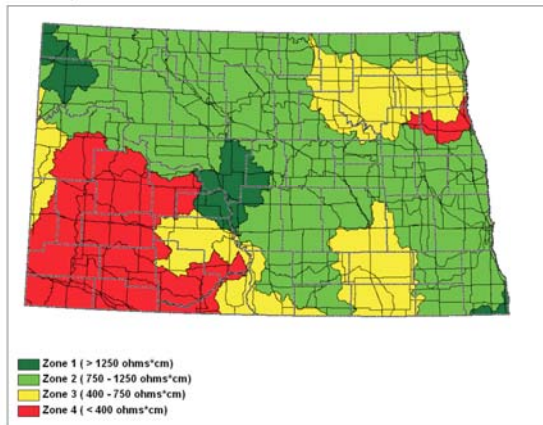
AISI Chart for Estimating Average Invert Life for Galvanized CSP



Service Life Prediction Charts

Corrosion Zone Map & Tables

North Dakota Corrosion Zones (Map 1)
 (Based on Soil Resistivity)



This information is taken from the Ch. 5 of NDDOT Pipe Design Manual

Service Life Prediction Charts

Corrosion Table: 4a

Mainline Drainage
(Design Service Life – 75 Years)

Pipe Material		Corrosion Zone			
		Zone 1	Zone 2	Zone 3	Zone 4
Concrete Pipe (Section 830.01)		Y	Y	Y	Y
Metal Pipe (Section 830.02)					
Zinc Coated Corrugated Steel	Gauge				
	16 ga.				
	14 ga.				
	12 ga.				
	10 ga.	Y			
	8 ga.	Y	Y		
Aluminum Coated Corrugated Steel (Type 2)	16 ga.				
	14 ga.				
	12 ga.	Y			
	10 ga.	Y	Y		
	8 ga.	Y	Y	Y	
Polymeric Coated Steel (over Zinc or Aluminum Coated Steel)	16 ga.	Y	Y	Y	Y
	14 ga.	Y	Y	Y	Y
	12 ga.	Y	Y	Y	Y
	10 ga.	Y	Y	Y	Y
	8 ga.	Y	Y	Y	Y
Plastic Pipe (Section 830.03)					
Polypropylene Pipe (Type S)		Y	Y	Y	Y

This information is taken from the Ch. 5 of NDDOT Pipe Design Manual

Service Life Prediction Charts

Corrosion Table: 4b

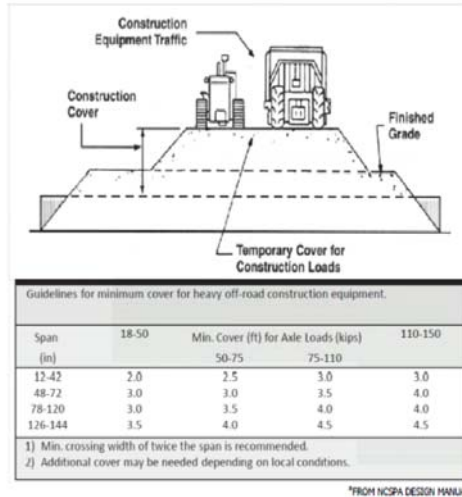
Approach Drainage
(Design Service Life – 40 Years)

Pipe Material		Corrosion Zone			
		Zone 1	Zone 2	Zone 3	Zone 4
Concrete Pipe (Section 830.01)		Y	Y	Y	Y
Metal Pipe (Section 830.02)					
Zinc Coated Corrugated Steel	Gauge				
	16 ga.	Y	Y	Y	Y
	14 ga.	Y	Y	Y	Y
	12 ga.	Y	Y	Y	Y
	10 ga.	Y	Y	Y	Y
	8 ga.	Y	Y	Y	Y
Aluminum Coated Corrugated Steel (Type 2)	16 ga.	Y	Y	Y	Y
	14 ga.	Y	Y	Y	Y
	12 ga.	Y	Y	Y	Y
	10 ga.	Y	Y	Y	Y
	8 ga.	Y	Y	Y	Y
Polymeric Coated Steel (over Zinc or Aluminum Coated Steel)	16 ga.	Y	Y	Y	Y
	14 ga.	Y	Y	Y	Y
	12 ga.	Y	Y	Y	Y
	10 ga.	Y	Y	Y	Y
	8 ga.	Y	Y	Y	Y
Plastic Pipe (Section 830.03)					
High-Density Polyethylene (Type S)		Y	Y	Y	Y
Polypropylene Pipe (Type S)		Y	Y	Y	Y

