

STRUCTURAL GENERAL REQUIREMENTS

1. GENERAL NOTES

- CHECK ALL DIMENSIONS ON STRUCTURAL DRAWINGS WITH ALL OTHER CONTRACT DRAWINGS. DIMENSIONS AND ELEVATIONS RELATING TO STRUCTURAL MEMBERS AS SHOWN ON THESE DRAWINGS GOVERN THE STRUCTURAL WORK. REPORT ANY INCONSISTENCIES BEFORE PROCEEDING WITH CONSTRUCTION. DO NOT SCALE THESE DRAWINGS. THE ATTACHED DRAWINGS AND SPECIFICATIONS RELATE ONLY TO THE SCOPE OF WORK AND CONTRACT FOR WHICH NUNA BURNSIDE HAS BEEN RETAINED. THESE DOCUMENTS MAY BE FOR COMPONENTS, OR LIMITED PORTIONS OF, THE TOTAL PROJECT BEING UNDERTAKEN BY THE OWNER AND CONTRACTOR. REVIEW THESE DOCUMENTS IN THE CONTEXT OF THE ENTIRE PROJECT AND ITEMS PRODUCED BY OTHER FIRMS OR DISCIPLINES.
- THE STRUCTURAL DESIGN IS BASED UPON THE INFORMATION PROVIDED IN THE FOLLOWING REPORTS: AMEC GEOTECHNICAL REPORT XY00756, DATED DECEMBER 2005, AMEC GEOTECHNICAL MEMO XY877, DATED SEPTEMBER 20, 2012.
- THESE DRAWINGS ARE THE PROPERTY OF NUNA BURNSIDE LTD., ARE PROTECTED BY COPYRIGHT AND ARE NOT TO BE REPRODUCED IN ANY MANNER WITHOUT WRITTEN APPROVAL.
- THESE DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AS ISSUED FOR CONSTRUCTION" AND SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER FROM NUNA BURNSIDE LTD.
- THESE DRAWINGS SHOW THE COMPLETED STRUCTURE FOR ITS INTENDED FINAL USE AND OCCUPANCY AS STATED. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY AND FOR DESIGN, INSTALLATION, AND ALL TEMPORARY BRACING, SHORING AND CONSTRUCTION LOADS AND SUPPORTS DURING CONSTRUCTION. PROTECT WORK AND MATERIALS FROM HAZARDS AND ENVIRONMENTAL CONDITIONS THAT WOULD BE DETRIMENTAL TO THE FINISHED PRODUCT. CONDITIONS SUCH AS FLOODING, FROST, EXTREME WEATHER, UNEVEN SUPPORTS FOR STORAGE OF FRAGILE MATERIALS AND SO ON. THE CONTRACTOR IS RESPONSIBLE FOR ALL SITE CLEAN UP AND RECYCLING OF WASTE OR UNUSED MATERIALS.
- STANDARD OR TYPICAL DETAIL SHEETS ON THIS PROJECT SHOW STRUCTURAL INTENT RATHER THAN ACTUAL CONDITIONS FOR THIS PROJECT.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED. ELEVATIONS ARE IN METRES UNLESS NOTED.
- THE CONTRACTOR SHALL BE EXPERIENCED IN THE WORK REQUIRED. WORK SHALL BE COMPLETED IN ACCORDANCE WITH ACCEPTED STANDARD PRACTICE OF THE INDUSTRY.
- THE CONTRACTOR IS REQUIRED TO SCHEDULE ALL INDEPENDENT INSPECTION AND TESTING SERVICES. REPORTS ARE TO BE SUBMITTED TO THIS OFFICE FOR REVIEW. THE CONTRACTOR IS TO KEEP THIS OFFICE UPDATED WITH RESPECT TO SITE PROGRESS ON A PERIODIC BASIS, TO ALLOW FOR PERIODIC FIELD REVIEWS BY THE ENGINEER. PROVIDE AT LEAST 5 BUSINESS DAYS MINIMUM NOTICE TO THE ENGINEER FOR ANY REQUIRED SITE VISITS.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL SITE CONDITIONS, UTILITY LOCATIONS, AND REPORT ANY DISCREPANCIES OR UNSATISFACTORY CONDITIONS IMPACTING THE DESIGN, IMMEDIATELY TO THE ENGINEER.
- SUBMIT ENGINEERED ERECTION DRAWINGS FOR ALL OFF SITE FABRICATED COMPONENTS AND ASSEMBLIES, FOR REVIEW AND COORDINATION OF DESIGN ELEMENTS ONLY BEFORE FABRICATION.
- CONNECTION DESIGN BETWEEN ALL SIMILAR MATERIALS, SUCH AS STEEL TO STEEL, OR WOOD TO WOOD ARE TO BE DESIGNED BY THE SUPPLIER'S ENGINEER UNLESS NOTED.
- ALL STRUCTURAL MEMBERS ARE LOADED CONCENTRICALLY AT MEMBER CENTERLINES UNLESS NOTED.

