

NOTES:

GENERAL

- THE CONTRACTOR SHALL READ STRUCTURAL DRAWINGS IN CONJUNCTION WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL DRAWINGS, SPECIFICATIONS, AND OTHER CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO COMMENCING WITH CONSTRUCTION WORK.
- TEMPORARY SUPPORT AND BRACING FOR CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR U.N.O. ON DRAWING.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING AND PROTECTION OF THE EXISTING FACILITIES AND UTILITIES WHICH MAY BE AFFECTED BY THE WORK OF THIS CONTRACT.
- ALL WORK SHALL CONFORM TO THE MANITOBA BUILDING CODE 2011 AND THE ASSOCIATED NATIONAL BUILDING CODE.
- DO NOT CONSTRUCT FROM THESE DRAWINGS UNLESS MARKED "ISSUED FOR CONSTRUCTION".
- DO NOT SCALE FROM THE DRAWINGS.

DESIGN LOAD

CLIMATIC DATA WINNIPEG, MANITOBA

LOADING CRITERIA	IMPORTANCE CATEGORY	POST-DISASTER
SNOW	Ss = 1.9 kPa Sr = 0.2 kPa	
WIND	q 1/50 = 0.45 kPa	
ONE DAY RAIN	108 mm	
SEISMIC	Ss (0.2) 0.054 Ss (0.5) 0.032 Ss (1.0) 0.016 Ss (2.0) 0.006 Ss (5.0) 0.0013 Ss (10.0) 0.0007	
	PGA 0.032 PGV 0.021	
DEAD LOAD		
FIRST FLOOR	4.8 kPa	
ROOF	1.0 kPa	
LIVE LOAD		
FIRST FLOOR	4.8 kPa	
ROOF	1.0 kPa	
ACCESS LEVEL	4.8 kPa	

SITE REVIEW AND SHOP DRAWING REVIEW

- PREPARE AND SUBMIT ALL REQUIRED SHOP DRAWINGS FOR REVIEW 7 DAYS PRIOR TO FABRICATION.
- THE REVIEW IS ONLY FOR THE WORK SHOWN ON THE DRAWINGS AND IS TO ASCERTAIN THAT THE WORK IS IN GENERAL CONFORMANCE WITH THE DRAWINGS.
- THE REVIEW DOES NOT RELIEVE THE CONTRACTOR RESPONSIBILITY TO PERFORM THE WORK IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.

STRUCTURAL STEEL

- STRUCTURAL STEEL WORK SHALL CONFORM TO CSA S16-14.
- ALL FABRICATION, ERECTION, AND WELDINGS SHALL BE IN ACCORDANCE WITH THE LATEST CODES AND STANDARDS.
- ALL STRUCTURAL SHAPES SHALL CONFORM TO CSA G40.21-13 GRADE 350W.
- ALL STRUCTURAL PLATES SHALL CONFORM TO CSA G40.21-13 GRADE 300W.
- CONNECTION DETAILS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED UNDER THE SUPERVISION OF AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF MANITOBA.
- UNLESS NOTED OTHERWISE, DESIGN ALL CONNECTIONS FOR NON-COMPOSITE BEAMS FOR 50% OF THE SHEAR RESISTANCE OF THE BEAM AND USE A MINIMUM OF 3-19 mm DIA BOLTS IN EACH BOLTED CONNECTION.
- ALL STRUCTURAL STEEL AND CONNECTIONS, INCLUDING ANCHOR BOLTS EXPOSED TO ENVIRONMENT TO BE GALVANIZED.
- THE CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS FOR CONTRACT ADMINISTRATOR TO REVIEW PRIOR TO FABRICATION.
- THE CONTRACTOR SHALL ARRANGE FOR MATERIALS AND WORKMANSHIP TESTING BY AN INDEPENDENT INSPECTION FIRM.
- WELDERS' CERTIFICATES, ORGANIZATION CERTIFIED BY THE CANADIAN WELDING BUREAU IN ACCORDANCE WITH CSA W47.1-09 (R2014).
- ALL STRUCTURAL STEEL TO BE GALVANIZED TO CSA G164.2 ASTM A123/A123M.
- SHOP GALVANIZING: HOT DIPPED GALVANIZING WITH A MINIMUM COATING OF 700 g/m².
- TOUCH UP DAMAGED GALVANIZED COMPONENTS WITH COLD GALVANIZING SPRAY.

