

## GENERAL NOTES

- STRUCTURAL DESIGN BASED ON THE MANITOBA BUILDING CODE 2011 EDITION.
  - IMPORTANCE CATEGORY: NORMAL
  - WIND LOAD:  $450 = 0.45 \text{ kPa}$
  - GROUND SNOW LOAD:  $S_g = 1.9 \text{ kPa}$
  - ASSOCIATED WIND LOAD:  $S_r = 0.2 \text{ kPa}$
- DO NOT SCALE DRAWINGS.
- DO NOT BACKFILL UNTIL GROUND FLOOR STRUCTURE IS IN PLACE AND BASEMENT SLABS HAVE BEEN POURED AND CURED.
- ALL DIMENSIONS ARE TO BE VERIFIED WITH THE ARCHITECTURAL DRAWINGS PROJECT DRAWINGS AND EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION.
- THESE STRUCTURAL DRAWINGS SHOW THE COMPLETED STRUCTURE AND DO NOT INDICATE ALL COMPONENTS NECESSARY FOR SAFETY DURING CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SAFETY ON AND AROUND THE JOBSITE DURING CONSTRUCTION.

### FOUNDATIONS

- A COPY OF THE GEOTECHNICAL REPORT COMMISSIONED BY THE OWNER IS AVAILABLE FOR REVIEW AT THE OFFICES OF THE CONSULTANT.
- NOTWITHSTANDING THE INFORMATION PROVIDED IN THE GEOTECHNICAL REPORT THE FOUNDATION AND GENERAL CONTRACTORS SHALL SATISFY THEMSELVES AS TO THE PREVAILING CONDITIONS AT THE SITE AS NO EXTRAS SHALL BE GRANTED SHOULD CONDITIONS DIFFER FROM THOSE INDICATED.
- ALL FRICITION PILES ARE DESIGNED ON AN ALLOWABLE SKIN FRICTION OF  $14.4 \text{ kPa}$ . EFFECTIVE LENGTH OF FRICITION PILES IS TOTAL LENGTH AS SHOWN ON PLAN MINUS  $3000 \text{ mm}$  FOR PERIMETER AND EXTERIOR PILES AND MINUS  $1500 \text{ mm}$  FOR INTERIOR PILES BELOW BASEMENT.
- FRICITION PILE REINFORCING TO BE  $6000 \text{ mm}$  LONG UNLESS NOTED IN PLANS;  $10 \text{M}$  RINGS AT  $1200 \text{ mm}$  ON-CENTRE AND  $3-10 \text{M}$  RINGS AT  $150 \text{ mm}$  ON-CENTRE AT TOP. EXTEND VERTICAL PILE REINFORCING  $450 \text{ mm}$  INTO BEAMS OR WALLS. PILE REINFORCING TO BE  $5-10 \text{M}$  FOR  $400$  DIAMETER PILES,  $6-10 \text{M}$  FOR  $450 \text{ mm}$ ,  $5-15 \text{M}$  FOR  $500 \text{ mm}$ ,  $5-15 \text{M}$  FOR  $550 \text{ mm}$ ,  $6-15 \text{M}$  FOR  $600 \text{ mm}$ .
- PROVIDE  $10 \text{ MIL}$  POLYETHYLENE WRAPPED SONOTUBE PLASTIC TUBE, GREASED COMPLETELY ON INSIDE FOR TOP  $1800 \text{ mm}$  OF PILES INDICATED ON PLAN.

### CAST-IN-PLACE CONCRETE

#### 1 CONCRETE

- ALL CONCRETE IS TO BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF CSA-A23.1-14 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION" AND CSA-A23.2-14 "METHOD OF TEST FOR CONCRETE".
- PROVIDE CERTIFICATION THAT MIX PROPORTIONS SELECTED WILL PRODUCE CONCRETE OF QUALITY, YIELD AND STRENGTH AS SPECIFIED IN CONCRETE MIXES, AND WILL COMPLY WITH CSA-A23.1. CERTIFICATION LETTER TO BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA.
- PROVIDE CERTIFICATION THAT PLANT, EQUIPMENT, AND MATERIALS TO BE USED IN CONCRETE COMPLY WITH REQUIREMENTS OF CSA-A23.1. CERTIFICATION LETTER TO BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA.
- CONCRETE PROPERTIES SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

