



Peace Project Water Use Plan

Implementation Year 9

Reference: GMSWORKS-19

Williston Reservoir Trial Tributaries

Implementation Year 9

2019 - Ole Creek Engineering Inspection Report

Study Period: 2019

Kerr Wood Leidal

December 12, 2019

Site Inspection Report

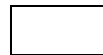
PROJECT:	2019 WILLISTON TRIAL TRIBUTARIES POST-CONSTRUCTION MONITORING				
CLIENT:	BC Hydro				
TO:	Teri Neighbour, Water License Requirements, Environment				
SITE NAME:	6 Mile Creek				
REPORT DATE:	December 12, 2019				
FILE NO.:	BC Hydro Contract 00093683 & KWL File: 0478.189				
PREPARED BY:	Stefan Joyce, PEng	ON SITE	May 7: 9 am May 8: 8 am	OFF SITE	May 7: 5:30 pm May 8: 3:00 pm
INSPECTION DATE:	May 7 & 8, 2019	WEATHER	May 7: cool, overcast, and windy May 8: mild, some cloud cover, and light wind		
TAILGATE MEETING NOTES	Reviewed hazards, risks, game plan for day and check-in schedule. Confirmed safety gear and equipment. <i>{Used in this form in lieu of KWL "Appendix B04-Tailgate Meeting"}</i>				

KWL STAFF		EMERGENCY CONTACT	
Stefan Joyce	{Original hardcopy signed}	Nearest Hospital: Mackenzie District Hospital 45 Centennial Dr., Mackenzie BC	
Tom Claxton	{Original hardcopy signed}		
Peter Collins	{Original hardcopy signed}		
Planned Daily Activities		Emergency Services	911
Survey and inspection (May 7, 2019)		Hospital (non-emergency):	250-997-3263
Survey and inspection (May 8, 2019)		Police (non-emergency):	250-997-3288
		Wildfire Management	1-800-663-5555
		Client Project Manager	<i>Teri Neighbour</i> 604 528-7716
		On-site First aid Attendant	Peter Collins
Additional Identified Hazards		Additional Identified Hazard Mitigation	
Creek flows were low enough to safely cross in several locations.		Swift water safety measures (staff trained in swift water). Wear PFDs and throw ropes. Minimum of 1 person on shore spotting the other person while crossing or surveying creek bed. Do not enter creek in areas that are considered to be unsafe to cross with waders for survey.	

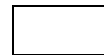
Site Hazard Assessment and Safety Plan reviewed?



YES



NO



N/A

1.0 SURVEY SUMMARY

- Flows in Six Mile Creek were low enough to safely survey most areas.
- The 2019 survey extents are presented in the enclosed drawings.
- Berm profiles and sections are presented on the survey drawings showing the 2014 pre-construction, 2014 post-construction, and both the 2016 and 2019 follow up surveys. The 2016 survey is not shown in plan for clarity.
- The 2019 survey drawings used the record drawings as the base and have retained the 2014 drawing numbering of 1000-C1800063 and 1000-C1800064 for plan and profile of Six Mile Creek. 2019 cross section drawing was added to drawing numbers 1000-C1800067 and 1000-C1800068 which had been added in 2016 to follow the numbering from the 2014 drawing set. Digital survey data was also provided for BC Hydro's records.

2.0 GENERAL SITE OBSERVATIONS:

- As observed in 2016, the works are continuing to perform well, and the creek is still maintaining a single thread.
- Due to the low reservoir level and creek flows, all the berms were exposed and could be fully inspected. The water level of the reservoir was not able to be surveyed as it was too low and far from the project site at the time of the work. The reservoir level was estimated to be between approximately 656.7 m and 656.8 m (on May 7 and 8, 2019).
- The upstream most berm (Berm 'J') continues to effectively prevent an avulsion around the lower works.
- There appears to be more flow in the right side channel between Berm 'F' and 'G', and some significant channel erosion has happened on the right bank of the right side channel across from the downstream end of Berm 'G'. This is not presently a concern, but should be monitored.
- No significant damage to the works was observed and the berm geometry largely has been preserved.
- The majority of the coir on the surface of the soil wraps is holding up very well and no bulk bags (white material) have become exposed. A small section of coir on Berm 'C' has been damaged / decomposed where it is more exposed to the elements, wave and debris action, but the berm is still functioning well. Some decomposition of the coir is expected after 5 years and full decomposition of the coir generally happens after about 10-12 years.
- The erosion control matting (ECM) has almost completely deteriorated (as expected).
- The large woody debris (LWD) has remained stable reinforcing the berm toe and appears to be creating some habitat complexity along the creek in some areas, as intended. There were some sections of LWD that have become partially buried by sediment and so appear to be not providing fish habitat in the active creek with water levels at the time of site visit.
- Please refer to the enclosed survey drawings, the 2016 inspection report¹, and the construction completion report².



PHOTO 1 (Panoramic): Single Thread Channel Looking Downstream from Berm 'B' (repeat of 2016 Ph#1)

¹ KWL, May 14, 2018, 2016 Williston Reservoir Trial Tributaries Post-Construction Monitoring – Six Mile Creek, KWL File: 0478.189.

² KWL, February 2015, Construction Completion Report: GMSWORKS #19 Williston Reservoir Trial Tributaries – BC Hydro Report No. N3700.



