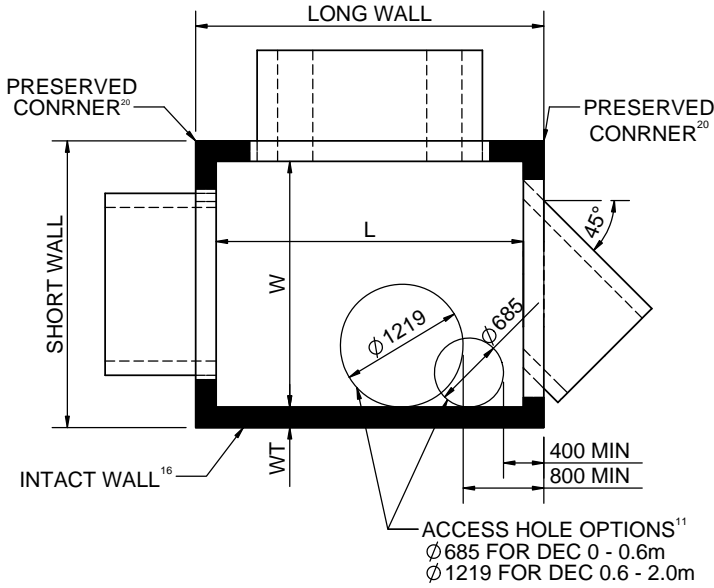
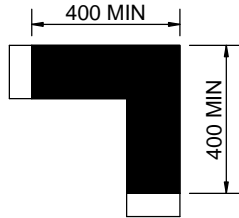


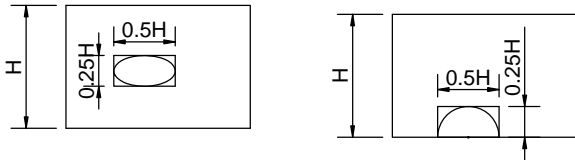
PRODUCT DIMENSION						SIZE SELECTION					
SIZE	THICKNESS		INTERNAL HEIGHT (H)			PIPE		HEP		BOX SPAN	
	WT	ST	MIN	INTV.	MAX	LONG / SHORT WALL	LONG / SHORT WALL	LONG / SHORT WALL	LONG / SHORT WALL	LONG / SHORT WALL	
L X W	WT	ST	MIN	INTV.	MAX	STRAIGHT	45° ANGLED	STRAIGHT	45° ANGLED	STRAIGHT	45° ANGLED
2438 X 1829	NOTE (18)	203	914	152	1524	1800 / 1200	1200 / 825	1500 / 1050	900 / NA	1800 / NA	NA
3048 X 1829	254	254	914	152	2438	2400 / 1200	1500 / 825	1950 / 1050	1200 / NA	2400 / NA	NA
3048 X 2438	203	254	914	152	1829	2400 / 1500	1500 / 1050	1950 / 1500	1200 / 900	2400 / 1800	NA
3962 X 2438	254	305	914	152	2134	3000 / 1800	1950 / 1050	2400 / 1500	1650 / 900	3000 / 1800	1800 / NA
3900 X 3000	254	305	914	152	2134	3000 / 2400	1950 / 1500	2400 / 1950	1650 / 1200	3000 / 2400	1800 / NA



