

COLD WEATHER CONCRETE HEATING

- CHECK AMBIENT TEMPERATURE FOR THE DAY BEFORE AND 3 DAYS AFTER CONCRETE POUR.
- PLUS TEN (+10) DEGREES CELSIUS IS THE MINIMUM PERMISSABLE CONCRETE TEMPERATURE AT TIME OF PLACING FOR 300mm OR LESS CONCRETE ELEMENT. CONCRETE GENERATES HEAT DURING ITS CURING PROCESS, THIS IS NOT A HEAT SOURCE FOR COLD WEATHER CONDITIONS AND ITEMS LISTED BELOW ARE TO BE IN PLACE WHEN AMBIENT TEMPERATURE IS BELOW PLUS FIVE (+5) DEGREES CELSIUS.
- ENCLOSE AREA AROUND THE PERIMETER OF THE SLAB POUR WITH TARPS SECURING TO BOTH FORMWORK OF CURRENT POUR AREA AND STRUCTURE BELOW.
- MAINTAIN HEAT UNDER THE SLAB AFTER CONCRETE HAS BEEN POURED FOR A MINIMUM OF THREE (3) DAYS IF OUTDOOR AMBIENT TEMPERATURE IS BELOW FIVE (+5) DEGREES CELSIUS. IF OUTDOOR AMBIENT TEMPERATURE IS ABOVE FIVE (+5) DEGREES CELSIUS FOR DAYS AHEAD HEATING UNDER THE SLAB CAN BE REDUCED BY A DAY.
- DO NOT HEAT SPACE ABOVE TEN (+10) DEGREES CELSIUS AS EXCESSIVE HEAT TEMPERATURES CAN INCREASE EVAPORATION AND CRACKING WILL OCCUR IN SLAB.
- DO NOT USE DE-ICING SALTS / MATERIAL ANYWHERE IF THERE IS ANY ACCUMULATION OF ICE AND OR SNOW TO AID OR REPLACE THE NEED FOR HEATING.
- CALCIUM CHLORIDE SHALL NOT BE USED AS AN ACCELERATOR. A NON-CHLORIDE ADDITIVE SUCH AS "POLARSET" IS AN ACCEPTABLE ALTERNATIVE.
- THE PROTECTION SHALL NOT BE COMPLETELY REMOVED UNTIL THE CONCRETE HAS COMPLETELY COOLED TO A TEMPERATURE DIFFERENTIAL NOTED IN CSA A23.1 (ITEM #6).
- PROVIDE ADEQUATE EXHAUST AND VENTILATION OF COMBUSTION GASES FROM HEATING SOURCES THAT PRODUCE CARBON DIOXIDE AND OR CARBON MONOXIDE DURING PLACING AND CURING OF CONCRETE.

