



Canadian Navigable Waters Act
Subsection 9(1)

NPP File: 2008-500822

Approval

OWNER: BC Hydro
13th Floor 333 Dunsmuir St.
Vancouver, BC V6B 5R3

WORK: **Dam, Spillway, Cofferdams, Diversion Tunnels, Generating Station and Reserve Surplus Excavated Materials (RSEM) R5b**

SITE LOCATION: Located at Approximately 56° 11' 51.62" N 120° 54' 56.31" W, Peace River, Site C Dam, located on foreshore or land covered by water being part District Lot 4425 Peace River District as shown on Plan EPP85446, City of Fort St. John, in the Province of British Columbia

Regarding the notice and application to the Minister of Transport, originally submitted pursuant to the *Navigation Protection Act (NPA)*, for an approval of a work, and now the *Canadian Navigable Waters Act (CNWA)*, as of the date signed below, the Minister hereby amends the approval (of the above-described work, and the attached plans, pursuant to subsection 9(1) in accordance with the following terms and conditions:

General

1. The works are to be constructed or installed in accordance with the attached approved plans.
2. Once the construction of the works are completed, the owner shall provide a Statutory Declaration to Transport Canada that the works are built and placed in conformity with the approved plans and site pursuant to the *Canadian Navigable Waters Act*, its regulations and the terms and conditions of approval.
3. As built plans of the works are to be forwarded to Transport Canada within 6 months upon completion of the project and commencing operation. (Construction related terms and conditions are attached in appendix A)

LIDAR Survey

4. The owner shall conduct an Airborne LIDAR survey of the downstream area to site of the Water Survey Station 07FA004 (Peace River above Pine River) (56° 11' 57" N 120° 48' 52" W). The survey shall take place post construction, but prior to the operations. (This survey can be conducted at the same time as the LIDAR survey in Condition 42)

Dam Operations



5. The CNWA Approval including the cover letter and its Terms and Conditions shall be posted at the dam site office during operations. (See appendix A for construction related posting)
6. While operating, the owner shall maintain a minimum water flow release of 390 cubic meters per second from the Site C dam as measured from the dam or a site no more than 6.5km downstream of the dam (consistent with condition 4.1 in the Decision Statement issued under section 54 of the *Canadian Environmental Assessment Act, 2012*).
7. The owner shall maintain the flow discharge and elevation levels as required by Transport Canada. The Minister may also limit changes to ramp rates as required for navigation safety.
8. The owner shall maintain records and data related to flow discharge, dam safety, surveillance and dam operations, including the Operation, Maintenance and Surveillance Manual, and provide these records to Transport Canada upon request.

Signage

9. The proponent shall develop a draft Operations Public Safety Signage Plan, to be submitted to the Navigation Protection Program at Transport Canada a minimum of 90 days prior to the filling of the reservoir. A final plan shall be submitted to Transport Canada a minimum of 30 days prior to filling of the reservoir for approval.
10. The owner shall install and maintain warning signs on both banks of the waterway at locations approximately 800-1,000m upstream of the dam site. Unless otherwise approved by Transport Canada, each Sign shall state;

**WARNING DAM AHEAD
WATER LEVELS AND FLOWS
MAY CHANGE WITHOUT NOTICE**

Signs must be in accordance with the Canadian Dam Association Technical Bulletin on Public Safety around Dams 2011, or as updated. See Appendix B for Examples taken from the Bulletin.

11. Install and maintain warning signs on both banks of the river at locations approximately 900m, approximately 6 kms downstream of the dam site, and at Old Fort. Unless otherwise approved by Transport Canada, the Signs shall state:

At approximately 900m

**WARNING DAM AHEAD
STAY CLEAR
WATER LEVELS AND FLOWS
MAY CHANGE WITHOUT NOTICE**

At approximately 6 km

**WARNING DAM AHEAD
WATER LEVELS AND FLOWS
MAY CHANGE WITHOUT NOTICE**

At Old Fort

**WARNING
WATER LEVELS AND FLOWS
MAY CHANGE WITHOUT NOTICE**



Signs must be in accordance with the Canadian Dam Association Technical Bulletin on Public Safety around Dams, 2011 or as updated. See Appendix B for Examples taken from the Bulletin.

Public Safety Signage Plan During Construction

12. The proponent shall install and implement the Peace River Diversion Public Safety Signage Plan, approved by Transport Canada, and as amended from time to time by BC Hydro, and be in accordance with the *Canadian Dam Association Technical Bulletin on Public Safety around Dams, 2011* or as updated.

Portage System

13. A non-motorized vessel portage system includes appropriate boat launches and the transportation of non-motorized vessels and allowable passengers for each such vessel. The owner is only required to portage non-motorized vessels that are already waterborne, that have arrived by water to the boat launch from another location and have met the notification requirements.
14. The owner is required to portage up to the allowable number of passengers based on the certified capacity of the portaged vessel. The owner can request this information as part of its notification requirements.

The owner shall:

- (a) Between May 15 and September 15, provide a portage system operating in both directions from downstream of the construction zone to upstream of the construction zone to transiting non-motorized vessels between the hours of 7am and 7pm daily. The portage system shall be able to transport the non-motorized watercraft typically transiting the river.
 - (b) Post notice of the suspension of service and post the reason for the suspension of service on the owner's public facing website, or at the point of reservation, and at the portage locations, if the portage system is not in operation at any time during the operating period of May 15 to September 15, or the reservoir is being filled.
 - (c) Operate the portage system if provided notification a minimum of 7 days in advance, unless multiple vessels are transiting together (a public or groups event) in which case a minimum 2 weeks of notice is required.
 - (d) Provide adequate information about the portage system and notification requirements using the Boater Communications Protocol, and:
 - For the initial start of the portage system, and opening of the reservoir boat launches, publicize in regional newspapers bi-weekly for the first month, weekly for the next 2 months (can be combined with river closure information)
 - For the next 5 years of operation, publicize weekly for the months of April to August.
 - Permanently post notice at the Peace Island Park boat launch
 - Permanently post notice at the Halfway River replacement boat launch
 - Permanently post notice at the Lynx Creek, boat launch
 - Post portage information on the owner website, on a dedicated page related to the project
15. Install and maintain a sign on the opposite bank of the portage indicating that the portage is on the opposite side. The sign shall be a minimum of 72" x 48", a white background with black lettering.



16. The owner shall comply with any direction from Transport Canada modifying the requirements in this section in regards to the Portage System.

Discharge in excess of maximum diversion rate

17. The owner shall provide notification for discharges in excess of 2700 m³/s (discharge greater than maximum generation capacity) to Transport Canada and the public using the Boater Communications Protocol as soon as the date and extent of the discharge is known.

Audible warnings for flow release changes

18. The owner shall:
 - (a) Install and maintain audible warning devices that meet the current Canadian Dam Association Guidelines to cover the downstream tailrace and spillway discharge area. The audio devices shall emit a signal that is clearly distinguishable throughout the downstream tailrace and spillway discharge danger area and downriver for 1.5km or a distance specified by Transport Canada.
 - (b) Operate the warning signals upon a discharge from the spillway, except to maintain the minimum flow requirement of 390 cm/s or during spillway gates and sluice gate tests
 - (c) Operate the warning signals upon an increase of flows from the tailrace as specified by Transport Canada.
 - (d) The owner shall provide flow data and video recordings of flows and water levels downstream of the tailrace as required by Transport Canada.
 - (e) Audible warning signals are only required to operate during daylight hours.
 - (f) Conduct ongoing maintenance and inspection of audio warning devices.
 - (g) Conduct tests of the audio warning devices at least 2 times a year.
 - (h) Maintain records of maintenance tests, inspections and repairs of all audible warning devices for a period of 5 years.

Monitoring of flows downstream

19. The owner shall work with the Water Survey of Canada and relevant provincial partners under the Federal-Provincial Hydrometric Program Agreement to ensure that hydrometric data from the below hydrometric stations on the Peace River are collected, stored and reported as a part of the National Hydrometric Database. The owner shall provide the information to Transport Canada as outlined below and as otherwise requested. Upon direction by Transport Canada, the owner shall reinstate, or arrange with Water Survey of Canada to reinstate, any discontinued hydrometric survey stations or install and maintain new hydrometric survey stations on the Peace River and ensure that water level and flow data is collected, stored and made available for the purpose of navigation.

Station Name

Prov Water Survey Station ID



PEACE RIVER ABOVE PINE RIVER	BC	07FA004
PEACE RIVER NEAR TAYLOR	BC	07FD002
PEACE RIVER ABOVE ALCES RIVER	BC	07FD010
PEACE RIVER AT DUNVEGAN BRIDGE	AB	07FD003
PEACE RIVER NEAR ELK ISLAND PARK	AB	07FD934
PEACE RIVER ABOVE SMOKY RIVER CONFLUENCE	AB	07FD901
PEACE RIVER AT PEACE RIVER	AB	07HA001
PEACE RIVER NEAR CARCAJOU	AB	07HD001
PEACE RIVER AT FORT VERMILION	AB	07HF001
PEACE RIVER AT PEACE POINT	AB	07KC001

20. The owner shall provide records of discharges from the dam or data collected from relevant hydrometric stations on a given date or time to assist in determining the causes of any reported impacts on navigation upon request by Transport Canada.
21. In addition to the data required to be collected by the owner pursuant to section 6 of the CEAA 2012 Decision Statement, the owner shall prepare and submit to Transport Canada a report of the data collected from the following sites showing actual measurements of water flow and levels compared to the predicted water flows and levels done through modeling presented by BC Hydro in its Environmental Impact Statement for the Project. This review shall be done at 5, 10 and 15 years after start of operational flows, and the results for each review period shall be submitted to Transport Canada within 6 months of the end of each review period. The report shall cover the period of operations preceding the report include a summary of findings, supporting tables or graphs and data sets for the Water Survey of Canada stations:
 - (a) Near Taylor 07FD002
 - (b) Near Dunvegan bridge 07FD003
 - (c) Near Peace Point 07KC001
22. The owner shall conduct a review of any navigational impacts on operations of the 3 existing ferries (La Crete, Shaftsbury and Little Red River Cree Nation/Fox Lake) on the Peace River. A report of this review must be submitted to Transport Canada after the first year of operation and thereafter every 5 years for the next 20 years after the start of dam operations. On the 20th year Transport Canada will determine if continued review is warranted. As part of the review process the owner shall:
 - (a) Prior to the start of dam operations,
 - i. Contact the ferry operators and establish a reporting protocol that the ferry operators can use to report any groundings, strandings or inability to operate a ferry due to water levels.
 - ii. Provide a copy of this reporting protocol to Transport Canada.
 - (b) Submit to Transport Canada a report of all navigational impacts reported to the owner within 1 month. The owner shall provide the following in the report;
 - i. Water levels recorded from the nearest hydrometric station and,
 - ii. Information about flow releases from the dam at or around the times of the reported navigational impact and an analysis of the findings.
23. If another water control or large withdrawal structure is built on the Peace River downstream of Site C, Transport Canada will determine which of the downstream monitoring requirements will remain in effect.



Reservoir Filling

24. The owner shall submit a draft operational debris management plan to Transport Canada for review and approval no later than 90 days prior to reservoir filling. The owner shall submit a final operational debris management plan no later than 30 days prior to reservoir filling.
25. Prior to reservoir filling, the owner shall:
 - i. Complete the clearing plan in the reservoir area in accordance with the Environmental Assessment and Water License Conditions, as outlined in the Joint Review Panel and the Vegetation Clearing and Debris Management Plan as per the British Columbia Environmental Assessment Office Certificate Conditions,
 - ii. Submit documentation to Transport Canada that these conditions have been fulfilled, and
 - iii. Provide Transport Canada with the same information, at the same time it is being provided to Canadian Environmental Assessment Agency to meet condition 4.2 of the CEAA 2012 Decision Statement:

The Owner shall, 90 days prior to initiating reservoir filling, provide the Agency with estimates of downstream water flows and water levels to Peace Point, Alberta for scenarios at minimum, average and maximum rates of reservoir filling and a description of how these estimates have been used to undertake reservoir filling in a manner that would minimize impacts on downstream water flows and water level conditions.

26. 90 days prior to the start of the filling of the reservoir, the owner shall provide the public with information about the reservoir filling using the Boater Communications Protocol and the following:
 - (a) Publication in regional newspapers bi-weekly for the first month, weekly for the next 2 months.
 - (b) Posted notice at the Peace Island Park, boat launch
 - (c) Posted notice at the Halfway River replacement boat launch
 - (d) Posted notice at the Lynx Creek, boat launch
 - (e) Posted notice at the Hudson Hope, boat launch
 - (f) Post information on the owner website, on a page related to the project

Reservoir Operation Operating Regime

27. Except for emergency operating conditions or planned drawdowns the owner shall operate the reservoir between the elevations of 460.0 meters ASL, the minimum operating level, and 461.8 meters ASL, the full supply level, measured at the dam using Geodetic Survey of Canada datum.
28. The owner shall install and maintain staff water level gauges, at the dam and at each of the 3 boat launches as outlined in condition 48. The owner shall at a minimum of once a week post, on a webpage related to the project, the current level of the reservoir.