#### PILES:

$32 \text{ MPa}$  MIN. AT  $56 \text{ DAYS}$   
CLASS OF EXPOSURE: S-2  
ENTRAINED AIR/CATEGORY: 2 (4% TO 7%)  
CEMENT TYPE: IS  
AGGREGATE MAX.  $20 \text{ mm}$   
CURING TYPE: TYPE 1 - BASIC  
SLUMP: MIN.  $120 \text{ mm}$

#### EXTERIOR WALLS AND GRADE BEAMS:

$30 \text{ MPa}$  MIN. AT  $28 \text{ DAYS}$   
CLASS OF EXPOSURE: F-2  
ENTRAINED AIR/CATEGORY: 2 (4% TO 7%)  
AGGREGATE MAX.  $20 \text{ mm}$   
CURING TYPE: TYPE 2 - ADDITIONAL

#### INTERIOR SLABS-ON-GRADE:

$25 \text{ MPa}$  MIN. AT  $28 \text{ DAYS}$   
CLASS OF EXPOSURE: N  
ENTRAINED AIR/CATEGORY: NONE  
AGGREGATE MAX.  $20 \text{ mm}$   
CURING TYPE: TYPE 2 - ADDITIONAL

#### INTERIOR STRUCTURAL SLABS:

$25 \text{ MPa}$  MIN. AT  $28 \text{ DAYS}$   
CLASS OF EXPOSURE: N  
ENTRAINED AIR/CATEGORY: NONE (LESS THAN 3%)  
AGGREGATE MAX.  $20 \text{ mm}$   
CURING TYPE: TYPE 2 - ADDITIONAL

UNLESS INDICATED OTHERWISE THE CONTRACTOR SHALL SPECIFY CONCRETE SLUMP APPROPRIATE WITH PLACEMENT METHODS AND SITE CONDITIONS. THE CONTRACTOR SPECIFIED SLUMP MUST BE SHOWN ON THE CERTIFICATION LETTER AND CONCRETE DELIVERY TICKET.

- UNLESS NOTED OTHERWISE CONCRETE CURING TO CONFORM TO THE LATEST EDITION OF CSA-A23.1-14 AS FOLLOWS:
  - TYPE 1 - BASIC: 3 DAYS  $\geq 10^\circ\text{C}$  AND FOR A TIME NECESSARY TO ATTAIN 40% OF THE SPECIFIED STRENGTH.
  - TYPE 2 - ADDITIONAL: 7 DAYS  $\geq 10^\circ\text{C}$  AND FOR A TIME NECESSARY TO ATTAIN 70% OF THE SPECIFIED STRENGTH.
  - TYPE 3 - EXTENDED: 7 DAYS WET CURING  $\geq 10^\circ\text{C}$ .
- AIR ENTRAINING ADMIXTURES SHALL CONFORM TO THE REQUIREMENTS OF ASTM C260/C260M-10a "STANDARD SPECIFICATION FOR AIR ENTRAINING ADMIXTURES FOR CONCRETE". SUPERPLASTICIZING ADMIXTURES SHALL CONFORM TO ASTM C494/C494M "STANDARD SPECIFICATION FOR CHEMICAL ADMIXTURES FOR CONCRETE" OR ASTM C1017/C1017M "STANDARD SPECIFICATION FOR CHEMICAL ADMIXTURES FOR USE IN PRODUCING FLOWING CONCRETE" WHEN FLOWING CONCRETE IS APPLICABLE. AIR ENTRAINING ADMIXTURES TO HAVE A DURABILITY FACTOR GREATER THAN 75, WHEN TESTED TO ASTM STANDARDS C666/C666M PROCEDURE A. SPACING FACTOR FOR ANY AIR ENTRAINING ADMIXTURE MUST BE  $0.17 \text{ mm}$  OR LESS WHEN TESTED IN ACCORDANCE WITH ASTM C457 "STANDARD TEST METHOD FOR MICROSCOPICAL DETERMINATION OF PARAMETERS OF THE AIR-VOID SYSTEM IN HARDENED CONCRETE".

