

GENERAL NOTES:

1. ALL SPECIFICATIONS AND CODES SPECIFIED SHALL BE THE LATEST REVISION AVAILABLE.
2. SITE VERIFY ALL DIMENSIONS, ELEVATIONS, DETAILS, QUANTITIES AND CONDITIONS PRIOR TO START OF ANY DEMOLITION, CONSTRUCTION OR PREFABRICATION OF ANY STRUCTURAL COMPONENT.
3. EXISTING STRUCTURAL SUPPORTS WHICH INTERFERE WITH NEW WORK SHALL BE RELOCATED UPON APPROVAL BY THE DESIGN ENGINEER.
4. THE CONTRACTOR SHALL ENSURE THAT ALL BURIED SERVICES ARE LOCATED AND MARKED PRIOR TO EXCAVATION.
5. ALL BUILDING SYSTEMS COMPONENTS SHALL BE THE PRODUCTS OF A SINGLE MANUFACTURER UNLESS SPECIFIED OTHERWISE.
6. SHIP, STORE, HANDLE, ERECT, INSTALL, ETC. ALL BUILDING MATERIALS, COMPONENTS, FIXTURES, EQUIPMENT, ETC. AS PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
7. ALL DEMOLITION, FABRICATION, CONSTRUCTION, ETC. SHALL BE CARRIED OUT IN ACCORDANCE WITH ALL PERTINENT BUILDING CODES, AND LOCAL BYLAWS AND ORDINANCES.
8. EACH TRADE SHALL BE RESPONSIBLE TO PROVIDE ADEQUATE PROTECTION FOR THE EXISTING FACILITY/PROPERTY TO PREVENT PHYSICAL DAMAGE AND LOSS OF VALUE OR USE OF ANY KIND, AS A RESULT OF DEMOLITION, CONSTRUCTION AND RELATED ACTIVITIES.
9. TIME AND DURATION OF ANY NECESSARY DISRUPTION IN THE USE OF ANY ROOM, SPACE, SERVICE, EQUIPMENT, ETC. SHALL BE COORDINATED WITH, AND APPROVED BY THE OWNER AT THE START OF THE PROJECT. PROVIDE OWNER WITH MINIMUM ONE WEEK NOTICE (OR AS REQUIRED) PRIOR TO EACH ACTUAL OCCURRENCE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE TO NOTIFY THE OWNER AND THE CONTRACT ADMINISTRATOR OF ANY PREVIOUSLY UNNOTICED PRE-EXISTING FLAW OR CONDITION THAT MIGHT INCREASE THE SCOPE OF WORK OR COMPROMISE NEW CONSTRUCTION, PRIOR TO THE START OF DEMOLITION AND CONSTRUCTION, OR AS SOON AS IT IS DISCOVERED.
11. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT TECHNICAL SPECIFICATIONS.

EXCAVATION & BACKFILL:

1. REMOVE ALL FILL MATERIALS, DELETERIOUS SOILS AND ORGANICS IN AREAS REQUIRING GRANULAR BASE MATERIALS. COMPACT SUBGRADE TO 95% STANDARD PROCTOR DENSITY. SUB-EXCAVATE AND REPAIR ALL AREA EXHIBITING UNSUITABLE DEFLECTIONS.
2. GRANULAR BASE TO BE PLACED ON GRADE SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY IN MAXIMUM 150mm LIFTS.
3. DO NOT COMPACT FROZEN BACKFILL OR PLACE ON FROZEN SUBGRADE.
4. SUB-GRADE, SUB-BASE AND BASE COURSE MATERIALS AND CONSTRUCTION METHODS SHALL BE AS PER CITY OF WINNIPEG SPECIFICATION CW3110 UNLESS NOTED.
5. SUBGRADE AND BASE COURSE INSTALLATION SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER, REGISTERED IN THE PROVINCE OF MANITOBA, RETAINED BY THE CONTRACTOR AT CONSTRUCTION PHASES AS DETERMINED BY THE GEOTECHNICAL ENGINEER, BEFORE WORK IS TO COMMENCE.