2. DESIGN CODES AND LOADING

- THE DESIGN HAS BEEN PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2010 NATIONAL BUILDING CODE, THE CONSTRUCTION AND TEMPORARY WORKS MUST ALSO BE IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS (LATEST EDITIONS), LOCAL REGULATIONS AND BYLAWS.
- DESIGN STANDARDS
 - CSA CAN/CSA-086-09 "ENGINEERING DESIGN IN WOOD"
 - CSA A371-04 "MASONRY CONSTRUCTION FOR BUILDINGS"
 - CSA S304.1-04 "DESIGN OF MASONRY STRUCTURES"
 - CSA CAN/CSA-A23.1-09 "CONCRETE MATERIALS & METHODS OF CONCRETE CONSTRUCTION"
 - CSA CAN/CSA-A23.3-04 "DESIGN OF CONCRETE STRUCTURES"
 - CSA CAN/CSA-A23.4-09 "PRECAST CONCRETE - MATERIAL AND CONSTRUCTION"
 - CSA CAN/CSA-S136-01 "COLD FORMED STEEL STRUCTURAL MEMBERS"
 - CSA CAN/CSA-S16-09 "LIMIT STATES DESIGN OF STEEL STRUCTURES"
 - CANADIAN FOUNDATION ENGINEERING MANUAL 4TH EDITION/2006

ALL LOADS SHOWN ON DRAWINGS ARE UNFACTORED SERVICE LOADS IN KN AND KPA UNLESS OTHERWISE NOTED. DESIGN LOADS: BASED ON 2010 N.B.C. AS NOTED BELOW OR SHOWN ON PLANS.

ALL DESIGN LOADS ARE NOT TO BE EXCEEDED DURING CONSTRUCTION.

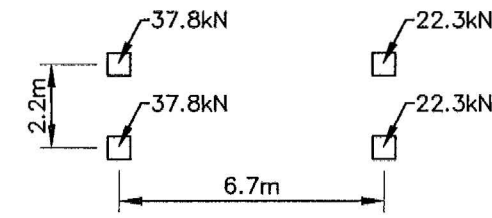
LOADS AND EFFECTS

A) IMPORTANCE CATEGORY (DIV. B, TABLE 4.1.2.1B.) POST DISASTER (SEWAGE TREATMENT FACILITY)

B) DEAD LOADS: 0.75 KPa
ALLOWANCE FOR MECHANICAL AND ELECTRICAL 0.24 KPa

MEZZANINE:
SELF WEIGHT 1.14 KPa
CONCRETE TOPPING 50 mm THICK AVERAGE 0.75 KPa
MISC ELECTRICAL AND MECHANICAL ON UNDERSIDE 0.25 KPa
TOTAL 2.14 KPa

C) LIVE LOADS DUE TO USE AND OCCUPANCY (UNLESS GROSSED AND NOTED ON PLANS):
GROUND FLOOR (EXCLUDING TRUCK AREA) 4.8 KPa
EXIT STAIRS AND CORRIDORS 4.8 KPa
MEZZANINE FLOOR 4.8 KPa
TRUCK AREA
TABLE 4.5.3 (MINIMUM DISTRIBUTED LOAD) 12.0 KPa
TABLE 4.5.10 (MINIMUM CONCENTRATED LOAD) 54.0 kN
IN ADDITION CONSIDERATION HAS BEEN GIVEN FOR THE FOLLOWING VEHICLE:
VAC-CON 3.5 YARD V-230 COMBINATION MACHINE
FRONT AXLE CAPACITY: 10,000 lb (44.5 kN)
REAR AXLE CAPACITY: 17,000 lb (75.6 kN)



C).LOADS DUE TO SNOW, ICE AND RAIN: (POST DISASTER)
IMPORTANCE FACTOR (I_s) (ULS) 1.25 (SLS) .90
ROOF SPECIFIED SNOW LOAD, 3.00 kPa
1/50 GROUND SNOW LOAD (S_s) 3.00 kPa
1/50 GROUND RAIN LOAD (S_r) .20 kPa
WIND EXPOSURE FACTOR (C_w) 1.0
BASIC SNOW LOAD FACTOR (C_b) .8
(CASE 1): 3.25 kPa
(CASE 2) UNBALANCED LOADING, FIGURE G-1 NBCC COMMENTARY G): 3.95 kPa

IN ADDITION TO THE BASIC LOADS NOTED, DESIGN RELATED TO THE TRANSMISSION AND SUPPORT OF LOADS FROM THE ROOF SYSTEM MUST CONSIDER THE FOLLOWING:

TRUSS SYSTEMS: THE TRUSS SYSTEM FOR THE EXISTING BUILDING AND PROPOSED ADDITION MUST BE INDEPENDENT. ALLOW FOR FALL PROTECTION LOADS, AND MISC. FRAMING AS NECESSARY TO CREATE ROOF LINES.

E.) HOIST LOADS:
AS PROVIDED, THE HOIST SYSTEM IS EXPECTED TO EXPERIENCE ONLY ONE OF THE FOLLOWING LOADS @ ANY TIME (UNFACTORED)
MONSTER AUGER: 1480# (6.6kN)
GRINDER: 1250# (5.6kN)
EFFLUENT PUMP MOTOR: 600# (2.7kN)

GENERAL NOTES CONT'D.

- F) LOADS DUE TO WIND: TABLE C-2, DIV. B, 2010 NBCC
IMPORTANCE FACTOR (I_w) (ULS)1.25 (SLS) 0.75
(q) 1/50 HOURLY WIND PRESSURE 0.60 kPa
- G) LOADS DUE TO EARTHQUAKES: TABLE C-2, DIV. B. NBCC 2010
S_a(0.2) = 0.12
S_a (0.5) = 0.056
S_a(1.0) = 0.023
S_a(2.0) = 0.006

PEAK GROUND ACCELERATION (PGA) 0.059
SITE CLASS: B (ROCK)
F_g = 0.80
F_v = 0.60
I_e = 1.0
I_eF_gS_a (0.2) =0.10

THE SUPERSTRUCTURE LATERAL STABILITY IS BASED UPON A WOOD FRAMED WITH WOOD BASE PANELING SHEAR WALL SYSTEM. LATERAL LOADS ARE TRANSFERRED TO THE CONCRETE FOUNDATION THROUGH SHEAR CAPACITY OF ANCHOR BOLTS, AND TRANSFERRED TO THE STEEL PILE SYSTEM THROUGH SHEAR ANCHORS. (DOWELS)

3. FOUNDATION SYSTEM (LIMIT STATES DESIGN)
(NBC, DIV. B, 4.1.3., 4.2.)

THE FOUNDATIONS ARE DESIGNED AS ROCK SOCKETED PILES TO BE DRILLED INTO SOLID ROCK IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND MEMO NOTED IN THE GENERAL NOTES.

