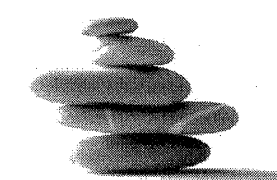


KEY PLAN

NTS

300-275 Carlton Street
Winnipeg, Manitoba R3C 5B6
T 204.943.7201
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2016-11-02

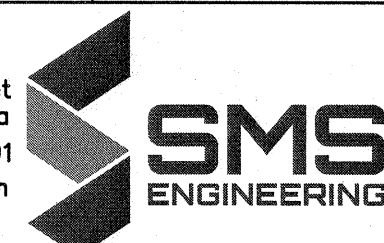


Crosier Kilgour
& Partners Ltd.
CONSULTING STRUCTURAL ENGINEERS

5			
4			
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0	ISSUED FOR CONSTRUCTION	JAL	2016-11-10
NO.	Description	BY	DO/MM/YY



770 Bradford Street
Winnipeg, Canada
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SMSeng.com



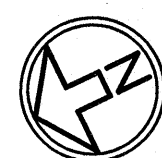
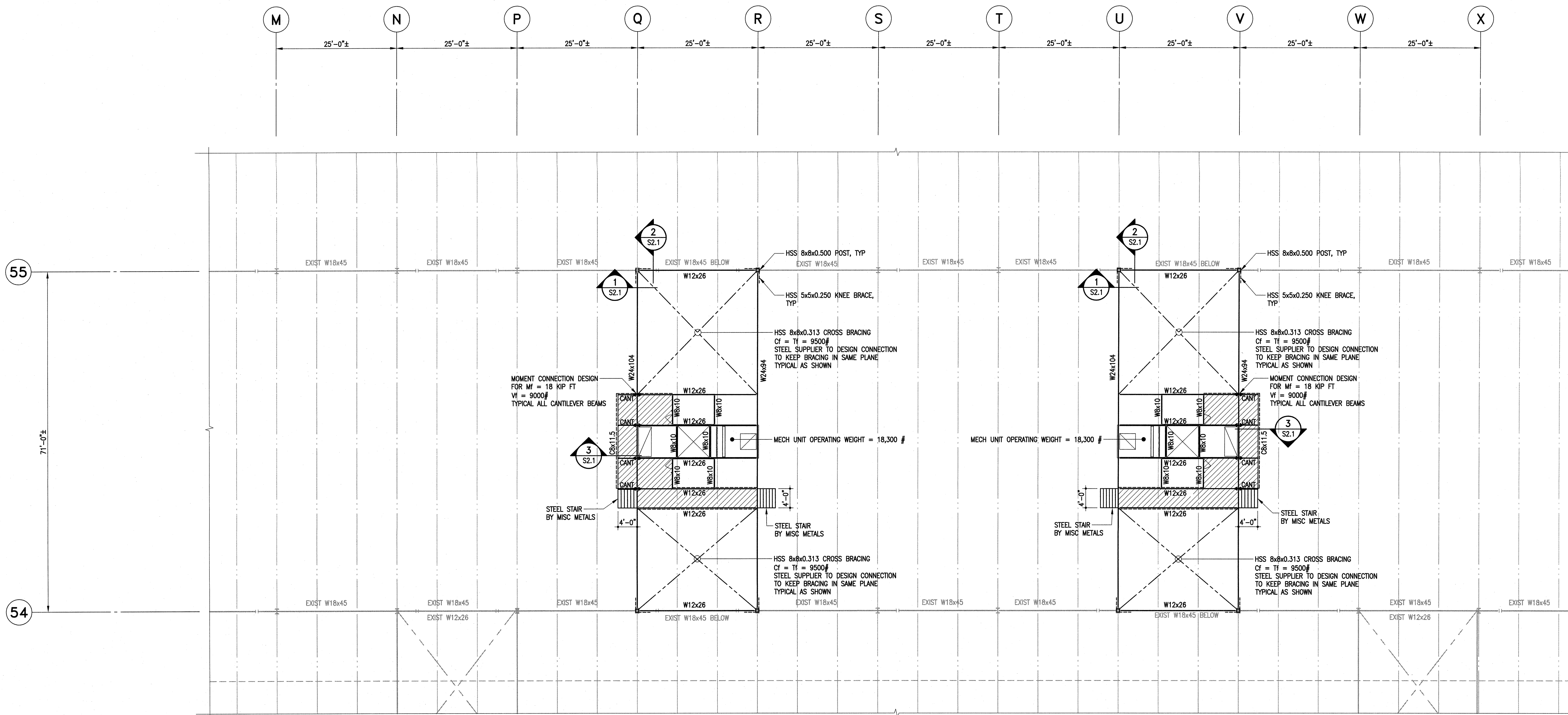
Winnipeg Transit