PHOTO 2 (Panoramic): Single Thread Channel Looking Downstream from Downstream End of Berm 'C'
(repeat of 2016 Ph#2)



PHOTO 3 (Panoramic): Channel Along Sharp Bend Along Berm 'J' (Note Panoramic Exaggerates Bend)
(repeat of 2016 Ph#3)



**PHOTO 4: Deteriorating ECM (above) & Coir Soil Wraps in Good Condition (below)
(repeat of 2016 Ph#4)**



**PHOTO 5: Decomposing ECM
(repeat of 2016 Ph#5)**

3.0 BERM GEOMETRY, EROSION AND AGGRADATION, CHANNEL OBSERVATIONS

List of berms (in order from reservoir to upland):

3.1 Berm 'A': LWD and buried bulk bag (left bank)

- Berm 'A' was fully exposed due to the low reservoir and creek levels (it was submerged in 2016).
- This berm is considered to be less critical than the upper berms relative to the overall function of the works.
- Berm A is in good condition. No erosion has occurred to the berm core, and it is continuing to effectively block off left side secondary channels.



PHOTO 6 (Panoramic): Looking Downstream at Berm 'A'



PHOTO 7 (Panoramic): Looking at Berm 'A' from Across the Creek (Right Bank)



PHOTO 8: Looking at Berm 'A' from Left Bank



PHOTO 9: Looking Upstream at Berm 'A'

3.2 Berm 'G': Non-vegetated geogrid soil wrap (left bank):

- Berm 'G' was fully exposed due to low reservoir and creek levels (it was mostly submerged in 2016).
- The berm crest appears to be generally in good condition and there is no significant berm settlement or erosion to the majority of the berm crest and profile based on the survey (see Profile on DWG 1000-C1800064-R3, and Sections 0+800 through 0+820 on 1000-C1800068-R1). The limited local erosion noted in 2016 (see Section 0+800) has not noticeably increased.
- Some channel erosion and deposition are evident in the vicinity of Stations 0+820 and 0+0840 since 2014.
- Significant bank erosion is noted on the right bank since 2014 in the vicinity of 0+860. This is not considered to be a concern to the function of the works and maintaining a 'single-thread' channel.
- The coir geogrid fabric is still intact and in good condition where visible.
- The large woody debris (LWD) was in good condition and is protecting the berm, however some sections of the LWD have become partially buried by sediment and so appear to not be providing fish habitat in the active creek with water levels at the time of site visit.
- The ECM has almost completely deteriorated, as expected.



PHOTO 10: Looking Downstream at Berm 'A' and Berm 'G' (repeat of 2016 Ph#6)



PHOTO 11 (Panoramic): Looking Upstream at Berm 'G' (repeat of 2016 Ph#7)



PHOTO 12 (Panoramic): Looking Downstream at Berm 'G' (repeat of 2016 Ph#8)



PHOTO 13: Survey of Toe of Berm 'G' on Creek Side (repeat of 2016 Ph#9)



PHOTO 14: Berm 'G' Coir Geogrid & LWD, and sedimentation (repeat of 2016 Ph#10)

3.3 Berm 'F': Non-vegetated geogrid soil wrap (left bank)

- Berm 'F' was fully exposed due to low reservoir and creek levels.
- The berm appears to be in good condition. There appears to be a limited settlement or erosion based on the survey, however no significant observations were noted in the field (see Profile on DWG 1000-C1800064-R3, and Sections 0+660 through 0+760 on DWG 1000-C1800068-R1). There appears to be deposition on the berm crest.
- The LWD is in good condition and has not displaced. There are some eroded pools and gravel deposition at the toe around the LWD, which was desired for habitat, but there is also some deposition of sediment since 2014.
- The creek channel closer to the thalweg (lowest point) appears to have scoured down to some degree since the berm was constructed, likely due to the greater concentration of flow, as shown on the profile on DWG 1006-C18-00063 & 1006-C18-00064.
- The ECM is almost completely deteriorated along water side top of berm.
- There was a layer of sand/silt covering berm and some areas of the toe u/s of the large deposited log.
- Exposed coir geogrid material used in the soil wraps is in good condition and functioning well.
- Erosion appears to have occurred downstream of the berm where the ground is 'natural' (see Photo 17).
- Coir geogrid tie-in at upstream end of Berm 'F' has become exposed at the tie-in with Berm 'D'. This could result in a local failure of the coir in the future, and should be monitored. (See Photo 19).
- There appears to be more flow on the right side channel across from Berm 'F' and 'G'. This is not a present concern.



PHOTO 15 (Panoramic): Looking Upstream from Berm 'G' to Berm 'F'(repeat of 2016 Ph#11)



PHOTO 16 (Panoramic): Looking Downstream at Berms 'D' and 'F'



PHOTO 17: Downstream End of Berm 'F' Looking Upstream. Possible Erosion Downstream of Berm in 'Natural' Area (wet area in centre of Photo) (repeat of 2016 Ph#12)



PHOTO 18: Berm 'F' Looking Upstream (Note Damaged/Decomposing ECM) (repeat of 2016 Ph#13)



PHOTO 19: Coir Geogrid Matting becoming loose at the tie in between berm 'F' & 'D'



PHOTO 20: Sediment and Riffle at Approx. 0+640



PHOTO 21: Berm 'F' Looking Upstream (Note Damaged/Decomposing ECM) (repeat of 2016 Ph#14)



PHOTO 22: Upstream End of Berm 'F' Looking Upstream (repeat of 2016 Ph#15)



PHOTO 23: LWD and Channel Erosion and Deposition Looking Downstream (repeat of 2016 Ph#16)



PHOTO 24: LWD and Channel Erosion and Deposition Looking Upstream (repeat of 2016 Ph#17)



PHOTO 25: Deposited Log Along LWD and Deteriorating ECM (repeat of 2016 Ph#18)



PHOTO 26: Coir Geogrid "Soil Wrap" Layers in Good Condition. Note Upper Layer is ECM (repeat of 2016 Ph#19)

3.4 Berm 'D': LWD and buried bulk bag (left bank)

- The berm is in good condition. No significant settlement or erosion was observed in the field or noted in the survey (see Profile on DWG 1000-C1800063-R3, and Sections 0+620 and 0+640 on DWG 1000-C1800068-R1)
- The LWD is in good condition and is not displaced.
- The ECM (erosion control matting) has mostly deteriorated and there is little remaining.
- The creek eroded pools and deposited gravel material around LWD.
- This berm does not have coir soil wraps as erosion protection on its face as a variety of methods were utilized in this trial. There is no evidence of erosion observed on the berm face, however if it were to occur, then additional longitudinal LWD or coir soil wraps could be installed.



