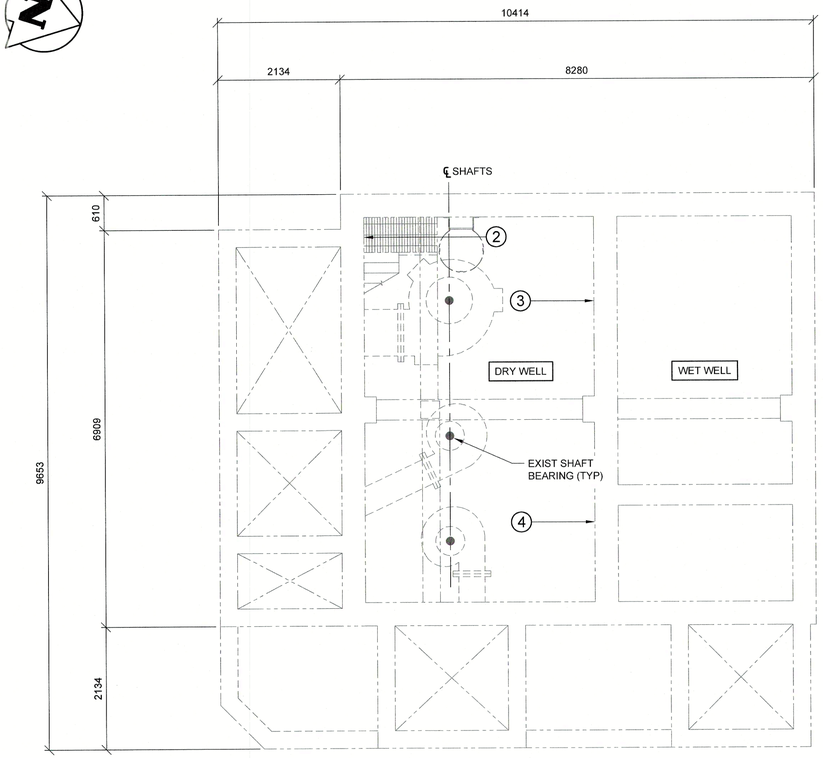
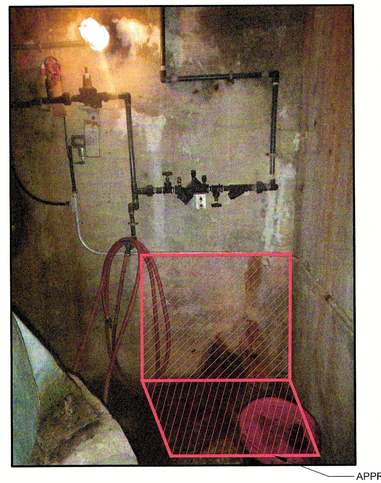


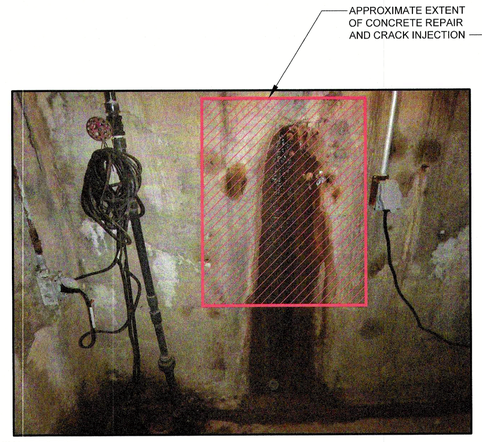
1 - - DRY/WET WELL - CONCRETE REPAIR LOCATIONS