### II REINFORCING STEEL

- ALL REINFORCING STEEL TO BE CSA-G30.10M-09 GRADE 400R DEFORMED BARS EXCEPT BEAM STIRRUPS WHICH SHALL BE GRADE 400W STEEL. ALL REINFORCING IS TO BE DETAILED IN ACCORDANCE WITH THE LATEST EDITION OF THE REINFORCING STEEL INSTITUTE OF CANADA - MANUAL OF STANDARD PRACTICE, EXCEPT OTHERWISE NOTED.
- REINFORCING STEEL COVER IS TO CONFORM TO CAN/CSA A23.3-14 "DESIGN OF CONCRETE STRUCTURES FOR BUILDINGS" AND AS FOLLOWS:

EXTERIOR WALLS: EXPOSURE CLASS: F-2  $40 \text{ mm}$  OUTSIDE FACE  $20 \text{ mm}$  INSIDE FACE

INTERIOR STRUCTURAL SLABS: EXPOSURE CLASS: N  $20 \text{ mm}$  TOP  $20 \text{ mm}$  BOTTOM

GRADE BEAMS: EXPOSURE CLASS: F-2  $50 \text{ mm}$  BOTTOM TO TIES  $40 \text{ mm}$  SIDES AND TOP TO TIES.

PILES: EXPOSURE CLASS: S-2  $75 \text{ mm}$  TO TIES.

INTERIOR SLABS-ON-GRADE: EXPOSURE CLASS: N  $40 \text{ mm}$  TOP  $20 \text{ mm}$  BOTTOM

- IN WALLS AND GRADE BEAMS, BEND ALL TOP AND INTERMEDIATE HORIZONTAL STEEL  $600 \text{ mm}$  AROUND CORNERS, OR USE EXTRA L BARS  $1200 \text{ mm}$  LONG. ALL OPENINGS IN WALLS TO HAVE  $2-15 \text{M}$  EACH SIDE AND  $2-25 \text{M}$  OVER, EXCEPT AS NOTED.
- TOP STEEL IN BEAMS TO BE LAPPED AT CENTRE SPAN, BOTTOM STEEL TO BE BUTTED AT SUPPORT.
- ALL REINFORCING TO BE HELD IN PLACE, AND TIED BY THE USE OF PROPER ACCESSORIES, SUCH AS HI-CHAIRS, SPACERS, ETC. TO BE SUPPLIED BY THE REINFORCING STEEL FABRICATOR. HI-CHAIRS TO HAVE 4 LEGS AND TO BE STAPLED OR WEALED TO THE FORMWORK.
- ALL OPENINGS IN CAST-IN-PLACE CONCRETE FLOWWORK TO BE TRIMMED WITH  $2-15 \text{M}$  ALL AROUND ON BOTH FACES, EXCEPT AS NOTED.
- FOR ALL STRUCTURAL SLABS A MINIMUM OF  $50\%$  OF THE BOTTOM STEEL SHALL BE CONTINUED A MINIMUM DISTANCE OF  $150 \text{ mm}$  INTO ALL SUPPORTING WALLS AND BEAMS. IF KEYS ARE USED AT JOINTS BETWEEN SLABS AND WALLS OR BEAMS, BOTTOM DOWELS EQUAL TO BOTTOM REINFORCEMENT OR  $10 \text{M}$  AT  $300 \text{ mm}$  O/C SHALL BE PROVIDED WHICHEVER IS GREATER.
- ALL MISCELLANEOUS CONCRETE PADS AND CURBS ARE TO BE REINFORCED WITH A MINIMUM OF  $10 \text{M}$  AT  $400 \text{ mm}$  O/C EACH WAY, UNLESS NOTED.
- WHEN CONCRETE BEAMS ARE CAST INTO A WALL CHASE, DOWELS SIZE AND NUMBER SAME AS BEAM REINFORCING ARE TO BE PROVIDED FROM WALL, UNLESS OTHERWISE SHOWN ON PLAN.