FACTORED BEARING RESISTANCE OF PILES MEETING THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER ARE DESIGNED TO ACHIEVE A BEARING RESISTANCE OF 17,500 kPa OVER THE BASE OF THE GROUTED PILE.

FACTORED UPLIFT RESISTANCE OF PILES MEETING THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER ARE DESIGNED TO ACHIEVE AN UPLIFT RESISTANCE OF 150kPa OVER THE AREA OF CONTACT WITH THE ROCK.

4. SHOP DRAWINGS

- SUBMIT WHITE PRINTS OF ERECTION PLANS AND SHOP DETAILS OF STRUCTURAL COMPONENTS, FOR REVIEW PRIOR TO FABRICATION. ELECTRONIC VERSIONS WILL BE ACCEPTED IN .PDF FILE FORMAT ONLY. REVIEW OF SHOP DRAWINGS IS A PRECAUTION AGAINST OVERSIGHT OR ERROR. IT IS NOT A DETAILED CHECK AND SHALL NOT BE CONSTRUED AS RELIEVING THE CONTRACTOR OF RESPONSIBILITY FOR MAKING THE WORK ACCURATE AND IN CONFORMITY WITH THE CONTRACT DOCUMENTS. MAINTAIN A SET OF REVIEWED DRAWINGS ON SITE. DRAWINGS ARE TO BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER IN THE TERRITORY OF NUNAVUT, FOR THE FOLLOWING SUBMISSIONS: TRUSSES, STRUCTURAL LIGHT STEEL FRAMING, MISC. METALS AND TEMPORARY WORKS.

SUBMISSIONS ARE EXPECTED FOR THE FOLLOWING SPECIFICATION DIVISIONS WHICH DO NOT REQUIRE A SEAL BY A PROFESSIONAL ENGINEER. REINFORCING STEEL FOR CAST IN PLACE CONCRETE AND STRUCTURAL STEEL COMPONENTS .

5. INSPECTION AND TESTING

- THE ENGINEER AND THE OWNER WILL COORDINATE THE APPOINTMENT AND PAYMENT OF AN INDEPENDENT INSPECTION AND TESTING AGENCY, WHICH IS IN ADDITION TO PERIODIC GENERAL PROJECT REVIEW BY THE ENGINEER. THE COST OF THE INSPECTION SHALL BE PAID BY THE OWNER. WORK WILL BE INSPECTED TO ENSURE CONFORMANCE WITH THE CONTRACT DOCUMENTS. WORK OF THE FOLLOWING DISCIPLINES: CONCRETE, REINFORCING STEEL, STRUCTURAL STEEL, STEEL JOISTS, COLD FORMED STEEL INCLUDING STEEL DECK, LIGHT STEEL FRAMING JOISTS AND STUDS, PRECAST CONCRETE, AND MASONRY REQUIRE INDEPENDENT INSPECTION AND TESTING. WORK SHALL BE SCHEDULED WITH THE CONTRACTOR AND COPIES OF ALL REPORTS FORWARDED TO THE ENGINEER.

FOUNDATION AND STRUCTURAL SLAB

NOTES

- SEE GENERAL AND CONCRETE NOTES, RELATED DIVISIONS OF THE CONTRACT SPECIFICATIONS AND APPENDED GEOTECHNICAL INFORMATION IN SPECIFICATIONS.
- THE AREA WITHIN THE BUILDING SHALL BE STRIPPED TO A MINIMUM OF 600MM BELOW FINISHED FLOOR DEPTH. AREAS OF UNSUITABLE FILL OR FROZEN MATERIAL TO BE REMOVED AND REPLACED WITH SUITABLE GRANULAR MATERIAL COMPACTED TO 98% SPDD.
- AS NOTED ON THE DRAWINGS, ALL CONCRETE IN CONTACT WITH GROUND WILL RECEIVE 100MM OF RIGID INSULATION, FOUNDED ON A GRANULAR 'B' 1300MM WORKING BASE COMPACTED TO 98% SPDD AS A WORKING PAD.
- REMOVED MATERIAL FROM UNDER THE BUILDING AREA IS NOT TO BE USED WITHIN THE BUILDING AREA, FOR BACKFILLING TRENCHES, OR PITS OR RAISING GRADES OR FOR FILL AGAINST THE BUILDING, UNLESS SPECIFICALLY TESTED AND APPROVED FOR USE BY THE GEOTECHNICAL CONSULTANT.
- INSTALL HSS PILES AS PER GEOTECHNICAL RECOMMENDATIONS, PLUMB AND TRUE. HSS PILES TO BE EMBEDDED A MINIMUM 2M INTO FRESH ROCK WITH AN ANNULUS OF 50MM MORE THAN SPECIFIED PILE DIAMETER.
- ANTICIPATED TIMING FOR INSTALLATION IS BETWEEN JANUARY AND APRIL OF THE YEAR TO MAKE USE OF THE ACTIVE LAYER OF MATERIAL BEING FROZEN.
- INSTALLER TO PROVIDE CASING IN THE EVENT OF POTENTIAL SEEPAGE OR SLOUGHING WITHIN THE EXCAVATION. INSTALLER TO CONSIDER THE NEED FOR TREMIE TECHNIQUES FOR GROUT PLACEMENT IF WATER IS FOUND AT THE BASE OF THE EXCAVATION.
- PLACE NON-SHRINKABLE GROUT SUITABLE FOR THIS USE (SIKA GROUT ARCTIC 100) IN THE SOCKET PORTION OF THE BOREHOLE TO THE TOP OF THE FRESH ROCK ELEVATION IMMEDIATELY AFTER CLEANING THE HOLE.
- USE CENTRALIZERS DURING PLACEMENT OF THE PILE TO ENSURE CENTERING WITHIN THE BOREHOLE. FILL ANNULAR SPACE AROUND PILE WITH A SAND SLURRY AS PER THE SPECIFICATIONS, AND THE INTERIOR OF THE PILE WITH DRY DRILL CUTTINGS TO WITHIN 1M OF THE CUTOFF ELEVATION. VERTICAL LOCATION OF PLACEMENT MUST BE WITHIN 20MM OF DESIGNED CENTRELINE LOCATION FOR EACH PILE
- UPPER 2M OF THE PILES ARE TO BE COATED WITH ARCTIC HEAVY GREASE, THEN WRAPPED WITH TWO LAYERS POLYETHYLENE SHEETS ALSO COATED WITH ARCTIC HEAVY GREASE.
- PLACE 100MM RIGID INSULATION UNDER ALL PORTIONS OF THE FLOOR SYSTEM; GRADE BEAMS TO BE PLACED WITH MINIMUM 100MM GEOSPAN VOID FORM UNDER THE BEAMS TO PREVENT INFLUENCE FROM POTENTIAL SETTLEMENT OR EXPANSION OF SOILS UNDER THE BEAMS.
- FOUNDATION DIMENSION, IF SHOWN ON THE STRUCTURAL PLANS, ARE ACTUAL AND ARE TO THE FACE OF FOUNDATION WALLS OR TO THE GRID LINES UNLESS NOTED. REPORT ANY DIMENSIONAL DISCREPANCIES WITH THE ARCHITECTURAL PLANS PRIOR TO PROCEEDING.
- LOCATIONS OF LAP SPLICES IN GRADE BEAMS MUST BE AS PER PLAN TO ENSURE LOAD TRANSFERRANCE.
- STRUCTURAL SLAB ON GRADE TO BE REINFORCED AS PER PLANS; NOTE THAT THE DIRECTIONS AND PLACEMENT OF THE BARS AS MATS OF STEEL IS CRITICAL TO PROPER TRANSFERRANCE OF THE LOADS.

