

Sault Ste. Marie Canal National Historic Site

Northern Ontario Field Unit Parks Canada Agency

511 SSM POWERHOUSE STRUCTURAL STABILIZATION PROJECT PENSTOCK BULKHEAD PROJECT PROJECT DESIGN DRAWINGS

<u>Issued For Tender</u>

Date: December 2020

Prepared For:

Northern Ontario Field Unit





LIST OF DRAWINGS

PROJECT DRAWINGS

DRAWING COVER SHEET

SITE PLAN AND TURBIDITY CURTAIN DETAILS

BULKHEAD #2 REFERENCE PHOTOS

REFERENCE PHOTOS

CONSULTANT:



SAULT STE.MARIE ONTARIO CANADA P6A 3C8 TEL.: 705-942-2070 | FAX: 705-942-3532 | WWW.WSP.COM





- DRAWINGS TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS.
- NOTIFY DEPARTMENTAL REPRESENTATIVE IF ANY DISCREPANCIES ARE FOUND BETWEEN THESE NOTES AND THE SPECIFICATIONS.
- IN CASE OF CONFLICTING INFORMATION BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS, THE MORE STRINGENT SHALL GOVERN OR CONTRACTOR MUST SEEK CLARIFICATION IN WRITING
- ALL WORK IS TO CONFORM TO LATEST EDITION OF THE FISHERIES ACT, THE LAKES AND RIVERS IMPROVEMENT ACT, THE NAVIGATION PROTECTION ACT, AND WITH ALL APPLICABLE CODES AND BYLAWS. THE CONTRACTOR SHALL SUBMIT A WORK PLAN FOR ALL WORK FALLING WITHIN EITHER ACT.
- BEFORE PROCEEDING WITH WORK, VERIFY DIMENSIONS SHOWN ON THE DRAWINGS AND REPORT DISCREPANCIES TO THE DEPARTMENTAL REPRESENTATIVE, REFER TO OTHER DRAWINGS FOR LOCATIONS AND DIMENSIONING OF APPURTENANCES NOT SHOWN ON THE STRUCTURAL DRAWINGS, OBTAIN DEPARTMENTAL REPRESENTATIVE'S APPROVAL BEFORE MODIFYING WORK TO SUIT EXISTING CONDITIONS WHICH ARE NOT SHOWN ON THE DRAWINGS.
- ALL DIMENSIONS GIVEN ON DRAWINGS ARE IN METRIC SYSTEM UNLESS OTHERWISE NOTED. DO NOT SCALE DRAWINGS.
- THE CONTRACTOR SHALL FACILITATE ALL MATERIAL TESTING REQUIRED BY THE DEPARTMENTAL REPRESENTATIVE AND AS OUTLINED IN THE CONTRACT SPECIFICATIONS, CONTRACTOR TO ORGANIZE AND COORDINATE AS REQUESTED
- THE PROJECT IS LOCATED IN A NATIONAL HISTORIC SITE (NHS) OF CANADA, THEREFORE STANDARDS FOR ENVIRONMENTAL PROTECTION SHALL BE OF THE HIGHEST QUALITY STANDARD. CONTRACT LIMITS SHALL BE STRICTLY ADHERED TO AND CONTRACTOR IS TO TAKE SPECIAL CARE TO MINIMIZE DAMAGE, DISRUPTION, AND PROTECT EXISTING FEATURES OF THE NATIONAL PARK. THE DEPARTMENTAL REPRESENTATIVE OR DELEGATE IS TO BE NOTIFIED IMMEDIATELY IF ANY NATURAL OR CULTURAL RESOURCES OF INTEREST ARE LOCATED DURING CONSTRUCTION.
- ALL WORK IS TO BE CONDUCTED IN ACCORDANCE WITH THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT.
- ALL ENVIRONMENTAL CONTROLS TO BE INSTALLED PRIOR TO ANY IN-WATER WORKS.
- CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DISTURBED AREAS OUTSIDE THE CONSTRUCTION LIMITS BACK TO ORIGINAL CONDITIONS OR BETTER AFTER COMPLETION OF THE
- ENVIRONMENTAL PROTECTION MEASURES: EMPLOYMENT OF MITIGATION MEASURES DURING ALL PHASES OF CONSTRUCTION WILL PROTECT IDENTIFIED NATURAL FEATURES LOCATED ON AND WITHIN THE VICINITY OF THE SUBJECT SITE.
- 12.1. THE PROPONENT / CONTRACTOR SHALL MONITOR THE WEATHER SEVERAL DAYS IN ADVANCE TO ENSURE THAT WORKS ARE CONDUCTED DURING FAVOURABLE WEATHER CONDITIONS.
- WHERE A SPECIES AT RISK IS OBSERVED, WORK SHOULD STOP IMMEDIATELY AND THE SPECIES AT RISK BIOLOGIST AT THE SAULT STE. MARIE MINISTRY OF NATURAL RESOURCES AND FORESTRY
- CONTACTED FOR FURTHER DIRECTION. THE SPECIES MUST NOT BE HANDLED THE CONTRACTOR WILL SUBMIT A RISK MANAGEMENT PLAN TO THE DEPARTMENTAL REPRESENTATIVE OR DELEGATE FOR APPROVAL. THE CONTRACTOR SHALL MAINTAIN AND CONSTANTLY UPDATE THE PLAN THROUGHOUT THE PROJECT LIFECYCLE.
- ALL CONTRACTOR SUBMITTALS SHALL BE DONE IN S.I. UNITS (METRIC).
- THE CONTRACTOR SHALL SUBMIT A PROJECT SPECIFIC HEALTH AND SAFETY PLAN FOR REVIEW PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL ONLY PROCEED WITH
- CONSTRUCTION UPON ACCEPTANCE OF THE PROJECT SPECIFIC HEALTH AND SAFETY PLAN BY THE DEPARTMENTAL REPRESENTATIVE OR DELEGATE. THE CONTRACTOR SHALL SUBMIT A DEMOLITION PLAN FOR REVIEW PRIOR TO SITE REMOVALS. THE CONTRACTOR SHALL ONLY PROCEED WITH CONSTRUCTION UPON ACCEPTANCE OF THE
- DEMOLITION PLAN BY THE DEPARTMENTAL REPRESENTATIVE OR DELEGATE
- THE CONTRACTOR SHALL SUBMIT A TEMPORARY CROSSING PLAN FOR REVIEW PRIOR TO COMMENCING CONSTRUCTION FOR ALL STRUCTURES WHERE PUBLIC ACCESS WILL BE IMPACTED DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A PEDESTRIAN TRAFFIC A SAFE MEAN OF CROSSING DURING CONSTRUCTION AS THE NHS WILL REMAIN OPEN TO THE PUBLIC.
- THE CONTRACTOR SHALL MAINTAIN THE WORK SITE IN A TIDY CONDITION AND FREE FROM THE ACCUMULATION OF WASTE PRODUCTS AND DEBRIS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE CLEANLINESS OF THE WORK AREA AND THE ROAD FROM THE ENTRANCE ON CANAL DRIVE TO THE WORK AREAS.
- USE DRAWINGS THAT ARE "ISSUED FOR CONSTRUCTION" AND WHICH ARE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. CONFIRM WITH THE DEPARTMENTAL REPRESENTATIVE OR DELEGATE TO ENSURE THE MOST CURRENT REVISIONS ARE USED.
- ALL SECTIONS, DETAILS AND STATEMENTS NOTED AS "TYPICAL" APPLY TO LIKE/SIMILAR CONDITIONS.
- THE CONSULTANT AND THE DEPARTMENTAL REPRESENTATIVE, AT TIMES, WILL CONDUCT INSPECTIONS OF THE WORK TO ENSURE GENERAL CONFORMANCE WITH THE DESIGN DRAWINGS. THIS DOES NOT REPLACE THE CONTRACTOR'S RESPONSIBILITY TO IMPLEMENT AND MAINTAIN A QUALITY CONTROL PROGRAM.
- SUBSTANTIAL COMPLETION OF THE PROJECT WILL NOT BE AWARDED UNTIL AS-BUILT RECORD DRAWINGS HAVE BEEN PROVIDED WITH ALL REQUIRED INFORMATION TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
- THE CONTRACTOR SHALL PROVIDE TWO (2) COMPLETE SETS OF AS-BUILT RECORD DRAWINGS. ALL CHANGES ARE TO BE MARKED IN RED AND MUST BE CLEAN AND LEGIBLE.
- NO BURNING IS PERMITTED WITHIN THE NATIONAL HISTORIC SITE.
- THE CONTRACTOR SHALL PROVIDE ALL SHOP DRAWINGS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. ALL SHOP DRAWINGS ARE SUBJECT TO APPROVAL FROM DEPARTMENTAL REPRESENTATIVE OR DELEGATE.
- ALL WORK SHALL CONFORM TO THE ENVIRONMENTAL BASIC IMPACT ANALYSIS (BIA). REFER TO CONTRACT SPECIFICATION

- ALL REMOVALS ARE TO BE CARRIED OUT WITH PRECAUTIONS FOR THE SAFETY OF THE PUBLIC AND PARKS CANADA'S EMPLOYEES.
- DEMOLITION WORK SHALL BE CARRIED OUT WITHOUT CAUSING OVERSTRESS OR EXCESSIVE DEFLECTION TO ANY PART OF THE EXISTING WORK WHICH IS TO REMAIN. THE CONTRACTOR IS RESPONSIBLE TO RECTIFY ANY DAMAGE CAUSED DURING DEMOLITION.