### III FORMWORK

- CARDBOARD VOIDFORM WITH A MIN. DEPTH OF  $150 \text{ mm}$  SHALL BE USED AS THE BOTTOM FORM FOR STRUCTURAL SLABS AT GRADE, GRADE BEAMS, AND WALLS IN CONTACT WITH SOIL. SELECT AND INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ACCESSORIES SUCH AS HI-CHAIRS, SPACERS, ETC. SHALL BE SUPPORTED BY PADS OF PLYWOOD OR TEAPED HARDBOARD TO PREVENT PUNCTURING THE VOIDFORM.
- UNLESS NOTED OTHERWISE PROVIDE SLIP JOINT ALL PAVING OR CONCRETE SLABS ON GRADE AGAINST STRUCTURAL MEMBERS WITH  $12 \text{ mm}$  ASPHALT IMPREGNATED FIREBOARD.
- ALL CONSTRUCTION JOINT KEYS ARE TO BE A MINIMUM OF  $40 \text{ mm}$  DEEP.
- ALL STRUCTURAL SLABS FRAMING INTO BASEMENT WALLS ARE TO HAVE A MINIMUM KEY OF  $40 \text{ mm}$ .
- ALL CONCRETE BEAMS FRAMING INTO CONCRETE WALLS ARE TO BE SUPPORTED BY A CHASE OF MINIMUM  $100 \text{ mm}$  DEPTH AND THE HEIGHT AND WIDTH OF THE BEAM.
- PLACE  $10 \text{ MIL}$  POLYETHYLENE UNDER ALL SLABS ON FILL AND OVER TOP OF VOIDFORM.
- PROVIDE  $150 \text{ mm}$  WIDE, RIBBED, PVC WATERSTOPS IN ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS IN ALL EXTERIOR WALLS BELOW GRADE AND PIT WALLS.

### STRUCTURAL STEEL

- STRUCTURAL STEEL TO CONFORM TO CSA-G40.21, "STRUCTURAL QUALITY STEELS" AND CSA-G40.20 "GENERAL REQUIREMENTS FOR ROLLED OR WELDED STRUCTURAL QUALITY STEEL".
- ALL ROLLED OR STEEL STRUCTURAL SECTIONS SHALL BE G40.21-350W. ALL HOLLOW STRUCTURAL SECTIONS TO BE G40.21-350W CLASS C OR ASTM A500-C. ALL ANGLES, CHANNELS AND PLATES SHALL BE G40.21-350W.
- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE PERFORMED IN ACCORDANCE WITH CSA S16-14, "DESIGN OF STEEL STRUCTURES".
- ALL WELDING SHALL CONFORM TO THE LATEST EDITION OF CSA W59, "WELDED STEEL CONSTRUCTION". FABRICATORS SHALL BE PROPERLY CERTIFIED IN ACCORDANCE WITH CSA W47.1, "CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES".
- ALL BOLTED CONNECTIONS TO USE A325 HIGH STRENGTH BOLTS. MINIMUM CONNECTION SHALL CONSIST OF 2 BOLTS.
- ALL STRUCTURAL STEEL IS TO RECEIVE ONE COAT OF CSO/CPMA 1-73s QUICK DRYING SHOP PRIMER. STEEL TO BE CLEANED IN CONFORMANCE WITH SSPC-SP2. STEEL RECEIVING FINISH PAINTING TO HAVE ONE COAT OF CSO/CPMA 2-75 QUICK DRYING SHOP PRIMER. STEEL TO BE CLEANED IN CONFORMANCE WITH SSPC-SP7. STEEL DESIGNATED AS GALVANIZED TO CONFORM TO CSA G164 "HOT-DIP GALVANIZING OF IRREGULARLY SHAPED ARTICLES" TO MINIMUM  $610 \text{ g/m}^2$  COATING.
- ANCHOR BOLTS TO BE ASTM A307 GRADE C OR ASTM F1554 GRADE 36, WELDABLE, PROVIDED BY STEEL SUPPLIER AND SET BY THE GENERAL CONTRACTOR, WHERE ASTM F1554 GRADE 55 ANCHOR BOLTS ARE USED, BOLTS TO BE WELDABLE GRADE STEEL.
- FABRICATOR TO NOTIFY ENGINEER OF ANY PROPOSED MEMBER SUBSTITUTIONS AND CHANGED CONNECTION DETAILS.
- THE STRUCTURAL STEEL SUPPLIER SHALL PROVIDE AND BE RESPONSIBLE FOR ALL HOLES IN STEEL SECTIONS REQUIRED BY OTHER TRADES. SECTION SHALL BE STRENGTHENED WHERE REQUIRED TO GUARANTEE THE ORIGINAL STRENGTH OF THE BEAM. ANY CUTTING OF STEEL AT THE JOB SITE SHALL BE DONE ONLY AS DIRECTED AND APPROVED BY THE ENGINEER.
- STRUCTURAL STEEL SUPPLIER IS TO SUBMIT ENGINEERING DRAWINGS BEARING THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA COVERING THE DESIGN OF CONNECTIONS, TO THE PROJECT DESIGN ENGINEER FOR REVIEW PRIOR TO FABRICATION. CONNECTION DESIGN TO INCLUDE FOR ALL ADJUSTABLE CONNECTIONS REQUIRED TO SUITE FABRICATION AND ERECTION PROCEDURES AND TOLERANCES.