Drawdowns for planned maintenance, upgrades and unplanned repairs

29. The owner shall provide information about planned drawdowns below the reservoir level of 460 meters ASL, 20 days prior to the start of the drawdown of the reservoir, using the Boater Communications Protocol and:



- (a) Publicize in regional newspapers weekly for the first month, bi-monthly for the 2nd month and once per month for the remaining length of the drawdown or by other public media or publication methods upon agreement with Transport Canada
- (b) Posted notice at the Halfway River replacement boat launch
- (c) Posted notice at the Lynx Creek, boat launch
- (d) Posted notice at the Hudson Hope, boat launch
- (e) Post information on the owner website, on a page related to the project
- (f) Notice to Transport Canada

Emergency drawdowns

30. The owner shall provide information about an emergency drawdown below the 460.0 meters ASL to Transport Canada and the public as soon as the date and extent of the drawdown is known using the Boater Communications Protocol, and:

- (a) Initial and ongoing notifications to the regional media outlets, throughout the period of the drawdown
- (b) Posted notice at the Halfway River replacement boat launch
- (c) Posted notice at the Lynx Creek, boat launch
- (d) Posted notice at the Hudson Hope, boat launch
- (e) Post information on the owners website, on a page related to the project
- (f) Notice to Transport Canada

Drawdowns ordered by the Comptroller

31. For drawdowns below the 460.0 meters ASL operating regime, as ordered by the Comptroller of Water Rights in accordance with the Province of BC *Water Act* or *Water Sustainability Act*, the owner shall provide information about a drawdown ordered by the Comptroller to Transport Canada and the public as soon as the date and extent of the drawdown is known using the Boater Communications Protocol, and:

- (a) Posted notice at the Halfway River replacement boat launch
- (b) Posted notice at the Lynx Creek, boat launch
- (c) Posted notice at the Hudson Hope, boat launch
- (d) Post information on the owners website, on a page related to the project
- (e) Notice to Transport Canada

Emergency surcharges

32. In the event of an emergency surcharge greater than elevation 462.10 m that will extend beyond 24 hours the owner shall provide information to Transport Canada and the public as soon as the date and extent of the surcharge is known using the Boater Communications Protocol, and:

- (a) Posted notice at the Halfway River replacement boat launch
- (b) Posted notice at the Lynx Creek, boat launch
- (c) Posted notice at the Hudson Hope, boat launch
- (d) Post information on the owners website, on a page related to the project
- (e) Notice to Transport Canada

Debris Management on the Reservoir



33. The owner shall maintain the active debris management plan (from condition 24) to remove debris from the reservoir for the first 5 years from the start of reservoir filling. This system will consist of equipment to marshal debris, move it to a collection site and remove it from the waterway.
34. Long term debris management shall be dependent on the actual accumulation of debris. The owner shall revise its operational debris management plan and submit to Transport Canada for review and approval, 1 year prior to the end of the first 5 year period.
35. The owner shall continually monitor the reservoir, advise the public of areas of potentially floating debris and remove the debris in an expedient manner.
36. Debris storage at the dam site shall not block vessel navigation access to the Moberly River.
37. The owner shall cut or remove submerged or partial submerged timbers that are potential hazards to navigation. Timbers not removed shall be cut to Elevation 455m ESL unless otherwise approved by Transport Canada.
38. The owner shall conduct further debris management activities that Transport Canada may require.

Post filling reservoir survey and long term safety and shoreline monitoring

39. The owner shall;
 - (a) Submit a draft boating safety and shoreline monitoring plan 90 days prior to the filling of the reservoir for Transport Canada review. A final plan must be submitted 30 days prior to reservoir filling for Transport Canada approval. This plan must include details meeting parameters of b) to d) below.
 - (b) Conduct a safety survey of the reservoir post filling and prior to May 30th of the first year after reservoir filling and report the findings to Transport Canada. This information will be used to determine when the full access for the public to the reservoir is granted.
 - (c) Conduct an annual safety survey of the reservoir prior to the boating season and report any potential navigation safety concerns to Transport Canada.
 - (d) Conduct a safety inspection at any time for all or a portion of the reservoir and report the findings to Transport Canada upon request.

Sediment survey

40. The owner shall:
 - (a) Conduct a hydrographic survey of the Halfway River embayment to determine sediment deposition rates. The area to be surveyed is bank to bank, 1.5km upstream from the new Halfway River Bridge to the site of the confluence of the Halfway River embayment at approximately 56°13'9.80"N 121°26'50.87"W at 10 year and 15 year intervals from start of operation. Survey results are to be provided to Transport Canada within 6 months of each survey period.
 - (b) Conduct hydrographic surveys for portions of the reservoir and report as required to Transport Canada.



Navigation aids

41. The owner shall:
- (a) Place, operate, and maintain a flashing white light (.5 sec. flash, 3.5 sec. Eclipse) on the North Bank at the mouth of the Halfway River.
 - I. Sited to maximize the sightlines both upstream and down along the Peace River reservoir. Final location shall be approved by Transport Canada.
 - II. This light shall have a nominal range of 12km.
 - (b) Place, operate, inspect and maintain a flashing white light (.5 sec. flash, 3.5 sec. Eclipse) on the dam at a location to maximize the sightline, facing upstream on the Peace River reservoir.
 - i. This light shall have a nominal range of 5km.
 - ii. Final location shall be approved by Transport Canada.
 - (c) Install and maintain other navigation aids as required by the Transport Canada.

LIDAR Survey

42. The owner shall conduct an Airborne LIDAR survey of the reservoir area post construction and clearing, but prior to the filling of the reservoir. This survey shall be the basis for bathymetric mapping. (This survey can be conducted at the same time as the LIDAR survey in Condition 4)

Mapping

43. Prior to starting operation of the boat launches, the owner shall produce and make publicly available a map or maps of the reservoir at a scale that is usable to vessel operators. The map(s) must be available on the internet and the owner must provide paper copies for purchase by the public at a nominal fee equivalent to the cost of marine charts. Drafts of these map(s) must be submitted to Transport Canada for review 120 days prior to full access to the reservoir being granted. The map or maps must be reviewed and updated every 10 years or when required by Transport Canada due to a significant change in the reservoir. The map must show at the minimum, the following information:

A. Map information

- I. Date of Issue
- II. Scale bar
- III. Scale
- IV. True North to be indicated
- V. Depth datum
- VI. Emergency contact information

B. Amenities

- I. Boat launches
- II. Navigation aids
- III. In-water works

C. Depths

Bathymetry contours shall be delineated in meters as follows; 0, 1, 2, 5, 10, 20, 30, 40, 50
The datum for depth at 0m shall be the 460.0 ASL

D. Marking of navigation hazards

- I. Small or individual hazards shall be marked as point features with unique symbology.



- II. Areas with multiple hazards may be outlined with a polygon using appropriate symbology.
- III. Fish habitat compensation areas to be marked and outlined with a polygon using appropriate symbology.

Signage and notifications

44. The owner shall provide boater information about the reservoir using the Boater Communications Protocol and signage at the following locations:
 - (a) Halfway River boat launch
 - (b) Lynx Creek boat launch
 - (c) Hudson Hope boat launch
 - (d) On the owner website, on a dedicated page on a site related to the project
45. In the year that the public boat launches are opened, the owner shall establish and chair a reservoir marine user group, open to all interested users of the reservoir, to discuss issues or concerns related to navigation on the reservoir.
46. The owner shall arrange and hold a minimum of one meeting per calendar year for the reservoir marine user group and maintain the minutes and contact lists. The meetings are to be held at Fort St John or a location agreed upon by members of the group.
 - a. The owner is responsible for documenting and actioning any issues or concerns related to navigation that arise during these meeting.
 - b. Unresolved issues may be submitted by either the owner or user group members to Transport Canada for review.
 - c. Minutes of the meetings must be provided to Transport Canada upon request.
 - d. After 5 years, meetings may cease if the majority of the reservoir marine user group makes a motion to end them

Emergency dock at dam site

47. The owner must not restrict the use or access of any docking or landing facility at the dam site for use in an emergency. Signage at this facility shall have emergency contact information.

Boat launches

48. The owner shall construct the three boat launches prior to filling of the reservoir.
 - I. Near Halfway River
 - II. At Lynx Creek
 - III. At Hudson Hope

Decommissioning

49. Unless otherwise specified in the Act, the owner shall submit notice and detailed plans to the Minister responsible one year prior to the planned decommissioning date.

Indigenous Relations



50. In regards to Indigenous groups affected by the proposed project, the Proponent, in consultation with the Department of Transport, shall:

(a) Collaborate with Indigenous groups to:

- Develop, implement and manage a plan to monitor the terms and conditions in this approval;
- In the event of unforeseen circumstances related to navigation, identify and develop additional mitigation measures to address impacts to current use of lands and resources for traditional purposes; and
- Share information about the project.

(b) Establish committees and/or mechanisms for dialogue among the Proponent, Indigenous groups, and the governments of Canada and British Columbia on ways to mitigate the impacts of the project as it relates to navigation;

(c) Inform Indigenous groups about project activities that may affect access to land and waters for the purpose of those uses;

(d) Notify without delay Indigenous groups of an occurrence that results in a significant interference to navigation which poses a serious and imminent danger of such an occurrence, and which occurrence is not captured by this authorization; and

(e) Provide funds to Indigenous groups to support their capacity to carry out these activities.

SIGNED in two copies on May 6, 2022 in Vancouver, B.C.

Leung,
Eric

Digitally signed by Leung, Eric
DN: C=CA, O=G.C, OU=TC-TC, CN="Leung, Eric"
Reason: I am approving this document
Location: Langley
Date: 2022.05.06 14:29:05-07'00'
Foxit PDF Editor Version: 11.2.1

Eric Leung
Navigation Protection Program Officer
Programs Group
Transport Canada
Pacific Region
For the Minister of Transport

Appendix A - CONSTRUCTION RELATED TERMS AND CONDITIONS

1. During the construction period, the owner shall:
 - (a) Provide real time flow and level data from a location no more than 7 km below the proposed dam on a public webpage related to the project, if data is not available from the existing Water Survey of Canada hydrometric station identified as *Peace River above Pine River #7FA004*,
2. In the event that construction of the works are terminated prior to their completion, it will be the owner's responsibility to remove the works and associated equipment in their entirety from the waterway including any anchors and pilings. The banks and bed of the waterway disturbed by the works shall be contoured to match the local conditions as required.
3. Post the NPA Approval and its Terms and Conditions at following locations and times;
 - i. During construction at the BC Hydro office onsite and the site offices of all contractors conducting work on, in, through, over or under the waterway.
 - ii. The construction related terms and conditions in appendix A shall also be posted at site of the boat operations during construction.
4. The owner shall immediately remove construction debris from the waterway.
5. While public vessel traffic on the Peace River is capable of transiting through or accessing portions of the construction site the owner shall:
 - (a) Install and maintain warning signs at locations approximately 100m upstream and downstream of the dam site advising of the work in progress prior to, and for the duration of, construction until the closure of the river. Signs shall state

WARNING CONSTRUCTION AHEAD PROCEED WITH CAUTION

and be in accordance with the Canadian Dam Association Technical Bulletin on Public Safety around Dams, 2011 or as updated. See Appendix B for Examples taken from the Bulletin;

- (b) Mark the outermost extremity of the works extending from either bank above the surface with orange high visibility markers on the upstream and downstream corners and every 75m,
 - (c) Install and maintain a flashing yellow light on the outermost extremity of the works above the surface on the upstream and downstream corners and every 150m. The lights shall be in operation in periods of darkness or limited visibility,
 - (d) Install and maintain a yellow flashing light on the outermost extremity of any equipment, construction machinery or barges anchored or left in or on the waterway overnight. The lights shall be visible upstream and downstream, and
 - (e) Inspect and maintain weekly all lights and markings to ensure function and correct positioning.
6. Upon closure of the river by the completion of the cofferdam(s), the owner shall:
 - (a) Install and maintain warning signs on the upstream and downstream wetted sides of the cofferdam(s) advising that the river is closed. The signs shall state

WARNING RIVER CLOSED

and be in accordance with the Canadian Dam Association Technical Bulletin on Public Safety around Dams, 2011 or as updated. See Appendix B for Examples taken from the Bulletin.

- (b) Mark all cofferdams with flashing yellow lights and orange high visibility markers on the upstream and downstream wetted sides with lights spaced at intervals of 75m. The lights shall be in operation during periods of darkness or limited visibility.
- (c) Inspect and maintain weekly all lights and markings to ensure function and correct positioning.

Diversion Tunnel

7. The owner shall:

- (a) Install and maintain warning signs at the entrances of both the upstream and downstream diversion tunnel channel on both banks during construction until the diversion tunnels are closed. The signs shall state:

**DANGER
EXTREME HAZARD
DO NOT ENTER**

and be in accordance with the Canadian Dam Association Technical Bulletin on Public Safety around Dams, 2011 or as updated. See Appendix B for Examples taken from the Bulletin.

- (b) Install and maintain flashing yellow warning lights on both banks, at the entrance of the upstream and downstream diversion tunnel channels. The lights shall be in operation in periods of darkness or limited visibility, and
- (c) Inspect and maintain weekly all lights and markings to ensure function and correct positioning.