EROSION CONTROL

- INSTALL EFFECTIVE EROSION AND SEDIMENT CONTROL MEASURES BEFORE STARTING WORK TO PREVENT SEDIMENT FROM ENTERING THE WATER COURSE. TURBIDITY CURTAINS SHOULD BE INSTALLED AT THE PENSTOCK AREA TO ISOLATE WORK AREA FROM THE REST OF THE LAKE.
- TURBIDITY CURTAINS SHOULD BE INSTALLED IN ACCORDANCE WITH OPSD 219.260/219.261 T THE AREA OF BULKHEAD #2 TO ISOLATE WORK AREA FROM THE REST OF THE LAKE.
- SILTATION FENCING SHOULD ALSO BE PLACED AROUND THE STORAGE AND LAYDOWN AREAS AND ANY STOCKPILE AREAS.
- ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, SHOULD BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, OR OTHER DELETERIOUS SUBSTANCES FROM ENTERING THE WATERBODY.
- VEHICULAR REFUELING AND MAINTENANCE SHALL BE CONDUCTED 30 M FROM THE WATERBODY.
- APPLY MEASURES FOR CONTAINING AND STABILIZING WASTE MATERIAL (E.G., DREDGING SPOILS, CONSTRUCTION WASTE AND MATERIALS, COMMERCIAL LOGGING WASTE, UPROOTED OR CUT AQUATIC PLANTS, ACCUMULATED DEBRIS) ABOVE THE HIGH WATER MARK OF NEARBY WATERBODIES TO PREVENT RE-ENTRY.
- DAILY INSPECTION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES AND STRUCTURES DURING THE COURSE OF CONSTRUCTION ARE REQUIRED.
- REPAIR EROSION AND SEDIMENT CONTROL MEASURES AND STRUCTURES IF DAMAGE OCCURS.
- REMOVE NON-BIODEGRADABLE EROSION AND SEDIMENT CONTROL MATERIALS ONCE SITE IS STABILIZED.

CONTAMINANT CONTROL

- TEMPORARILY STORE, HANDLE AND DISPOSE OF ALL MATERIALS USED OR GENERATED (E.G. ORGANICS, SOILS, WOODY DEBRIS, TEMPORARY STOCKPILES, CONSTRUCTION DEBRIS) DURING SITE PREPARATION, CONSTRUCTION AND CLEAN-UP IN A MANNER THAT PREVENTS THEIR ENTRY INTO NATURALIZED AREAS IN THE VICINITY OF THE EXCAVATION SITE, INCLUDING SURROUNDING WATER FEATURES.
- ENSURE A SPILLS MANAGEMENT PLAN (INCLUDING MATERIALS, INSTRUCTIONS REGARDING THEIR USE, EDUCATION OF CONTRACT PERSONNEL, EMERGENCY CONTACT NUMBERS) IS ONSITE AT ALL TIMES FOR IMPLEMENTATION IN EVENT OF ACCIDENTAL SPILL DURING CONSTRUCTION. ADEQUATE MEASURES TO PREVENT OR CAPTURE AND CONTAIN ANY DEBRIS AND SPILLS RESULTING FROM CONSTRUCTION ACTIVITIES SHOULD BE KEPT ONSITE IN SUFFICIENT QUANTITIES. STAFF SHOULD BE ORIENTATED AS TO THE LOCATION OF MATERIALS AND THEIR PROPER USE AND DISPOSAL. ALL MEASURES AND PROCEDURES SHOULD CONFORM TO PERTINENT PROVINCIAL REQUIREMENTS.
- OPERATING, REFUELLING AND MAINTENANCE OF CONSTRUCTION EQUIPMENT AND THE HANDLING AND STORAGE OF TOXIC MATERIALS (E.G. FUEL, LUBRICANTS, AND OTHER CHEMICALS) MUST BE CARRIED OUT IN SUCH A WAY AS TO AVOID CONTAMINATION OF SOILS, GROUNDWATER AND SURFACE WATERS.
- ALL PARTS OF EQUIPMENT SHALL BE FREE OF FLUID LEAKS AND EXTERNALLY CLEANED/DEGREASED OFFSITE, IN A CONTAINED ENVIRONMENT.
- AN EMERGENCY SPILL KIT WILL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION OR WHEN VEHICLES OR EQUIPMENT ARE PRESENT ONSITE.
- BEST MANAGEMENT PRACTICES SHOULD BE EMPLOYED IN THE DEVELOPMENT OF ANY STORMWATER, SEDIMENT AND EROSION CONTROL PLANS TO MINIMIZE SEDIMENT AND EROSION ASSOCIATED IMPACTS.

FISH PROTECTION

THE IN- WATER WORK AREA SHALL BE ISOLATED WITH A SILT BOOM OR CURTAIN PRIOR TO INITIATING CONSTRUCTION

MATERIALS

- ALL PROPOSED WORKS SHALL BE CONSTRUCTED WITH NEW MATERIAL ONLY. MATERIALS IDENTIFIED FOR DEMOLITION ARE TO BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF IN STRICT ACCORDANCE WITH APPLICABLE STANDARDS AND LAWS.
- MATERIAL USED FOR CONSTRUCTION SHALL BE FREE OF ANY DEFECTS.
- THE CONTRACTOR SHALL REPAIR, AT THEIR COST, ANY DAMAGES AS A RESULT OF CONSTRUCTION THAT IS NOT SPECIFIED FOR REMOVAL. ALL REPAIRS MUST BE COMPLETED TO THE SATISFACTION OF THE DEPARTMENTAL REPRESENTATIVE.
- ALTERNATIVE PRODUCTS MAY BE CONSIDERED AFTER CONTRACT AWARD ONLY. THE CONTRACTOR SHALL SUBMIT A PROPOSAL IN WRITING FOR ALTERNATIVE PRODUCTS AND ALLOW FOR RESPONSE TIME OF 7 CALENDAR DAYS FOR DEPARTMENTAL REPRESENTATIVE'S REVIEW AND APPROVAL.
- MATERIALS AND WORKMANSHIP SHALL BE FREE FROM DEFECTS AND SHALL BE OF HIGHEST QUALITY APPLICABLE TO WORK. ALL MATERIALS SHALL BE NEW AND SHALL COMPLY WITH STANDARDS OF CSA, ASTM AND OTHER STANDARDS SPECIFIED IN THIS SPECIFICATION. DEVIATIONS FROM THESE STANDARDS AND FROM SPECIFIC MATERIALS OR COMPONENTS MENTIONED IN THIS SPECIFICATION WILL NOT BE ACCEPTABLE WITHOUT PRIOR WRITTEN AGREEMENT OF OWNER'S REPRESENTATIVE OR OWNER'S DESIGNATED DELEGATE. VENDOR SHALL INDICATE IN WRITING HOW PROPOSED ALTERNATIVES ARE EQUAL TO OR BETTER THAN THOSE SPECIFIED HEREIN.
- DESIGN, FABRICATION, HEAT TREATMENT, INSPECTION AND CERTIFICATION SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF CSA, ASTM, ASME, AND OTHER SPECIFIED STANDARDS. STANDARD MECHANICAL COMPONENTS AND EQUIPMENT SHALL BE OF NORTH AMERICAN MANUFACTURE UNLESS OTHERWISE SPECIFIED.
- NO PATCHING, PLUGGING, SHIMMING, OR OTHER SUCH MEANS TO OVERCOME DEFECTS, DISCREPANCIES OR ERRORS SHALL BE EMPLOYED WITHOUT PRIOR WRITTEN AGREEMENT OF OWNER'S REPRESENTATIVE OR OWNER'S DESIGNATED DELEGATE. FAILURE TO COMPLY WITH THESE REQUIREMENTS SHALL CONSTITUTE GROUNDS FOR REJECTION OF ITEM IN QUESTION.