REINFORCED CONCRETE NOTES

- MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS SHALL BE AS FOLLOWS:
 - CONCRETE ELEMENTS UNLESS NOTED OTHERWISE - 28 MPa
 - EXTERIOR CONCRETE ELEMENTS EXPOSED TO WEATHER - 35 MPa
 - MUD SLAB - 14 MPa
 - FOOTINGS - 21 MPa
- ALL CONCRETE EXPOSED TO WEATHER OR FREEZING CONDITIONS SHALL BE AIR ENTRAINED TO 6.5% (±1.5%) UNLESS NOTED OR OTHERWISE REQUIRED IN CSA-A23.1. HOT AND COLD WEATHER CONCRETING SHALL COMPLY WITH ALL REQUIREMENTS OF CSA STANDARD A23.1. CALCIUM CHLORIDE ADDITIVES WILL NOT BE PERMITTED WITHOUT WRITTEN APPROVAL FROM DEPARTMENTAL REPRESENTATIVE.
- NO ADMIXTURES SHALL BE USED WITHOUT PRIOR APPROVAL FROM THE DEPARTMENTAL REPRESENTATIVE. DO NOT ADD WATER TO CONCRETE ON SITE. IF HIGHER SLUMP CONCRETE IS DESIRED, CONCRETE SUPPLIER SHALL DESIGN AND SUPPLY ACCORDINGLY.
- ALL BARS IN SLABS MUST BE SUPPORTED ACCURATELY ON CHAIRS TO GIVE SPECIFIED CONCRETE COVER, WHERE U/S OF SLAB IS TO BE EXPOSED, USE PLASTIC COATED CHAIRS OR APPROVED EQUAL TO SUPPORT TOP AND BOTTOM BARS.
- ELECTRICAL CONDUITS SHALL NOT PASS THROUGH A COLUMN. CONDUITS IN SLABS OR WALLS SHALL NOT BE LARGER THAN 40mm OUTSIDE DIAMETER AND SHALL BE SPACED NO CLOSER THAN 150mm ON CENTRE. CONDUIT PARALLEL TO REINFORCING STEEL SHALL BE CENTRED BETWEEN BARS, CONDUIT TO BE PLACED IN AN ORGANIZED MANNER.
- CONDUIT SHALL HAVE A MINIMUM CONCRETE COVER OF 25mm (1") AND UNLESS SPECIFICALLY PERMITTED OTHERWISE, SHALL NOT RUN HORIZONTALLY IN A CONCRETE WALL.
- THE CONTRACTOR SHALL PROVIDE CONTINUOUS SUPERVISION DURING THE PLACEMENT OF CONCRETE TO ENSURE THAT THE REINFORCING STEEL IS MAINTAINED IN ITS CORRECT POSITION.
- CONSTRUCTION JOINTS SHALL BE LOCATED SO AS TO AT LEAST IMPAIR THE STRENGTH OF THE STRUCTURE.
- ALL REINFORCING STEEL SHALL BE DETAILED, FABRICATED, PLACED AND SUPPORTED IN ACCORDANCE WITH "REINFORCING STEEL MANUAL OF STANDARD PRACTICE" BY THE REINFORCING STEEL INSTITUTE OF CANADA. SUBMIT SHOP DRAWINGS TO DEPARTMENTAL REPRESENTATIVE FOR REVIEW, INCLUDING PLACING OF REINFORCEMENT, INDICATE ON SHOP DRAWINGS, BAR BENDING DETAILS, LISTS, QUANTITIES OF REINFORCEMENT, SIZES, SPACING, LOCATION OF REINFORCEMENT TO PERMIT CORRECT PLACEMENT WITHOUT REFERENCE TO STRUCTURAL DRAWINGS, INDICATE SIZES, SPACING AND LOCATIONS OF CHAIRS, SPACERS AND HANGERS.
- ALL OIL, GREASE, MUD, AND DEBRIS SHALL BE ENTIRELY REMOVED FROM THE REINFORCING, ANCHOR BOLTS, AND FORM SURFACES PRIOR TO PLACEMENT OF CONCRETE.

GENERAL NOTES

- ALL WORK AND MATERIALS SHALL CONFORM TO THE 2015 EDITION OF THE NATIONAL BUILDING CODE OF CANADA (NBCC). ALL WORK TO BE CARRIED OUT IN FULL ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT OF NOVA SCOTIA, LATEST EDITIONS OF APPLICABLE CSA AND ALL APPLICABLE SAFETY STANDARDS.
- THE DRAWINGS DO NOT INDICATE ELEMENTS THAT MAY BE NECESSARY FOR CONSTRUCTION SAFETY. THE CONTRACTOR IS RESPONSIBLE FOR ALL SAFETY MEASURES PERTAINING TO THE PROJECT.
- DO NOT SCALE THE DRAWINGS. NO ALTERATIONS TO STRUCTURAL DETAILS SHALL BE MADE WITHOUT PERMISSION OF THE STRUCTURAL ENGINEER. CONSTRUCTION ERRORS ARE TO BE DOCUMENTED AND REPORTED TO THE STRUCTURAL ENGINEER BEFORE PROCEEDING WITH SUBSEQUENT WORK.
- THE CONTRACTOR SHALL REVIEW ALL THE CONTRACT DRAWINGS & SPECIFICATIONS AND CHECK/COORDINATE DIMENSIONS/ELEVATIONS BEFORE CONSTRUCTION. REPORT ANY DISCREPANCIES BETWEEN STRUCTURAL AND OTHER DISCIPLINE'S DRAWINGS & SPECIFICATIONS FOR CLARIFICATION PRIOR TO PROCEEDING WITH WORK. ALL BUILDING DIMENSIONS, ELEVATIONS, DRAINAGE SLOPES, ETC. SHOWN ON STRUCTURAL DRAWINGS SHALL BE FULLY COORDINATED BY THE CONTRACTOR WITH THE OTHER CONSULTANTS DRAWINGS.
- THE CONTRACTOR SHALL EXAMINE ALL DRAWINGS AND CHECK ALL DIMENSIONS AGAINST SITE CONDITIONS AND REPORT ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
- DO NOT IMPOSE CONSTRUCTION LOADS ON THE STRUCTURE IN EXCESS OF THE DESIGN LOADS.
- FOR OPENINGS THROUGH FLOORS, ROOFS, AND WALLS, SEE OTHER CONSULTANTS DRAWINGS FOR SIZE AND LOCATION. NO NEW OPENINGS SHALL BE WITHOUT APPROVAL OF DEPARTMENTAL REPRESENTATIVE.
- ALL OPENINGS IN SLABS OR WALLS ARE TO BE PRE-FORMED AND ALL HOLES SLEEVED.
- INSTALL ALL ADHESIVE/EXPANSION ANCHORS AS PER MANUFACTURER'S INSTRUCTIONS. ADHESIVE/EXPANSION ANCHORS TO BE INSTALLED BY EXPERIENCED APPLICATORS, TRAINED BY THE ANCHOR MANUFACTURER. CONTRACTOR SHALL SUBMIT TRAINING CERTIFICATE(S) TO OWNER'S REPRESENTATIVE AND/OR CONSULTANT UPON REQUEST.
- CONTRACTOR SHALL DESIGN, INSTALL AND MAINTAIN ADEQUATE TEMPORARY BRACING AND SHORING OF ALL STRUCTURAL ELEMENTS FOR STABILITY AND SAFETY WHERE REQUIRED DURING CONSTRUCTION.