PHOTO 27 (Panoramic): Looking Downstream at Berm 'D' (repeat of 2016 Ph#20)



PHOTO 28 (Panoramic): Looking Upstream from Upstream End of Berm 'D' (repeat of 2016 Ph#21)



PHOTO 29: Looking Upstream at Berm 'D' (repeat of 2016 Ph#22)



PHOTO 30: LWD at Berm 'D' (repeat of 2016 Ph#23)



PHOTO 31: Material Used to Cover ECM When it Became Buoyant Still in Place, also Deposition (repeat of 2016 Ph#24)



PHOTO 32: Deposition and Erosion Near LWD (repeat of 2016 Ph#25)

3.5 Berm 'B': Non-vegetated geogrid soil wrap (left bank)

- Berm in good condition. No significant settlement or erosion observed in the field or noted in the survey (see Profile on DWG 1000-C1800063-R3, and Sections 0+540 and 0+560 on DWG 1000-C1800067-R1)
- LWD is in good condition and is not displaced.
- There appears to be some erosion near the toe and deposition mid-channel, which is confirmed on Section 0+540.
- The coir material in the soil wraps is in good condition.
- ECM is deteriorating where exposed (not covered with sand/cobble to prevent floating).
- Overland flow blockage / roughness (buried LWD) are not disturbed and in good condition (See Photos 37 and 38).



PHOTO 33 (Panoramic): Looking Downstream at Berm 'B' (repeat of 2016 Ph#26)



PHOTO 34 (Panoramic): Looking Upstream at Berm 'B' (repeat of 2016 Ph#27)



PHOTO 35: Coir Soil Wraps in Good Condition (repeat of 2016 Ph#28)



PHOTO 36: Some Channel Deposition and Erosion (repeat of 2016 Ph#29)



PHOTO 37: Downstream line of buried LWD



PHOTO 38: Upstream line of buried LWD

3.6 Berm 'C': Vegetated geogrid soil wrap (left bank)

- Berm 'C' is in good condition with no significant settlement or erosion observed in the field or noted in the survey (see Profile on DWG 1000-C1800063-R3, and Sections 0+380 and 0+460 on DWG 1000-C1800067-R1)
- The LWD is in good condition and has not displaced.
- Most of the willows (2014 live brush and stakes) do not appear to have survived however there are a few areas where the willow has taken (see Photo 47). It was also early in the season, so it is likely that additional growth will take hold above the reservoir this summer.
- The upstream half of the berm had good grass growth on the crest (see Photos 49 & 50).
- The coir geogrid is generally in good condition, however there is a section of damaged coir approximately 5 m long 3 to 4 m upstream from the downstream end of Berm 'C' (See Photo 46). The damage is potentially from ice, wave action, or debris. The damaged coir is considered to still be stable and it is not an issue at this time, however it should be monitored in future inspections.
- The ECM, where exposed, has significantly deteriorated.
- The rock spur at the downstream end is still intact (see Photo 43).
- The upstream tie-in location for Berm 'C' to the beaver pond is stable and has not changed since construction.



PHOTO 39 (Panoramic): Downstream end of Berm 'C' looking upstream (repeat of 2016 Ph#30)



PHOTO 40 (Panoramic): Berm 'C' looking upstream from downstream end (repeat of 2016 Ph#31)



PHOTO 41 (Panoramic): Looking downstream from upstream end of Berm 'C' (repeat of 2016 Ph#32)



PHOTO 42 (Panoramic): Intact beaver/habitat pond upstream of Berm 'C' (repeat of 2016 Ph#33)



PHOTO 43: Downstream end of Berm 'C' looking downstream (repeat of 2016 Ph#34)



PHOTO 44: Downstream end of Berm 'C' looking upstream (repeat of 2016 Ph#35)



PHOTO 45: Coir soil wraps, willow brush layers along berm and native grasses/reeds at toe (repeat of 2016 Ph#36)



PHOTO 46: Damaged coir, perhaps due to ice or waves



PHOTO 47: Few willow stakes took hold downstream berm area, but some growth (repeat of 2016 Ph#38)



PHOTO 48: Looking upstream at willow layers in the lower berm and grasses on crest (no active growth given time of site visit) (repeat of 2016 Ph#39)



PHOTO 49: Looking downstream along Berm 'C' (repeat of 2016 Ph#40)



PHOTO 50: Looking upstream at upstream end of Berm 'C' (repeat of 2016 Ph#41)

3.7 Berm 'J': Vegetated geogrid soil wrap (left bank)

- Berm 'J' has effectively protected the bank and kept the creek from eroding behind the works. The berm is in good condition. No significant settlement or erosion observed in the field or noted in the survey (see Profile on DWG 1000-C1800063-R3, and Sections 0+300 and 0+320 on DWG 1000-C1800067-R1)
- The LWD is in good condition and has been not displaced.
- The creek has eroded away the bank in front of the berm and there is now an approximately 10 m long section of riprap exposed to the water (see Photos 57, 58 & 65).
- Riprap launching toe trench has begun to 'launch' into eroded creek bank as expected and designed protecting the toe of Berm 'J' (see Photo 59).
- Willows are starting to come up and establish well all along berm at the time of the site visit (see Photo 63).
- Grass and other vegetation growing on top and on back side of berm.
- The ECM has almost completely deteriorated as expected.
- Some erosion was noted just downstream of the riprap on Berm 'J' (See Photo 64).
- Evidence of moose damage to crest of berm as noted in 2016.