Headpond

- 8. Upstream of the cofferdam(s), riverbank warning signage is required if booms, buoys are not installed and maintained or if a patrol boat is not monitoring the area. If this is the case, the owner shall:
 - a) Install and maintain warning signs facing traffic moving downstream at locations on both banks of the river at approximately the maximum upstream extent of the Headpond prior to and for the duration of construction. The signs shall state

**WARNING
SUBMERGED HAZARDS AHEAD
PROCEED WITH CAUTION
STAY CLEAR OF BANKS**

and be in accordance with the Canadian Dam Association Technical Bulletin on Public Safety around Dams, 2011 or as updated. See Appendix B for Examples taken from the Bulletin,

Closure Notification

- 9. The owner shall, 30 days prior to the physical closure of the river to vessel traffic by the cofferdams, provide information to boaters that the river will be closed using the BC Hydro's Public Safety Management Plan - Boater Communications Protocol, and:
 - Publication in regional newspapers bi-weekly.
 - Posted notice at the Peace Island Park, boat launch

- Posted notice at the Halfway river, boat launch
- Posted notice at the Lynx Creek, boat launch
- Notification to Transport Canada
- On the owner's website, on a page related to the project

Portage System during construction

9. A portage system includes appropriate boat launches and the transportation of vessels and allowable passengers for each such vessel. The owner is only required to portage vessels that are already waterborne, that have arrived by water to the boat launch from another location and have met the notification requirements.
10. The owner is required to portage up to the allowable number of passengers based on the certified capacity of the portaged vessel. The owner can request this information as part of its notification requirements.
11. There is no requirement for a portage system while the reservoir is being filled.
12. The owner shall:
 - (a) Upon the closure of the river, unless the upstream or downstream boat launches are blocked by ice, provide a portage system operating in both directions from downstream of the construction zone to upstream of the construction zone to transiting vessels during daylight hours. The portage system shall be able to transport the watercraft typically transiting the river including canoes and large jetboats.
 - (b) If the portage system is not operating, because boat launches are blocked by ice or the reservoir is being filled, post notices of this suspension of service on the BC Hydro project website or the point of reservation and at the portage locations.
 - (c) Operate the portage system if provided notification 24 hours in advance, unless multiple vessels are transiting together (a public or groups event) in which case a minimum of 2 weeks notice is required.
 - (d) Provide adequate information about the portage system and notification requirements using the Boater Communications Protocol, and:
 - For the initial start of the portage system, publicize in regional newspapers bi-weekly for the first month, weekly for the next 2 months. (can be combined with river closure information)
 - For subsequent years of construction, publicize weekly for the months of April, May and June
 - Permanent posted notice at the Peace Island Park boat launch
 - Permanent posted notice at the Halfway river boat launch
 - Permanent posted notice at the Lynx Creek boat launch
 - Post portage information on the owner website, on a page related to the project

Existing Boat launches

13. During construction, the owner shall maintain access at all times to at least one boat launch at either Lynx Creek or Halfway River during the Highway 29 re-alignment construction until the flooding of the reservoir.

Risk Treatment – Control Measures

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Signage Technical Bulletin

Examples of signs



Public Safety Around Dams Workshop
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CDA  ACB

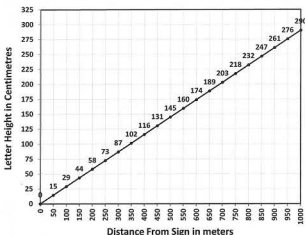
Risk Treatment – Control Measures

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Signage Technical Bulletin

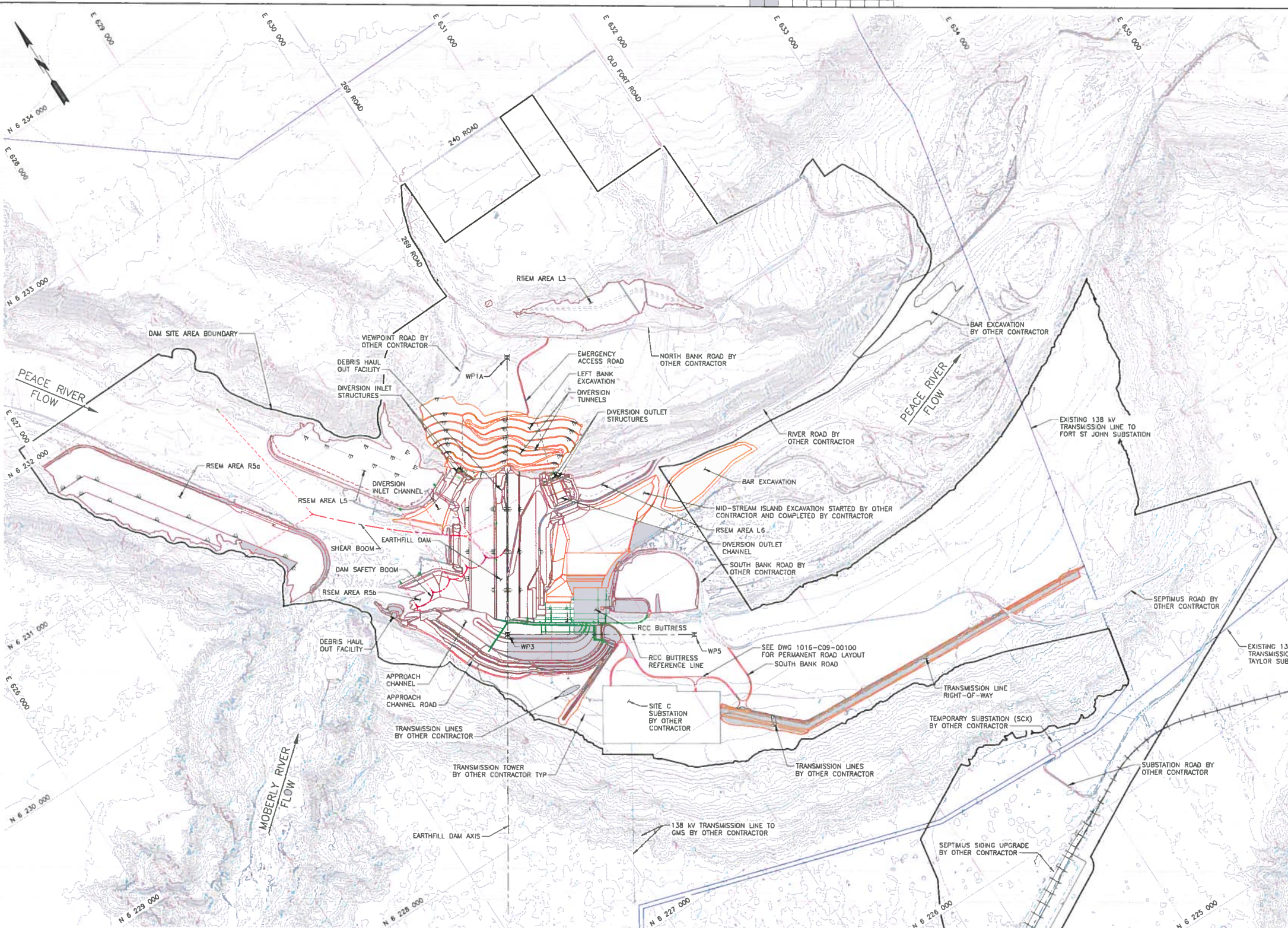
Sizing of signs (pg. 4):

The size of the sign is determined by the letter size of the message text, which should be such that persons even with less than perfect eyesight can read it. Most provinces use 20/40 as the minimum vision standard for motor vehicle licensing. Given this standard in Canada for visual acuity, it is recommended that the height of a capital letter of message text be 0.29 centimetres for every meter of viewing distance:



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CDA  ACB



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 25/NOV/2014 10:42 AM
 J. NUNN

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		REFERENCE DRAWINGS			REFERENCE DRAWINGS

PLAN
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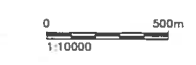
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WORK POINT	EASTING	NORTHING
WP1A	630167.026	6230859.113
WP3	629126.987	6229253.621
WP5	630218.058	6228546.824

Reviewed / Examiné
 Page 1 of 12
 2008-500422
JAN 31 2019
 By/par:
COLIN PARKINSON
 Navigation Protection Program /
 Programme de protection de la navigation

- GENERAL NOTES:
- TEMPORARY CONSTRUCTION WORKS, AREA A EXCAVATION AND SITE RESTORATION WORKS NOT SHOWN.
 - ALL SUPPORTED WORKS ABOVE RCC BUTTRESS, INCLUDING INTAKES, PENSTOCKS, POWERHOUSE, ALL BY OTHER CONTRACTORS, NOT SHOWN.
 - SOME ELEMENTS OF THE ROADS AND RSEM AREAS DEPICTED ARE A CONCEPTUAL DESIGN. FINAL DESIGN OF THESE ELEMENTS IS BY THE CONTRACTOR.
 - ALL DIMENSIONS TO BE TAKEN WITH RESPECT TO WP3. EARTHFILL DAM AXIS IS DEFINED AS PASSING THROUGH WP1A AND WP3. RCC BUTTRESS REFERENCE LINE IS DEFINED AS PASSING THROUGH WP3 AND WP5.
 - ALL COORDINATES ARE IN OTM ZONE 10, NAD 83 SYSTEM.

ISSUED FOR PROPOSAL

NOT FOR CONSTRUCTION



ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE

PLATE NO: GEN-002



BGhydro

SITE C CLEAN ENERGY PROJECT

MAIN CIVIL WORKS

PLAN

GENERAL ARRANGEMENT

DSGN	J. NUNN
INDEP CHK	G. HANNA
DFTC	MGL AR
DFTC CHK	WK
INSP	BM NH GWS
	CV STR MECH GEO ELEC
REV	B. KEMP
ACPT	J. NUNN & HANNA & WATSON

ORIGINAL SEALED BY
 J. NUNN
 09APR2015
 P. ENG.
 APEGBC

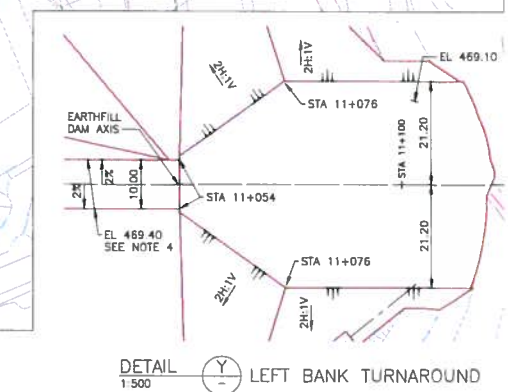
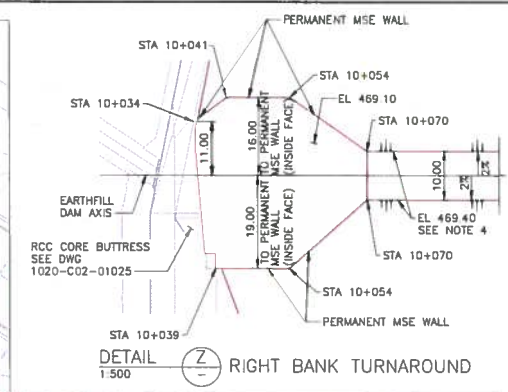
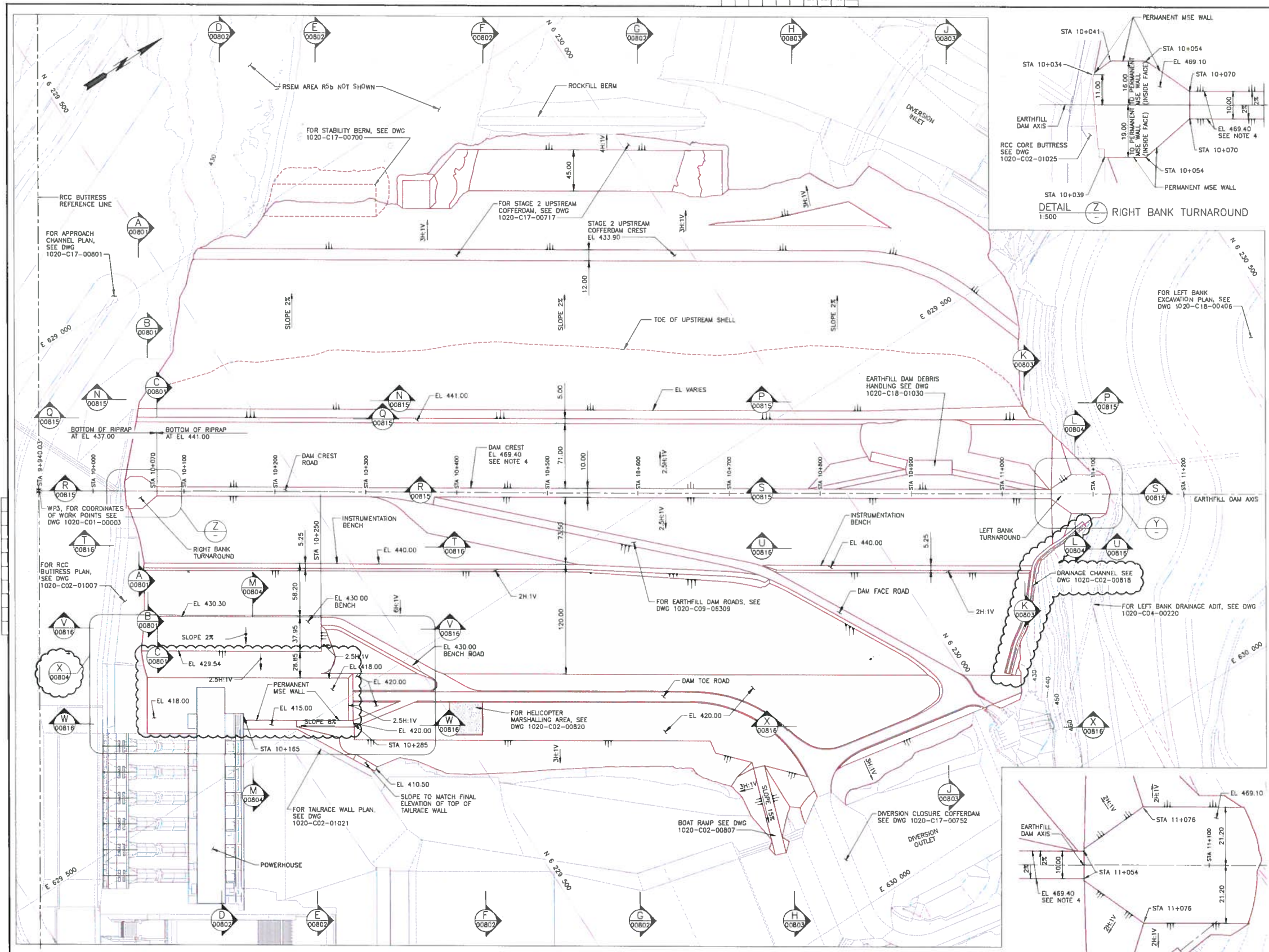
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1	GENERAL REVISION	09APR2015	J. NUNN																		