STRUCTURAL ABBREVIATIONS

AB	ANCHOR BOLT	EX, EXIST	EXISTING
A _t	FACTORED AXIAL FORCE (TENSION OR COMPRESSION)	f' _c	28 DAY CONCRETE COMPRESSIVE STRENGTH
Ø	AT (SPACING)	FTG	FOOTING
BOT	BOTTOM	f _y	MATERIAL YIELD STRENGTH
BL	BOTTOM LOWER LAYER	GALV	GALVANIZED
BLDG	BUILDING	H _f	FACTORED HORIZONTAL FORCE
BUL	BOTTOM UPPER LAYER	HORIZ	HORIZONTAL
C#	COLUMN #	HSS	HOLLOW STRUCTURAL SECTION
C _r	FACTORED COMPRESSION FORCE	L	SINGLE ANGLE SECTION
CJ	CONTROL JOINT	LG	LONG
COL	COLUMN	LL	LIVE LOAD
CONC	CONCRETE	LDH	LONG DIMENSION HORIZONTAL
CONT	CONTINUOUS	LDV	LONG DIMENSION VERTICAL
CMU	CONCRETE MASONRY UNIT	LLH	LONG LEG HORIZONTAL
c/w	COMPLETE WITH	LLV	LONG LEG VERTICAL
DL	DEAD LOAD	M _f	FACTORED MOMENT
DWL(S)	DOWEL(S)	NTS	NOT TO SCALE
EA	EACH	OWSJ	OPEN WEB STEEL JOIST
EE	EACH END	P#	PIER/PILASTER #
EF	EACH FACE	SOG	SLAB ON GRADE
EMBED	EMBEDMENT	T _f	FACTORED TENSILE FORCE
EMBED	EMBEDMENT	V _f	FACTORED SHEAR FORCE
		WWM	WELDED WIRE MESH

CONCRETE COVER OVER REINFORCING

EXPOSURE CONDITION	COVER
EXPOSURE CLASS N CONCRETE THAT IS NOT EXPOSED TO CHLORIDES OR FREEZING & THAWING, OR SULPHATES EXAMPLES: FOOTINGS & INTERIOR SLABS, WALLS AND COLUMNS	
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, INCLUDING FOOTINGS AND PILES	3" (75mm)
BEAMS, GIRDERS, AND COLUMNS	1 1/4" (30mm)
SLABS, WALLS, AND JOISTS	1" (25mm)
MIN. RATIO OF COVER TO NOMINAL BAR DIAMETER. INCREASE COVER AS REQUIRED TO MEET THIS REQUIREMENT	1.0
EXPOSURE CLASS F, S, R CONCRETE THAT IS EXPOSED TO FREEZING & THAWING, OR SULPHATES EXAMPLES: EXTERIOR WALLS AND COLUMNS, FOUNDATION WALLS, RESIDENTIAL CONSTRUCTION	
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, INCLUDING FOOTINGS AND PILES	3" (75mm)
BEAMS, GIRDERS, AND COLUMNS	1 1/2" (40mm)
SLABS, WALLS, AND JOISTS	1 1/2" (40mm)
MIN. RATIO OF COVER TO NOMINAL BAR DIAMETER. INCREASE COVER AS REQUIRED TO MEET THIS REQUIREMENT	1.5