PHOTO 51 (Panoramic): Downstream end of Berm 'J' looking upstream (repeat of 2016 Ph#42)



PHOTO 52 (Panoramic): Berm 'J' looking upstream. Beaver / habitat pond at right of the photo. (repeat of 2016 Ph#43)



PHOTO 53 (Panoramic): Looking downstream at Berm 'J' (repeat of 2016 Ph#44)



PHOTO 54 (Panoramic): Upstream end of Berm 'J' looking upstream (repeat of 2016 Ph#45)



PHOTO 55 (Panoramic): Looking Downstream at Berm 'J' from Left Bank of Creek



PHOTO 56 (Panoramic): Looking Downstream at Berm 'J' from Right Bank Bar



PHOTO 57: Eroding Bank and ‘launching’ riprap toe trench looking upstream (repeat of 2016 Ph#46)



PHOTO 58: Eroding bank and ‘launching’ riprap toe trench looking downstream (repeat of 2016 Ph#47)



PHOTO 59: Launching riprap toe (repeat of 2016 Ph#48)



PHOTO 60: Coir Geogrid “Soil Wraps”, willow, LWD, and riprap toe looking upstream (repeat of 2016 Ph#49)



PHOTO 61: Gravel bar across from Berm ‘J’ (repeat of 2016 Ph#50)



PHOTO 62: Soil wraps, willow brush layers, LWD and riprap looking downstream (repeat of 2016 Ph#51)



PHOTO 63: Willow starting to take in brush layers (repeat of 2016 Ph#52)



PHOTO 64: Erosion at downstream end of riprap toe protection



PHOTO 65: Launched Toe Riprap at Berm 'J'



PHOTO 66: Moose related damage on back-side slope of berm (repeat of 2016 Ph#55)

4.0 WOOD DEBRIS OBSERVATIONS

- There is very little accumulation of woody debris.
- Some isolated pieces and logs observed, such as at Berm 'F' as noted in Photo 18 above.

5.0 UPSTREAM CHANNEL OBSERVATIONS

- The creek has eroded the bank along the toe of Berm 'J' as noted in the section above.
- The channel upstream of the works and gravel bar across from 'Berm 'J' does not appear to have changed significantly since 2014.
- From a review of publicly available GIS data, approximately 40% of the watershed has been affected by Western Balsam Bark Beetle and Mountain Pine Beetle in the last couple of decades.

6.0 RECOMMENDATIONS

- Continue to visually monitor the works every three to five years. This inspection form could be used as a template.
- We understand that the monitoring site visits by the environmental monitoring contractor are scheduled at different stages over the spring, summer and fall. As this inspection occurred prior to the vegetation growth period, we recommend that the biologist observe and record the locations, approximate elevations and success of vegetation growth along Berm 'C' and Berm 'J'.
- As the ECM has a relatively short lifespan and has deteriorated significantly, the berm surfaces covered by the ECM, may experience some erosion. These areas should be monitored during future annual monitoring. If significant erosion occurs, then BC Hydro could consider protecting those areas.
- Consider installing additional planting on the upper berms (Berms 'C' and 'J') to further stabilize the upper works, particularly as the coir geogrid ages in the future. The potential extent and density of additional planting would best be determined in the early to midsummer, when the amount of existing planting can be better assessed.
- In future inspections monitor the two areas of interest for the coir geogrid matting: at the exposed tie-in location between Berms 'D' and 'F'; and at the damaged coir at the downstream end of Berm 'C'.
- Future monitoring should also consider the relative flow split to the right side channel between Berm 'F' and 'G', and the erosion on the right bank of the right side channel across from the downstream end of Berm 'G'. At present it is not a concern to the works.
- Schedule any future surveys and inspections to occur prior to increased spring melt (high creek flow), and during the lowest annual reservoir levels (following ice melt) to enable survey of the creek bed and inspection of the lowest elevation berm works.
- As the annual monitoring does not include a survey component, include GPS waypoints of key observations. Photographs should be referenced to key berm features (e.g., upstream end of Berm 'B' looking downstream) and could be geo-referenced with waypoints at the key observation locations.

Closing

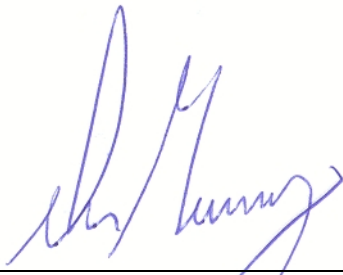
If you have any questions regarding this Inspection report, please contact the undersigned at 604-294-2088.

KERR WOOD LEIDAL ASSOCIATES LTD.