ALUMINUM CHECKER PLATE HATCH OPENING COVERS

- ALUMINUM TO BE 6061-T6 FOR STRUCTURAL APPLICATION
- PANEL TO BE DESIGNED FOR UNIFORM DISTRIBUTED LOAD OF 4.8 KPA WITH MAXIMUM DEFLECTION OF 1 mm.
- PANEL TO BE DESIGNED FOR CONCENTRATED LOAD OF 10 kN APPLIED OVER AREA OF 25x25 mm AT ANY LOCATION WITH MAXIMUM DEFLECTION OF 2.54 mm.
- LIFTING HANDLE TO BE RECESSED.

CAST-IN-PLACE CONCRETE

- CONC. MATERIAL, QUALITY, MIXING, PLACING, FORMWORK, AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CSA A23.1/A23.2.
- ALL CONC. SHALL BE NORMAL WEIGHT CONC.
- ADMXTURES CONTAINING CALCIUM CHLORIDE ARE NOT PERMITTED.
- CONC. STRENGTH AND MIX SPECIFICATIONS ARE AS FOLLOWS:

EXP. CLASS	SUPPLY AND USE	W/C RATIO	STRENGTH	CEMENT TYPE	SLUMP	MAX. AGG. SIZE	AIR ENTRAINMENT	MAX. FLY ASH CONTENT
S1	FOUNDATION WALL	0.4	35 MPa @ 28 DAYS	HS	110mm +/- 25	19 mm	5-8%	25%
N	STRUCTURAL SLAB	0.45	30 MPa @ 28 DAYS	GU	110mm +/- 25	19 mm	N/A	25%
C1	APRON	0.4	35 MPa @ 28 DAYS	GU	110mm +/- 25	19 mm	5-8%	25%

- DO NOT ADD WATER TO CONC. ON SITE UNLESS AUTHORIZED BY SUPPLIER.
- PROTECT CONC. FROM ADVERSE WEATHER CONDITIONS.
- WHEN THE AMBIENT TEMPERATURE IS AT OR ABOVE 25°C OR WHEN THERE IS A PROBABILITY OF THE AMBIENT TEMP. RISING TO OR ABOVE 25°C, HOT WEATHER REQUIREMENTS APPLY. MOIST CURE CONC. ONLY. CURING COMPOUND IS NOT PERMITTED.
- WHEN THE AMBIENT TEMPERATURE IS AT OR BELOW 5°C OR WHEN THERE IS A POSSIBILITY OF THE AMBIENT TEMP. FALLING TO OR BELOW 5°C, COLD WEATHER REQUIREMENTS APPLY.

EXCAVATION AND BACKFILL

- ALL EXCAVATIONS SHALL BE MADE TO ALLOW SAFE ACCESS TO COMPLETE ALL PHASES OF THE WORK.
- THE CONTRACTOR SHALL CONFIRM LOCATIONS OF EXISTING UTILITIES PRIOR TO EXCAVATING.
- THE CONTRACTOR SHALL SECURE THE WORK AREA WITH BARRICADE TAPE AND WARNING SIGNS SUPPORTED WITH FENCING AND/OR POSTS NECESSARY TO PRECLUDE ENTRY BY UNAUTHORIZED INDIVIDUALS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY SHORING OF EXCAVATION
- BACKFILL MATERIALS TO BE NON-FROST SUSCEPTIBLE MATERIALS.
- BACKFILL MATERIALS SHALL BE BASE COURSE GRANULAR MATERIALS IN ACCORDANCE WITH CW3110.
- COMPACT BACKFILL MATERIALS IN LAYERS TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY.

CONCRETE FORMWORK

- FORM WORK TO CONFORM TO CSA A23.1/A23.2.
- FORM STRIPPING AGENT - COLORLESS MINERAL OIL, NON-TOXIC, BIODEGRADABLE, FREE OF KEROSENE.
- PROVIDE BRACING TO ENSURE STABILITY OF FORMWORK.
- DO NOT PLACE SHORING AND MUD SILLS ON FROZEN GROUND.
- VOID FORM SHALL BE DYNVOID, OR APPROVED EQUIVALENT.
- FORM WORK SHALL BE CLEANED OF DEBRIS BEFORE PLACING CONCRETE.
- LEAVE FORM WORK IN PLACE FOR THE FOLLOWING MINIMUM OF 7 DAYS FOR GRADE BEAMS AND SLABS OR UNTIL THE CONCRETE HAS REACHED 70% OF ITS DESIGN STRENGTH.
- DO NOT WEDGE PRY BARS OR HAMMERS AGAINST CONCRETE SURFACES.