### MISCELLANEOUS METAL - STEEL STAIR AND GUARDRAILS

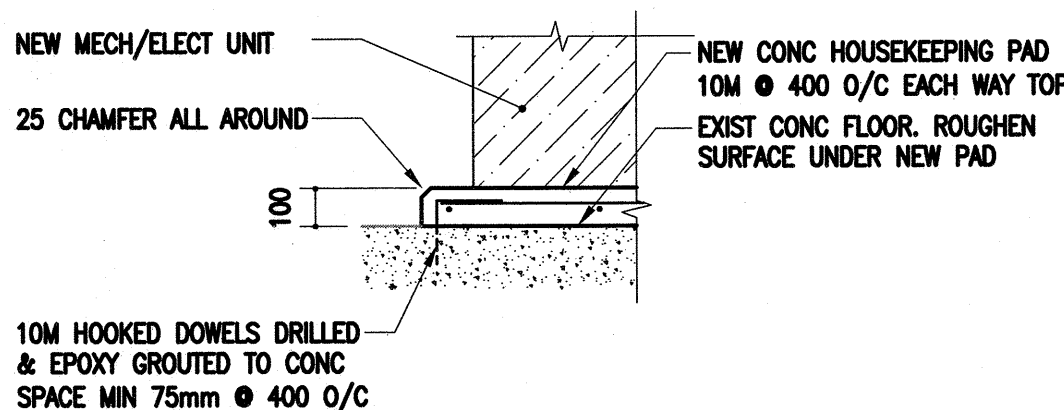
- STEEL STAIR AND GUARDRAIL SUPPLIER IS TO SUBMIT ENGINEERING DRAWINGS BEARING THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA FOR REVIEW BY THE PROJECT ENGINEER, PRIOR TO FABRICATION. ENGINEERING SHOP DRAWINGS SHALL INCLUDE DESIGN LOADS, LAYOUT PLAN, CONNECTION DETAILS, AND ALL OTHER PERTINENT INFORMATION.
- STEEL STAIR AND GUARDRAIL SUPPLIER/DESIGNER SHALL PROVIDE A FINAL INSPECTION AND A LETTER SEALED BY THE ENGINEER RESPONSIBLE FOR THE STAIR AND GUARDRAIL DESIGN, CERTIFYING THAT STAIRS AND GUARDRAILS ARE CONSTRUCTED AND INSTALLED AS PER DESIGN ASSUMPTIONS AND INSTALLATION REQUIREMENTS.

