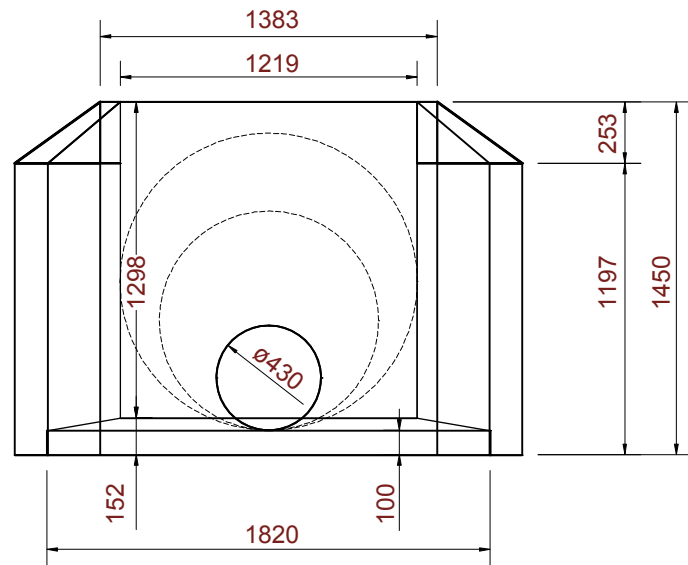
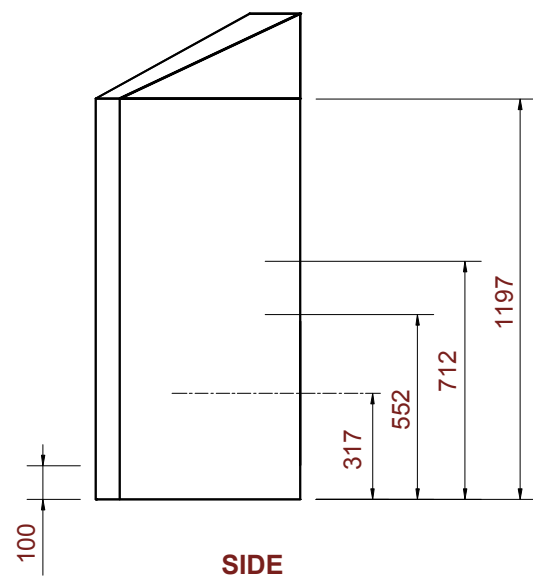


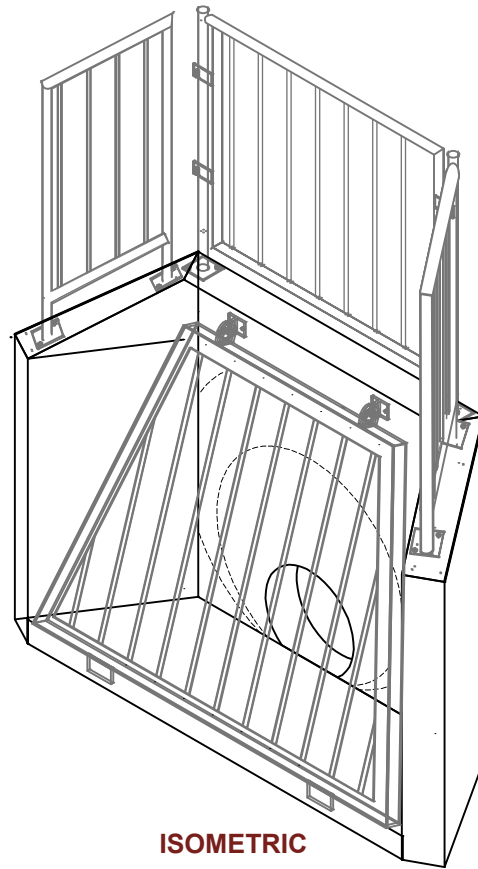
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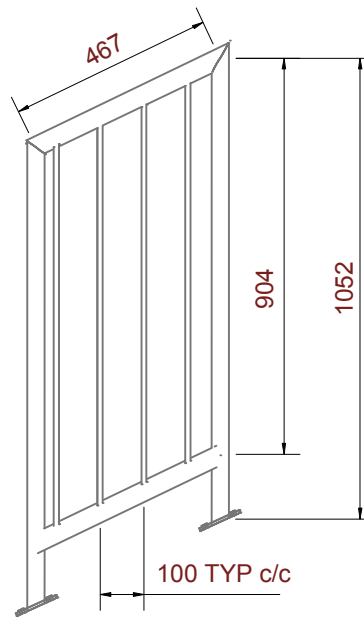
FRONT



