MSE-001-1 General - Project documents

1. Structural drawings shall be read in conjunction with project specifications and all other relevant contract documents and specifications. In the event of discrepancy between these structural drawings and the project specifications, the more stringent of the two shall govern.
2. Contractor shall verify all existing conditions and dimensions at the site. Contractor shall use structural drawings in conjunction with all relevant consultant drawings and shall report any discrepancies or ambiguities requiring clarification or revision, and any perceived deficiency or omission before commencing with the work.
3. Refer to other relevant consultant drawings for locations of non-structural items, openings and equipment. Where shown on structural drawings and unless specifically noted, these items are only indicated approximately as to size and location.
4. Contractor shall verify all dimensions with the architectural, mechanical and electrical drawings prior to construction and report discrepancies to the architect for review and comment before proceeding with work. Scales noted on the drawings are provided for general information only. Do not obtain dimensional information by scaling from the drawings.
5. No modification to the structural elements and no openings, perforations or cuts are allowed unless specifically shown on these drawings and modified only with written consent from the Structural Engineer.
6. If details in these drawings differ from the applicable detail in the typical details section (not necessarily referenced on the plans), the more stringent of the two shall govern.
7. Structural drawings indicate general and typical details of construction. Where conditions are not specifically indicated, but are similar in character to details shown, similar details of construction shall be used. This is subject to review and approval by the Structural Engineer throughout the shop drawing review process.
8. These drawings show requirements for the completed structure only. No provisions or allowances have been made for the construction sequence or methods unless specifically noted on these drawings.
9. The use of these drawings is limited to that identified in the revision column. Do not use these drawings unless marked "Issued for Construction" in the revision column.
10. All drawings, specifications and related documents are the property of Moses Structural Engineers Inc. and may not be used or reprinted without written consent.
11. This work applies to the design of new structure and modifications to existing structures. The remainder of the existing structures have not been checked by Moses Structural Engineers Inc. and remain responsibility of others.

MSE-001-2 General - Codes and standards

1. All materials, workmanship, design and construction shall conform to the project documents, the 2012 Ontario Building Code, any applicable acts of authority having jurisdiction and federal and municipal regulations and by-laws.
2. In addition, the following standards shall apply, where more stringent, and as modified by the building code:
   a. CAN/CSA A23.1, A23.2, and A23.3 for concrete construction requirements.
   b. CSA S304.1, CSA A179, and CSA A371 for masonry construction requirements.
   c. CAN/CSA S16 for steel construction requirements.
   d. CAN/CSA O86 for wood construction requirements.
   e. CSA S157 for aluminium construction requirements.
3. Where project documents reference documents and standards, they shall be the latest editions, unless otherwise noted.

MSE-001-3 General - List of submissions and review process

1. Where submissions listed below are required to be sealed by an engineer, the Professional Engineer shall be registered in the jurisdiction noted in MSE-001-2 and provide proof of a valid Certificate of Authorization in that jurisdiction, as required.
2. The following submissions are required for this project:
   a. Concrete mix designs for each element and strength of cast-in-place concrete.
   b. Structural steel mill certificates.
   c. Reinforcing steel shop drawings.
   d. Formwork and/or shoring drawings.
   e. Pour schedule showing location of all proposed construction joints.
   f. Structural steel shop drawings, sealed by a Professional Engineer.
   g. Hollow core slab shop drawings, sealed by a professional engineer.
   h. Calculations, upon request, sealed by a Professional Engineer for any of the above-noted submittals.
3. Submit electronic copy or four (4) hardcopies of shop drawings for review by the Structural Engineer. Shop drawings to show complete information for the fabrication and erection of the structural components.
4. Only shop drawings marked "No exceptions", "Note comments" or "Revise as noted" may be used by the contractor in the work. Shop drawings marked "Rejected" or "Resubmit" shall be corrected and completed as required and resubmitted to the Structural Engineer for approval before they may be used in the work.
5. Dimensions and quantities on shop drawings are not reviewed by the Structural Engineer. The Engineer's review is only to assess that the submitted shop drawings reflect the intent of the structural design.
6. Contractor to review and stamp the shop drawings prior to the review by the Engineer. Contractor to review drawings for conformance with the means, methods, techniques, sequences and operations of construction, as well as for all applicable safety precautions.
7. In case of deviations, discrepancies or conflicts between shop drawing submittals and contract documents, the design drawings and specifications shall control and shall be followed regardless of whether the discrepancy is discovered before or after the review by the Structural Engineer. The Engineer's review does not relieve the contractor of the responsibility of verifying that work is complete, accurate and in conformity with project documents.
8. Shop drawing submittals processed by the consultants are not change orders.
9. Contractor-initiated changes shall be explicitly submitted in writing to the consultants for approval, prior to fabrication or construction. Changes shown on shop drawings only will not satisfy this requirement.

MSE-001-4 General - Miscellaneous

1. Provide temporary bracing and shoring for construction loading conditions and stability of the structure during construction. Construction loads shall not exceed horizontal and vertical design loads as noted in these drawings. It shall also be the contractor's responsibility to provide all necessary bracing, shoring, sheet piling or other temporary supports to safeguard all existing or adjacent construction affected by this work.
2. Contractor to retain a Professional Engineer registered in the jurisdiction noted in MSE-001-3 to design and take responsibility for any temporary shoring, bracing, scaffolding or other designs required to complete construction.
3. Contractor shall be responsible for all safety precautions and the methods, techniques, sequences or procedures required to perform the work pursuant to the Occupational Health and Safety Act (OHSA).
4. Where the scope of the structural work is delineated into phases on the drawings and details, the scope of the initial phase(s) shall include the supply and installation of all work shown cast or set into this initial work, as well as all dowels and the like that may project out of this work, unless noted otherwise on the drawings and details.
5. Unless specifically shown on these drawings, do not cut or drill any openings or cope structural elements without written permission from the Structural Engineer.
6. All dimensions are in metric units unless noted otherwise.
7. Structural plans show bearing walls and columns above the storey plan being shown.
8. Attachment of non-structural elements for seismic loads is the responsibility of others.

MSE-002 Design criteria

1. All design has been completed in accordance with the 2012 Ontario Building Code (OBC), for Quinte West, Ontario.

MSE-002-1 Design criteria - Loading

1. Specified roof live/snow load schedule.

TABLE 002-1.1

Item		Value	Reference (OBC)
Roof live load		1.00 kPa	Table 4.1.5.3
ULS importance factor (Normal)	(I_s)	1.00	Table 4.1.6.2.A
SLS importance factor (Normal)	(I_s)	0.90	Table 4.1.6.2.A
Ground snow load	(S_s)	1.6 kPa	Table 2, SB-1
Basic roof snow factor	(C_b)	0.80	Clause 4.1.6.2 (2)
Wind exposure factor	(C_w)	1.00	Clause 4.1.6.2 (3) and (4)
Slope factor	(C_s)	1.00	Clause 4.1.6.2 (5), (6) and (7)
Accumulation factor	(C_a)	1.00	Clause 4.1.6.2 (8)
Associated rain load	(S_r)	0.40 kPa	Table 2, SB-1
Flat roof snow load	(S)	1.68 kPa	Clause 4.1.6.2 (1)
Snow drift and sliding		See plan	Article 4.1.6.5 - 4.1.6.8, 4.1.6.11
Rainwater ponding load		Min 1.0 kPa or see plan	Table 2, SB-1 for 1-day rain

2. Specified gravity load schedule.

TABLE 002-1.2

Area/Component	Total dead load	Specified live load
Ground floor	3.9	4.8
Floors (residential units)	5.85	1.9
Roof	5.85	(a)
Common areas	5.85	4.8
All loads shown are in kPa		

   a. Snow and wind loads per tables 002-1.1 & 002-1.3.

3. Specified lateral load design schedule.

TABLE 002-1.3

Wind load data			
Item		Value	Reference (OBC)
ULS importance factor (Normal)	(I_w)	1.00	Table 4.1.7.3
SLS importance factor (Normal)	(I_w)	0.75	Table 4.1.7.3
Reference velocity pressure	($q_{1/50}$)	0.47 kPa	Table 2, SB-1
Exposure factor	(C_e)	1.03	Clause 4.1.7.3 (5) and (7)
Topographic factor	(C_t)	1.00	Article 4.1.7.4
External gust effect factor	(C_g)	2.0	Clause 4.1.7.3(8)(a)
External pressure factor	(C_p)		Article 4.1.7.5 and 4.1.7.6
Comb. ext. pressure & gust factor	(C_pC_g)	Varies	Figure 4.1.7.6.A
Internal gust factor	(C_{gi})	2.0	Clause 4.1.7.3 (10)
Internal pressure factor	(C_{pi})	-0.45 to 0.3	Article 4.1.7.7
Non-uniformly distributed openings from Table 4.1.7.7 have been considered for internal pressure. All doors and windows must be non-significant or designed to be wind resistant and must remain closed during storms.			
Seismic load data			
Item		Value	Reference (OBC)
ULS importance factor (Normal)	(I_E)	1.00	Table 4.1.8.5
SLS importance factor (Normal)	(I_E)	1.00	Table 4.1.8.5
Peak ground acceleration	(PGA)	0.104	Table 3, SB-1
Peak ground velocity	(PGV)	0.086	Table 3, SB-1
0.2 sec spectral acceleration	(S_a (0.2))	0.167	Table 3, SB-1
0.5 sec spectral acceleration	(S_a (0.5))	0.105	Table 3, SB-1
1.0 sec spectral acceleration	(S_a (1.0))	0.060	Table 3, SB-1
2.0 sec spectral acceleration	(S_a (2.0))	0.030	Table 3, SB-1
5.0 sec spectral acceleration	(S_a (5.0))	0.0077	Table 3, SB-1
10.0 sec spectral acceleration	(S_a (10.0))	0.0032	Table 3, SB-1
Ductility force mod. factor	(R_d)	1.5	Masonry (conventional construction shear walls) table 4.1.8.9
Overstrength mod. factor	(R_0)	1.5	Masonry (conventional construction shear walls) table 4.1.8.9
Site class		D	Per Geotechnical report

4. Wind uplift on roofs.
   Supplier-designed roof components (for example, trusses, joists, steel deck) and their connections are to be designed for a net factored uplift of 1.0 kPa minimum.

MSE-002-1.1 Design criteria - Lateral Loads

1. Seismic force resisting system (SFRS):

System and connections:	Reinforced masonry shear walls
Ductility modification factor:	Rd = 1.5
Over-strength modification factor:	Ro = 1.5
Reference:	CSA S304
Fundamental period (Ta)	
OBC Clause 4.1.8.11 (3)	Ta = 0.227 sec, in both directions
5% damped spectral response	NBC Online Seismic Hazard Calculation
	Sa(T= 0.2) = 0.167
	Sa(T= 0.5) = 0.105
	Sa(T= 1.0) = 0.060
	Sa(T= 2.0) = 0.030
	Sa(T= 5.0) = 0.0077
	Sa(T= 10.0) = 0.0032
	PGA = 0.104
	PGV = 0.086

Acceleration and velocity based site coefficients:

Site class:	C (see MSE-003-1)
Reference peak ground acceleration	PGA_{ref} = 0.8*0.104 = 0.0832
Acceleration based site coefficients:	F(0.2) = 1.24
	F(0.5) = 1.47
	F(1.0) = 1.55
	F(2.0) = 1.57
	F(5.0) = 1.58
	F(10.0) = 1.49
Velocity based site coefficient:	Fv = 1.4
Design spectral response acceleration:	$F(0.2)S_a(0.2)$ or $F(0.5)S_a(0.5)$ = 0.207 (whichever is larger for T ≤ 0.2 sec)
	$F(0.5)S_a(0.5)$ = 0.154
	$F(1.0)S_a(1.0)$ = 0.093
	$F(2.0)S_a(2.0)$ = 0.047
	$F(5.0)S_a(5.0)$ = 0.0122
	$F(10.0)S_a(10.0)$ = 0.0048
Importance factor	IE = 1.0
Higher mode factor	Mv = 1.0

Torsional sensitivity parameter

North-South direction:	B = 1.5
East-West direction:	B = 1.33

Structural irregularity review (OBC Article 4.1.8.6):

Type 1 Vertical stiffness irregularity:	Not present
Type 2 Mass irregularity:	Not present
Type 3 Vertical geometric irregularity:	Not present
Type 4 In-plane discontinuity in vertical SFRS:	Not present
Type 5 Out-of-plane offsets	Not present
Type 6 Weak storey	Not present
Type 7 Torsional sensitivity	Not present
Type 8 Non-orthogonal systems	Not present
Type 9 Gravity-induced lateral demand	Not present
Conclusion:	Building is regular.

Dynamic analysis not required per OBC Clause 4.1.8.7 (1)(c)

Governing static force procedure formula:

V = larger of 2/3 S(0.2) IE W/(R_dR_o) and S(0.5) IE W/(R_dR_o)

= max of 2/3 (0.207)(1.0)(1.0)W/(1.5*1.5) and 0.154 (1.0)/(1.5*1.5) in both directions

Base shear as a fraction of the weight:

V/W = 0.062 in both directions

Base shear and overturning moments:

V = 1520 kN	in both directions
M = 10,440 kN-m	in both directions

SFRS Foundation design:

As per OBC Article 4.1.8.16, foundations have been designed to resist the lateral load capacity of the SFRS. Foundation design is to CSA A23.3. Capacity of SFRS determined per CSA O86.

SFRS Diaphragm design:

Diaphragm design per OBC Clause 4.1.8.15 (2)(c), with RdR0= 2.0. Design of deck to CSA A23.3 and connections to SFRS to CSA S304.

2. Wind

Importance category:	Normal
Importance factor:	Iw = 1.0 (ULS)
	Iw = 0.75 (SLS)
Refer velocity pressure:	q 1/50 = 0.47 kPa
Terrain type:	Open
Max height above grade:	H = 11.4 m
Plan width:	Ds = 19.9 m
	H/Ds = 11.4/19.9
	= 0.57
	H < 20 m
Building is:	Mid Rise
Ce (at H):	1.03
Ct:	1.00
Cp Cg	
NS Wind:	2.0
EW Wind:	2.0
Factored design Loads:	1.4 W
NS Wind	
Base Shear:	641 kN
Base Overturning Moment:	3,586 kNm
EW Wind	
Base Shear:	203 kN
Base Overturning Moment:	1,206 kNm

MSE-002-2 Design criteria - Serviceability

1. Typical horizontal elements have been designed so that the theoretical deflections do not exceed the following values.

TABLE 002-2.1

Type of member	Deflection to be considered	Deflection limit
Flat roofs not supporting non-structural elements and finishes likely to be damaged by large deflections	Immediate deflection due to specified live/snow load	L/180
Floors not supporting non-structural elements likely to be damaged by large deflections	Immediate deflection due to specified live/snow load	L/360
Roofs or floors supporting non-structural elements and finishes likely to be damaged by large deflections	Portion of deflection occuring after attachment of non-structural elements	L/360
Roofs or floors supporting non-structural elements and finishes not likely to be damaged by large deflections	Sum of long-term deflections due to permanent loads and immediate deflection due to specified live load	L/300
Members of all floors and roofs	Total load	L/360
Green roof	Total load	L/360

2. Perimeter or spandrel members (supporting cladding, pre-cast or masonry walls) have been designed for an allowable deflection of one half the values on Table 002-2.1 or 20 mm, whichever is less.
3. The inter-storey drift due to wind has been limited to h/500 (where h is the floor to floor height between adjacent floors). Under seismic loads, the inter-storey drift has been limited to 0.02 h.

MSE-002-3 Design criteria - Provision for future extensions and existing structures

1. This structure has not been designed for any future extensions or changes in occupancy.

MSE-002-4 Design criteria - Fire resistance rating requirements

1. Unless otherwise noted, fire proofing methods and materials for structural members are not shown on structural drawings.
2. Refer to architectural drawings and specifications for fire rating requirements, fireproofing methods and materials. Each structural element shall be fireproofed as required to meet these requirements.
3. Refer to Table 010-2.1 for reinforcement cover to achieve required fire ratings.

MSE-003-1 Geotechnical considerations - Geotechnical report

1. Refer to Geotechnical report prepared by Cambium report number 13324-049, dated 2023/06/15.
2. Design of foundations is based on the following from the geotechnical report capacities:
   a. Pad footings: 150 kPa allowable bearing pressure (SLS)
      200 kPa ultimate bearing pressure (ULS)
   b. Strip footings: 150 kPa allowable bearing pressure (SLS)
      200 kPa ultimate bearing pressure (ULS)
3. Provide minimum frost protection cover of 1200 mm.
4. Contractor to read Geotechnical Report and become familiar with its findings and recommendations. copy of the report is available from the Consultant. Visit the site as required.
5. No responsibility is accepted by the owner or the Consultant for the correctness of the report, nor shall its accuracy or any omissions affect the provisions of this contract.

MSE-003-2 Geotechnical considerations - Foundations

1. Unless specifically noted, found all footings on naturally consolidated undisturbed soil capable of sustaining the above mentioned bearing pressures.
2. Foundation bearing material shall be protected from rain, frost, snow and water infiltration. Disturbed and softened material shall be removed and the foundation depth lowered to suit. For isolated footings, if the foundation depth is lowered by more than 600 mm, notify the Structural Engineer.
3. Centre all footings under centroid of columns and walls unless specifically noted otherwise.
4. No foundations shall be poured before bearing material has been reviewed and approved by the Geotechnical Engineer. MSE is not responsible for verifying bearing capacities of soils. Contractor to provide notice prior to concrete pours as described in MSE-060 Field Review. Provide 50 mm ground seal under footings as required by soil conditions after approval. Pour foundations on the same day that approval was received from Geotechnical Engineer.
5. Foundation depths as indicated on the drawings are general and represent minimum values to be used. Firm bearing depths for footings and fill shall be established from the geotechnical report. Found footings exposed to freezing below the minimum frost protection depth under finished grade as mentioned above.
6. Provide temporary frost protection, during construction, for all interior footings which are not founded at the minimum frost protection depth as mentioned above.
7. Before proceeding with the work, contact Geotechnical Engineer and Structural Engineer for written instructions regarding site conditions that differ from what is shown on these drawings and indicated in the Geotechnical Report.
8. When located adjacent to existing footings, found new footing at the same elevation as existing ones unless specifically noted otherwise.
9. Insulation is shown only where required for protection of the foundations from damage due to frost action. Refer to architectural drawings for additional foundation insulation not shown on the structural drawings.
10. Provide footings as per typical details for all load bearing and for non-load bearing walls thicker than 190 mm. All non-load bearing walls 190 mm thick or less shall rest on a slab thickening as per typical details or as noted on the drawings.
11. The line of slope between adjacent footings or excavations or along stepped footings shall not exceed a rise of 7 in a run of 10.
12. Concrete placed under water shall conform to section 19.6 of CAN/CSA A23.1.
13. See architectural drawings and Geotechnical report for all elevations and drainage slopes.
14. Where unsuitable bearing material is found at the indicated foundation depth, excavate to suitable bearing material as approved by the Geotechnical Engineer. Fill the excavation with a lean mix concrete such that the foundations are founded at the indicate depths. The concrete shall fill an area no less than the plan dimensions of the foundation(s).

MSE-003-3 Geotechnical considerations -Excavation, backfill and compaction

1. The contractor is responsible for shoring, underpinning and protection of existing and adjacent structures against detrimental influence from the excavation process (drainage included). All documents relating to this work shall be sealed by a Professional Engineer registered in the jurisdiction noted in MSE-001-3. Design and field review of excavation, shoring and backfill is not carried out by MSE.
2. Footings may have to be lowered to accommodate mechanical or electrical services. Footings shall not be undermined by excavation for services or pits. Refer to other consultant drawings for locations of such services.
3. Retaining walls have been designed to resist lateral pressures for free draining compacted granular backfill unless specifically noted in these drawings. Material to be approved by Geotechnical Engineer.
4. Slabs-on-grade, floor construction and all structural elements framing into retaining walls must be in place and have attained 70% of specified strength before backfilling.
5. Where slabs-on-grade tie into the top of a retaining wall, the wall shall be adequately shored until the slab has been poured and attained at least 70% of its specified strength and a minimum of 14 days.
6. Backfilling against foundation walls where there is grade on both sides shall be carried out in such a manner that the level of backfilling on either side of the wall never differs by more than 500 mm from the level on the other side of the wall.
7. Place slabs-on-grade on material capable of sustaining a specified uniform distributed pressure of 25 kPa without significant relative settlement with respect to the building footings. See Geotechnical report/specifications for sub-grade design and preparation.
8. Minimum compaction under all slabs (and footings where applicable) for compacted granular fill is 98% corrected standard proctor density. Geotechnical Engineer or Testing Agency to confirm prior to placing concrete.

MSE-010-1 Cast-in-place concrete notes - Concrete properties

1. Concrete to conform to the requirements of CAN/CSA A23.1 and Table 010-1.1. All cement to be Type 10 Portland Cement and normal weight unless noted otherwise.

TABLE 010-1.1

Location/member		Minimum compressive strength f'_c at 28 days (MPa)	Slump [b] (mm)	Exposure class	Maximum water/cement ratio	Air content (%)
Concrete exposed to de-icing chemicals	Footings	35	75 ± 20	C-1,S-3[a]	0.40	5 - 8
	Foundation walls	35	75 ± 20	C-1[a,c]	0.40	5 - 8
	Retaining walls	35	75 ± 20	C-1[a,c]	0.40	5 - 8
	Shear walls	35	75 ± 20	C-1[a,c]	0.40	5 - 8
	Columns	35	75 ± 20	C-1[a,c]	0.40	5 - 8
	Structural slabs/beams	35	75 ± 20	C-1[a]	0.40	5 - 8
	Slab-on-grade (not exposed to freezing and thawing)	30	40 ± 20	C-4	0.55	4 - 7
	Slab-on-grade (exposed to freezing and thawing)	32	40 ± 20	C-2	0.45	5 - 8
	Sidewalks, curbs and paving slabs	32	40 ± 20	C-2	0.45	5 - 8
Concrete exposed to freeze/thaw without de-icing chemicals	Footings	30	75 ± 20	F-2[c]	0.55[c]	4 - 7
	Foundation walls	30	75 ± 20	F-2[c]	0.55[c]	4 - 7
	Columns	30	75 ± 20	F-2[c]	0.55[c]	4 - 7
	Retaining walls	30	75 ± 20	F-2[c]	0.55[c]	4 - 7
	Shear walls	30	75 ± 20	F-2[c]	0.55[c]	4 - 7
	Structural slabs/beams	30	75 ± 20	F-2[c]	0.55[c]	4 - 7
	Slab-on-grade	32	40 ± 20	C-2	0.45	5 - 8
Concrete not exposed to freeze/thaw or de-icing chemicals	Footings	30	75 ± 20	S-3	0.50	4 - 7
	Foundation walls	30	75 ± 20	N[c]	c	c
	Shear walls and other walls	30	75 ± 20	N[c]	c	c
	Columns	30	75 ± 20	N[c]	c	c
	Structural slabs/beams	30	75 ± 20	N[c]	c	c
	Concrete on steel deck	25	75 ± 20	N[c]	c	c
	Slab-on-grade	30	100 ± 20	S-3	0.50	4 - 7
	Housekeeping pads	30	75 ± 20	S-3	0.50	4 - 7
	Skim slabs	30	75 ± 20	S-3	0.50	4 - 7

   a. Concrete shall have minimum cementing materials content of 320 kg/m³.
   b. Specified slump refers to slump before the addition of any superplasticizing admixtures, greater slumps are not acceptable. Slump after the addition of superplasticizing admixture shall remain below the point at which segregation will occur. All admixtures shall conform to CSA A23.5.
   c. For walls and columns below grade level or slabs in contact with grade, provide concrete for exposure class S-3, water-cement ratio of 0.50 and 4 to 7% air content, unless protected by a waterproof membrane.
2. Special handling and placing methods or the use of a superplasticizer will be required.
3. Specified air content is for 14 to 20 mm aggregate only. Adjust air content for different size aggregates.
4. Maximum aggregate size is 10 mm for concrete toppings and masonry grout.
5. Where any two different structural elements are cast monolithically, cast both elements with concrete of the higher specified strength.
6. Exterior concrete and frost slabs shall be considered exposed to de-icing chemicals. Direct corrosion inhibitor shall also be added to the concrete where reinforcement is indicated. See architectural drawings for other areas exposed to de-icing chemicals.
7. No Calcium chloride, in any form, is permitted without written permission from the Structural Engineer.
8. Fly ash may be used in concrete mixes. Fly ash shall conform to ASTM C618, class F and its addition shall not exceed 15% of the cement weight.
9. Submit mix design per MSE-001-03.