1 : 50



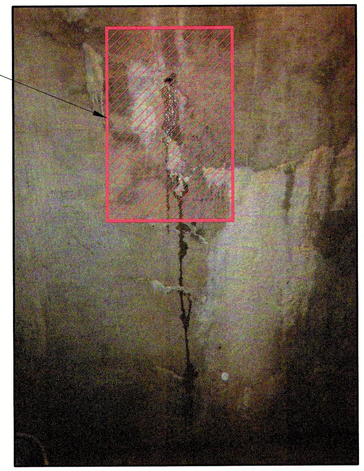
2 - - CONCRETE REPAIR - ELEVATION

NTS
- REFER TO PLAN FOR LOCATION



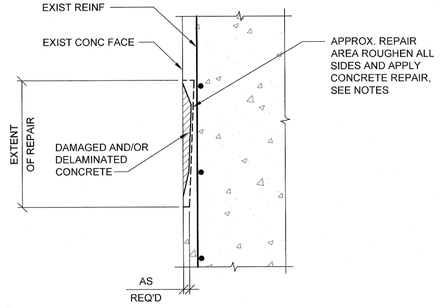
3 - - CONCRETE REPAIR - ELEVATION

NTS
- REFER TO PLAN FOR LOCATION



4 - - CONCRETE REPAIR - ELEVATION

NTS
- REFER TO PLAN FOR LOCATION



5 - - TYPICAL CONCRETE REPAIR - PARTIAL DEPTH

1 : 10

GENERAL

.1 ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH MANITOBA BUILDING CODE 2011, MANITOBA REGULATION 217/2006, LOCAL BYLAWS AND ORDINANCES AND SAFETY REGULATIONS.
.2 THE COMPLETE WORK SHALL BE GOVERNED BY THE DICTATES OF GOOD PRACTICE IN ALL DETAILS OF MATERIALS AND METHODS EVEN IF NOT MINUTELY SPECIFIED.
.3 THE DRAWINGS DESCRIBE THE COMPLETED PROJECT AND DO NOT INDICATE COMPONENTS THAT MAY BE NECESSARY FOR CONSTRUCTION SAFETY. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY IN AND ABOUT THE JOB SITE DURING CONSTRUCTION, AND THE DESIGN AND ERECTION OF ALL TEMPORARY AND PERMANENT STRUCTURES, FORMWORK, FALSEWORK, SHORING, ETC., REQUIRED TO COMPLETE THE PROJECT. MAINTAIN THE SITE, AT LEAST ON A DAILY BASIS, FREE FROM ACCUMULATIONS OF WASTE MATERIAL AND DEBRIS. DISPOSE OF WASTE MATERIAL IN ACCORDANCE WITH LOCAL REGULATIONS.
.4 DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR.
.5 LOCATE AND PROTECT ALL EXISTING MECHANICAL, ELECTRICAL AND MUNICIPAL SERVICES BEFORE COMMENCING CONSTRUCTION. COORDINATE THE WORK WITH THE REQUIREMENTS OF ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS. VERIFY THE LOCATIONS OF ALL EXISTING EQUIPMENT AND OPENINGS. DO NOT SEPARATE DRAWING SETS.
.6 THE CONTRACTOR WILL LEAVE THE SITE IN THE SAME OR BETTER CONDITION THAN IT WAS BEFORE CONSTRUCTION. SITE CLEAN-UP, DRAINAGE, SECURITY, ETC. AND CONDITION OF THE WORK WILL BE TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
.7 ALL DIMENSIONS ARE IN MILLIMETRES (mm) AND ALL ELEVATIONS ARE IN METRES (m) UNLESS NOTED OTHERWISE.

LOADING

LOADS AND FORCES SHOWN ARE SERVICE (UNFACTORED) LOADS IN KILOPASCALS (kPa) AND KILONEWTONS (kN) UNLESS NOTED OTHERWISE.

.1 LIVE LOADS = 4.8 kPa

SHOP DRAWINGS

.1 SUBMIT SHOP DRAWINGS, SKETCHES AND DESIGN CALCULATIONS (AS REQUIRED) FOR REVIEW. ALLOW MINIMUM TEN (10) WORKING DAYS FOR REVIEWS. SUBMISSIONS FOR THIS PROJECT INCLUDE;
- METAL FABRICATIONS
- GRATINGS

SHOP DRAWINGS FOR COMPONENTS DESIGNED BY THE CONTRACTOR MUST BEAR THE STAMP OF A QUALIFIED PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF MANITOBA.