FOUNDATION AND SLAB-ON-GRADE CONT'D.

- CONCRETE BEAMS TO BE CURED MINIMUM 7 DAYS TO 70% OF CONCRETE STRENGTH PRIOR TO PLACEMENT OF THE SLAB CONCRETE.
- CONCRETE SLABS TO BE WET CURED FOR A MINIMUM OF 7 DAYS. PROVIDE FINISH AS PER CAST-IN-PLACE CONCRETE NOTES. REFER TO ARCHITECTURAL FOR SPECIAL FINISHES. ALSO REFER TO TYPICAL OR STANDARD DETAIL SHEETS. DO NOT EXCEED MINIMAL WORKMAN LOAD ON SLAB FOR MINIMUM OF 7 DAYS AFTER POUR. ON RECEIPT OF CINDER BREAKS SHOWING 70% OF STRENGTH, 80% OF DESIGN LOAD CAN BE APPLIED TO SLAB. ONCE 28 DAYS FROM POUR AND 100% STRENGTH IS ACHIEVED, FULL LOAD CAN BE APPLIED TO SLAB.
- PROTECT FOOTINGS, WALLS, SLABS-ON-GRADE AND ADJACENT SOIL AGAINST FREEZING AND FROST ACTION AT ALL TIMES DURING CONSTRUCTION.
- THE LINE OF SLOPE BETWEEN ADJACENT EXCAVATIONS FOR FOOTINGS OR TRENCHES OR ALONG STEPPED FOOTINGS SHALL NOT EXCEED A RISE OF 7 IN A RUN OF 10. MAXIMUM STEP APPROXIMATELY 600 mm. DO NOT EXCAVATE BELOW THE ELEVATION OF EXISTING FOOTINGS.
- DO NOT BACKFILL AGAINST WALLS RETAINING EARTH. UNTIL ELEMENTS PROVIDING LATERAL SUPPORT ARE COMPLETED. PLACE BACKFILL SIMULTANEOUSLY ON BOTH SIDES OF OTHER WALLS, OR GRADE BEAMS, BELOW GRADE, WITH A MAXIMUM DIFFERENTIAL OF 600 mm.
- LOWER INTERIOR WALL AND COLUMN FOOTINGS WHERE REQUIRED TO SUIT MECHANICAL STORM AND SANITARY LINES AND OTHER UNDERGROUND UTILITIES. THE MAXIMUM SLOPE FROM THE UNDERSIDE OF THE ADJACENT FOOTING TO THE BOTTOM OF THE UTILITY EXCAVATION IS 7 VERTICAL TO 10 HORIZONTAL.
- AN "SD" NOTATION ON THE DRAWING INDICATES THAT THE FOOTING IS TO BE STEPPED DOWN IN THE DIRECTION OF ANY ARROW. AN "SC" NOTATION INDICATES A SAW CUT OR TOOLED JOINT IN THE CONCRETE SLAB. A "CJA" REFERS TO A CONTROL JOINT IN THE MASONRY WALL ABOVE. ALL JOINTS ARE NOT SHOWN ON THE STRUCTURAL PLANS - COORDINATE REQUIREMENTS WITH THE ARCHITECTURAL DRAWINGS AND SPECS.
- FOR CONCRETE "HOUSEKEEPING" PADS OR LOCKER BASES, AND ANY OTHER NON-STRUCTURAL CONCRETE PADS, BOLLARDS OR CURBS, REFER TO THE ARCHITECTURAL AND MECHANICAL DRAWINGS FOR COORDINATION.
- PRIOR TO THE START OF WORK ARRANGE FOR A PROJECT MEETING OF ALL PARTIES ASSOCIATED WITH THE PLACEMENT OF CONCRETE SLABS ON GRADE, PRESIDED BY THE ARCHITECT, WITH THE REPRESENTATIVES OF THE FOLLOWING: THE CONTRACTOR, THE OWNER, CONTRACTOR SUPPLIER, BACKFILLING AND COMPACTION CONTRACTOR, STRUCTURAL ENGINEER, AND SOIL CONSULTANT. SPECIFICATIONS FOR THE WORK OF THIS SECTION SHALL BE REVIEWED TO ENSURE A COMPLETE UNDERSTANDING OF THE REQUIREMENTS AND RESPONSIBILITIES RELATIVE TO THE WORK, MATERIALS AND THEIR HANDLING AND STORAGE, WORK SEQUENCE, QUALITY CONTROL, STAFFING, RESTRICTIONS ON AREAS OF POUR AND OTHER MATTERS AFFECTING THE CONSTRUCTION SO AS TO FACILITATE COMPLIANCE WITH THE INTENT OF THIS SECTION.