ABBREVIATIONS

&	AND
@	AT
AB	ANCHOR BOLT
ADD'L	ADDITIONAL
ALT	ALTERNATE
BTW	BETWEEN
BCE	BOTTOM CHORD EXTENSION
BLL	BOTTOM LOWER LAYER
BOT	BOTTOM
BUL	BOTTOM UPPER LAYER
CANT	CANTILEVER
CONC	CONCRETE
CONT	CONTINUOUS
CF	FACTORED COMPRESSION FORCE
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CLT	CROSS LAMINATED TIMBER
CLR	CLEAR
C/W	COMPLETE WITH
CS	COUNTERSINK
CSP	CANADIAN SOFTWOOD PLYWOOD
CL	CENTERLINE
COL	COLUMN
DL	DEAD LOAD
DO	DO OVER
DP	DEEP
DFIR	DOUGLAS FIR
EA	EACH
EE	EACH END
EF	EACH FACE
EL	ELEVATION
ES	EACH SIDE
EW	EACH WAY
EXT	EXTERIOR
EXIST	EXISTING
FDN	FOUNDATION
FTG	FOOTING
GALV	GALVANIZED
GL	GLULAM
GrL	GRID LINE
GT	GIRDER TRUSS
H1E	HOOK ONE END
H2E	HOOK TWO ENDS
HDG	HOT DIPPED GALVANIZED
H&V	HORIZONTAL AND VERTICAL
HORIZ	HORIZONTAL
I/F	INSIDE FACE
INT	INTERIOR
KD	KILN DRIED
LG	LONG
LL	LIVE LOAD
LH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LSL	LAMINATED STRAND LUMBER (TIMBERSTRAND)
LVL	LAMINATED VENEER LUMBER (MICROLLAM)
MAX	MAXIMUM
MF	FACTORED MOMENT
MIN	MINIMUM
NLT	NAIL-LAMINATED TIMBER
NTS	NOT TO SCALE
OC	ON CENTRE
OD	OUTSIDE DIAMETER
O/F	OUTSIDE FACE
PL	PLATE
PLY	PLYWOOD
PSL	PARALLEL STRAND LUMBER (PARALLAM)
P/T	POST-TENSION
PT	PRESSURE TREATED
REINF	REINFORCING
R/W	REINFORCE WITH
SB	SLAB BAND
SIM	SIMILAR
SOG	SLAB ON GRADE
SS	STAINLESS STEEL
STAGG	STAGGER
TBC	TO BE CONFIRMED
T&B	TOP AND BOTTOM
Tf	FACTORED TENSION FORCE
T&G	TONGUE AND GROOVE
THK	THICK
TL	TOTAL LOAD (DL+LL)
TLL	TOP LOWER LAYER
TO	TOP OF
TOS	TOP OF SLAB
TS	TIMBERSTRAND
TUL	TOP UPPER LAYER
TYP	TYPICAL
UDL	UNIFORMLY DISTRIBUTED LOAD
UNO	UNLESS NOTED OTHERWISE
U/S	UNDERSIDE
VERT	VERTICAL
Vf	FACTORED SHEAR FORCE
W/	WITH
WD	WIDTH
WP	WORKING POINT
WWM	WELDED WIRE MESH

DRAWING LIST

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2024/07/30
PROVINCE OF ONTARIO

Project:

32 UNIT AFFORDABLE HOUSING APARTMENT BUILDING

20 SOUTH ST., TRENTON, ON

Project No:
23.012

Scale: AS NOTED
Drawn By: KM
Checked By: AF/MP

MSE START DATE: 19-APR-2023
REVISIONS AND DISTRIBUTION LOG

Rev	Date	Note
	15-JUN-2023	Issued for Coordination
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	18-JAN-2024	Issued for Class "B" Estimate
	12-FEB-2024	Issued for Bldg Permit
	17-JUN-2024	Issued for Tender Coord.
	30-JUL-2024	Issued for Tender

Drawing Title:

GENERAL NOTES

Drawing No:

S001

cm in

MSE-010-2 Cast-in-place concrete notes - Reinforcement

1. Reinforcing bars shall be deformed and shall conform to CAN/CSA G30.18 with fy = 400 MPa.
2. Welded wire fabric to conform to CSA G30.5 or ASTM A1064 with fy = 386 MPa.
3. Weldable low alloy deformed steel reinforcing bars shall be grade 400W and shall conform to CAN/CSA G30.18. Mill certificates shall be supplied to the Structural Engineer for all weldable reinforcing steel prior to welding.
4. Welding of reinforcing steel shall be allowed only where noted on these drawings and shall conform to CSA W186. Written authorization from Structural Engineer is required for any additional welding.
5. Minimum concrete cover to reinforcement in non-corrosive environment:
    a. All concrete cast against and permanently exposed to earth or rock: 75 mm.
    b. All concrete cast against forms per Table 010-2.1:

TABLE 010-2.1

Structural Element	Exposed	Not exposed to earth or weather				
		Fire rating (in hours)				
		0	1½	2	3	4
Beams girders and piles (longitudinal reinforcement)						
35M and smaller	50	40	40	40	40	50
45M	60	45	45	45	45	50
Columns (longitudinal reinforcement)						
35M and smaller	50	40	40	50	50	65
Slabs and walls						
20M and smaller	40	20	20	25	35	40
25M	40	25	25	25	35	40
30M	45	30	30	30	35	40
35M	55	35	35	35	35	40
Ties , stirrups and spirals	40	30				

    i. Provide cover for minimum 2 hour fire rating unless otherwise noted.
    ii. Reinforced concrete walls which may be exposed to fire on both sides simultaneously shall have the minimum cover requirements for columns.
6. Minimum concrete cover to reinforcement exposed to de-icing chemicals:
    a. Parking slabs, ramps, truck docks (including wearing slabs): 40 mm for top and 30 mm for bottom reinforcement.
    b. Vertical elements: 40 mm for wall reinforcement (horizontal and vertical) and 40 mm for column ties.
7. Unless otherwise noted, provide minimum rebar splice lengths as per Table 010-2.2 to Table 010-2-5:

TABLE 010-2.2

Bar size	Tension development length for concrete strengths (mm)				
	20 MPa	25 MPa	30 MPa	35 MPa	40 MPa
10M	350 (450)	300 (400)	300 (350)	300 (350)	300 (300)
15M	500 (650)	450 (600)	400 (550)	400 (500)	350 (450)
20M	650 (850)	600 (750)	550 (700)	500 (650)	500 (600)
25M	1050 (1350)	900 (1200)	850 (1100)	800 (1000)	750 (950)
30M	1250 (1600)	1100 (1450)	1000 (1300)	950 (1200)	900 (1150)
35M	1450 (1850)	1300 (1650)	1200 (1500)	1100 (1400)	1000 (1300)

TABLE 010-2.3

Bar size	Compression development length for concrete strengths (mm)				
	20 MPa	25 MPa	30 MPa	35 MPa	40 MPa
10M	250	200	200	200	200
15M	350	300	300	300	300
20M	450	400	400	400	400
25M	550	500	450	450	450
30M	650	600	550	550	550
35M	800	700	650	650	650

TABLE 010-2.4

Bar size	Tension splice "Class B" for concrete strengths (mm)				
	20 MPa	25 MPa	30 MPa	35 MPa	40 MPa
10M	450 (550)	400 (500)	400 (450)	400 (450)	400 (400)
15M	650 (850)	600 (750)	550 (700)	500 (650)	450 (600)
20M	850 (1100)	750 (1000)	700 (900)	650 (850)	600 (800)
25M	1350 (1750)	1200 (1550)	1100 (1400)	1000 (1300)	950 (1250)
30M	1600 (2050)	1450 (1850)	1300 (1700)	1200 (1550)	1150 (1450)
35M	1850 (2400)	1650 (2150)	1500 (1950)	1400 (1800)	1300 (1700)

TABLE 010-2.5

Bar size	Compression splice "Class B" for concrete strengths (mm)
10M	300
15M	450
20M	600
25M	750
30M	900
35M	1050

    a. Top bar splice lengths are denoted in parenthesis and should be used when horizontal spliced bars are placed such that there is no more than 300 mm of concrete poured below the bar. All horizontal bars in walls shall be treated as top bars.
    b. Unless noted otherwise, provide embedment lengths for reinforcement bars and dowels per Table 010-2.2 above.
8. All reinforcing bars noted as continuous shall be tension spliced unless otherwise noted.
9. All bars shall have a standard hook at non-continuous ends.
10. No splices other than those noted on these drawings are permitted without written permission from the Structural Engineer.
11. All reinforcing steel to be free of loose scale, dirt or any other foreign materials which would be detrimental to the bond to the concrete. Storage of the reinforcing steel on site shall be off the ground.
12. All reinforcement to be uncoated, except where the suffix “C” is used to designate epoxy coated reinforcement and at locations above grade where concrete is exposed to weather. Epoxy coating to conform to ASTM A775. Multiply basic tension splice lengths by 1.5 for top epoxy coated bars; multiply basic tension splice lengths by 1.2 for all other coated bars.
13. Detailing of reinforcing steel (including hooks and bends) shall be in accordance with CSA A23.1.
14. All reinforcing bars shall be tied securely to prevent displacement. All dowels shall be tied securely in place prior to pouring concrete. Wet doweling of any reinforcement steel is not permitted.
15. After initial fabrication, reinforcing steel shall not be re-bent or straightened unless approved in writing by the Structural Engineer.
16. Provide corner bars to match horizontal wall reinforcement and provide dowels between footings and walls or piers/columns to match size, number and spacing of vertical reinforcement or element above.

MSE-010-3 Cast-in-place concrete notes - Installation

1. Forms shall be free from debris, hardened concrete and any other foreign materials prior to pouring concrete. Formwork shall conform to CSA A23.1 and CSA S269.3 and falsework shall conform to CSA S269.1.
2. Prior to construction and upon request, the design of the formwork shall be submitted for review per MSE-001-03. Formwork drawings and design shall bear the stamp of a licensed Professional Engineer registered in the jurisdiction noted in MSE-003-1.
3. Unless noted otherwise, provide slabs and beam forms with an upward camber of 2 mm / 1000 mm of span and uplift ends of cantilevered slab and beam forms 3 mm / 1000 mm of cantilever length.
4. Concrete mixing, transportation, handling and placing shall conform to CSA A23.1.
5. All concrete curing to conform to CSA A23.1 and special precautions shall be taken when placing and curing concrete above 30°C. Curing and sealing compounds to conform to ASTM C309. All concrete surfaces are to be sealed unless noted otherwise. Sealing compounds are to be compatible with applied finishes.
6. Construction joints for walls, slabs and beams not specifically shown on these drawings shall be submitted on drawings for approval by the Structural Engineer before construction. Prior to placing concrete, the contractor shall submit a concrete pour schedule showing location of all proposed construction joints and pour placements for review by the Structural Engineer. Keys at all construction joints shall be 38 x 89 mm unless noted otherwise. Provide water stops for all construction joints below grade.

TABLE 010-3.1

Slab Thickness (mm)	Key size (mm)
THK <150	40x40
150<THK<250	40x90
250<THK<350	40x140
THK>350	40xTHK/2

7. Control joints shall be provided in all slabs-on-grade at a maximum spacing of 4500 mm in both directions unless noted otherwise on these drawings. Saw cuts to be 3 x 38 mm and to be cut no longer than 18 hours after concrete is finished. Seal all saw cuts.
8. Proprietary products increasing the spacing of the control joints or otherwise varying the design of the slabs-on-grade shall be submitted to the Structural Engineer for approval. The submittal documents shall bear the seal of a Professional Engineer registered in the jurisdiction noted in MSE-001-3.
9. Coordinate control joint spacing in concrete walls, interior and exterior, to match the control joints in masonry above. Coordinate with architectural drawings. Provide control joints at a maximum of 7500 mm on-centre unless noted otherwise.
10. Joint filler shall be installed in expansion joints and construction joints where indicated on the drawings.
11. Welded Wire Mesh reinforcement for slabs-on-grade to be placed 40 mm from the top of slabs with proper reinforcement chairs.
12. Where concrete surfaces are to be exposed, only non-corrosive type reinforcing chairs shall be used to support the reinforcement steel. If pre-cast concrete blocks are used as reinforcement chairs, they shall be of the same quality as the concrete specified for the structure.
13. Plastic or plastic coated wire shall be used for tying epoxy coated reinforcement.
14. Uncoated metal ties shall not extend more than 5 mm into concrete cover.
15. Inserts, frame-outs, sleeves, brackets, conduits and fastening devices shall be installed as required by the drawings and specifications in a manner that shall not impair the structural strength of the system, and be installed so that they shall not require the cutting, bending or displacement of the reinforcement other than as shown on typical details.
16. Embedded conduits shall not be made of materials that react with concrete (for example, aluminium). Conduits shall not pass through columns, and shall not have an outside diameter larger than one third of the thickness of the slab, wall or beam in which they are embedded. Conduits shall not be spaced closer than 6 diameters on centre or run horizontally in concrete walls unless specifically permitted otherwise. All conduits to have a minimum cover of 25 mm. No conduits permitted in exterior slabs.
17. Openings and driven fasteners required in the concrete after concrete is placed shall be approved by the Structural Engineer before proceeding.
18. Use mechanical vibrators to compact concrete throughout.
19. All honeycombing shall be cut out and filled with concrete using an approved bonding agent. Refer to architectural drawings and specifications for required finish of exposed concrete. Concrete finishes shall conform to CSA A23.1.
20. Chamfer all exposed edges of concrete with a 20 mm chamfer unless noted otherwise.
21. No bars partially embedded in hardened concrete shall be field bent unless specifically noted or approved by the Structural Engineer.
22. Do not substitute deformed wire or wire mesh for reinforcing bars without the prior approval of the Structural Engineer.
23. Non-shrink grout shall be furnished by an approved manufacturer and shall be mixed and placed in strict accordance with the manufacturer's published recommendations. Grout strength shall be at least equal to the material on which it is placed, but not less than 20 MPa.
24. Do not cover concrete with finishes until curing period of concrete is complete and surfaces are completely dry. Surfaces to be considered dry if no moisture is visible on the underside of a 450 x 450 mm sheet of polyethylene plastic taped to the slab surface for 16 hours. Allow 28 days for drying after moist curing.
25. Anchor bolts for structural steel and embedded plates shall be securely tied or fastened in place prior to pouring concrete. Wet doweling of anchor bolts and embedded plates is not permitted.
26. Concrete shall be tested in conformance with CSA A23.1, CSA A23.2, MSE-061 and the project specifications.

MSE-010-4 Cast-in-place concrete notes - Cold weather requirements

1. Forms and reinforcing steel shall be free from ice or snow.
2. Mixing water shall be heated, as required, to produce a minimum concrete temperature of 10°C at point of pouring.
3. Concrete shall not be placed on or against a surface which is at a temperature of less than 5°C.
4. Slabs shall be covered with a canvas or similar, kept a few inches clear of the surface.
5. Temperature of the concrete at all surfaces shall be kept at a minimum of 20°C for 3 days or 10°C for 7 days. Concrete shall be kept above freezing temperatures until it reaches 7 MPa of strength.
6. Storey below shall be enclosed and if temperature falls below -4°C provided with artificial heating. Heating is to start at least one hour before pouring and is to be maintained for 3 days after pouring.
7. See CSA A23.1 for additional requirements. Follow the above mentioned as a minimum.

MSE-010-5 Cast-in-place concrete notes - Stripping notes

1. No column or wall forms shall be removed before concrete has reached 10 MPa.
2. No slab or beam forms shall be removed before concrete has reached 17 MPa or 75% of design strength (whichever is greater).
3. The design of re-shoring is the responsibility of the contractor. Re-shoring drawings to be submitted to the Structural Engineer before stripping the forms per the requirements of MSE-001-3.
4. All slabs, beams and girders to be shored until concrete reaches full design strength.
5. Strength of concrete for stripping and shoring purposes to be determined from field-cured cylinders. Alternate methods may be used, subject to the approval of the Structural Engineer.
6. See Structural Drawings for special shoring requirements.

MSE-010-6 Cast-in-place concrete notes - Construction tolerances

1. Tolerances for placing structural concrete, reinforcing steel, cast-in hardware and for floor and roof finishes shall be as specified in CSA A23.1, except as noted below. These tolerances are structural guidelines only, more stringent tolerances shall be maintained where architectural details or others require it.
2. Variation from the plumb:
    a. 0.25% of height (1 in 400) for lines and surfaces of columns, piers, walls and in arrises. Only one curvature allowed per 3000 mm. Tolerance is given for maximum deviation from plumb line and all measurements shall be to the same side of the plumb line.
    b. 0.125% of height (1 in 800) for exposed corner columns, control joints, grooves and other conspicuous lines. Only one curvature allowed per 6000 mm.
    c. 0.2% of opening width at window bays.
3. Variation from the level or from the grades or cambers indicated on these drawings:
    a. Unless specified elsewhere, floor finishes shall be class A “Conventional”, with a tolerance of ± 8 mm per 3000 mm. Only one curvature allowed per 3000 mm.
    b. Tolerance is given for maximum deviation from specified levels.
    c. Closer tolerances may be required to give the quality of finish floor surfaces called for elsewhere in the contract documents.
4. Location of columns and walls: columns per CSA A23.1, use column requirements for walls.
5. Variation of cross-sectional dimensions of columns and beams and in the thickness of slabs and walls as in CSA A23.1. Only one curvature per 3000 mm.
6. Footings:
    a. Variation in dimensions in plan: +50 mm / -10 mm.
    b. Misplacement or eccentricity: maximum of 2% of the footing width in the direction of misplacement, but not more than 50 mm.
    c. Reduction in thickness: not more than 5% of specified thickness.
7. The above requirements do not relieve the contractor of this responsibility of meeting more rigid requirements specified elsewhere in the construction documents or as required by equipment shop drawings or specifications (for example, elevators).
8. Where any deviation occurs and it is deemed acceptable by the Structural Engineer and Architect, the contractor is responsible for adjustment of other building elements to accommodate such deviation. Cost of remedial work for deviations not accepted shall be borne by the contractor.

MSE-017-1 Hollow core slab - Precast prestressed concrete slabs

1. All hollow core concrete slabs to be designed by a Professional Engineer registered in the jurisdiction noted in MSE-001-2. Design of hollow core slabs shall conform to CSA A23.3 and the requirements of the building code as per MSE-001-2, to carry the design loads and not to exceed the deflection limits as specified on the drawing.
2. Manufacturer to be certified to requirements of CSA A23.4 and be in good standing with the CPCI.
3. Submit 4 sets of shop drawings indicating design loads (including mechanical unit locations and loads), slab unit layout, all applicable details (including all openings) and material specifications to the Engineer for review prior to fabrication. Shop drawings shall be sealed by a Professional Engineer registered in the jurisdiction noted in MSE-001-2. Fabrication is not allowed until approved by the Engineer.
4. Identify each slab unit with mark number and prescribed drilling and cutting locations.

MSE-020-1 Masonry - Materials

1. Masonry designed in accordance with CSA S304.1. Construction to conform to CSA A371.
2. Provide masonry construction to the following material standards:

TABLE 020-1.1

Material	Standard	Strength
Concrete block H/15/A/M	CSA A165 Series-04	15 MPa
Wire reinforcing (3.8 mm (9ga.) ladder type)	CSA G30.15-M1983	
Grout and mortar "Type S"	CSA A179	12 MPa
Connectors	CSA A370	
Reinforcing Steel	CSA G30.18-M92	400 MPa

3. Bearing on masonry unit compressive strength shall be 20 MPa at 28 days with mortar f'm=13 MPa. Use only Type 'S' mortar using Type 10 Portland cement in Portland cement-lime mix formulation. No calcium chloride in any form is permitted in the grout or mortar mixes.
4. Contractor shall provide Structural Engineer with written confirmation of the unit strengths prior to installation.
5. Grout shall be course grout. Grout shall be fluid enough in order to flow in all joints of the masonry without segregation. Slump to be between 200 mm and 250 mm.
6. Testing of mortar and grout mix designs shall be in accordance with CSA A179 and test requirements of MSE-061.
7. Fill all cells containing reinforcement and inserts with 25 MPa concrete (200 mm maximum slump and 10 mm maximum aggregate size). Vibrate or puddle to completely fill cells. All grouted cells shall contain reinforcement.

MSE-020-2 Masonry - Reinforcement

1. All cells to be reinforced shall be kept clean of mortar.
2. All structural masonry walls shall be reinforced as follows, unless noted otherwise:
    a. Vertical: 1-15M @ 800 mm on-centre. Provide dowels from foundation walls of same size and spacing as verticals above. All vertical steel to run full height of wall and to be located at centreline of wall, unless noted otherwise.
    b. Horizontal: Bonds beams as indicated on drawings. Minimum shall be 2-15M in bond beam at maximum 2400 mm on-centre and at underside of each floor and roof. All openings C/W 2-15M continuous. Install mesh grout stop below bond beam courses. 3.8 mm (9 ga.) ladder reinforcement every second course (400 mm), unless noted otherwise.
3. Provide 1-15M vertical full height at:
    a. Each side of control joints.
    b. Unsupported ends of walls, corners and intersections.
    c. Each side of doors and other openings less than 1200 mm wide. For openings larger than 1200 mm, wall ends, corners and intersection, provide 2-15M full height verticals, unless noted otherwise.
4. Hooked dowels from foundations to match vertical reinforcement in wall.
5. Vertical bars to be held in position at top and bottom and at intervals not exceeding 3000 mm or:
    a. 10M 1900 mm
    b. 15M 2600 mm
    c. 20M 3800 mm
6. Vertical bars shall have a minimum clearance of 19 mm from masonry and 25 mm from adjacent bars and not less than 1 bar diameter between bars not spliced.
7. Provide the following laps for reinforcement using wires (bend and lap at wall intersections and corners):
    a. Wire ladder or mesh 200 mm
    b. 10M 400 mm
    c. 15M 600 mm
    d. 20M 800 mm
    e. 25M 1300 mm
8. At control joints, all horizontal joint reinforcing shall terminate 50% of all horizontal reinforcement (wire and bars) on each side of the joint. Bond beam reinforcing at tops of walls shall continue through joint.
9. Reinforce lintels over all openings or recesses (including those for mechanical and electrical equipment) with minimum 2-15M for openings less than 1500 mm wide. Lintels over 1500 mm and less than 2500 mm shall be 400 mm deep with 4-15M reinforcement. Extend lintels 600 mm past edges of openings.
10. For non-load bearing masonry provide minimum vertical reinforcement:
    a. 290 mm wall 20M @ 800
    b. 240 mm wall 15M @ 800
    c. 140 mm and 190 mm walls 15M @ 1200

MSE-020-3 Masonry - Installation

1. Masonry contractor shall discuss all masonry construction with the Structural Engineer prior to commencing work.
2. Provide adequate temporary bracing to masonry walls until floor and/or roof diaphragms are installed and can develop adequate diaphragm action.
3. Provide cleanouts at the base of the wall to verify proper placement of grout. Place grout in maximum 2000 mm lifts or between bond beams, whichever is less. If no cleanout provided, pour height limited to 1500 mm.
4. When grouting is stopped for a period of one hour or longer except at the top of the wall, form construction joint by stopping the grout pour minimum 25 mm below the uppermost unit height.
5. Coring openings in grouted masonry is not permitted. No pipes or electrical conduits shall pass through masonry lintels and/or reinforced, grouted cells. Provide fully grouted lintel beam for conduits and pipes running horizontally within wall.
6. Provide cold weather protection as required by CSA A371.
7. Where dowels, anchor bolts etc. are shown projecting into masonry, build these tightly into masonry voids with masonry grout.
8. Beneath steel and concrete beams, joists and trusses, provide a minimum depth of 400 mm 100% solid masonry units projecting a minimum of 200 mm beyond the edges of bearing plates, unless noted otherwise.
9. Provide a minimum length of 200 mm and a minimum depth of 200 mm of 100% solid masonry units for steel, concrete or reinforced masonry lintels.
10. Provide a minimum length of 200 mm of 100% solid masonry units for slabs or steel deck bearing on masonry.
11. Provide 100% solid masonry units or concrete filled block under all concentrated loads bearing on the masonry.
12. Provide concrete filled cores at all locations where metal fabrications, other equipment, utilities, etc., are to be fastened to block walls.
13. Where a change in thickness of masonry occurs, grout solid, or use solid units for the thicker portion for a height of 200 mm at the change.
14. Provide bond beams at the top and bottom of openings less than 1800 mm wide using minimum 2-15M horizontal and extend 600 mm beyond edges of opening. Install bond beams at each 12th course and top of parapet, unless noted otherwise.
15. All joints shall be flush, full bed joints, unless noted otherwise. Use running bond, unless noted otherwise.
16. Build masonry tightly into webs of all wall bearing steel beams at their points of bearing.
17. Build masonry into webs of all steel columns.
18. Build masonry tightly around joist shoes.
19. Fully grout block cells at parapets.
20. Provide vertical control joints at maximum 7500 mm on-centre or as shown on the drawings. Horizontal reinforcing steel shall continue through the control joint. Caulk control joints against an appropriate joint filler, refer to architectural drawings. Install expansion joints as shown.
21. Maintain support of masonry lintels for a minimum of seven days or until sufficient strength is gained to safely support imposed loads.
22. Reinforcing steel shall be secured in place and inspected before grouting begins.
23. Grouting shall be stopped 38 mm below the top of a course and 12 mm below the top of a bond beam so as to form a key at the pour joint.
24. Grouting of masonry beams over openings shall be done in one continuous operation.
25. Provide permanent lateral support at the top of non-load bearing masonry walls and dowels into concrete base at bottom of wall, according to typical details. Extend such walls to within 50 mm of all concrete, columns and up to 40 mm of structure above and fill gap with compressible acoustic or fire-stop material as required to maintain fire rating.