This information is taken from the Ch. 5 of NDDOT Pipe Design Manual

Backfilling and Compaction

- Live loads for construction traffic shall be in accordance with the manufacturer’s recommendation.
- During construction phases it is necessary to cross over the pipe with heavy equipment.
- To accommodate the loads imposed by construction equipment excess fill material may be needed.
- The minimum cover shall be 4 feet unless field conditions and experience justify modifications.



Jobsite Inspection

- Typical “stage” inspection forms similar to this for CSP culverts are available.
- It is important to verify these:
 - Foundation
 - Bedding
 - Pipe Construction
 - Backfill – Haunches
 - Backfill – Spring line
 - Backfill – Crown
 - Backfill – Minimum cover

**SOIL-STEEL BRIDGE STRUCTURE
CONSTRUCTION CONTROL FORM**

Owner _____ Location _____

Supervising Engineer and/or Auth./Rep. _____

Contract Firms and Supervising Personnel _____

Design Engineer _____

Geotechnical Assessment _____

Stage Inspection	Dates of Inspection	Action-Date and Time of Stage Approval	Authorization to Next Stage
1. Foundation			
2. Bedding			
3. Erection			
4. Backfill-Haunches			
5. Backfill to Spring Line			
6. Backfill to Crown			
7. Backfill to Min. Cover			

Note:
It is suggested that the above form be attached to the certificate of final inspection, and that "as-constructed" drawings be based on cross-section and deflection surveys at least six months after reaching profile grade. (Note: This is a typical control document only.)

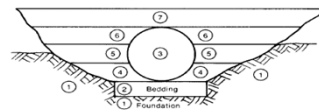


Figure 10.32 Typical inspector’s document for construction control of large corrugated steel pipe structures.



Steel Reinforced PolyEthylene

SRPE

<http://truenorthsteel.com>

SRPE



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Concept

Strength of Steel



+

Durability of Plastic



Diameter Ranges

8" – 72"

Pipe Lengths

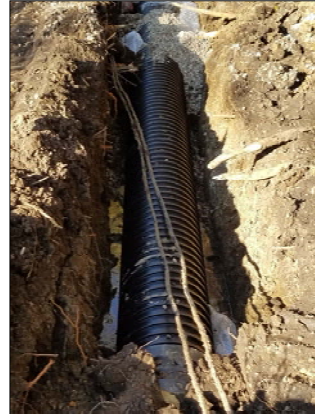
20ft, 24ft, 30ft, & 40ft

SRPE

- Made and sold in U.S. for last 9 years
- ASTM Standard Specification is released
 - ASTM F2435 Standard Specification for Steel Reinforced Polyethylene Pipe
- AASHTO spec is in the works and is anticipated for release in 2019
- Manning's "n" value = 0.010

Applications

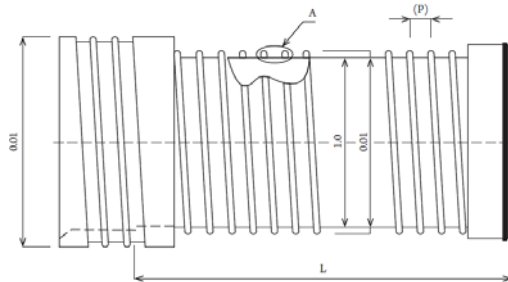
- Sanitary Sewers
- Storm Sewers
- Trunk Lines
- Culverts
- Irrigation
- Detention/Retention (Perf)
- Storage
- Rehabilitation-Reline