CAST IN PLACE CONCRETE

GENERAL

- CONFORM TO THE GENERAL REQUIREMENTS AND SPECIAL CONDITIONS CONTAINED IN DIVISION 1 OF THE CONTRACT DOCUMENTS.
- INCLUDE IN THE WORK OF THIS SECTION ALL CONCRETE INCORPORATED IN THE PROJECT. REFER ALSO TO PRECAST CONCRETE SPECIFICATION, PLAN NOTES, SLAB ON GRADE AND FOUNDATION NOTES, COLUMN, BEAM, WALL, AND SLAB SCHEDULES FOR ADDITIONAL CONCRETE REQUIREMENTS.
- CONFORM TO CSA -- A23 SERIES OF STANDARDS, (ACI 318, AND ACI REPORT 350 WHERE APPLICABLE) AND THE RISC MANUAL OF STANDARD PRACTICE (LATEST EDITION) FOR DESIGN, MATERIALS, CONSTRUCTION, CURING, TESTING, TOLERANCES, AND FINISHING OF CONCRETE.
- INSTALL, OR SUPPLY AND INSTALL, ANCHORAGE, FASTENINGS AND BLOCKING AS REQUIRED, FOR WORK OF OTHER SECTIONS.
- MATERIALS SHOWN ON THE DRAWINGS OR IN THIS SPECIFICATION ARE TO ESTABLISH THE REQUIRED DEGREE OF QUALITY OR PERFORMANCE. SUBSTITUTION MAY BE PERMITTED UPON PROOF OF EQUIVALENCE. SUBMIT ALL PROPOSALS FOR SUBSTITUTION TO THE CONSULTANT IN WRITING IN ADVANCE. IF SHOP DRAWINGS, EACH ITEM SHALL BE CLEARLY IDENTIFIED. DO NOT PROCEED WITH PROPOSAL UNLESS IT IS ACCEPTED IN WRITING BY THE CONSULTANT.
- SUBMIT BAR LISTS AND PLACING DIAGRAMS TO THE CONSULTANT FOR REVIEW PRIOR TO FABRICATION OF REINFORCING STEEL. DRAW DIAGRAMS TO A SCALE OF NOT LESS THAN 1:50. SHOW ELEVATIONS OF ALL WALLS. ALL MARK NUMBERS ON THE BAR LISTS MUST BE SHOWN ON THE SCHEDULE PLACING DIAGRAMS. SEE THE GENERAL NOTES SECTION FOR SHOP DRAWING REQUIREMENTS.

PRODUCTS

1. MATERIALS:

- CEMENT GENERAL USE TYPE GU PORTLAND CEMENT TO CSA A3001.
- WATER, FINE AGGREGATES, COARSE AGGREGATES: TO CSA-A23.1. MAXIMUM COARSE AGGREGATE, 20 mm DIAMETER UNLESS NOTED FOR FORMED CONCRETE. MAXIMUM COARSE AGGREGATE, 40 mm DIAMETER FOR LARGE AUGURED PIERS OR MASS CONCRETE.
- AIR-ENTRAINING ADMIXTURE: TO ASTM C260.
- CHEMICAL ADMIXTURES: TO ASTM C494 OR ASTM C1017.
- CURING-SEALING COMPOUND: WHEN WATER CURING IS NOT PRACTICAL AS APPROVED BY THE ENGINEER, USE A CLEAR LIQUID PRODUCT TO ASTM C-309, TYPE 1. USE SEALTIGHT VOCOMP20 BY W.R. MEADOWS OF CANADA LIMITED.
- RIGID PVC TYPE WATERSTOP: SPECIFICATION GRADE, STYLE 951 OR 955 BY GREENSTREAK.
- HYDROPHILIC TYPE WATERSTOP: HYDROTITE CJK -- BY MME MULTITECHNANES.
- REINFORCING STEEL: NEW, DEFORMED, BILLET STEEL BARS TO CSA STANDARD G30.18, GRADE 400R. WHERE WELDING OF BARS IS REQUIRED USE GRADE 400W.
- WELDED WIRE FABRIC: NEW MATERIAL SUPPLIED IN FLAT SHEETS, NOT ROLLS, TO CSA G30.5. SIZE AS INDICATED ON PLANS.
- PLYWOOD FOR FORMWORK: COFI EXTERIOR GRADE, TO CSA STANDARD 0121. FOR EXPOSED CONCRETE USE NEW PLYWOOD.
- SAW-CUT JOINT FILLER: FOR AREAS SUBJECT TO HIGH WHEEL LOADS USE SEMI RIGID EPOXY, POURABLE CONSISTENCY, SUCH AS REZIWELD FLEX BY W.R. MEADOWS. FOR OTHER LOCATIONS USE SIKAFLEX 1C SL POLYURETHANE SEALANT.
- PREMOULDED JOINT FILLER: CERAMAR FLEXIBLE FOAM BY W.R. MEADOWS.
- NON-METALLIC FLOOR SURFACE HARDENER: USE A DRY SHAKE PRODUCT APPLIED IN TWO PASSES SUCH AS: TRAPROOK BY SIKKA CANADA INC. TOTAL APPLICATION RATE OF 5-6 kg/ sq. m.
- LIQUID DENSIFYING SEALER: USE LIQUID- HARD BY W.R. MEADOWS OF CANADA.
- ASPHALT IMPREGNATED ISOLATION JOINT MATERIAL MEETING ASTM D 994, FED. SPEC. HH-F-341 F, Type III, AASHTO M 33, AND FAA SPEC. ITEM P-610-2.7, BY W.R. MEADOWS OR EQUAL.
- VOID FORMS: GEOSPAN COMPRESSIBLE FILL 50 kPa MAX COMPRESSIVE STRENGTH POLYSTYRENE FOAM BY PLASTI-FAB.
- RIGID FOUNDATION INSULATION: CLOSED CELL POLYSTYRENE FOAM, STYROFOAM SM, DOW CHEMICAL COMPANY, MINIMUM 30psi COMPRESIVE STRENGTH.