FOUNDATION NOTES

- INFORMATION RELATING TO THE VALUE OF THE BEARING CAPACITY UNDER FOOTINGS IS BASED ON INFORMATION SPECIFIED IN THE GEOTECHNICAL REPORT PREPARED BY ENGLOBE CORP. DATED OCTOBER 30, 2020. THE CONTRACTOR IS TO FOLLOW ALL RECOMMENDATIONS WITHIN THE GEOTECHNICAL REPORT INCLUDING REMOVALS OF ALL NON-ACCEPTABLE SOILS AND REPLACEMENT WITH APPROVED STRUCTURAL FILLS, ETC. UNLESS SPECIFICALLY NOTED OTHERWISE. ALL ENGINEERED (STRUCTURAL) FILL & BACKFILLING IS TO BE PLACED UNDER THE CONTINUOUS SUPERVISION OF THE GEOTECHNICAL ENGINEER.
- ALL FOOTINGS SHALL BEAR ON UNDISTURBED SOIL, STRUCTURAL FILL OR SOUND CLEAN BEDROCK HAVING A MINIMUM ALLOWABLE BEARING CAPACITY OF 200 kPa. ALTERNATELY THE FACTORED ULTIMATE LIMITS STATES (ULS) BEARING CAPACITY SHALL BE A MINIMUM OF 300 kPa AND THE SERVICEABILITY LIMITS STATES (SLS) BEARING CAPACITY SHALL BE A MINIMUM OF 200 kPa. DO NOT PLACE CONCRETE IN FOOTING FORMS UNTIL BEARING CAPACITIES ARE CHECKED AND APPROVED IN WRITING BY THE GEOTECHNICAL ENGINEER. FOOTINGS MAY HAVE TO BE LOWERED TO ACHIEVE PROPER BEARING. DURING COLD WEATHER, SOILS SHALL BE PROTECTED AGAINST FREEZING TO PREVENT FROST HEAVE, LOSS OF BEARING CAPACITY, OR OTHER DAMAGE TO STRUCTURAL MEMBERS, SLABS ON GRADE, MASONRY, FORMWORK, AND OTHER ITEMS SUPPORTED THEREON.
- ALL FOOTINGS SUBJECT TO FREEZING CONDITIONS SHOULD HAVE A MINIMUM OF 1220mm OF SOIL COVER FOR FROST PROTECTION UNLESS NOTED OTHERWISE.
- REMOVE ALL LOOSE ROCK DOWN TO SOUND BEDROCK TO MAXIMUM REFUSAL DEPTH POSSIBLE WITH MECHANICAL EQUIPMENT. OBTAIN GEOTECHNICAL ENGINEER'S APPROVAL, IN WRITING, OF ROCK BEARING CAPACITY BEFORE PLACING FOOTINGS.
- ANY EXCAVATION IN PROXIMITY OF EXISTING FOOTINGS MUST BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO COMMENCEMENT AND COMPLETED UNDER THEIR CONTINUAL SUPERVISION.
- ANY FOOTING ELEVATIONS INDICATED ON THE DRAWINGS ARE GENERAL AND SHALL BE USED FOR ESTIMATING AND BIDDING PURPOSES ONLY. FOOTINGS MAY HAVE TO BE PLACED AT DIFFERENT ELEVATIONS AS A RESULT OF LOCAL SOIL CONDITIONS, UNDERGROUND SERVICES, AND TO ACCOMMODATE OTHER MECHANICAL AND ELECTRICAL SERVICES. FOLLOW TYPICAL DETAILS SHOWN ON THE DRAWINGS FOR FOOTING PLACEMENT RELATIVE TO ADJACENT FOOTINGS AND OTHER STRUCTURES/SERVICES AND LOCATE AS DIRECTED BY TYPICAL DETAILS.
- COORDINATE CONSTRUCTION WITH UNDERSLAB SERVICES AS SHOWN ON MECHANICAL, ELECTRICAL, ARCHITECTURAL, AND CIVIL DRAWINGS.
- ALL GEOTECHNICAL MATERIALS BENEATH SLABS ON GRADE (INCLUDING REMOVAL OF NON-ACCEPTABLE MATERIALS AND REPLACEMENT WITH APPROVED MATERIALS) SHALL BE PREPARED AS DETAILED IN THE GEOTECHNICAL REPORT UNLESS SPECIFICALLY NOTED OTHERWISE. SUB BASE UNDER SLABS ON GRADE SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY. COMPACTION SHALL BE VERIFIED IN WRITING BY THE GEOTECHNICAL ENGINEER PRIOR TO CASTING OF SLABS.
- BACKFILL BEHIND RETAINING WALLS SHALL BE CARRIED OUT IN LIFTS. LIFT THICKNESS AND COMPACTION EQUIPMENT MUST BE COMPATIBLE TO PROVIDE ADEQUATE COMPACTION.CONTRACTOR IS RESPONSIBLE TO ENSURE COMPACTION EQUIPMENT AND PROCEDURES DO NOT OVERLOAD RETAINING WALL DURING CONSTRUCTION. FREE STANDING RETAINING WALLS ARE DESIGNED FOR ACTIVE EARTH PRESSURES AND RETAINING/FOUNDATION WALLS WHICH ARE PART OF A BUILDING ARE DESIGNED FOR AT REST EARTH PRESSURE UNLESS NOTED OTHERWISE.