CONCRETE REPAIR, CUTTING, AND CORING

- FILL ALL HOLES FROM PIPE REMOVAL WITH NON-SHRINK HIGH STRENGTH GROUT.
- SUBMIT PATCHING PRODUCT TECHNICAL DATA SHEET FOR REVIEW PRIOR TO COMMENCING WORK.
- PREPARE SURFACE RECEIVING REPAIR IN ACCORDANCE WITH THE MANUFACTURER INSTRUCTION.
- NO OVER-SAWCUT IS ALLOWED.
- NO CORING THROUGH CONCRETE BEAM MAIN REINFORCEMENT IS ALLOWED.
- SCAN REINFORCEMENT PRIOR TO CORING. NOTIFY THE ENGINEER ANY CONFLICT OR POSSIBILITY OF CORING THROUGH REINFORCEMENT.

DEMOLITION

- PROVIDE TEMPORARY SHORING TO UNDERGROUND CONCRETE WALL AS PER DRAWING PRIOR TO DEMOLITION
- PROVIDE TEMPORARY SUPPORTING STRUCTURES AND SHORING SYSTEMS, WHERE REQUIRED AND NOT SHOWN ON DRAWINGS, DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF MANITOBA.
- PREVENT MOVEMENT, SETTLEMENT OR DAMAGE OF ADJACENT STRUCTURES, SERVICES, AND PART OF EXISTING BUILDING TO REMAIN.
- IF SAFETY OF BUILDING BEING DEMOLISHED OR ADJACENT STRUCTURES OR SERVICES APPEARS TO BE ENDANGERED, CEASE OPERATIONS AND NOTIFY THE CONTRACT ADMINISTRATOR IMMEDIATELY.
- RELOCATE ELECTRICAL SUPPLY TO PUMPING STATION TO ALLOW CONTINUOUS OPERATION OF PUMPING STATION DURING DEMOLITION.

REINFORCING STEEL

- ALL REINFORCING STEEL SHALL BE CONFORM TO CSA G30.18 GRADE 400W.
- ALL REBAR SHALL BE STORED ON WOOD BLOCKING AT THE SITE.
- REINFORCEMENT SHALL BE FREE OF CLAY, DIRT AND FROM OIL OR OTHER DELETERIOUS MATERIAL WHICH WOULD REDUCE THE BOND OF CONCRETE.
- CONCRETE COVER SHALL CONFORM TO THE FOLLOWING LIST:

CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	75 mm
FORMED SURFACES EXPOSED TO EARTH	40 mm
SLAB, WALLS, BEAMS NOT EXPOSED TO EARTH	20 mm
SIDEWALKS, CURBS AND GUTTERS, SPLASH PADS AND SUMP PITS	30 mm
RATIO OF COVER TO NOMINAL BAR DIAMETER	
EXPOSURE CLASS N	1.0
EXPOSURE CLASS F, S	1.5
EXPOSURE CLASS C, A	2.0
RATIO OF COVER TO MAXIMUM AGGREGATE SIZE	
EXPOSURE CLASS N	1.0
EXPOSURE CLASS F, S	1.5
EXPOSURE CLASS C, A	2.0

- UNLESS NOTED OTHERWISE, MINIMUM EMBEDMENT AND LAP LENGTHS SHALL BE AS FOLLOW:

BAR SIZE	EMBEDMENT	LAP SPLICE
10M	400 mm	500 mm
15M	600 mm	750 mm
20M	750 mm	1000 mm
25M	1200 mm	1550 mm
30M	1450 mm	1850 mm
35M	1500 mm	2150 mm

- CLEAR SPACING SHALL BE GREATER THAN 2 BAR DIAMETER.
- CONTRACTOR SHALL PREPARE AND SUBMIT DETAILED REINFORCING STEEL DRAWINGS FOR REVIEW PRIOR TO FABRICATION.
- DO NOT FIELD BEND REINFORCEMENT EXCEPT WHERE INDICATED OR AUTHORIZED BY THE CONTRACT ADMINISTRATOR.
- NOTIFY ENGINEER 24 HOURS PRIOR TO PLACING CONCRETE FOR SITE REVIEW.

