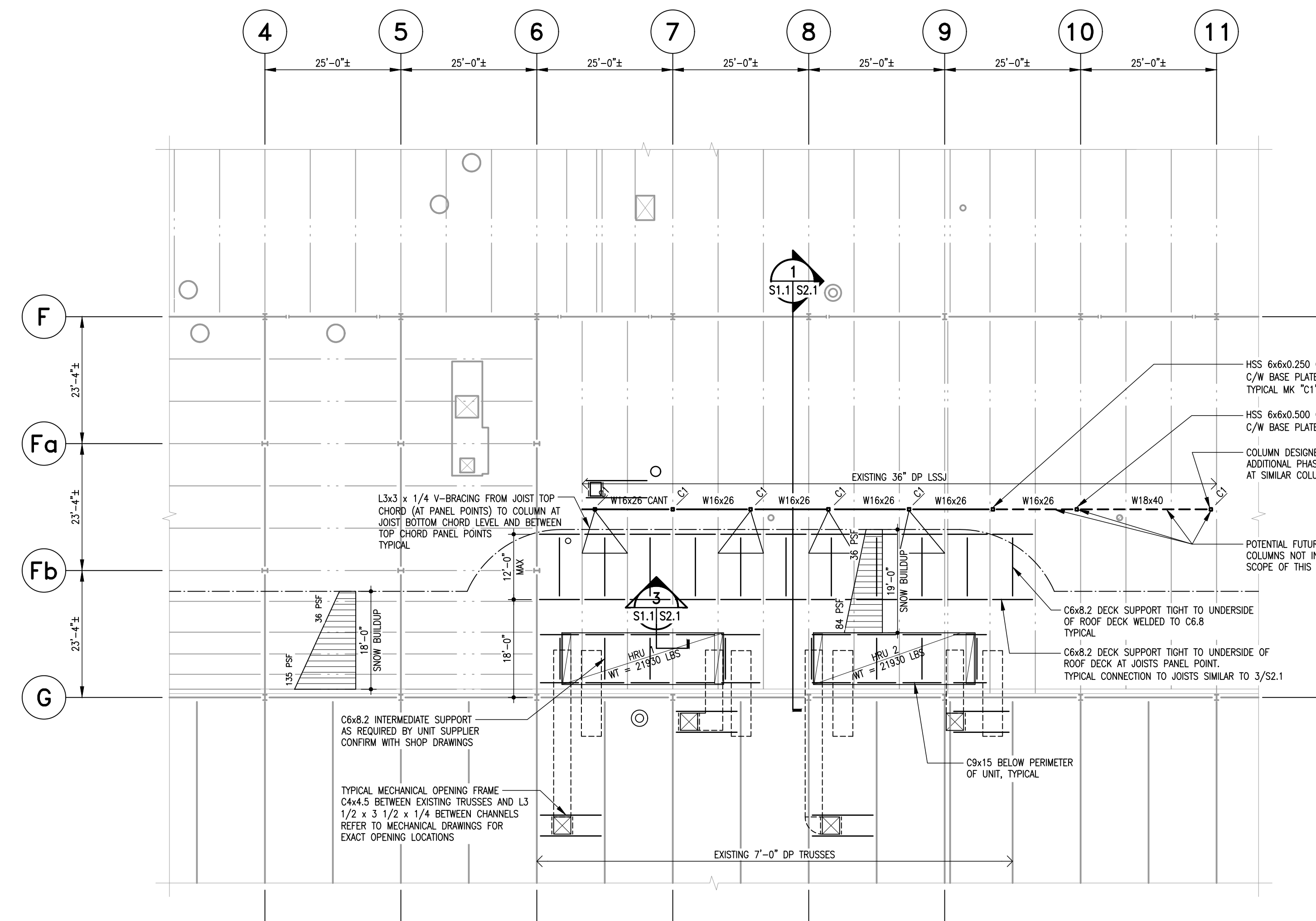


PARTIAL FOUNDATION PLAN
1/16" = 1'-0"



PARTIAL ROOF FRAMING PLAN
1/16" = 1'-0"

GENERAL NOTES

- STRUCTURAL DESIGN BASED ON THE MANITOBA BUILDING CODE 2011 EDITION.
 - IMPORTANCE CATEGORY: NORMAL
 - WIND LOAD: $q_{50} = 9.4$ PSF
 - GROUND SNOW LOAD: $S_g = 38.6$ PSF
 - ASSOCIATED RAIN LOAD: $S_r = 4.2$ PSF
- SEISMIC SITE CLASSIFICATION: NOT APPLICABLE
- 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, MECHANICAL 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 INCLUDING BUT NOT LIMITED TO ALL TEMPORARY SHORING/BRACING.
- CONTRACTOR TO ENSURE FUMES FROM EQUIPMENTS ARE CAPTURED PROPERLY. CONTRACTOR TO COORDINATE DRILLING RIG LOCATIONS TO POSSIBLY UTILIZE THE CURRENT EXHAUST CAPTURE SYSTEM FOR THE BUSES. USE OF ELECTRICAL POWERED SKID STEER IS MANDATORY FOR REMOVAL OF PILING TAILINGS.