Characteristics

High Strength Steel Core

- Galvanized corrugated steel “ribs”
- Ribs are bonded to HDPE unlike other pipe materials
- Predictable strength and long-term performance
- Height of cover 1’ to 66’



Profiles

Type III (Type III of ASTM F2435)

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Water-Tight Bell and Spigot Joints

- 20 psi joint
 - Exceeds the SS Sewer industry standard of 10.8 psi
- Meets or exceeds ASTM F477
- Hydrostatic pressure testing @ 20 psi
- Maintains pressure rating @ 5% joint deflection

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Resin

High Performance Virgin HDPE Resin

- Virgin polyethylene resin
 - Meets cell classification 333430C per ASTM D3350
- Chemical and abrasion resistant
- Minimizes creep and stress cracking



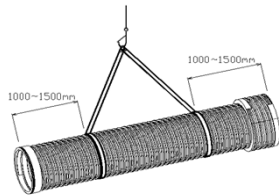
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Installation

- Longer pipe lengths = Fewer Joints
 - Stock Lengths = 20ft
 - Max Lengths
 - 12" to 60" = 40ft
 - 72" = 25ft
- Lightweight
- Lower installed cost
- Safer to Install



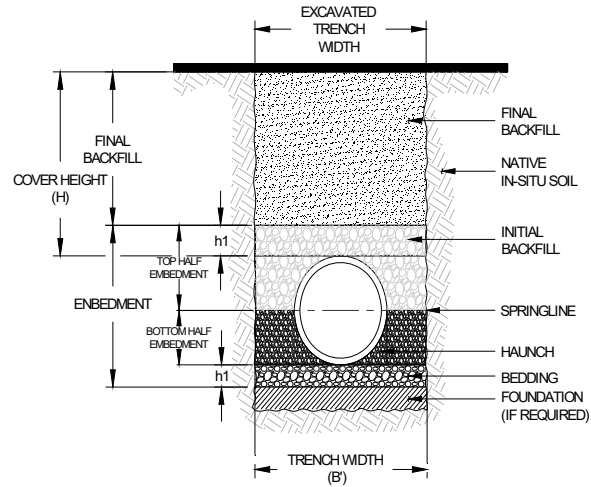
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Installation

- Install per ASTM D2321
- Select fill to Spring-Line or bottom embedment



Prior Projects



Pictures



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Pictures



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Pictures



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Similar Products

- Contech's DuroMaxx – ASTM F2562 – Provisional AASHTO Spec (MP-20)
 - These have non-bonded, steel inserts that tend to “layover” and “dislodge”.
- PP Triple Wall – ASTM F2764
- RCP
- SRPE is not intended to compete with Dual Wall HDPE (M294).
 - It's not the same material also *creep* and *stress cracking* is much less of a concern due to the bonded, steel reinforcements.

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Recap

- Specification ASTM F2435
- Predictability and Strength of Steel
- Durable, Long-Term Performance
- Superior Joint Performance @ 20 psi
- Superior Pipe Stiffness
- Hydraulic Performance for Gravity Sewers
- Easily installed...Safely!



Culvert Rehabilitation Opportunities

Rehabilitation – Where do you start?

- Define the problem
- Invert only?
- Disjointed due to settlement?
- Is the existing pipe structurally sound?

Rehabilitation – Where do you start?

A structural assessment should include identifying:

- Shape of the host pipe
 - CSP liners can be made to any diameter!!
- Joint Separation
- Crimping of the pipe wall
- Invert lifting
- Excessive alignment changes



Rehabilitation Opportunities

When does it make sense to rehabilitate?