METAL FABRICATIONS

.1 SHOP DRAWINGS: PROVIDE DRAWINGS BEARING SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA FOR REVIEW PRIOR TO FABRICATION.
.2 MATERIAL: GALVANIZED STEEL U.N.O.
.3 WELDING: STEEL TO CSA W59-13, ALUMINUM TO CSA CSA W59.2-M1991 (R2013)
.4 CONFORM TO W47.1-09, CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES.
.5 W AND S SHAPES, HSS: TO CSA G40.21 GR 350W OR ASTM A992/A572 GR 50 GRADE C
.6 CHANNELS, ANGLES, TEES AND PLATES: TO CSA G40.21-13, 300 mPa
.7 GUARDRAIL STEEL PIPE: TO ASTM A53, GRADE B (Fy=241 mPa).
.8 ANCHOR RODS: TO ASTM F1554 GR 55 S1.
.9 BOLTS: TO ASTM A325.
.10 ALL STEEL TO BE GALVANIZED TO Z275.

GRATING

.1 GRATING TO BE WELDED TYPE W30-102 CONFORMING TO THE METAL BAR GRATING MANUAL OF THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS.
.2 ALL GRATING SHALL BE FASTENED WITH SADDLE CLIPS. METHODS OF FIXING SHALL CONFORM TO THE METAL GRATING INSTITUTE RECOMMENDATIONS.
.3 ALL LOOSE EDGES AND REMOVABLE PANELS TO BE BANDED WITH 4.8x32 PLATE UNLESS NOTED OTHERWISE.
.4 PROVIDE 6.4x150 KICK PLATE AROUND ALL OPENINGS. KICK PLATES SHALL BE WELDED SIMILAR TO BANDING.
.5 GRATING SHALL BE CUT AND NEATLY FITTED AROUND COLUMNS, MACHINERY SUPPORTS, PIPING, DUCTS, ETC. TOUCH-UP PAINTING SHALL BE PERFORMED ON ANY FIELD BURNING AND WELDING.
.6 ALL GRATING TO BE GALVANIZED UNLESS NOTED OTHERWISE.

POST INSTALL ANCHORS

.1 INSTALL ALL ANCHORS WITH HILTI HIT-HY 200 ADHESIVE SYSTEM. FOLLOW MANUFACTURER'S INSTRUCTIONS.

CONCRETE REPAIR

.1 WORK SHALL CONSIST OF DEMOLITION, REMOVAL AND DISPOSAL OF EXISTING CONCRETE
.2 DETERIORATED CONCRETE SHALL BE REMOVED USING A CHIPPING HAMMER NO HEAVIER THAN 20 lbs
.3 REPAIR BOUNDARY SHALL BE SAWCUT TO PREVENT FEATHERED EDGES. CUT PERIMETER AT 90 DEGREE ANGLES TO A DEPTH NO GREATER THAN 25mm TO AVOID CUTTING REINFORCING.
.4 IF REINFORCING IS EXPOSED REMOVE CONCRETE TO A DEPTH OF 25mm PAST THE EXPOSED REINFORCING.
.5 EXPOSED REINFORCING SHALL BE CLEANED OF RUST, CONCRETE AND OTHER BOND INHIBITING MATERIALS.
.6 REPLACE DAMAGED REINFORCING AS DIRECTED BY THE CONTRACT ADMINISTRATOR.
.7 ALL SURFACES TO BE INSPECTED BY THE CONTRACT ADMINISTRATOR FOLLOWING REMOVAL OF CONCRETE AND PREPARATION OF REINFORCING STEEL.
.8 APPROVED CONCRETE MATERIALS INCLUDE SIKAREPAIR 223.
.9 SURFACE OF CONCRETE TO RECEIVE REPAIR TO BE PREPARED IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
.10 TEMPERATURES OF SUBTRATE RECEIVING REPAIR TO BE MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S DATA SHEET PRIOR TO REPAIR.
.11 TEMPERATURE TO BE MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S DATA SHEET FOR A MINIMUM OF 7 DAYS AFTER REPAIRS ARE COMPLETE.
.12 CONCRETE SUBSTRATE TO BE SATURATED SURFACE DRY BEFORE APPLICATION OF THE CONCRETE REPAIR, IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
.13 FORMWORK TO REMAIN IN PLACE FOR A MINIMUM OF 7 DAYS AFTER PLACEMENT OF CONCRETE REPAIR.
.14 UNFORMED SURFACES SHALL BE COVERED AND KEPT MOIST BY MEANS OF WET CURING BLANKETS FOR 7 DAYS IMMEDIATELY AFTER FINISHING