MSE-020-4 Masonry - Lintels

1. Unless noted otherwise, provide steel lintels over all openings in masonry walls as follows:
    a. For openings up to 1200 mm clear provide one angle 90x90x6 for each 100 mm of wall thickness or portion thereof or 200 mm deep masonry lintel block reinforced with 1-10M bottom for each 100 mm of wall thickness or portion thereof.
    b. For openings from 1200 mm clear to 1800 mm clear provide one angle 125x90x8 long leg vertical for each 100 mm of wall thickness or portion thereof or 200 mm deep masonry lintel block reinforced with 1-15M bottom for each 100 mm of wall thickness or portion thereof.
2. All lintels to bear 150 mm minimum at each end on solid masonry unless noted otherwise.
3. Pairs of lintel angles are to be bolted or welded together, prior to shipment, at maximum 450 mm centres.
4. Steel lintels are to be supplied by steel contractor but placed by general contractor or masonry sub-contractor.
5. Steel contractor to supply all necessary directions for placing steel lintels.
6. Masonry lintel blocks may on be used in load-bearing walls with permission and must be filled with 25 MPa concrete. Mortar is not acceptable and will be rejected.
7. It is the general contractor's responsibility to coordinate and supply all lintels required through all walls (including over doors, mechanical and electrical services, recesses, pockets, non-load bearing walls, etc.) throughout the project.

MSE-030-1 Structural steel - Materials

1. All structural steel shall be detailed, fabricated and erected in accordance with CAN/CSA S16.
2. Provide structural steel to CSA G40.20/CSA G40.21 with the following grades:

TABLE 030-1.1

Type of member	Grade
Rolled shapes W, WWF, S, T	350W
Rolled shapes C, MC, HP	300W
Rolled shapes L (angles)	300W
Rolled plates	350W
HSS (Class C)	350W
Pipe (ASTM A53 grade B)	240W
Bolts	ASTM A325
Anchor rods	300W

3. All structural steel shall receive one shop coat of primer to CISC/CPMA 1-73A or 2-75, unless otherwise noted, except parts of members to be embedded in concrete. Primer for exterior exposure shall conform to CGSB 1-GP-40d and shall be zinc-chromate Type 1.
4. Hot dipped galvanizing shall conform to CAN/CSA G164-M92, where required, with a minimum zinc coating of 600g/sq.m. Field touch-up all abrasions, scratches, welds or bolts.
5. Provide camber to beams, girders and trusses as shown on the plans. Cambers shown are for erected in-place condition of members before installation of deck.

MSE-030-2 Structural steel - Submittals

1. Steel fabricator to submit shop drawings per MSE-001-3 including all details, material specifications and design loads.

MSE-030-3 Structural steel - Connections - General

1. Provide a minimum bearing of 200 mm for all steel beams bearing on concrete or masonry and a minimum of 100 mm on structural steel, unless noted otherwise.
2. Unless noted otherwise, at beams terminating on concrete or masonry walls, provide 200 mm deep pocket (or full depth for thinner walls) and provide 200x500x19 thick bearing plate and 2-19Øx200 embed anchors with HY-200 epoxy system by Hilti. Fully grout pocket after beam installation.
3. Centre bearing plates under beams, or as noted.
4. Provide full height web stiffeners on both sides of beams at point of concentrated loads, including beams running over tops of columns or girders, beams supporting columns and cranked beams. Web stiffeners shall be of the same size and thickness as the column flanges and shall align with the flanges of the supporting column.
5. Provide seal welded closure plates, minimum 6 mm thick, at all open ends of HSS members, unless noted otherwise.
6. Architecturally Exposed Structural Steel (AESS) members and connections shall be to AISC standards. All welds to be ground smooth. Any splices introduced by the contractor for reasons of constructability must be site welded and ground smooth. Bolted splices in AESS members are not permitted except as shown on the drawings.
7. Where moment connections are indicated, the connection shall develop the full flexural capacity of the smaller connected member.
8. Member splices, where approved, shall develop the full flexural and shear capacity of the member. Members shall not be spliced at points of maximum stress and shall be made only with the approval of the Structural Engineer.
9. Beam connections shall be designed for a minimum of 50% of the beam shear capacity unless noted otherwise and in no case shall be less than the loads shown on or implied by the drawings.
10. Connect all columns to base plates for the forces shown in addition to the larger of:
    a. The factored horizontal components from bracing at bracing locations.
    b. 3% of factored vertical column load applied horizontally.

MSE-030-4 Structural steel - Bolted connections

1. Bolted connections shall have a minimum of 2-19 mm diameter bolts with 10 mm connector plate.
2. Slip critical connections of A325 or A490 bolts shall be used for all bolted connections of bracing members, moment connections, cantilevers and as shown on drawings. Oversized and slotted holes are allowed for slip critical connections. All other bolted connections shall be bearing type where oversized and slotted holes are not allowed unless shown on the drawings.
3. Protruded bolt heads, shafts or nuts shall not extend into or prohibit the application of architectural finishes and shall not extend into or prohibit placement of steel decking.

MSE-030-5 Structural steel - Welded connections

1. Welding shall conform to CSA W59 and performed by welders under CSA W47.1. Fabricators to be “Fully approved” by the Canadian Welding Bureau under CSA W55.3.
2. A copy of the fabricator's Canadian Welding Bureau certificates shall be included with the shop drawing submission.
3. Welds shall be E49XX (E-70xx).
4. Minimum welds for connections shall be 5 mm fillet welds.
5. At partial penetration welds, the size given is the minimum effective throat. Fabricator shall provide proper joint preparation to achieve the minimum effective throat as required by CSA W59.
6. All welds exposed to view shall be ground smooth.
7. All stud anchors (Nelson studs) and deformed bar anchors shall be fusion welded to plates as per manufacturer's specifications and recommendations. Any field fillet welded studs or deformed bars will be rejected.
8. Beams noted as composite on the drawings require shear stud connections.

MSE-030-6 Structural steel - Installation

1. The contractor shall provide temporary bracing during construction necessary to erect the structure, maintain correct alignment and safely resist all possible combinations of dead, construction, erection, wind and other lateral loads. The bracing shall be designed, installed and maintained by the contractor. The bracing shall be removed only after permanent roof and floor diaphragms, shear walls and permanent bracing are complete.
2. No structural steel shall be cut in the field or spliced unless approved by the Structural Engineer. No field burning of holes shall be allowed in structural steel anywhere. No field cutting or alteration of structural members is to occur without the prior written approval of the Structural Engineer. No change in size or position of the structural elements shall be made and holes, slots, cuts, etc., are not permitted through any member unless they are detailed on the approved shop drawings.
3. If anchor bolts are misplaced, or bolt holes misaligned, inform the Structural Engineer.
4. Where columns are stabilized by walls, provide column anchors in abutting walls. Provide erection bracing until walls are built tightly to columns.
5. Grout under base plates to be a minimum of 25 mm using non-shrink grout (48 MPa at 28 days).
6. Where concrete is poured on steel deck, screed slab to suit beam cambers.
7. No final bolting or welding shall be made until as much of the structure as will be stiffened thereby has been properly aligned.
8. Where, in the sole opinion of the Structural Engineer, visual inspection of the welds or the steel members in place in the field is inadequate or inconclusive, such welds shall be examined by a non-destructive testing method. The cost of such testing and reporting shall be paid by the contractor. This is in addition to the requirements of MSE-061.

MSE-040-1 Wood frame - Materials

1. All structural wood frame construction shall conform to CAN/CSA O86 and the requirements of the building code noted in MSE-001-2.
2. All structural lumber to be kiln-dried (KD) spruce-pine-fir (SPF) #2 or better, unless noted otherwise, conforming to CSA O141 with a maximum moisture content of 19% at the time of installation. Solid wood posts to be SPF #1 or better, unless noted otherwise. Lumber shall bear the grade stamp of a grading agency approved by the Canadian Lumber Standards Accreditation Board.
3. Finger jointed studs are not permitted in load bearing walls.
4. Nails and spikes shall be manufactured to CSA B111.
5. Screws and lag screws shall be manufactured to ANSI/ASME B18.2.1, complete with standard cut washers when bearing against wood. Lag screws shall have minimum half the bolt length threaded with sharp threads. Dull threads or insufficient thread length will be rejected.
6. Bolts shall be ASTM A307 or better, unless noted otherwise, complete with standard cut washers when bearing against wood.
7. Steel plates shall be ASTM A36 or better, unless noted otherwise.
8. All steel hardware including, but not limited to, bolts, screws, nuts and washers are to be hot dipped galvanized.
9. Framing anchors, joist hangers, beam hangers, post caps, anchors, and straps as manufactured by Simpson Strong Tie (or approved equivalent) to have all nail holes filled with the nail types specified by the manufacturer. Minimum joist hanger 6.3 kN resistance or fully nailed pressure block for all flush framing, unless noted otherwise.
10. Plywood for roofs and floors shall be exterior grade Douglas fir plywood to CSA O121 or Canadian Softwood plywood to CSA O151. Plywood to be legibly identified as exterior type.
11. Preservative treatment, where required, to conform to CAN/CSA O80 Series-08 for pressure treatment. Field apply compatible preservative to all field cuts and drilled holes. Provide preservative treatment and finishes to consultants' approval for all exposed wood elements. Provide flashing to architect's approval for all exposed end grain.

MSE-040-2 Wood frame - Installation

1. Store all wood products off the ground with spacer blocks between members, keeping wrapping in place until installed. Cut holes in wrapping to provide ventilation and prevent moisture accumulation. Provide protection of installed elements from weather until permanent protection is in place.
2. All framing, bridging, blocking and nailing shall be in accordance with Part 9 of the building code noted in MSE-001-2. Provide minimum 38x38 bridging at 2000 mm on-centre for all spans greater than 3000 mm with a 13 mm gap between bridging.
3. Built-up beams and posts shall consist of a minimum of 2 members. Minimum lintels shall be 1-89x241 TimberStrand LSL or 2-38x235, unless noted otherwise.
4. Sill plates for stud walls to be full width and anchored using cast-in-place 19 mm diameter anchor bolts x 250 mm long with 75 mm hooks at 1200 mm on-centre maximum and at 200 mm from ends of walls and corners, and at edges of window and door openings. Epoxied anchor bolts may be used 19 mm diameter with 200 mm embedment using Hilti HIT 150 epoxy system or equivalent.
5. Studs to be continuous full storey height with no splice.
6. Provide minimum 2 top plates for load bearing walls, unless noted otherwise. Lap plates at corners and intersections.
7. Provide minimum 2 studs at corners, intersections and each side of openings, installing double cripples under lintels, unless noted otherwise.
8. Provide blocking at mid-height of stud walls where no plywood sheathing is applied.
9. Laminate studs solid beneath all beam ends and carry through to concrete foundation below. Built-up stud columns shall match the number of laminations in built-up members being supported. Fully block at joist spaces below point loads. Take care to ensure beams bear fully on supporting members.
10. Unless noted otherwise, minimum studs to be:
    a. First floor, second floor and third floor
        i. 38x140 @ 400 on-centre
11. Unless noted otherwise, minimum joists to be 38x235 @ 400 on-centre. Joists shall be continuous in any one span with no splice. Install double joists under parallel non-load bearing partitions above.
12. Notching and drilling of members to be in conformance with limitations set by the building code noted in MSE-001-2.
13. Re-tighten all accessible bolts late in construction where shrinkage of timbers may have occurred.

MSE-051 Wood sheathed shear walls

1. Plywood for walls shall be exterior grade Douglas fir plywood to CSA O121 or Canadian Softwood plywood to CSA O151. Plywood to be legibly identified as exterior type.
2. Unless noted otherwise, plywood panels for walls shall be applied with grain perpendicular to studs, with a half-sheet stagger and be fastened to supports with 75 mm common nails at 100 mm on-centre along panel edges and at 300 mm on-centre along intermediate studs, unless noted otherwise on the plans. All unsupported sheathing edges to be blocked with 38x89 blocking on flat and nailed as above.
3. Stud walls with sheathing nailed at 75 mm on-centre, or less, or walls with sheathing on both sides shall have double studs. Provide 38x140 blocking on flat at all unsupported sheathing edges. Nail double studs with 75 mm common nails at 50 mm staggered over full height.
4. Refer to shear wall schedule on plans for additional requirements including plywood thickness, nailing and anchoring requirements.
5. Nail gun pressure shall be tested and carefully set to ensure nail heads do not embed more than 3 mm into the face of the sheathing.
6. Provide at least a 2 mm gap between the sheets.
7. Fasten bottom wall plate to floor sheathing with 102 mm spikes at 100 on-centre and to concrete with 19mm diameter x 250 mm long anchor bolts complete with 65 mm diameter x 6 mm thick plate washers at 600 mm on-centre maximum and at 200 mm from ends of walls and corners, and at edges of window and door openings. Add hold down anchors by Simpson Strong Tie where noted on plan.
8. Lap wall top plates 1200 mm and connect with 12 - 76 mm nails staggered minimum, unless noted otherwise.
9. Drill adequate holes in exterior walls for ventilation.

MSE-056 Architectural brick veneer

1. Masonry contractor shall be responsible for the design of masonry tie-back.
2. Design of masonry tie-backs shall be performed by a Professional Engineer registered in the jurisdiction as noted in MSE-001-3. Proof of design shall be submitted to the Structural Engineer prior to commencing work including allowance for wind, seismic and ice loading.
3. Tie-backs shall be stainless steel or hot dipped galvanized. Confirm with architectural drawings.
4. Refer to architectural drawings for locations and layout of brick veneer and locations and length of ledgers.
5. Provide L127x127x9.5 lintel angle over windows or door openings less than 1500 mm wide, unless noted otherwise.
6. Provide and install brick veneer anchors at 600 mm on-centre horizontally and 400 mm vertically plus 1 row of anchors at top of veneer, above and below openings, unless noted otherwise.
7. Brick veneer ties and installation shall meet the requirements of CSA A370. Contractor shall submit sample tie to the Structural Engineer for approval prior to commencing work.
8. All steel supports and connectors, including bolts and screws shall be hot dipped galvanized, unless noted otherwise. Touch up field welds with Galvacon after erection.

MASONRY VENEER LOOSE LINTEL SCHEDULE

Span (mm)	Dimension (mm)	Bearing at each end (mm)
0 - 1200	L 89x89x8	100
1201 - 1800	L 102x89x8 LLV	100
1801 - 2400	L 127x89x8 LLV	100
2401 - 3000	L 152x102x8 LLV	150
3001 - 3500	L 152x102x9.5 LLV	175
All exterior angles to be hot dipped galvanized.		

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2024/07/30
PROVINCE OF ONTARIO

Project:

32 UNIT AFFORDABLE HOUSING APARTMENT BUILDING

20 SOUTH ST.,
TRENTON, ON

Project No:

23.012

Scale: AS NOTED
Drawn By: KM
Checked By: AF/MP

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Drawing Title:

GENERAL NOTES

Drawing No:

S002

cm in

MSE-059 Non-structural elements

1. Non-structural (secondary) elements include but are not limited to the following:
    a. Architectural components such as guard and hand rails, flag posts, canopies, ceilings, etc.
    b. Cladding, window mullions, glazing, interior and exterior partition or infill walls.
    c. Skylights.
    d. Architectural pre-cast and pre-cast cladding.
    e. Attachments and bracing for electrical and mechanical components.
    f. Window washing equipment and its attachments.
    g. Escalators, elevators and conveying systems.
    h. Brick or block veneers and their attachments.
    i. Interior and exterior light gauge steel stud walls.
    j. Non-load bearing masonry.
    k. Non-structural concrete topping.
    l. Landscape elements such as benches, light posts, planters, etc.
    m. Roofing material.
2. Design and detailing of the above items and their attachments are not the responsibility of the Structural Engineer. They shall be designed by Specialty Structural Engineers retained by the contractor, who will seal all related shop drawings, review the components in the field and provide all required sealed letters to the authorities having jurisdiction.
3. Secondary or non-structural components and their attachments shall be designed in accordance with Part 4 of the building code.
4. Sealed shop drawings of the secondary or non-structural components which may affect the primary structural system shall be submitted to the Structural Engineer only for the review of their effect on the primary structural system. The subcontractor of these components is responsible for protection of aluminium-steel connections against galvanic corrosion.
5. Installation of non-structural elements to commence at least one month after the reinforced concrete slab supporting the non-structural elements has been poured and the re-shores removed.
6. Non-structural elements must be designed and detailed to accommodate the anticipated deformations as noted above.
7. In addition to construction tolerance, non-structural components shall be detailed for the following building movement and deflection:
    a. Vertical deflections of beams, slabs and decking: ± 20 mm
    b. Differential vertical deflections of edge beams and edges of slabs: ± 16 mm
    c. Horizontal drift during wind and earthquake between floors:
        i. Drift without damage to non-structural components: ± 13 mm
        ii. Drift without collapse of non-structural components: ± 50 mm
    d. Movement at expansion joints:
        i. Perpendicular ± 50 mm
        ii. Parallel ± 50 m
        iii. Vertical ± 25 mm

MSE-060 Field Review

1. The contractor on projects shall provide the Structural Engineer with a minimum of 72 hours (3 business days) advance notice prior to pouring or concealment for field reviews. Field reviews shall be scheduled to be carried out during normal business hours unless special arrangements are made with the Structural Engineer.
2. Field review is only for the work shown on these structural drawings. This review is not a "full time" review but is a periodic review at the sole discretion of the Structural Engineer in order to ascertain that the work is in general conformance with the plans and supporting documents prepared by the Structural Engineer. Field review is not carried out for the contractor's benefit nor does it make the Structural Engineer guarantor of the contractor's work. It remains the contractor's responsibility to build and review the contractor's (and sub-trades) work in conformance with the contract documents. The Structural Engineer shall not be responsible for the acts or omissions of the contractor, sub-contractor, or any other persons performing any of the work or for the failure of any of them to carry out the work in accordance with the contract documents.
3. The following field reviews are considered to be the minimum number of structural field reviews requiring written review by the Structural Engineer for the project:
    a. Concrete: reinforcing steel shall be reviewed prior to placing concrete. Reinforcing in concrete walls shall be reviewed prior to "buttoning up" wall forms.
    b. Masonry (including non-load bearing partitions): reinforcing steel shall be reviewed prior to pouring all bond beams. Bond beam and vertical reinforcing shall be in place at the time of field review.
    c. Timber: framing shall be reviewed prior to covering any framing and before additional loads such as concrete topping and mechanical equipment are applied.
    d. Steel: structural steel shall be reviewed after the members have been fabricated and are in their final position with all connections complete and all bolts installed and torqued.

MSE-061 Testing and inspection

1. A Geotechnical consultant and an independent inspection and testing company are to be engaged to carry out the following services:
    a. Soil bearing - refer to MSE-003 and soils report.
    b. Fill under slabs-on-grade - confirm that fill material used is satisfactory and that the required degree of compaction has been attained.
    c. Cast-in-place and pre-cast concrete - routine inspection of materials, including slump, cylinder and air entrainment tests and reinforcing rod tests when required or directed in accordance with CSA A23.2. Unless permitted by the Structural Engineer, a minimum of 3 test cylinders shall be cast for each 50 cubic metres or each day's pour, whichever is less. Test one at 7 days and two at 28 days and submit written reports for review by the Structural Engineer. For high fly ash concrete (33% or more) provide one additional test cylinder tested at 56 days. Test reports shall be identified by grid lines, location and elevation for the batch of placed concrete. Submit test results maximum 24 hours after test.
    d. The project superintendent is to advise the Structural Engineer a minimum of 24 hours in advance of a concrete pour for a review of preparations.
    e. Structural steel and OWSJ - routine shop and field inspection shall be carried out in accordance with the requirements of CAN/CSA S16. The owner shall appoint an independent testing agency to carry out representative testing of bolt torque and welding on structural steel work, including decking as directed by the Structural Engineer. This testing shall take place prior to concealment of all structural steel. The contractor must make accommodation for the testing to take place without additional costs.
    f. Steel deck - see MSE-033.
    g. Masonry - when required or directed, concrete blocks shall be tested in accordance with CAN/CSA A165, bricks in accordance with CSA/CAN3-A82.2-M78, and mortar and/or grout in accordance with CSA A179.
2. All inspection and testing services are to be performed by companies certified by the Canadian Standards Association and, for welding, inspectors certified by the Canadian Welding Bureau.
3. Materials testing shall be as directed by the Structural Engineer at the expense of the owner.
4. Additional testing and field review resulting from the rejection of more than 5% of work tested will be at the contractor's expense.