Project Title
CITY OF WINNIPEG FORT ROUGE
TRANSIT BASE - STORAGE TRACK
1-12 VENTILATION UPGRADE

WINNIPEG MANITOBA

PARTIAL ROOF FRAMING PLAN
& GENERAL NOTES

Drawn By	MS	Checked By	JAL	Approved By	H.L.
Scale	AS SHOWN	Date	2016-11-10	Project No.	16-149-01
Revision Number	0	Drawing Number	S1.1	Sheet Order	
				1 OF 2	



PARTIAL ROOF FRAMING PLAN

3/32" = 1'-0"

ROOF DESIGN LOADS:
LIVE LOAD: 36 PSF
DEAD LOAD: 15 PSF
NEW ROOF TOP UNITS: AS NOTED ON PLAN

GENERAL NOTES

- STRUCTURAL DESIGN BASED ON THE NATIONAL BUILDING CODE OF CANADA 2010 EDITION AND THE 2011 MANITOBA AMENDMENTS.
 - IMPORTANCE CATEGORY: NORMAL
 - WIND LOAD: $q_50 = 9.4$ P.S.F.
 - GROUND SNOW LOAD: $s_g = 39.6$ P.S.F.
 - ASSOCIATED RAIN LOAD: 4.2 P.S.F.
- SEISMIC SITE CLASSIFICATION: NOT APPLICABLE
- DO NOT SCALE DRAWINGS.
- ALL DIMENSIONS ARE TO BE VERIFIED WITH THE 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.

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.

INTERIOR SLAB-ON-GRADE:
(TRENCHES & HOUSEKEEPING PADS)
25 MPa MIN. AT 28 DAYS
CLASS OF EXPOSURE: N
EXTRAINED AIR/CATEGORY: NONE (LESS THAN 3%)
AGGREGATE MAX. 20 mm
CURING TYPE: TYPE 1 - BASIC

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.

- 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 0.17mm 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-G30.18M-09 GRADE 400R DEFORMED BARS EXCEPT COLUMN TIES AND 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:
INTERIOR SLABS-ON-GRADE:
EXPOSURE CLASS: N
1 1/2 IN. TOP
3/4 IN. BOTTOM
- 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 NAILED TO THE FORMWORK.
- ALL OPENINGS IN CAST-IN-PLACE CONCRETE FLATWORK TO BE TRIMMED WITH 2-15M ALL AROUND ON BOTH FACES, EXCEPT AS NOTED.
- ALL MISCELLANEOUS CONCRETE PADS AND CURBS ARE TO BE REINFORCED WITH A MINIMUM OF 10M AT 16 IN. O/C EACH WAY, UNLESS NOTED.

III. FORMWORK

- ACCESSORIES SUCH AS HI-CHAIRS, SPACERS, ETC. SHALL BE SUPPORTED BY PADS OF PLYWOOD OR TEMPERED HARDBOARD TO PREVENT PUNCTURING THE VOIDFORM.
- UNLESS NOTED OTHERWISE PROVIDE SLIP JOINT ALL PAVING OR CONCRETE SLABS ON GRADE AGAINST STRUCTURAL MEMBERS WITH 1/2 IN. ASPHALT IMPREGNATED FIBREBOARD.
- PLACE 10 MIL POLYETHYLENE UNDER ALL SLABS ON FILL AND OVER TOP OF VOIDFORM.