- Deep fill sections!
- To avoid closure of crossing!
- Condition on host pipe!
- Historical status



Rehabilitation vs. Replacement

- Limit traffic disruptions and detours
- Minimal permitting
- Significantly shorter project time
- Historic preservation
- Reduced costs of 30%-50% in most cases
- Heavy equipment may not be required

Rehabilitation Options

- Slip-Lining...most common
- Invert Only Rehabilitation
 - Concrete Paving
 - Hard Armor Plating
- Shotcrete Lining
- Inversion Lining (CIPP)
- Patching



Slip-Lining: CMP

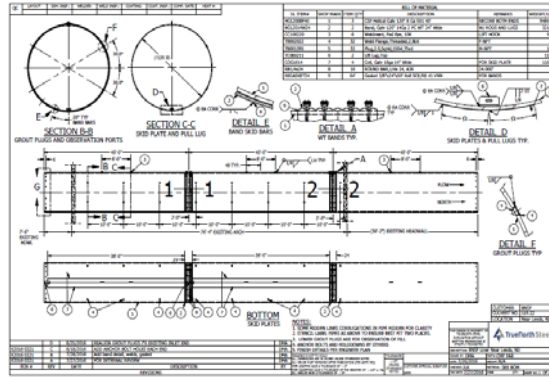


Manning's "n" Factor of Spiral Rib CMP = 0.012

Slip-Lining: CMP

Project Details

- Rail Road Embankment
- 23 feet of fill
- Existing opening 14' arch
- Liner is 10' diameter
- 5" x 1" corrugation
- 8 gauge galvanized CSP
- Annual space will be grouted in 3 stages.



Slip-Lining: CMP

- This existing CSP crossing was lined with CSP. The County desired to rehabilitate with a liner so they would not have to close the road.
- The existing culvert was a 30" diameter annular – riveted CSP



Slip-Lining: CMP

- A small tractor backhoe slide the liner pipe into the host pipe easily as the existing pipe was fairly straight in alignment
- Gasketed connecting bands are used to keep the grout from entering the pipe during that process



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Slip-Lining: CMP

- Often time, it is necessary to use a silo type “rod and lug” fastener in these applications as the typical band angle creates clearance problems
- Excess bolt thread can be trimmed off prior to advancing the liner completely into the host pipe



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Slip-Lining: Snap-Tite

- Another liner option to consider is Snap Tite.
- This is a solid walled HDPE material that is slid into the host pipe in a similar fashion.
- Two pipe snap together as they are slid into position.




Slip-Lining: Snap-Tite

- **Corrosion Resistant - Inert**
 - Impervious to acid rain, road salts, fuels and motor oil
- **Abrasion**
 - HDPE pipe has demonstrated wear rates 10x that of steel
- **Ultraviolet (UV) Stabilizers**
 - Virtually unaffected by sun and weather
- **Strength**
 - Rigid, yet flexible, adaptability to unique requirements
- **Longevity**
 - 100yr lifespan
- **Hydraulic flow capability**
 - Manning's flow is .009

Slip-Lining: Snap-Tite

Snap-Tite® Design

The diagram illustrates the Snap-Tite pipe design. It shows a long pipe section with a 'SnapTite Female' end on the left and a 'SnapTite Male' end on the right. Two dimensions are indicated: 'Over All Length' (the total length of the pipe) and 'Laying Length' (the length of the pipe section that is laid in the trench). Below the main diagram are two cross-sectional views of the pipe joint, showing the interlocking mechanism between the female and male ends.

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Slip-Lining: Snap-Tite

The photographs show the installation process. The top-left photo shows two workers in safety gear handling a large pipe section. The top-right photo shows a long pipe section being laid in a trench. The bottom-left photo is a close-up of the pipe's interior, showing the smooth surface and the joint.

Available in diameters 10" – 63"

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Rehabilitation Opportunities

Type of Distress Noted

- The un-tied joints on this RCP have separated allowing backfill material to wash into the pipe.
- Internal expanding bands were placed to seal the joint separation.