FOUNDATIONS (DRIVEN PRECAST CONCRETE PILES):

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DOCUMENTS AND THE PILING SPECIFICATION.
2. FOUNDATIONS SHALL BE DRIVEN PRECAST CONCRETE PILES AS SHOWN ON DRAWINGS.
3. DRIVEN PRECAST CONCRETE PILES HAVE BEEN DESIGNED FOR, AND SHALL BE DRIVEN TO CAPACITIES SHOWN IN THE PILE SCHEDULE IN ACCORDANCE WITH RECOMMENDATIONS MADE BY BLOCK & ASSOCIATES LTD. IN THEIR REPORT "RE: GEOTECHNICAL INVESTIGATION FOR THE PROPOSED HYDROGEN PRODUCTION AND DISPENSING STATION SITE TO BE LOCATED AT 421 OSBORNE STREET IN WINNIPEG, MANITOBA" DATED AUGUST 14, 2023.
4. FABRICATE PRECAST PILES WITH CONCRETE OF 35 MPa MINIMUM 28 DAY COMPRESSIVE STRENGTH USING "TYPE MS" SULPHATE RESISTANT CEMENT, IN ACCORDANCE WITH CSA A23.1-09 (R2014), CSA A23.3-14 AND CSA A23.4-09 (R2014).
5. FULL TIME INSPECTION BY A QUALIFIED INDEPENDENT GEOTECHNICAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA, SHALL BE PROVIDED DURING THE INSTALLATION OF ALL PILES. THE COST OF THIS SERVICE SHALL BE INCLUDED IN THE PILING CONTRACT.
6. THE PILING CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND SERVICES IN PILING AREA WHETHER SHOWN OR NOT. EXPOSE ALL SERVICES CLOSE TO PILING AS REQUIRED. CONDITION OF NEARBY STRUCTURES (WITHIN 30.5 METRES OF SITE), SHALL BE DOCUMENTED VERBALLY AND/OR PHOTOGRAPHICALLY PRIOR TO DRIVING PILES. THE PILING CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ANY DAMAGE RESULTING FROM PILING OPERATIONS.
7. PILES SHALL NOT BE MORE THAN 50mm OUT OF POSITION Laterally AT THE TOP AND NOT MORE THAN 2% OUT OF PLUMB.
8. DAMAGED PILES SHALL BE REJECTED.
9. DO NOT SPLICE PILES WITHOUT APPROVAL OF THE CONTRACT ADMINISTRATOR.
10. PRE-BORE ALL PILES 3.0m.
11. RESET PILES LIFTED DURING DRIVING OF ADJACENT PILES.
12. CUT-OFF PILES NEAT AND SQUARE AT ELEVATIONS INDICATED. PRESTRESSING STRANDS TO EXTEND 460mm MINIMUM ABOVE CUT-OFF ELEVATION FOR EMBEDMENT INTO STRUCTURAL COMPONENTS ABOVE.

REINFORCING STEEL:

1. REINFORCING STEEL TO BE NEW DEFORMED BILLET STEEL BARS CONFORMING TO CSA G30.18-09 (R2014). GRADE TO BE 400 MPa.
2. REINFORCING STEEL SHALL BE CLEAN, FREE OF RUST, DIRT, LOOSE SCALE, OIL, GREASE OR ANY OTHER MATERIAL WHICH WOULD REDUCE BOND WITH THE CONCRETE.
3. WELDED STEEL WIRE FABRIC SHALL CONFORM TO A1064/A1064M-14. 400 MPa MINIMUM GRADE IN FLAT SHEETS ONLY UNLESS APPROVED OTHERWISE.
4. SUBMIT SHOP DRAWINGS WHICH CLEARLY INDICATE BAR SIZES, SPACINGS, LOCATIONS & QUANTITIES OF REINFORCING STEEL, BENDING & CUTTING SCHEDULES, SUPPORTING & SPACING DEVICES, ETC. FOR REVIEW PRIOR TO FABRICATION. DETAIL, FABRICATE AND PLACE REINFORCING IN ACCORDANCE WITH CSA A23.1-19, CSA A23.3-19 AND ACI SP-66 (2004) UNLESS NOTED. LAP STEEL 36 BAR DIAMETERS (MINIMUM) UNLESS NOTED.
5. LAP BEAM AND STRUCTURAL SLAB TOP REINFORCING AT CENTER SPAN, AND BOTTOM STEEL AT SUPPORTS.
6. BEND ALL HORIZONTAL REINFORCING 305mm AROUND CORNERS OR PROVIDE ADDITIONAL 610mm X 610mm ANGLE BARS.
7. PROVIDE AT EACH FACE, 2-15M EXTRA BARS ALONG ALL SIDES, AND 2-15M DIAGONAL BARS AT ALL CORNERS OF OPENINGS UNLESS NOTED. PROJECT ALL BARS 610mm PAST CORNERS.
8. TIE, SUPPORT AND SPACE ALL REINFORCING STEEL WITH PROPER APPROVED DEVICES DESIGNED FOR USE IN REINFORCED CONCRETE, TO PREVENT DISPLACEMENT OF REINFORCING AND ENSURE SPECIFIED CONCRETE COVER.
9. PROVIDE MINIMUM CONCRETE COVER FOR REINFORCING STEEL AS FOLLOWS:
- PILES75mm