CONCRETE CRACK INJECTION REPAIRS

.1 COVER ALL OPERATIONS RELATED TO THE REPAIR OF CRACKS IN CONCRETE BY PRESSURE INJECTION OF EPOXY RESIN ADHESIVE.
.2 THE MATERIAL FOR CONCRETE CRACK INJECTION REPAIRS SHALL BE A TWO-COMPONENT LOW VISCOSITY STRUCTURAL EPOXY RESIN ADHESIVE CAPABLE OF BONDING TO CONCRETE SUCH AS SIKADUR 35, HI-MOD EV, KEMKO 038 REGULAR IR OR EQUIVALENT AS APPROVED BY THE CONTRACT ADMINISTRATOR.
.3 THE PRODUCT SHALL HAVE PHYSICAL PROPERTIES MEETING THE PROVISIONS OF ASTM C881-90, TYPE I.
.4 THE SURFACE SEAL MATERIAL SHALL BE COMPATIBLE FOR USE WITH THE EPOXY RESIN ADHESIVE AND SHALL HAVE ADEQUATE STRENGTH TO BOND AND SHALL BE CAPABLE OF FULLY CONTAINING AND PREVENT LEAKAGE OF THE EPOXY RESIN ADHESIVE DURING PRESSURE INJECTION OF THE REPAIR MATERIAL. THE SURFACE SEALING MATERIAL SHALL HAVE ADEQUATE STRENGTH TO HOLD INJECTION PORTS IN PLACE.
.5 AT LEAST SEVEN (7) CALENDAR DAYS BEFORE STARTING CRACK INJECTION WORK, THE CONTRACTOR SHALL PREPARE AND SUBMIT A WRITTEN PROCEDURE, TO THE CONTRACT ADMINISTRATOR FOR REVIEW, DETAILING THE PROPOSED METHODS AND MATERIALS.
.6 CONCRETE CRACK INJECTION REPAIRS SHALL BE DONE BY AN APPLICATOR LICENSED BY THE MANUFACTURER OF THE EPOXY RESIN ADHESIVE.
.7 ALL PROCESSES RELATED TO THE CONCRETE CRACK INJECTION SHALL BE DONE IN ACCORDANCE WITH THE DIRECTIONS OF THE EPOXY RESIN ADHESIVE MANUFACTURER.
.8 IN GENERAL, THE FOLLOWING SHALL APPLY:
1. EQUIPMENT SHALL EMPLOY POSITIVE DISPLACEMENT METERING PUMPS, INTERLOCKED TO PROVIDE DELIVERY OF THE EPOXY RESIN ADHESIVE IN PROPORTIONS REQUIRED BY THE COMPOSITION OF THE TWO COMPONENT MATERIAL. INJECTION EQUIPMENT SHALL BE CAPABLE OF MAINTAINING THE VOLUME RATIO OF THE EPOXY RESIN ADHESIVE COMPONENTS DURING UNINTERRUPTED FLOW WITHIN A TOLERANCE OF +/-5%. THE EQUIPMENT SHALL HAVE AN AUTOMATIC SHUT-OFF FEATURE TO PREVENT DELIVERY OF ONE COMPONENT ONLY WHEN THE OTHER COMPONENT SUPPLY IS EXHAUSTED.
2. SURFACES ADJACENT TO CRACKS OR OTHER AREAS OF APPLICATION SHALL BE CLEANED OF DIRT, DUST, GREASE, OIL, EFFLORESCENCE OR OTHER FOREIGN MATTER DETRIMENTAL TO BOND OF EPOXY INJECTION SURFACE SEAL. ENTRY PORTS SHALL BE PROVIDED ALONG THE CRACK AT INTERVALS AS REQUIRED TO ENSURE THAT THE CRACK INJECTION REPAIRS ARE UNDERTAKEN AND COMPLETED TO BE EFFECTIVE AND SUCCESSFUL. SURFACE SEAL MATERIAL SHALL BE APPLIED TO THE FACE OF THE CRACK BETWEEN THE ENTRY PORTS. FOR THROUGH CRACKS, SURFACE SEAL SHALL BE APPLIED TO BOTH FACES. ENOUGH TIME FOR THE SURFACE SEAL MATERIAL TO GAIN ADEQUATE STRENGTH SHALL PASS BEFORE PROCEEDING WITH THE INJECTION.