Prepared by:

Reviewed by:

Stefan Joyce, PEng
Senior Hydrotechnical Engineer



Dave Murray, PEng, ASCT, CPESC
Senior Water Resources Engineer

Encl.: Survey Drawings

Statement of Limitations

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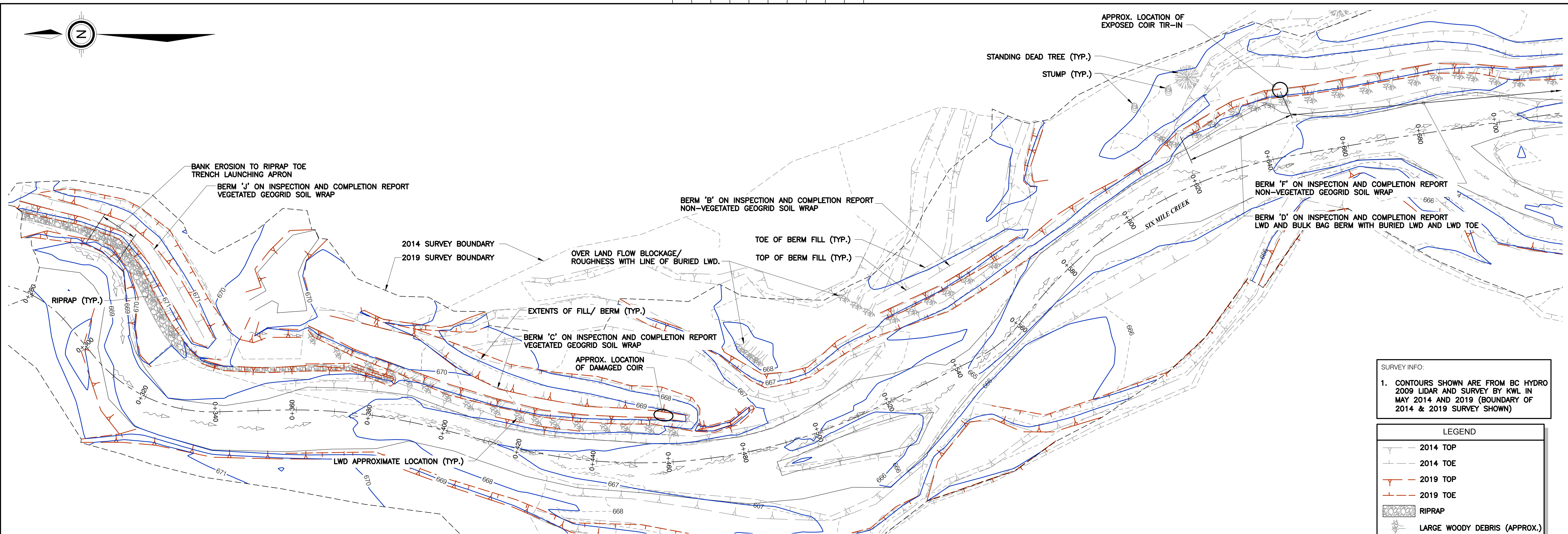
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Revision History

Revision #	Date	Status	Revision Description	Author
0	December 12, 2019	Final	Final	PAC/SFJ



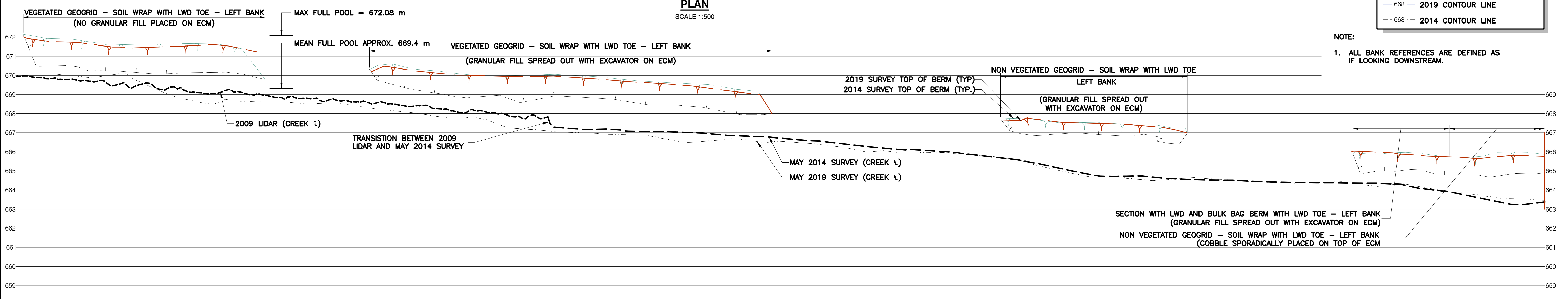


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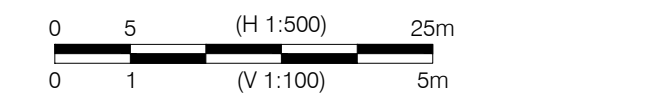
SURVEY INFO:
1. CONTOURS SHOWN ARE FROM BC HYDRO 2009 LIDAR AND SURVEY BY KWL IN MAY 2014 AND 2019 (BOUNDARY OF 2014 & 2019 SURVEY SHOWN)

LEGEND	
	2014 TOP
	2014 TOE
	2019 TOP
	2019 TOE
	RIPRAP
	LARGE WOODY DEBRIS (APPROX.)
	2019 CONTOUR LINE
	2014 CONTOUR LINE

NOTE:
1. ALL BANK REFERENCES ARE DEFINED AS IF LOOKING DOWNSTREAM.