MASONRY

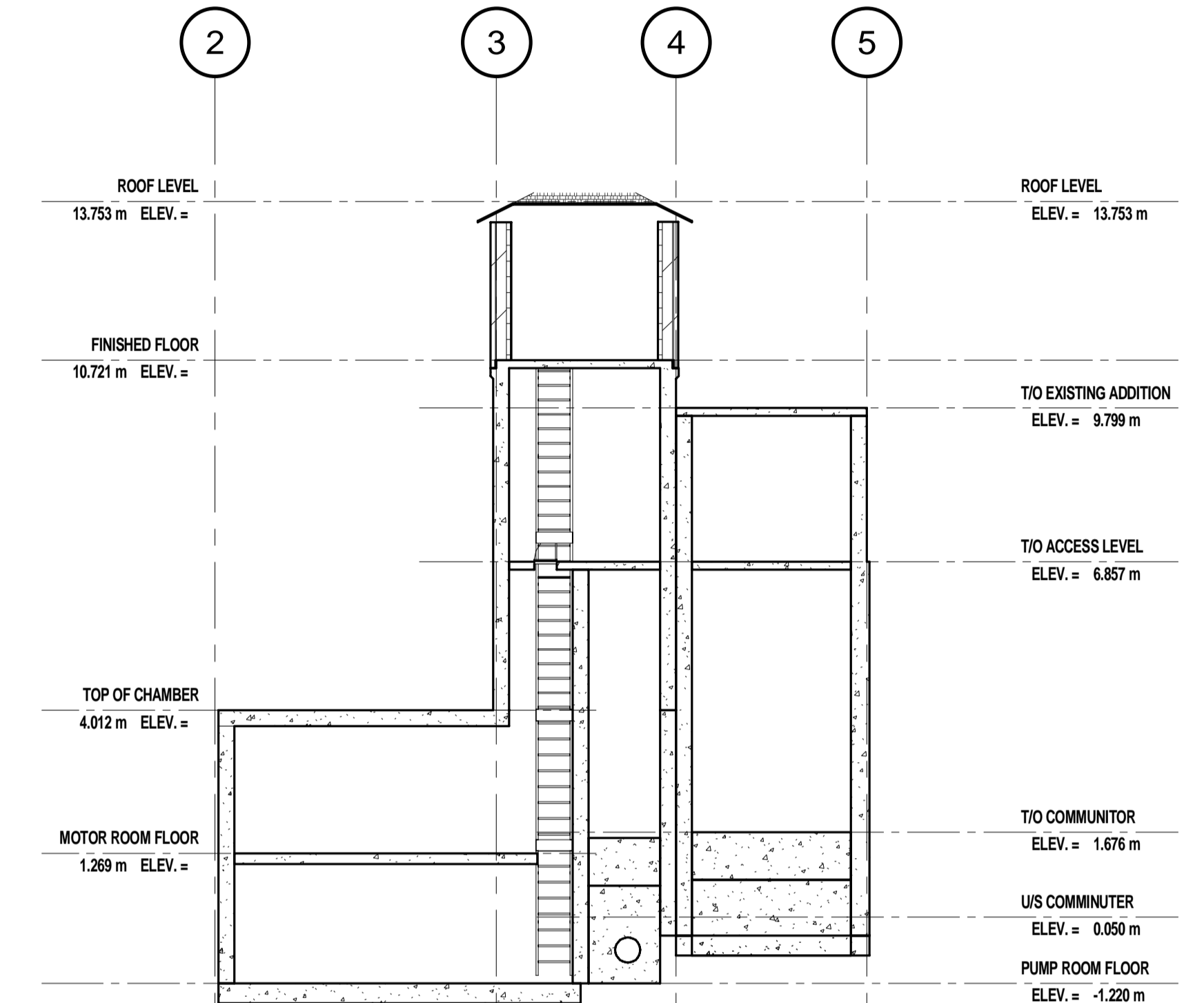
- ALL MASONRY WORK SHALL BE PERFORMED IN ACCORDANCE WITH CSA A371.
- CONCRETE BLOCK SHALL CONFORM TO CAN3-A165. STANDARD HOLLOW MASONRY UNIT H/15/A/M.
- FACE BRICK TO CSA A82.14, ASTM C216. TYPE FBS GRADE SW. ACCEPTABLE MATERIAL: XL INTERSTATE BRICK'S MOUNTAIN RED BRICK.
- LIME STONE TO ASTM C568. ACCEPTABLE MATERIAL: TYNDALL STONE GILLIS QUARRIES.
- MORTAR AND GROUT TO CSA A179.
- MASONRY CONNECTORS TO CSA A370 AND CSA A304.
- MASONRY REINFORCEMENT TO CSA A371 TRUSS TYPE
- BAR REINFORCEMENT TO CSA G30.18 GRADE 400
- TOP COURSE OF ALL BLOCK WALLS TO BE 400 DEEP "U" BLOCK WITH 2-15M REINFORCING BARS AND 20 MPa CONCRETE FILL CONTINUOUS.
- MINIMUM HORIZONTAL JOINT REINFORCEMENT: 3.8 MM TRUSS TYPE WIRE REINFORCEMENT AT EVERY 200 MM.
- ALL MASONRY WALLS TO BE SECURELY BRACED UNTIL STRUCTURE IS CLOSED IN.
- PROVIDE "U" BLOCK LINTELS OVER OPENINGS IN BLOCK WALL AS FOLLOWS UNLESS NOTED OTHERWISE:
 - UP TO 1200 mm SPAN - 200 mm "U" BLOCK, 2-15M BOTTOM, 20 MPa, BEARING 200 mm MIN EACH END, FILL 3 CORES IN WALL EACH END.
 - 1200 TO 2400 mm SPAN - 400 mm "U" BLOCK, 2-15M BOTTOM, 20 MPa, BEARING 200 mm MIN EACH END, FILL 3 CORES IN WALL EACH END.
- PROVIDE 15M VERTICAL REINFORCEMENT FULL HEIGHT WITH MATCHING DOWEL AND COREFILL AT 800 mm O/C; EACH WALL CORNER; EACH SIDE OF DOORS AND OPENINGS.

