

## From Cover



Victoria Avenue (TransCanada Hwy 1) is the primary entrance into the east side of Regina, SK and has over 40,000 vehicles per day travelling on it. The existing eastbound and westbound bridge structures between Coleman Crescent and Prince of Wales Drive over Pilot Butte Creek were at the end of their life cycle and required replacement.

The City of Regina put out a tender to replace the existing bridge structures with four rows of $3000 \mathrm{~mm} \times 2400 \mathrm{~mm}$ precast box culvert. The tender was awarded to WF Botkin Construction Ltd who had until the fall of 2015 to complete the work. To help achieve success on this tight timeline the installation of the box culvert was subcontracted to NIS Contractors Ltd who sourced supply of the box culverts from Inland Pipe.

For the duration of the project the contractor had to maintain two-lane traffic in both directions to try and minimize traffic disruptions. In order to achieve this, removal of the existing bridges and installation of the precast box culvert sections had to be completed in three stages. Due to the expertise of NIS and the well-timed supply of the boxes from Inland Pipe, NIS was able to complete the installation of the three phases on time. Great job!

## INLAND <br> HEIDELBERGCEMENTGroup




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## ABOUT INLAND

The company now known as Inland Pipe began in Saskatchewan in the early 1960's as a family owned business.

Through a number of mergers and acquisitions, Inland Pipe is now part of the Lehigh Hanson group in North America and part of the world-wide HeidelbergCement Group.

HeidelbergCement is the global market leader in aggregates and a prominent player in the fields of cement, concrete and other downstream activities, making it one of the world's largest manufacturers of building materials. The company employs some 52,000 people at 2,500 locations in more than 40 countries.

Inland Pipe and our our sister company Ocean Pipe (British Columbia) combine to form the largest producer of concrete pipe and manholes in Western Canada. Our automated Spyhill facility in Calgary, Alberta is the most advanced precast drainage facility in North America.

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## Notes:

- All concrete products within this catalogue are manufactured using sulphate resistant (HS or HSb) cement as per CSA A3000.
- Restocking fees are $15 \%$ for returned undamaged stock items. Cancelled orders may be subject to $100 \%$ restocking charges.
- Listed product weights are approximate and intended for shipping purposes. Exact weights can be calculated upon request.
- Prices shown in this catalogue are intended as an estimating guide and are subject to change. Detailed quotations are available upon request.
- Cast-in fixtures and appurtenances, other than swift lifts, are subject to approval by design Engineer and extra costs will apply.


## Plant Prequalification Program

$\%$

## This stamp means Quality . It signifies that your precast concrete drainage

 product has met the stringent demands of the Plant Prequalification Program.
## What does Prequalification mean?

Owners of infrastructure projects, who purchase precast concrete drainage products from prequalified plants, receive products that have been tested for quality through the manufacturing process and inspected upon completion. Concrete drainage products supplied from a prequalified plant comply with the requirements of the latest editions of the following specifications:

- CSA A257.0 / ASTM C497 - testing procedures for precast drainage materials
- CSA A257.1 / ASTM C14 - non-reinforced concrete pipe
- CSA A257.2 / ASTM C76 - reinforced concrete pipe
- CSA A257.3 / ASTM C443 - joints for precast drainage materials
- CSA A257.4 / ASTM C478 - precast reinforced manhole sections
- CSA S6-06 / ASTM C1433 - precast reinforced box culvert sections


## ACHIEVING AND MAINTAINING PREQUALIFICATION:

A consulting engineer is retained to carry out an independent inspection of the applicant's plant and product. Samples of products are tested and the engineer submits a detailed report to the third party consultant. The report to the Chair states a compliance, or noncompliance with the prequalification requirements, together with a recommendation. The Chair issues the Prequalification Certificate.

The Certificate states the Product to which the prequalification applies and is normally valid for 12 months after the date of issue.

Each year, plants are inspected by the engineer who checks and tests to ascertain whether or not quality control and the standard of workmanship is being maintained at a satisfactory level. Every third year, the engineer undertakes detailed inspection and testing, and submits a report comparable to the original inspection for prequalification.

Quality control personnel within the precast concrete manufacturing facilities receive regular training, provided by the manufacturer, to ensure the quality control processes are performed correctly by the staff, and the information gathered is analyzed and maintained in accordance with the program.

## Bell \& Spigot Pipe

|  |  |  | PRICE (\$ PER METRE) |  |  |  | $\begin{array}{\|l\|} \hline \text { CITY } \\ \text { CARTAGE } \\ \$ / \mathrm{m} \end{array}$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { INSIDE } \\ & \text { DIA. } \\ & \text { mm } \end{aligned}$ | LENGTH m | $\begin{gathered} \text { WEIGHT } \\ \mathrm{kg} / \mathrm{m} \end{gathered}$ | REINFORCED PIPE ASTM C76, CSA 257.2 |  |  |  |  | ACTUAL PIPE DIMENSIONS (mm) |  |  |  |  |  |  |
|  |  |  | CL-2 | CL-3 | CL-4 | CL-5 |  |  |  |  |  |  |  |  |
|  |  |  | 50-D | 65-D | 100-D | 140-D |  | Di | Do | LL | Lo | Tw | B | G |
| 300 | 2.50 | 220 |  |  |  |  |  | 305 | 407 | 2500 | 2606 | 51 | 500 | 103 |
| 375 | 2.50 | 275 |  |  |  |  |  | 381 | 495 | 2500 | 2606 | 57 | 611 | 103 |
| 450 | 2.50 | 284 |  |  |  |  |  | 457 | 583 | 2500 | 2621 | 63 | 700 | 118 |
| 525 | 2.50 | 380 |  | Prices avai | pon request |  |  | 533 | 673 | 2500 | 2621 | 70 | 795 | 118 |
| 600 | 2.50 | 461 |  |  |  |  |  | 610 | 762 | 2500 | 2621 | 76 | 902 | 118 |
| 750 | 2.50 | 655 |  |  |  |  |  | 762 | 940 | 2500 | 2635 | 89 | 1060 | 131 |
| 900 | 2.50 | 880 |  |  |  |  |  | 914 | 1116 | 2500 | 2635 | 101 | 1260 | 131 |

Notes: 1) All pipe manufactured with Type $\mathrm{HS}(50)$ high sulphate-resistant hydraulic cement.
3) All products are pre qualified under the plant prequalification program.
2) Prices for bends and junctions available on request.