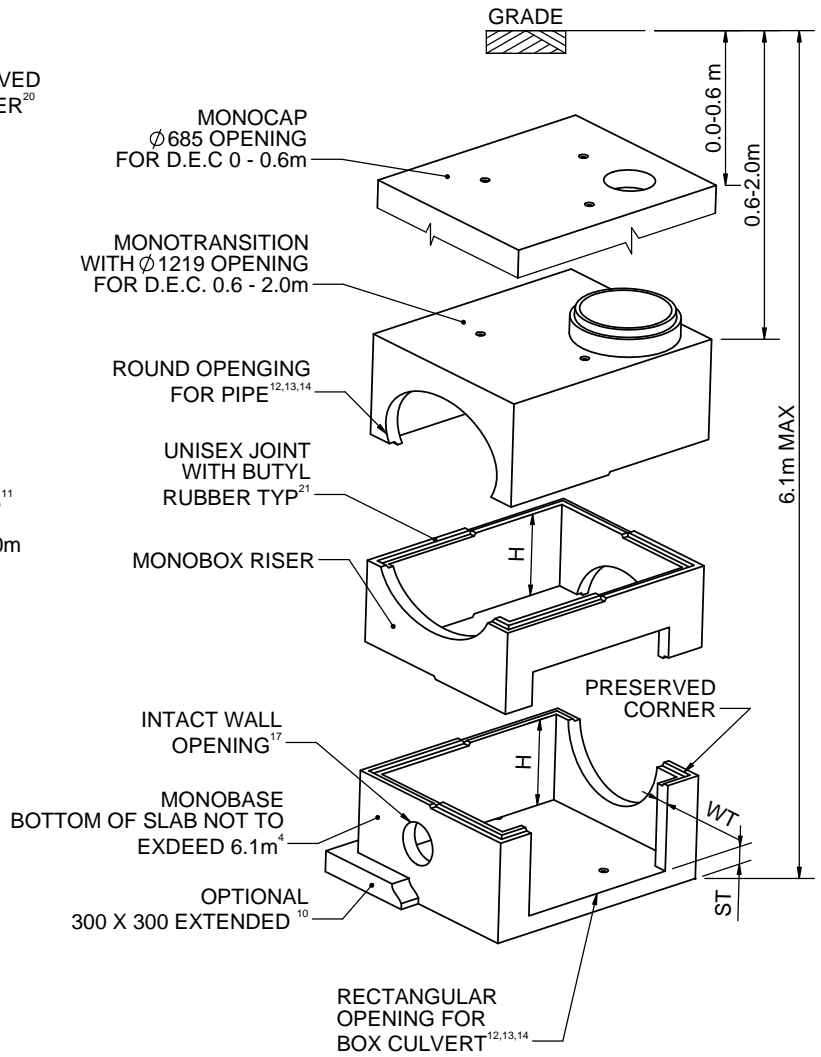
SECTION PLAN VIEW



PRESERVED CORNER



MAX ALLOWABLE OPENING ON INTACT WALL



ISOMETRIC VIEW

ALL DIMENSIONS ARE IN mm
DRAWINGS ARE NOT TO SCALE

CON CAST PIPE (CCP) STANDARD DRAWING

STD. CCP ENG GUIDE B.8.1.3 PART MONOBOX-GUIDE

TITLE **MONOBOX - MANHOLE APPLICATION DESIGN GUIDE**

3	MODIFY TO 2012 GAMSBY DESIGN	SW	1MAY2014
2	MAX PIPE SIZE CORRECTION	CW	16DEC11
1	MAX PIPE SIZE, ADD HEP AND BOX SIZE	JL	26APR11
REV.	DESCRIPTION	ENG.	DATE

DRAWN BY	CHECKED BY	DATE	FILE	PAGE
SW	CHKD BY	6MAR14	MONOBOX Rev 2	1 OF 2

GENERAL NOTES:

DESIGN CRITERIA

1. DESIGN TO CSA S6-06 CHBDC TRUCK LOADING
2. DESIGN EARTH COVER 0 - 2.0m TO THE BOTTOM OF THE TOP SLAB
3. MAXIMUM BURIED DEPTH 6.1m
4. DESIGN EARTH COVER > 2.0m AND / OR BURIED DEPTH BEYOND 6.1m IS AVAILABLE UPON REQUEST

CONCRETE

5. MINIMUM CONCRETE STRENGTH 40MPa.

REINFORCING STEEL

6. REINFORCING STEEL CONFORMS TO THE FOLLOWING LATEST CSA STANDARDS:
 - G30.5-M WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT
 - G30.15-M WELDED DEFORMED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT
 - G30.18-M BILLET STEEL BARS FOR CONCRETE REINFORCEMENT
 - W186-M WELDING OF REINFORCING BARS IN REINFORCED CONCRETE CONSTRUCTION
 - G30.18-M DEFORMED REINFORCING BARS SHALL BE 400W PER LATEST
7. CLEAR COVER TO REINFORCING STEEL
 - MESH: 40 mm +/- 5 mm
 - REBAR: 50 mm +/- 10 mm

INSTALLATION

8. BACKFILL AND COMPACTION TO OWNER'S REQUIREMENT
9. RESPONSIBILITY FOR CONSTRUCTION REVIEW, ADEQUACY, AND SUITABILITY OF EXCAVATION, DEWATERING, SHORING, HANDLING EQUIPMENT, AND SOIL STABILITY BY OTHERS

BUOYANCY

10. WHEN APPLICABLE, 300 X 300 EXTENDED BASE IS REQUIRED WHEN THE SUM OF WATER TABLE TO GRADE AND TOP OF THE SLAB TO GRADE IS GREATER THAN 2.2m.