SYMBOLS

Symbol	Description
# S###	DENOTES PARTIAL SECTION
# S###	DENOTES ELEVATION
# S###	DENOTES DETAIL
#	DENOTES REVISION ON PLAN/SECTION
	DENOTES CONCRETE TOPPING ON SECTION
	DENOTES MASONRY WALL ON PLAN
	DENOTES EXISTING CONCRETE ON PLAN & SECTION
	DENOTES NEW CONCRETE ON PLAN & SECTION
	DENOTES EXISTING WOOD WALL ON PLAN
	DENOTES NEW WOOD WALL ON PLAN
	DENOTES JOISTS ON PLAN
H	DENOTES STEPPED FLOOR OR ROOF (LOW/HIGH) SEE ARCH FOR DATUMS
	DENOTES HANGER DENOTES INVERTED HANGER
▶	DENOTES MOMENT CONNECTION

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GENERAL NOTES

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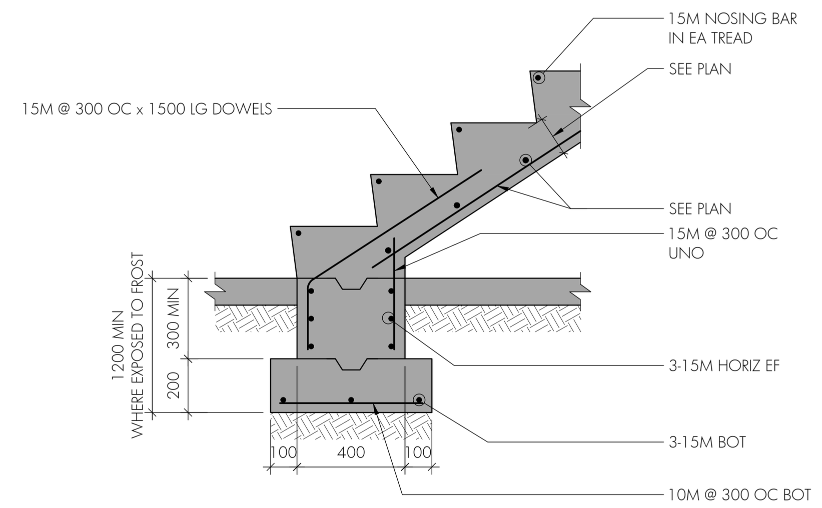
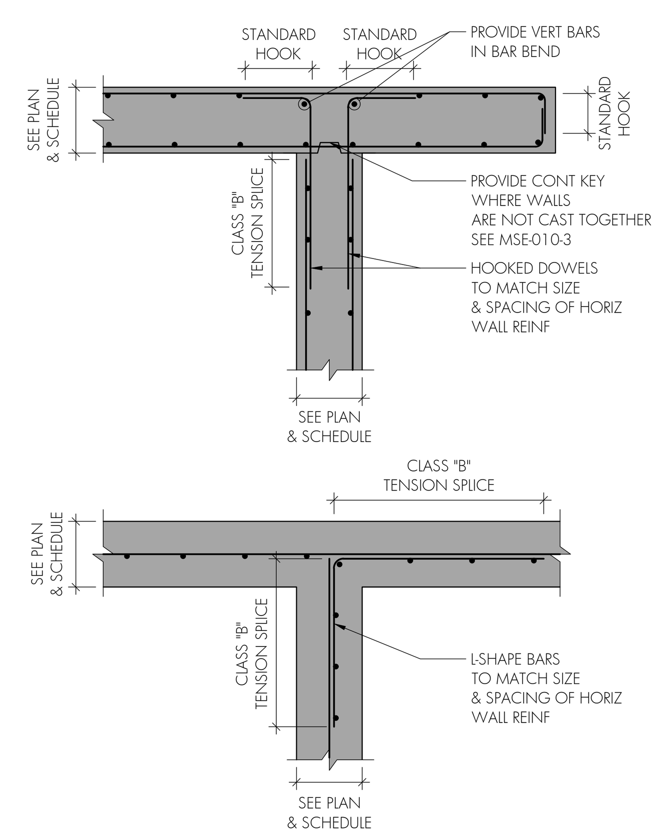
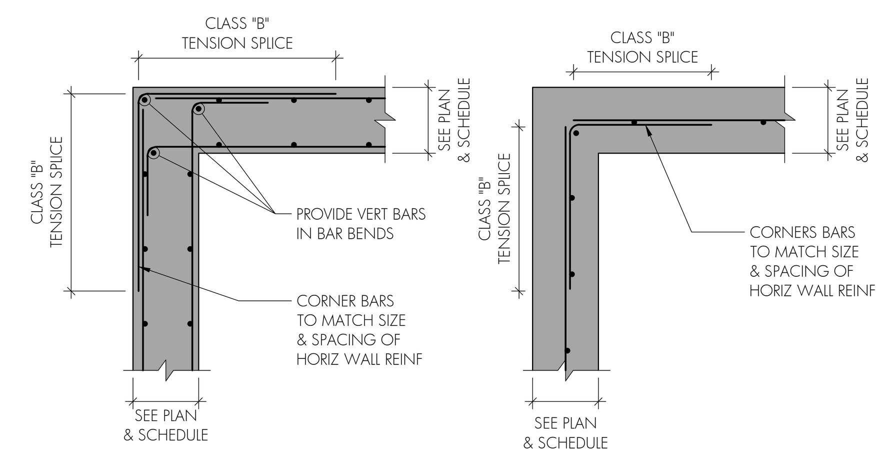
S003

cm in



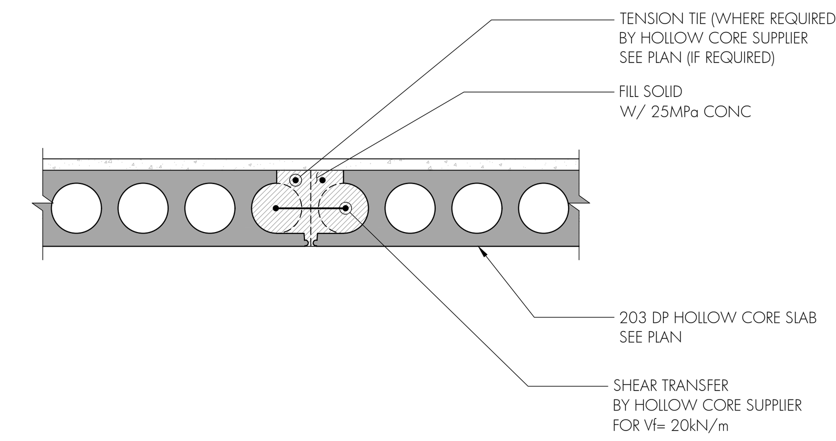
12 TYP SECTION AT CONCRETE STAIR FOUNDATION
S004 NTS



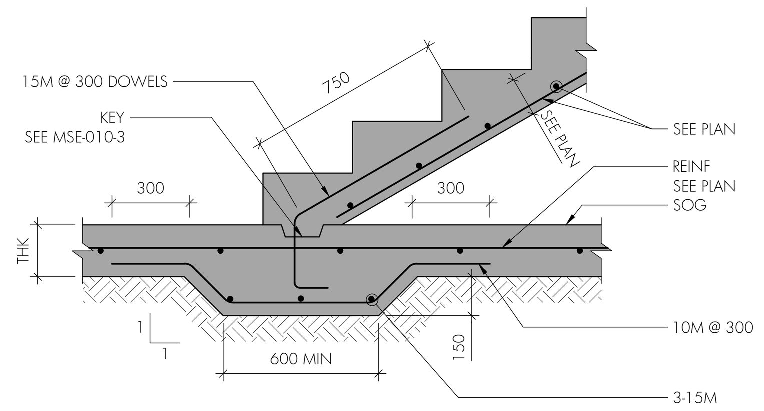


NOTES:
1. FOR WALL REINFORCEMENT SEE PLAN & SCHEDULE
2. HORIZONTAL BARS WITH TENSION SPLICE LENGTH HOOK CAN BE USED INSTEAD OF CORNER BARS
3. FOR HORIZONTAL REINFORCEMENT AT CORNERS SEE ALSO ZONE REINFORCEMENT SCHEDULE
4. ALL WALL REINFORCEMENT SHALL BE CONTINUOUS WITH HOOKS OR CORNER BARS AT ALL JUNCTIONS EXTEND HOOKS TO FAR FACE WALL CORNER BARS TO BE LOCATED ON OUTSIDE FACE OR CENTER OF WALL

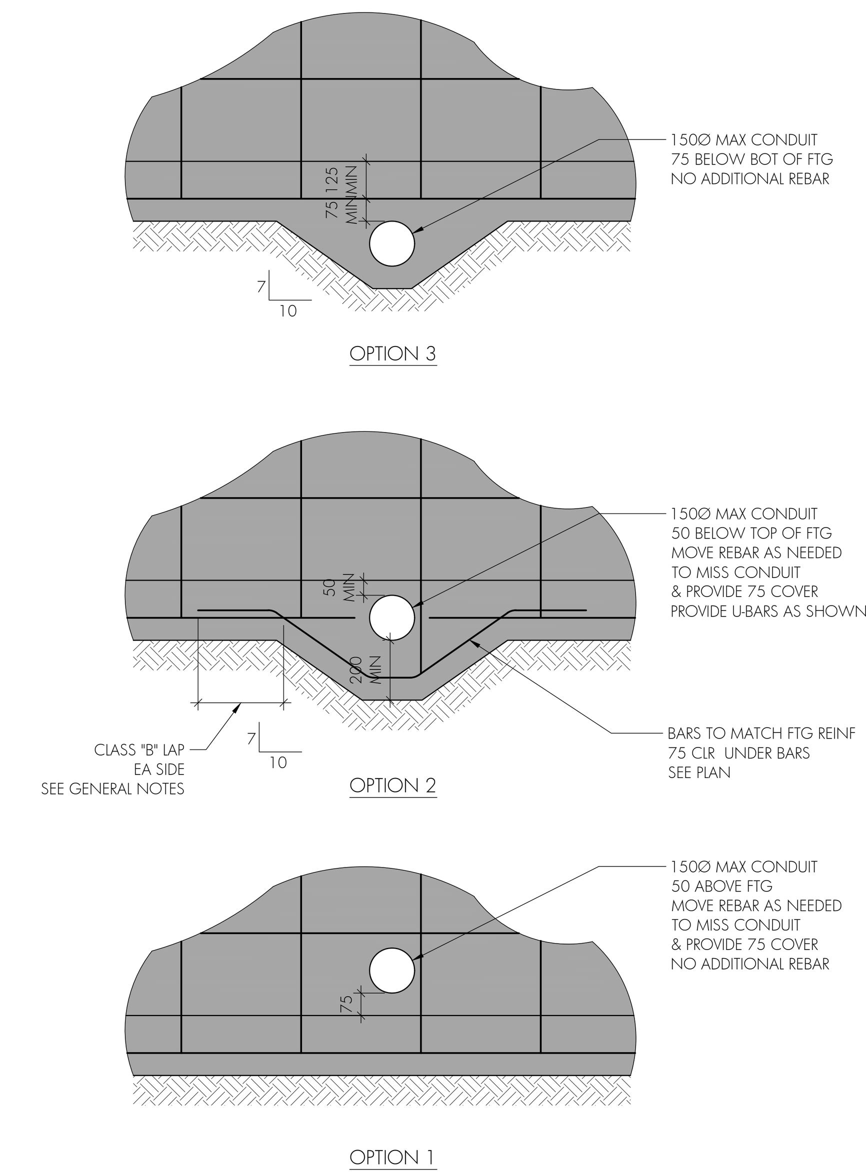
11 PLANS - TYP HORIZ REINF AT WALL INTERSECTIONS
S004 NTS



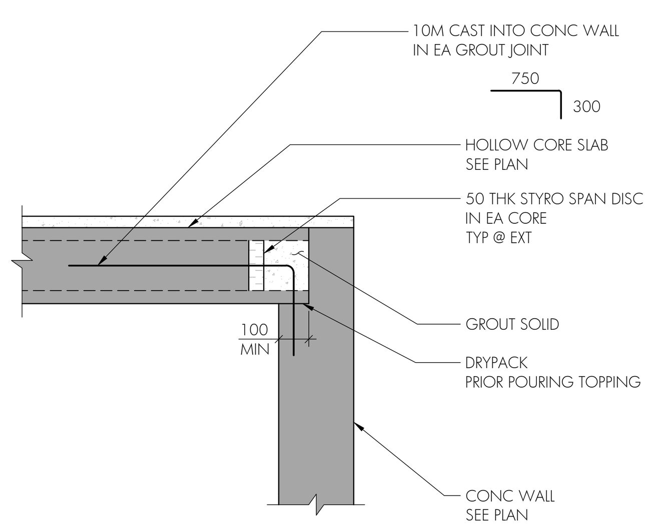
10 HOLLOW CORE TYP SHEAR CONNECTION
S004 NTS



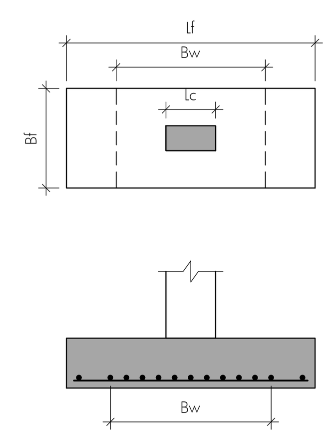
9 TYP SLAB ON GRADE THICKENING UNDER CONCRETE STAIRS
S004 NTS



5 TYP DETAILS FOR CONDUITS THROUGH FDN
S004 NTS



8 TYP HOLLOW CORE SLAB TO CONC WALL
S004 NTS

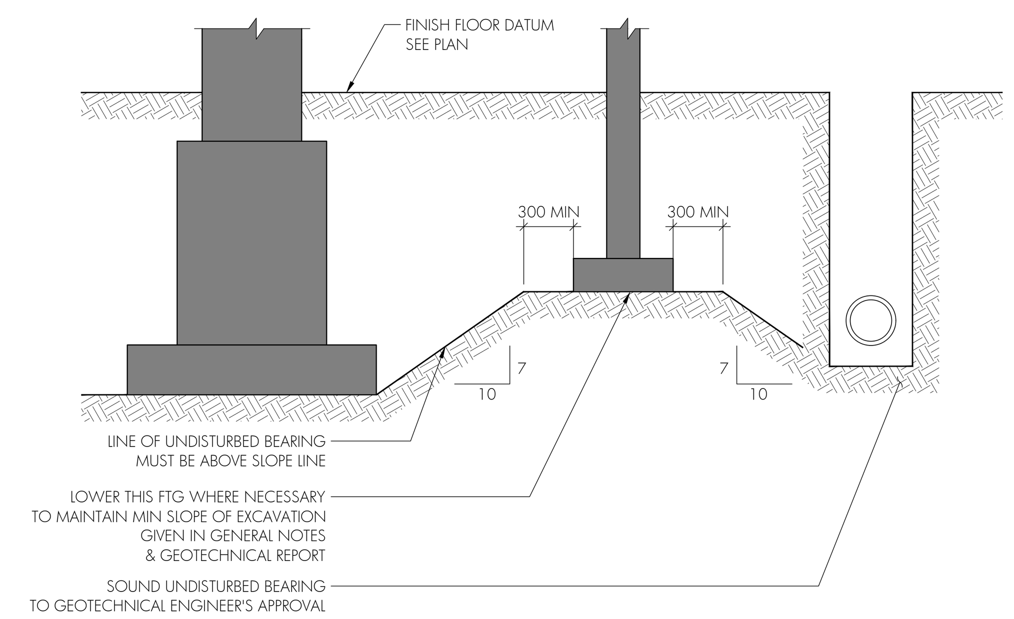


NOTES:
1. Lf: LONG DIMENSION OF THE FOOTING
Bf: SHORT DIMENSION OF THE FOOTING
Lc: LONG DIMENSION OF COLUMN/WALL
Bw: MAX (Bf & Lc)
2. REINFORCEMENT IN LONG DIRECTION SHOULD BE UNIFORMLY DISTRIBUTED ACROSS ENTIRE WIDTH OF FOOTING (Bf)
3. FOR REINFORCEMENT IN SHORT DIRECTION, A CENTRAL BAND OF WIDTH EQUAL TO THE MAXIMUM OF WIDTH OF FOOTING IN THE SHORT DIRECTION AND COLUMN LONGER DIMENSION (Lf), SHALL CONTAIN A MAJOR PORTION OF THE REINFORCEMENT. THE PORTION OF TOTAL REINFORCEMENT IN THE SHORT DIRECTION DISTRIBUTED OVER THE BAND WIDTH Bw IS AS FOLLOWS:

$$\frac{\text{REINFORCEMENT IN BAND WIDTH}}{\text{TOTAL REINFORCEMENT IN SHORT DIRECTION}} = \frac{2}{(B+1)} \qquad \text{WHERE: } B = Lf/Bf$$

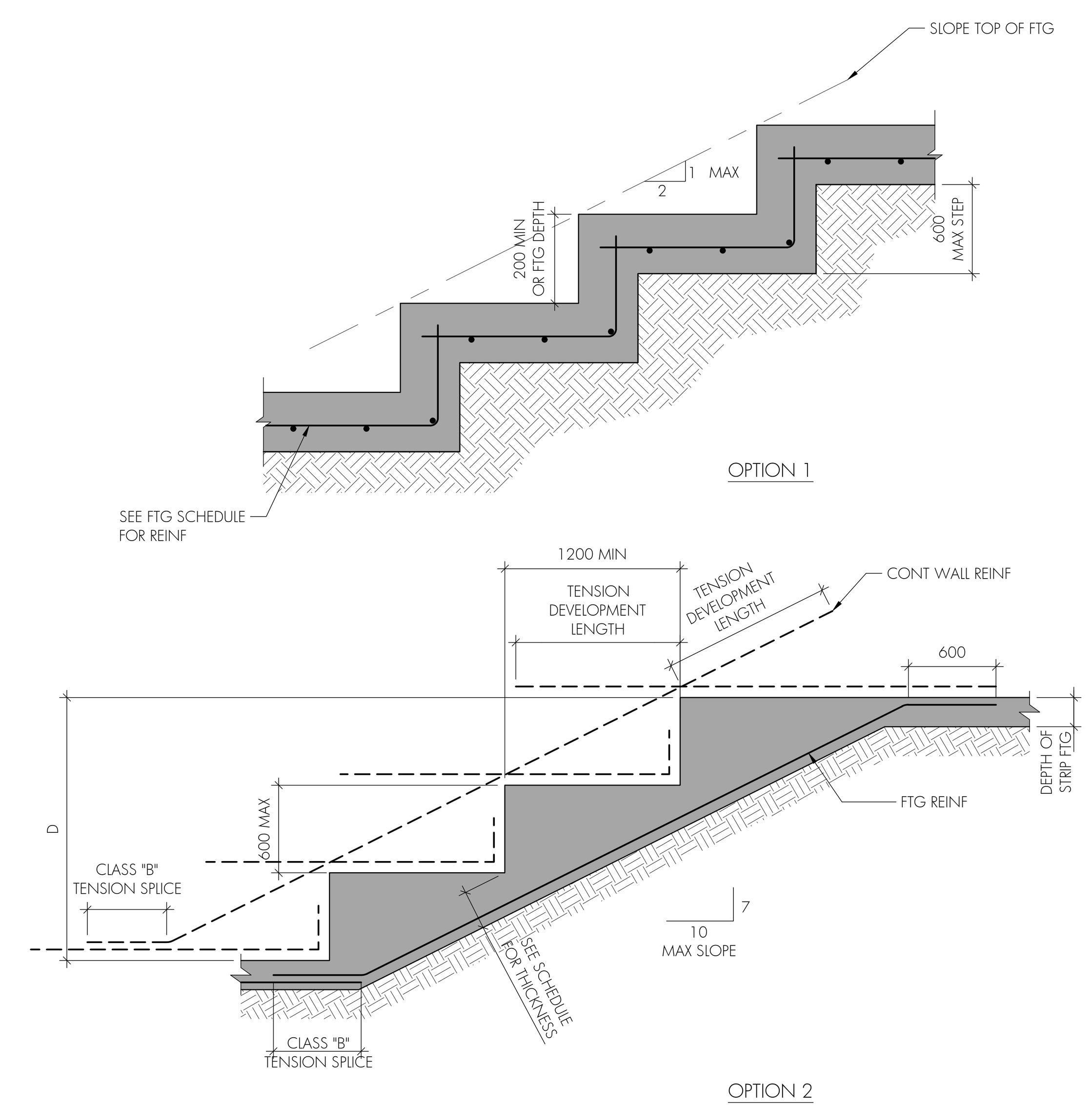
REMAINING BARS IN SHORT DIRECTION SHOULD BE UNIFORMLY SPACED IN OUTER PORTIONS OF THE FOOTING

7 REINFORCEMENT PLACEMENT IN RECTANGULAR FOOTINGS
S004 NTS

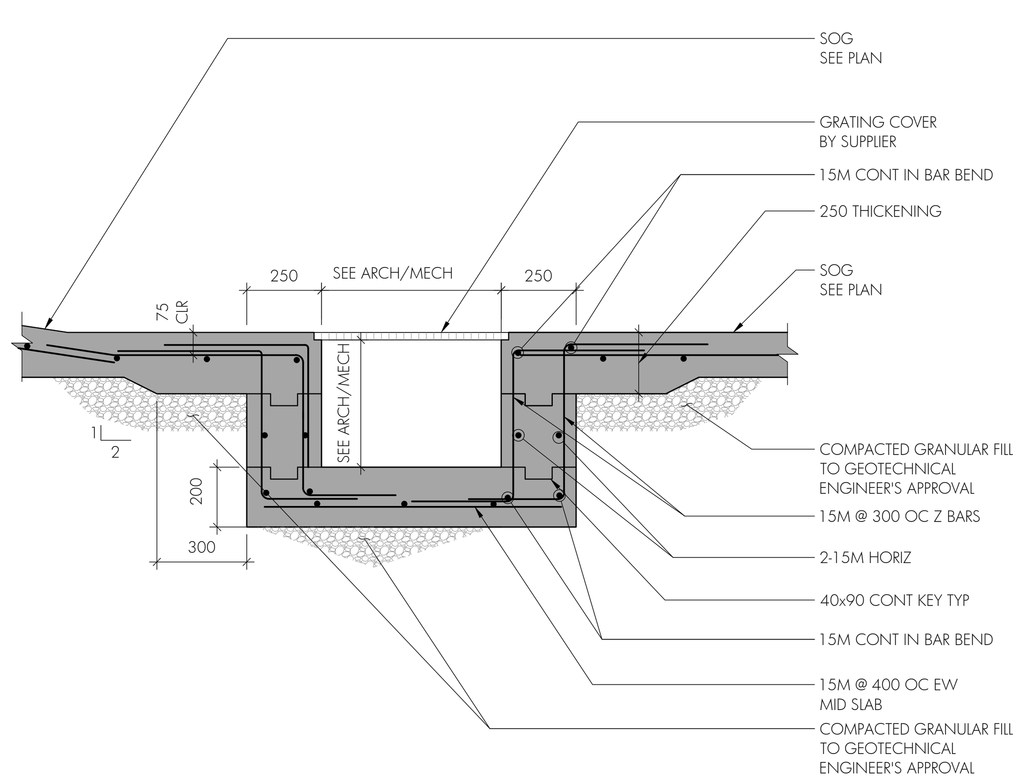


NOTE:
APPLIES TO EDGE OF ADJACENT EXCAVATION FOR FOOTINGS, SUMPS PITS, BASEMENT, SITE SERVICES, ETC.