- SUPPLY CONCRETE AS PER CSA A23.1-09. ALL CONCRETE MIXES CLEARLY IDENTIFY AND CONFIRM THE UNDERSTANDING OF THE CONCRETE REQUIREMENTS IN WRITING PRIOR TO PRODUCTION FOR ALL MIXES. SUCH A SUBMISSION SHALL INCLUDE, AS A MINIMUM; THE LOCATION OF EACH MIX DESIGN TO BE USED IN THE STRUCTURE, THE CEMENT TYPE, ALL SUPPLEMENTARY MATERIALS, CLASS OF EXPOSURE, COMPRESSIVE STRENGTHS, AGGREGATE SIZE, AND CONCRETE DENSITY.

USE READY MIXED CONCRETE TO GIVE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 25 MPa, (EXCEPT MINIMUMS AS NOTED BELOW). USE A WATER-REDUCING CHEMICAL ADMIXTURE FOR ALL CONCRETE. USE AN AIR ENTRAINING ADMIXTURE TO GIVE TOTAL AIR CONTENT CONFORMING TO TABLE 1 AND 2 AND 4 OF A23.1 09 TO MATCH REQUIRED CONCRETE CLASSIFICATIONS. WATER-CEMENT RATIO SHALL CONFORM TO TABLE 2 OF A23.1 09 UNLESS NOTED OTHERWISE. COORDINATE WITH THE GENERAL CONTRACTOR (AND STEEL FIBRE SUPPLIER AS APPLICABLE) WITH RESPECT TO WORKABILITY ISSUES, AND CONFIRM THE CRITERIA IN THE SUBMISSION (SLUMP, PUMP MIX, DESIGN CONCRETE TEMPERATURE, ETC.).

| EXPOSURE CLASS | USE | STRENGTH | W/C RATIO | AIR | MAX AGGREGATE SIZE (mm) | CEMENT CONTENT (kg/m ³) | (kg/m ³) SLUMP |
|----------------|--------------------------------------|------------------|-----------|----------|-------------------------|-------------------------------------|----------------------------|
| - | LEAN MIX OR UNSHRINKABLE FILL | = 0.4 TO 0.7 MPa | AS REQ'D | - | 19 | AS REQ'D | AS REQ'D |
| N | SKIM COATS | = 15 MPa | 0.7 | - | 19 | 255 | 80± 25mm |
| F-1 | GRADE BEAMS | = 25 MPa | 0.52 | 5% to 8% | 19 | 340 | 80± 25mm |
| N | STRUCTURAL SLABS | = 25 MPa | 0.52 | 5% to 8% | 19 | 340 | 80± 25mm |
| F-1 | SLABS-ON-GRADE - WALKWAYS - EXTERIOR | = 32 MPa | 0.40 | 5% to 8% | 19 | 355 | 80± 25mm |

CAST IN PLACE CONCRETE CONT'D.