DESIGN CONSIDERATION

11. SLAB OPENING: $\phi 685$ OR $\phi 1219$. LARGER OPENING OR RECTANGULAR OPENING MAY BE ACCOMODATED.
12. WALL OPENING IN MONOBASE: MAXIMUM WIDTH CAN BE THE INSIDE WIDTH OF THE WALL; MAXIMUM HEIGHT CAN BE THE INSIDE HEIGHT OF THE WALL
13. WALL OPENING IN MONOTOP, MONOTRANSITION, AND RISER: MAXIMUM WIDTH CAN BE THE INSIDE WIDTH OF THE WALL; MAXIMUM HEIGHT CAN BE THE INSIDE HEIGHT OF THE WALL LESS 500.
14. WALL OPENING DEFINED IN (11) AND (12) MAY BE IN ANY OR ALL THREE WALLS OF THE COMPONENTS
15. OPENING IN ADJECENT WALL: MINIMUM 400 X 400 PRESERVED CORNER MUST BE MAINTAINED.
16. MINIMUM ONE INTACT WALL PER COMPONENT
17. INTACT WALL MAY HAVE AN OPENING OR MULTIPLE OPENINGS WITH OVERALL HEIGHT NO LARGER THAN 0.25 TIMES INSIDE HEIGHT OF THE COMPONENT AND TOTAL WIDTH NO LARGER THAN 0.5 TIMES INSIDE WIDTH OF THE COMPONENT.

OTHER DESIGN NOTES

18. MONOBOX WALL THICKNESS FOR 2438 X 1829: DRY CAST 203, WET CAST 152
19. MONOBOX MUST MAINTAIN MINIMUM ONE INTACT WALL
20. RESERVED CORNER OCCURS BETWEEN TWO LARGE OPENING AT ADJACENT WALLS
21. MINIMUM EDGE DISTANCE FROM ACCESS HOLE W.R.T. WALL OPENING IS 400 AND 800 FOR $\phi 685$ AND $\phi 1219$ OPENINGS RESPECTIVELY.
22. STANDARD MONOBOX COMPONENT HAS UNISEX JOINT AND TONGUE/GROOVE JOINT FOR WET CAST AND DRY CAST RESPECTIVELY. 19mm BUTYL RUBBER TO BE SUPPLIED BY CON CAST PIPE AND INSTALLED ON SITE BY OTHERS. SPECIAL JOINT OR WATER PROOFING ARE AVAILABLE UPON REQUEST.
23. MONOBOX STRUCTURE COMES WITH STANDARD 16" HOLLOW ALUMNUM STEP(S) CONFORMED TO OPSD405.010 SPACED AT 300. OTHER TYPE OF STEP(S) OR LADDER ARE AVAILABLE UPON REQUEST.
24. CAST-IN DAYTON SUPERIOR P50 SWIFT LIFT ANCHORS OR EQUIV. ARE STANDARD DEVICE FOR HANDLING AND INSTALLATION.
25. CAST-IN INSERTS FOR CAST-IN-PLACE COMPONENTS SUCH AS THRUST BLOCK ARE AVAILABLE UPON REQUEST.
26. CAST-IN LIFTING HOOKS OR THREADED INSERTS FOR INTERNAL LIFTING ANCHORS ARE AVAILABLE UPON REQUEST.
27. CONTACT CON CAST ENGINEERING FOR DESIGN BEYOND THE DESIGN CRITERIA AND LIMITATION LISTED IN THIS DOCUMENT

FINAL DESIGN FOR APPROVAL AND MANUFACTURING

28. STANDARD REINFORCEMENT FULFILLS THE DESIGN CRITERIA.
29. FINAL DESIGN OF MONOBOX INCLUDING, BUT NOT LIMITED TO, STACKING, ADDITIONAL REINFORCING, CUSTOMIZATION WILL PRESENT IN SHOP DRAWING PACKAGE.