### WOOD

- ALL LUMBER TO BE NO.1/NO.2 SPF. ALL WOOD TO BE KILN DRIED.
- ALL WALLS TO BE ADEQUATELY BRACED UNTIL SHEATHING INSTALLED ON WALLS, FLOOR BELOW AND STRUCTURES ABOVE.
- THE BOTTOM PLATE AT THE MAIN FLOOR IS TO BE BOLTED TO THE FOUNDATION WITH A MINIMUM OF  $13 \text{ mm}$  DIAMETER ANCHOR BOLTS  $100 \text{ mm}$  EMBEDMENT  $800 \text{ mm}$  O/C.
- NAILING PATTERNS AND NAIL LENGTHS SHALL CONFORM TO TABLE 9.23.3.4. AND 9.23.3.5. OF THE NATIONAL BUILDING CODE RESIDENTIAL STANDARDS.
- PLYWOOD SHEATHING SHALL BE EXTERIOR DOUGLAS FIR PLYWOOD CONFORMING TO CSA 0121-08(R2013) "DOUGLAS FIR PLYWOOD" UNLESS OTHERWISE NOTED.

### MASONRY

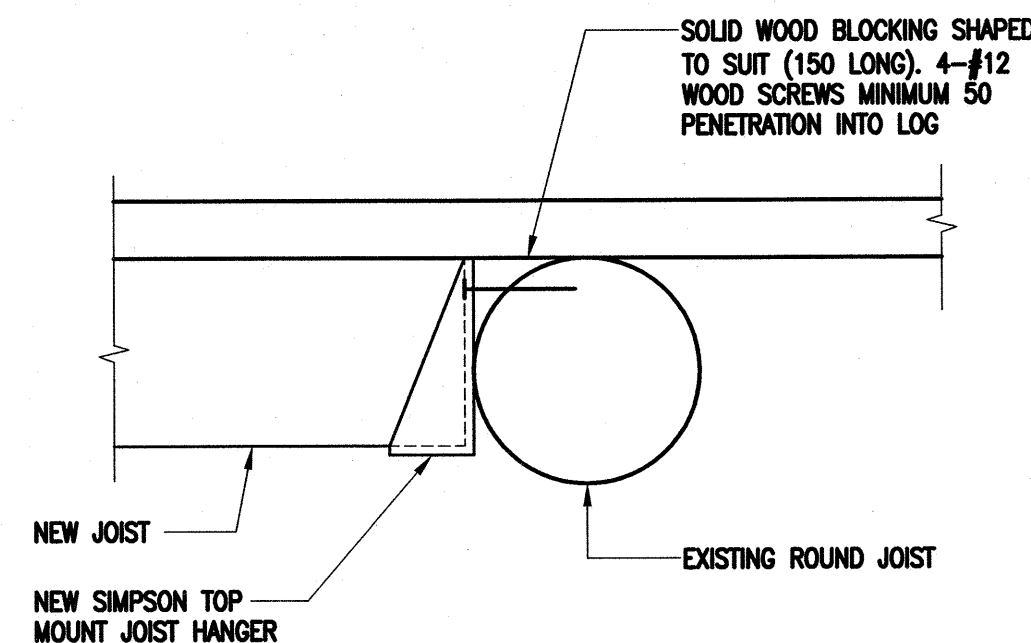
- EXTERIOR AND LOAD BEARING WALLS ARE TO BE BUILT WITH TYPE "S" MORTAR HAVING A MINIMUM STRENGTH OF  $12 \text{ MPa}$  AT  $28 \text{ DAYS}$ . INTERIOR MASONRY NON-LOAD BEARING WALLS MAY BE BUILT WITH TYPE "M" MORTAR HAVING A COMPRESSIVE STRENGTH OF  $5 \text{ MPa}$  AT  $28 \text{ DAYS}$ . INTERIOR WALLS SHALL CONFORM TO CSA A178-14, "MORTAR AND GROUT FOR UNIT MASONRY".
- ALL MASONRY WALLS TO BE PROPERLY BRACED UNTIL STRUCTURE IS CLOSED IN AND WALL PERMANENTLY SUPPORTED.
- MASONRY TIES AND ANCHORS SHALL BE DESIGNED IN CONFORMANCE WITH CSA-A370-14, "CONNECTORS FOR MASONRY". DESIGN WIND PRESSURE FOR TIES IN EXTERIOR WALLS SHALL BE  $1.2 \text{ kPa}$