DATE: 25NOV2014

DWG NO: 1016-C01-00170

SIZE: A0

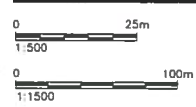
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 Page 2 of 12
 1008-500 822
 JAN 31 2019
 By/par:
COLIN PARKINSON
 Navigation Protection Program /
 Programme de protection de la navigation

- EARTHFILL DAM GENERAL NOTES**
- FOR CORE TRENCH EXCAVATIONS, FOUNDATION PREPARATION AND PROTECTION, SEE DRAWINGS 1020-C02-00403, 00404, 00405, 00600 AND 00601.
 - FOR CROSS SECTIONS OF UPSTREAM AND DOWNSTREAM COFFERDAMS, SEE DRAWINGS 1020-C17-00718 TO 00722.
 - FOR CURTAIN AND CONSOLIDATION GROUTING, SEE DRAWINGS 1020-C02-00603, 00604 AND 00605.
 - THE NOMINAL CREST ELEVATION (EL 469.40) IS SHOWN ON THE DRAWINGS FOR CAMBER DETAILS, SEE DRAWING 1020-C02-00805.
 - DEBRIS BOOMS AND ANCHORS NOT SHOWN.
 - COFFERDAM CREST ELEVATIONS SHOWN ARE THE MINIMUM REQUIRED.
 - ANY TEMPORARY SLOPES IN THE CORE AND FILTER AREAS IN THE EARTHFILL DAM TRANSVERSE TO THE DAM AXIS SHALL BE AS APPROVED BY HYDRO'S REPRESENTATIVE. IN NO CASE THE SLOPE SHALL BE STEEPER THAN 4H:1V.

BC Hydro CONTRACT NO. REF 520938
ISSUED FOR CONSTRUCTION
 BY: A. WATSON HYDRO'S REPRESENTATIVE DATE: 15JAN2017



ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE

BC Hydro **SNC-LAVALIN**

CLEAN ENERGY PROJECT - SITE C
DAM - EARTHFILL

FILL
PLAN

DATE: 15DEC2015
 DWG NO: 1020-C02-00800
 SHEET: A0 R 1

DESIGN	M. AFIF
INDEPENDENT CHECK	J. MENDIETA
DRAFTING	EG
DRAFTING CHECK	PKL
INSPECTION	IKQ
CONSTRUCTION	CV
STRUCTURE	STR
MECHANICAL	MECH
CIVIL	CED
ELECTRICAL	ELEC

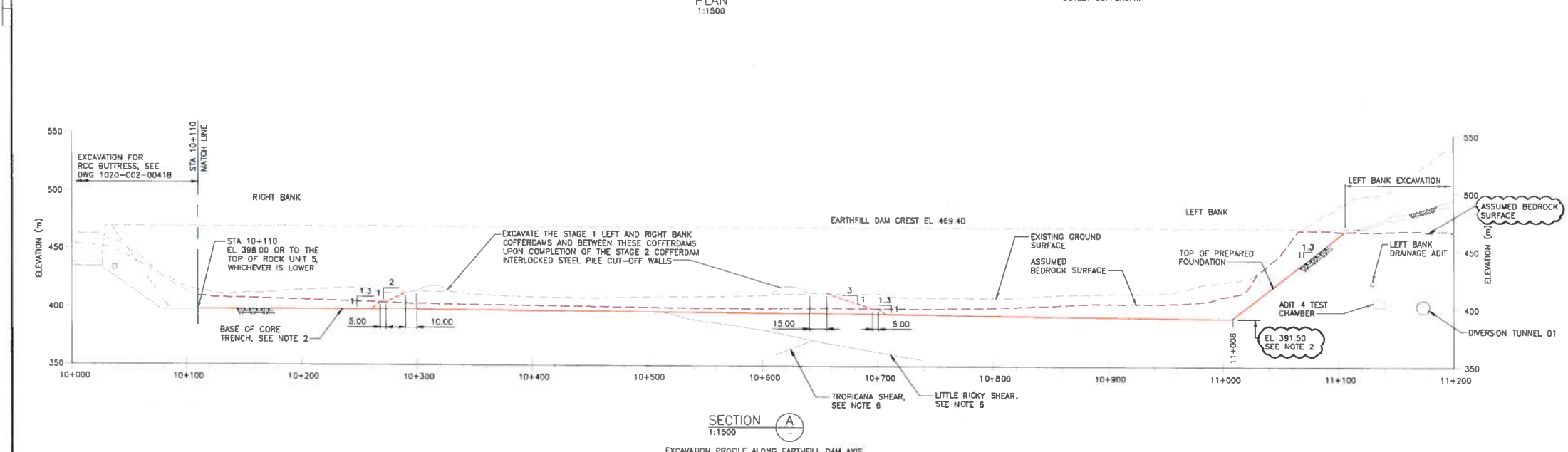
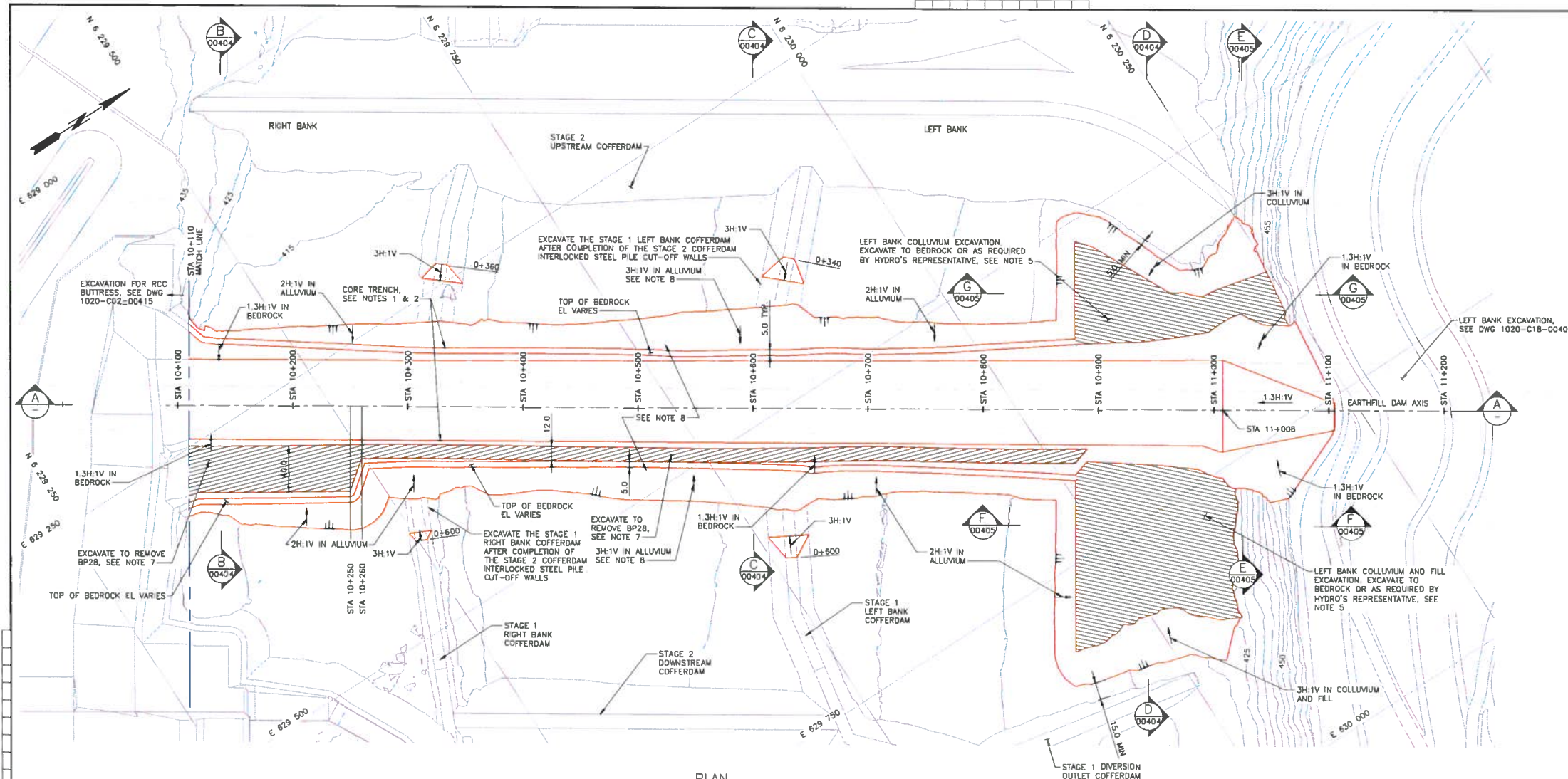
ORIGINAL SEALED BY M. AFIF 16 JAN. 2017 P. ENG. APEGBC

DATE: 15DEC2015
 DWG NO: 1020-C02-00800

NO	REVISIONS	DATE	DESIGNED	INSP	CHK	DFTG	INSPECTION	CONSTRUCTION	AW
1	TOP OF FILL IN VICINITY OF POWERHOUSE REVISED, DETAIL X AND DRAINAGE CHANNEL ADDED.	16JAN2017	M. AFIF	JM	GL	PKL	INSPECTION	CONSTRUCTION	AW

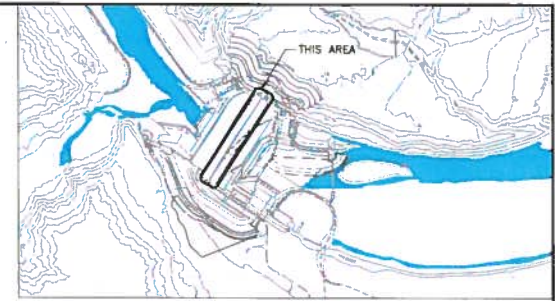
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		REFERENCE DRAWINGS			REFERENCE DRAWINGS



REF#	DRAWING NUMBER	TITLE	REF#	DRAWING NUMBER	TITLE	NO	REVISIONS	DATE	DESIGNED	MA	GL	PKL	INSP	INSP	INSP	INSP	INSP	INSP	INSP	INSP	AW
1		ELEVATION ADDED.				1	ELEVATION ADDED.	16JAN2017	J. MENDIETA												

1	1020-C02-00403	EXCAVATION
2	1020-C02-00404	RIGHT BANK COFFERDAM
3	1020-C02-00405	LEFT BANK COFFERDAM
4	1020-C02-00406	LEFT BANK EXCAVATION
5	1020-C02-00407	STAGE 1 DIVERSION
6	1020-C02-00408	STAGE 2 COFFERDAM
7	1020-C02-00409	STAGE 2 DOWNSTREAM COFFERDAM
8	1020-C02-00410	STAGE 1 RIGHT BANK COFFERDAM
9	1020-C02-00411	STAGE 1 LEFT BANK COFFERDAM
10	1020-C02-00412	STAGE 1 DIVERSION OUTLET COFFERDAM
11	1020-C02-00413	STAGE 2 UPSTREAM COFFERDAM
12	1020-C02-00414	STAGE 1 RIGHT BANK COFFERDAM
13	1020-C02-00415	EXCAVATION FOR RCC BUTTRESS
14	1020-C02-00416	EXCAVATION FOR RCC BUTTRESS
15	1020-C02-00417	EXCAVATION FOR RCC BUTTRESS
16	1020-C02-00418	EXCAVATION FOR RCC BUTTRESS
17	1020-C02-00419	EXCAVATION FOR RCC BUTTRESS
18	1020-C02-00420	EXCAVATION FOR RCC BUTTRESS
19	1020-C02-00421	EXCAVATION FOR RCC BUTTRESS
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22	1020-C02-00424	EXCAVATION FOR RCC BUTTRESS
23	1020-C02-00425	EXCAVATION FOR RCC BUTTRESS
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99	1020-C02-00501	EXCAVATION FOR RCC BUTTRESS
100	1020-C02-00502	EXCAVATION FOR RCC BUTTRESS



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JAN 31 2019
By/par:
COLIN PARKINSON
Navigation Protection Program /
Programme de protection de la navigation