STRUCTURAL STEEL

- THE STRUCTURAL STEEL FABRICATOR'S ENGINEER SHALL BE RESPONSIBLE FOR LOCATING AND DESIGNING PROVISIONS FOR ALL TEMPORARY FALL PROTECTION SYSTEMS REQUIRED DURING CONSTRUCTION TO MEET MANITOBA WORKPLACE HEALTH AND SAFETY REGULATIONS.
- 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 G40.21-50W. ALL HOLLOW STRUCTURAL SECTIONS TO BE G40.21-50W CLASS C OR ASTM A500-C. ALL ANGLES, CHANNELS AND PLATES SHALL BE G40.21-44W.
- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE PERFORMED IN ACCORDANCE WITH CAN/CSA S16-09, "STEEL STRUCTURES FOR BUILDINGS".
- 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 CISC/CPMA 1-736 QUICK DRYING SHOP PRIMER. STEEL IN CRAWLSPACES SHALL RECEIVE 2 COATS. STEEL TO BE CLEANED IN CONFORMANCE WITH SSPC-SP2. STEEL RECEIVING FINISH PAINTING TO HAVE ONE COAT OF CISC/CPMA 2-75 QUICK DRYING SHOP PRIMER. STEEL TO BE CLEANED IN CONFORMANCE WITH SSPC-SP7.
- NO HOLES PERMITTED IN TOP FLANGE OF BEAMS AT COLUMNS WHERE BEAMS ARE CONTINUOUS OVER COLUMNS.
- ALL BEAMS CONTINUOUS OVER COLUMNS ARE TO HAVE WEB STIFFENERS THE SAME SIZE AND ORIENTATION AS THE COLUMN BELOW, UNLESS OTHERWISE NOTED.
- THE FABRICATOR TO NOTIFY CONTRACT ADMINISTRATOR 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 CONTRACT ADMINISTRATOR.
- THE STRUCTURAL STEEL ERECTOR SHALL BE RESPONSIBLE FOR SUPPLYING AND ERECTING ALL TEMPORARY GUYING AND BRACING OF THE STEEL FRAMING TO PROVIDE STABILITY FOR THE STRUCTURE AS A WHOLE. THESE SHALL REMAIN IN PLACE UNTIL ALL PERMANENT STEEL BRACING IS INSTALLED.
- ALL DUCTS LARGER THAN 18 IN. X 18 IN. THROUGH ROOF DECK TO BE FRAMED WITH L4 X 4 X 5/16 ANGLES ALL AROUND, EXCEPT AS NOTED. SMALLER OPENINGS TO BE ADDRESSED ON A CASE BY CASE BASIS, CONTACT THE CONTRACT ADMINISTRATOR AS REQUIRED. WHERE STEEL DECK REVERSES ITS FRAMING DIRECTION, USE L 2 1/2 X 2 1/2 X 1/4 ANGLE TO SUPPORT EDGE.
- 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 DESIGNER OF RECORD FOR REVIEW PRIOR TO FABRICATION. CONNECTION DESIGN TO INCLUDE FOR ALL ADJUSTABLE CONNECTIONS REQUIRED TO SUITE FABRICATION AND ERECTION PROCEDURES AND TOLERANCES.

ALL HOLES IN EXIST ROOF TO BE FILLED IN WITH 1 1/2" DEEP 18GA METAL ROOF DECK C/W 3/4" PUDDLE WELD ϕ 12" O/C AROUND PERIMETER. EXTEND MIN 6" BEYOND EDGE OF OPENING IN ALL DIRECTIONS.

THE EXIST ROOF HAS BEEN DESIGNED FOR 36 psf LIVE LOAD. THE CONTRACTOR IS TO DETERMINE AN APPROPRIATE METHOD OF TRANSPORTING MATERIALS & MECHANICAL UNITS TO THE FINAL LOCATION WITHOUT EXCEEDING THIS DESIGN LOAD. ANY TRANSPORTATION METHOD SHOULD ENSURE PROTECTION OF THE EXIST ROOF SURFACE & UNDERLYING INSULATION. CONTRACTOR TO SUBMIT SEALED SHOP DRAWINGS TO ADDRESS MEANS AND METHODS OF INSTALLATION.

INFILL EXIST OPENINGS IN MASONRY WALL WITH MATCHING WIDTH BLOCKS. MIN BLOCK STRENGTH 15 MPa. TYPE S MORTAR MUST BE USED. MASON TO REMOVE ANY PARTIAL BLOCKS FRAMING THE CURRENT OPENING PRIOR TO INFILLING.

NEW OPENINGS IN EXISTING WALLS

CONCRETE WALLS ON GRIDLINES 51 AND 52

- SCAN EACH SIDE OF WALL TO LOCATE REINFORCING.
- LOCATE NEW OPENING SUCH THAT IT DOES NOT DAMAGE ANY EXIST REINFORCING.
- MAINTAIN A MINIMUM OF 12" OF SOLID CONCRETE BETWEEN ADJACENT OPENINGS.
- MAXIMUM HOLE DIAMETER 9".

MASONRY BLOCK WALLS ALONG GRIDLINES 52, 53 AND 54

- MAXIMUM HOLE DIAMETER 9".
- TOP OF OPENING TO BE MINIMUM 2 COURSES DOWN FROM TOP OF WALL.
- MAINTAIN MINIMUM 2 BLOCKS BETWEEN ADJACENT OPENINGS.

* FOR ANY ADDITIONAL OPENINGS REQUIRED BEYOND THOSE NOTED ABOVE CONTACT CONTRACT ADMINISTRATOR.