PILECAPS75mm

GRADE BEAMS40mm

STRUCTURAL SLAB BOTTOM40mm

STRUCTURAL SLAB TOP60mm

CONCRETE:

1. CONCRETE MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH CSA A23.1-19. SEE BELOW FOR MIX REQUIREMENTS.
2. ADMIXTURES SHALL NOT BE USED UNLESS SPECIFIED HEREIN OR APPROVED BY CONTRACT ADMINISTRATOR. CALCIUM CHLORIDE SHALL NOT BE USED.
3. DESIGN, FABRICATE AND ERECT FORMWORK/SHORING IN ACCORDANCE WITH CAN/CSA-S269.1-16. ALLOW SUFFICIENT CONCRETE CURING TIME PRIOR TO REMOVAL.
4. CONCRETE FINISHING SHALL MEET THE REQUIREMENTS OF CSA A23.1-19.
5. FORM RELEASE AGENT SHALL BE BIODEGRADABLE, NON-STAINING AND NON-VOLATILE.
6. PROVIDE ADEQUATE COLD/HOT WEATHER PROTECTION AS REQUIRED DURING CURING PERIOD.
7. PLACE AND SECURE ALL EMBEDDED ANCHORS, WELD PLATES, SLEEVES, BUCKS, DOWELS, INSERTS, WATERSTOPS, ETC., PRIOR TO PLACING CONCRETE. CO-ORDINATE WITH ALL TRADES FOR EMBEDDING OF ALL OTHER, CONDUIT, SERVICES, BLOCKING, ETC.
8. LOCATE AND FABRICATE ALL CONSTRUCTION JOINTS, CONTROL JOINTS AND EXPANSION JOINTS AS DETAILED ON THE DRAWINGS. JOINTS NOT SHOWN SHALL BE APPROVED BY THE CONTRACT ADMINISTRATOR PRIOR TO THE PLACEMENT OF CONCRETE.
9. WATERSTOP TO BE 100mm PVC TYPE 2 BY DURAJOINT OR APPROVED EQUAL.
10. ALL EXPOSED CORNERS TO HAVE 25mm CHAMFER FILLET UNLESS NOTED.
11. CAST-IN-PLACE ANCHOR BOLTS SHALL MEET REQUIREMENTS OF ASTM A307-14.
12. EXPANSION ANCHORS SHALL BE HILTI KWIK-BOLTS OR APPROVED EQUAL, UNLESS NOTED. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
13. ADHESIVE ANCHORS SHALL BE HAS RODS W/ HILTI HIT-HY 200 ADHESIVE OR APPROVED EQUAL, UNLESS NOTED. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
14. GROUT REINFORCING DOWELS WITH EPOXY GROUT HILTI HIT-HY 200, OR APPROVED EQUAL. GROUT BASE PLATES WITH NON-SHRINK GROUT SIKAM-BED STANDARD, OR APPROVED EQUAL. PLACE AND CURE ALL GROUT WITHIN TEMPERATURE RANGE RECOMMENDED BY MANUFACTURER.
15. BONDING AGENTS SHALL BE USED TO ADHERE NEW CONCRETE TO EXISTING CONCRETE OR STEEL. ACCEPTABLE PRODUCT: SIKADUR 32 HI-MOD (EPOXY) OR APPROVED EQUAL.
16. THE CONCRETE SUPPLIER SHALL BE CERTIFIED TO MEET THE REQUIREMENTS OF CSA A23.1-19.
17. THE CONCRETE SUPPLIER SHALL SUBMIT CONCRETE MIX DATA SUBMISSION FORMS FOR EACH TYPE OF CONCRETE SPECIFIED FOR REVIEW PRIOR TO BATCHING ANY CONCRETE.
18. CONCRETE STRENGTH TESTS SHALL BE ARRANGED BY THE CONTRACTOR. PROVIDE ONE SET OF TEST CYLINDERS IN ACCORDANCE WITH CSA A23.1-14 FOR EVERY 50 CUBIC METERS OF CONCRETE PLACED AND A MINIMUM OF ONE SET PER STRUCTURAL COMPONENT.

