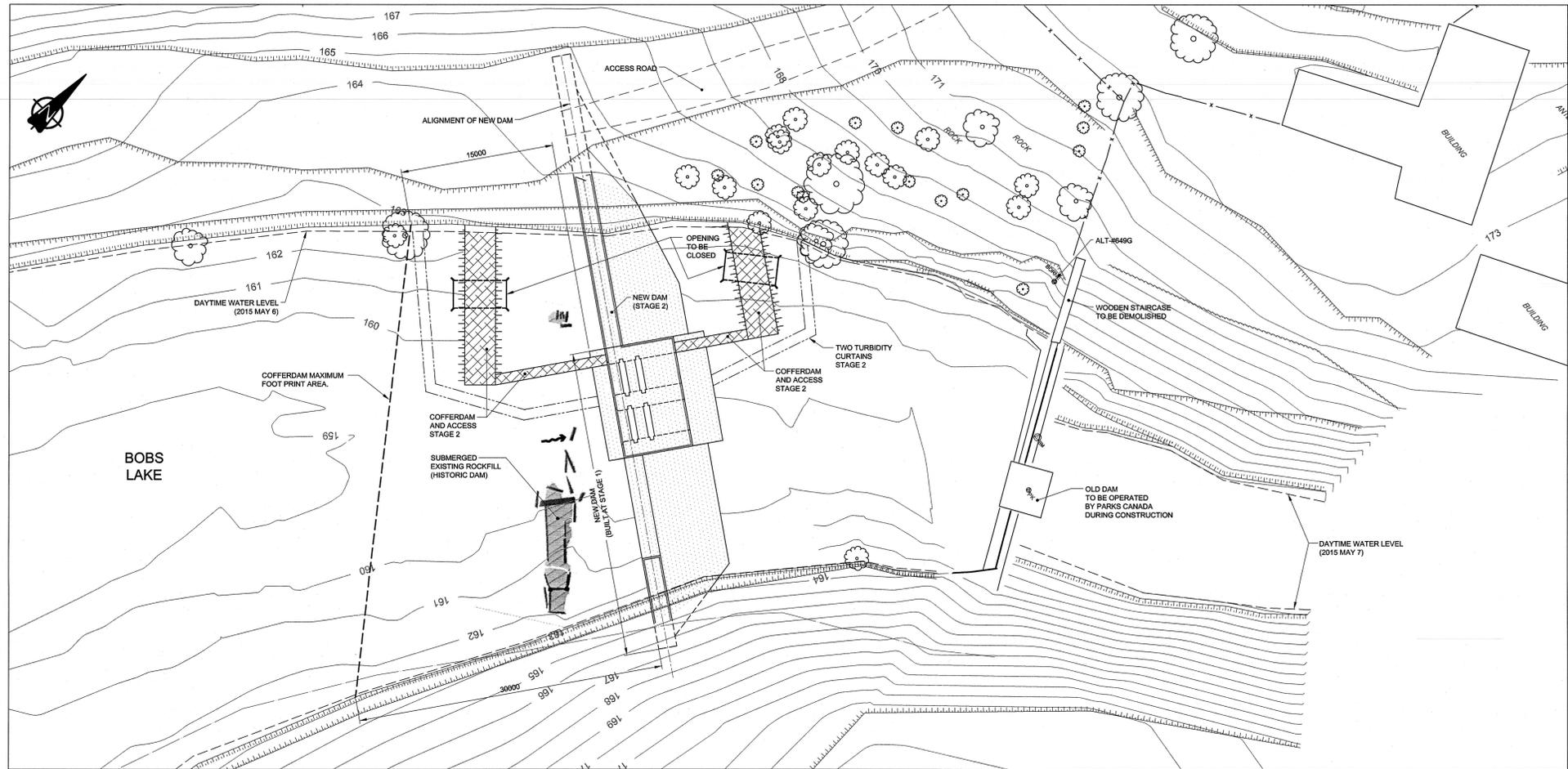


COFFERDAM STAGE 1
1:200



COFFERDAM STAGE 2
1:200

GENERAL SPECIFICATIONS:

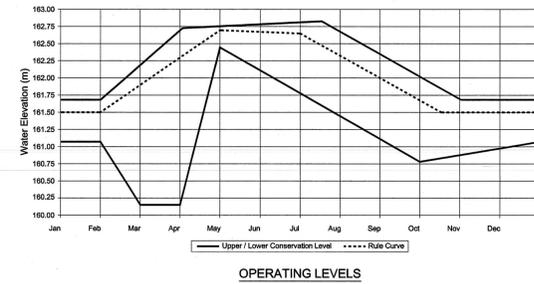
1. COFFERDAM, DIVERSIONS AND DEWATERING ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. DESIGN MUST BE PREPARED BY A P. ENG. CERTIFIED IN ONTARIO QUALIFIED FOR THIS TYPE OF WORK. INSTALLATION MUST BE CERTIFIED BY A P. ENG. PRIOR TO COMMENCING WORKS IN THE DRIED UP AREA.
2. COFFERDAM MUST COMPLY WITH PCA ENVIRONMENTAL STANDARDS AND GUIDELINES (ESG).
3. THE PLACEMENT OF LOOSE OR UNCONFINED ROCKFILL, EARTH OR GRANULAR MATERIAL IS NOT ACCEPTABLE FOR COFFERDAM CONSTRUCTION.
4. SEE SPECIFICATIONS FOR ALLOWED COFFERDAM TYPES.
5. THE CONTRACTOR IS RESPONSIBLE TO KEEP THE WORK AREA DE-WATERED. PERMITTING LEAKING WILL NOT BE ALLOWED.
6. DEWATERED AREA INFILTRATION PUMPING MUST BE PUMPED IN A SEDIMENTATION BASIN AT LEAST 5 m FROM THE RIVER, OR OTHER METHODS APPROVED BY THE DEPARTMENTAL REPRESENTATIVE. ISOLATE CLEAN WATER AREA INSIDE DEWATERED ZONE TO MINIMIZE USE OF TURBIDITY TREATMENT.
7. AT THE DISCHARGE POINTS OF PUMPING INTO ANY WATERBODY, A MAXIMUM INCREASE OF SUSPENDED SEDIMENT CONCENTRATION SHALL NOT BE MORE THAN 8 NTU (25 mg/l) OVER BACKGROUND LEVELS DURING ANY SHORT TERM EXPOSURE PERIOD (I.E. LESS THAN 24 HOURS). FOR LONGER TERM OPERATIONS (I.E. MORE THAN 30 DAYS), AVERAGE SUSPENDED SEDIMENT CONCENTRATIONS SHALL NOT BE INCREASED BY MORE THAN 2 NTU (5 mg/l) OVER BACKGROUND LEVELS. SHOULD THERE BE EXCEEDENCE, THE DEPARTMENTAL REPRESENTATIVE MAY ANALYZE SUSPENDED SOLIDS (SS) CONCENTRATION WITH LAB SAMPLES (LIMITS ARE 25 mg/l FOR SHORT TERM EXPOSURE AND 5 mg/l FOR LONG TERM EXPOSURE).
8. CORRECTIVE MEASURES SHOULD BE IMPLEMENTED IF DOWNSTREAM WATER pH HAS CHANGED MORE THAN 1.0 pH UNIT, MEASURED TO AN ACCURACY OF ±0.2 pH UNITS FROM THE BACKGROUND LEVEL, OR IS BELOW 6.5 OR ABOVE 9.0 pH UNITS.
9. ALL SEDIMENTATION WORKS MUST BE REMOVED AT THE END OF WORKS AND THE SITE RETURNED TO ITS NATURAL STATE.
10. DIFFICULT SOIL/SEDIMENT CONDITIONS ARE EXPECTED ON SITE (INCLUDING, BUT NOT LIMITED TO, LOOSE SEDIMENTS, RIP RAP, BOULDERS, WOOD BEAMS AND BRANCHES, ETC.) AS WELL AS DIFFICULT BEDROCK CONDITIONS (INCLUDING, BUT NOT LIMITED TO, FRACTURED ROCK, HIGH PERMEABILITY, ETC.). SEE GEOTECHNICAL AND GEOPHYSICAL REPORTS IN THE APPENDIX OF THE SPECS FOR FURTHER DETAILS.

HYDROTECHNICAL SPECIFICATIONS:

- COFFERDAM CREST IS TO BE AT A MINIMUM OF 163.4 m.
- DIVERSION OPENING TO BE A MINIMUM OF 18 m².
- WATER LEVELS TO BE BALANCED UPSTREAM AND DOWNSTREAM OF CONSTRUCTION ZONE.
- LAKE OPERATION TO BE CONDUCTED AT BOBS LAKE EXISTING STRUCTURE.
- LAKE OPERATION CAPACITIES TO BE MAINTAINED DURING THE DURATION OF THE WORKS.
- DESIGN FLOWS ARE AS FOLLOWS:
 - ECOLOGICAL FLOW AT ALL TIME: 1.5m³/s UP TO 2.5m³/s
 - 2 YEAR RETURN: 23.1 m³/s
 - 5 YEAR RETURN: 29.8 m³/s
 - 10 YEAR RETURN: 33.1 m³/s
 - 20 YEAR RETURN: 36.8 m³/s

ENVIRONMENTAL SPECIFICATIONS:

- REFER TO PARKS CANADA ENVIRONMENTAL STANDARDS AND GUIDELINES AND TO SPECIFICATIONS FOR ENVIRONMENTAL REQUIREMENTS AND MITIGATIONS.
- A MINIMUM OF TWO TURBIDITY CURTAINS TO OPSD 219.26 REQUIRED BOTH UPSTREAM AND DOWNSTREAM OF COFFER DAMS AS ILLUSTRATED. TURBIDITY CURTAINS TO BE IN PLACE PRIOR TO COFFER DAM INSTALLATION.
- PROTECT AND REMOVE ALL FISH STRANDED WITHIN COFFER DAM AREA PRIOR TO COFFER DAM INSTALLATION.
- WATER THAT SEEPS INTO WORK AREA TO BE PUMPED TO SETTLING POND/BASIN SYSTEM PRIOR TO RELEASE TO WATER COURSE.
- ALL WORK AND STAGING AREAS TO BE ENCLOSED AND PROTECTED BY OPSD 219.130 HEAVY DUTY SILT FENCE AS A MINIMUM FENCE MEASURE.
- ENVIRONMENTAL MITIGATIONS AND MEASURES INCLUDING THE ENVIRONMENTAL PROTECTION PLAN TO BE DEVELOPED AND CERTIFIED BY CONTRACTOR PROFESSIONAL ENGINEER EXPERIENCED IN SEDIMENT AND TURBIDITY CONTROL.
- THE PLACEMENT OF LOOSE UNCONTAINED AGGREGATE OR ROCK FILL INTO WATER BODY WILL NOT BE PERMITTED.
- DESIGN AND INSTALLATION OF COFFER DAM TO SATISFY ENVIRONMENTAL SPECIFICATION AND PARKS CANADA ENVIRONMENTAL STANDARDS AND GUIDELINES.



HISTORIC DAM

PROTECT HISTORIC DAM FOR DURATION OF CONSTRUCTION. FENCE AND COVER WITH TARPS AND OTHER MEASURES FOR PROTECTION. KEEP WET. ALLOW FOR FIVE DAYS FOR ARCHEOLOGISTS TO RECORD STRUCTURE ONCE AREA IS DE-WATERED.

NOTES

1. SEE DRAWING CV-004-01 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. SUMMARY TECHNICAL NOTE ON THE BEDROCK FOUNDATION FOR THE NEW CONCRETE DAM DETAILED RESULTS OF A 1983 GEOTECHNICAL INVESTIGATION AND OF THE PRE-ENGINEERING FIELD INVESTIGATIONS PROGRAM EXECUTED IN 2016 ARE PRESENTED IN THE SPECIFICATIONS APPENDICES. THESE INVESTIGATIONS SHOW THAT THE LOCAL BEDROCK CONSISTS UNIFORMLY OF A HIGHLY WEATHERED, INTENSELY FRACTURED COARSE GRAINED CALCITE MARBLE.
3. THE ROCK QUALITY IS VERY POOR TO POOR IN THE UPPER PORTION OF THE BEDROCK AND BECOMES FAIR IN QUALITY WITH DEPTHS (AROUND 9 TO 10 m BELOW GROUND SURFACES) AT SOME BORSHOLE LOCATIONS. THE MARBLE STRUCTURE IS DOMINATED BY SEVERAL JOINTS AND FRACTURE SETS, TOGETHER WITH VOIDS AND ESCALATION CAVITIES. A TURBULENT FLOW WITHIN THE BEDROCK WAS ALSO ENCOUNTERED WITH WASH CUT OR VOID FILLING IN SOME OF THE TEST LOCATIONS.
4. ACCORDING TO CIMA'S OPINION, THE PARAMETER VALUES GIVEN IN TABLE 1 OF CIMA'S 2016 REPORT ARE VALID FOR ONLY A SMALL BLOCK OF INTACT ROCK. THE ROCK MASS IS OF VERY POOR TO POOR QUALITY AND STRONG LEAKAGE WAS OBSERVED UNDER THE EXISTING DAM AND THROUGH THE ROCK ADJUTMENTS. THE FOLLOWING PARAMETERS SHOULD BE USED FOR DESIGN (E.A. DEWATERING AND WATER DIVERSION WORKS):
5. ASSUMPTION OF A SIGNIFICANT FLOW (OVER 100 l/s) THROUGH THE BEDROCK FOUNDATION ACROSS THE WHOLE WIDTH OF THE STREAM. AN UPPER BEDROCK LAYER WITH A HYDRAULIC CONDUCTIVITY OF 10-10 m/s AND A THICKNESS OF 7 METERS AND AN UNDERLYING BEDROCK LAYER WITH A CONDUCTIVITY OF 10-3 m/s.
6. FRICTION ANGLE AT THE CONCRETE/ROCK INTERFACE: PEAK = 31°, RESIDUAL = 20°
7. ALL TEMPORARY WORKS ARE SHOWN FOR INDICATIVE PURPOSE ONLY. DESIGN IS THE RESPONSIBILITY OF THE CONTRACTOR.

no	date	issues and/or modifications	by
4	2019-02-22	ISSUED FOR TENDER	J.K.
3	2017-02-23	ISSUED FOR REVIEW	J.K.
2	2016-11-04	ISSUED FOR REVIEW	J.K.
1	2016-08-02	PRELIMINARY DESIGN - 66% STAGE	J.K.
0	2016-06-02	PRELIMINARY	J.K.

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ISQ 9001

project: **BOBS LAKE DAM REPLACEMENT
BOLINGBROKE - ONTARIO**

title: **COFFERDAM STAGING
PLAN**

drawn: H. OTMANI	scale: 1:200
checked: J. CARON	date: 2015-08-03
designed: Y. BERTON	reference:
approved: J. KONCZYNSKI	

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