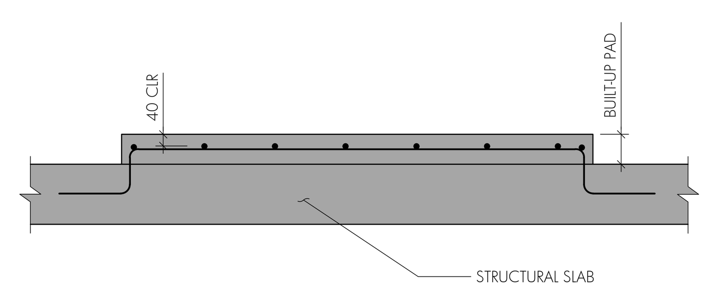
6 ELEVATIONS OF ADJACENT FOOTINGS AND EXCAVATIONS
S004 NTS



1 TYP STEPPED FOOTING OPTIONS
S004 NTS



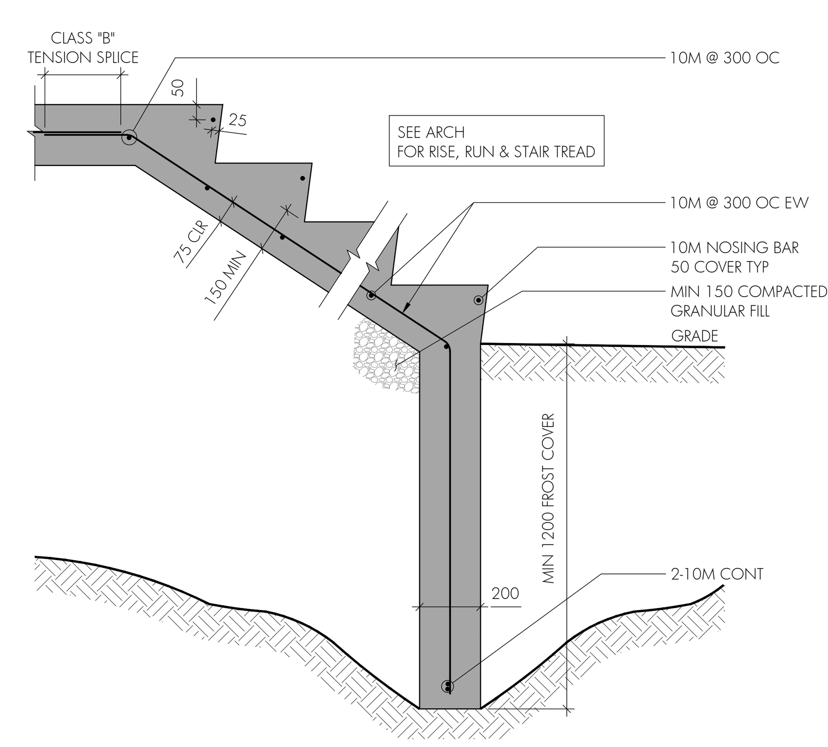
4 TYP TRENCH DRAIN
S004 NTS



PAD THICKNESS "THK"	REINFORCEMENT
50	152MWx152MW18.7xMW18.7WWF 1 LAYER
100	152MWx152MW18.7xMW18.7WWF 2 LAYERS
150	10M @ 300 OC MID-DEPTH OF "THK" EW
200	10M @ 250 OC TOP & BOT EW

NOTE:
GROUT ALL CRACKS IN THE HOUSEKEEPING PAD WITH MORTAR AND BONDING AGENT OR AS NOTED IN SPECIFICATIONS

3 TYP HOUSEKEEPING PAD
S004 NTS



2 TYP STAIR ON GRADE
S004 NTS

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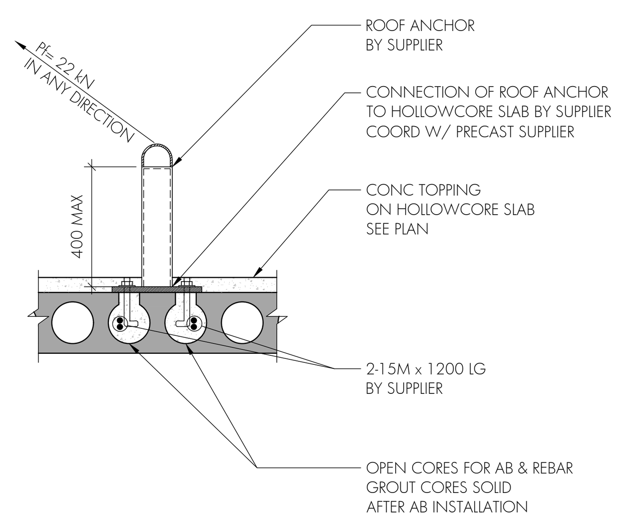
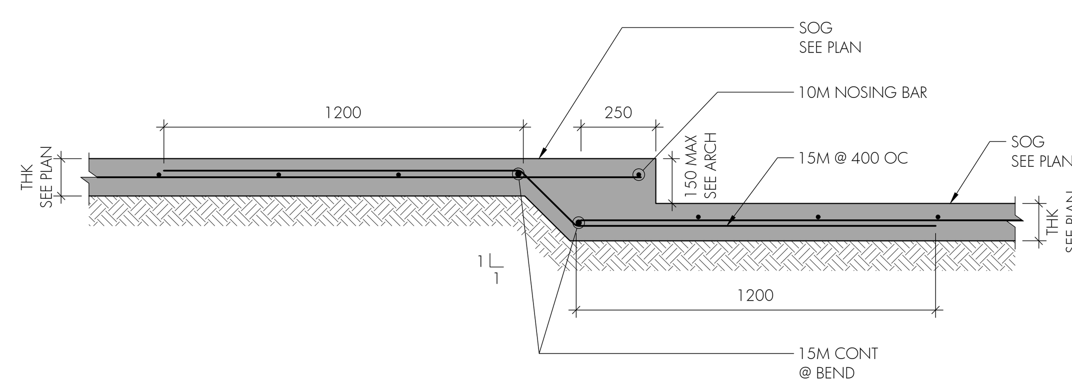
TYPICAL DETAILS

Drawing No:
S004

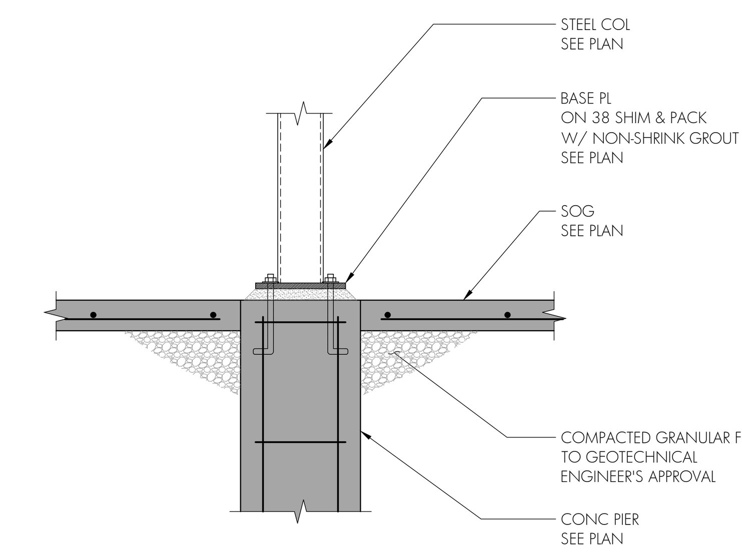
cm in



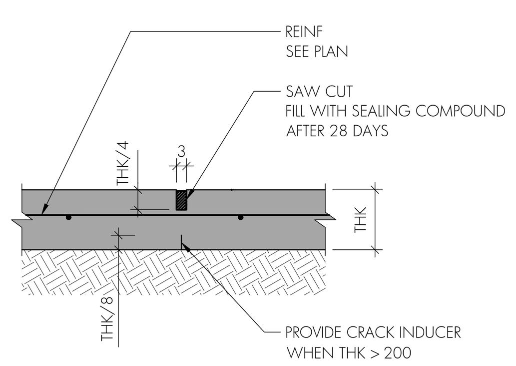
13 S005 TYPICAL ROOF ANCHOR AT HOLOWCORE SLAB
NTS



12 S005 STEP UP TO 6" IN SLAB-ON-GRADE
NTS

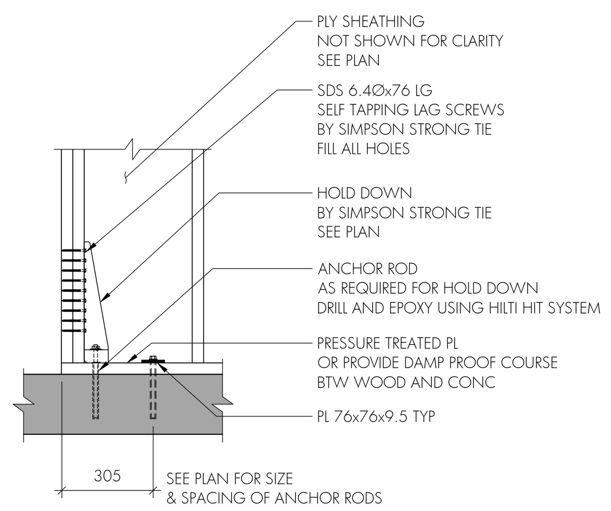


11 S005 TYPICAL STEEL POST BASE PLATE ON CONCRETE
NTS

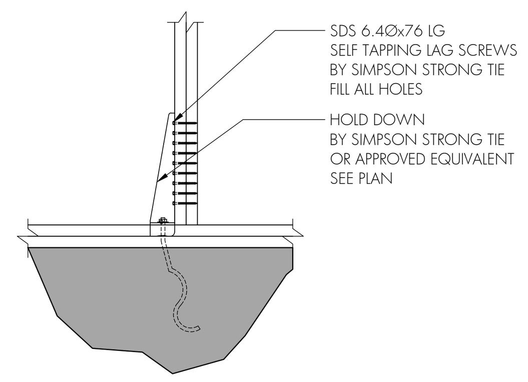


NOTES:
1. SEE MSE-010-3 FOR SAW CUT SPACING
2. SAW CUT DIAMOND PATTERN AROUND COLUMNS 150 CLEAR ALL SIDES UNO
3. SAW CUT 12 TO 18 HOURS AFTER POURING CONCRETE

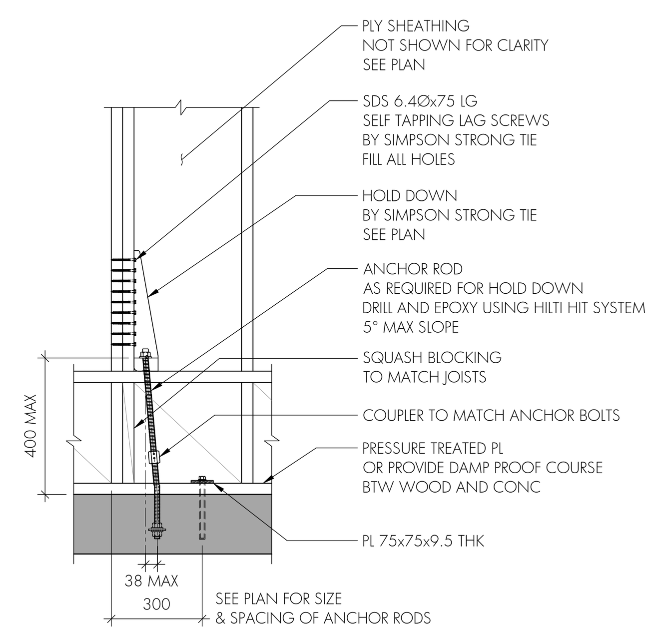
10 S005 CONTROL JOINT IN SOG
NTS



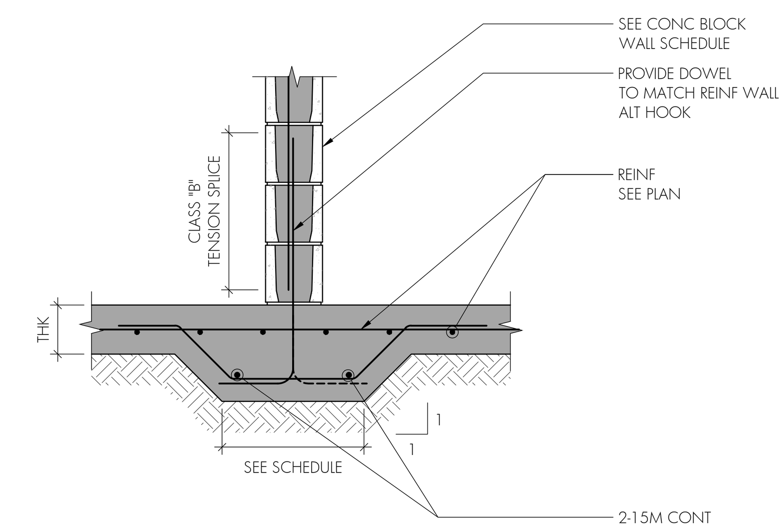
9 S005 HOLD DOWN TO CONCRETE (CAST-IN)
NTS



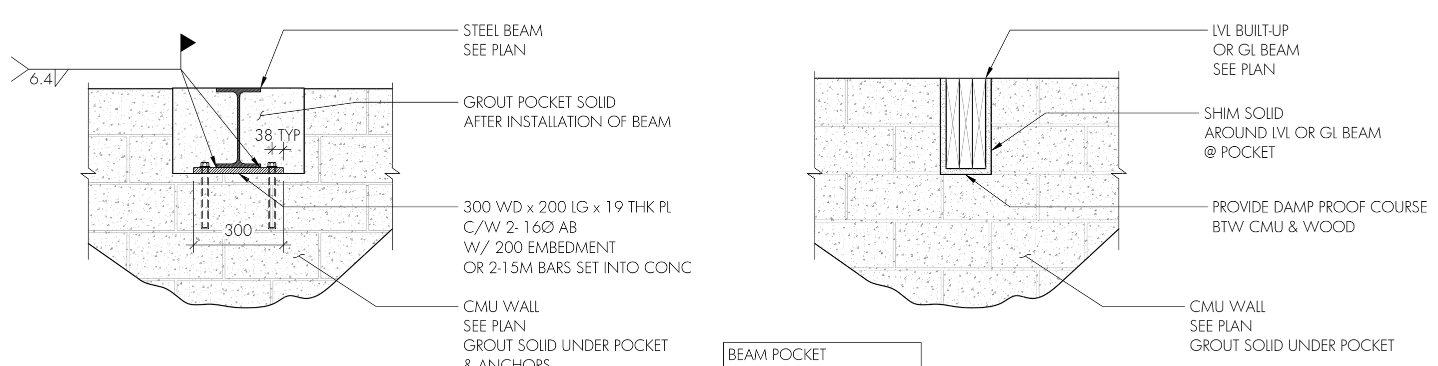
8 S005 HOLD DOWN TO CONCRETE (CAST-IN)
NTS



7 S005 RAISED HOLD DOWN TO CONCRETE (EPOXY ANCHORS)
NTS

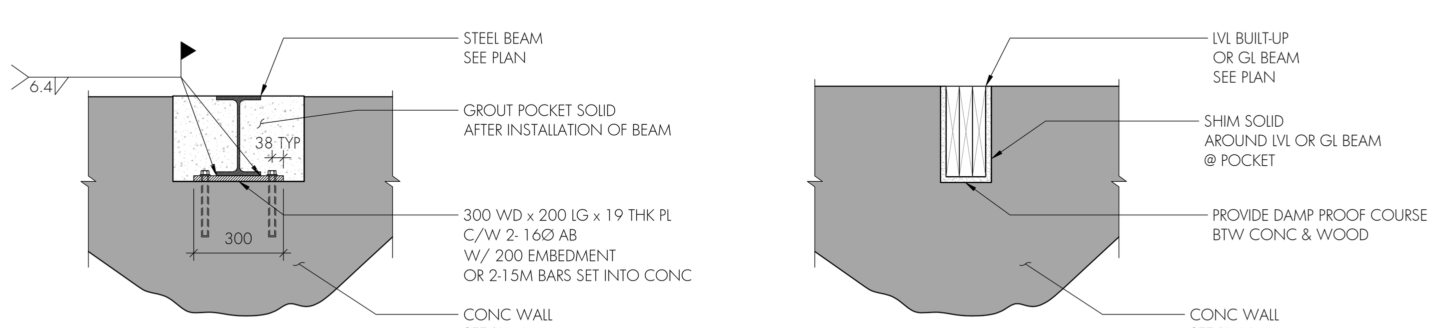


6 S005 TYP SLAB THICKENING SECTION UNDER NON-BEARING MASONRY WALL
NTS



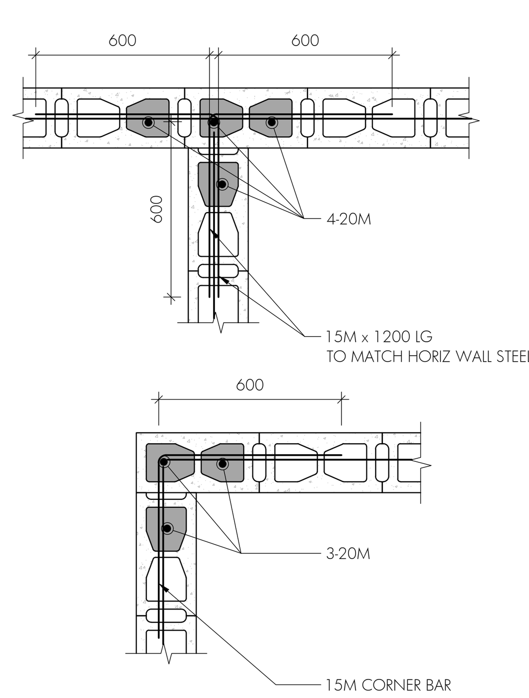
BEAM POCKET
TO BE FULL DEPTH OF WALL
UNO

5 S005 TYP BEAM POCKET DETAIL IN MASONRY WALL
NTS

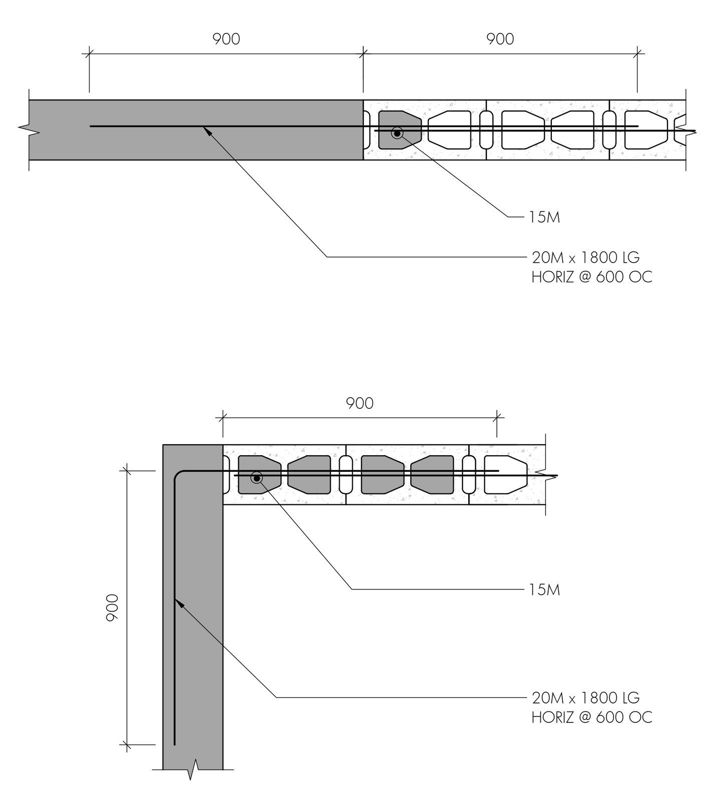


BEAM POCKET
TO BE FULL DEPTH OF WALL
UNO

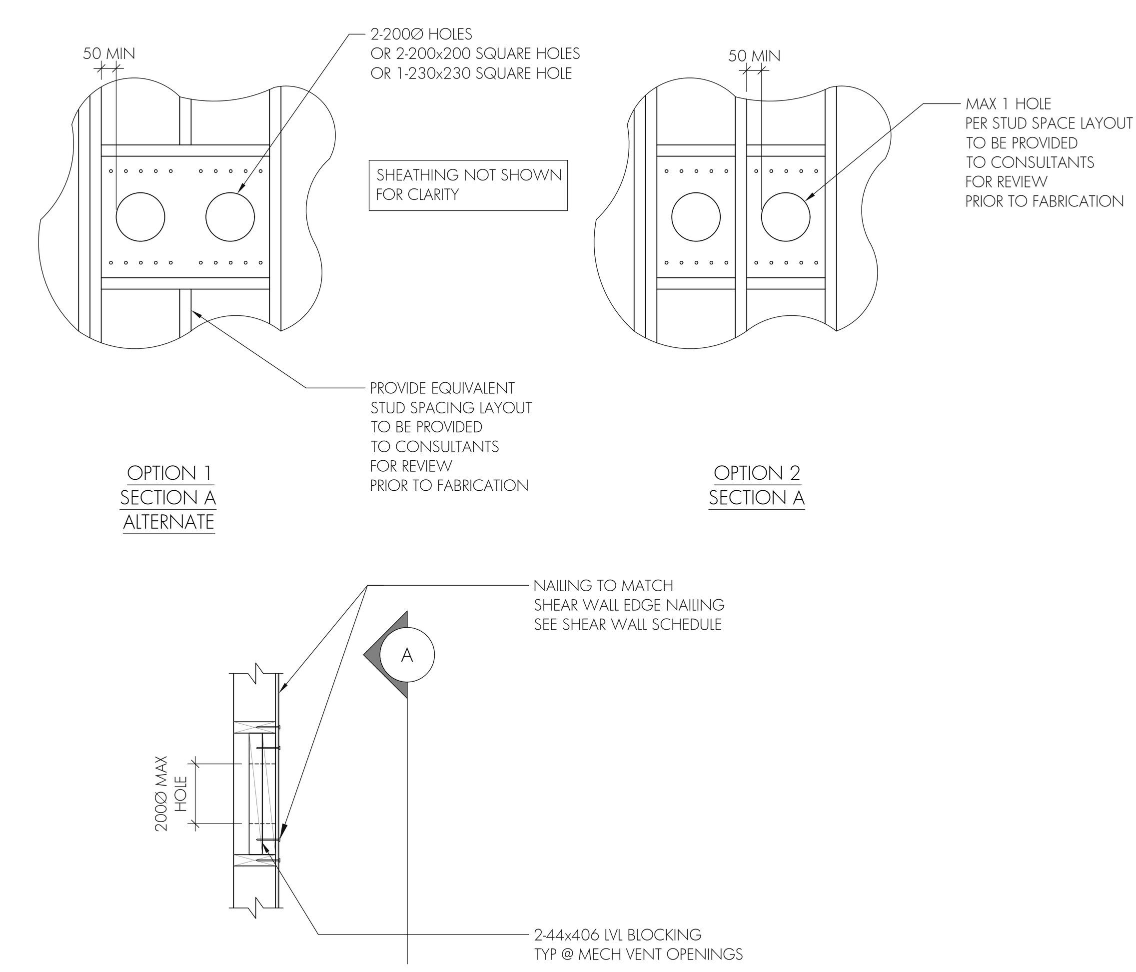
4 S005 TYP BEAM POCKET DETAIL IN CONCRETE WALL
NTS



3 S005 TYP REINFORCEMENT AT MASONRY WALL INTERSECTIONS
NTS



2 S005 TYP REINFORCEMENT AT MASONRY WALL TO CONCRETE WALL INTERSECTIONS
NTS



1 S005 TYP BLOCKING AT VENTS IN WOOD SHEAR WALLS
NTS

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PROVINCE OF ONTARIO

Project:
32 UNIT AFFORDABLE HOUSING APARTMENT BUILDING
20 SOUTH ST., TRENTON, ON

Project No:
23.012

Scale: AS NOTED
Drawn By: KM
Checked By: AF/MP

MSE START DATE: 19-APR-2023
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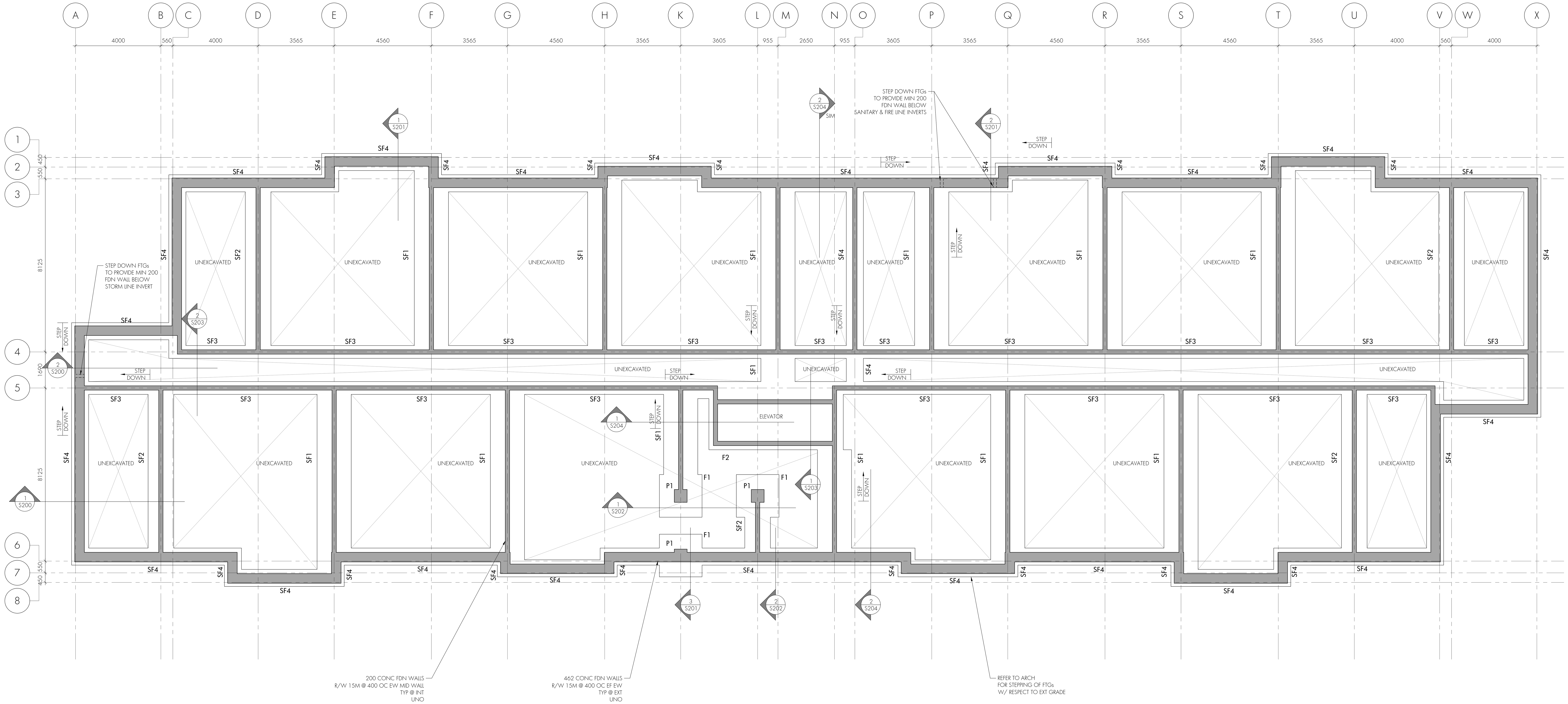
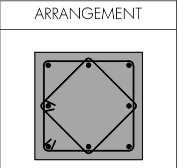
	30-JUL-2024	Issued for Tender