SIDE

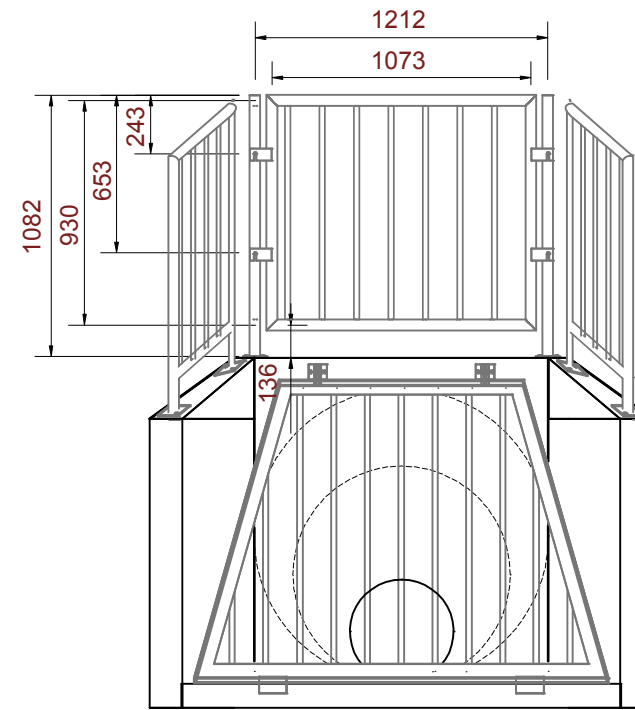


ISOMETRIC

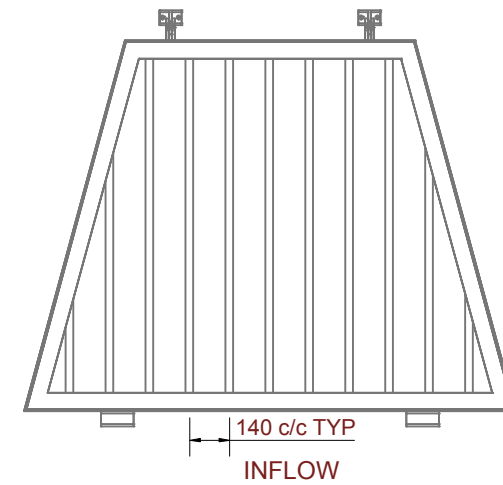


SIDE HAND RAIL TYPICAL

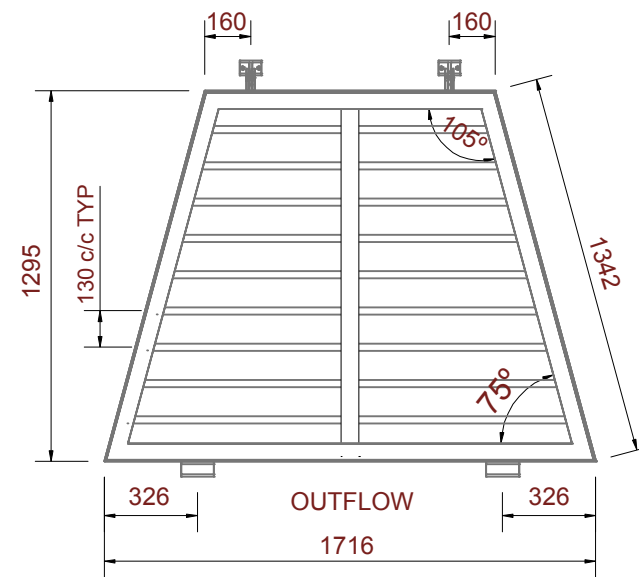
SHAW SUPPLIED ITEMS	
3	STAINLESS STEEL "L" BRACKETS
6	190mm (3/4") STAINLESS DROP-IN ANCHORS
6	190mm (3/4") x 380mm (1 1/2") BOLTS
6	190mm (3/4") WASHERS