- EARTH FILL DAM EXCAVATION NOTES:
- FOR FOUNDATION PREPARATION AND PROTECTION SEE DRAWINGS 1020-C02-00600 AND 00601.
 - MINIMUM EXCAVATION OF THE BASE OF THE CORE TRENCH IN THE VALLEY AREA SHALL BE TO THE TOP OF ROCK UNIT 5. ACTUAL EXCAVATION LEVELS SHALL BE DETERMINED BY HYDRO'S REPRESENTATIVE IN THE FIELD.
 - THE BASE WIDTH OF THE CORE TRENCH UPSTREAM OF THE DAM AXIS IS EQUAL TO: $(467.75 - \text{ELEVATION OF BASE OF CORE TRENCH}) \times 0.5 + 4.9$.
 - THE BASE WIDTH OF THE CORE TRENCH DOWNSTREAM OF THE DAM AXIS IS EQUAL TO: $(467.75 - \text{ELEVATION OF BASE OF CORE TRENCH}) \times 0.25 + (1.9 + \text{WIDTH OF ZONES 2a AND 2b})$.
 - THE LIMIT OF COLLUVIUM AND FILL EXCAVATION ON THE LEFT BANK SHOWN ON THIS DRAWING IS BASED ON AVAILABLE DATA. ACTUAL LIMIT WILL DEPEND ON FOUNDATION CONDITIONS EXPOSED DURING EXCAVATION.
 - THE LOCATIONS OF THE LITTLE RICKY AND TROPICANA SHEARS SHOWN ON THE DRAWING ARE APPROXIMATE. OTHER SHEARS MAY BE EXPOSED DURING EXCAVATION. FOR TREATMENT OF SHEARS IN THE CORE TRENCH AREA SEE DRAWING 1020-C02-00600.
 - THE DEPTH OF EXCAVATION TO REMOVE BP28 WILL BE DETERMINED BY HYDRO'S REPRESENTATIVE.
 - THE EXTENTS OF THE 3H:1V EXCAVATION IN ALLUVIUM SHALL BE DETERMINED BY HYDRO'S REPRESENTATIVE. ALLUVIUM EXCAVATION SHALL BE 2H:1V OUTSIDE THESE AREAS.
 - THE ASSUMED BEDROCK SURFACE HAS BEEN GENERATED FROM THE INTERPRETATION OF AVAILABLE INVESTIGATION DATA AND IS THEREFORE APPROXIMATE.

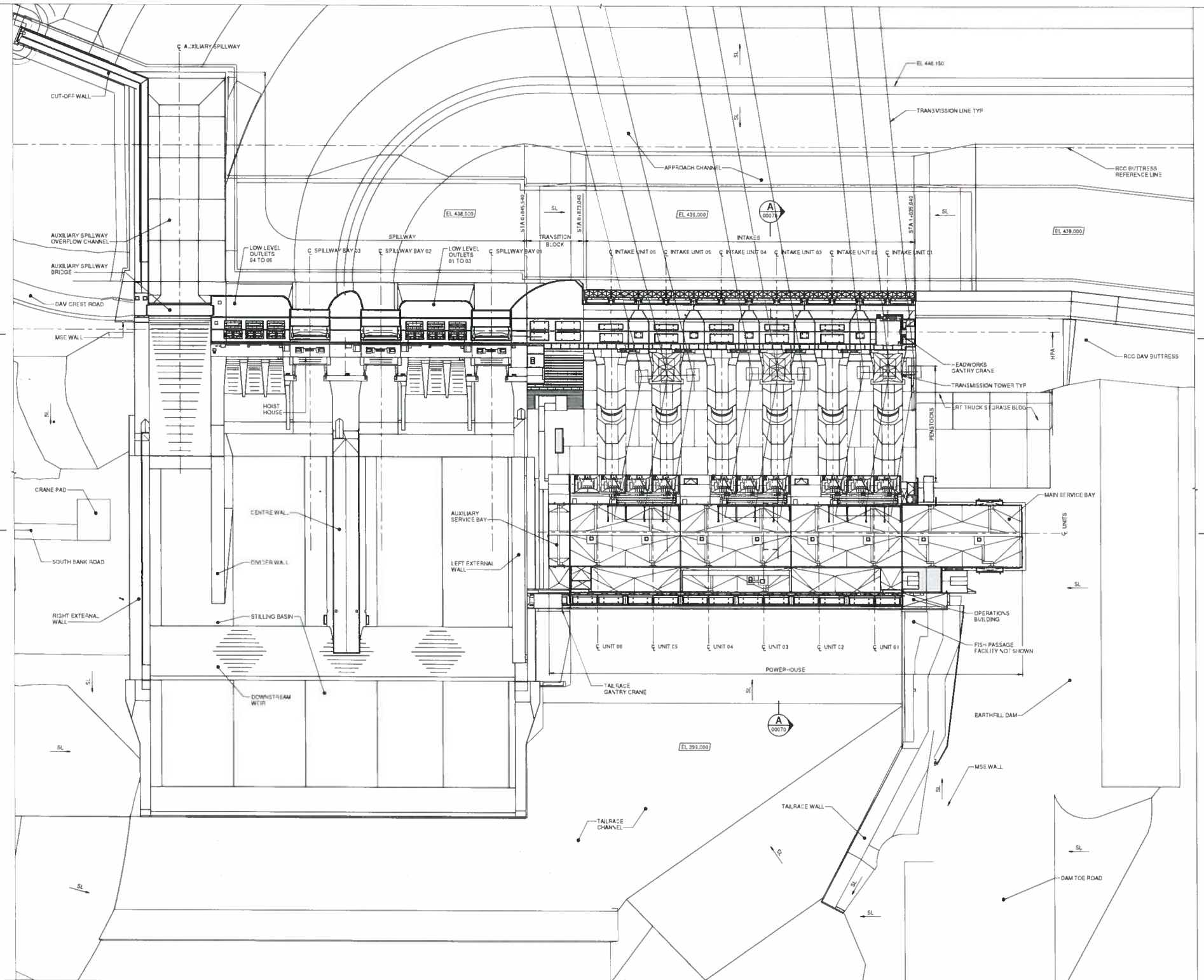
BC Hydro CONTRACT NO. REF 520938
ISSUED FOR CONSTRUCTION
BY A. WATSON DATE: 19JAN2017
HYDRO'S REPRESENTATIVE



ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

		CLEAN ENERGY PROJECT - SITE C DAM - EARTH FILL EXCAVATION PLAN AND SECTION A	
DSN J. MENDIETA INSP M. AFIF DTG EG PKL INSP	ORIGINAL SEALED BY J.E. MENDIETA 16 JAN 2017 P.ENG. APEGBC	DATE 15DEC2015 DWG NO 1020-C02-00403 SIZE A0 NO 1	REV G. STEVENSON ACPT J. NUNN A. WATSON

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PLAN
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 By/par:
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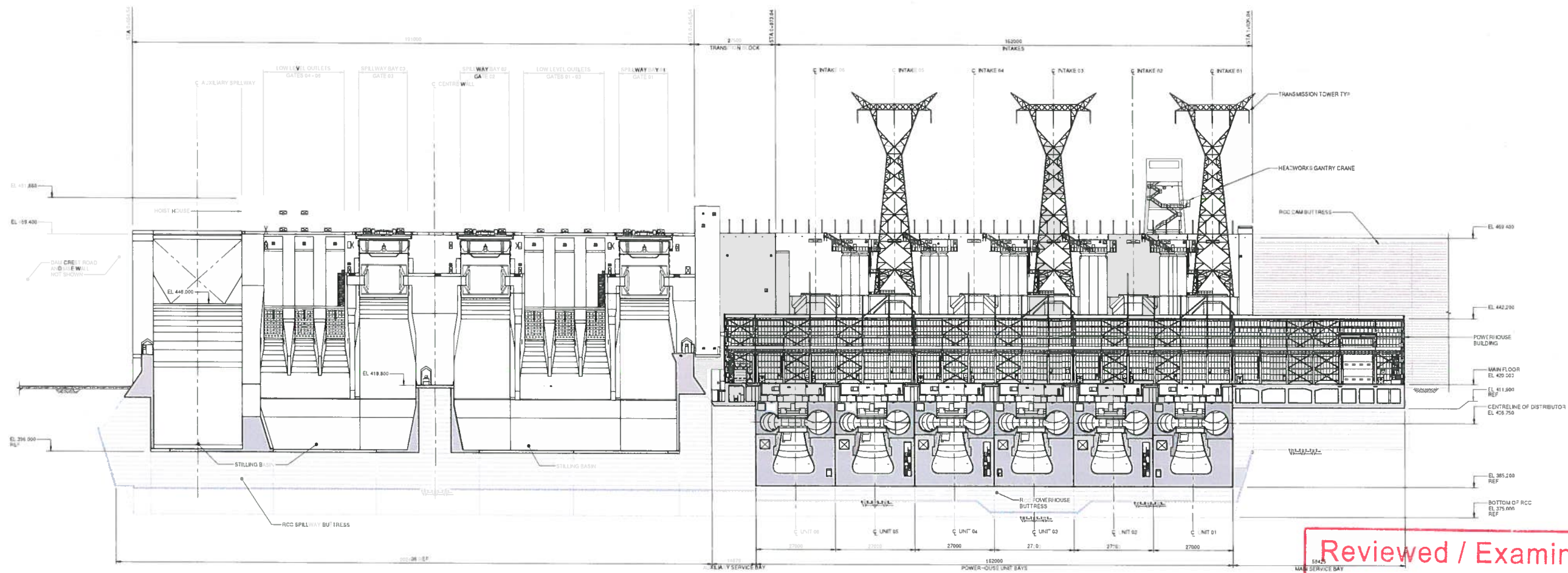
- NOTES:
- FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND SEE DWG 1020-C01-0056.
 - THIS GENERAL ARRANGEMENT DRAWING AS SHOWN REFLECTS THE COMPLETED CONDITION. EACH CONTRACTOR SHALL REFER TO THE CONTRACT FOR A COMPLETE DESCRIPTION OF THEIR SCOPE OF WORK.
 - FOR GENERAL ARRANGEMENT SECTION VIEWS THROUGH SPILLWAY BAYS AND LOW LEVEL OUTLETS SEE DWG 1020-C21-0105 AND 1020-C21-0106.

BC Hydro CONTRACT NO. 101417
ISSUED FOR INFORMATION
 BY: B. HULSMAN DATE: 26 JAN 2018
 HYDRO REPRESENTATIVE

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE

SITE C CLEAN ENERGY PROJECT		ORIGINAL SEALED BY Dr. S. MOUSSEAU 15 DEC 2017 APEGBC	BC Hydro CLEAN ENERGY PROJECT - SITE C PROJECT SITE INTAKES, PENSTOCKS, POWERHOUSE, AND SPILLWAY GENERAL ARRANGEMENT PLAN	
DESGN S. MOUSSEAU INDEP CHK J. BRUCE DFTG BGP DFTG WK INSP CIV STR MECH GEO ELEC	REV A. MAIOROV L. TURCOTTE ACPT A. WATSON		DATE 15 DEC 2017	DWGNO 1020 - C 01 - 00060

REF#	DRAWING NUMBER	TITLE	REF#	DRAWING NUMBER	TITLE	NO	REMARKS	DATE	DESIGNED	INDEP CHK	DFTG CHK	INSP CIV	INSP STR	INSP MECH	INSP GEO	INSP ELEC	REV	ACPT
						0	ISSUED FOR CONSTRUCTION											