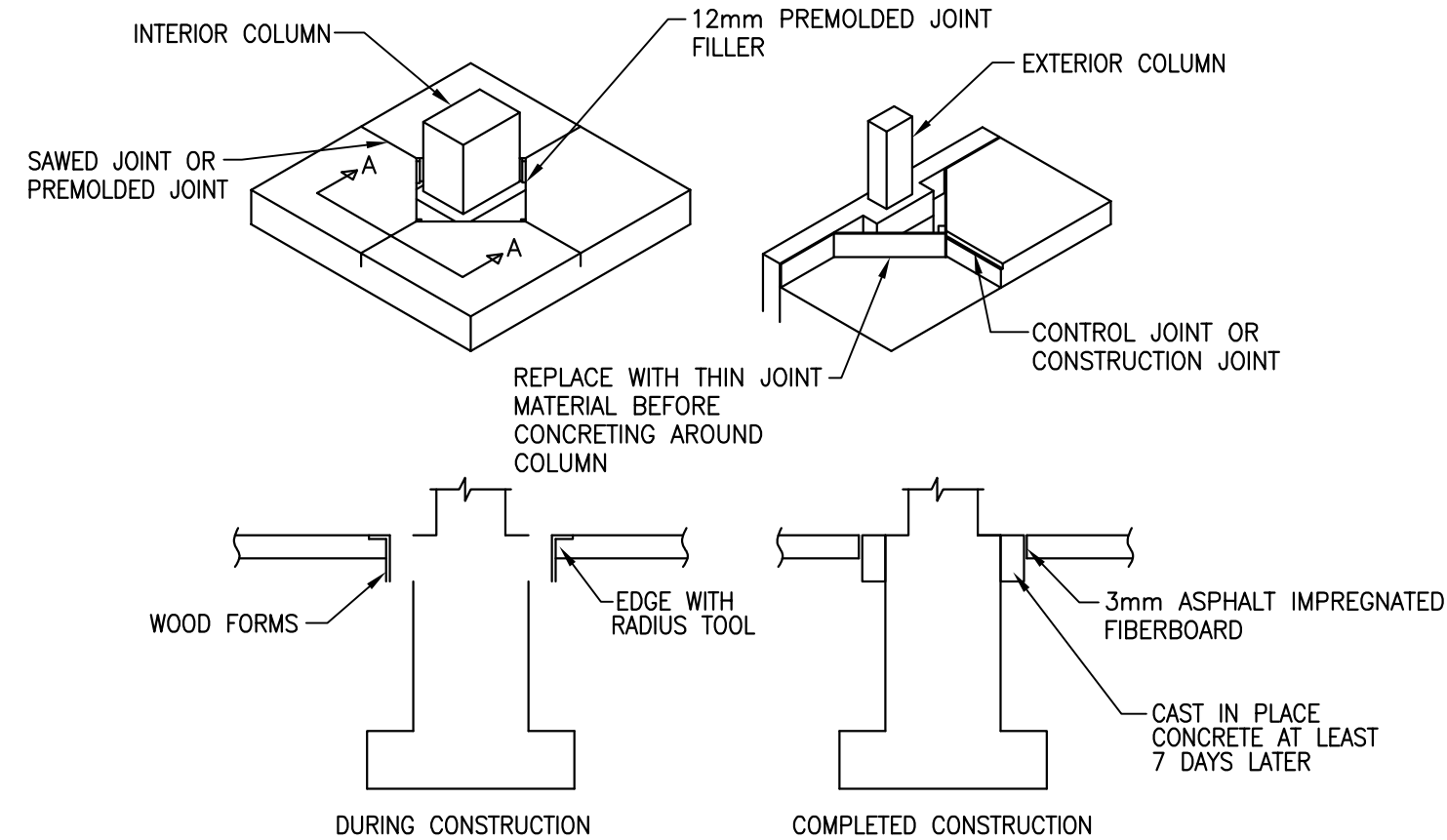
DESIGN NOTES

- ALL REINFORCED CONCRETE ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA STANDARD A23.3. ALL STRUCTURAL STEEL ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CAN/CSA-S16. ALL STRUCTURAL TIMBER ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA STANDARD 086. ALL STRUCTURAL MASONRY ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA STANDARD S304.1.
- ALL LOADS INDICATED ON DRAWINGS ARE SERVICE (UNFACTORED) LOADS UNLESS NOTED.
- THE STRUCTURE HAS NOT BEEN DESIGNED FOR ANY FUTURE EXTENSIONS U/N.
- DESIGN LOAD CRITERIA:**
IMPORTANCE CATEGORY: NORMAL (LOW/NORMAL/HIGH/POST DISASTER)
EARTHQUAKE DESIGN FACTORS:
S_o(0.2)= 0.110 S_o(0.5)= 0.082 S_o(1.0)= 0.053 S_o(2.0)= 0.029
S_u(5.0)= 0.0076 S_u(10.0)= 0.0032 PGA= 0.064 PGV= 0.068
R_u= 1.5 R_o= 1.5
SITE CLASS= C (REFER TO GEOTECHNICAL REPORT)
I_e F_oS_o(0.2)= 0.110 (SEISMIC HAZARD INDEX)

ALL NON-STRUCTURAL COMPONENTS & EQUIPMENT AND THEIR CONNECTIONS TO THE STRUCTURE (ALL BY OTHERS) AS DEFINED IN CLAUSE 4.1.8.18 OF THE 2015 NBCC SHALL BE DESIGNED TO ACCOMMODATE DEFLECTIONS AND LOADS NOTED THEREIN FOR THE IMPORTANCE FACTOR NOTED ABOVE.