- ALL WELDING SHALL COMPLY WITH CSA W59 REQUIREMENTS, EXCEPT AS MODIFIED AS PER THE PROJECT SPECIFICATIONS, AND CARRIED OUT AT SHOP UNLESS OTHERWISE INDICATED ON DRAWINGS. IN GENERAL, ONLY NON-LOAD CARRYING SEAL WELDS WILL BE PERMITTED IN THE FIELD. ANY WELD PERFORMED AT WORKSITE SHALL BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO EXECUTION.
- WELDERS SHALL BE QUALIFIED WORKERS AND WELDING PROCESSES SHALL BE APPROVED BY CANADIAN WELDING BUREAU TO MINIMUM REQUIREMENTS OF CSA W47.1, DIVISION 2.
- NO WELDING OPERATION SHALL BE UNDERTAKEN BEFORE OWNER HAS ACCEPTED ALL WELDING PROCEDURES, WELDING MACHINE OPERATORS, AND WELDERS. PRIOR TO WELDING, VENDOR SHALL SUBMIT THE FOLLOWING INFORMATION RELATING TO WELDING PROCEDURES TO OWNER'S REPRESENTATIVE OR OWNER'S DESIGNATED DELEGATE FOR REVIEW.
- a) DESCRIPTION OF WORK TO BE FABRICATED OR REPAIRED;
- b) TYPE OF WELDING PROCESS PROPOSED;
- c) TYPE AND SIZE OF ELECTRODE TO BE USED;
- d) METHODS TO BE USED FOR EDGE PREPARATION AND PROCEDURES TO BE TAKEN TO CONTROL EFFECTS OF DISTORTION AND SHRINKAGE.
- e) WELDING PROCEDURES CONTRACTOR PROPOSES TO USE, INCLUDING PREHEATING REQUIREMENTS, SEQUENCE OF ASSEMBLING AND WELDING, DETAILS OF STRESS RELIEF METHODS AND IN REPAIR WELDS, METHODS PROPOSED FOR PREPARATION. THESE PROCEDURES SHALL BE APPROVED AND STAMPED BY CANADIAN WELDING BUREAU.
- ALL SHOP AND FIELD WELDING PERFORMED ON WORK SHALL BE SUBJECT TO INSPECTION BY OWNER'S REPRESENTATIVE OR OWNER'S DESIGNATED DELEGATE. ALL WELDMENTS ON WORK SHALL BE IDENTIFIED WITH VENDOR'S AND WELDING OPERATORS' ASSIGNED SYMBOL. FOREGOING REQUIREMENTS SHALL APPLY, WITHOUT EXCEPTION, TO ALL WORK UNDERTAKEN BY SUB-VENDOR.
- ALL WELDING ELECTRODES SHALL COMPLY WITH REQUIREMENTS SET FORTH IN CSA W48.1.
- LOW HYDROGEN CONTENT ELECTRODES SHALL BE USED. DAMP ELECTRODES SHALL BE REJECTED.
- WELDED PLATES SHALL BE CUT CAREFULLY TO EXACT DIMENSION. DIMENSIONS AND EDGE PROFILES SHALL PROMOTE DEEP FUSION AND FULL PENETRATION.
- ALL WELDS IN PARTS EXPOSED TO ATMOSPHERE OR SUBJECT TO GALVANIZING SHALL BE CONTINUOUS.
- NO WELDING SHALL BE EXECUTED WHEN TEMPERATURE OF PARENT METAL IS LOWER THAN 10 °C IN WHICH CASE ALL SURFACES WITHIN A 3" (75 MM) RADIUS OF WELD SHALL BE PREHEATED AS RECOMMENDED IN CSA W59 AND MAINTAINED AT THAT TEMPERATURE THROUGHOUT WELDING PROCEDURE. MEASURE THE TEMPERATURE WITH TEMPILSTIK OR OTHER TEMPERATURE INDICATOR STICKS. WELD HAMMERING IS NOT AUTHORIZED.
- BOTH SIDES OF BUTT-WELD JOINTS SHALL BE SCOURED OVER 2" (50 MM) TO ELIMINATE RUST, GREASE AND BURRS.
- TACK WELDS, WHICH ARE NOT INCORPORATED IN FINAL WELD, WILL NOT BE PERMITTED. TACK WELDS INCORPORATED INTO FINAL WELD SHALL BE MADE WITH ELECTRODES MEETING REQUIREMENTS OF FINAL WELDS AND SHALL BE CLEANED THOROUGHLY. TEMPORARY WELDS REQUIRED FOR ASSEMBLY PURPOSES SHALL BE IN ACCORDANCE WITH SECTION 5.4.8 OF CSA
- WELDING SEQUENCE SHALL BE PLANNED TO CONTROL AND MINIMIZE DISTORTION. STRESS-RELIEVING SHALL BE DONE IN ACCORDANCE WITH REQUIREMENTS OF CSA W59.
- WELDED COMPONENTS SUBJECT TO VIBRATION AND STRESS REVERSALS SHALL BE FABRICATED WITH FULL PENETRATION WELDS.
- MAXIMUM SIZE FILLET WELDS, WHICH MAY BE MADE IN ONE PASS, SHALL BE:
- a) 3/8" (10 MM) IN FLAT POSITION;
- b) 5/16" (8 MM) IN HORIZONTAL OR OVERHEAD POSITION;
- c) ½" (12 MM) IN VERTICAL POSITION.
- 16. PREHEAT AND INTER-PASS TEMPERATURES SHALL NOT BE LESS THAN THOSE LISTED IN TABLE 5.3, CSA STANDARD W59 FOR TYPE OF ELECTRODE USED FOR BASE METAL BEING WELDED.
- WHERE FIELD WELDING IS PERMITTED BY OWNER'S REPRESENTATIVE OR OWNER'S DESIGNATED DELEGATE, GROUND CLAMP SHALL BE ATTACHED TO WORK PIECE AND SHALL BE LOCATED NEAR WELD LOCATION TO PREVENT TRANSFER OF ELECTRIC CURRENT THROUGH ASSOCIATED ELECTRICAL COMPONENTS OR STEELWORK.
- WELDED CONSTRUCTION ELEMENTS SUCH AS GATE GUIDES AND SILLS WITH SURFACES MACHINED FOR PRECISE ALIGNMENT SHALL UNDERGO THERMAL OR VIBRATION STRESS RELIEF TREATMENT BEFORE MACHINING. STRESS RELIEVING METHOD SHALL BE INDICATED IN PROCESS DESCRIPTION OR ON DRAWINGS SUBMITTED TO OWNER FOR REVIEW AND APPROVAL.

- REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO CSA G30.12M. FY=400MPA (GRADE400)
- ANCHOR BARS SHALL BE 20M DOWELS EMBEDDED A MINIMUM 200mm. SET DOWELS AND FILL HOLES WITH SHRINKAGE COMPENSATING GROUT

- THE TREMIE PIPE SHALL CONSIST OF A TUBE, HAVING A DIAMETER OF NOT LESS THAN 250 MM, CONSTRUCTED WITH SECTIONS HAVING FLANGE COUPLINGS FITTED WITH GASKETS. THE DISCHARGE END SHALL HAVE A PROPER SEAL SO THAT WATER WILL NOT ENTER THE TUBE AT ANY TIME. TREMIE CONCRETE MAY ALSO BE DEPOSITED BY MEANS OF A BOTTOM DUMP TREMIE BUCKET EQUIPPED WITH A CLOSING TOP. THE TREMIE BUCKET SHALL BE OF A TYPE APPROVED BY THE ENGINEER.
- THE DISCHARGE ENDS ON BOTH THE TREMIE PIPE AND THE TREMIE BUCKET SHALL BE FABRICATED TO ALLOW FOR THE FULL OPENING OF THE DISCHARGE ENDS OF THE PIPE OR BUCKET, BY SLIGHTLY RAISING THE PIPE OR BUCKET.
- 3. SET DOWELS AND FILL HOLES WITH SHRINKAGE COMPENSATING GROUT CONSTRUCTION METHODS
- TREMIE CONCRETE SHALL ATTAIN A MINIMUM STRENGTH OF 28.0 MPA AT 28 DAYS. USING A SLUMP OF 150 TO 200 MM. SUFFICIENT ADDITIONAL CEMENT SHALL BE ADDED TO THE MIX IN ORDER TO COMPENSATE FOR THE DILUTION DUE TO THE DEPOSITING OF CONCRETE IN WATER.
- **DEPOSITING TREMIE CONCRETE**
- PERFORM ALL CAST-IN-PLACE CONCRETE WORK IN ACCORDANCE WITH CAN/CSA-A23.1-04.
- FORMWORK AND FALSEWORK TO CLAUSE 6.5 OF CAN/CSA-A23.1-04 AND CSA S269.1 1975 (R2003) AND CAN/CSA S269.3 M92 (R2003).
 - CONSTRUCTION TOLERANCES FOR CAST-IN-PLACE CONCRETE TO CAN/CSA-A23.1-04.
- FABRICATION AND PLACEMENT OF REINFORCEMENT TO CLAUSE 6 OF CAN/CSA-A23.1-04.
- TO PREVENT SEGREGATION, CONCRETE DEPOSITED UNDER WATER SHALL BE CAREFULLY DEPOSITED IN A COMPACT MASS IN ITS FINAL POSITION BY MEANS OF A TREMIE PIPE, OR OTHER APPROVED METHOD, AND SHALL NOT BE DISTURBED AFTER BEING DEPOSITED. STILL WATER SHALL BE MAINTAINED AT THE POINT OF DEPOSIT, THE WATER LEVEL SHALL BE REGULATED SO THAT THERE SHALL BE NO FLUCTUATION OF WATER HEAD THAT MAY BE INJURIOUS TO THE CONCRETE.
- CONCRETE DEPOSITING UNDER WATER SHALL BE CARRIED OUT CONTINUOUSLY FROM START TO FINISH. THE SURFACE OF THE CONCRETE SHALL BE KEPT AS HORIZONTAL AS IS PRACTICABLE AT ALL TIMES, TO ENSURE THOROUGH BONDING, EACH SUCCEEDING LAYER OF CONCRETE SHALL BE DEPOSITED BEFORE THE PRECEDING LAYER HAS TAKEN ITS INITIAL SET.
- IN THE EVENT OF LONG DELAYS IN THE POUR DURING WHICH THE ALREADY DEPOSITED TREMIE HAS STARTED TO SET. THE CONTRACTOR SHALL REMOVE THE LAITANCE, DRILL HOLES AND SUPPLY AND GROUT DOWELS IN THE ALREADY DEPOSITED PORTION BEFORE RESUMING THE TREMIE POUR: OR THE CONTRACTOR MAY BE REQUIRED TO REMOVE THE CONCRETE ALREADY DEPOSITED AND
- THE MINIMUM RATE OF DEPOSITING UNDERWATER CONCRETE SHALL BE 15 M3/H. CONTINUOUS SOUNDINGS SHALL BE TAKEN DURING THE CONCRETE POUR AND ALL IRREGULARITIES IN THE CONCRETE PROFILE SHALL BE CORRECTED. IF A TREMIE PIPE IS USED FOR DEPOSITING, IT SHALL BE SUPPORTED SO AS TO PERMIT:
- FREE MOVEMENT OF THE DISCHARGE END OVER THE ENTIRE TOP SURFACE OF THE WORK, AND
- RAPID LOWERING WHEN NECESSARY TO RETARD OR STOP THE FLOW OF CONCRETE.
- THE DISCHARGE END SHALL BE CLOSED AT THE START OF THE WORK IN ORDER TO PREVENT WATER FROM ENTERING THE TUBE AND IT SHALL BE SEALED AT ALL TIMES WHEN NOT IN THE DEPOSITED CONCRETE. THE TREMIE TUBE SHALL BE KEPT FULL UP TO THE BOTTOM OF THE HOPPER. WHEN A BATCH IS DUMPED INTO THE HOPPER, THE FLOW OF CONCRETE SHALL BE INDUCED BY SLIGHTLY RAISING THE DISCHARGE END, ALWAYS KEEPING IT IN THE DEPOSITED CONCRETE.
- 12. IF A BOTTOM DUMP TREMIE BUCKET IS USED FOR DEPOSITING THE CONCRETE THE BUCKET SHALL ALWAYS BE IN THE DEPOSITED CONCRETE BEFORE THE BOTTOM IS OPENED.
- THE CONTRACTOR SHALL DEPOSIT TREMIE CONCRETE TO SUCH ELEVATIONS THAT AFTER ALL UNSOUND CONCRETE HAS BEEN REMOVED FROM THE SURFACE, THE FINISHED ELEVATIONS SHALL BE THOSE WHICH ARE SHOWN ON THE PLANS.