GUARDRAILS

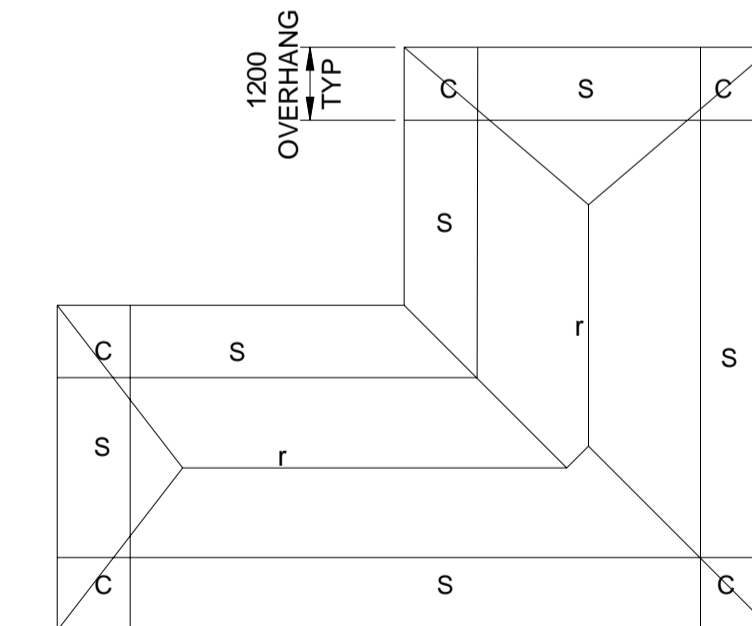
- STEEL PIPE SHALL BE IN ACCORDANCE WITH ASTM A53 TYPE S GRADE A OR B.
- GALVANIZE IN ACCORDANCE WITH ASTM A123 TO A NET RETENTION OF 610 g/m².
- GALVANIZING GUARDRAILS SHALL RESULT IN SMOOTH SURFACE, FREE OF SHARP EDGES AND PROJECTIONS.
- PREPARE AND SUBMIT SHOP DRAWING FOR REVIEW PRIOR TO FABRICATION.