## Straight Wall Pipe

|  |  |  | PRICE (\$ PER METRE) |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| INSIDE | LENGTH | WEIGHT | REINFORCED PIPE ASTM C76, CSA 257.2 |  |  |  | CITY CARTAGE \$/m | ACTUAL PIPE DIMENSIONS (mm) |  |  |  |  |  |
| DIA. <br> mm | m | kg/m | $\begin{aligned} & \text { 50-D } \\ & \text { CL-2 } \end{aligned}$ | $\begin{aligned} & \text { 65-D } \\ & \text { CL-3 } \end{aligned}$ | $\begin{gathered} \text { 100-D } \\ \text { CL-4 } \end{gathered}$ | $\begin{gathered} \text { 140-D } \\ \text { CL-5 } \end{gathered}$ |  | Di | ACTU Do | L PIPE DI LL | MENSION Lo | (mm | G |
| 300 | 1.25 | 200 |  |  |  |  |  | 305 | 444 | 1250 | 1323 | 70 | 73 |
| 375 | 1.25 | 262 |  |  |  |  |  | 381 | 533 | 1250 | 1323 | 76 | 73 |
| 450 | 1.25 | 330 |  |  |  |  |  | 457 | 622 | 1250 | 1323 | 83 | 73 |
| 525 | 1.25 | 416 |  |  |  |  |  | 533 | 711 | 1250 | 1336 | 89 | 86 |
| 600 | 1.25 | 520 |  |  |  |  |  | 610 | 800 | 1250 | 1336 | 95 | 86 |
| 750 | 1.22/1.83 | 609 |  |  |  |  |  | 762 | 940 | 1219/1829 | 1319/1929 | 89 | 100 |
| 900 | 1.22/1.83 | 850 |  |  |  |  |  | 914 | 1118 | 1219/1829 | 1319/1929 | 102 | 100 |
| 1050 | 1.22/2.44 | 1066 |  | Prices | ilable upon | equest |  | 1067 | 1295 | 1219/2438 | 1308/2527 | 114 | 101 |
| 1200 | 1.22/2.44 | 1346 |  |  |  |  |  | 1219 | 1473 | 1219/2438 | 1308/2527 | 127 | 101 |
| 1350 | 2.44 | 1639 |  |  |  |  |  | 1372 | 1651 | 2438 | 2548 | 140 | 108 |
| 1500 | 2.44 | 2005 |  |  |  |  |  | 1524 | 1829 | 2438 | 2559 | 153 | 121 |
| 1650 | 2.44 | 2442 |  |  |  |  |  | 1676 | 2007 | 2438 | 2565 | 166 | 127 |
| 1800 | 2.44 | 3100 |  |  |  |  |  | 1829 | 2222 | 2438 | 2565 | 197 | 127 |
| 2100 | 2.44 | 4175 |  |  |  |  |  | 2134 | 2540 | 2438 | 2565 | 203 | 121 |
| 2400 | 2.44 | 4737 |  |  |  |  |  | 2438 | 2896 | 2438 | 2565 | 229 | 184 |

Notes: 1) All pipe manufactured with Type $\mathrm{HS}(50)$ high sulphate-resistant hydraulic cement.
2) Pricing for bends and junctions is available upon request.
3) Pipe 900 mm and larger come with swift lift.
4) Banding prices are available upon request.
5) Pipe larger than 2400 mm is available upon request.


## Manhole Material 1050mm \& 1200mm Diameter

| BASE SECTIONS FOR 1050mm MANHOLE SECTIONS | TYPE | WEICHT $\mathrm{kg} / \mathrm{ea}$. | PRICE per section | $\begin{gathered} \text { CITY } \\ \text { CARTAGE /ea. } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: |
| 1050mm x 1.83m Riser | A | 1896 |  |  |
| 1050mm x 1.83m Base | A1 | 2334 |  |  |
| 1050mm $\times 1.22 \mathrm{~m}$ Riser | A | 1264 |  |  |
| 1050mm x 1.22 m Base | A1 | 1702 |  |  |
| 1050mm x 0.92m Riser | A | 953 |  |  |
| $1050 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Base | A1 | 1391 |  |  |
| 1050mm x 0.61m Riser | A | 632 | Prices avail | upon request |
| $1050 \mathrm{~mm} \times 0.61 \mathrm{~m}$ Base | A1 | 1070 |  |  |
| 1050mm x 0.46 m Riser | A | 477 |  |  |
| 1050mm x 0.46 m Base | A1 | 915 |  |  |
| 1050mm $\times 0.31 \mathrm{~m}$ Riser | A | 321 |  |  |
| 1050mm x 0.31 m Base | A1 | 759 |  |  |
| BASE SECTIONS FOR 1200mm MANHOLE SECTIONS | TYPE | WEICHT kg/ea. | PRICE per section | $\begin{gathered} \text { CITY } \\ \text { CARTAGE /ea. } \end{gathered}$ |
| 1200mm x 1.83m Riser | A | 2408 |  |  |
| $1200 \mathrm{~mm} \times 1.83 \mathrm{~m}$ Base | A1 | 2979 |  |  |
| $1200 \mathrm{~mm} \times 1.22 \mathrm{~m}$ Riser | A | 1605 |  |  |
| $1200 \mathrm{~mm} \times 1.22 \mathrm{~m}$ Base | A1 | 2176 |  |  |
| $1200 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Riser | A | 1210 |  |  |
| $1200 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Base | A1 | 1781 | Prices available upon request |  |
| $1200 \mathrm{~mm} \times 0.61 \mathrm{~m}$ Riser | A | 803 |  |  |
| $1200 \mathrm{~mm} \times 0.61 \mathrm{~m}$ Base | A1 | 1374 |  |  |
| $1200 \mathrm{~mm} \times 0.46$ Riser | A | 605 |  |  |
| $1200 \mathrm{~mm} \times 0.46 \mathrm{~m}$ Base | A1 | 1176 |  |  |
| $1200 \mathrm{~mm} \times 0.31$ Riser | A | 408 |  |  |
| $1200 \mathrm{~mm} \times 0.31$ Base | A1 | 979 |  |  |
| MANHOLE REDUCERS |  | WEICHT kg/ea. | PRICE <br> /ea. | CITY CARTAGE /ea. |
| 1050mm/635mm x 20 m Flat Reducer |  | 490 |  |  |
| $1050 \mathrm{~mm} / 635 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Conical Top |  | 870 |  |  |
| $1200 \mathrm{~mm} / 635 \mathrm{~mm} \times .20 \mathrm{~m}$ Flat Reducer |  | 680 | Prices available upon request |  |
| $1200 \mathrm{~mm} / 635 \mathrm{~mm} \times 0.91 \mathrm{~m}$ Conical Top |  | 1050 |  |  |
| ADJUSTING RINGS |  | WEIGHT $\mathrm{kg} / \mathrm{ea}$. | PRICE /ea. | CITY CARTAGE /ea. |
| $635 \mathrm{~mm} \times 50 \mathrm{~mm}$ (2") |  | 45 |  |  |
| $635 \mathrm{~mm} \times 100 \mathrm{~mm}$ (4") |  | 80 | Prices available upon request |  |
| $635 \mathrm{~mm} \times 150 \mathrm{~mm}$ ( $6^{\prime \prime}$ ) |  | 95 |  |  |

Notes: 1) Manholes manufactured to ASTM C478
2) Manholes, reducers and risers $c / w$ swift lift lifting pins.
3) All manhole material manufactured with Type $\operatorname{HS}(50)$ high sulphate-resistant hydraulic cement.

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## Manhole Material Large Diameter



Notes: 1) SPECIAL MH'S AND / OR COMPONENTS AVAILABLE UPON REQUEST
2) All large diameter MH's are non stocked items.
3) Manholes manufactured to ASTM C478 and are prequalified under the Plant Prequalification Program.
4) Additional information on sizes and/or classifications not shown is available on request
5) Line reducers indicated above are cast integrally to base section.
6) Tee Risers are manufactured with $1050 \mathrm{~mm} / 1200 \mathrm{~mm}$ stub stack.
7) Flat reducers available in various diameter openings.
8) Manholes, reducers and risers $c / w$ swift lift lifting pins.
9) All manholes and components manufactured with Type HS(50) high sulphate-resistant hydraulic cement.