HAND RAIL



INFLOW



GRADE ELEVATION

NOTES

**GENERAL**  
1. FOR HANDLING, STORAGE, TRANSPORTATION AND ERECTION PROCEDURES PLEASE REFER TO "HEADWALL INSTALLATION GUIDE" AND "DAYTON/RICHMOND GUIDELINES FOR HANDLING CONCRETE PIPE AND UTILITY PRODUCTS".

2. WEIGHT = 1420 kg

3. TOLERANCE FOR STRUCTURAL ELEMENTS, MATERIALS & CONSTRUCTION CONFORM TO CAN/CSA A23.4 "PRECAST CONCRETE" CLAUSE 10.

4. PRECAST HEADWALL MUST BE FASTENED TO REINFORCED CONCRETE PIPE WITH SHAW SUPPLIED HARDWARE (SEE HEADWALL INSTALLATION GUIDE).

**GEOTECHNICAL**  
1. GEOTECHNICAL ENGINEER TO PROVIDE ON-SITE INSPECTION FOR PLACEMENT AND COMPACTION OF BACKFILL.

**DESIGN**  
1. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH CAN/CSA S6.06 UNDER THE FOLLOWING DESIGN PARAMETERS:  
- DESIGN LIVE LOAD = CL-625  
- DESIGN DEAD LOAD = 2H:1V EARTH FILL TOP SLOPE.  
- CONCRETE UNIT WEIGHT = 24.0 kN/m<sup>3</sup>  
- SOIL/BACKFILL UNITWEIGHT = 22.0 kN/m<sup>3</sup>

**REINFORCEMENT**  
1. ALL REINFORCING STEEL SHALL BE GRADE 400 AND CONFORM TO CAN/CSA G30.18 (LATEST EDITION).

2. ALL WELDED WIRE MESH SHALL HAVE A F<sub>y</sub> = 485 MPA AND CONFORM TO CAN/CSA G30.14 AND G30.15 (LATEST EDITION).

3. ALL REINFORCING SHALL BE DETAILED, FABRICATED, PLACED AND SUPPORTED IN ACCORDANCE WITH CAN/CSA A23.4 (LATEST EDITION).

4. THE CONCRETE COVER OVER PRINCIPAL REINFORCING SHALL BE 50mm ± 10mm AS REQUIRED BY ENVIRONMENTAL EXPOSURE 8.11.2.2 (a) IN CAN/CSA S6.06.

**CONCRETE**  
1. CONCRETE MIX DESIGNS SHALL CONFORM TO REQUIREMENTS:  
- CONCRETE STRENGTH = 28 MPA AT TIME OF STRIPPING  
- DESIGN CONCRETE STRENGTH OF 45 MPA AT 28 DAYS OR TIME OF SHIPPING  
- 5% TO 7% AIR ENTRAINMENT  
- GLEN HOLME AGGREGATE SHALL BE USED WITH A NOMINAL AGGREGATE SIZE OF 13mm

2. CONCRETE CURING SHALL BE IN CONFORMANCE WITH CAN/CSA A23.1 (LATEST EDITION).

3. SHAW CONCRETE BATCH No. SHALL BE 406.

**ITEMS INCLUDED:**  
1. HW/HAND  
2. HWG1450H OR HWG1450V

REV NO.	REASON	DATE



DRAWING NO.

DRAWING NO.  
STANDARD LAYOUT  
1450 X 1383  
430mmØ - 1220mmØ PIPE

DRAWING NO.  
INFLOW & OUTFLOW GRATE  
HEADWALL C/W 430Ø PIPE  
HANDRAIL & SIDE RAIL

CONTRACTOR  
XXXXXXXXXX

DATE  
19 FEBRUARY 2008

DRAWN  
N. DIMOCK

CHECKED  
R. MacDOW