EXECUTION

- NOTIFY THE ENGINEER 5 WORKING DAYS IN ADVANCE OF PLACING CONCRETE TO PERMIT VIEWING OF REINFORCEMENT AND PLACING OF CONCRETE. ALSO COORDINATE SCHEDULES WITH THE INDEPENDENT INSPECTION AND TESTING COMPANY. DO NOT CLOSE FORMS UNTIL THE REINFORCEMENT HAS BEEN REVIEWED.
- USE VIBRATORS FOR CONSOLIDATION OF CONCRETE. DO NOT PLACE CONCRETE FOR EXPOSED SLABS IN THE RAIN.
- USE PLASTIC OR CONCRETE BAR SUPPORTS IN EXPOSED LOCATIONS AND PARKING AREAS. USE CONCRETE BAR SUPPORTS FOR STEEL ABOVE SOFT VOID FORM FILLER MATERIAL. IN OTHER LOCATIONS PROVIDE STEEL CHAIRS OR CONCRETE SPACERS TO MAINTAIN SPECIFIED COVER TO REINFORCING STEEL. UNLESS OTHERWISE NOTED, INTERIOR AREAS 25 mm COVER, EXTERIOR AREAS 40 mm COVER, UNFORMED SURFACES EXPOSED TO SOIL PROVIDE 75 mm COVER.
- EXPOSED CONCRETE SHALL BE FREE FROM HONEYCOMBING, VOIDS, LOSS OF FINES, VISIBLE FLOW LINES AND COLD JOINTS, CHIPS AND SPALLS. EXPOSED CONCRETE SHALL BE RUBBED SMOOTH USING WATER AND CARBORUNDUM BRICK. PATCH DEFECTS AND THE HOLES, REMOVE FINIS. ALSO REFER TO ARCHITECTURAL SPECIFICATIONS.
- PLACE 19 mm MINIMUM BEVELS OR CHAMFERS AT ALL EXPOSED CORNERS.
- MAXIMUM DISTANCE BETWEEN CONSTRUCTION JOINTS ARE:
 - WALLS AND FRAMED SLABS: 9m, OR 18m ALTERNATING WITH CONTROL JOINTS AT SAME SPACING.
 - SLABS-ON-GRADE: 6m, OR 18m WITH 5 mm WIDE X ¼ OF SLAB DEPTH (SAW-CUT JOINTS) (TOOL JOINTS) AT 6m CENTRES. FOR SLABS LESS THAN OR EQUAL TO 125 mm THICK REDUCE CONTROL JOINT SPACING TO 4.5m ON CENTRE. ALSO SEE PLANS.
- LEAVE CHASES AND POCKETS IN WALLS FOR SEATING OF SLABS AND BEAMS.
- REINFORCE ALL SIDES OF OPENINGS IN CONCRETE WALLS. LENGTH OF BARS EQUAL TO OPENING DIMENSION PLUS 600 mm EACH SIDE. USE 2 - 15M FOR WALL THICKNESS UP TO 200 mm, 2 - 20M FOR WALLS OVER 200 UNLESS NOTED. REFER ALSO TO THE STANDARD OR TYPICAL DETAIL SHEETS.
- UNLESS OTHERWISE SPECIFIED ON THE PLANS, PROVIDE TEMPERATURE REINFORCING FOR FRAMED ONE-WAY SLABS IN ACCORDANCE WITH THE TYPICAL OR STANDARD DETAIL SHEETS.
- LAP ALL REINFORCING WITH CLASS 'B' SPLICES U/N. ALL STEEL MUST BE ADEQUATELY TIED AND ACCURATELY PLACED PRIOR TO THE COMMENCEMENT OF ANY CONCRETE POUR.
- PROVIDE CONTINUOUS GALVANIZED VERTICAL DOVETAIL ANCHOR SLOTS AT 600 IN ALL CONCRETE SURFACES WITH BRICK OR STONE VENEER FINISHES AND AT ABUTTING MASONRY WALLS.
- PROVIDE WATERSTOPS IN ALL CONSTRUCTION JOINTS BELOW GRADE (EXCEPT WHERE BACKFILLED BOTH SIDES) UNLESS NOTED OTHERWISE.
- COORDINATE HOUSE KEEPING PADS, SUMP PITS, LIGHT POLE FOUNDATIONS AND CONDUIT ENCASMENT WITH THE MECHANICAL, ELECTRICAL AND PLUMB DRAWINGS. COORDINATE SLEEVES THROUGH OR UNDER WALLS WITH THE DRAWINGS WHICH SHOW THE APPLICABLE UTILITIES AND PIPING.
- ELECTRICAL CONDUIT AND PIPING TO BE CAST IN CONCRETE STRUCTURES ARE TO BE COORDINATED WITH THIS OFFICE. NO HORIZONTAL RUNNING CONDUIT IS ALLOWED WITHIN THE WALLS, UNLESS SPECIFIC LOCATIONS ARE APPROVED BY THE ENGINEER.
- SURFACE FINISHING - PROVIDE FINAL FINISH IN ACCORDANCE WITH PROPOSED USE.

REFER TO ARCHITECTURAL ROOM SCHEDULE:

SKIM COATS, PITS: SCREEDED AND BULL FLOATED

BASE SLAB FOR TERRAZZO, TILE OR BONDED TOPPING: SCREEDED, BULL FLOATED AND SCORED WITH WIRE BRUSH

FLOORS WHICH RECEIVE RESILIENT FLOOR OR CARPET, FUTURE FLOORS: POWERED STEEL TROWEL

INTERIOR EXPOSED SLABS: POWERED STEEL TROWEL WITH NON-SLIP SWIRLS

EXTERIOR EXPOSED SLABS: WOOD FLOAT FINISH WITH BROOMING

STAIRS: PROVIDE A SLIP RESISTANT STEEL TROWEL FINISH TO EXPOSED CONCRETE STAIR TREADS AND LANDINGS. (INSTALL CARBORUNDUM STRIPS AT EDGES OF TREADS AND LANDINGS IF SHOWN ON THE DRAWINGS).

- CONSTRUCT MEMBERS ACCURATELY AND IN ACCORDANCE WITH THE TOLERANCE LIMITS AS SPECIFIED IN CSA A23.1, AND OTHER THEREIN REFERENCED SECTIONS. MAINTAIN A RELATIVELY CONSTANT TEMPERATURE FOR REINFORCEMENT AND HARDWARE PLACEMENT. REFER TO ARCHITECTURAL PLANS FOR FINISHED DIMENSIONS.

- COMPLETE FORMWORK IN ACCORDANCE WITH CSA A23.1. SUBMIT COPIES OF ENGINEERED FALSEWORK SHOP DRAWINGS AT LEAST 2 WEEKS IN ADVANCE OF SCHEDULED POUR DATES. ALL FORMWORK GEOMETRY AND ALIGNMENT IS TO BE CHECKED PRIOR TO THE COMMENCEMENT OF THE PLACEMENT OF REINFORCING STEEL. FINAL ADJUSTMENTS SHALL BE MADE AFTER ALL STEEL AND HARDWARE PLACEMENT IS COMPLETE.