- CAST-IN-PLACE CONCRETE**
- CONCRETE
 - ALL CONCRETE IS TO BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF CSA-A23.1-09 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION" AND CSA-A23.2-09 "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 TESTING TO BE PERFORMED IN ACCORDANCE WITH CSA-A23.1-09. MINIMUM ONE SET OF TESTS PER POUR. COST OF TESTING TO BE CARRIED BY THE CONTRACTOR.
 - CONCRETE PROPERTIES SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

PILES:	32 MPa MIN. AT 56 DAYS
	CLASS OF EXPOSURE: S-2
	ENTRAINED AIR/CATEGORY: 2 (4% TO 7%)
	CEMENT TYPE: HS
	AGGREGATE: MAX. 20 mm
	CURING TYPE: TYPE 2 - ADDITIONAL
	SLUMP: MIN. 120 mm

- FOUNDATIONS**
- FOUNDATION DESIGN BASED ON GEOTECHNICAL RECOMMENDATIONS PROVIDED BY ENG-TECH CONSULTING LIMITED. ACTUAL DESIGN VALUES WILL BE CONFIRMED AT THE TIME OF PILE INSTALLATION AND DOCUMENTED TO THE CITY OF WINNIPEG VIA THE LETTER OF COMMITMENT METHOD.
 - 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 FRICTION PILES ARE DESIGNED BASED ON THE FOLLOWING:

COMPRESSIVE DEPTH FT	ULS PSF	SLS PSF
0 - 8	0	0
8 - 25	375	312
25 - 49	200	166

ULS SKIN FRICTION VALUES HAVE BEEN MULTIPLIED BY A GEOTECHNICAL RESISTANCE FACTOR OF 0.4.
 - EFFECTIVE LENGTH OF FRICTION PILES IS TOTAL LENGTH AS SHOWN ON PLAN MINUS 8'-0" FOR INTERIOR PILES BELOW GRADE.
 - FRICTION PILE REINFORCING TO BE 20'-0" LONG UNLESS NOTED IN PLANS; 10M RINGS AT 48 IN. ON-CENTRE AND 3-TIM RINGS AT 6 IN. ON-CENTRE AT TOP. PILE REINFORCING TO BE 6'-15M FOR 24 IN., 8'-15M FOR 30 IN.
 - ALL FOUNDATION INSTALLATIONS SHALL BE REVIEWED BY QUALIFIED GEOTECHNICAL PERSONNEL REPORTING TO THE GEOTECHNICAL ENGINEER THAT ISSUED THE SITE-SPECIFIC GEOTECHNICAL REPORT IN ACCORDANCE WITH THE REQUIREMENTS OF PART 4 OF THE NATIONAL BUILDING CODE OF CANADA/THE MANITOBA BUILDING CODE.
 - REMOVAL OF UNSATURATED MATERIALS, SUB-GRADE PREPARATIONS AND COMPACTED GRANULAR FILL FOR ALL SLABS SUPPORTED ON GRADE AS PER SITE-SPECIFIC GEOTECHNICAL REPORT.

- REINFORCING STEEL**
- ALL REINFORCING STEEL TO BE CSA-G30.18M-M92 GRADE 400R DEFORMED BARS EXCEPT COLUMN TIES AND BEAM STIRRUPS WHICH SHALL BE GRADE 400M STEEL.
 - ALL REINFORCING IS TO BE DETAIL IN ACCORDANCE WITH THE LATEST EDITION OF THE REINFORCING STEEL INSTITUTE OF CANADA - MANUAL OF STANDARD PRACTICE, EXCEPT OTHERWISE NOTED. ALL LAPPED SPLICES TO BE CLASS B SPLICES, UNLESS NOTED.
 - WELDED STEEL WIRE MESH SHALL BE TO ASTM A185/A185M-07, 400 MPa YIELD, FLAT SHEETS ONLY.
 - REINFORCING STEEL COVER IS TO CONFORM TO CAN/CSA A23.3-09 "DESIGN OF CONCRETE STRUCTURES FOR BUILDINGS" AND AS FOLLOWS:

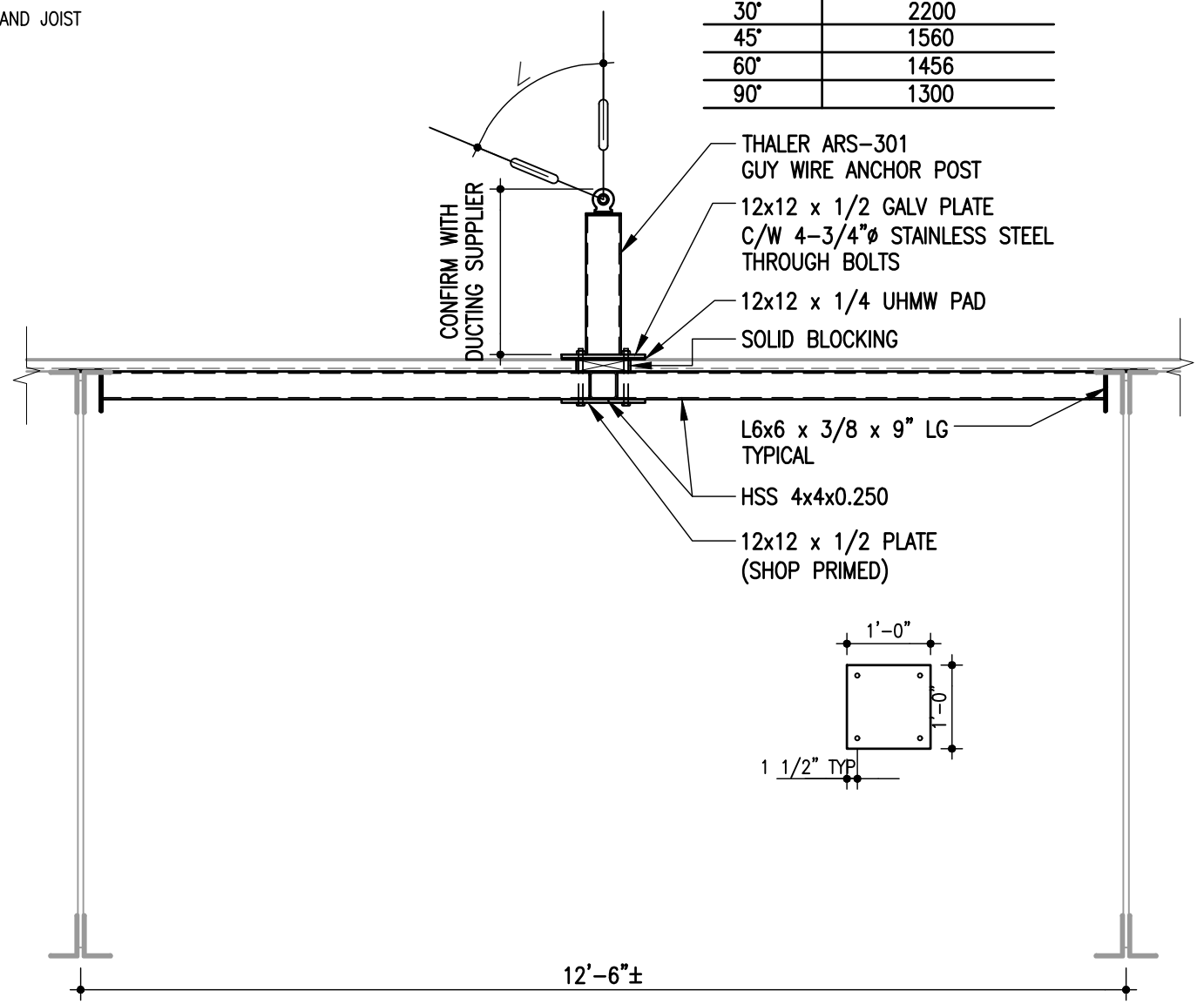
PILES:	EXPOSURE CLASS: S-2	3 IN. TO TIES.
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 - ALL REINFORCING TO BE HELD IN PLACE, AND TIED BY THE USE OF PROPER ACCESSORIES, SUCH AS HI-CHAIRS, SPACERS, ETC. TO BE SUPPLIED BY THE REINFORCING STEEL FABRICATOR. HI-CHAIRS TO HAVE 4 LEGS AND TO BE STAPLED 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.
 - FOR ALL CONTINUED SLABS A MINIMUM OF 50% OF THE BOTTOM STEEL SHALL BE CONTINUED A MINIMUM DISTANCE OF 6 IN. INTO ALL SUPPORTING WALLS AND BEAMS. IF KEYS ARE USED AT JOINTS BETWEEN SLABS AND WALLS OR BEAMS, BOTTOM DONNELS EQUAL TO BOTTOM REINFORCEMENT OR 10M AT 12 IN. O/C SHALL BE PROVIDED WHICHEVER IS GREATER.
 - ALL MISCELLANEOUS CONCRETE PADS AND CURBS ARE TO BE REINFORCED WITH A MINIMUM OF 10M AT 16 IN. O/C EACH WAY, UNLESS NOTED.
 - WHEN CONCRETE BEAMS ARE CAST INTO A WALL/BEAM CHASE, DONNELS SIZE AND NUMBER SAME AS BEAM REINFORCING ARE TO BE PROVIDED FROM WALL, UNLESS OTHERWISE SHOWN ON PLAN.
 - FOR TWO-WAY FLAT SLABS PROVIDE MINIMUM 2-10M BOTTOM INTEGRITY BARS THROUGHOUT STRUCTURES IN ACCORDANCE WITH CSA A23.3-09, CLAUSE 13.10.6.