ALL DIMENSIONS ARE IN mm
DRAWINGS ARE NOT TO SCALE

CON CAST PIPE (CCP) STANDARD DRAWING

STD. CCP ENG GUIDE B.8.1.3 PART MONOBOX-GUIDE

TITLE
**MONOLITHIC BOX MANHOLE
DESIGN GUIDE**

3	MODIFY TO 2012 GAMSBY DESIGN	SW	1MAY2014
2	MAX PIPE SIZE CORRECTION	CW	16DEC11
1	MAX PIPE SIZE, ADD HEP AND BOX SIZE	JL	26APR11
REV.	DESCRIPTION	ENG.	DATE

DRAWN BY	CHECKED BY	DATE	FILE	PAGE
DRWN BY	CHKD BY	DD/MON/YY	MONOBOX Rev 2	2 OF 2

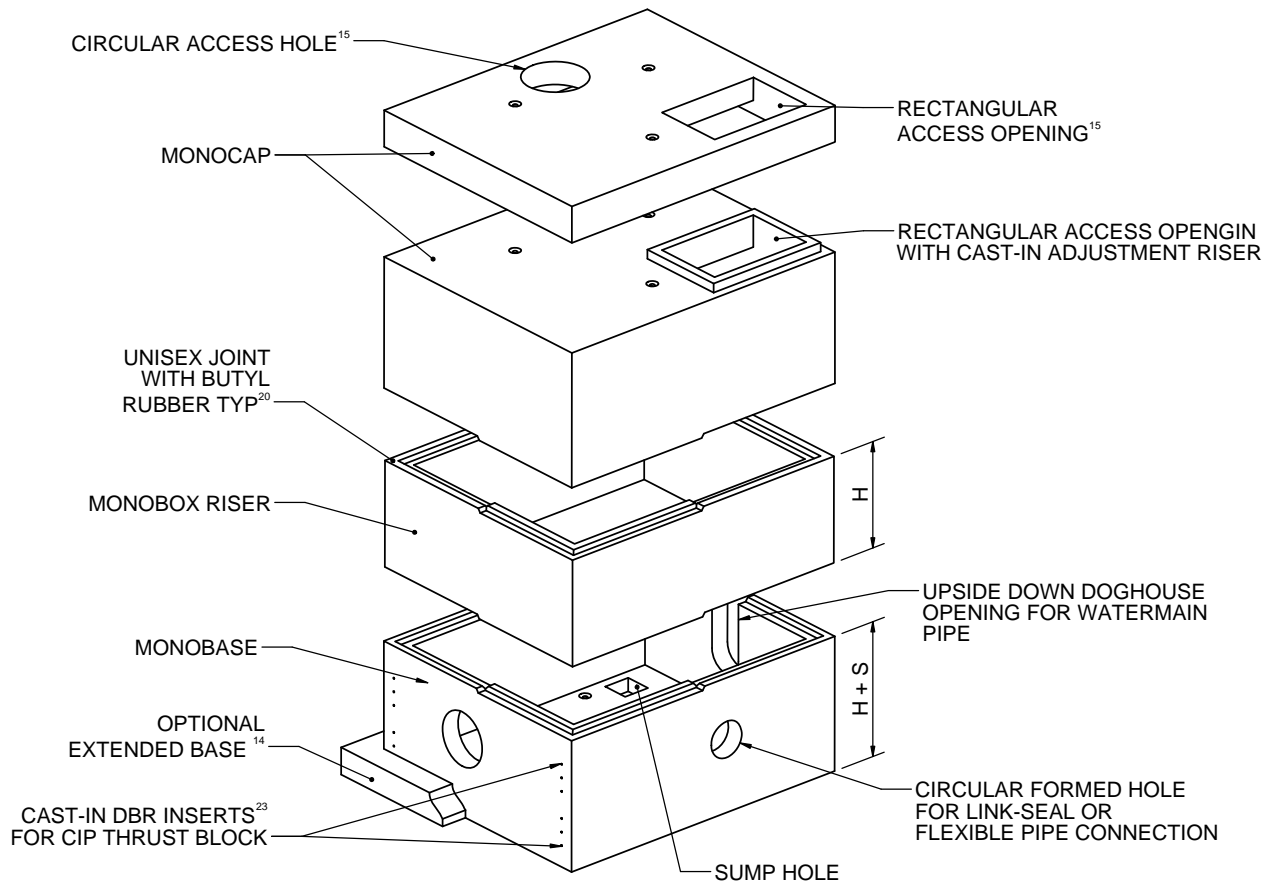
 **CON CAST PIPE** RR 3 Guelph, ON N1H 6H9

