# GENERAL NOTES FOR STRUCTURES:

## GENERAL

1. THE METRIC SYSTEM OF MEASUREMENT IS USED ON ALL DRAWINGS, ELEVATIONS AND STATIONS ARE SHOWN IN METRES AND ALL OTHER DIMENSIONS ARE SHOWN IN MILLIMETRES.
2. CONTRACTOR MUST VERIFY ALL EXISTING AND PROPOSED GEOMETRY, DIMENSIONS, ELEVATIONS AND LAYOUT IN THE FIELD PRIOR TO FABRICATION AND CONSTRUCTION AND NOTIFY THE CONTRACT ADMINISTRATOR OF ANY CHANGES. EXISTING DIMENSIONS ARE APPROXIMATE ONLY.
3. CONTRACTOR MUST VERIFY, SAFEGUARD AND PROTECT ALL EXISTING UTILITIES PRIOR TO EXCAVATION OR CONSTRUCTION. ANY DAMAGE TO EXISTING STRUCTURES AND UTILITIES BY THE CONTRACTORS OPERATIONS MUST BE REPAIRED BY THE CONTRACTOR AT HIS OWN COST.
4. ALL REFERENCES TO CODES, STANDARDS, SPECIFICATIONS, GUIDELINES, ETC, SHALL MEAN THE LATEST EDITION.
5. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS.
6. ALL WORK SHALL CONFORM TO THE 2010 MANITOBA BUILDING CODE.
7. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH APPLICABLE LEGISLATION AND REGULATIONS INCLUDING, BUT NOT LIMITED TO, OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS.

## EXCAVATION AND BACKFILL

1. ALL EXCAVATIONS SHALL BE COMPLETELY DEWATERED DURING CONSTRUCTION TO PREVENT UPLIFT OF THE STRUCTURE. KEEP EXCAVATION DEWATERED TO, AT LEAST, 300 mm BELOW LOWEST ELEVATION OF EXCAVATION.
2. PLACE ALL CONCRETE IN THE DRY.
3. THE FOUNDATION SLABS SHALL BEAR ON LAYER OF WELL GRADED GRANULAR/CRUSHED ROCK COMPACTED TO 100% STANDARD PROCTOR DRY DENSITY (SPDD) UNLESS OTHERWISE INDICATED.

## CAST IN PLACE CONCRETE

1. CONCRETE MATERIAL, QUALITY, MIXING, PLACING, FORM WORK AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CSA A23.1 / A23.2 - 2014
2. ALL EXPOSED CORNERS SHALL HAVE A 20 mm CHAMFER OR FILLET UNLESS OTHERWISE NOTED.

| TYPE | SUPPLY AND PLACE STRUCTURAL CONCRETE | STRENGTH (MPa) | EXP. CLASS |
|---|---|---|---|
| 1 | PILES, GRADE BEAMS, SUSPENDED SLABS | 35 @ 56 DAYS | S-2 |
| 2 | RETAINING WALLS, STRUCTURAL SLABS | 35 @ 28 DAYS | S-2 |

## ANCHOR BOLTS FOR LIGHT STANDARDS

1. ANCHOR BOLTS SHALL BE IN ACCORDANCE WITH ASTM F1554 GRADE 105, HOT DIPPED GALVANIZED.
2. ANCHOR BOLTS SHALL BE 25Ø x 915 LONG C/W 150 HOOK, UNLESS SHOWN OTHERWISE.
3. CONFIRM ANCHOR BOLT SIZE, B.C.D. AND PROJECTION WITH LIGHT STANDARD SUPPLIER PRIOR TO INSTALLATION.
4. PROTECT THREADS FROM FOULING DURING CONCRETE POUR.
5. ANCHOR BOLTS TO BE SET USING STEEL SETTING TEMPLATE (MIN. 10 THICK) TO BE REMOVED AFTER MIN. 24hr CURING PERIOD.
6. REFER TO SHEET S6 FOR ALIGNMENT OF ANCHOR BOLTS.
7. B.C.D. = BOLT CIRCLE DIAMETER.

## POST-INSTALLED ANCHOR BOLTS

1. UNLESS OTHERWISE NOTED, POST-INSTALLED ANCHOR BOLTS SHALL BE HILTI KWIK BOLT TZ - SS TO THE DIAMETER AND LENGTH AS INDICATED ON THE DRAWINGS OR EQUAL AS APPROVED BY THE CONTRACT ADMINISTRATOR.
2. CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.

## HANDRAILS AND GUARDRAILS

1. STEEL PIPE SHALL BE IN ACCORDANCE WITH ASTM A53 TYPE S GRADE A OR B.
2. GALVANIZE IN ACCORDANCE WITH ASTM A123-09 TO A NET RETENTION OF 610 g/m2
3. GALVANIZING HANDRAIL AND GUARDRAILS SHALL RESULT IN A SMOOTH SURFACE FREE OF SHARP EDGES AND PROJECTIONS.
4. VENT HOLE SIZE AND LOCATIONS AS PER GALVANIZING PROCESS REQUIREMENTS.
5. EXPANSION JOINTS SHALL BE LOCATED TO ACCOMMODATE GALVANIZING PROCESS.