3. INJECTION OF EPOXY RESIN ADHESIVE SHALL BEGIN AT LOWEST ENTRY PORT AND CONTINUE UNTIL THERE IS AN APPEARANCE OF EPOXY RESIN ADHESIVE AT THE NEXT PORT ADJACENT TO THE ENTRY PORT BEING PUMPED. WHEN EPOXY RESIN ADHESIVE TRAVEL IS INDICATED BY APPEARANCE AT THE NEXT ADJACENT PORT, INJECTION SHALL BE DISCONTINUED ON THE ENTRY PORT BEING PUMPED, AND EPOXY RESIN ADHESIVE INJECTION SHALL BE TRANSFERRED TO THE NEXT ADJACENT PORT WHERE EPOXY RESIN ADHESIVE HAS APPEARED. EPOXY RESIN ADHESIVE INJECTION SHALL BE PERFORMED CONTINUOUSLY UNTIL CRACKS ARE COMPLETELY FILLED. IF PORT TO PORT TRAVEL OF EPOXY RESIN ADHESIVE IS NOT INDICATED, THE WORK SHALL BE IMMEDIATELY STOPPED AND REMEDIAL ACTION UNDERTAKEN BY THE CONTRACTOR TO RECTIFY THE SITUATION. THE REMEDIAL ACTION PROCEDURE SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE CONTRACT ADMINISTRATOR IN WRITING FOR REVIEW.
4. WHEN CRACKS ARE COMPLETELY FILLED, EPOXY RESIN ADHESIVE SHALL BE CURED FOR SUFFICIENT TIME TO ALLOW REMOVAL OF SURFACE SEAL WITHOUT ANY DRAINING OR RUN BACK OF EPOXY RESIN MATERIAL FROM THE CRACKS. SURFACE SEAL MATERIAL AND EPOXY RESIN ADHESIVE RUNS OR SPILLS SHALL BE REMOVED FROM CONCRETE SURFACES. THE FACE OF THE CRACK SHALL BE FINISHED FLUSH WITH THE ADJACENT CONCRETE SHOWING NO INDENTATIONS OR PROTRUSIONS CAUSED BY THE PLACEMENT OF ENTRY PORTS.

1:50 1 0 1 2m

1:10 100 0 100 300 500mm

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
Tetra Tech Canada Inc.
No. 6499

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPR. UIG STRUCTURES COMMITTEE _____ DATE _____

NOTE:
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

B.M. ELEV. F.B.

NO.	REVISIONS	DATE	BY
00	ISSUED FOR TENDER	18.08.02	MS

TETRA TECH

DESIGNED BY	MS	CHECKED BY	
DRAWN BY	EV/HA	APPROVED BY	
HOR. SCALE: / VERTICAL:	AS NOTED	RELEASED FOR CONSTRUCTION	
DATE		DATE	

PROVINCE OF MANITOBA
18.08.02
M. J. SCERBO
REGISTERED PROFESSIONAL ENGINEER

CONSULTANT DRAWING NO.
1800120700-DWG-S0001

Winnipeg

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

BALTIMORE FLOOD PUMPING STATION UPGRADES

STRUCTURAL
CONCRETE REPAIR LOCATIONS
AND GENERAL NOTES

CITY DRAWING NUMBER

SHEET 4 OF 23

S0001