## TYPICAL HOUSEKEEPING PAD DETAIL

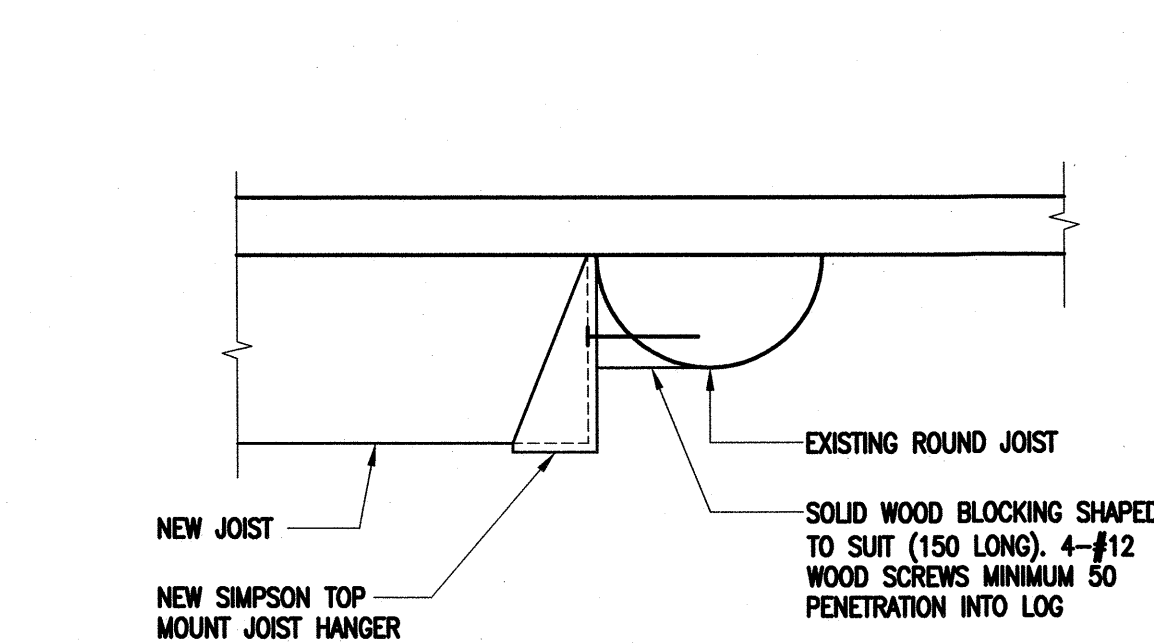
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- COORDINATE EXACT DIMENSIONS & LOCATIONS REQUIRED WITH MECHANICAL & ELECTRICAL