Fax: (519) 763-1956

1-800-668-7473

www.concastpipe.com

PRODUCT GEOMETRY					MAX MASS (X 1000 kg)																
SIZE	WALL (W)	SLAB (S)	HAUNCH	CAST ¹⁹ / JOINT ²⁰	SLAB	RISER (PER m)	INTERNAL HEIGHT (H) ^{7,8}														
							610	762	914	1067	1219	1372	1524	1676	1829	1981	2134	2286	2438		
2438 X 1829	203	203	0	DC/TG	3.20	4.71			7.50	8.22	8.94										
2438 X 1829	152	203	0	WC-S/US	2.94	3.45	8	8	6.09	6.62	7.15	7.67	8.20								
2438 X 1829	152 ⁵	203 ⁶	0	WC-F/US	2.94	3.45	5.05	5.57	6.09	6.62	7.15	7.67	8.20	8.72	9.25	9.77	10.30	10.82	11.35		
3048 X 2438	203	254	0	DC/TG	6.19	5.93			11.61	12.52	13.42										
3048 X 2438	203	254	0	WC-S/US	6.19	5.93	8	8	11.61	12.52	13.42	14.33	15.23	16.13	17.04						
3048 X 2438	203 ⁵	254 ⁶	0	WC-F/US	6.19	5.93	9.81	10.71	11.61	12.52	13.42	14.33	15.23	16.13	17.04	17.94	18.85	19.75	20.65		
3048 X 1829	254 ⁵	254 ⁶	0	WC-F/US	5.23	6.78	9.37	10.40	11.44	12.47	13.50	14.54	15.57	16.61	17.64	18.67	19.71	20.74	21.77		
3810 X 2438	254 ⁵	305 ⁶	0	WC-F/US	9.62	8.51	14.81	16.11	17.40	18.70	20.00	21.30	22.59	23.89	25.19	26.48	27.79	29.08	30.37		
3900 X 3000	254	305	0	WC-S/US	11.70	9.33	8	8	20.23	21.65	23.07	24.50	25.92	27.34	28.77	30.18	31.61				
3962 X 2438	254	305	0	WC-S/US	9.96	8.70	8	8	17.92	19.25	20.57	21.90	23.22	24.55	25.88	27.20	28.53				
4420 X 3048	305 ⁵	305 ⁶	305	WC-F/US	13.92	12.68	21.65	23.58	25.51	27.45	29.38	31.32	33.24	35.17	37.11	39.04	/	/	/	/	/
4877 X 2591	305 ⁵	305 ⁶	305	WC-F/US	13.29	12.68	21.02	22.95	24.88	26.82	28.74	30.68	32.61	34.54	36.48	38.41	/	/	/	/	/
5029 X 3048	305 ⁵	305 ⁶	305	WC-F/US	15.60	13.60	23.90	25.97	28.04	30.12	32.18	34.27	36.33	38.40	/	/	/	/	/	/	/
5639 X 2743	305 ⁵	305 ⁶	305	WC-F/US	15.85	14.06	24.43	26.57	28.70	30.86	32.99	35.15	37.28	39.42	/	/	/	/	/	/	/
6858 X 3048	305 ⁵	305 ⁶	305	WC-F/US	20.66	16.37	30.65	33.14	35.63	38.13	/	/	/	/	/	/	/	/	/	/	/



ALL DIMENSIONS ARE IN mm
DRAWINGS ARE NOT TO SCALE

CON CAST PIPE (CCP) STANDARD DRAWING

STD. CCP ENG GUIDE B.8.1.5 PART MONOBOX-GUIDE

TITLE
**MONOBOX - CHAMBER APPLICATION
DESIGN GUIDE**

3									
2									
1	NEW RELEASE	SW	1MAY2014	DRAWN BY	CHECKED BY	DATE	FILE	PAGE	
REV.	DESCRIPTION	ENG.	DATE	SW		6MAR14	MONOBOX Rev 2	1 OF 2	

GENERAL NOTES:

DESIGN CRITERIA

1. DESIGN TO CSA S6-06 CHBDC TRUCK LOADING
2. DESIGN EARTH COVER 0 - 2.0m TO THE BOTTOM OF THE TOP SLAB
3. MAXIMUM BURIED DEPTH 6.1m
4. DESIGN EARTH COVER > 2.0m AND / OR BURIED DEPTH BEYOND 6.1m IS AVAILABLE UPON REQUEST

GEOMETRY

5. WALL THICKNESSES SHOWN IN TABLE ARE STANDARD FOR THE ABOVE DESIGN CRITERIA. THICKER WALL IS AVAILABLE FOR DEEPER STRUCTURE.
6. SLAB THICKNESS SHOWN IN TABLE ARE STANDARD FOR THE ABOVE DESIGN CRITERIA. MAXIMUM SLAB THICKNESS IS 406mm
7. MAXIMUM INTERNAL HEIGHT FOR LARGER MONOBOX IS 2438. THE HEIGHT IS LIMITED BY THE MAXIMUM SHIPPING HEIGHT AND MASS.
8. MINIMUM INTERNAL HEIGHT FOR WET CAST MONOBOX IS ZERO. A SLAB WITH UNISEX JOINT WILL BE PROVIDED.