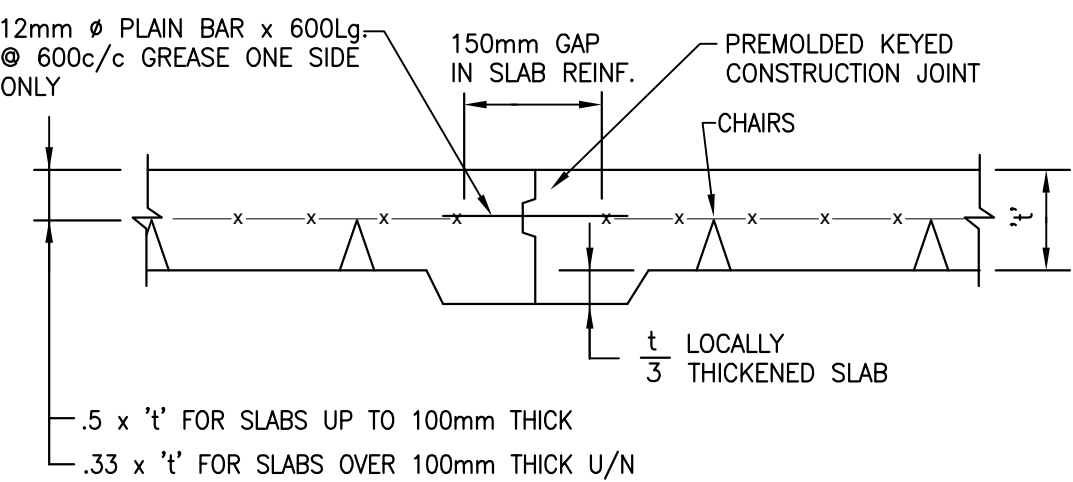
WIND LOAD:
q_v10= 0.45 kPa
q_v0= 0.58 kPa

SNOW LOADING: S_a= 1.9 kPa
RAIN LOAD: S_r= 0.6 kPa
- ROOFS HAVE BEEN DESIGNED FOR CONTROL FLOW DRAINS. MAXIMUM DEPTH OF RETAINED WATER TO BE 150mm.