SECTION B
1:500

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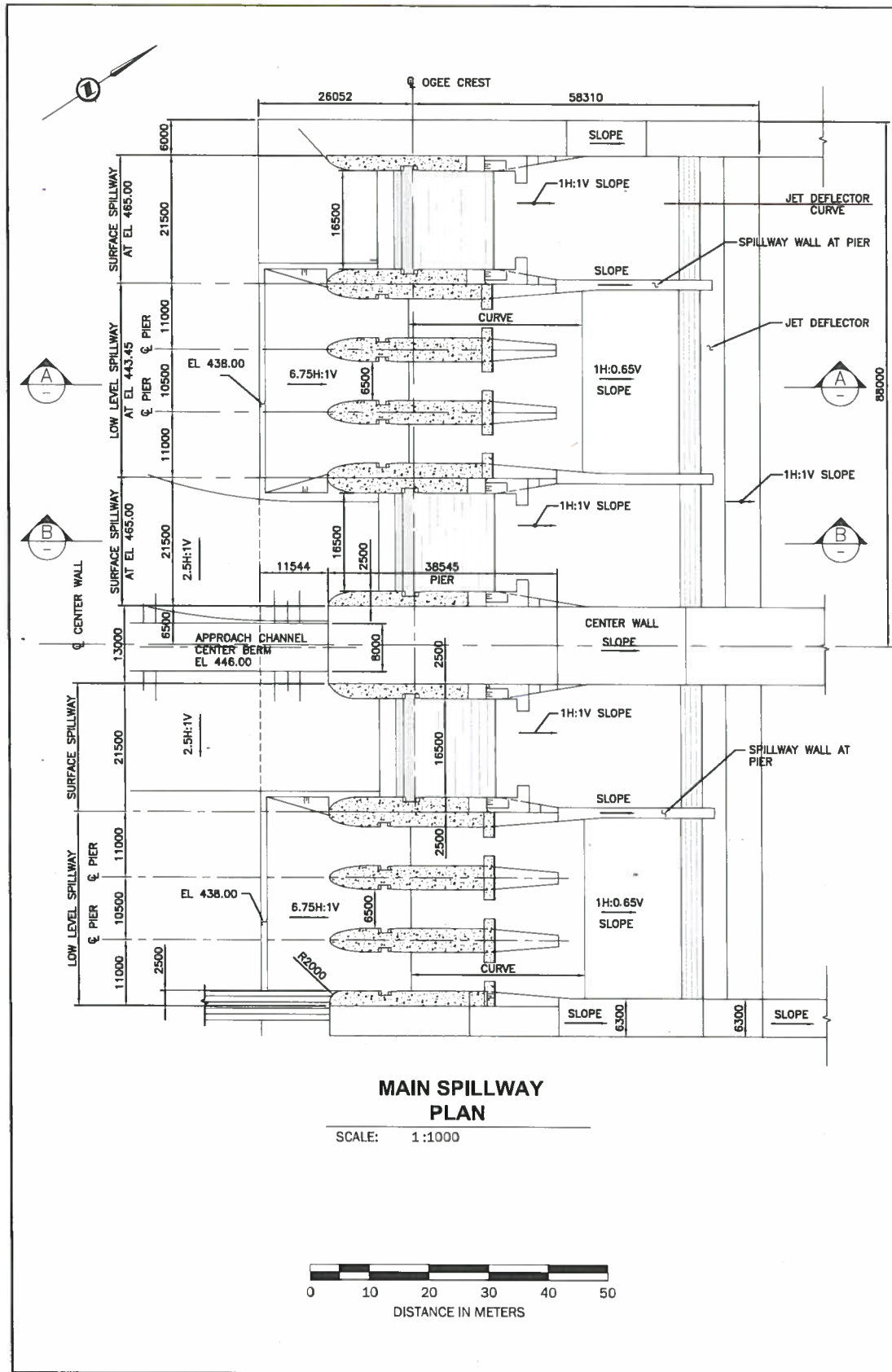
BC Hydro CONTRACT NO. 151417
ISSUED FOR INFORMATION
 BY: B. HILSMAN DATE: 25 JAN 2018
 HYDROS REPRESENTATIVE



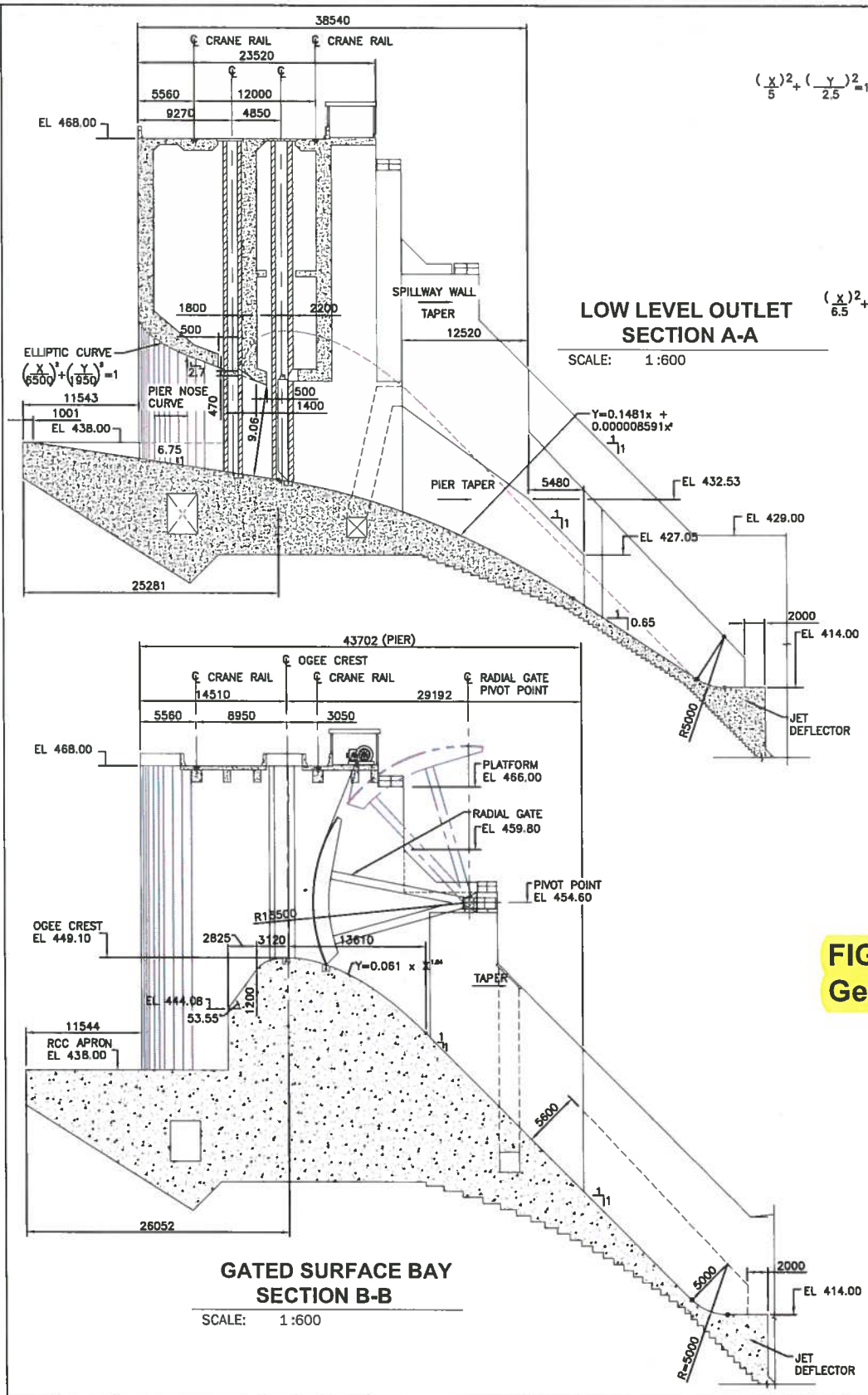
ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE

SITE C CLEAN ENERGY PROJECT		ORIGINAL SEALED BY Dr. S. MOUSSEAU 15 DEC 2017 APEGBC	BC Hydro CLEAN ENERGY PROJECT - SITE C PROJECT SITE INTAKES, PENSTOCKS, POWERHOUSE, AND SPILLWAY GENERAL ARRANGEMENT LONGITUDINAL SECTION
DSGN: S. MOUSSEAU INSP: J. BRUCE DFTG: BGP WK: WK INSP: CIV STR MECH GED ELEC	REV: A. MAJROV L. TURCOTTE ACFT: A. WATSON		

REF#	DRAWING NUMBER	TITLE	REF#	DRAWING NUMBER	TITLE	NO	ISSUED FOR CONSTRUCTION	REMARKS	DATE	DESIGNED	INSP	DFTG	INSP	INSP	INSP	INSP	INSP	REV	ACFT
		REFERENCE DRAWINGS			REFERENCE DRAWINGS														

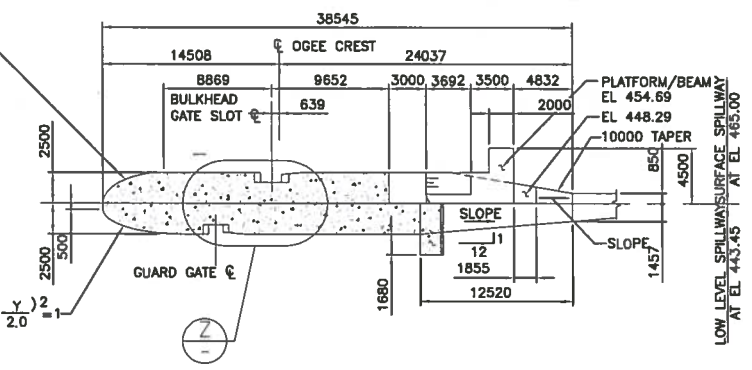


MAIN SPILLWAY PLAN
SCALE: 1:1000

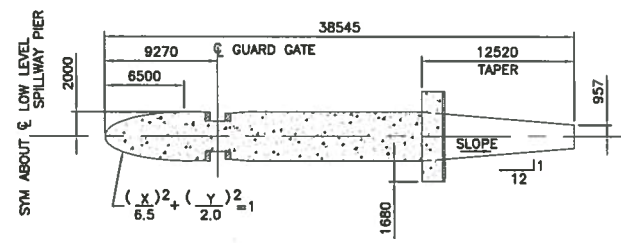


GATED SURFACE BAY SECTION B-B
SCALE: 1:600

LOW LEVEL OUTLET SECTION A-A
SCALE: 1:600



COMBINED SURFACE AND LOW LEVEL SPILLWAY PIER DETAIL
SCALE: 1:600



LOW LEVEL SPILLWAY PIER DETAIL
SCALE: 1:600

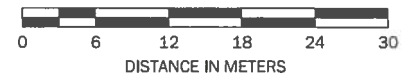
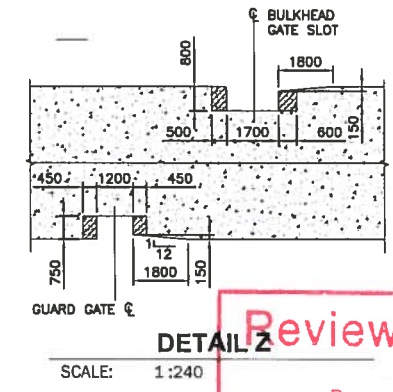


FIGURE 6 - Engineering drawing of Generating Station Spillway, revised design



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By/par: COLIN PARKINSON
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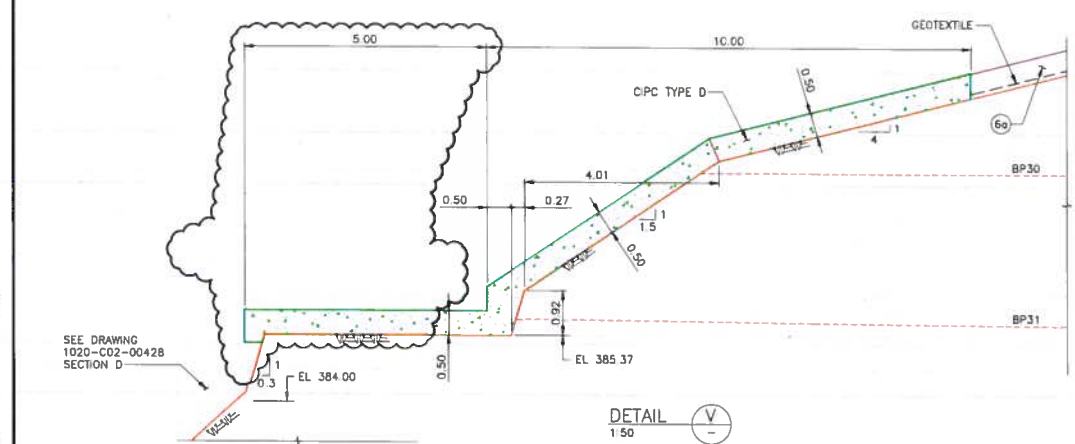
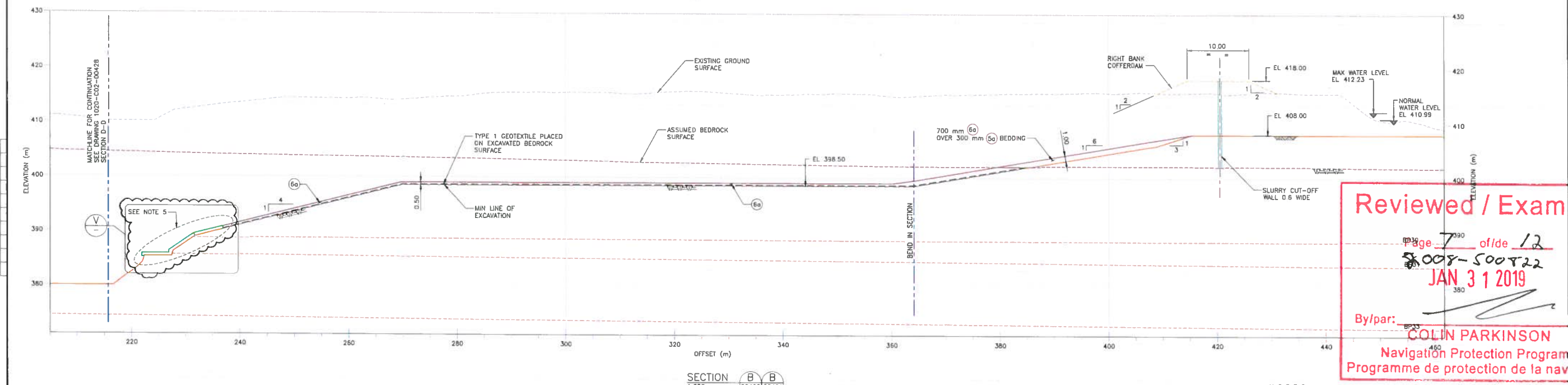
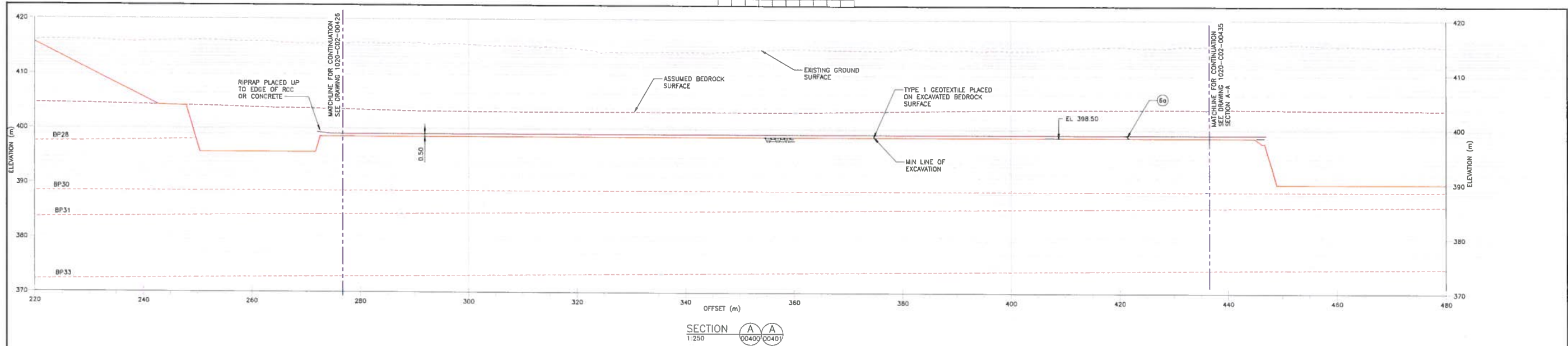
NOTES:
1. Reference: BC Hydro Drawing 1016-C14-05902 REV. F, 1016-C14-05904 REV. N, 1016-C14-05905 REV. C and 1016-C14-05919 REV. B
2. All dimensions are in millimeters and elevation are in meters