PROFILE
SCALE: HORIZ. 1:500 VERT. 1:100



669.96	669.86	669.33	669.03	668.77	668.60	668.26	667.84	667.17	667.05	666.83	666.57	666.14	665.86	665.28	664.72	664.53	664.41	664.36	664.03	663.29	663.37
0+270	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580	0+600	0+620	0+640	0+660	0+670

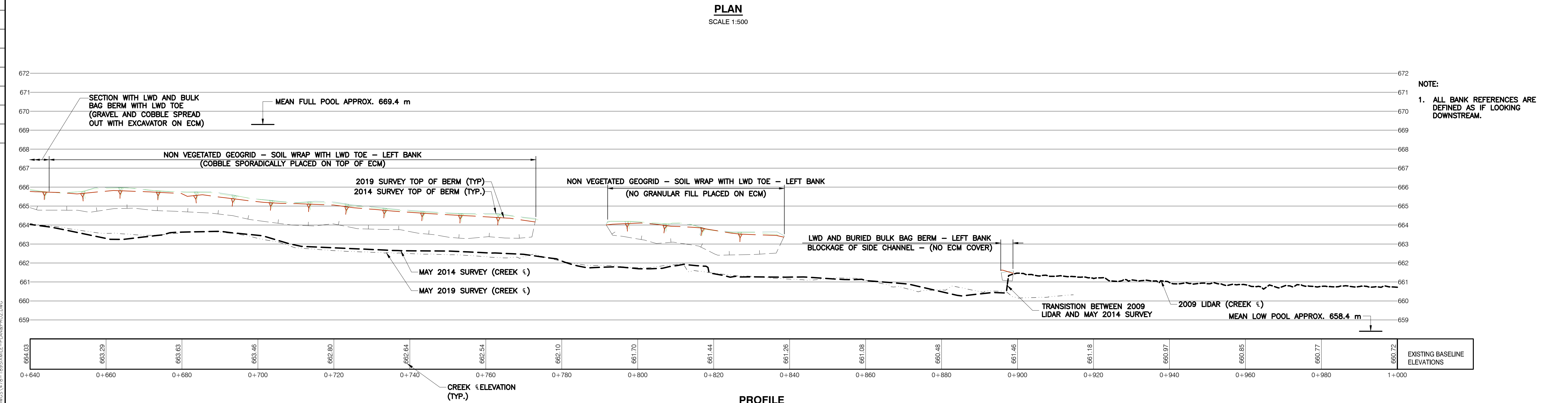
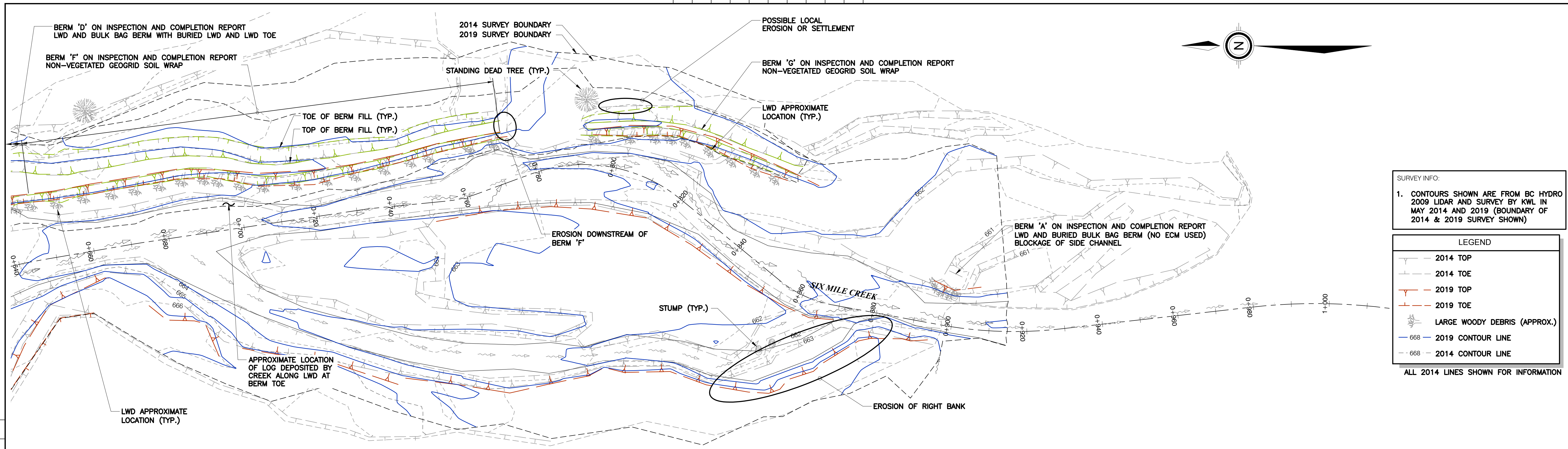
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		REFERENCE DRAWINGS			REFERENCE DRAWINGS

NO	REVISIONS	DATE	DESIGNED	INDEP CHK	DFTG	DFTG CHK	INSP	REV	ACPT
3	2019 MONITORING SURVEY	29 AUG'19	SFJ						
2	2016 MONITORING SURVEY	30 AUG'16	SFJ						
1	RECORD DRAWING	17 SEP'14	SFJ	DNM	PAC	JN		SFJ	
0	ISSUED FOR CONSTRUCTION	16 MAR'14	SFJ	DNM	BV	COT		SFJ	

DSGN	INDEP CHK	DFTG	DFTG CHK	INSP	REV	ACPT
SFJ						
	PAC					

DATE	2019-08	DIST		DWG NO	1006-C18-00063	SIZE	D	R	3
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GMS WORKS #19
WILLISTON RESERVOIR TRIAL TRIBUTARIES
SIX MILE CREEK
PLAN AND PROFILE (1 OF 2)