- 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.
- 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 STEEL DECKING IS ERECTED AND ALL JOIST REINFORCEMENT ARE INSTALLED.
- STRUCTURAL STEEL TO CONFORM TO CSA-400.21-04, "STRUCTURAL QUALITY STEELS" AND CSA-400.20 "GENERAL REQUIREMENTS FOR ROLLED OR WELDED STRUCTURAL QUALITY STEEL", ASTM A572/A572M "STANDARD SPECIFICATION FOR HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STRUCTURAL STEEL" OR ASTM A992/A992M "STANDARD SPECIFICATION FOR STRUCTURAL STEEL SHAPES".
- ALL ROLLED OR STEEL STRUCTURAL SECTIONS SHALL BE G40.21-350M, ASTM A992 OR ASTM A572 GRADE 50. ALL ANGLES, AND PLATES SHALL BE G40.21-300M.
- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE PERFORMED IN ACCORDANCE WITH CSA S16-09, "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".
- 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 SUIT FABRICATION AND ERECTION PROCEDURES AND TOLERANCES.
- ALL STRUCTURAL STEEL IS TO RECEIVE ONE COAT OF CISC/CPMA 1-730 QUICK DRYING SHOP PRIMER. 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.
- 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.
- ALL OPENINGS LARGER THAN 18 IN. x 18 IN. THROUGH STEEL DECK TO BE FRAMED WITH L3x3 x 1/4 ANGLES ALL AROUND, EXCEPT AS NOTED. SMALLER OPENINGS THROUGH STEEL DECK TO BE STIFFENED BY STEEL DECK SUPPLIER. WHEN STEEL DECK CHANGES ITS FRAMING DIRECTION, USE L 2 1/2 x 2 1/2 x 1/4 ANGLE TO SUPPORT EDGE.

- DUST TIGHT SCREENS**
- CONTRACTOR TO ENSURE THE FOLLOWING SILICA DUST MONITORING/CONTROL MEASURES ARE IN PLACE:
- PROVIDE DUST TIGHT SCREENS TO LOCALIZE DUST GENERATING ACTIVITIES, AND FOR PROTECTION OF WORKERS, FINISHED AREAS OF WORK, AND PUBLIC.
 - MAINTAIN AND RELOCATE PROTECTION UNTIL SUCH WORK IS COMPLETE.
 - DUST CONTROL IS TO CONFORM WITH "MANITOBA REGULATION 217/2006 - WORKPLACE SAFETY AND HEALTH REGULATION"

- DESIGN LOADS:**
- DEAD LOAD = 18 PSF
 - SNOW LOAD = 36 PSF + SNOW BUILDUP
 - SEE DRAWING S2.1 FOR JOIST MODIFICATION ELEMENTS
 - BEAMS AND COLUMNS LAYOUT BASED ON PRELIMINARY FLOOR PLAN PROVIDED BY WINNIPEG TRANSIT. EXACT LOCATION OF STRUCTURAL ELEMENTS SHALL BE COORDINATED PRIOR TO CONSTRUCTION.
 - JOIST LOCATIONS SHOWN ARE APPROXIMATE ONLY. SITE CONFIRM LOCATION AND JOIST PROFILE PRIOR TO COMMENCING FABRICATION.

