

# Smooth Cor™ Double Wall CSP

The Storm Sewer System Alternative for Difficult Situations



## Smooth Cor™ vs. Reinforced Concrete Box (RCB)

Smooth Cor™ consists of a corrugated steel pipe exterior shell and a smooth steel liner. The Smooth Cor storm sewer system is an economical alternative to concrete materials and ideal for difficult site conditions such as weak soils, poor drainage conditions, steep slopes, and high fills.

- Hydraulically efficient - 0.012 Manning's "n"
- Longer lengths and lighter weights
- Lower installed costs
- High beam strength



### DESIGN CHALLENGE » 335 LF 72" STORM SEWER

| PROJECT MATERIALS SUMMARY | SMOOTH COR<br>(12 ga. outershell/18 ga. innershell ) | RCB*<br>(7' X 4') |
|---------------------------|--|-------------------|
| Lay length (ft)           | 25   | 6                 |
| Inside dimension          | 72" diameter   | 84" x 48"         |
| Outside dimension         | 74" diameter   | 100" x 64"        |
| Weight per foot (lbs/ft)  | 157  | 2,565             |
| Weight per piece (lbs/ft) | 3,925  | 15,390            |
| Total Length (ft)         | 335  | 335               |
| Number of pieces          | 14   | 56                |

| PROJECT REQUIREMENTS       | SMOOTH COR          | RCB*                | SMOOTH COR ADVANTAGES |
|----------------------------|---------------------|---------------------|-----------------------|
| Total # of pieces          | 14                  | 56                  | 75% fewer pieces      |
| Total weights, lbs         | 52,595              | 859,275             | 1634% less weight     |
| Total # of trucks          | 7                   | 19                  | 63% fewer truckloads  |
| Excavation volume**        | 833 yd <sup>3</sup> | 968 yd <sup>3</sup> | 14% less volume       |
| Installation cycle time*** | 12 hours            | 48 hours            | 75% less time         |

\* ASTM C-76 Tongue & Groove joints, Class III

\*\* Trench width is based on table provided below.

\*\*\* Assuming production time for line/grade preparation, handling, and setting pipe is 20 minutes per piece.

### PRODUCT COMPARISON

|                                 | 42"         |            | 48"         |            | 60"         |            | 72"         |            | 84"         |            | 96"         |            |
|---------------------------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
|                                 | 3' x 3' RCB | Smooth Cor | 4' x 3' RCB | Smooth Cor | 5' x 4' RCB | Smooth Cor | 7' x 4' RCB | Smooth Cor | 8' x 5' RCB | Smooth Cor | 7' x 7' RCB | Smooth Cor |
|                                 | Class III   | 16 Ga.     | Class III   | 16 Ga.     | Class III   | 14 Ga.     | Class III   | 12 Ga.     | Class III   | 12 Ga.     | Class III   | 12 Ga.     |
| Pipe Length, Ft.                | 6           | 25         | 6           | 25         | 6           | 25         | 6           | 25         | 6           | 25         | 6           | 25         |
| Approx. Wt. Lb./Ft.             | 1120        | 60         | 1385        | 67         | 1780        | 105        | 2565        | 157        | 2960        | 181        | 3160        | 208        |
| Approx. Area (ft <sup>2</sup> ) | 8.8         | 9.6        | 11.5        | 12.6       | 19.5        | 19.6       | 27.1        | 28.1       | 39.1        | 38.5       | 48.1        | 50.3       |
| O.D., In.                       | 44          | 43         | 58          | 49         | 72          | 62         | 100         | 74         | 112         | 86         | 100         | 98         |
| Max. Allowable Fill, Ft.        | 20          | 71         | 30          | 62         | 30          | 63         | 30          | 74         | 20          | 63         | 30          | 55         |
| Truck Loads per 100 Ft. of Pipe | 3           | 1          | 4           | 1          | 5           | 2          | 6           | 2          | 9           | 2          | 9           | 2          |
| # of Pieces per 100 Ft. of Pipe | 17          | 4          | 17          | 4          | 17          | 4          | 17          | 4          | 17          | 4          | 17          | 4          |
| Trench Width, In.               | 67          | 66         | 85          | 74         | 102         | 90         | 137         | 105        | 152         | 120        | 137         | 135        |

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## Smooth Cor™ vs. Reinforced Concrete Box (RCB)

### SUBMITTAL FOR DOUBLE WALL CORRUGATED STEEL PIPE AS AN ALTERNATE STORM SEWER MATERIAL

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Please consider this a formal request for your review and approval of polymer-coated double wall corrugated steel pipe (CSP) for storm sewer application and inclusion into this project. Contech Engineered Solutions proposes to furnish this pipe as an alternate to the project specified material.

#### POLYMER-COATED DOUBLE WALL CSP:

1. Significant material cost savings
2. Faster lead times
3. Installation advantages offered by lightweight pipe in long lengths
  - a. Utilize lightweight equipment
  - b. All junctions, fittings, manholes, grate inlets, etc. can be handled "in-line" as a fabricated fitting – "Feels like another piece of pipe."

#### POLYMER-COATED DOUBLE WALL CSP FOR STORM SEWER

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##### 1.0 GENERAL

- 1.1 This specification covers the manufacture and installation of the double wall corrugated steel pipe (Type IA) or pipe-arch (Type IIA) (Double Wall CSP) detailed in the project plans.

##### 2.0 DESIGN STANDARDS

- 2.1 The Double Wall CSP meets the design parameters of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specification for Highway Bridges, AASHTO LRFD Bridge Design, and/or the American Iron and Steel Institute (AISI).

##### 3.0 MATERIAL

- 3.1 The polymer coated steel coils shall conform to the applicable requirements of AASHTO M 246 or ASTM A742.

##### 4.0 PIPE

- 4.1 The Double Wall CSP shall be manufactured in accordance with the applicable requirements of AASHTO M 36 or ASTM A760. The pipe sizes, gages and corrugations shall be as shown on the project plans.
- 4.2 The corrugated external shell and the smooth interior liner shall be polymer coated steel.
- 4.3 All fabrication of the product shall occur within the United States.

##### 5.0 COUPLING BANDS

- 5.1 Coupling bands for the Double Wall CSP shall be made of the same base metal and coatings as the Double Wall CSP.
- 5.2 Connection fasteners will be provided.

##### 6.0 HANDLING & ASSEMBLY

- 6.1 Refer to the recommendations of the National Corrugated Steel Pipe Association's (NCSPA).

##### 7.0 INSTALLATION

- 7.1 The installation shall be in accordance with AASHTO Standard Specifications for Highway Bridges, LRFD Section 26, Division II, NCSPA, or ASTM A798 and in conformance with the project plans and specifications. If there are any inconsistencies or conflicts, the contractor must bring them to the attention of the project engineer.
- 7.2 It is always the contractor's responsibility to follow OSHA guidelines for safe practices.

##### 8.0 CONSTRUCTION LOADS

- 8.1 Construction loads may be greater than design loads. The contractor shall follow the recommendations for additional compacted material per manufacturer's or NCSPA guidelines.