## Manhole Material 1050mm Estimating Table

QUICK REFERENCE ESTIMATING TABLE (1050mm MANHOLE MATERIAL)

| DEPTH <br> (m) | 1050mm MHBASE c/w Floor |  | 1050mm MANHOLE RISER SECTIONS |  |  |  |  |  | CONEREDUCER 0.92 | FLAT REDUCER 0.20 | $\begin{aligned} & \text { ADJUSTING } \\ & \text { RINGS } \end{aligned}$ |  |  | $\begin{aligned} & \text { SUPER } \\ & \text { SEAL } \\ & \text { GASKETS } \end{aligned}$ |  | TOTAL HEIGHT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1.22 | 0.92 | 1.83 | 1.22 | 0.92 | 0.61 | 0.46 | 0.31 |  |  | 0.15 | 0.1 | 0.05 |  |  |  |
| 1.50 |  | 1 |  |  |  |  |  |  |  | 1 | 1 |  | 1 | 1 | 1 | 1.47 |
| 1.60 | 1 |  |  |  |  |  |  |  |  | 1 | 1 |  |  | 1 | 1 | 1.57 |
| 1.70 | 1 |  |  |  |  |  |  |  |  | 1 | 1 |  |  | 1 | 1 | 1.72 |
| 1.80 | 1 |  |  |  |  |  |  |  |  | 1 | 1 |  | 1 | 1 | 1 | 1.77 |
| 1.90 | 1 |  |  |  |  |  |  | 1 |  | 1 | 1 |  |  | 2 | 1 | 1.88 |
| 2.00 | 1 |  |  |  |  |  |  | 1 |  | 1 |  | 1 |  | 2 | 1 | 1.98 |
| 2.10 | 1 |  |  |  |  |  |  | 1 |  | 1 | 1 |  | 1 | 2 | 1 | 2.08 |
| 2.20 | 1 |  |  |  |  |  | 1 |  |  | 1 | 1 |  |  | 2 | 1 | 2.18 |
| 2.30 | 1 |  |  |  |  | 1 |  |  |  | 1 |  | 1 |  | 2 | 1 | 2.28 |
| 2.40 | 1 |  |  |  |  |  |  |  | 1 |  |  | 1 |  | 1 | 1 | 2.38 |
| 2.50 | 1 |  |  |  |  |  |  |  | 1 |  | 1 |  | 1 | 1 | 1 | 2.48 |
| 2.60 | 1 |  |  |  |  |  |  |  | 1 |  | 2 |  |  | 1 | 1 | 2.58 |
| 2.70 | 1 |  |  |  |  |  |  | 1 | 1 |  |  | 1 |  | 2 | 1 | 2.69 |
| 2.80 | 1 |  |  |  |  |  |  | 1 | 1 |  | 1 |  | 1 | 2 | 1 | 2.79 |
| 2.90 | 1 |  |  |  |  |  | 1 |  | 1 |  | 1 |  |  | 2 | 1 | 2.89 |
| 3.00 | 1 |  |  |  |  |  | 1 |  | 1 |  | 1 | 1 |  | 2 | 1 | 2.99 |
| 3.10 | 1 |  |  |  |  | 1 |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 3.09 |
| 3.20 | 1 |  |  |  |  |  | 1 | 1 | 1 |  | 1 |  |  | 3 | 1 | 3.2 |
| 3.30 | 1 |  |  |  |  |  | 1 | 1 | 1 |  | 1 | 1 |  | 3 | 1 | 3.3 |
| 3.40 | 1 |  |  |  | 1 |  |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 3.4 |
| 3.50 | 1 |  |  |  |  | 1 | 1 |  | 1 |  | 1 |  |  | 3 | 1 | 3.5 |
| 3.60 | 1 |  |  |  |  | 1 | 1 |  | 1 |  | 1 | 1 |  | 3 | 1 | 3.6 |
| 3.70 | 1 |  |  | 1 |  |  |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 3.7 |
| 3.80 | 1 |  |  |  | 1 |  | 1 |  | 1 |  | 1 |  |  | 3 | 1 | 3.81 |
| 3.90 | 1 |  |  |  | 1 |  | 1 |  | 1 |  | 1 | 1 |  | 3 | 1 | 3.91 |
| 4.00 | 1 |  |  | 1 |  |  |  | 1 | 1 |  | 1 |  | 1 | 3 | 1 | 4.01 |
| 4.10 | 1 |  |  | 1 |  |  | 1 |  | 1 |  | 1 |  |  | 3 | 1 | 4.11 |
| 4.20 | 1 |  |  | 1 |  |  | 1 |  | 1 |  | 1 | 1 |  | 3 | 1 | 4.21 |
| 4.30 | 1 |  | 1 |  |  |  |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 4.31 |
| 4.40 | 1 |  | 1 |  |  |  |  |  | 1 |  | 2 |  |  | 2 | 1 | 4.41 |
| 4.50 | 1 |  |  | 1 |  |  | 1 | 1 | 1 |  | 1 |  | 1 | 4 | 1 | 4.47 |
| 4.60 | 1 |  | 1 |  |  |  |  | 1 | 1 |  | 1 |  |  | 3 | 1 | 4.57 |
| 4.70 | 1 |  | 1 |  |  |  |  | 1 | 1 |  | 1 | 1 |  | 3 | 1 | 4.67 |
| 4.80 | 1 |  | 1 |  |  |  | 1 |  | 1 |  | 1 |  | 1 | 3 | 1 | 4.77 |
| 4.90 | 1 |  | 1 |  |  | 1 |  |  | 1 |  | 1 |  |  | 3 | 1 | 4.87 |
| 5.00 | 1 |  | 1 |  |  | 1 |  |  | 1 |  | 1 | 1 |  | 3 | 1 | 4.97 |

## Manhole Material 1200mm Estimating Table

QUICK REFERENCE ESTIMATING TABLE (1200mm MANHOLE MATERIAL)

| DEPTH <br> (m) | 1200 mm MH <br> BASE c/w Floor |  | 1200mm MANHOLE RISER SECTIONS |  |  |  |  |  | $\begin{gathered} \text { CONE } \\ \text { REDUCER } \\ 0.91 \end{gathered}$ | $\begin{gathered} \text { FLAT } \\ \text { REDUCER } \\ 0.20 \end{gathered}$ | ADJUSTING RINGS |  |  | SUPER SEAL GASKETS | $\begin{gathered} \text { FRAME } \\ \& \\ \text { COVER } \end{gathered}$ | TOTAL HEIGHT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1.22 | 0.92 | 1.83 | 1.22 | 0.92 | 0.61 | 0.46 | 0.31 |  |  | 0.15 | 0.1 | 0.05 |  |  |  |
| 1.50 |  | 1 |  |  |  |  |  |  |  | 1 | 1 |  | 1 | 1 | 1 | 1.47 |
| 1.60 | 1 |  |  |  |  |  |  |  |  | 1 | 1 |  |  | 1 | 1 | 1.57 |
| 1.70 | 1 |  |  |  |  |  |  |  |  | 1 | 1 |  |  | 1 | 1 | 1.72 |
| 1.80 | 1 |  |  |  |  |  |  |  |  | 1 | 1 |  | 1 | 1 | 1 | 1.77 |
| 1.90 | 1 |  |  |  |  |  |  | 1 |  | 1 | 1 |  |  | 2 | 1 | 1.88 |
| 2.00 | 1 |  |  |  |  |  |  | 1 |  | 1 |  | 1 |  | 2 | 1 | 1.98 |
| 2.10 | 1 |  |  |  |  |  |  | 1 |  | 1 | 1 |  | 1 | 2 | 1 | 2.08 |
| 2.20 | 1 |  |  |  |  |  | 1 |  |  | 1 | 1 |  |  | 2 | 1 | 2.18 |
| 2.30 | 1 |  |  |  |  | 1 |  |  |  | 1 |  | 1 |  | 2 | 1 | 2.28 |
| 2.40 | 1 |  |  |  |  |  |  |  | 1 |  |  | 1 |  | 1 | 1 | 2.38 |
| 2.50 | 1 |  |  |  |  |  |  |  | 1 |  | 1 |  | 1 | 1 | 1 | 2.48 |
| 2.60 | 1 |  |  |  |  |  |  |  | 1 |  | 2 |  |  | 1 | 1 | 2.58 |
| 2.70 | 1 |  |  |  |  |  |  | 1 | 1 |  |  | 1 |  | 2 | 1 | 2.69 |
| 2.80 | 1 |  |  |  |  |  |  | 1 | 1 |  | 1 |  | 1 | 2 | 1 | 2.79 |
| 2.90 | 1 |  |  |  |  |  | 1 |  | 1 |  | 1 |  |  | 2 | 1 | 2.89 |
| 3.00 | 1 |  |  |  |  |  | 1 |  | 1 |  | 1 | 1 |  | 2 | 1 | 2.99 |
| 3.10 | 1 |  |  |  |  | 1 |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 3.09 |
| 3.20 | 1 |  |  |  |  |  | 1 | 1 | 1 |  | 1 |  |  | 3 | 1 | 3.2 |
| 3.30 | 1 |  |  |  |  |  | 1 | 1 | 1 |  | 1 | 1 |  | 3 | 1 | 3.3 |
| 3.40 | 1 |  |  |  | 1 |  |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 3.4 |
| 3.50 | 1 |  |  |  |  | 1 | 1 |  | 1 |  | 1 |  |  | 3 | 1 | 3.5 |
| 3.60 | 1 |  |  |  |  | 1 | 1 |  | 1 |  | 1 | 1 |  | 3 | 1 | 3.6 |
| 3.70 | 1 |  |  | 1 |  |  |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 3.7 |
| 3.80 | 1 |  |  |  | 1 |  | 1 |  | 1 |  | 1 |  |  | 3 | 1 | 3.81 |
| 3.90 | 1 |  |  |  | 1 |  | 1 |  | 1 |  | 1 | 1 |  | 3 | 1 | 3.91 |
| 4.00 | 1 |  |  | 1 |  |  |  | 1 | 1 |  | 1 |  | 1 | 3 | 1 | 4.01 |
| 4.10 | 1 |  |  | 1 |  |  | 1 |  | 1 |  | 1 |  |  | 3 | 1 | 4.11 |
| 4.20 | 1 |  |  | 1 |  |  | 1 |  | 1 |  | 1 | 1 |  | 3 | 1 | 4.21 |
| 4.30 | 1 |  | 1 |  |  |  |  |  | 1 |  | 1 |  | 1 | 2 | 1 | 4.31 |
| 4.40 | 1 |  | 1 |  |  |  |  |  | 1 |  | 2 |  |  | 2 | 1 | 4.41 |
| 4.50 | 1 |  |  | 1 |  |  | 1 | 1 | 1 |  | 1 |  | 1 | 4 | 1 | 4.47 |
| 4.60 | 1 |  | 1 |  |  |  |  | 1 | 1 |  | 1 |  |  | 3 | 1 | 4.57 |
| 4.70 | 1 |  | 1 |  |  |  |  | 1 | 1 |  | 1 | 1 |  | 3 | 1 | 4.67 |
| 4.80 | 1 |  | 1 |  |  |  | 1 |  | 1 |  | 1 |  | 1 | 3 | 1 | 4.77 |
| 4.90 | 1 |  | 1 |  |  | 1 |  |  | 1 |  | 1 |  |  | 3 | 1 | 4.87 |
| 5.00 | 1 |  | 1 |  |  | 1 |  |  | 1 |  | 1 | 1 |  | 3 | 1 | 4.97 |