Rehabilitation Opportunities

- For larger diameter and longer length CSP relining projects, it works well to screw in two guard rails along the existing pipe invert and then use 4x4 wood sections to pull in the pipe
- This makes the physical relining go very smooth and prevents coating damage by not allowing the corrugations from catching on each other

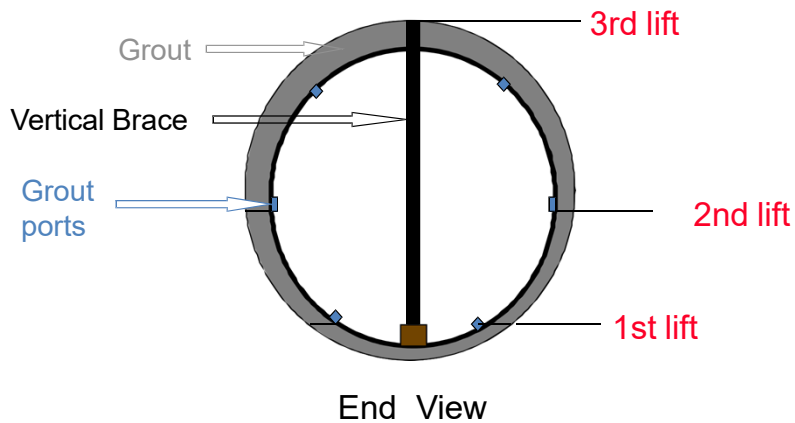


Rehabilitation Opportunities

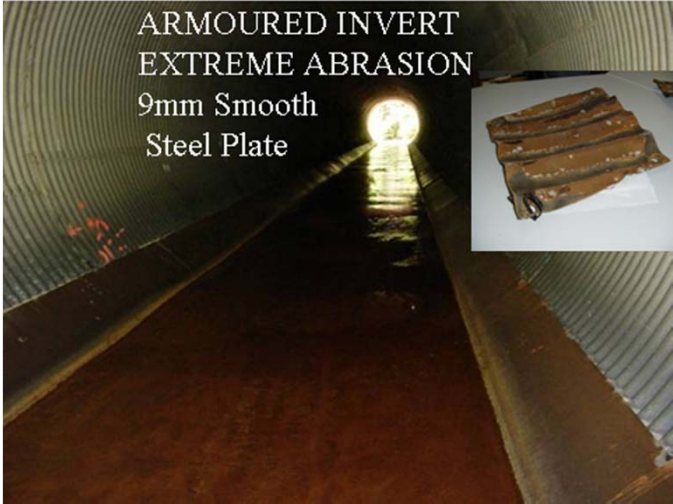
- For these rehabilitation options it is necessary to fill the annular space between the liner and the host pipe to effectively transfer the load to the liner pipe
- Selection of the grout type depends on the physical dimensions and condition of the host pipe



Grout in Stages



Invert Only – Hard Armor



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Invert Only – Concrete Invert

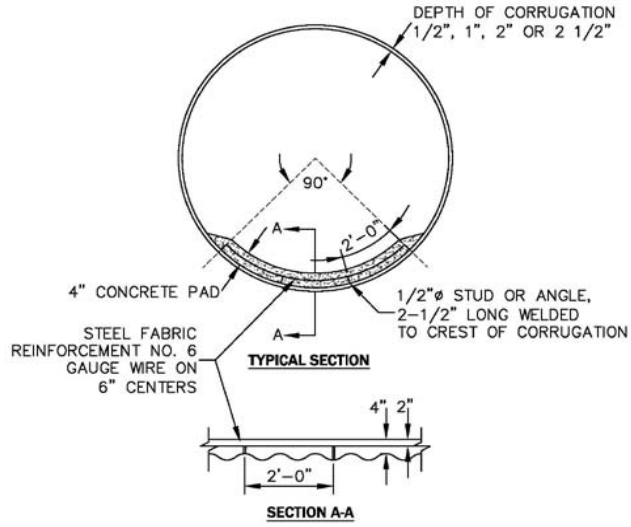


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Invert Only – Concrete Invert