- COORDINATE PLACEMENT OF HARDWARE, PIPES AND CONDUIT WITH OTHER TRADES AND THE REINFORCING STEEL PLACEMENT, AND SET IN ACCORDANCE WITH APPROVED PLACING DRAWINGS. CONTACT THE CONSULTANT PRIOR TO THE SCHEDULED POUR DATE IF THERE ARE CONCERNS OR UNCERTAINTIES WITH RESPECT TO THE SIZES, TYPE OR LOCATION OF PLANNED CAST IN MATERIALS.

- PROTECT FRESH CONCRETE FROM PREMATURE DRYING, SUNSHINE, EXCESSIVELY HOT OR COLD TEMPERATURES AND PREVENT DAMAGE TO THE CONCRETE. MAINTAIN AT A RELATIVELY CONSTANT TEMPERATURE FOR AS LONG AS IS REQUIRED FOR HYDRATION OF THE CEMENT AND CURING OF THE CONCRETE. REFER TO CSA A23.1 FOR HOT AND COLD WEATHER CONCRETING PRACTICES. PROVIDE AN OUTLINE OF PROPOSED PROCEDURES AND EQUIPMENT TO THE CONSULTANT PRIOR TO FORMING CONCRETE.

- PROTECT FRESH CONCRETE FROM COLD TEMPERATURES BELOW 5 DEGREES CELSIUS. PROVIDE TEMPORARY HEAT FOR A MINIMUM OF 3 DAYS TO MAINTAIN A TEMPERATURE OF GREATER THAN 15 DEGREES CELSIUS.

- WET CURE SLABS FOR 7 DAYS WHEN TEMPERATURES ARE ABOVE FREEZING, OTHERWISE APPLY CURING SEALING COMPOUND. PROVIDE FLOOR SURFACE HARDENER WHERE SPECIFIED AS PER MANUFACTURER'S INSTRUCTIONS.

- FOR STRUCTURAL SLABS AND BEAMS, MAINTAIN SHORING/FRESHING IN PLACE UNTIL THE CONCRETE HAS REACHED 75% OF THE SPECIFIED DESIGN STRENGTH, 7 DAYS MINIMUM UNLESS NOTED.

- ALL FOUNDATION INSULATION TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. FOR TOTAL THICKNESS GREATER THAN 50 mm, USE SHEETS WITH A MAXIMUM THICKNESS OF 50 mm AND INSTALL SUCH THAT ALL JOINTS ARE STAGGERED BY AT LEAST 300 mm. PLACE ON SMOOTH AND EVEN SURFACES AND PROTECT AGAINST DAMAGE. SEE ARCHITECTURAL SPECIFICATIONS FOR FINISHES AND COORDINATION WITH OTHER NON STRUCTURAL ELEMENTS.

- INDEPENDENT INSPECTION AND TESTING: THE GENERAL CONTRACTOR AND OWNER WILL COORDINATE THE APPOINTMENT AND COST OF AN INDEPENDENT INSPECTION AND TESTING AGENCY TO UNDERTAKE CONCRETE TESTS. THE COST OF TESTING SHALL BE AS AGREED BY THE GENERAL CONTRACTOR AND OWNER. LABORATORY CURING AND TESTING OF SAMPLES, AND FREQUENCY OF TESTING, WILL BE CARRIED OUT IN ACCORDANCE WITH CSA STANDARDS A23.1AND A23.2 AND TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR IS TO COORDINATE SCHEDULES WITH THE TESTING COMPANY.

| 1. This drawing is the exclusive property of Nuna Burnside and the reproduction of any part without prior written consent of this office is strictly prohibited. 2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction. 3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project. 4. Do not scale the drawings. | <table><tr><th>Issue / Revision</th><th>Date</th></tr><tr><td>1 ISSUED FOR 66% SUBMISSION</td><td>NOVEMBER 2012</td></tr><tr><td>2 ISSUED FOR 99 SUBMISSION</td><td>JANUARY 2013</td></tr><tr><td>3 ISSUED FOR TENDER</td><td>FEBRUARY 2013</td></tr><tr><td>4 REVISED AS PER ADDENDUM 1 TO 4 AND ISSUED FOR CONSTRUCTION</td><td>APRIL 2013</td></tr></table> | Issue / Revision | Date | 1 ISSUED FOR 66% SUBMISSION | NOVEMBER 2012 | 2 ISSUED FOR 99 SUBMISSION | JANUARY 2013 | 3 ISSUED FOR TENDER | FEBRUARY 2013 | 4 REVISED AS PER ADDENDUM 1 TO 4 AND ISSUED FOR CONSTRUCTION | APRIL 2013 | <table><tr><td>PERMIT TO PRACTICE Nuna Burnside Engineering and Environmental Ltd. Signature: <i>[Signature]</i> Date: <i>May 27/13</i> PERMIT NUMBER: P 535 The Association of Professional Engineers, Geologists and Geophysicists of NWTNU</td><td></td></tr></table> | PERMIT TO PRACTICE Nuna Burnside Engineering and Environmental Ltd. Signature: <i>[Signature]</i> Date: <i>May 27/13</i> PERMIT NUMBER: P 535 The Association of Professional Engineers, Geologists and Geophysicists of NWTNU | | Nuna Burnside Nuna Burnside Engineering & Environmental LTD. 106B Scurfield Blvd., Winnipeg, Manitoba telephone (204) 949-7110 fax (204) 949-7111 web www.neeganburnside.com | Client GOVERNMENT OF NUNAVUT COMMUNITY & GOVERNMENT SERVICES RANKIN INLET SEWAGE TREATMENT PLANT | Drawing Title STRUCTURAL GENERAL REQUIREMENTS <table><tr><td>Drawn By W. WHITEDUCK</td><td>Checked By C. JONES</td><td>Drawing No. S6</td></tr></table> | Drawn By W. WHITEDUCK | Checked By C. JONES | Drawing No. S6 |
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