COLD WEATHER PRECAUTIONS

- DURING FREEZING WEATHER, THE CONTRACTOR SHALL MAKE PROVISIONS FOR HEATING THE AGGREGATES AND THE WATER TO BE USED IN THE CONCRETE. THE DEPOSITED CONCRETE SHALL BE PROTECTED AGAINST FREEZING FOR A PERIOD OF AT LEAST 7 DAYS STARTING FROM THE TIME OF COMPLETION OF THE DEPOSITING OF CONCRETE. CONCRETE MATERIALS AND DEPOSITED CONCRETE SHALL BE HEATED ONLY ON THE WRITTEN ORDER OF THE ENGINEER AND THE CONTRACTOR WILL BE PAID FOR THE ACTUAL QUANTITY OF CONCRETE AGREED TO BE HEATED ON SUCH A
- AGGREGATES SHALL BE HEATED TO A TEMPERATURE OF NOT LESS THAN 20°C AND NOT MORE THAN 65°C. THE WATER FOR THE CONCRETE SHALL BE HEATED TO A TEMPERATURE OF BETWEEN 55°C AND 65° C. THE TEMPERATURE OF THE MIXED CONCRETE SHALL NOT BE LESS THAN 15° C AND NOT MORE THAN 25° C AT THE TIME OF PLACING.

REMOVAL OF FORMWORK

THE CONTRACTOR SHALL OBTAIN THE INSPECTOR'S APPROVAL BEFORE REMOVING ANY FORMWORK. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF CLAUSE 11.3.5 OF CSA A23.1-09/A23.2-09 (R2014). FORMS SHALL NOT BE DISTURBED UNTIL THE CONCRETE HAS ATTAINED ADEQUATE STRENGTH TO SUPPORT ITS OWN WEIGHT AND ANY SUPERIMPOSED LOADING APPLIED TO IT.

PAINTING

REFERENCE TO SPECIFICATIONS FOR PAINTING NOTES



Government Gouvernement of Canada

Parks Canada



du Canada

Parcs Canada Unité de gestion du Nord de l'Ontario

KEY PLAN:



18/12/20 ISSUED FOR TENDER 1.CARBONE D.SPACEK 30/11/20 ISSUED FOR CLIENT REVIEW M.CARBONE D.SPACEK 16/11/20 ISSUED FOR CLIENT REVIEW 1.CARBONE D.SPACEK 03/11/20 ISSUED FOR CLIENT REVIEW I.CARBONE D.SPACEK Drawn by Date Description eS.S.irie pa Approuvé

Revision / Revision

Detail number

A Numéro de detail B Numéro de la feuille

D. M. SPACEK

Dimensions linéaires Linear dimensions en millimétres in millimetres



BULKHEAD INSTALLATION

SAULT STE. MARIE CANAL

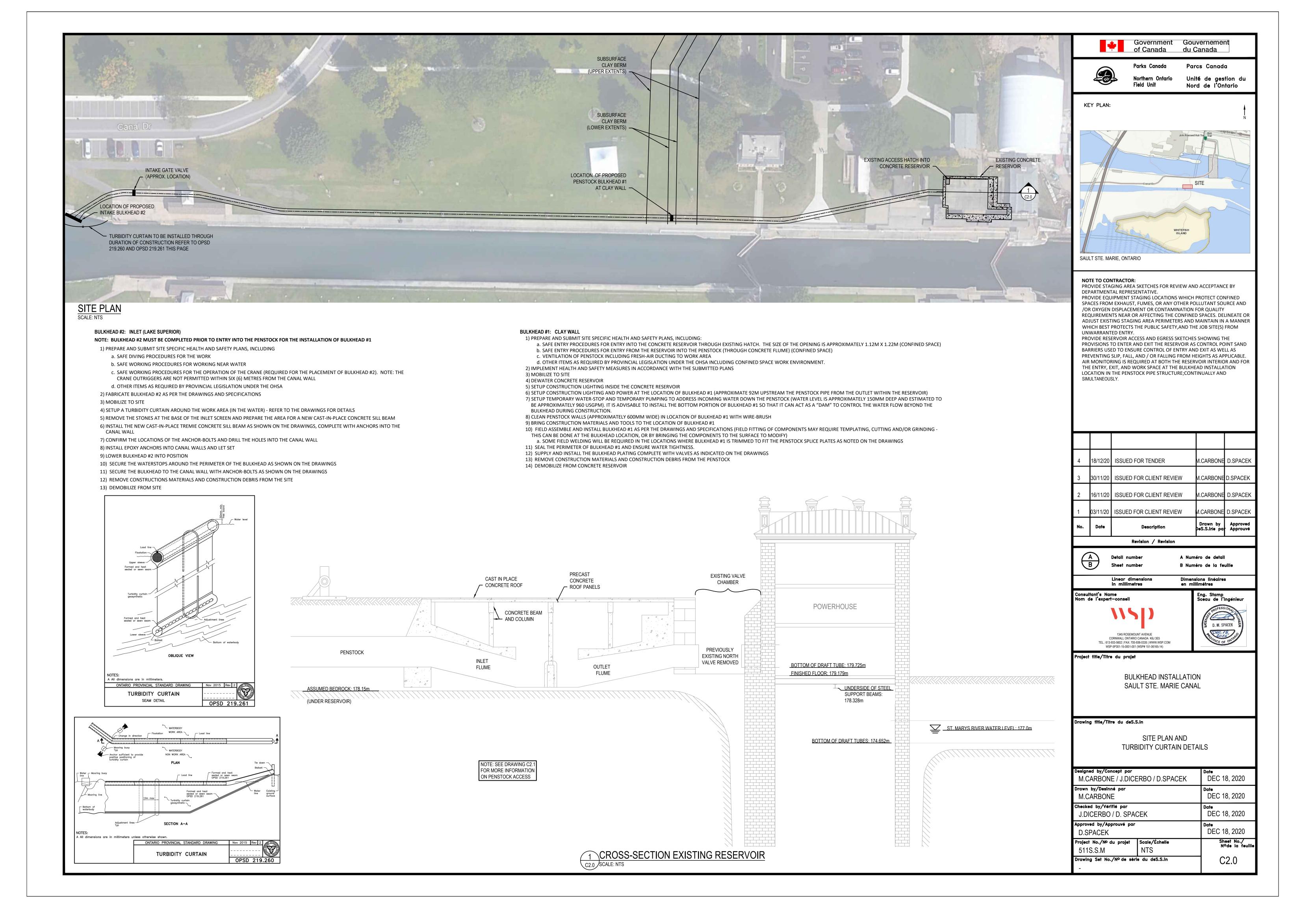
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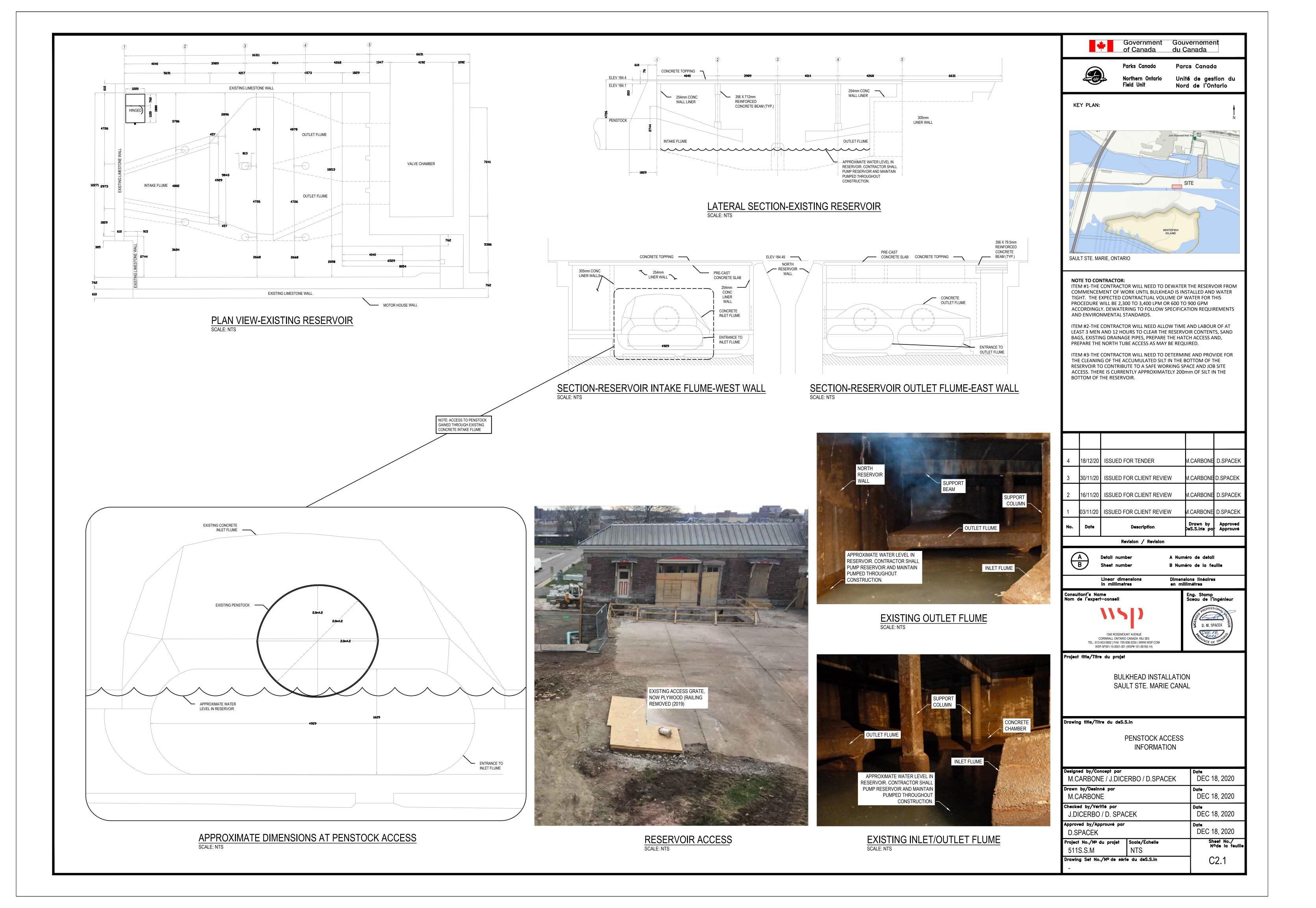
TEL.: 613-933-5602 | FAX: 705-936-0335 | WWW.WSP.COM