SHOP FABRICATED WOOD TRUSSES

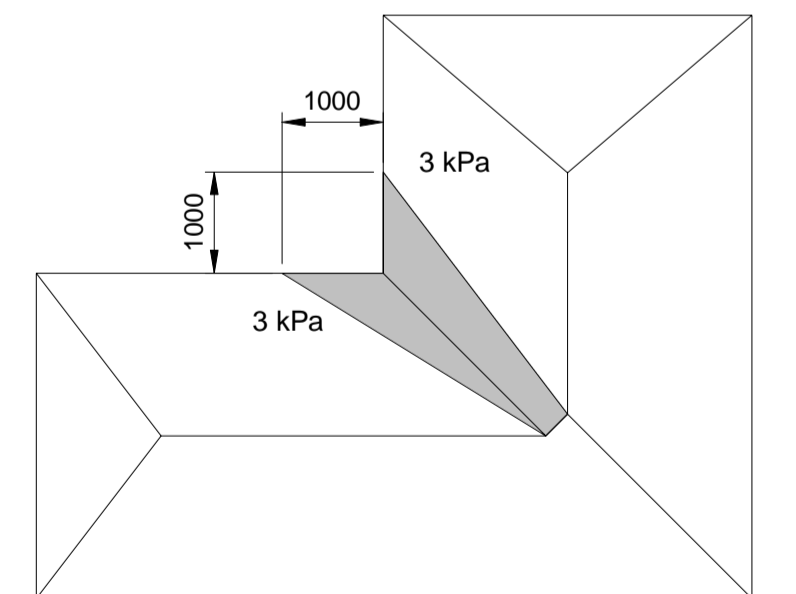
- DESIGN ROOF TRUSSES, BRACING, BLOCKING, BRIDGING, FRAMED OPENINGS, CAMBERS, AND CONNECTIONS IN ACCORDANCE WITH CSA O86.
- LIMIT LIVE LOAD DEFLECTION L/360.
- DESIGN FOR ALL DEFLECTION AND PROVIDE CAMBER TO ALLOW FOR SATISFACTORY PERFORMANCE OF TRUSSES.
- DESIGN FOR THE FOLLOWING CASES:
 - CASE 1: FULL UNIFORMLY DISTRIBUTED SNOW LOAD OF 1.72 kPa
 - CASE 2: UNBALANCED SNOW LOAD OF 2.10 kPa
- TRUSSES SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF MANITOBA.
- ALL FULL FRAMED TRUSSES SHALL BE SUPPORTED WITH METAL HANGERS. ALL HANGERS AND TRUSS TO TRUSS CONNECTIONS TO BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF MANITOBA.
- SUBMIT SHOP DRAWINGS FOR CONTRACT ADMINISTRATOR OF RECORD PRIOR TO FABRICATION.
- VERTICAL AND HORIZONTAL BRACING SHALL BE INSTALLED AS PER TRUSS SUPPLIER REQUIREMENT.
- ALL ROOF TRUSSES SHALL BE TIED TO SUPPORTING STRUCTURES WITH 18 GA. GALV. "HURRICANE" TIES AT EACH END IN ADDITIONAL TO NORMAL TOE-NAILING.
- TRUSSES SHALL NOT BE FIELD MODIFIED IN ANY WAY WITHOUT WRITTEN CONSENT OF THE DESIGN ENGINEER AND THE MANUFACTURER.
- SHIP, STORE, HANDLE AND INSTALL TRUSSES AND RELATED COMPONENTS IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTION.



EXISTING BLDG SECTION



WIND UPLIFT DIAGRAM
N.T.S.



SNOW PILING DIAGRAM
N.T.S.

C = 4.1 kPa
S = 2.7 kPa
r = 1.8 kPa

ISSUED FOR ADDENDUM No. 4

NOT FOR CONSTRUCTION



DESIGNED BY: NR	CHECKED BY: MBL	JESSIE WASTEWATER PUMPING STATION UPGRADES	
DRAWN BY: DJB	APPROVED BY: BLM	CITY DRAWING NUMBER: 1-0149LS0001-001	
HOR. SCALE: As indicated	RELEASED FOR CONSTRUCTION:	SHEET 11 OF 34	
VERTICAL:		CONSULTANT DRAWING NUMBER: S-01	
NO. REVISIONS	DATE	BY	DATE
2	10/03/19	BLM	
1	09/10/19	BLM	
CONSULTANT PROJECT NUMBER: 19-9259		STRUCTURAL NOTES	