SCALE:	-----	CLIENT:	-----
REVISION NO:	-----		
DRAWN BY:	G.Carier		
DATE:	02-FEB-2015		
DRAWING NO:	046-102-1205_07		



PROJECT:
SITE C CLEAN ENERGY PROJECT
Hydraulic Scale Model Study
TITLE:
Main spillway - final layout



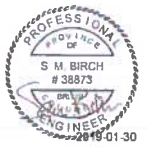


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 JAN 31 2019
 By/par: COLIN PARKINSON
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- NOTES:
- FOR TAILRACE EXCAVATION GENERAL NOTES SEE DRAWING 1020-C22-00400.
 - BEDDING PLANE (BP) LOCATIONS ARE APPROXIMATE AND ARE BASED ON AVAILABLE INFORMATION. DURING CONSTRUCTION, CONTRACTOR SHALL ADVISE HYDRO'S REPRESENTATIVE OF ANY DISCREPANCIES IN THE BP LOCATIONS.
 - THE ASSUMED BEDROCK SURFACE HAS BEEN GENERATED FROM THE INTERPRETATION OF AVAILABLE DATA AND IS THEREFORE APPROXIMATE.
 - NORMAL WATER LEVEL CORRESPONDS TO 2-YEAR RETURN FLOOD EVENT (Q=2000 m³/s). MAX. WATER LEVEL CORRESPONDS TO MAXIMUM POSSIBLE FLOW THROUGH DIVERSION TUNNELS (Q=3280 m³/s).
 - FOR ROCK TRAP CONCRETE OUTLINE AND REINFORCEMENT SEE DRAWINGS 1020-C22-01001 AND 1020-C22-02001.

LEGEND:

- (60) RIPRAP BEDDING
- (50) PERMANENT RIPRAP
- CIPC TYPE D
- GEOTEXTILE



BC Hydro CONTRACT NO. 1020-C22-00400
ISSUED FOR CONSTRUCTION
 BY: *S.M. Birch*
 FOR HYDRO'S REPRESENTATIVE: ROSS TURNER
 DATE: 2018-02-01

ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE

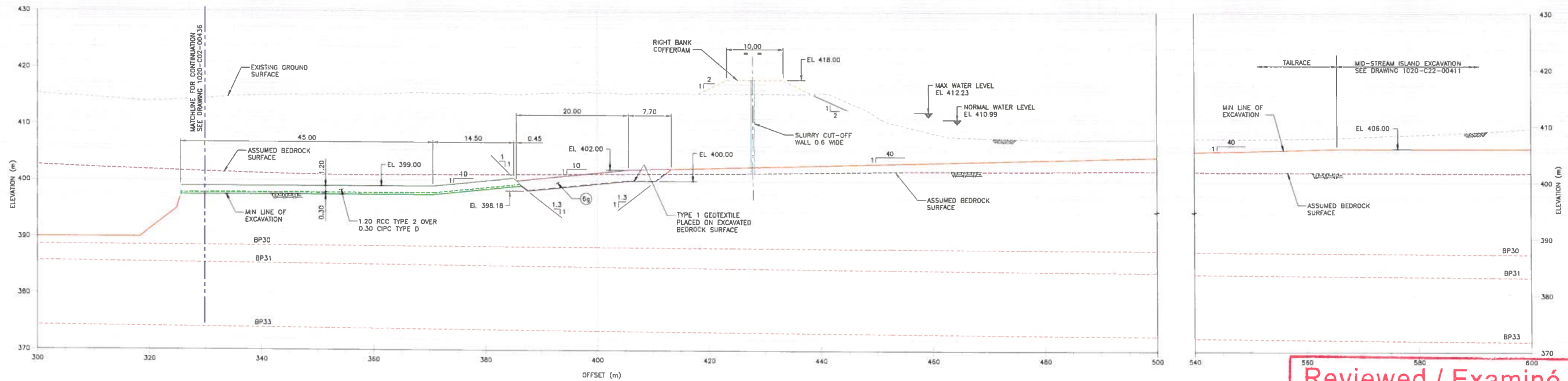
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INDEP. CHK	K. QAVAMI
DFTG. CHK	AKL
DFTG. CHK	PKL
INSP.	NH
INSP. CNV	STR
INSP. MECH	GED
INSP. ELEC	ELEC
REV.	B. MASSE B. GAGNE
ACPT.	A. WATSON

CLEAN ENERGY PROJECT - SITE C
 TAILRACE
 TAILRACE CHANNEL
 EXCAVATION AND FILL
 SECTIONS A, B AND DETAIL V

NO.	REVISIONS	DATE	DESIGNED	INSP. CHK	DFTG. CHK	INSP. CNV	INSP. MECH	INSP. ELEC	REV.	ACPT.
2	ROCK TRAP REVISED IN SECTION B AND DETAIL V. NOTE 5 ADDED. ISSUED FOR CONSTRUCTION.	25AUG2018	S.M. BIRCH	KQ	AKL	NH	PKL			
1	ROCK TRAP AND 4H 1V SLOPE REVISED	25AUG2018	S.M. BIRCH	KQ	AKL	NH	PKL			

REF#	DRAWING NUMBER	TITLE	REF#	DRAWING NUMBER	TITLE
		REFERENCE DRAWINGS			REFERENCE DRAWINGS

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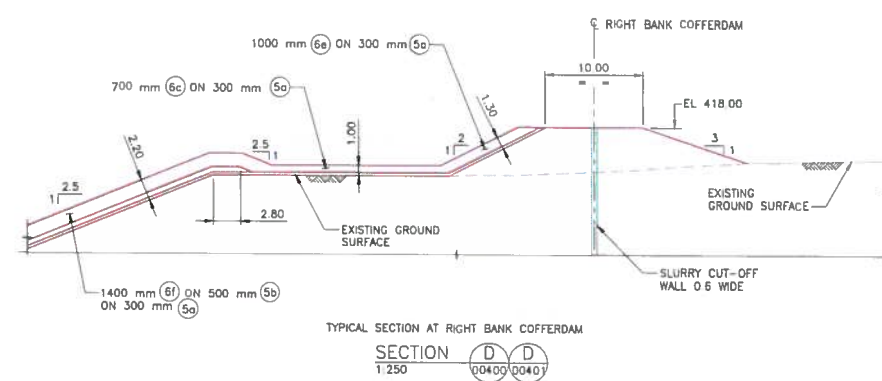
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Reviewed / Examiné

Page 8 of 12
 2008-500 F22
 JAN 31 2019

By/par: COLIN PARKINSON

NOTES: **Navigation Protection Program / Programme de protection de la navigation**



TYPICAL SECTION AT RIGHT BANK COFFERDAM
 SECTION D D
 1:250 00400 00401

- NOTES:
1. TAILRACE EXCAVATION GENERAL NOTES SEE DRAWING 1020-C22-00400
 2. BEDDING PLAN (BP) LOCATIONS ARE APPROXIMATE AND ARE BASED ON AVAILABLE INFORMATION. DURING CONSTRUCTION, CONTRACTOR SHALL ADVISE HYDRO'S REPRESENTATIVE OF ANY DISCREPANCIES IN THE BP LOCATIONS.
 3. THE ASSUMED BEDROCK SURFACE HAS BEEN GENERATED FROM THE INTERPRETATION OF AVAILABLE INVESTIGATION DATA AND IS THEREFORE APPROXIMATE.
 4. NORMAL WATER LEVEL CORRESPONDS TO 2-YEAR RETURN FLOOD EVENT (Q=2000 m³/s). MAX. WATER LEVEL CORRESPONDS TO MAXIMUM POSSIBLE FLOW THROUGH DIVERSION TUNNELS (Q=3280 m³/s).

- LEGEND:
- (5a) RIPRAP BEDDING
 - (5b) PERMANENT RIPRAP
 - (6c) PERMANENT RIPRAP
 - (6a) PERMANENT RIPRAP
 - (6f) PERMANENT RIPRAP
 - (6g) PERMANENT RIPRAP
 - GEOTEXTILE

BC Hydro CONTRACT NO. REF 520938
ISSUED FOR CONSTRUCTION
 BY: W VAN GASSEN FOR R PEEVER DATE: 02SEPT2016
 HYDRO'S REPRESENTATIVE



ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE

BC Hydro

CLEAN ENERGY PROJECT - SITE C
 TAILRACE
 TAILRACE CHANNEL
 EXCAVATION AND FILL

SECTIONS C AND D

1020-C22-00404
 A0 1

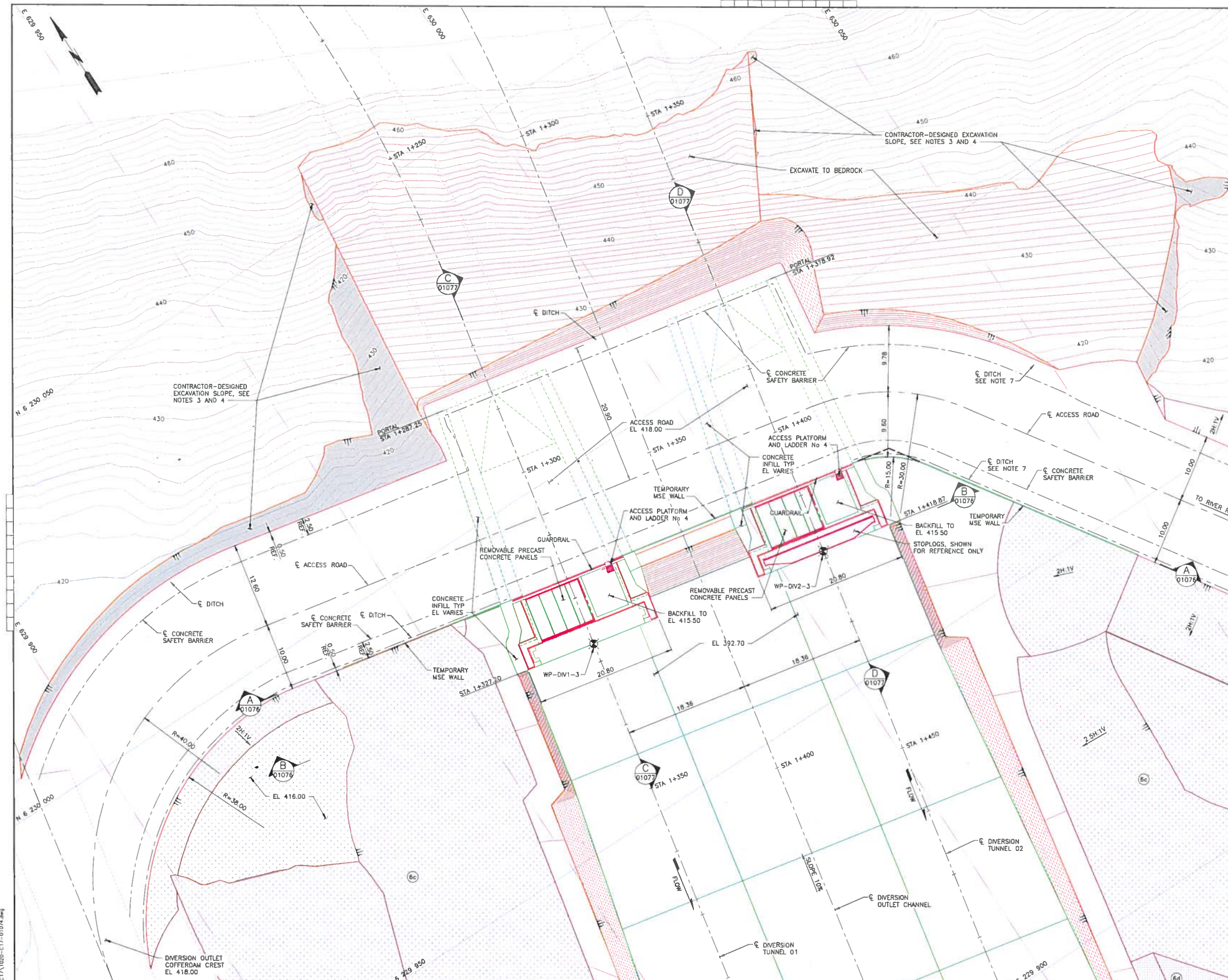
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INDEPENDENT CHECK	K. QAVANI
DRAWING CHECK	AKL
FIELD CHECK	PKL
INSPECTION	NH
REVISIONS	
REV	B. MASSE B. GAGNE
ACPT	A. WATSON