## DETAIL AT FULL ROUND JOIST

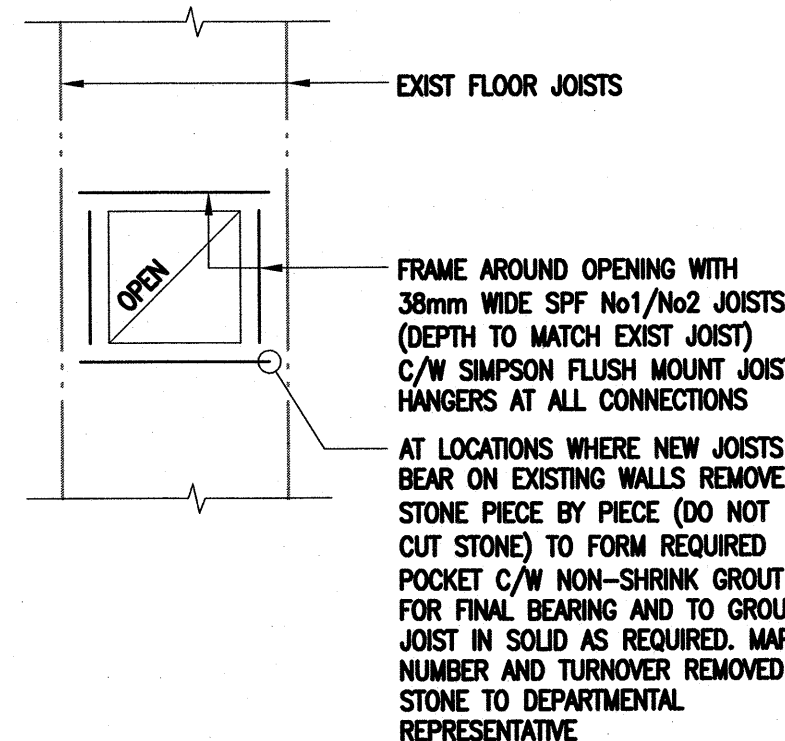
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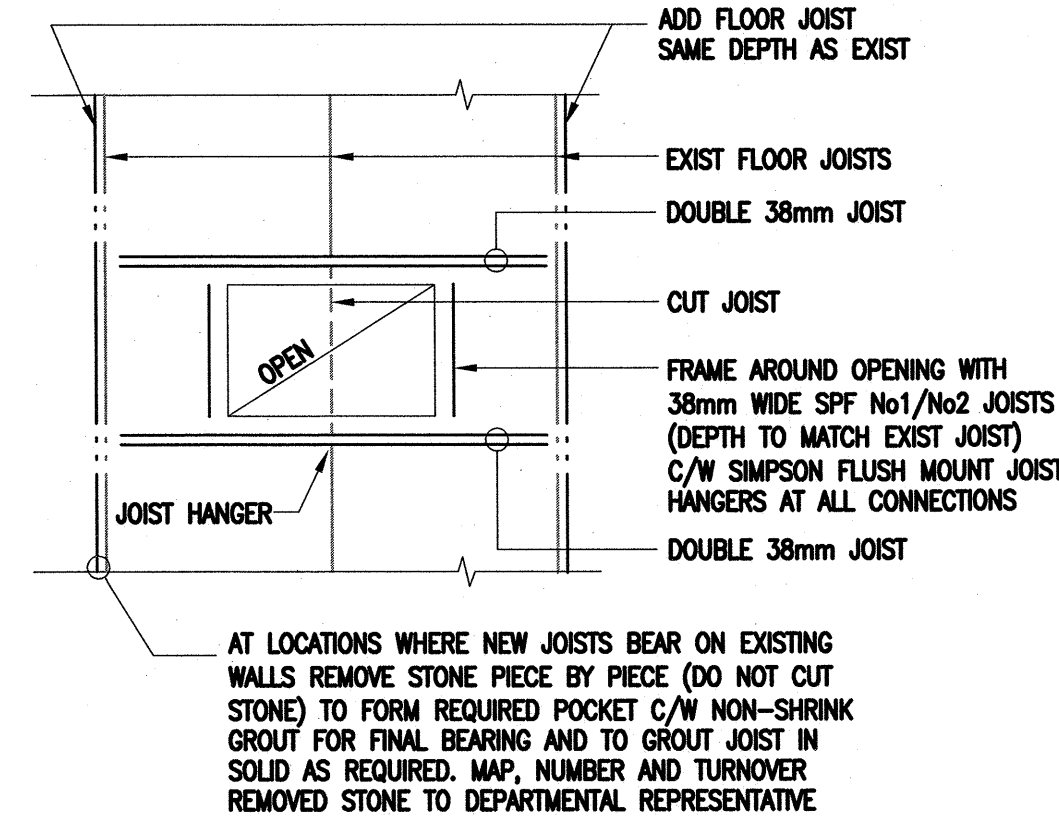
## DETAIL AT HALF ROUND JOIST

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### OPENING NARROWER THAN JOIST SPACE



### OPENING WIDER THAN JOIST SPACE



## TYPICAL EXIST WOOD FRAMED FLOOR OPENING DETAIL FOR MECH/ELECT

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