Invert Only – Concrete Invert



First piece thru



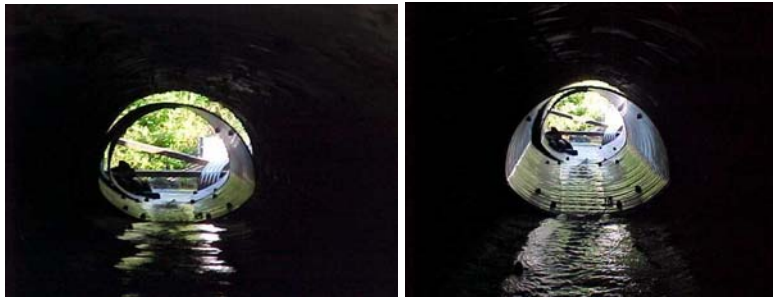
Pulling block



Pull in



One piece at a time



Pull in sling



End View



Internal bands



Day 2

Bypass Piping



Day 3

Coffer dam



Floatation bracing



Day 4

Skew w/bracing



Bracing to host structure
through 12 o'clock grout port



Bypass piping at outlet



Bulkheads



Day 5

Vent through headwall



Headwall Guniting Install



Day 5

Finish End wall



Vent through Headwall



Grout



Day 6

Minimum Strength 200 psi
Pumped at approx. 2.5 psi

Grout Port



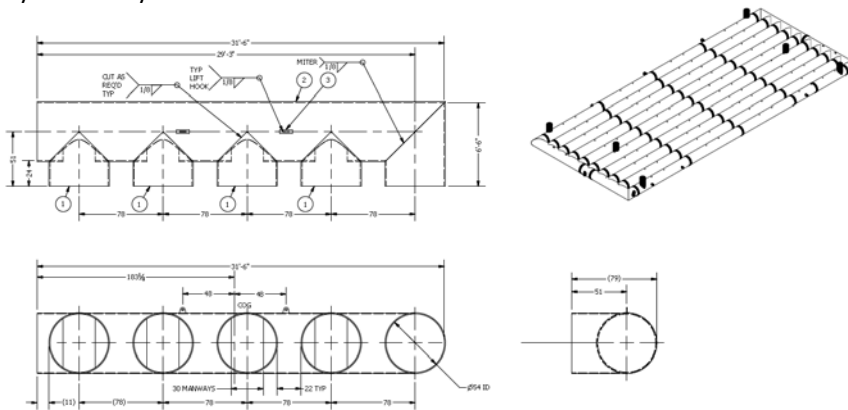
Day 8 –Last grout lift. Back grout procedure complete.

Grout through vent



Contact TrueNorth Steel

- Let TrueNorth Steel assist with your next project design!
- We have a competent drafting and engineering team that can draw up your next system.



Contact TrueNorth Steel

- TrueNorth Steel is available to assist with any further questions you may have regarding Corrugation Steel Pipe or related products
- Check out our new website at <http://truenorthsteel.com> for more information.
- Thank you and have a wonderful day!

- TrueNorth Steel can help with:**
- Sizing and system type selection
 - Layout
 - Drawings
 - Outlet control sizing
 - Specifications
 - Cost estimates
 - Minimizing cost
 - Construction assistance

LUNCH & LEARN

Thursday
April 25, 2019

12:00 pm - 1:00 pm CST

USACE

**How to Calculate
Project Impacts
& an
Update on the
2019 Clean Water Rule**

LOCATIONS

In Bismarck at Central Office
Room 310-312 (DOT Building – 608 E Boulevard Ave)

Or

Video conferencing at NDDOT district offices
(Dickinson, Minot, Williston, Valley City, Fargo, Devils Lake, Grand Forks,
and Materials & Research in Bismarck)

Or

Conference call-in is available
(Instructions available on website)

RSVP

www.dot.nd.gov/LunchAndLearn.htm

**PIZZA WILL BE
SERVED AT
CENTRAL OFFICE**

\$5 suggested
contribution

UPCOMING MEETINGS:

MAY 30
**BORROW
PROCESS
A TO Z**

JUNE 27
FIRE TO WAR
ND State Highway
Department &
Turbulent 1930's
**PRESENTED BY
BEN KUBISCHTA**

**SUGGESTIONS
QUESTIONS OR
COMMENTS?**

[www.dot.nd.gov/
LunchAndLearn.htm](http://www.dot.nd.gov/LunchAndLearn.htm)

NDDOT
North Dakota
Department of Transportation