## Manhole Material Prebench Bases \& Cored Holes

| MANHOLE <br> SIZE | WEIGHT <br> $(\mathrm{Kg})$ | STANDARD <br> PRICE <br> /ea. | CITY <br> CARTAGE <br> /ea. |
| :---: | :---: | :---: | :---: |
| $1050 \mathrm{~mm} \times 0.65 \mathrm{~m}$ Prebench | 1350 |  |  |
| $1050 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Prebench | 1545 |  |  |
| $1050 \mathrm{~mm} \times 1.22 \mathrm{~m}$ Prebench | 1740 | Prices available upon request |  |
| $1200 \mathrm{~mm} \times 0.65 \mathrm{~m}$ Prebench | 1988 |  |  |
| $1200 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Prebench | 2395 |  |  |
| $1200 \mathrm{~mm} \times 1.22 \mathrm{~m}$ Prebench | 2790 |  |  |

Notes: 1) SPECIAL MH'S AVAILABLE UPON REQUEST
2) Precast MH'S manufactured to ASTM C478.
3) All manholes and components manufactured with Type $\mathrm{HS}(50)$ high sulphate-resistant hydraulic cement.



1200 ¢ TOP VIEW

## Manhole Material



DIMENSIONAL DETAILS

| MANHOLE DIAMETER | STANDARD HEIGHT (m) | WALL THICKNESS (mm) |
| :---: | :---: | :---: |
| 1350 | 1.83 | 140 |
| 1500 | 1.83 | 153 |
| 1650 | 1.83 | 166 |
| 1800 | 1.83 | 197 |
| 2100 | 1.83 | 203 |
| 2400 | 1.80 | 229 |
| 2700 | 1.80 | 273 |
| 3000 | 1.80 | 279 |

## Gasket Information - Superseal

## Hinthamilton Kent

make the connection

## Say Goodbye to the lube bucket and brush Say Hello to fast, clean, simple installation

Requiring no field lubrication, the Tylox ${ }^{\circ}$ SuperSeal gasket* has a layer of silicone lubricant installed on the inner surface of the tube during the manufacturing process; saving you time, and money, on the job-site.

Self-contained Lubricant. Sealed within the tube, the lube is impervious to mud, dirt and debris. If you drop it in the trench, simply wipe the gasket surface clean and you're ready to install. No special handling or packaging is required.

Easier installation, without equalization, is made possible due to the reduced gasket stretch required by the unique lamell/rolling tube design. Quick and easy to install means you save even more time.

No gasket "roll" or "twist" during coupling is another benefit of the unique lamell/rolling tube design, which reduces the insertion force required.

Self-Centering of the Spigot within the Bell is carried out as the tube rolls into the annular space during the homing process.

Elimination of Joint Kick Back, is caused by the rearward locking action of the serrations as the tube rolls forward.

Bell and Spigot protection under deflection is accomplished by the cushioning effect of the tube, as it rests within the annular space.


## Gasket Information - Superseal

## INSTALLATION:

1. Ensure Bell, Spigot and Gasket are free from loose debris or foreign material.

Stretch the gasket around the spigot, with the nose against the step, and the tube laying flat against the spigot. DO NOT LUBRICATE.
1.

2. Align the spigot with the bell, and thrust the spigot home using suitable mechanical means. The homing process will cause the lubricated tube to "roll" over itself, above the compression section, allowing the pipe to slide forward.
2.

3. Once fully homed, the compression section seals the total annular space; the rolling tube comes to rest within the small annular space acting as a cushion against side loads, and the serrations act to resist pipe pull-out


## MATERIALS

Tylox ${ }^{\circ}$ SuperSeal gaskets*
are available in the following materials:

- Isoprene

Optional Materials

- Nitrite (Oil Resistant)
- Isoprene / EPDM blend
(Green Book \& C425)
- Neoprene (Oil and Ozone Resistant)

Other materials may be available as special order. Contact Inland Pipe for your specific requirements

## SPECIFICATIONS

Tylox SuperSeal gaskets* are manufactured to meet the material requirements of the following specifications:

- ASTM C361, C425, \& C443
- AASHTO M198.4
- CSA A257
- "Green Book"

Other specifications may be available as special order. Contact Inland Pipe for your specific requirements
*Tylox SuperSeal Gaskets are patented under US Patent 4934716