CONCRETE MIX DESIGNS:

CONCRETE MIX DESIGN SHALL BE PROPORTIONED TO MEET THE FOLLOWING PERFORMANCE REQUIREMENTS:

PILES, PILE CAPS:

EXPOSURE CLASS	S-2
MIN. 28 DAY COMP. STRENGTH	30 MPa
MIN. 56 DAY COMP. STRENGTH	32 MPa

GRADE BEAMS, FOUNDATION WALLS & PIERS:

EXPOSURE CLASS	S-2
MIN. 28 DAY COMP. STRENGTH	30 MPa
MIN. 56 DAY COMP. STRENGTH	32 MPa

EXTERIOR SLABS (STRUCTURAL):

EXPOSURE CLASS	C-1
MIN. 28 DAY COMP. STRENGTH	35 MPa

KGS GROUP SCOPE OF WORK & RESPONSIBILITY:

1. KGS GROUP IS THE ENGINEER OF RECORD FOR THE STRUCTURAL DESIGN OF THE FOUNDATION SYSTEMS AS INDICATED ON THE STRUCTURAL DRAWINGS.
2. THE STRUCTURAL DESIGN, LAYOUT AND REQUIRED SEALED SHOP DRAWINGS OF ALL PROCESS EQUIPMENT, SKIDS, AND ASSOCIATED STRUCTURES ARE BY OTHERS.
3. THE DESIGN AND DETAILING OF ALL CONNECTIONS BETWEEN PROCESS EQUIPMENT, SKIDS, ASSOCIATED STRUCTURES AND THE FOUNDATIONS ARE BY OTHERS.
4. KGS GROUP IS RESPONSIBLE FO THE CITY OF WINNIPEG DEVELOPMENT PERMIT APPLICATION AND CITY OF WINNIPEG FOUNDATION PERMIT. ALL OTHER PERMIT APPLICATIONS AND REQUIREMENTS ARE BY OTHERS.

DESIGN CRITERIA:

THIS COMPLETED STRUCTURE HAS BEEN DESIGNED AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF PART 4 OF THE MANITOBA BUILDING CODE-2024, NATIONAL BUILDING CODE OF THE CANADA-2020.

LOCATION:WINNIPEG, MANITOBA

IMPORTANCE CATEGORY:NORMAL

1-IN-50 YEAR GROUND SNOW LOAD: Ss = 1.9 kPa

1-IN-50 YEAR ASSOCIATED RAIN LOAD: Sr = 0.2 kPa

1-IN-50 YEAR REFERENCE VELOCITY WIND PRESSURE: q = 0.45 kPa

EXPOSURE FACTOR:ROUGH TERRAIN

SEISMIC DESIGN DATA:

Sa(0.2,XE)= 0.054

Sa(0.5,XE)= 0.032

Sa(1.0,XE)= 0.016

Sa(2.0,XE)= 0.0066

Sa(5.0,XE)= 0.0013

Sa(10.0,XE)= 0.0007

PGA(XE) = 0.032

PGV(XE) = 0.021

SITE CLASS: E

10	—	—
9	—	—
8	—	—
7	—	—
6	—	—
5	—	—
4	—	—
3	—	—
2	—	—
1	—	—
NO.	DRAWING NUMBER	REFERENCE DRAWING TITLE
REFERENCE DRAWINGS		




ENGINEERS
GEOSCIENTISTS
MANITOBA

Certificate of Authorization


KGS Group

No. 245

B.M. ELEV.			
CONSTRUCTION COMPLETION DATE: YYYY MM DD			
0	ISSUED FOR CONSTRUCTION	2025 07 08	
NO.	REVISIONS	DATE	BY

			
DESIGNED BY	MEL	CHECKED BY	
DRAWN BY	FBV	APPROVED BY	
SCALE:	AS SHOWN	RELEASED FOR CONSTRUCTION	
DATE	2024 07 18	DATE	

ENGINEER'S SEAL			
CONSULTANT DRAWING NUMBER	24-0107-004_S00		



THE CITY OF WINNIPEG

TRANSIT DEPARTMENT
ENGINEERING DIVISION

WINNIPEG TRANSIT – FORT ROUGE FACILITY
HYDROGEN REFUELLING STATION

STRUCTURAL
GENERAL NOTES

CITY DRAWING NUMBER465-2025-S0000

SHEET 1 OF 1