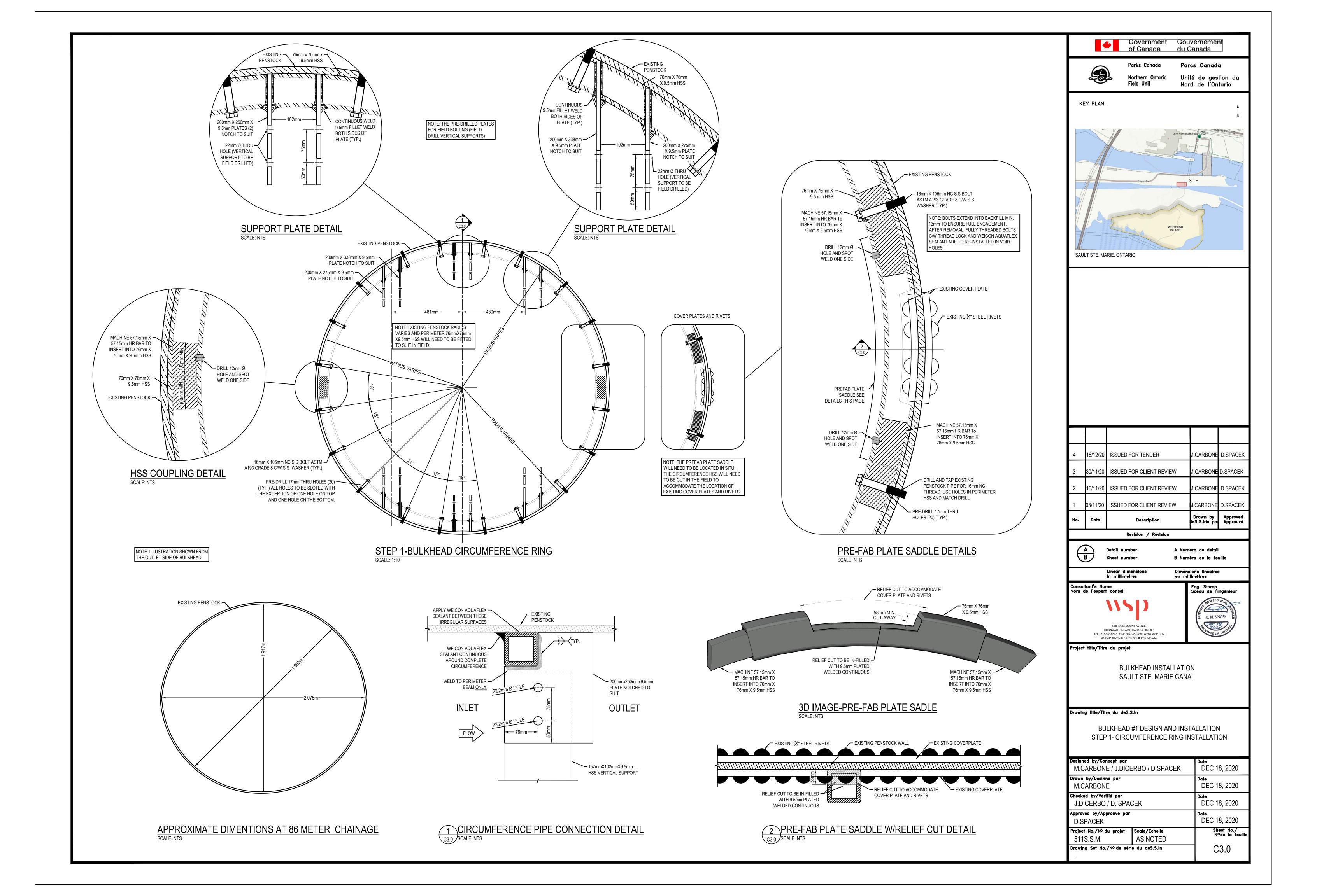
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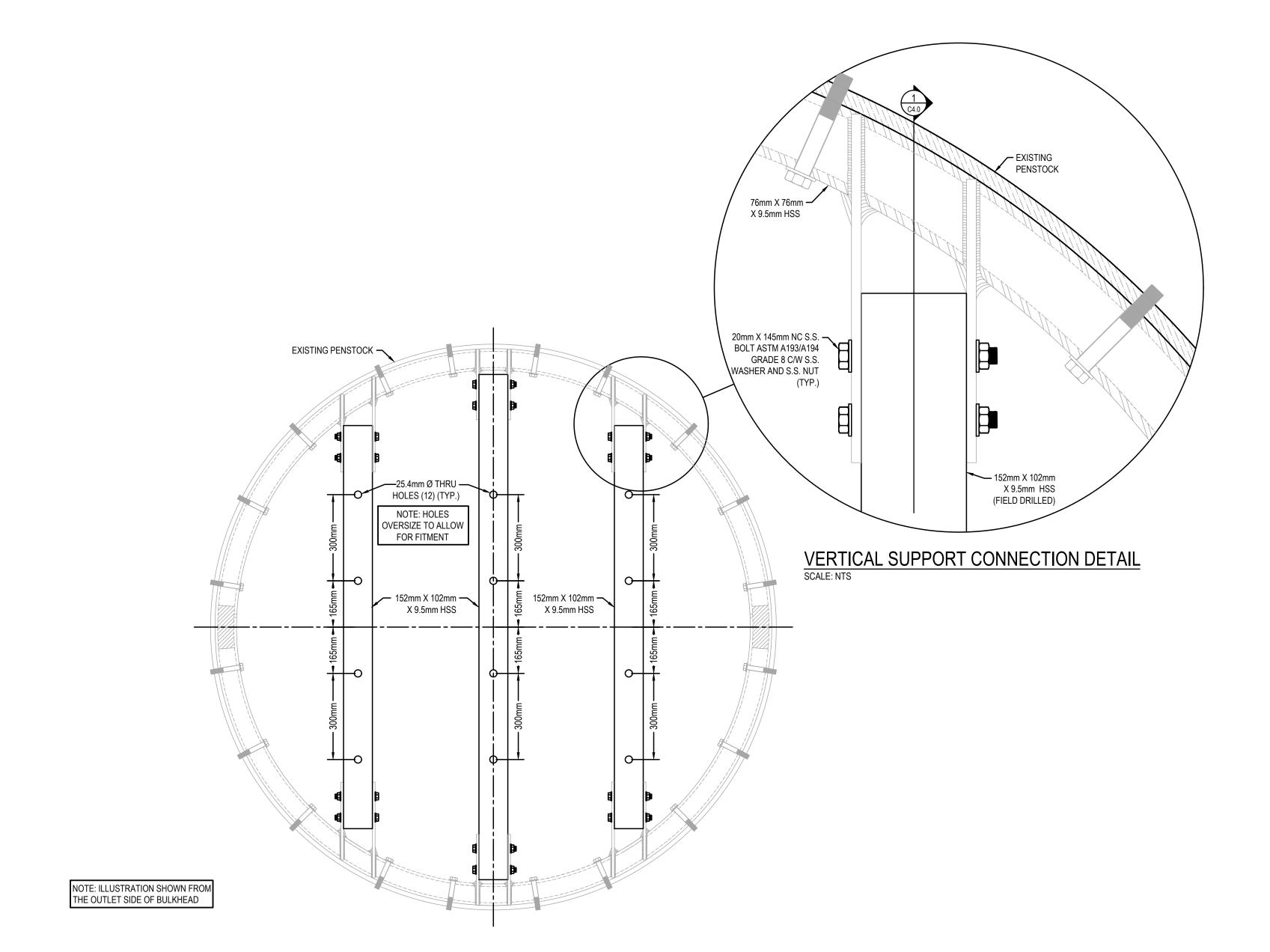
GENERAL NOTES

esigned by/Concept par M.CARBONE / J.DICERBO / D.SPACEK DEC 18, 2020 Drawn by/Desinné par DEC 18, 2020 M.CARBONE hecked by/Vérifié par DEC 18, 2020 J.DICERBO / D. SPACEK pproved by/Approuvé par DEC 18, 2020 D.SPACEK Project No./Nº du projet Scale/Échelle 511S.S.M rawing Set No./Nº de série du deS.S.in