## Catch Basin Material

| DESCRIPTION | SUMP HEIGHT mm | WEIGHT kg/ea | PRICE /ea | $\begin{aligned} & \text { CITY } \\ & \text { CARTAGE /ea. } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: |
| $900 \mathrm{~mm} \times 1.83 \mathrm{~m}$ Catch Basin | 450 | 1701 |  |  |
| $900 \mathrm{~mm} \times 1.22 \mathrm{~m}$ Catch Basin | 450 | 1214 |  |  |
| $900 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Catch Basin | 75 | 975 |  |  |
| $900 \mathrm{~mm} \times 0.61 \mathrm{~m}$ Catch Basin | 75 | 728 | Prices available upon request |  |
| $900 \mathrm{~mm} \times 0.46 \mathrm{~m}$ Catch Basin | 0 | 608 |  |  |
| $900 \mathrm{~mm} / 635 \mathrm{~mm} \times .15 \mathrm{~m}$ Reducer | - | 305 |  |  |
| $900 \mathrm{~mm} \times 1.83 \mathrm{~m}$ Riser |  | 1460 |  |  |
| $900 \mathrm{~mm} \times 1.22 \mathrm{~m}$ Riser |  | 973 |  |  |
| $900 \mathrm{~mm} \times 0.92 \mathrm{~m}$ Riser |  | 734 |  |  |
| $900 \mathrm{~mm} \times 0.61 \mathrm{~m}$ Riser |  | 487 | Prices available upon request |  |
| $900 \mathrm{~mm} \times 0.46 \mathrm{~m}$ Riser |  | 367 |  |  |
| $900 \mathrm{~mm} \times 0.31 \mathrm{~m}$ Riser |  | 247 |  |  |
| $900 \mathrm{~mm} \times 0.15 \mathrm{~m}$ Riser |  | 120 |  |  |

Notes: 1) Catch basins are prequalified under the Plant Prequalification Program.
2) Catch basins and risers c/w swift lift lifting pins.
3) All catch basin material manufactured with Type $\mathrm{HS}(50)$ high sulphate-resistant hydraulic cement.


STANDARD CATCH BASIN

## Flared Ends

| DIAMETER mm | SLOPE | $\underset{\mathrm{mm}}{\mathrm{~A}}$ | $\underset{\mathrm{mm}}{\mathrm{~B}}$ | $\underset{\mathrm{mm}}{\mathrm{C}}$ | $\stackrel{\mathrm{L}}{\mathrm{~mm}}$ | $\underset{\mathrm{wm}}{\mathrm{~W}}$ | WEIGHT <br> kg/ea | PRICE CITY <br> CARTAGE  <br> /ea.  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 300 | VARIES | 102 | 610 | 1245 | 1854 | 610 | 570 |  |
| 375 | VARIES | 152 | 686 | 1168 | 1854 | 762 | 780 |  |
| 450 | 3 TO 1 | 300 | 670 | 555 | 1225 | 935 | 430 |  |
| 525 | VARIES | 241 | 1105 | 762 | 1867 | 1219 | 1465 |  |
| 600 | 3 T0 1 | 225 | 1055 | 725 | 1780 | 1200 | 858 | Prices available upon |
| 750 | 3 T0 1 | 300 | 1325 | 525 | 1850 | 1500 | 995 | request |
| 900 | 3 T0 1 | 375 | 1590 | 860 | 2450 | 1800 | 1865 |  |
| 1050 | VARIES | 533 | 1600 | 889 | 2489 | 1981 | 4660 |  |
| 1200 | VARIES | 610 | 1829 | 660 | 2489 | 2134 | 4490 |  |
| 1350 | VARIES | 685 | 1650 | 895 | 2545 | 2545 | 3665 |  |
| 1500 | VARIES | 760 | 1525 | 820 | 2450 | 2740 | 3980 |  |

Notes: 1) Flared ends are non stock items - contact INLAND for availability.
2) Gaskets NOT included.
3) All flared end sections manufactured with Type HS(50) high sulphate-resistant hydraulic cement.
4) The following flared ends are produced in Calgary, please allow for extra lead time: $300 \mathrm{~mm}, 375 \mathrm{~mm}, 525 \mathrm{~mm}, 1050 \mathrm{~mm}, 1200 \mathrm{~mm}, 1350 \mathrm{~mm}$ and 1500 mm .


## Plugs \& Caps

| PLUG DIAMETER (mm) | WEIGHT <br> Kg/ea. | PRICE <br> /ea. | CITY CARTAGE <br> /ea. |
| :---: | :---: | :---: | :---: |
| 300 | 20 |  |  |
| 375 | 30 |  |  |
| 450 | 57 |  |  |
| 525 | 68 |  |  |
| 600 | 93 |  |  |
| 750 | 179 |  |  |
| 900 | 219 |  |  |
| 1050 | 327 |  |  |
| 1200 | 540 |  |  |
| 1350 | 640 |  |  |
| 1600 | 1120 |  |  |
| 1800 | 1730 |  |  |

Notes: 1) All plugs have a shoulder to accept rubber gaskets.
2) Gaskets NOT included.
3) These prices are provided as a guide for estimating and are subject to change without notice.
4) All plugs/caps manufactured with Type $\mathrm{HS}(50)$ high sulphate-resistant hydraulic cement.


## Box Sections

One of the advantages of the vibration method in manufacturing is the variety of shapes which can be produced to meet almost any pipe requirement. Precast concrete box sections are now available from INLAND PIPE in the sizes indicated in the following literature.

Box sections are advantageous in situations where it is desirable to minimize the vertical pipe dimension without reducing the total pipe area or having to use twin pipes. Ditch and creek replacements, storm sewers and highway culverts are examples of typical applications where restricted overhead clearance, shallow pipe depth or high water table make this section very useful. The designer may find many other uses for this shape such as pedestrian underpasses, chambers, etc.

The precast section compares favourably with the cost of cast-in-place concrete boxes, but gives the additional advantage of a much faster installation time. This reduces overall costs, the interference due to construction activities and possible dewatering problems.


## Box Sections

TYPE HS - HIGH SULFATE RESISTANCE CEMENT - ASTM C1433

|  |  |  | PRICES per ITEM |  |
| :---: | :---: | :---: | :---: | :---: |
| DESCRIPTION OF ITEMS <br> (SPAN x RISE x LENGTH) | VOLUME (L/box) | WEIGHT <br> (kg/ea.) | ASTM C1433 | CITY CARTAGE /ea. |
| $2400 \mathrm{~mm} \times 1200 \mathrm{~mm}$ ( $8^{\prime} \times 4^{\prime}$ ) |  |  |  |  |
| 2.5m Box Length | 6994 | 10253 |  |  |
| 2.0m Box Length | 5595 | 8202 |  |  |
| 1.8m Box Length | 5036 | 7382 |  |  |
| 1.5m Box Length | 4196 | 6152 | Prices av | quest |
| 1.2m Box Length | 3357 | 4921 |  |  |
| 0.6m Box Length | 1679 | 2461 |  |  |
| FLOOR / REDUCER | - | 3012 / 3586 |  |  |
| $2400 \mathrm{~mm} \times 1800 \mathrm{~mm}$ (8' $\mathbf{x ~ 6 ~}^{\prime}$ ) ${ }^{\text {c }}$ |  |  |  |  |
| 2.5m Box Length | 10594 | 11715 |  |  |
| 2.0m Box Length | 8475 | 9372 |  |  |
| 1.8m Box Length | 7628 | 8435 |  |  |
| 1.5m Box Length | 6356 | 7029 | Prices av | quest |
| 1.2m Box Length | 5085 | 5623 |  |  |
| 0.6m Box Length | 2543 | 2812 |  |  |
| FLOOR / REDUCER | - | 4203 / 4859 |  |  |
| $2400 \mathrm{~mm} \times 2400 \mathrm{~mm}$ ( $8^{1} \times 8^{\text {² }}$ ) |  |  |  |  |
| 2.5m Box Length | 14666 | 13368 |  |  |
| 2.0m Box Length | 11733 | 10694 |  |  |
| 1.8m Box Length | 10559 | 9625 |  |  |
| 1.5m Box Length | 8799 | 8021 | Prices av | quest |
| 1.2m Box Length | 7040 | 6416 |  |  |
| 0.6m Box Length | 3520 | 3208 |  |  |
| FLOOR / REDUCER | - | 5636 / 6214 |  |  |
| $3000 \mathrm{~mm} \times 2400 \mathrm{~mm}$ (10' x 8') |  |  |  |  |
| 2.5m Box Length | 18269 | 19100 |  |  |
| 2.0m Box Length | 14615 | 15240 |  |  |
| 1.8m Box Length | 13153 | 13716 |  |  |
| 1.5m Box Length | 10961 | 11430 | Prices av | quest |
| 1.2m Box Length | 8769 | 9144 |  |  |
| 0.6m Box Length | 4385 | 4572 |  |  |
| FLOOR / REDUCER | - | 7262 / 8085 |  |  |
| $3600 \mathrm{~mm} \times 3600 \mathrm{~mm}$ (12' $\times 12^{\prime}$ ) |  |  |  |  |
| 1.8m Box Length | 23751 | 21686 |  |  |
| 1.2m Box Length | 15834 | 14458 | Prices av | quest |
| FLOOR / REDUCER | - | 12615 / 14055 |  |  |

Notes: 1) Additional box sizes available; call Inland for details
2) Box material is NOT stock material; call for availability
3) Bend and beveled end sections produced with 2.5 m box length
4) Specifications: ASTM C1433 precast reinforced concrete box sections for culverts, storm drains and sewers.
5) Prices for bends and beveled ends are available upon request.