ORIGINAL SEALED BY
 S. M. BIRCH
 25 AUG 2016
 P. ENG.
 APEGBC

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		REFERENCE DRAWINGS			REFERENCE DRAWINGS

NO	REMARKS	DATE	DESIGNED	INDP. CHK	DFTG. CHK	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION
1	HOLD REMOVED.	25AUG2018	S. M. BIRCH	KQ	AKL	PKL	NH	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION	INSPECTION



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Page 10 of 12
2007-500822
JAN 31 2019

By/par:
COLIN PARKINSON
 Navigation Protection Program /
 Programme de protection de la navigation

- DIVERSION OUTLET GENERAL NOTES:**
1. FOR DIVERSION GENERAL NOTES AND LEGEND, SEE DWG 1020-C17-00005.
 2. FOR WORK POINT COORDINATES, SEE DWG 1020-C17-00005.
 3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE EXCAVATION SLOPES. ALL REQUIRED SUPPORT AND ALL SAFETY MEASURES IN AREAS INDICATED.
 4. EXTENTS AND LIMITS OF CONTRACTOR-DESIGNED EXCAVATION SLOPES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR DESIGN MAY DIFFER.
 5. CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN OF ACCESS ROAD. ACCESS ROAD DETAILS AND SAFETY MEASURES ARE SHOWN FOR REFERENCE ONLY.
 6. THE ASSUMED BEDROCK SURFACE HAS BEEN GENERATED FROM THE INTERPRETATION OF AVAILABLE FIELD INVESTIGATION DATA AND IS THEREFORE APPROXIMATE.
 7. CONTRACTOR SHALL MANAGE DRAINAGE OF WATER FROM DITCHES.
 8. ROCK SUPPORT NOT SHOWN.

- LEGEND:**
- CONTRACTOR-DESIGNED EXCAVATION SLOPE
 - PERMANENT RIPRAP
 - PERMANENT RIPRAP
 - ASSUMED BEDROCK CONTOURS
 - OVERBURDEN AND EXISTING GROUND CONTOURS

BC Hydro CONTRACT NO. REF 520938
ISSUED FOR CONSTRUCTION
 BY R. PEEVER HYDRO'S REPRESENTATIVE DATE 12 JAN 2015



ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE

 BC Hydro	CLEAN ENERGY PROJECT - SITE C DIVERSION - TUNNELS OUTLET - STRUCTURES 01 AND 02 GENERAL ARRANGEMENT PLAN								
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REV: G. STEVENSON ACPT: J. NUNN A. WATSON	DATE: 09 DEC 2015 DWG NO: 1020-C17-01074 SIZE: A0 R: 0								
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NO. REMARKS REVISIONS	DESIGNED: INDEP CHK: DFTG CHK: INSP CV: INSP STR: INSP MECH: INSP GEO: INSP ELEC: REV: ACPT:								

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 12/22/15



Reviewed / Examiné

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 2008-50082a
 JAN 31 2019

By/par:
COLIN PARKINSON
 Navigation Protection Program /
 Programme de protection de la navigation

- DIVERSION INLET GENERAL NOTES:**
- FOR DIVERSION GENERAL NOTES AND LEGEND, SEE DWG 1020-C17-00005.
 - FOR WORK POINT COORDINATES, SEE DWG 1020-C17-00005.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE EXCAVATION SLOPES, ALL REQUIRED SUPPORT AND ALL SAFETY MEASURES IN AREAS INDICATED.
 - EXTENTS AND LIMITS OF CONTRACTOR-DESIGNED EXCAVATION SLOPES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR DESIGN MAY DIFFER.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, ALL REQUIRED SUPPORT AND ALL REQUIRED SAFETY MEASURES FOR THE PEDESTRIAN ACCESS STAIRWAY AND PEDESTRIAN ACCESS BRIDGE.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN OF ACCESS ROAD. ACCESS ROAD DETAILS AND SAFETY MEASURES ARE SHOWN FOR REFERENCE ONLY.
 - THE ASSUMED BEDROCK SURFACE HAS BEEN GENERATED FROM THE INTERPRETATION OF AVAILABLE FIELD INVESTIGATION DATA AND IS THEREFORE APPROXIMATE.
 - CONTRACTOR SHALL MANAGE DRAINAGE OF WATER FROM DITCHES.
 - ROCK SUPPORT NOT SHOWN.

- LEGEND:**
- CONTRACTOR-DESIGNED EXCAVATION SLOPE
 - PERMANENT RIPRAP
 - TEMPORARY RIPRAP
 - ASSUMED BEDROCK CONTOURS
 - OVERBURDEN AND EXISTING GROUND CONTOURS

BC Hydro CONTRACT NO. REF 520938
ISSUED FOR CONSTRUCTION
 BY R. PEEVER DATE 12/JAN/2016
 HYDRO'S REPRESENTATIVE

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 ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE

BC Hydro

CLEAN ENERGY PROJECT - SITE C
DIVERSION - TUNNELS
INLET - STRUCTURES 01 AND 02

GENERAL ARRANGEMENT PLAN

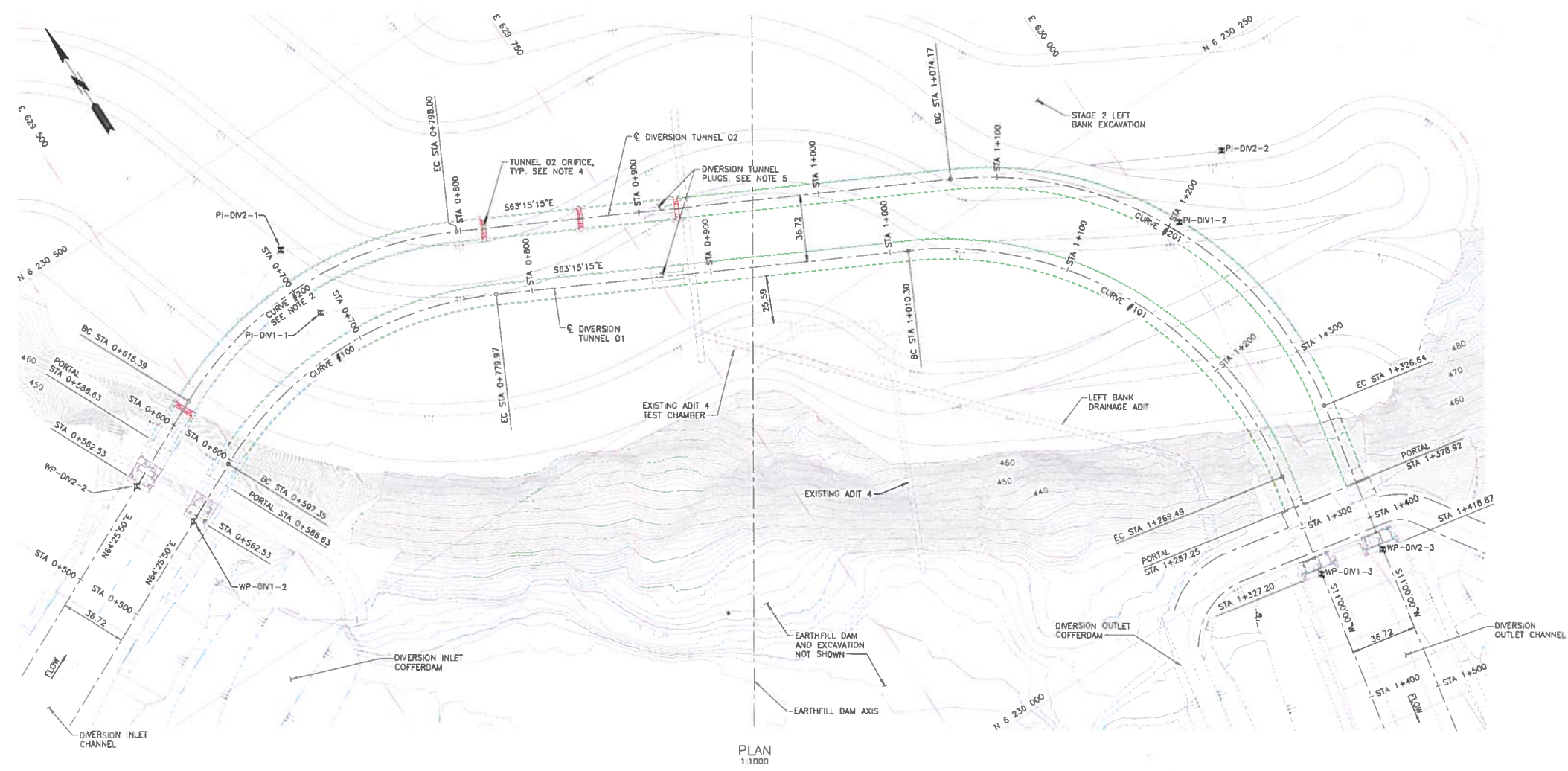
1020-C17-01000

DSGN	S. DOUGLAS
NDP/CHK	A. WEIN
DFTG	VY
DFTG/CHK	PKL
NSP	NH
	CV STR MECH GEO ELEC
REV	G. STEVENSON
ACPT	J. NUNN A. WATSON

ORIGINAL SEALED BY
 S. J. DOUGLAS
 09 DEC 2015
 P. ENG
 APEGBC

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		REFERENCE DRAWINGS			REFERENCE DRAWINGS													



TUNNEL 01			
STATION	EASTING	NORTHING	
PORTAL	0+586.63	629483.622	6230350.422
BC	0+597.35	629493.299	6230355.051
EC	0+779.97	629669.626	6230353.242
BC	1+010.30	629875.312	6230249.586
EC	1+269.49	629981.631	6230032.822
PORTAL	1+287.25	629978.242	6230015.387

CURVE DATA (SEE NOTE 6)				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
100	52°18'56"	200.00 m	182.62 m	98.23 m
101	74°15'15"	200.00 m	259.20 m	151.41 m

TUNNEL 02			
STATION	EASTING	NORTHING	
PORTAL	0+586.63	629467.774	6230383.545
BC	0+615.39	629493.718	6230395.950
EC	0+798.0	629670.046	6230394.149
BC	1+074.17	629916.662	6230269.867
EC	1+326.84	630022.990	6230053.152
PORTAL	1+378.92	630014.285	6230008.388

CURVE DATA (SEE NOTES 2 & 6)				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
200	52°18'56"	200.00 m	182.62 m	98.23 m
201	74°15'15"	200.00 m	259.20 m	151.41 m

ABBREVIATIONS
 BC - BEGINNING OF CURVE
 EC - END OF CURVE
 PI - POINT OF INTERSECTION
 WP - WORK POINT

- DIVERSION TUNNEL GENERAL NOTES:**
- FOR DIVERSION GENERAL NOTES, LEGEND, WORK POINTS AND PI COORDINATES, SEE DWG 1020-C17-00005.
 - FOR WORK POINTS DETAILING THE LAYOUT OF CURVE #200, SEE DWG 1020-C17-00224.
 - ALL TUNNEL CURVES MAY BE CONSTRUCTED USING STRAIGHT SEGMENTS. DEFLECTION ANGLES BETWEEN SUCCESSIVE STRAIGHT (CYLINDRICAL) SEGMENTS SHALL NOT EXCEED 5°.
 - ORIFICE LOCATIONS SHOWN FOR REFERENCE. FOR DETAILS SEE DWGS 1020-C17-00224, 1020-C17-00225 AND 1020-C17-00227. ORIFICES TO BE INSTALLED AT THE END OF DIVERSION STAGE 2 AND PRIOR TO RESERVOIR FILLING.
 - DIVERSION TUNNEL PLUGS SHOWN FOR REFERENCE. FOR DETAILS SEE DWGS 1020-C17-02010 AND 1020-C17-02011.
 - TUNNEL STATIONING AND CURVE GEOMETRY REFLECT HORIZONTAL DISTANCES ONLY. VERTICAL PROFILE IS IGNORED.

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 Page 12 of de 12
 2008-500822
 JAN 31 2019
 By/par:
COLIN PARKINSON
 Navigation Protection Program /
 Programme de protection de la navigation

BC Hydro CONTRACT NO. REF 520938
ISSUED FOR CONSTRUCTION
 BY R. PEEVER HYDRO'S REPRESENTATIVE DATE 12JAN2016

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Stalin Olypin Design **INC-LAYALIN**

BC Hydro
 CLEAN ENERGY PROJECT - SITE C
 DIVERSION - TUNNELS 01 AND 02
 GENERAL ARRANGEMENT
 PLAN
 1020-C17-00200
 SIZE A0 P 0

NO	DATE	DESIGNED	INSP	DFTG	CHK	REV	ACPT
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2							J. NUNN A. WATSON

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