## MISCELLANEOUS METAL FABRICATIONS

1. STEEL SHALL BE IN ACCORDANCE WITH CSA G40.21 GRADE 300W UNLESS OTHERWISE NOTED.
2. ALL FABRICATIONS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123-09 TO A NET RETENTION OF 610 g/m2
3. CONTRACTOR SHALL PREPARE AND SUBMIT DETAILED SHOP DRAWINGS PRIOR TO COMMENCING FABRICATION.

## REINFORCING STEEL FOR CAST-IN-PLACE CONCRETE

1. ALL REINFORCING SHALL BE BLACK STEEL CONFORMING TO CSA G30.18-09, GRADE 400W.
2. ALL REBAR SHALL BE STORED ON WOOD BLOCKING AT THE SITE.
3. CONCRETE CLEAR COVER TO REINFORCEMENT UNLESS NOTED OTHERWISE:

| | |
|---|---|
| PILES, FOUNDATIONS CAST AGAINST GRADE: | 75 mm |
| RETAINING WALLS, GRADE BEAMS FOUNDATIONS NOT CAST AGAINST AGAINST GROUND: | 60 mm |
| STRUCTURAL SLABS: | |
| TOP LAYER | 60 mm |
| BOTTOM LAYER | 50 mm |

4. SEE TABLE BELOW FOR REINFORCING LAP SPLICES/PROJECTION LENGTH TYPICAL UNLESS NOTED OTHERWISE.
5. NORMAL WEIGHT CONCRETE.
6. CLEAR COVER GREATER THAN 1.5 x BAR DIAMETER.
7. CLEAR SPACING NOT LESS THAN 2 x BAR DIAMETER.
8. Fy=400 MPa.
9. MULTIPLY ABOVE BY 1.3 FOR HORIZONTAL REBAR SO PLACED THAT MORE THAN 300 mm OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE DEVELOPMENT LENGTH OR SPLICE.
10. INCREASE ABOVE BY 1.5 FOR EPOXY COATED REBAR.
11. COMBINATION OF ABOVE TWO FACTORS NEED NOT EXCEED 1.7
12. CONTRACTOR SHALL PREPARE AND SUBMIT DETAILED REINFORCING STEEL SHOP DRAWINGS AND BAR LISTS PRIOR TO COMMENCING FABRICATION.
13. WELDED STEEL WIRE FABRIC SHALL CONFORM TO ASTM A1064/A1064M-13. PROVIDE IN FLAT SHEETS ONLY.

| MINIMUM LAP LENGTHS | | |
|---|---|---|
| BAR SIZE | 30 MPa CONCRETE | 35 MPa CONCRETE |
| 10M | 550 | 500 |
| 15M | 750 | 700 |
| 20M | 900 | 850 |
| 25M | 1450 | 1350 |
| 30M | 1700 | 1550 |
| 35M | 2000 | 1850 |

## CAST-IN-PLACE PILES

1. CAST-IN-PLACE PILES ARE FRICTION PILES WITH THE FOLLOWING PROPERTIES:

| SOIL | DEPTH (m) | | ULS RESISTANCE | | SLS SKIN FRICTION | LATERAL SUBGRADE REACTION MODULUS |
|---|---|---|---|---|---|---|
| | FROM | TO | END BEARING | SKIN FRICTION | | |
| CLAY FILL / FROST ZONE | 0.0 | 2.4 | 0 | 0 | 0 | 0 |
| SILTY CLAY | 2.4 | 11 | 60 KPa | 14 KPa | 12 KPa | 2400/d KN/m$^3$ |

ULS RESISTANCE = A RESISTANCE FACTOR OF 0.4 IS APPLIED
d = DIAMETER OF PILE.

## EPOXY ADHESIVE ANCHORAGE FOR REINFORCING

1. EPOXY ADHESIVE ANCHORAGE SYSTEM FOR POST INSTALLED REINFORCING BARS SHALL BE HILTI HIT-HY 200 OR EQUAL APPROVED BY THE CONTRACT ADMINISTRATOR.
2. CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

APEGM
Certificate of Authorization
Dillon Consulting Limited (MB)
No. 1789 Date: MAR. 4, 2016

| NO. | REVISIONS | DATE | BY |
|---|---|---|---|
| 1 | ISSUED FOR TENDER | 16/03/04 | ARR |

B.M. ELEV.

DESIGNED BY WCH
DRAWN BY PDR
CHECKED BY NR
APPROVED BY ARR
HOR. SCALE AS NOTED
VERTICAL
DATE

DILLON CONSULTING
RELEASED FOR CONSTRUCTION
DATE

ENGINEER'S SEAL
PROVINCE OF MANITOBA
D.N. BOTHWINOGLAROEM
Member 23609
REGISTERED PROFESSIONAL ENGINEER

CONSULTANT PROJECT NUMBER
13-8224

Winnipeg
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT

4R WINNIPEG DEPOT
PACIFIC AVENUE

CITY DRAWING NUMBER
1-0851A-S0001-001

SHEET 9 OF 43

GENERAL NOTES FOR STRUCTURES

CONSULTANT DRAWING NUMBER
S-1

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