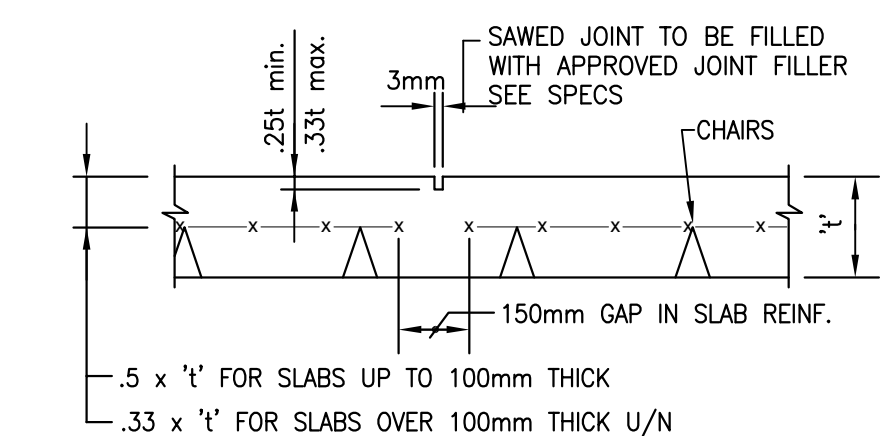


SECTION A-A

ISOLATION JOINT -INT. AND EXT. COLUMN

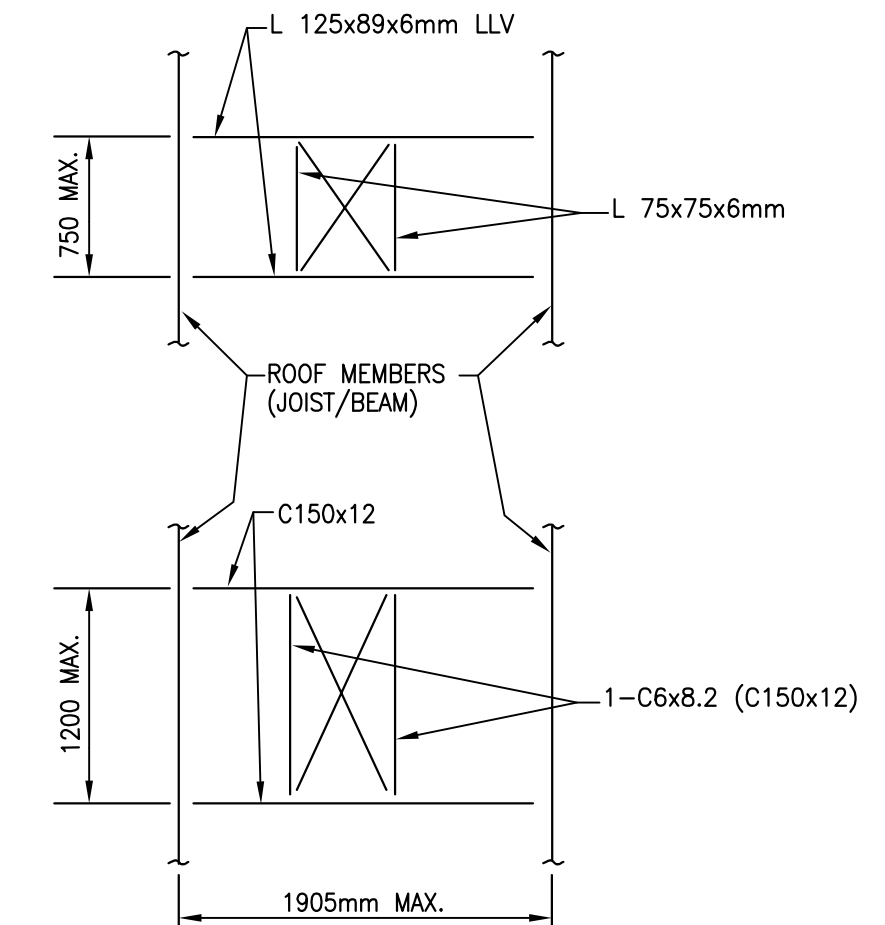


CONSTRUCTION JOINT SLAB ON GRADE



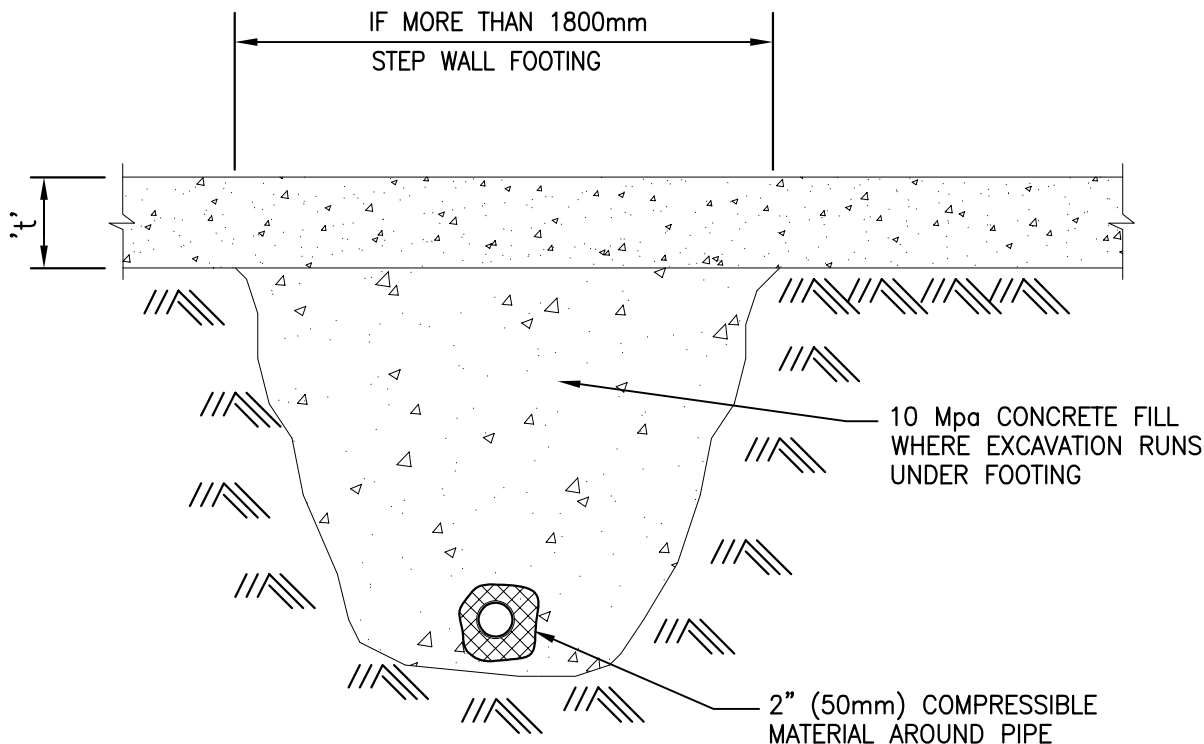
NOTE:
SPACING OF CONTROL JOINTS SHALL BE A MAXIMUM OF 36 TIMES THE SLAB THICKNESS IN BOTH DIRECTIONS