## Box Sections



## APPLICATIONS

- Ditch and Creek Replacements
- Storm Sewers
- Highway Culverts
- Pedestrian Underpasses
- Lift Station
- Utility Vaults

beveled end sections


BENDS (5 $5^{\circ}$ to $50^{\circ}$ )

## ADVANTAGES

- Cost Effective
- Reduced Vertical Dimension
- Reduced Installation Time
- Low Cover Requirements
- Reduced Dewatering Requirements
- Manufactured to International Specifications



## BOX SECTION DIMENSION DETAIL

| $\begin{aligned} & \text { DESCRIPTION } \\ & \text { NOMINAL } \\ & \text { SPAN x RISE } \end{aligned}$ | ACTUAL INSIDE DIMENSIONS SPAN x RISE | SIDE WALL THICKNESS "S" (mm) | TOP WALL THICKNESS "T" (mm) | BOTTOM WALL THICKNESS B" (mm) | $\begin{aligned} & \text { SLAB TOP } \\ & \text { THICKNESS } \\ & \text { "C" (mm) } \\ & \hline \end{aligned}$ | BASE THICKNESS "D" (mm) | $\begin{aligned} & \text { SPIGOT } \\ & \text { LENGTH } \\ & \text { "E" (mm) } \\ & \hline \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $2400 \mathrm{~mm} \times 1200 \mathrm{~mm}$ | $2439 \mathrm{~mm} \times 1219 \mathrm{~mm}$ | 203 | 203 | 203 | 305 | 305 | 127 |
| $2400 \mathrm{~mm} \times 1800 \mathrm{~mm}$ | $2439 \mathrm{~mm} \times 1829 \mathrm{~mm}$ | 203 | 203 | 203 | 305 | 305 | 127 |
| $2400 \mathrm{~mm} \times 2400 \mathrm{~mm}$ | $2439 \mathrm{~mm} \times 2439 \mathrm{~mm}$ | 203 | 203 | 203 | 305 | 305 | 127 |
| $3000 \mathrm{~mm} \times 2400 \mathrm{~mm}$ | $3049 \mathrm{~mm} \times 2439 \mathrm{~mm}$ | 254 | 254 | 254 | 305 | 305 | 127 |
| $3600 \mathrm{~mm} \times 3600 \mathrm{~mm}$ | $3658 \mathrm{~mm} \times 3658 \mathrm{~mm}$ | 305 | 305 | 305 | 356 | 356 | 127 |

## Manhole Vaults Type 1-S



Notes: 1) Minimum fill height of 1 m (over top of vault); call for pricing of vaults with shallower burials.
2) Bituminous joint sealant (Kent Seal) is provided with 1S manholes. Additional measures by contractor may be necessary to achieve water tightness in the joint.
3) Skimming manhole vaults and check valve vaults are available; call for details and pricing.
4) Max pipe size is for straight through applications. These sizes may not fit with angled pipe installations.


## $1 S$ VAULT DIMENSIONS

| $\begin{aligned} & \text { VAULT SIZE (I.D.) } \\ & (\mathrm{mm}) \end{aligned}$ | TOTAL INSIDE HEIGHT (mm) | $\begin{aligned} & \text { INSIDE HEIGHT } \\ & \text { OF TOP } \\ & \text { (mm) } \end{aligned}$ | $\begin{aligned} & \text { INSIDE HEIGHT } \\ & \text { OF BOTTOM } \\ & (\mathrm{mm}) \end{aligned}$ | $\begin{gathered} \text { WALL * } \\ (\mathrm{mm}) \end{gathered}$ | ROOF <br> (mm) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1220 | 2000 | 1000 | 1000 | 203 | 210 |
| 1525 | 2000 | 1000 | 1000 | 203 | 210 |
| 1830 | 2140 | 1000 | 1140 | 203 | 210 |
| 1980 | 2200 | 1060 | 1140 | 203 | 210 |
| 2440 | 2380 | 950 | 1430 | 203 | 210 |

Notes: 1) Spigot length is 90 mm
2) Inside height of bottom piece measured from floor to top of spigot
3) Inside height of top piece measured from bottom of bell to underside of roof
4) Floor thickness 203 mm for all sizes
5) Vault walls taper 25 mm per side and measure 203 mm at the narrowest point - this may affect the mounting of fixtures

## New Product Applications

$3660 \times 3660 \mathrm{~mm}$ Box Culvert


Inland Pipe's $3660 \times 3660 \mathrm{~mm}$ box culvert can be used for a number of applications.
Box sections can be used horizontally for culverts or storm water detention tanks and vertically for manholes, control structures and lift stations. See our box culvert section for more details.

## Headwalls

Inland Pipe can now provide Headwall structures for large diameter pipe in Western Canada.

Please contact your Inland Pipe representative for more information.


| TYPE | PIPE DIAMETER <br> $(\mathrm{mm})$ | A <br> $(\mathrm{mm})$ | B <br> $(\mathrm{mm})$ | C <br> $(\mathrm{mm})$ | D <br> $(\mathrm{mm})$ | E <br> $(\mathrm{mm})$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $26-28$ | $1500-1800$ | 2955 | 4186 | 2540 | 1421 | 406 |
| $26-28$ | $1950-2400$ | 2955 | 4186 | 3226 | 2107 | 406 |

## Three Sided Boxes / Utility Trays

## Three Sided Boxes / Utility Trays

## Applications:



Inland Pipe is now offering three sided boxes which can be used on various applications where the lid is required to be installed after the boxes. This allows utilities, power cables, or other contents to be installed and then covered with the matching lids.

## Sizes Available:

- $2400 \times 1200(8 \times 4)$
- $2400 \times 1800(8 \times 6)$
- $2400 \times 2400(8 \times 8)$

Cross sectional view


REMOVABLE LID

- $3000 \times 2400(10 \times 8)$


## Design:

Three sided boxes can be designed to work in most installations. All designs are completed in accordance with ASTM C1504.
Pricing:
Please contact your local sales representative for
 pricing.

## Standard Installations

## RESEARCH PRODUCES NEW INSTALLATIONS


#### Abstract

This foldout presents new installation technology with respect to concrete pipe through four unique standard installations developed over 20 years of investigation and research into the behavior of concrete pipe in the buried condition. The Standard Installations provide both the designer and the installer with measurable and verifiable soil types and compaction levels for the material used in the installation. These new installations facilitate the design of a rational and cost-effective concrete pipe soil system by providing an optimum range of installation characteristics.


Versatile: There is one word to describe the new standard installations, and that word is VERSATILITY. The range of installation types from 1 through 4 offer a concrete pipe designer the ability to tailor any individual project to suit specific site conditions and budgetary constraints.