Drawing Title:
TYPICAL DETAILS

Drawing No:
S005



1 S100 FOUNDATION PLAN 1:100

CONCRETE PIER SCHEDULE			
LABEL	DIMENSION	REINFORCEMENT	ARRANGEMENT
P1	600x600	8-20M VERT + 10M TIES @ 200 OC	

FOOTING SCHEDULE			
LABEL	TYPE	DIMENSIONS	REINFORCEMENT
F1	PAD	2000x2000x300 DP	7-15M BOT EW
F2	PAD	6300x3200x300 DP	15M @ 300 OC T&B EW H2E
SF1	STRIP	1600x300 DP	6-15M BOT LONG CONT + 15M BOT TRANS @ 400 OC
SF2	STRIP	1200x300 DP	5-15M BOT LONG CONT + 15M BOT TRANS @ 400 OC
SF3	STRIP	600x300 DP	3-15M BOT LONG CONT
SF4	STRIP	800x300 DP	4-15M BOT LONG CONT
ST1	THICKENING	400x200 DP	2-15M BOT CONT

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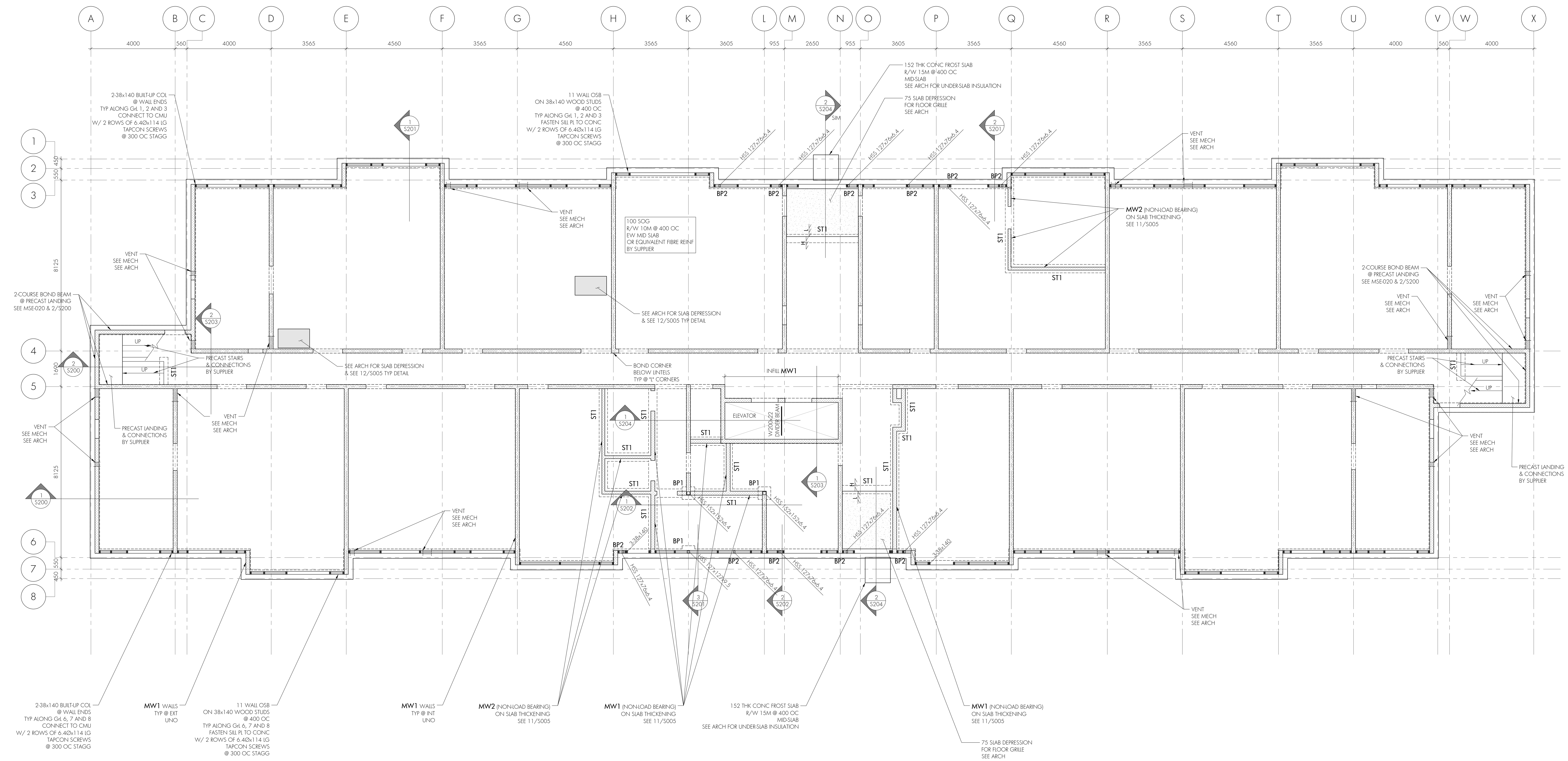
Drawing Title:

FOUNDATION PLAN

Drawing No:

S100

cm in



NOTE:
ALL BUILT-UP COLUMNS ARE 2-38x140, UNO.

BASE PLATE SCHEDULE			
LABEL	DIMENSION	ANCHORAGE	ARRANGEMENT
BP1	300x300x19 THK	4-19Øx200 EMBED AB	50 TYP, 200, 89
BP2	230x140x19 THK	2-19Øx200 EMBED AB	38 TYP, 200, 89

MASONRY BLOCK WALL SCHEDULE						
LABEL	THICK	STRENGTH	JOINT REINF	VERT REINF	HORIZ REINF	END REINF
MW1	190	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M
MW2	140	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M

NOTES:
1. TYPE 'S' MORTAR TO BE USED FOR ALL WALLS - REFER TO MASONRY NOTES ON GENERAL NOTES.
2. PROVIDE DOUBLE BOND R/W 2-15M EACH CORE TO HEAD OF ALL MASONRY WALLS UNO.
3. SEE MSE-020 FOR ADDITIONAL REQUIREMENTS.
4. WHERE DIFFERENT WALL TYPES INTERCEPT PROVIDE LARGER END REINFORCEMENT REQUIREMENT
5. PROVIDE MIN 3-15M IN 3 GROUTED CELLS UNDER ALL BEAMS AND POINT LOADS.

WIND GIRT SCHEDULE	
OPENING WIDTH (W)	WIND GIRT SECTION
W ≤ 1500	38x140 SPF No. 1/2
1501 < W ≤ 2500	2-38x140 SPF No. 1/2
2501 < W ≤ 3200	2-38x140 LSL

WIND GIRTS ABOVE AND BELOW OPENINGS WHERE OPENINGS DO NOT EXTEND TO FLOOR OR ROOF LEVEL CONNECT WOOD GIRTS WITH 2-A35 FRAMING ANGLES AT EACH END.

FOOTING SCHEDULE			
LABEL	TYPE	DIMENSIONS	REINFORCEMENT
F1	PAD	2000x2000x300 DP	7-15M BOT EW
F2	PAD	6300x3200x300 DP	15M @ 300 OC T&B EW H2E
SF1	STRIP	1600x300 DP	6-15M BOT LONG CONT + 15M BOT TRANS @ 400 OC
SF2	STRIP	1200x300 DP	5-15M BOT LONG CONT + 15M BOT TRANS @ 400 OC
SF3	STRIP	600x300 DP	3-15M BOT LONG CONT
SF4	STRIP	800x300 DP	4-15M BOT LONG CONT
ST1	THICKENING	400x200 DP	2-15M BOT CONT

1/S101 GROUND FLOOR PLAN 1:100

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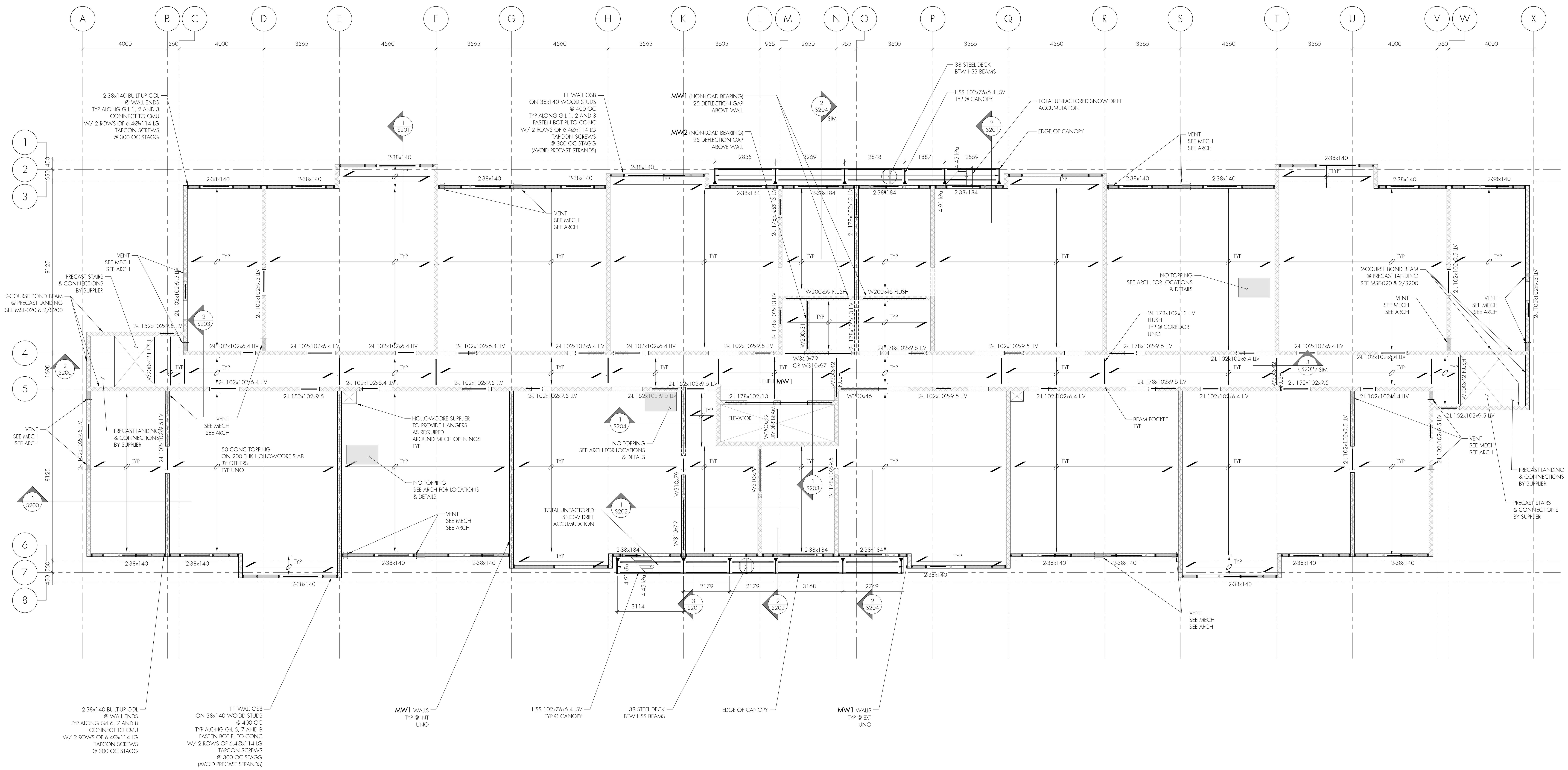
Drawing Title:
GROUND FLOOR PLAN

Drawing No:
S101

cm in



1 SECOND FLOOR PLAN
S102 1:100

NOTES:
1. PROVIDE 2-20M VERTICAL AT EACH POINT LOAD UNO.
2. ALL BEAMS ARE DROPPED, UNO.
3. ALL BEAMS ARE 2-L 102x102x6.4, UNO.
4. ALL BUILT-UP COLUMNS ARE 2-38x140, UNO.

WIND GIRT SCHEDULE

OPENING WIDTH (W)	WIND GIRT SECTION
W ≤ 1500	38x140 SPF No. 1/2
1501 < W ≤ 2500	2-38x140 SPF No. 1/2
2501 < W ≤ 3200	2-38x140 LSL

WIND GIRTS ABOVE AND BELOW OPENINGS WHERE OPENINGS DO NOT EXTEND TO FLOOR OR ROOF LEVEL CONNECT WOOD GIRTS WITH 2-A35 FRAMING ANGLES AT EACH END.

MASONRY BLOCK WALL SCHEDULE

LABEL	THICK	STRENGTH	JOINT REINF	VERT REINF	HORIZ REINF	END REINF
MW1	190	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M
MW2	140	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M

NOTES:
1. TYPE 'S' MORTAR TO BE USED FOR ALL WALLS - REFER TO MASONRY NOTES ON GENERAL NOTES.
2. PROVIDE DOUBLE BOND R/W 2-15M EACH CORE TO HEAD OF ALL MASONRY WALLS UNO.
3. SEE MSE-020 FOR ADDITIONAL REQUIREMENTS.
4. WHERE DIFFERENT WALL TYPES INTERCEPT PROVIDE LARGER END REINFORCEMENT REQUIREMENT
5. PROVIDE MIN 3-15M IN 3 GROUTED CELLS UNDER ALL BEAMS AND POINT LOADS.

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20 SOUTH ST., TRENTON, ON

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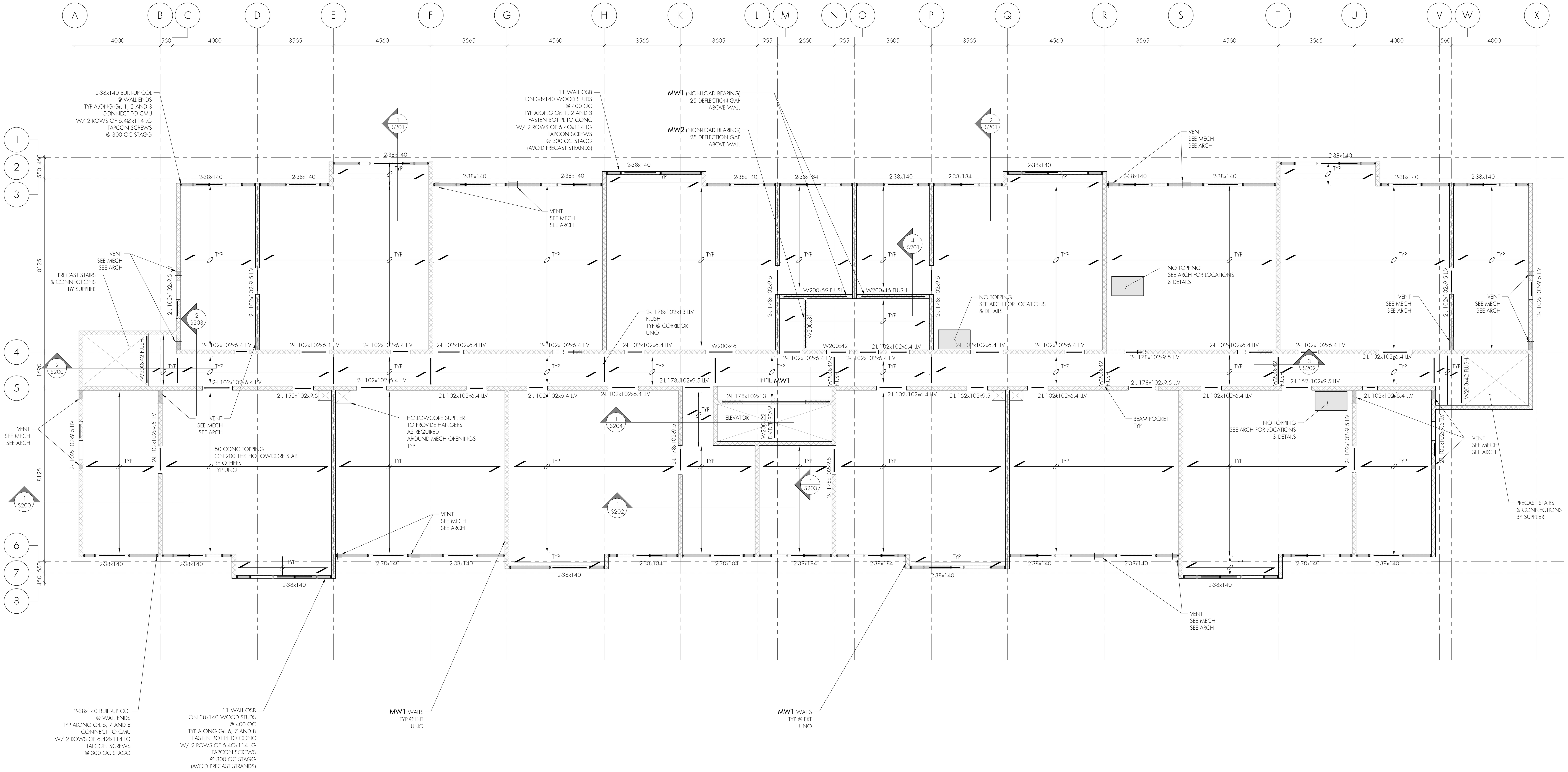
Drawing Title:
SECOND FLOOR PLAN

Drawing No:
S102

cm in



1 S103 THIRD FLOOR PLAN 1:100

NOTES:
1. PROVIDE 2-20M VERTICAL AT EACH POINT LOAD UNO.
2. ALL BEAMS ARE DROPPED, UNO.
3. ALL BEAMS ARE 2-L 102x102x6.4, UNO.
4. ALL BUILT-UP COLUMNS ARE 2-38x140, UNO.

WIND GIRT SCHEDULE

OPENING WIDTH (W)	WIND GIRT SECTION
W ≤ 1500	38x140 SPF No. 1/2
1501 < W ≤ 2500	2-38x140 SPF No. 1/2
2501 < W ≤ 3200	2-38x140 LSL

WIND GIRTS ABOVE AND BELOW OPENINGS WHERE OPENINGS DO NOT EXTEND TO FLOOR OR ROOF LEVEL CONNECT WOOD GIRTS WITH 2-A35 FRAMING ANGLES AT EACH END.

MASONRY BLOCK WALL SCHEDULE

LABEL	THICK	STRENGTH	JOINT REINF	VERT REINF	HORIZ REINF	END REINF
MW1	190	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M
MW2	140	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M

NOTES:
1. TYPE 'S' MORTAR TO BE USED FOR ALL WALLS - REFER TO MASONRY NOTES ON GENERAL NOTES.
2. PROVIDE DOUBLE BOND R/W 2-15M EACH CORE TO HEAD OF ALL MASONRY WALLS UNO.
3. SEE MSE-020 FOR ADDITIONAL REQUIREMENTS.
4. WHERE DIFFERENT WALL TYPES INTERCEPT PROVIDE LARGER END REINFORCEMENT REQUIREMENT
5. PROVIDE MIN 3-15M IN 3 GROUTED CELLS UNDER ALL BEAMS AND POINT LOADS.

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Project:

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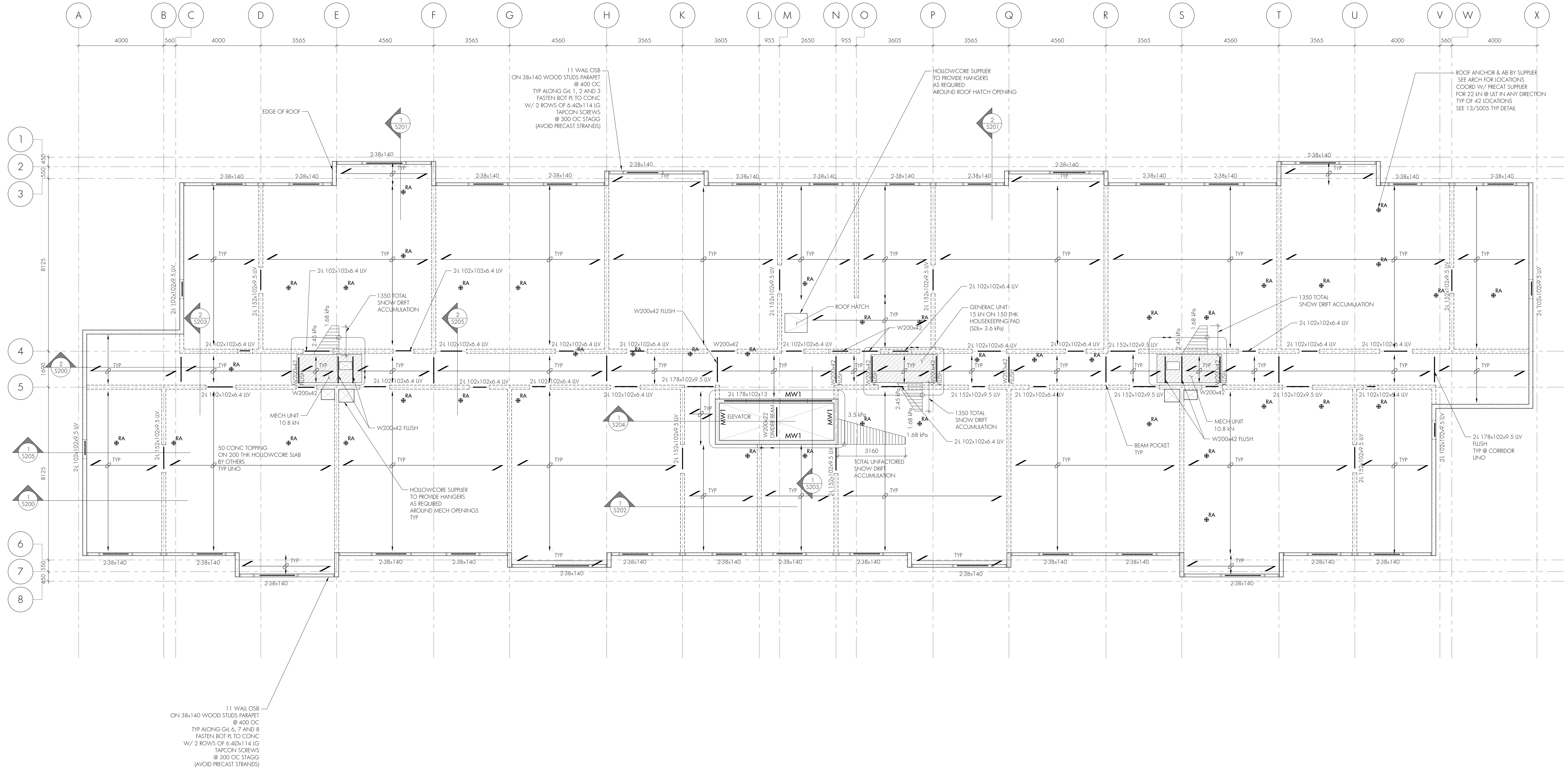
Drawing Title:
THIRD FLOOR PLAN

Drawing No:
S103



NOTES:
1. PROVIDE 2-20M VERTICAL AT EACH POINT LOAD UNO.
2. ALL BEAMS ARE DROPPED, UNO.
3. ALL BEAMS ARE 2-L 102x102x6.4, UNO.

WIND GIRT SCHEDULE

OPENING WIDTH (W)	WIND GIRT SECTION
W ≤ 1500	38x140 SPF No. 1/2
1501 < W ≤ 2500	2-38x140 SPF No. 1/2
2501 < W ≤ 3200	2-38x140 LSL

WIND GIRTS ABOVE AND BELOW OPENINGS WHERE OPENINGS DO NOT EXTEND TO FLOOR OR ROOF LEVEL CONNECT WOOD GIRTS WITH 2-A35 FRAMING ANGLES AT EACH END.

MASONRY BLOCK WALL SCHEDULE

LABEL	THICK	STRENGTH	JOINT REINF	VERT REINF	HORIZ REINF	END REINF
MW1	190	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M
MW2	140	15 MPa	2 WIRE 4.8Ø @ 400	1-15M @ 400	1-15M @ 800	2-20M

NOTES:
1. TYPE 'S' MORTAR TO BE USED FOR ALL WALLS - REFER TO MASONRY NOTES ON GENERAL NOTES.
2. PROVIDE DOUBLE BOND R/W 2-15M EACH CORE TO HEAD OF ALL MASONRY WALLS UNO.
3. SEE MSE-020 FOR ADDITIONAL REQUIREMENTS.
4. WHERE DIFFERENT WALL TYPES INTERCEPT PROVIDE LARGER END REINFORCEMENT REQUIREMENT
5. PROVIDE MIN 3-15M IN 3 GROUTED CELLS UNDER ALL BEAMS AND POINT LOADS.