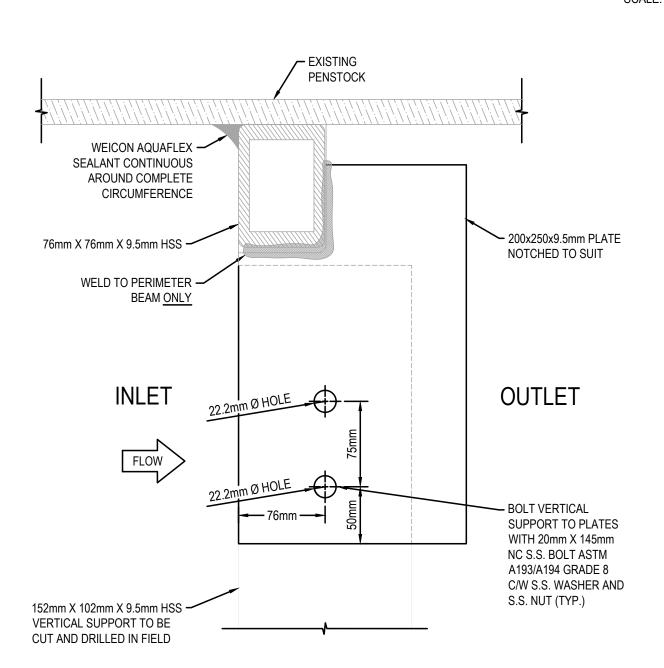




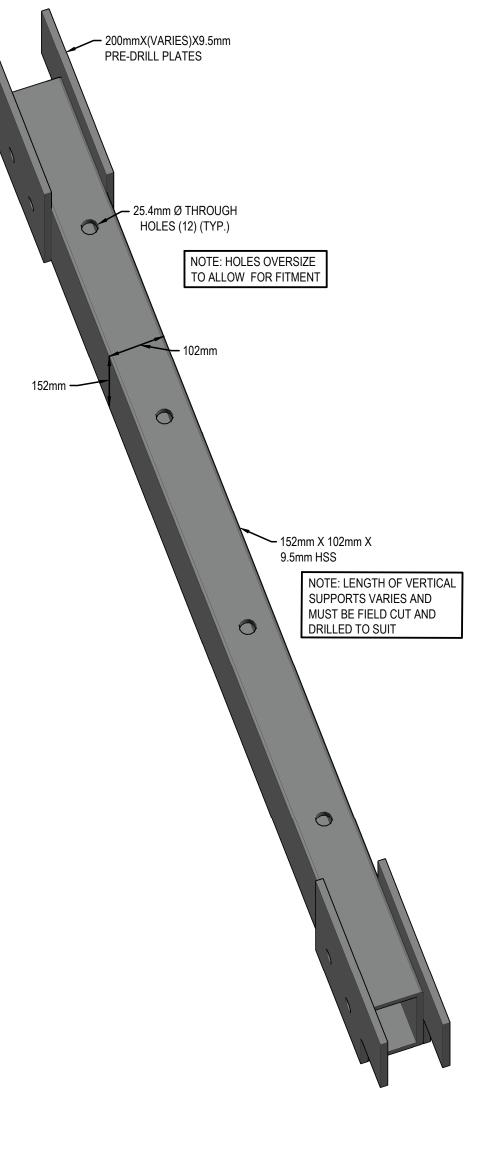




STEP 2-VERTICAL SUPPORT INSTALLATION SCALE: 1:10



1 VERTICAL SUPPORT PLATE CONNECTION DETAILS
C4.0 SCALE: NTS



3D IMAGE-VERTICAL SUPPORT SCALE: NTS



Government Gouvernement of Canada du Canada



Parks Canada Field Unit

Parcs Canada Unité de gestion du Nord de l'Ontario

KEY PLAN:



OAOLI	OIL.	wi/\i\\∟,	OIVI

No.	Date	Description	Drawn by DeS.S.irie pa	Approved Approuvé
1	03/11/20	ISSUED FOR CLIENT REVIEW	И.CARBONE	D.SPACEK
2	16/11/20	ISSUED FOR CLIENT REVIEW	M.CARBONE	D.SPACEK
3	30/11/20	ISSUED FOR CLIENT REVIEW	M.CARBONE	D.SPACEK
4	18/12/20	ISSUED FOR TENDER	M.CARBONE	D.SPACEK

Revision / Revision



A Numéro de detail B Numéro de la feuille

Linear dimensions in millimetres Dimensions linéaires en millimétres

Consultant's Name Nom de l'expert—conseil

Eng. Stamp Sceau de l'ingénieur D. M. SPACEK

1345 ROSEMOUNT AVENUE CORNWALL ONTARIO CANADA K6J 3E5 TEL:: 613-933-5602 | FAX: 705-936-0335 | WWW.WSP.COM WSP-5P301-15-0001-001 (WSP# 151-06165-14)

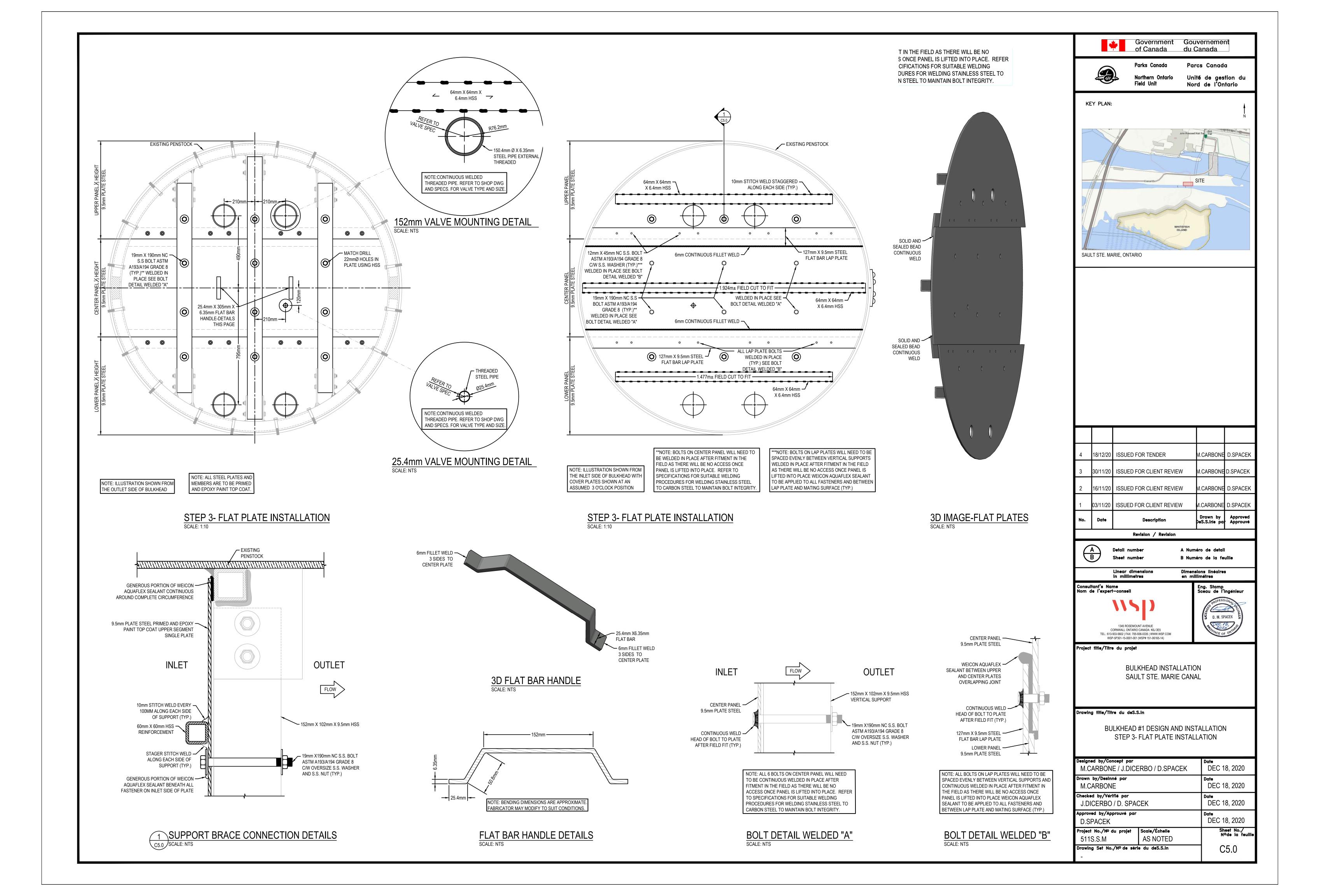
Project title/Titre du projet

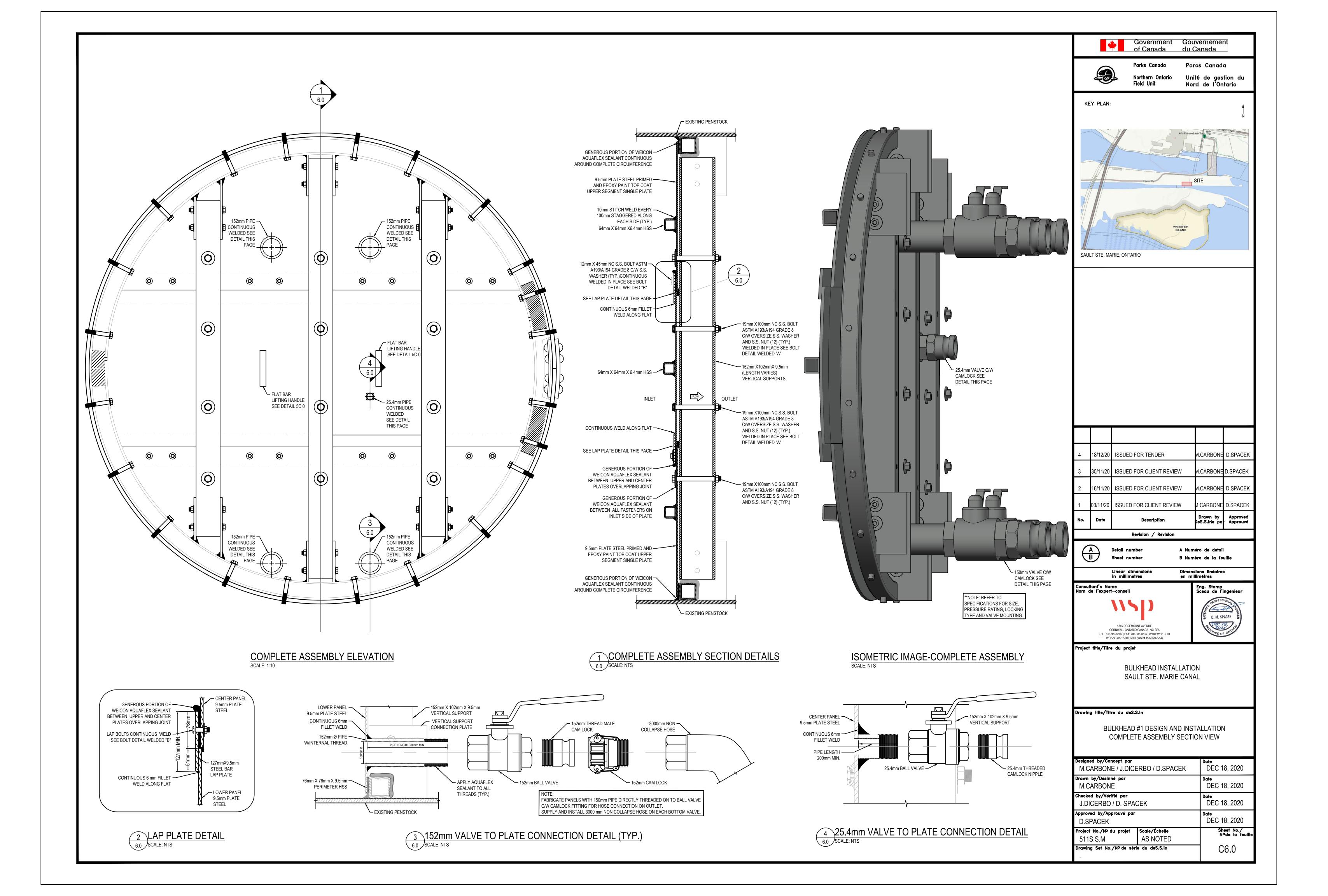
BULKHEAD INSTALLATION SAULT STE. MARIE CANAL