SECTION- CONTROL JOINT SLAB ON GRADE

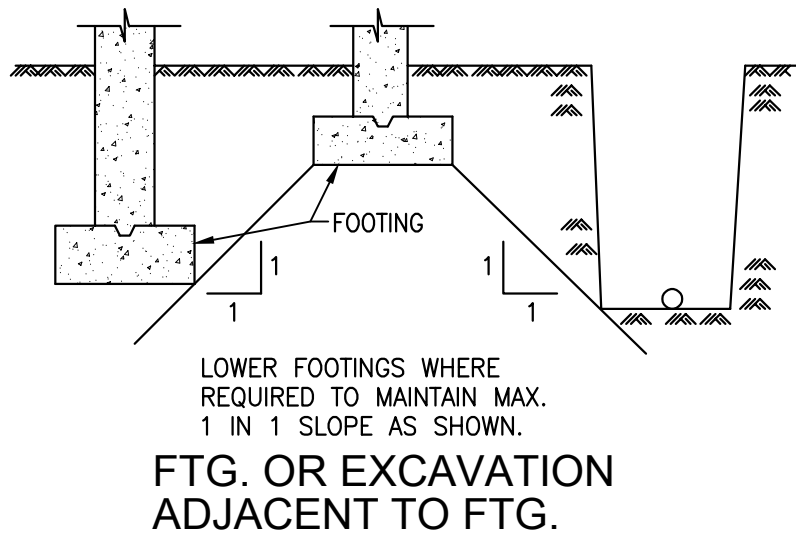


NOTE: FOR LOCATION SEE MECH. & OTHER DWGS. WHERE HEAVY EQUIPMENT IS TO BE SUPPORTED PROVIDE EXTRA JOISTS TO ENGINEERS APPROVAL.

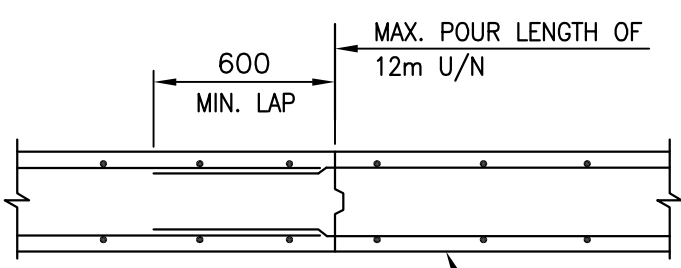
TYPICAL FRAMING AROUND ROOF OPENINGS



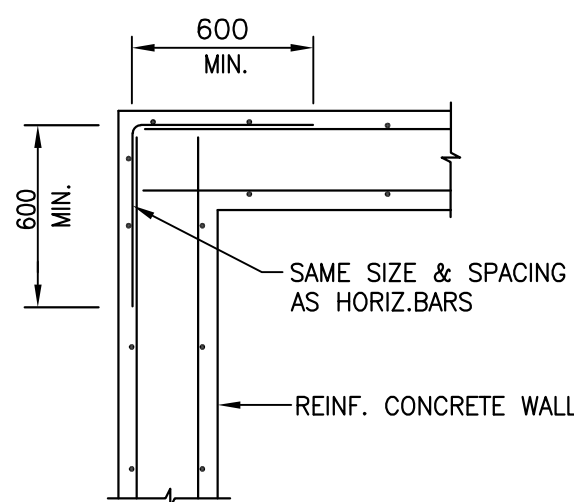
BACKFILL DETAIL UNDER FOOTING



FTG. OR EXCAVATION ADJACENT TO FTG.



PLAN- WALL CONSTRUCTION JOINT



PLAN- WALL CORNER

3	ISSUED FOR TENDER	02/18 2021
2	99%-RS4 SUBMISSION	01/29 2021
1	75%-RS4 SUBMISSION	12/16 2020
revisions		date

project

MCI HEAVY
EQUIPMENT FACILITY

BIO DARTMOUTH

drawing

design

STRUCTURAL
TYPICAL DETAILS
AND NOTES

designed J.R.

conqu

date OCTOBER 2020

drawn R.L.

dessiné

date OCTOBER 2020

approved

approuvé

date

Tender

Soumission

PWGSC Project Manager

Administrateur de projets TPSCG

project number

no. du projet

R.110935.001

drawing no.

no. du dessin

S01 OF 5