MAX ALLOWABLE	
ANGLE, \angle	TENSION FORCE (LB)
0°	5200
30°	2200
45°	1560
60°	1456
90°	1300



A GUY WIRE/ROOF ANCHOR BETWEEN TRUSSES
1/2" = 1'-0"

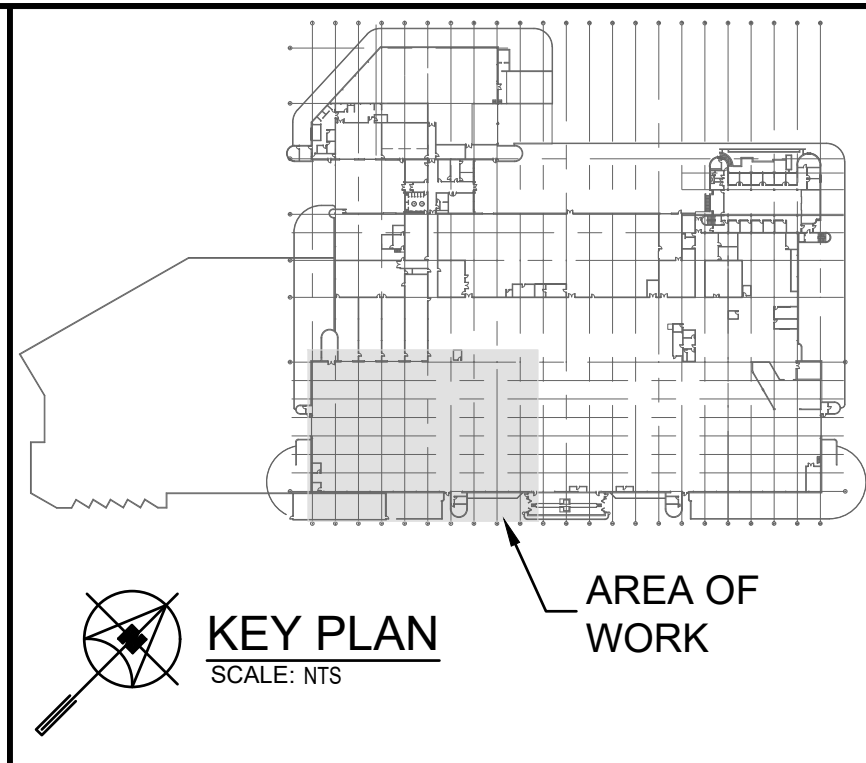
- GC TO COORDINATE NUMBER AND LOCATION OF GUY WIRE SUPPORTS WITH DUCTING SUPPLIER.
- POST COATING TO MATCH ROOFING.
- NOT DESIGNED AS A FALL ARREST HIT-OFF POINT.

DUCT SUPPORT DESIGN GUIDANCE

DUCT SUPPORT FRAMING IS TO BE DESIGNED AND SUPPLIED BY THE DUCTING CONTRACTOR. SHOP DRAWINGS OF DUCT SUPPORTS ARE TO BE SUBMITTED FOR REVIEW AND SHALL INCLUDE DESIGN LOADING AND MAXIMUM SUPPORT LEG REACTIONS. MAXIMUM LOAD APPLIED TO ROOF FRAMING TO BE 36 PSF. SUPPORT PADS TO BE DESIGNED ACCORDINGLY TO LIMIT LOAD APPLIED TO ROOF. SUPPORT PADS TO BE CONSTRUCTED OF MATERIAL TO AVOID DAMAGE TO ROOFING MEMBRANE, OR SHALL BE PLACED ON SOPREMA SOPRATAM ROOF PROTECTION PADS.

BP1

U/S BASE PLATE EL. 98'-11" UNLESS NOTED OTHERWISE



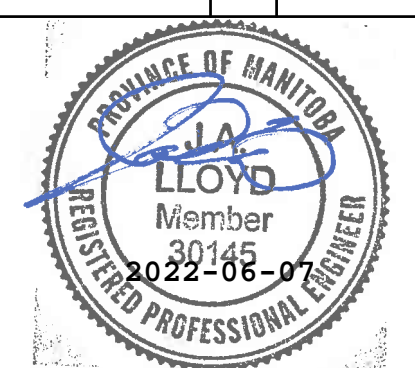
KEY PLAN
SCALE: NTS

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
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CONSULTING STRUCTURAL ENGINEERS

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NO.	Description	BY	DDMMYY



SMS Engineering
20-349-01



Project Title
TRANSIT MAINTENANCE AND REPAIR BUILDING MECHANICAL UPGRADE - WEST HIGH BAY
WINNIPEG MANITOBA

Drawing Title
JOIST REINFORCEMENT

PARTIAL ROOF FRAMING PLAN, AND GENERAL NOTES

Drawn By CJMMS	Checked By AL	Approved By JAL
Scale AS NOTED	Date JUNE 2022	Project No. 20-349-01
Revision Number 0	Drawing Number S1.1	Sheet Order 1 OF 2

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