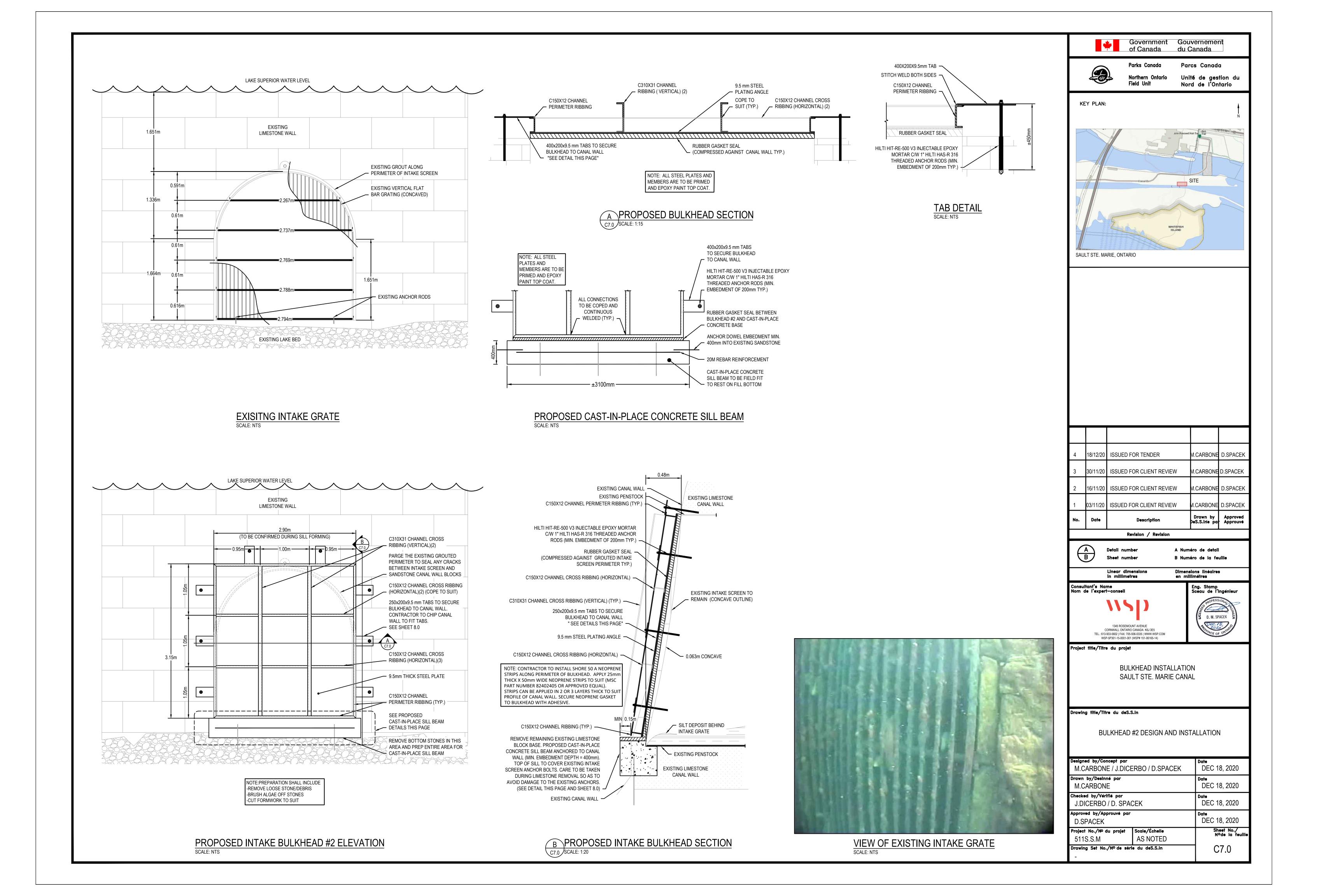
Drawing title/Titre du deS.S.in

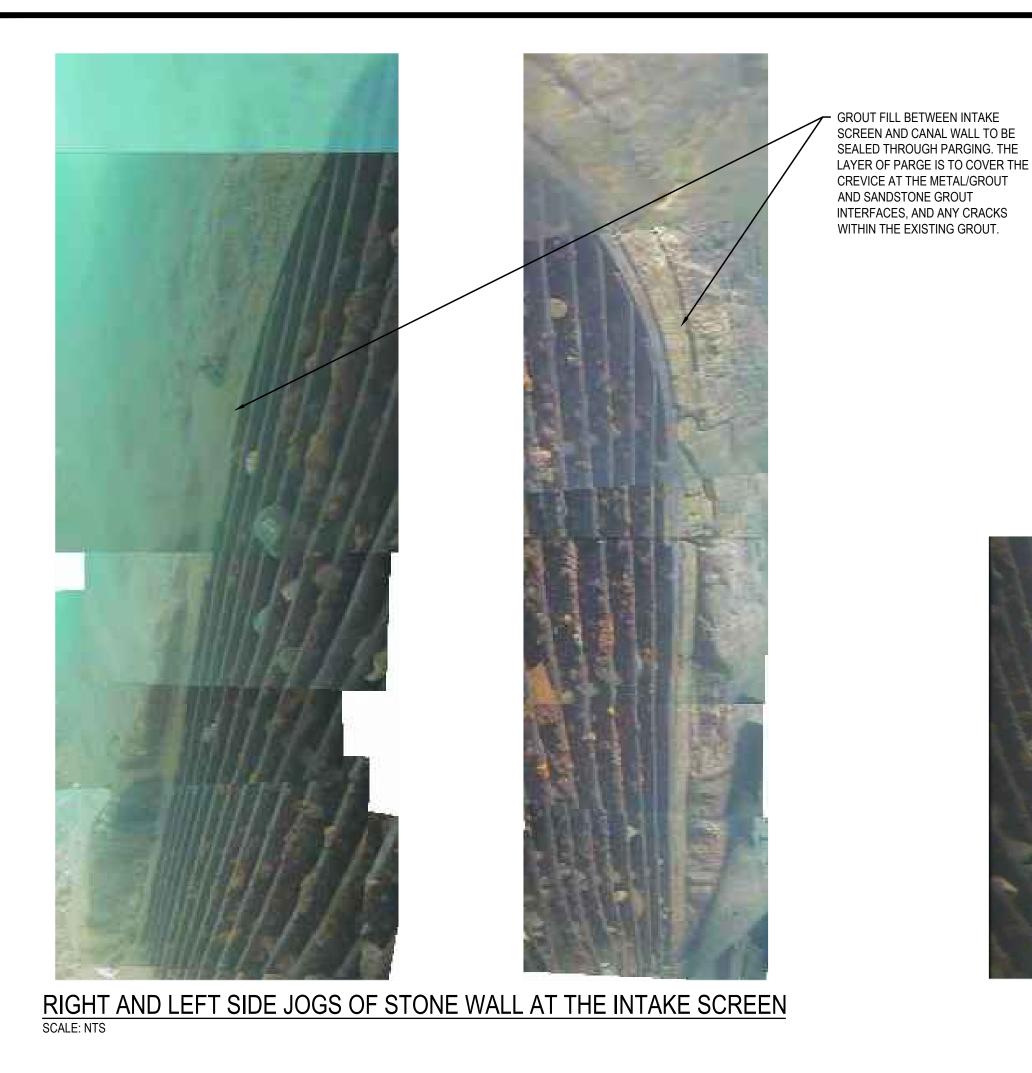
BULKHEAD #1 DESIGN AND INSTALLATION STEP 2- SUPPORT BRACE INSTALLATION

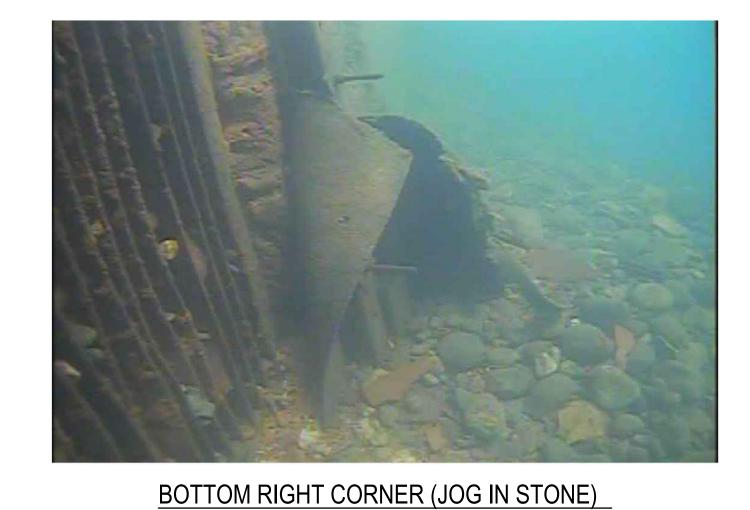
Designed by/Concept par M.CARBONE / J.DIC	ERBO / D.SPACEK	Date DEC 18, 2020
Drawn by/Desinné par M.CARBONE		Date DEC 18, 2020
Checked by/Vérifié par J.DICERBO/D.SPA	CEK	Date DEC 18, 2020
Approved by/Approuvé par D.SPACEK		Date DEC 18, 2020
** ** **	Scale/Échelle AS NOTED	1