In a Type 1 installation for example, the soil zone adjacent to the pipe and below the springline requires select materials with specified compaction limits. Through the use of this controlled soil envelope, a wide load distribution is achieved. In other words, a Type 1 installation uses this select material as an advantage in the design of the whole systema situation which translates to a lesser dependence on inherent pipe strength, and therefore lower pipe material costs when compared to the same site with a lower quality installation.

On the other end of the spectrum, in areas where native material is suitable, but perhaps not of the highest grade (silts and low plasticity clays), a Type 4 installation can be chosen by the designer. This installation type requires little or no inspection, almost no compaction requirements on the material, and the versatility to use almost any type of native soil as backfill in the trench. The trade-off here is reduced backfill material costs, and greatly reduced installation costs in terms of manpower required, but greater dependence on inherent pipe strength.

Figure 1 illustrates this versatility in a graphical manner. Looking at a Type 1 installation, it can be seen that the dependence on installation is significant in comparison to the dependency on the pipe section.


Conversely, in a Type 4 installation, a greater percentage of total dependency resides in the pipe section, while very little dependency is associated with material and installation. This graph is not meant to say that all four installation types are equivalent in terms of the total costs. By evaluating the ratio of pipe cost to backfill material cost, the four new standard installations can be used to optimize total expenditure by balancing the performance of the pipe-soil system.

Conservative: The design associated with the Standard Installations is founded in conservatism. The loads and pressures experienced by the pipe in the installed condition have been analyzed in depth and modeled through the use of the finite element analysis computer program, SPIDA (Soil-Pipe Interaction Design and Analysis). The SPIDA analyses are based on several key assumptions:

1. The worst case (embankment) loadings are used, and the same load factors used in the traditional AASHTO direct design procedure are still employed.
2. Voids are assumed to exist in the haunch zone of all four installation types. These voids are modeled into the SPIDA computer simulations used in the development of the design procedure.
3. In recognition of the variability of the loading characteristics, the new installations are based on the greatest predicted loads for design. Typical loads would likely be 10-20 percent less.
4. Through quantification of material and compaction requirements, a degree of uncertainty has been eliminated from the design assumptions - the new installations can, therefore, more accurately assess long-term performance of the system.

The new installations allow for better prediction of the loads and pressures which a pipe may experience during its life.

Quantifiable: One of the greatest benefits of the new installation types is that they are quantifiable, that is, they prescribe definite and measurable levels of acceptance. As is indicated in Figure 2, each of the new installations has specific materials requirements, and accompanying compaction levels, making them uniquely different, and prescribing clear and defined direction to the installer as to the requirements of a particular installation. These definitions provide direction to the engineer, owner, and contractor as to the installation factors impacting pipe performance.

## Standard Installations

## TECHNOLOGY LEADS TO STATE-OF-THE-ART BEDDINGS

These four new Standard Installations represent the first major change in the recommended installation of concrete pipe in over 70 years. Many changes have taken place in the design, manufacture and construction method over the years, but none regarding recommended beddings for concrete pipe. The new beddings are state of the art installations based on over 20 years of comprehensive research and analysis of the factors which affect field performance.

The four new installations reflect the many factors affecting the pipesoil system. The research recognized the difficulty in obtaining good compaction in the haunch area below the pipe and assumed poorly compacted material in this area. One of the key factors affecting performance, identified by the research, is the support provided by the haunch and lower side area adjacent to the pipe. Because of it's importance, the new beddings quantify the required compaction levels in this area. Improved backfilling procedures, compaction methods and introduction of modern testing equipment provide engineers the opportunity to use these new state of the art installations.

A bedding constructable in the underground utility environment is a necessity. There are more reasons for the new standard beddings. They are verifiable and quantifiable. The means to construct the beddings and the technology to measure the compaction levels are readily available.

If the pipe is installed in a trench or in a sub-trench within an embankment, the soils in the walls of the trench should have a firmness equivalent to the stiffness of the placed soils. This provision may require removal of soft soil, or soil with inadequate stiffness in the walls or foundation of the trench adjacent to the pipe.

## STANDARD INSTALLATIONS

These new Standard installations identify four principal zones surrounding the lower half of the pipe, which are critical to the pipe-soil system. The four zones are the middle bedding, the outer bedding, the haunch and the lower side. The type of material (based on soil characteristics) and level of compaction varies with the installation type, i.e., 1,2,3 or 4, and the material utilized in construction of these important zones.

Installation - Type 4 Type 4 is intended for installations where the most cost effective design approach is to specify the minimal requirements for soil type and compaction, together with a pipe having sufficient strength to safely resist the increased structural effects that result from using low quality soils. Thus, Type 4 has little or no requirement for control of compaction and type of placed soil used in the bedding and haunch areas, except if silty clay soils are used in the haunch and outer bedding zones, they must be compacted. It is desirable to scarcify (loosen) hard native soils before placing the pipe.

Installation - Type 3 Type 3 permits the use of soils in the haunch and bedding zones having easily attained compaction requirements, justifying less stringent inspection requirements with granular and some native soils. Silty clays may be used in the haunch zone if adequately compacted. In addition to the foundation similar to Type 4, a bedding layer with a minimum thickness of 75 millimeters is required to avoid placing the pipe directly on hard or variable subgrade.

Installation - Type 2 Type 2 is a standard installation where certain native soils are permitted to be used with proper compaction in the haunch and bedding zones. Adequately compacted native silty granular soils or select granular soils may be used in the haunch and outer bedding zones. This is intended to allow the use of soil frequently found at the site. Any natural soil adjacent to the pipe should have a firmness equivalent to the placed soils. Foundation and bedding requirements are similar to Type 3.

Installation - Type 1 Type 1 requires well compacted, select granular soil to be placed in the haunch and bedding zones. The structural design of the pipe section then takes advantage of the support provided by this high quality soil envelope, making this installation often cost effective for deep bury applications and for pipe 600 millimeters and larger.

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## Standard Installations

## EMBANKMENT

TRENCH


|  | Standard Installation Soil Types and Minimum Compaction Requirements |  |  |
| :---: | :---: | :---: | :---: |
|  | Bedding Thickness | Haunch | Lower Side |
| $\begin{aligned} & \stackrel{\rightharpoonup}{\stackrel{u}{\gtrless}} \end{aligned}$ | $D_{d} / 24$ minimum, not less than 75 mm ( 3 in ). If rock foundation use $D_{d} / 12$ minimum, not less than 150 mm ( 6 in ). | 95\% SW, SP, GW, GP | $90 \%$ SW, SP, GW, GP $95 \%$ GM, SM, ML, GC, SC* $100 \%$ CL, MH, GC, SC |
| $\begin{gathered} \text { ~ } \\ \stackrel{\text { un }}{2} \end{gathered}$ | $D_{d} 24$ minimum, not less than 75 mm ( 3 in ). If rock foundation, use $D_{0} / 12$ minimum, not less than 150 mm (6 in). | $90 \%$ SW, SP, GW, GP $95 \%$ GM, SM, ML, GC, SC* | $85 \%$ SW, SP, GW, GP $90 \%$ GM, SM, ML, GC, SC* 95\% CL, MH, GC, SC |
|  | $D_{d} / 24$ minimum, not less than 75 mm ( 3 in ). If rock foundation, use $\mathrm{D}_{\mathrm{d}} / 12$ minimum, not less than 150 mm (6 in). | 85\% SW, SP, GW, GP $90 \%$ GM, SM, ML, GC, SC* $95 \%$ CL, MH, GC, SC | $85 \%$ SW, SP, GW, GP $90 \%$ GM, SM, ML, GC, SC* $95 \%$ CL, MH, GC, SC |
| $\begin{gathered} \stackrel{\rightharpoonup}{山} \\ \stackrel{山}{\gtrless} \end{gathered}$ | No bedding required, except if rock foundation, use $D_{0} / 12$ minimum, not less than 150 mm ( 6 in). | No compaction required, except when CL, MH, GC, or SC soil types are used to compact to $85 \%$ | No Compaction required, except when CL, MH, GC, or SC soil types are used compact to $85 \%$ |

- The percentages listed above refer to standard proctor compaction levels

Figure 2

- The soil types above (ie. SW, GM) are taken from the Unified Soil Classification System (USCS)
- SC* indicates SC type soil with less than $20 \%$ passing the \#200 sieve


## Swift Lift <br> Pipe

How to Use the Swift Lift Universal Lifting Eye


1. To install the P-50 Universal Lifting Eye, hold the unit upside down with the T-shaped slot of the body directly over the head of the swift lift anchor.
2. Lower the body of the lifting eye until the T-shaped slot engages the head of the anchor.
3. Rotate the body until the extended lip of the body touches the concrete surface.