KERR WOOD LEIDAL
consulting engineers

BCHydro

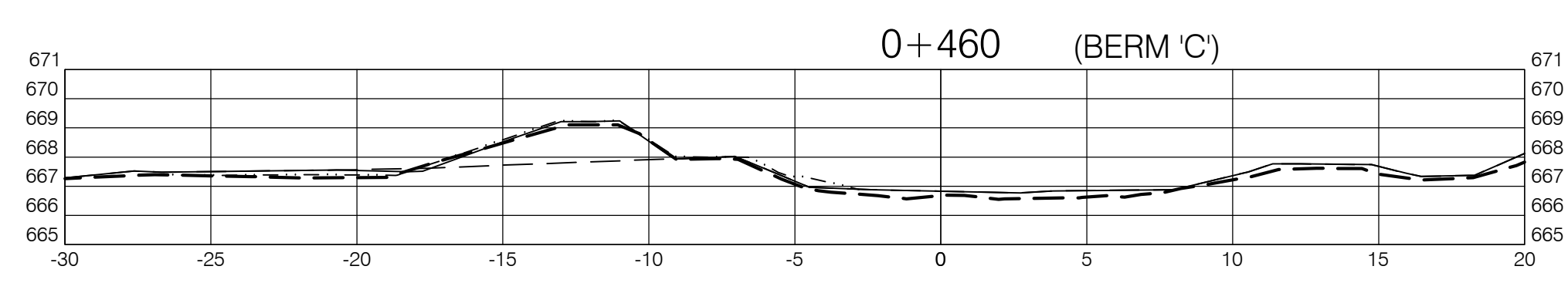
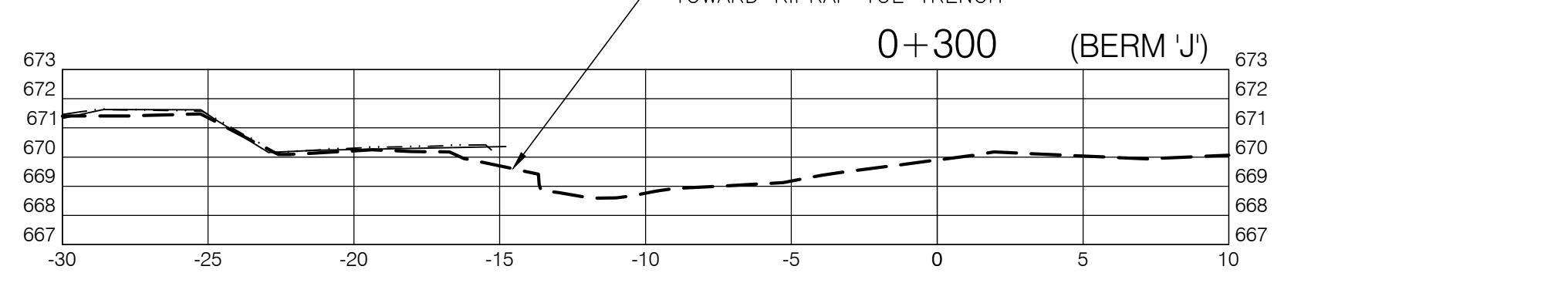
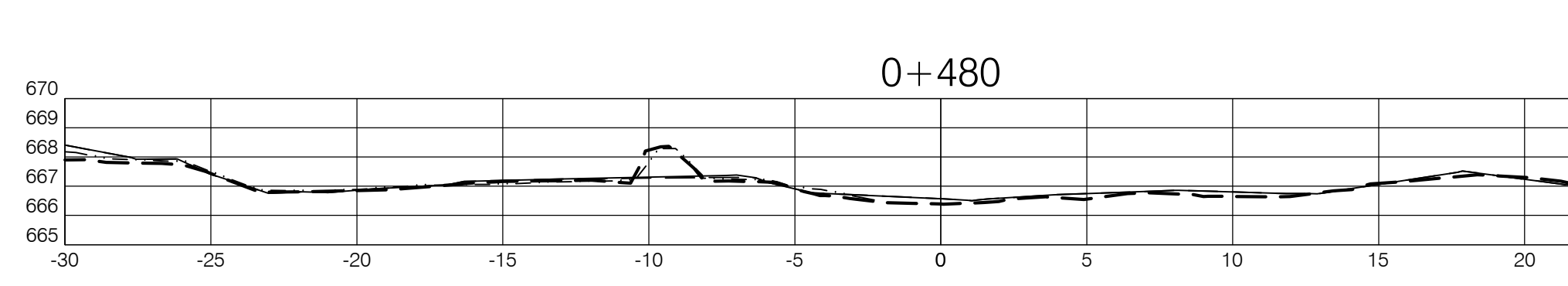