1 ROOF PLAN
S104 1:100

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32 UNIT AFFORDABLE HOUSING APARTMENT BUILDING

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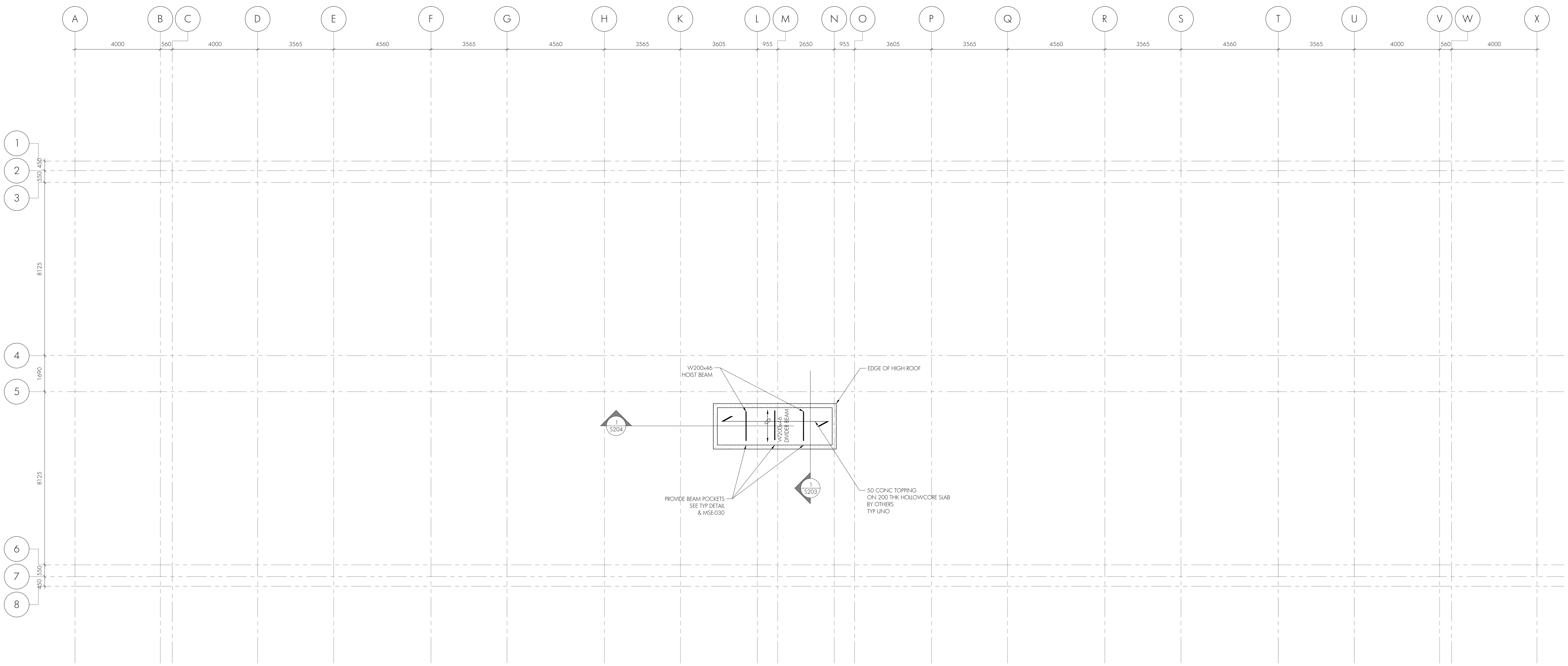
Drawing Title:

ROOF PLAN

Drawing No:

S104



NOTES:
1. PROVIDE 2-20M VERTICAL AT EACH POINT LOAD UNO.
2. ALL BEAMS ARE DROPPED, UNO.

1 HIGH ROOF PLAN
S105 1:100

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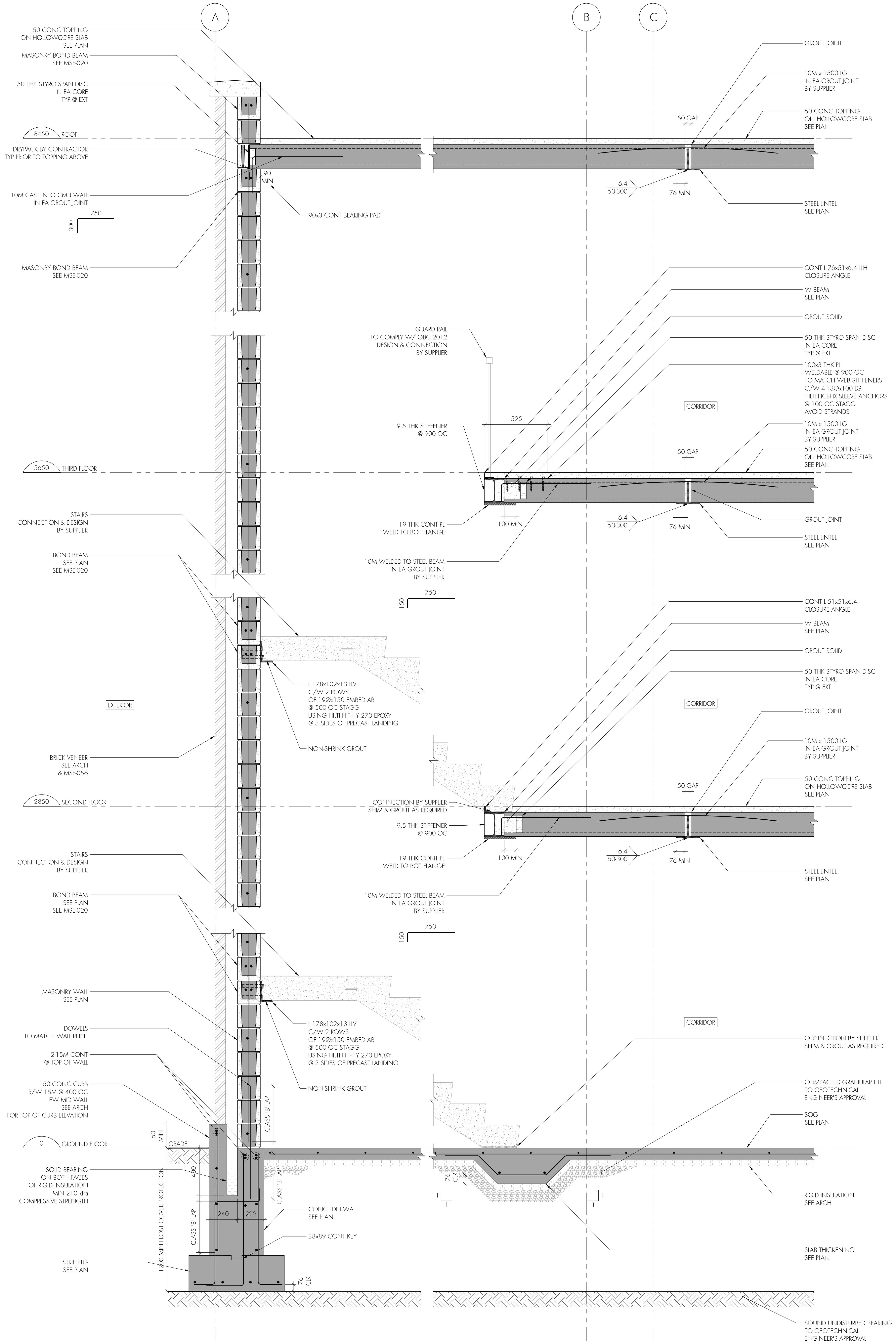
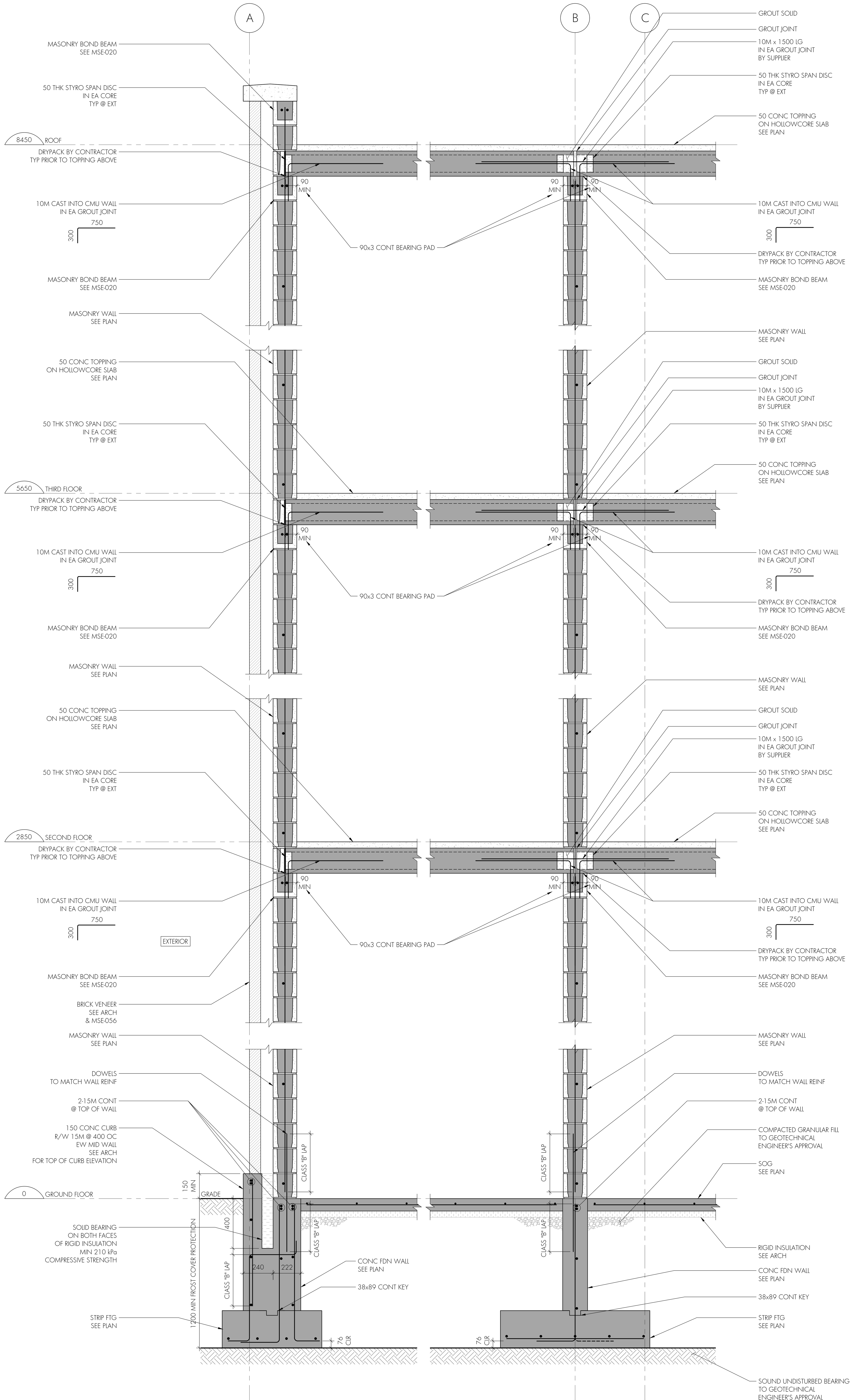
Drawing Title:
HIGH ROOF PLAN

Drawing No:
S105



2 SECTION
S200 1:20



1 SECTION
S200 1:20

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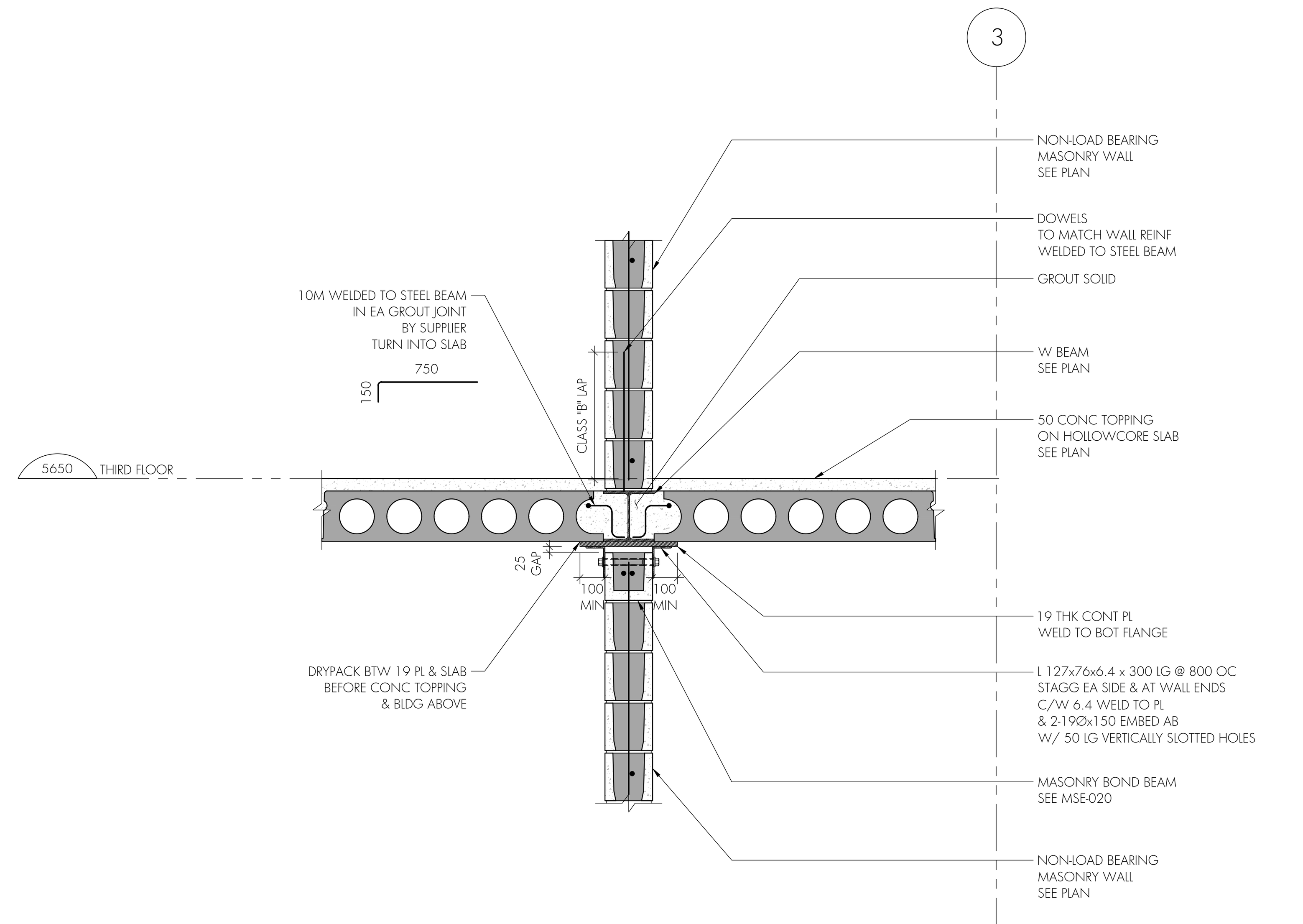
Drawing Title:

SECTIONS

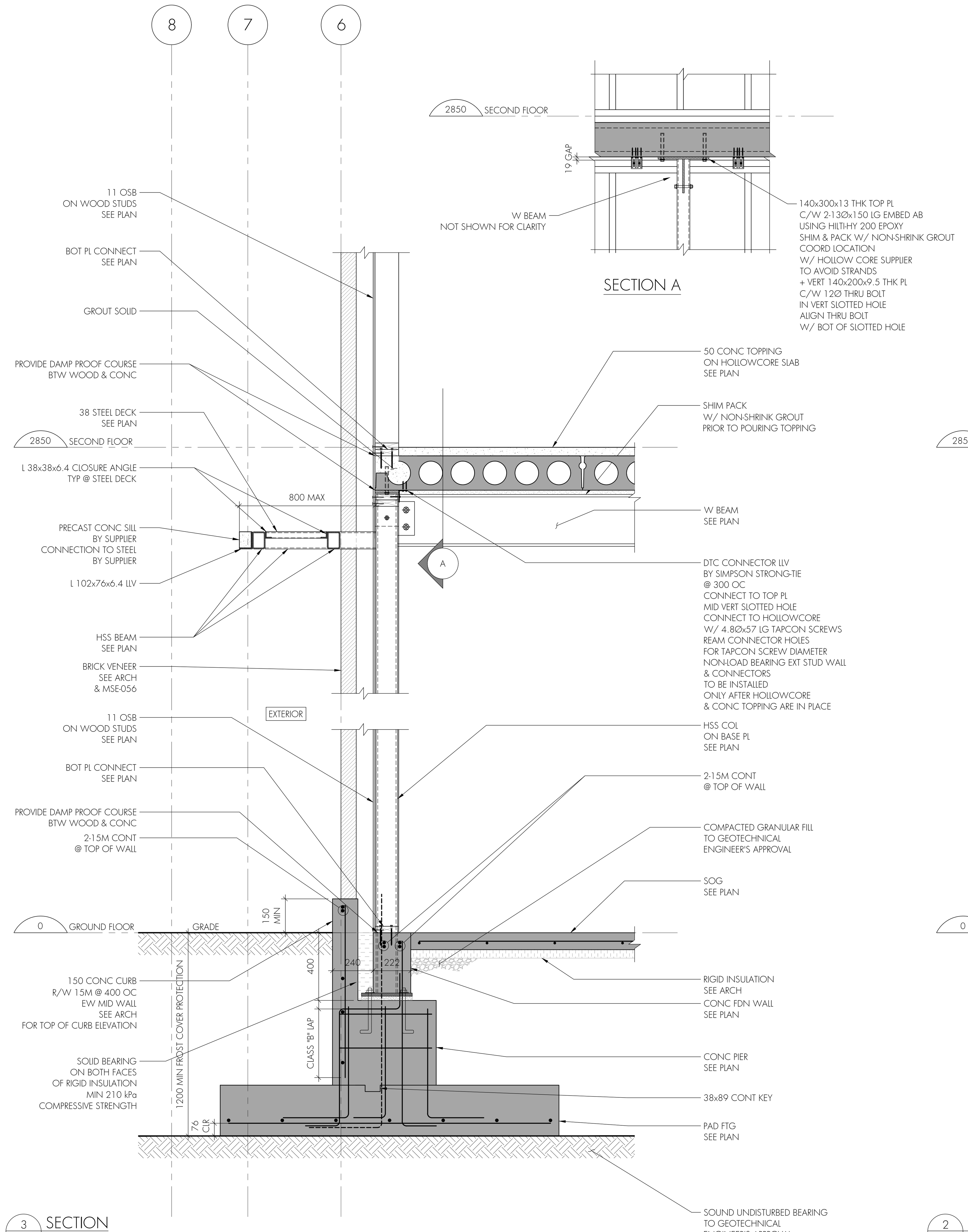
Drawing No:

S200

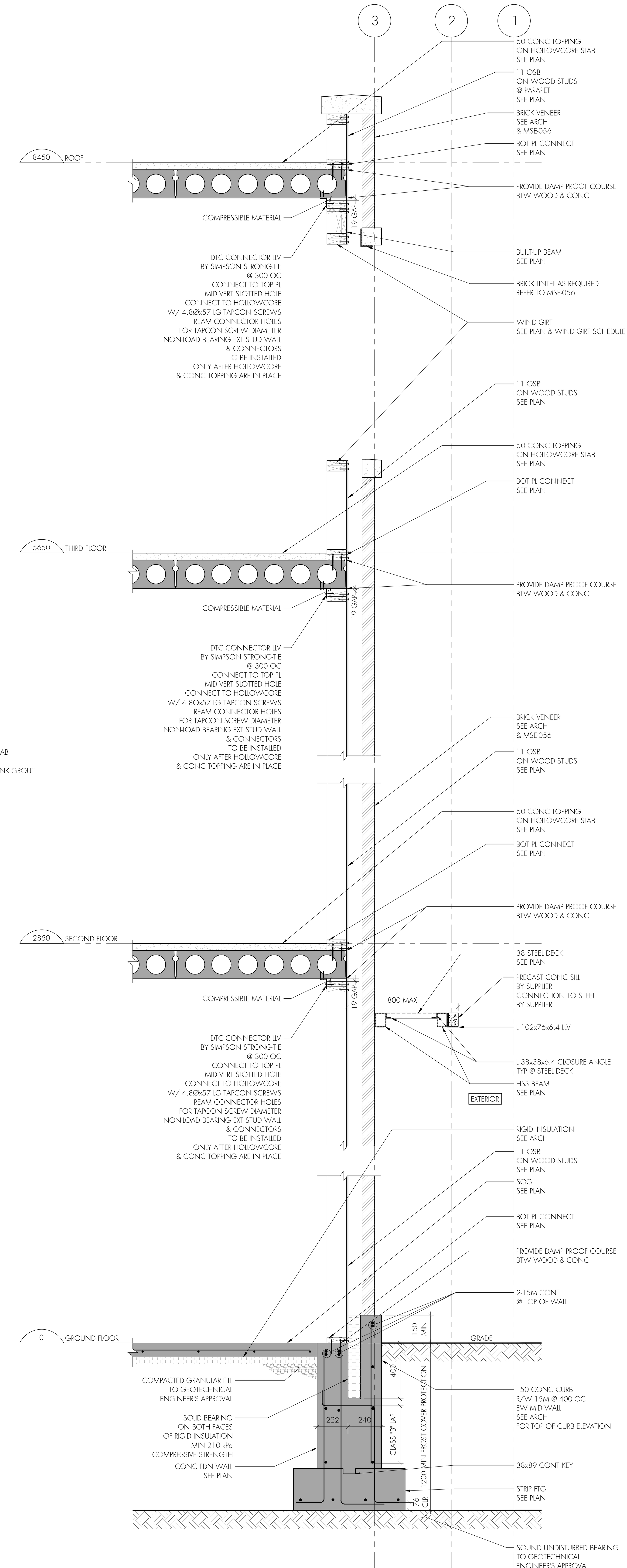
cm in



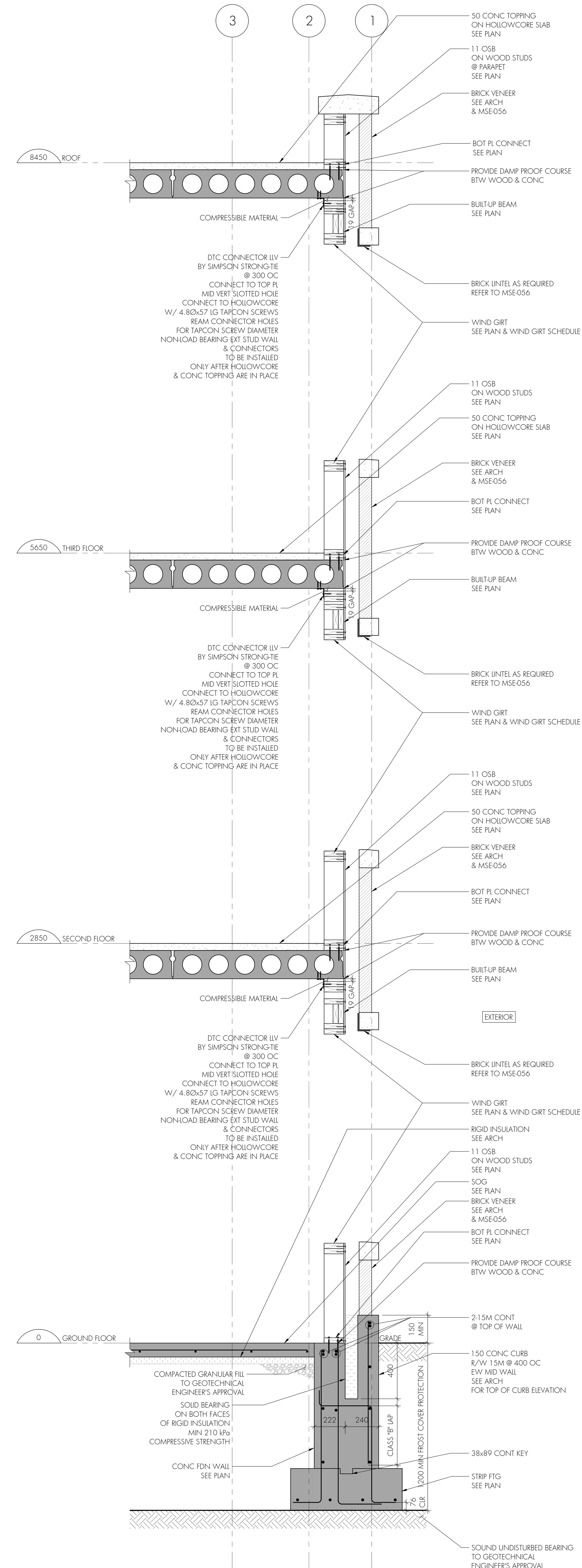
4 SECTION
S201 1:20



3 SECTION
S201 1:20



2 SECTION
S201 1:20



1 SECTION
S201 1:20

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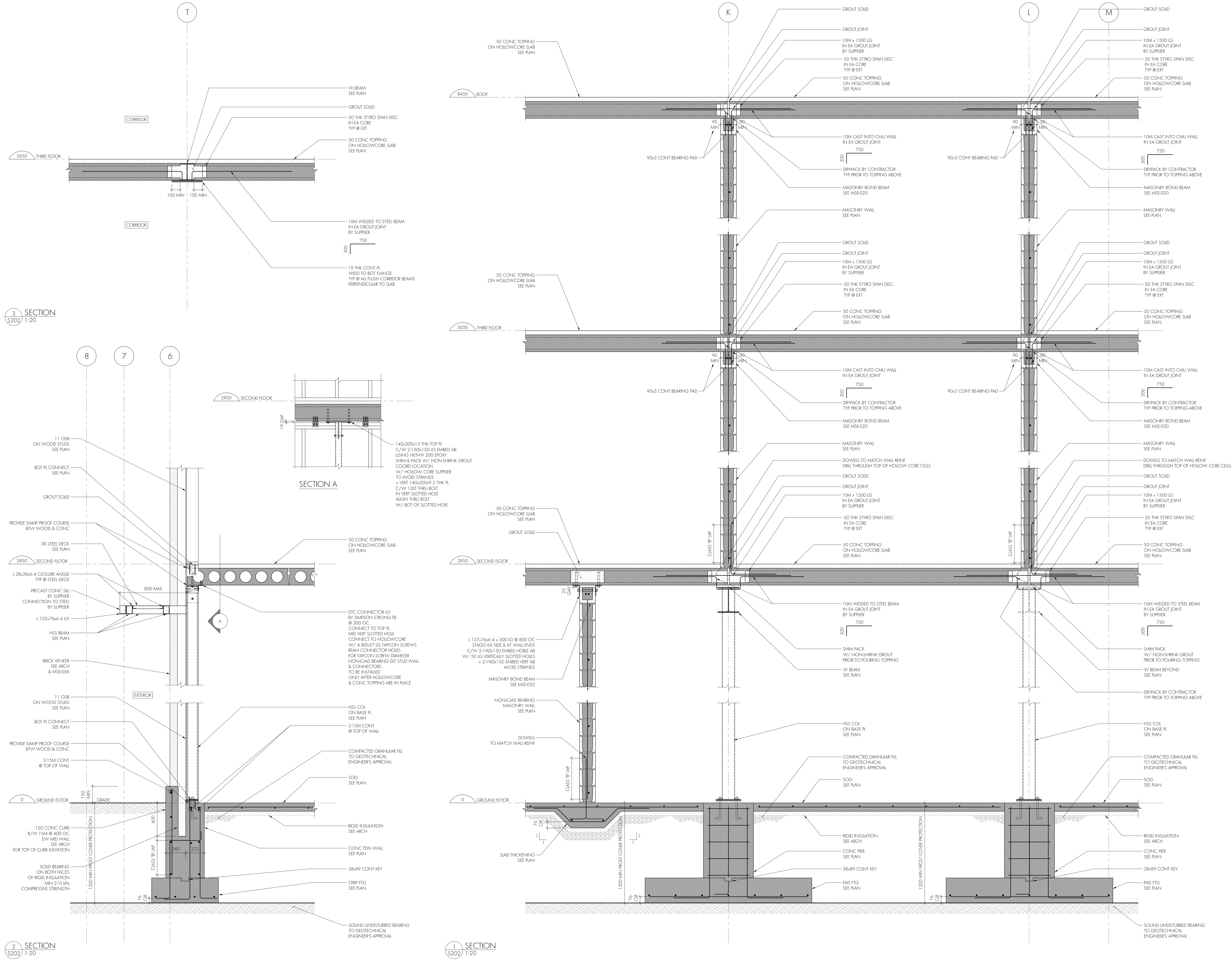
Drawing Title:

SECTIONS

Drawing No:

S201

cm in



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2024/07/30
PROVINCE OF ONTARIO

Project:

32 UNIT AFFORDABLE HOUSING APARTMENT BUILDING

20 SOUTH ST., TRENTON, ON

Project No:
23.012

Scale: AS NOTED
Drawn By: KM
Checked By: AF/MP

MSE START DATE: 19-APR-2023
REVISIONS AND DISTRIBUTION LOG

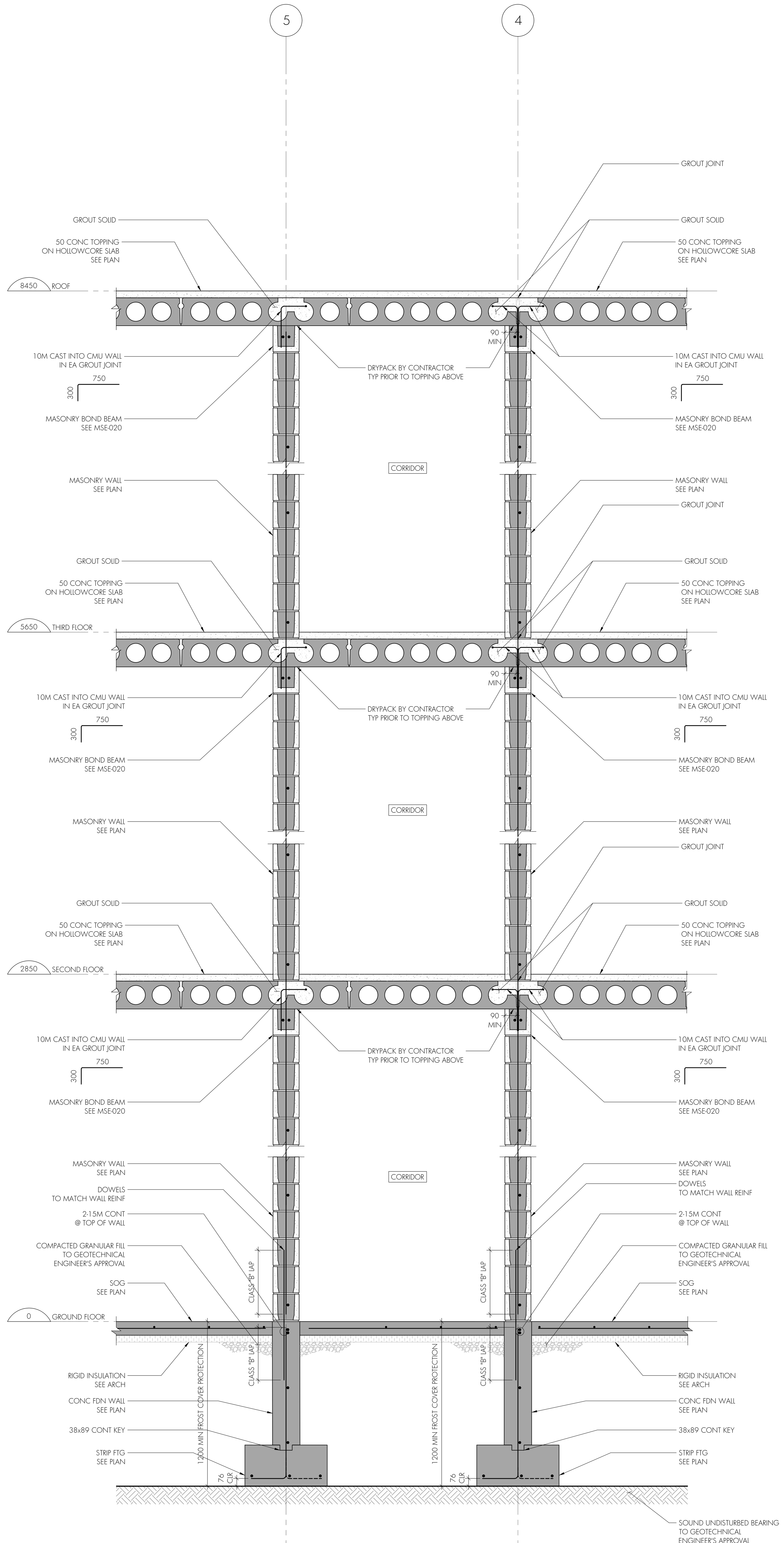
Rev	Date	Note
	15-JUN-2023	Issued for Coordination
	16-NOV-2023	Issued for Coordination
	18-JAN-2024	Issued for Class "B" Estimate
	12-FEB-2024	Issued for Bldg Permit
	17-JUN-2024	Issued for Tender Coord.
	30-JUL-2024	Issued for Tender

Drawing Title:

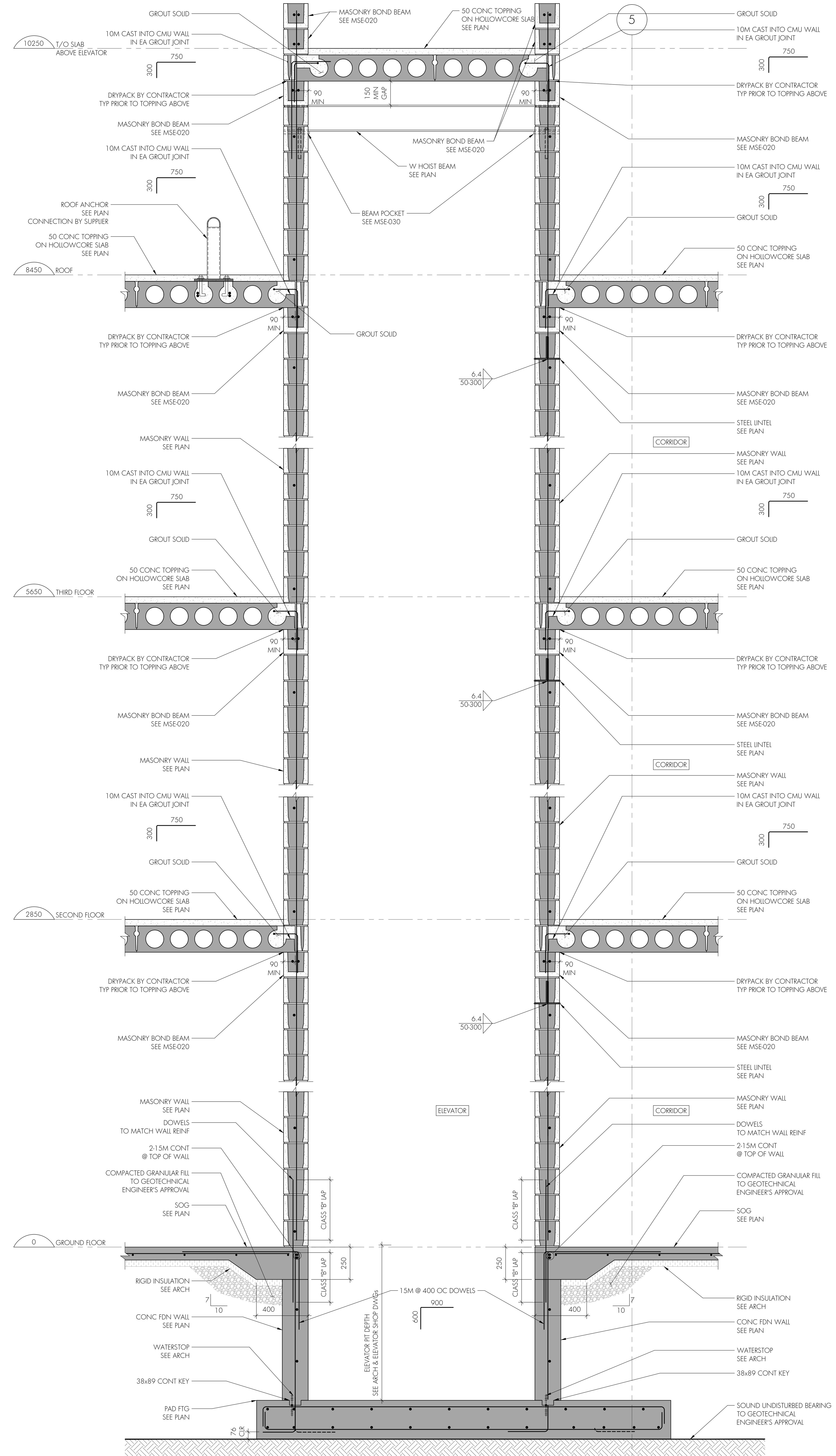
SECTIONS

Drawing No:

S202



2 SECTION
S203 1:20



1 SECTION
S203 1:20

moses structural engineers

25a Morrow Avenue, Suite 202
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SECTIONS

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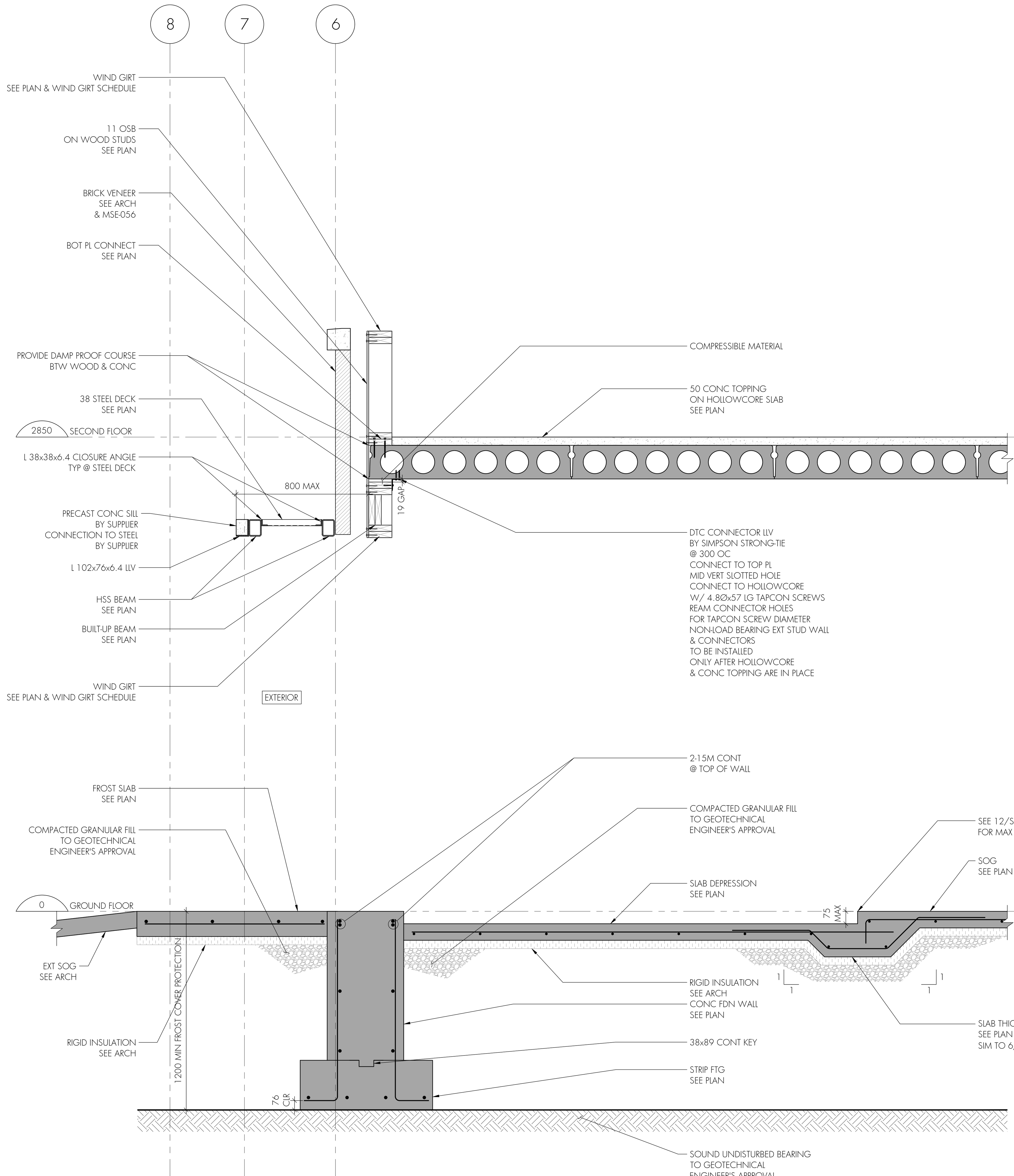
S203

cm in



2 SECTION
S204 1:20

1 SECTION
S204 1:20

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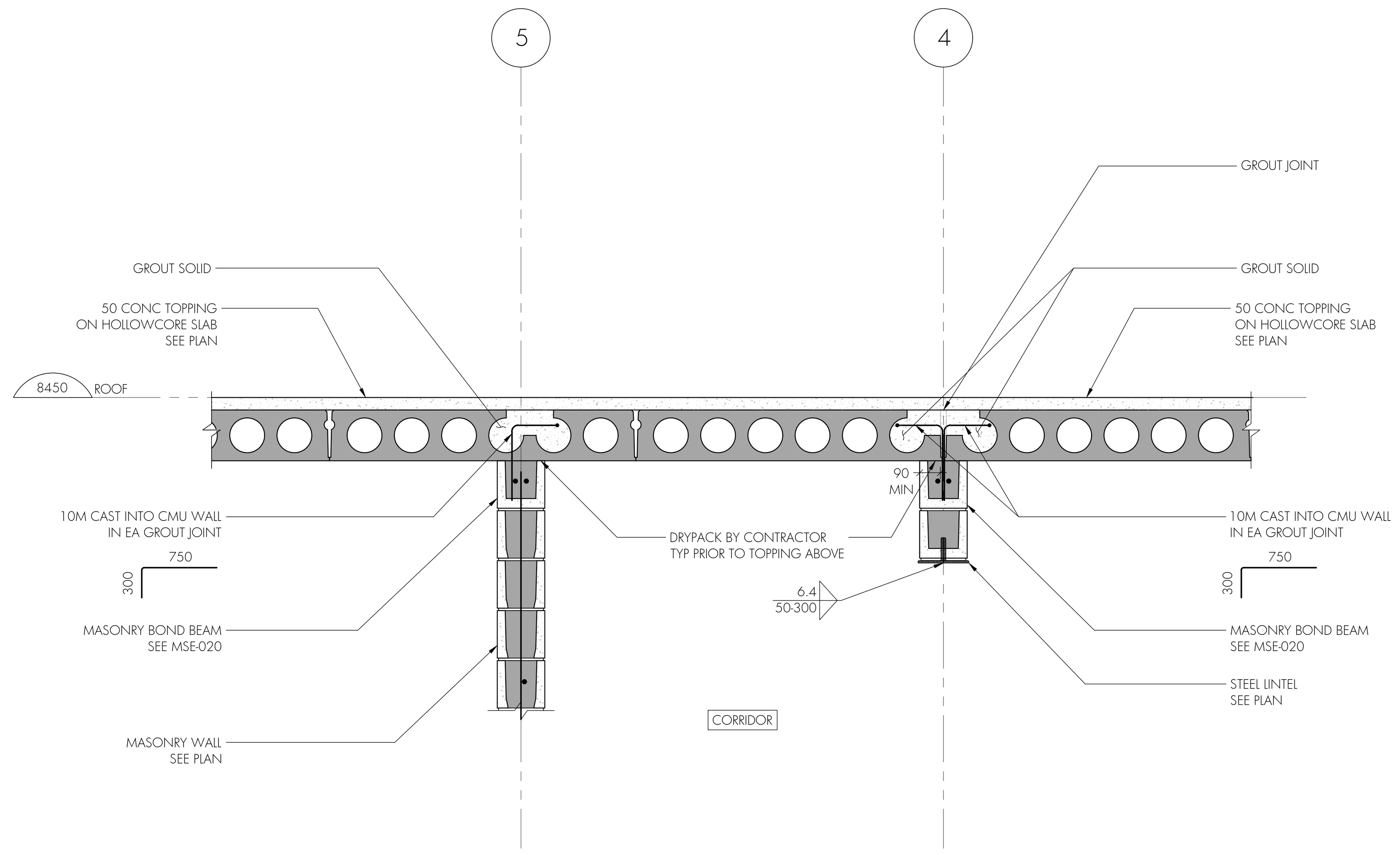
Drawing Title:
SECTIONS

Drawing No:
S204



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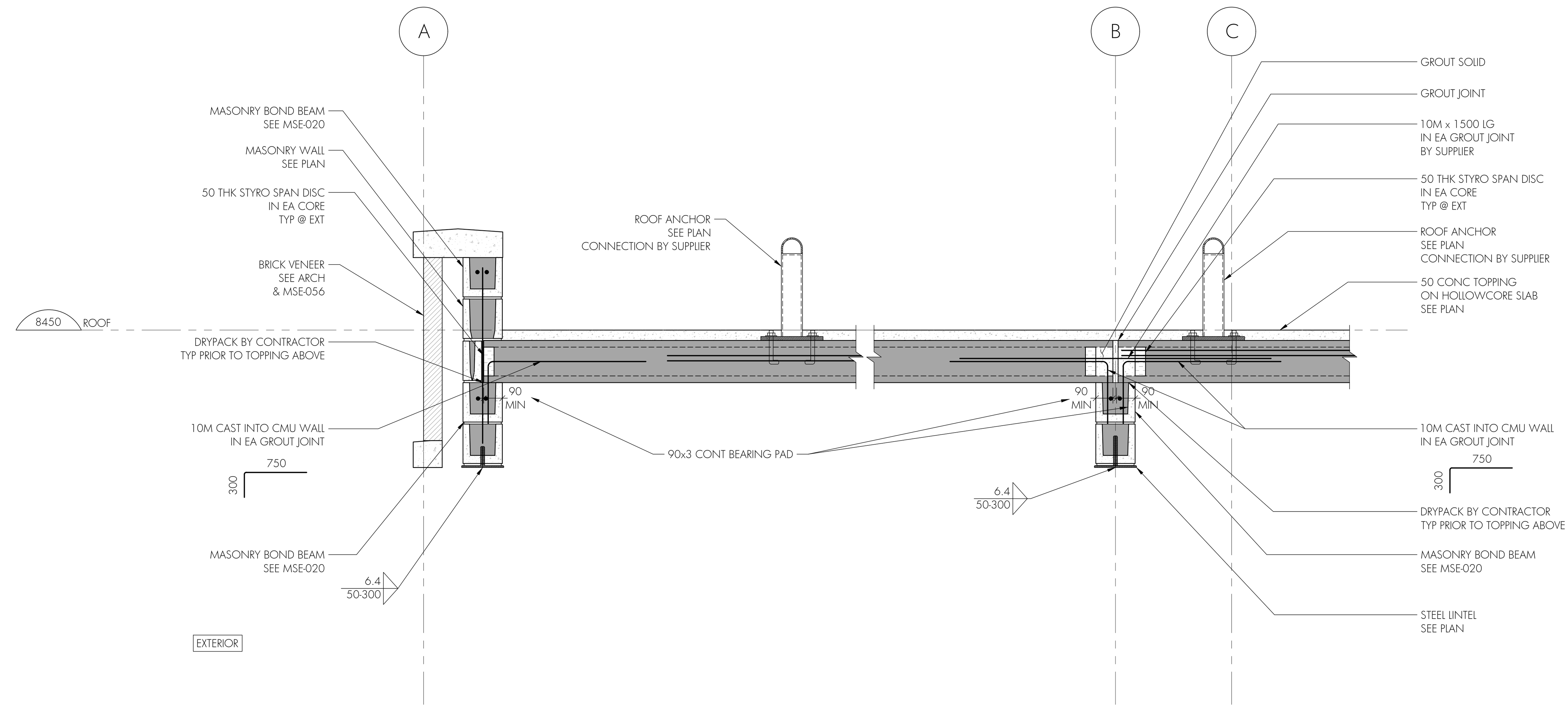

1 S205 SECTION 1:20

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SECTIONS

Drawing No:
S205

cm in