CONCRETE

9. MINIMUM CONCRETE STRENGTH 40MPa.

REINFORCING STEEL

10. REINFORCING STEEL CONFORMS TO THE FOLLOWING LATEST CSA STANDARDS:
 - G30.5-M WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT
 - G30.15-M WELDED DEFORMED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT
 - G30.18-M BILLET STEEL BARS FOR CONCRETE REINFORCEMENT
 - W186-M WELDING OF REINFORCING BARS IN REINFORCED CONCRETE CONSTRUCTION
 - G30.18-M DEFORMED REINFORCING BARS SHALL BE 400W PER LATEST
11. CLEAR COVER TO REINFORCING STEEL
 - MESH: 40 mm +/- 5 mm
 - REBAR: 50 mm +/- 10 mm

INSTALLATION

12. BACKFILL AND COMPACTION TO OWNER'S REQUIREMENT
13. RESPONSIBILITY FOR CONSTRUCTION REVIEW, ADEQUACY, AND SUITABILITY OF EXCAVATION, DEWATERING, SHORING, HANDLING EQUIPMENT, AND SOIL STABILITY BY OTHERS

BUOYANCY

14. WHEN APPLICABLE, EXTENDED BASE IS REQUIRED FOR ANTI-BUOYANCY.

DESIGN CONSIDERATION


15. SLAB OPENING: ϕ 685 OR 750 X 1000 OR 800 X 1200 OR 800 X 1800. LARGER OPENING OR RECTANGULAR OPENING MAY BE ACCOMODATED.
16. CAST-IN TRANSITION RISER IS AVAILABLE.
17. WALL OPENING: CIRCULAR, UPSIDE DOWN DOGHOUSE HOLE
18. WALL OPENING MAY BE FORMED OR CORED DEPENDS ON APPLICATION

OTHER DESIGN NOTES

19. MONOBOX MAY BE DRY CAST (DC) OR WET CAST (WC).
20. STANDARD MONOBOX COMPONENT HAS UNISEX JOINT AND TONGUE/GROOVE JOINT FOR WET CAST AND DRY CAST RESPECTIVELY. JOINT HEIGHT IS 40mm. 19mm BUTYL RUBBER TO BE SUPPLIED BY CON CAST PIPE AND INSTALLED ON SITE BY OTHERS. SPECIAL JOINT OR WATER PROOFING ARE AVAILABLE UPON REQUEST.
21. MONOBOX STRUCTURE COMES WITH STANDARD 16" HOLLOW ALUMNUM STEP(S) CONFORMED TO OPSD405.010 SPACED AT 300. OTHER TYPE OF STEP(S) OR LADDER ARE AVAILABLE UPON REQUEST.
22. CAST-IN DAYTON SUPERIOR P50 SWIFT LIFT ANCHORS OR EQUIV. ARE STANDARD DEVICE FOR HANDLING AND INSTALLATION.
23. CAST-IN INSERTS FOR CAST-IN-PLACE COMPONENTS SUCH AS THRUST BLOCK ARE AVAILABLE UPON REQUEST.
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FINAL DESIGN FOR APPROVAL AND MANUFACTURING

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27. FINAL DESIGN OF MONOBOX INCLUDING, BUT NOT LIMITED TO, STACKING, ADDITIONAL REINFORCING, CUSTOMIZATION WILL PRESENT IN SHOP DRAWING PACKAGE.

ALL DIMENSIONS ARE IN mm DRAWINGS ARE NOT TO SCALE				CON CAST PIPE (CCP) STANDARD DRAWING				
				STD. CCP ENG GUIDE B.8.1.5			PART MONOBOX-GUIDE	
				MONOBOX - CHAMBER APPLICATION DESIGN GUIDE				
3								
2								
1	NEW RELEASE	SW	1MAY2014	DRAWN BY	CHECKED BY	DATE	FILE	PAGE
REV.	DESCRIPTION	ENG.	DATE	DRWN BY	CHKD BY	DD/MON/YY	MONOBOX Rev 2	2 OF 2
 CON CAST PIPE RR 3 Guelph, ON N1H 6H9				Fax: (519) 763-1956		1-800-668-7473		www.concastpipe.com