## How to Lift Pipe Using Swift Lift



## Correct Method for Homing the Pipe Together



## Hoisting Gear Information



## Notes:

1. The pipe is first transported to the installation site with the symmetrical sling and lowered close to the already placed pipe .

Note: a) As with lifting any concrete element, special care should be taken by the driver of the placement vehicle to ensure that the impact or dynamic loads are reduced to a minimum. Because these loads can greatly increase the weight of the element, this safety note should not be overlooked.
b) Load must be applied simultaneously to all Swift Lift Anchors in order to safely lift product.

1. To pull the pipe into position, the long leg of the hoisting gear is coupled to the previously placed pipe.
2. Eye 2 is disconnected from the swift lift anchor and attached to master link.
3. Eye 3 is then connected to the pipe you will be homing to.
4. Crane or backhoe operator must ensure the lifting point is over the outer lifting anchor of the previously placed pipe so that the direction of pull is slightly inclined toward placed pipe.
5. Operator must then lift up on the hoisting gear until pipe is homed together.

| HOISTING GEAR LEG DIMENSIONS |  |  |  |
| :---: | :---: | :---: | :---: |
| A | B | C | D |
| 1440 mm | 400 mm | 1040 mm | 1940 mm |
| $\left(57^{\prime \prime}\right)$ | $(16 ")$ | $\left(411^{\prime \prime}\right)$ | $\left(76^{\prime \prime}\right)$ |

- The measurements listed above are for pipe 1.5 m to 2.5 m in length.

1. Swift Lift anchors are available in pipe sizes 1050 mm and larger.
2. Pipe 1050 mm to 1650 mm use the 4 ton lifting eye and pipe 1800 mm and larger use the 8 ton lifting eye.
3. Manholes 1200 mm to 1800 mm use 4 ton lifting eye and Manholes 2100 mm and larger use the 8 ton lifting eye. 4. Swift Lift clutches are not returnable for refund.

## Swift Lift <br> Manhole / Riser Material



Note: Direction of extended lip should be in the direction of lift.

How to Use the SL Universal Lifting Eye


Note: Load must be applied simultaneous to all Swift Lift Anchors in order to safely lift product.
Contact INLAND for more information.

## Terms \& Conditions

## TERMS AND CONDITIONS OF SALE

## This price list supercedes all previous lists.

1. PAYMENT TERMS: Invoices are due and payable on the 25th day of the month following delivery of Products. Invoices which are not paid by such date are subject to a service charge of $2 \%$ per month ( $24 \%$ per year). If Buyer defaults or if Seller considers Buyer's financial responsibility impaired or unsatisfactory, Seller shall be entitled to suspend or terminate, in whole or in part, any order or agreement until all outstanding payments are made and/or acceptable assurances or security is provided by Buyer. In addition to all other rights and remedies available to Seller, Seller shall have the right to recover from Buyer all costs of collection and/or suit, including reasonable legal fees. Seller's failure to exercise such rights and remedies or variance from these terms and conditions shall not constitute a waiver or change hereof unless agreed to by Seller in writing.
2. INABILITY TO PERFORM: Seller shall not be liable to Buyer if permanently or temporarily rendered incapable of performing its obligations hereunder because of strikes, lockouts, differences with workmen, accidents, insurrection, wars, delay or failure in transportation (including road bans) or by any supplier, shortage of inventory, raw materials, facility, equipment, fuel or other material, acts of government, fire, acts of God, acts of any Government or any contingencies beyond Seller's control. For greater certainty, Seller shall not be required to cross picket lines established as result of a strike. During any period Seller is rendered incapable of fully performing because of any such contingency, Seller shall have the right to prorate among its various customers such Products as it may be able to manufacture and ship.
3. SPECIFICATIONS AND WARRANTIES: PRODUCTS SHIPPED HEREUNDER SHALL CONFORM TO THE PRESENT STANDARD SPECIFICATIONS (FOR THE RESPECTIVE PRODUCTS) OF CSA and/or ASTM, and No Other warranty, representation or condition of ANY KIND, EXPRESS OR IMPLIED (INCLUDING NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE) SHALL APPLY THERETO. SELLER HAVING NO CONTROL OVER THE USE OF THE PRODUCTS WILL NOT GUARANTEE FINISHED WORK, NOR SHALL SELLER BE RESPONSIBLE FOR THE CONDITION OF PRODUCTS AFTER DELIVERY TO BUYER. ANY CHARGES INCIDENTAL TO INSPECTION OR TESTS MADE BY OR ON BEHALF OF BUYER SHALL BE PAID BY BUYER. UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR ANY SPECIAL, INCIDENTAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES.
4. TITLE, RISK OF LOSS, CHARGES: Title and risk of loss shall pass to Buyer on customer pick-up at Seller's premises. Title and risk of loss to Products delivered shall pass to Buyer upon receipt at the destination specified.
5. CLAIMS: Claims for loss or damage in transit must be reported to Seller within 24 hours of delivery of Product to the destination specified and must be supported by customer's notation on truck delivery receipt and/or bill of lading.
6. TAXES: Prices are exclusive of all present and future taxes imposed by any federal, provincial, municipal, foreign or local authority.
7. UNLOADING: Buyer will be responsible for unloading Products at the destination specified. If Buyer has not unloaded the truck within one hour of the truck's arrival at the destination specified, Buyer shall pay an additional charge of 100.00 per hour until the truck has been unloaded. All shipments shall be unloaded in their entirety at the destination specified or will be subject to an additional charge of 100.00 per hour.
8. DELIVERY CONDITIONS: Delivered prices are for delivery to the destination specified. The unloading point must be readily accessible and Buyer shall be responsible to provide suitable access roads to destination specified as well as equipment to unload the Products. In the event Seller requires access over curbs, sidewalks, driveways or other property, Seller shall not be responsible for any loss, cost or damage in connection therewith and Buyer shall indemnify and save the Seller harmless from any such loss, cost or damage.
9. QUOTATIONS: Quotations shall be in effect for a period of thirty (30) days from the date of the quote.
10. NOTICE: Buyer shall provide a minimum of twenty-four (24) hours notice of delivery.
11. BUILDER'S LIEN: For the purposes of the Builder's Lien Act Products not herein quoted but delivered or supplied to the same project shall be considered part of the same contract until last date of delivery or supply notwithstanding separate purchase orders.
12. PRODUCT RETURN: Buyer may return any standard Product to Seller's premises provided the Product is in good condition and Buyer pays a restocking fee of $15 \%$ of the price of the Product.
13. FREIGHT RATES: Freight rates for out of town delivery are based on a minimum truck load of 22,000 kilograms and do not apply during periods of road restrictions. Delivery charges for truck loads of less than 22,000 kilograms shall be calculated at an hourly rate as described in the Freight Guidelines outlined in the Seller's catalogue and shall include loading, traveling and unloading time.

## Look of it this way



## The world needs concrete solutions

The world is changing. Threats to our infrastructure are ever increasing. Protecting the environment and ensuring public safety are critical.
Providing a more resilient infrastructure...
That's our job.


Regina, Saskatchewan Depot

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