VIEW OF EXISTING INTAKE GRATE







CONCAVE DEFLECTION OF INTAKE SCREEN
SCALE: NTS



EXPOSED BOTTOM ANCHOR (RIGHT SIDE)
SCALE: NTS





GROUT FILL BETWEEN SCREEN AND STONE (TO BE PARGED)
SCALE: NTS

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4	18/12/20	ISSUED FOR TENDER	M.CARBONE	D.SPACEK

Government Gouvernement of Canada du Canada

KEY PLAN:

SAULT STE. MARIE, ONTARIO

Parcs Canada

Unité de gestion du Nord de l'Ontario

Revision / Revision

B Numéro de la feuille

Eng. Stamp Sceau de l'ingénieur

D. M. SPACEK

Dimensions linéaires en millimétres



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Project title/Titre du projet

BULKHEAD INSTALLATION SAULT STE. MARIE CANAL

Drawing title/Titre du deS.S.in

BULKHEAD #2 REFERENCE PHOTOS

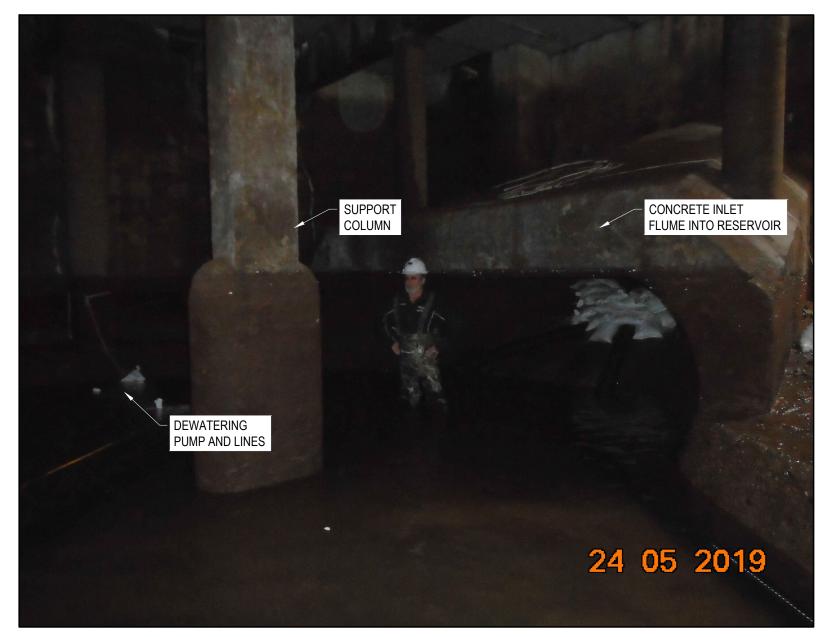
Designed by/Concept par M.CARBONE / J.DICE	ERBO / D.SPACEK	DEC 18, 2020
Drawn by/Desinné par M.CARBONE		DEC 18, 2020
Checked by/Vérifié par J.DICERBO/D.SPAC	CEK	DEC 18, 2020
Approved by/Approuvé par D.SPACEK		Date DEC 18, 2020
Project No./No du projet 511S.S.M	Scale/Échelle NTS	Sheet No./ N ^o de la feuille
Drawing Set No./Nº de série du deS.S.in -		C8.0



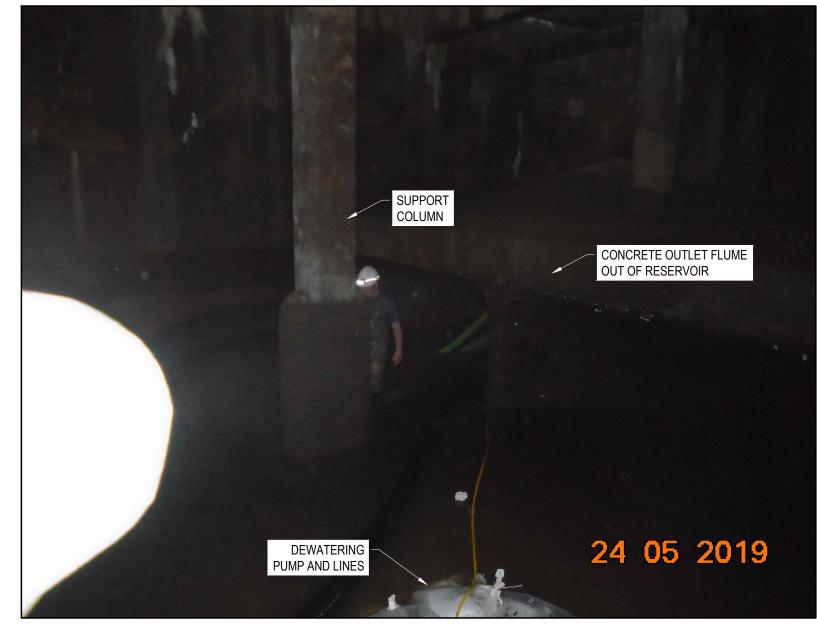
RESERVOIR ACCESS HATCH

RIVETED PLATE

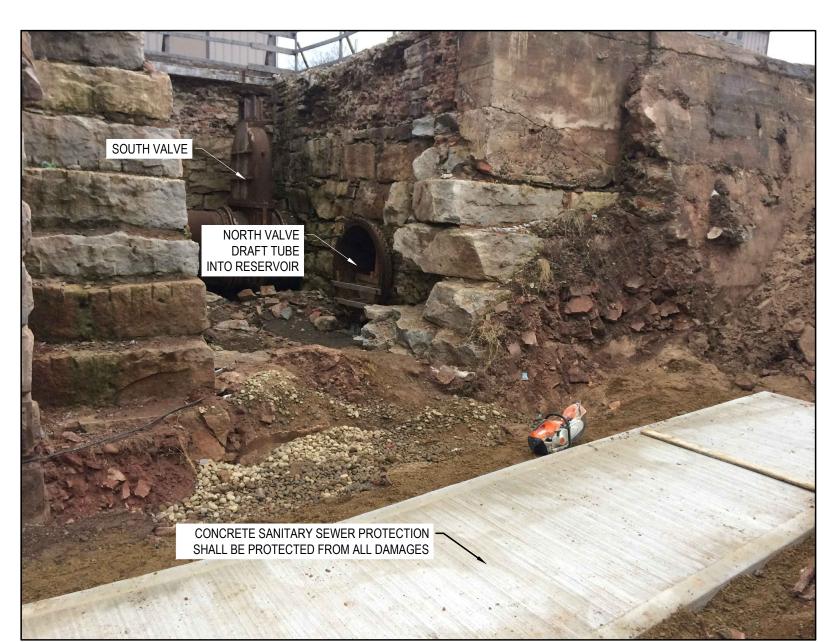
SEDIMENT ACCUMULATION



PENSTOCK INLET FROM WITHIN RESERVOIR
SCALE: NTS



RESERVOIR OUTLET FROM WITHIN RESERVOIR
SCALE: NTS



CURRENT PENSTOCK PIPE CONDITIONS
SCALE: NTS VALVE CHAMBER WITH SOUTH VALVE SCALE: NTS

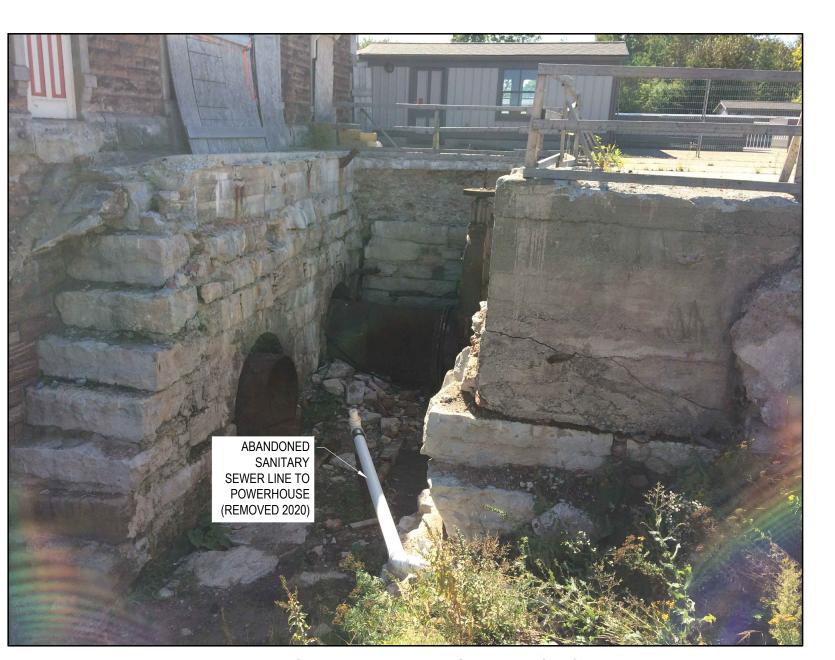


CURRENT CONDITIONS AT VALVE CHAMBER
SCALE: NTS



CONSTANT FLOW OF WATER

NEW STORM SEWER MANHOLE 2019



VALVE CHAMBER AT POWERHOUSE
SCALE: NTS



ACCESS TO RESERVOIR AND PENSTOCK SCALE: NTS



Government Gouvernement of Canada du Canada



Parcs Canada



Unité de gestion du Nord de l'Ontario

KEY PLAN:



18/12/20 ISSUED FOR TENDER 3 30/11/20 ISSUED FOR CLIENT REVIEW M.CARBONE D.SPACEK 2 16/11/20 ISSUED FOR CLIENT REVIEW M.CARBONE D.SPACEK 03/11/20 ISSUED FOR CLIENT REVIEW M.CARBONE D.SPACEK Date

Revision / Revision



A Numéro de detail B Numéro de la feuille

Eng. Stamp Sceau de l'ingénieur

Linear dimensions in millimetres Dimensions linéaires en millimétres

Consultant's Name Nom de l'expert—conseil



D. M. SPACEK PEC. 18, 2020 REPONINCE OF ONITH

Project title/Titre du projet

BULKHEAD INSTALLATION SAULT STE. MARIE CANAL

Drawing title/Titre du deS.S.in

REFERENCE PHOTOS

Designed by/Concept par M.CARBONE / J.DICE	ERBO / D.SPACEK	DEC 18, 2020
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