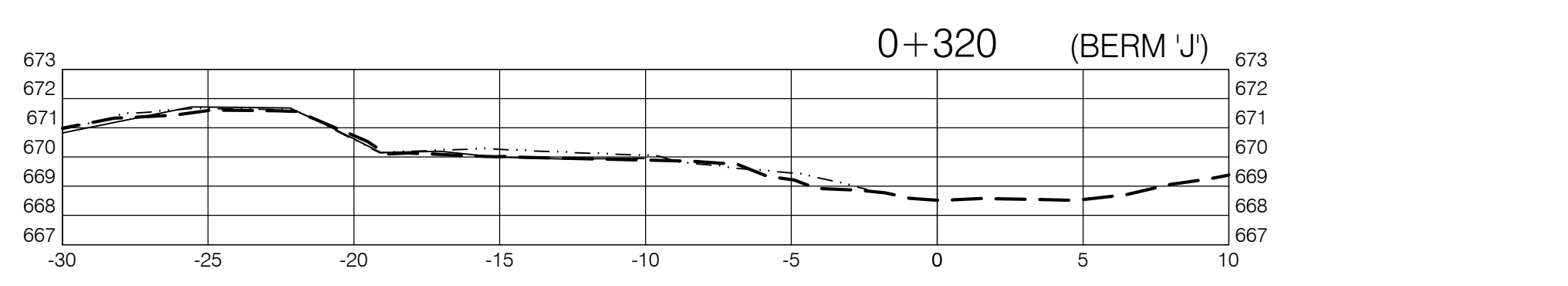
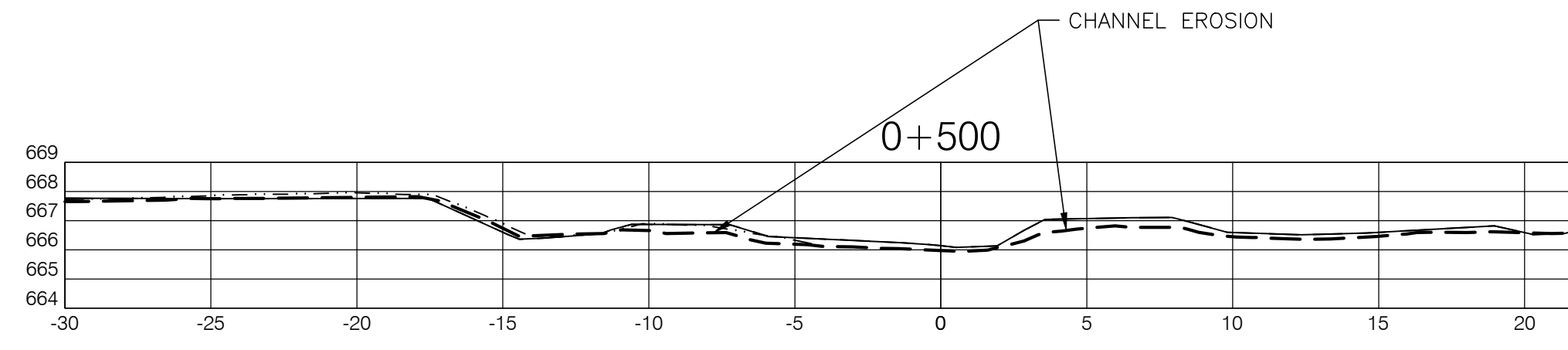
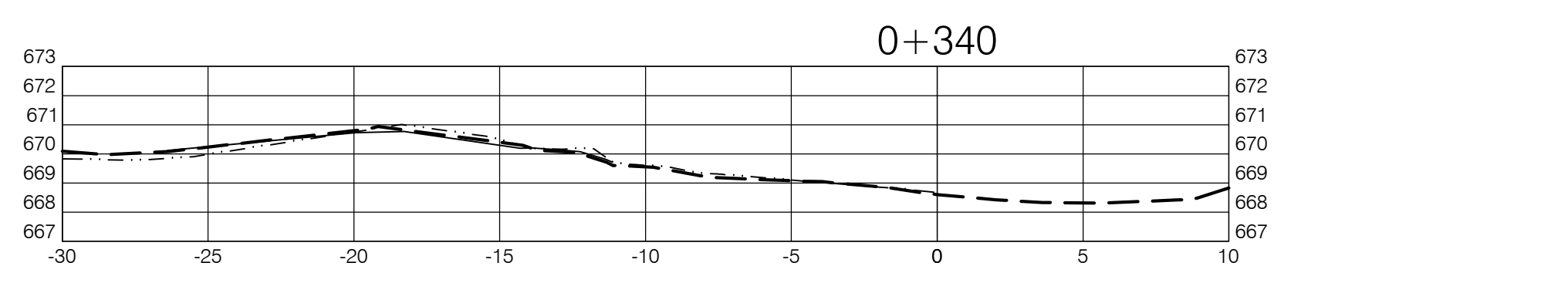
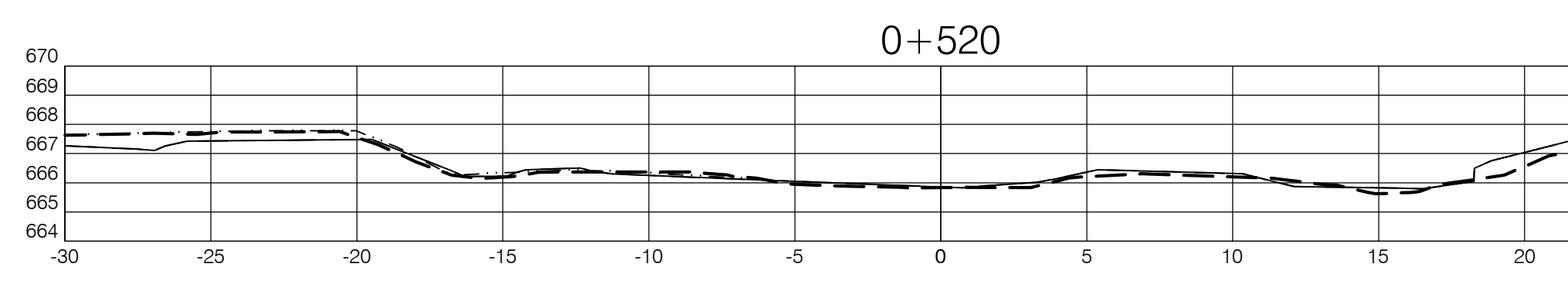
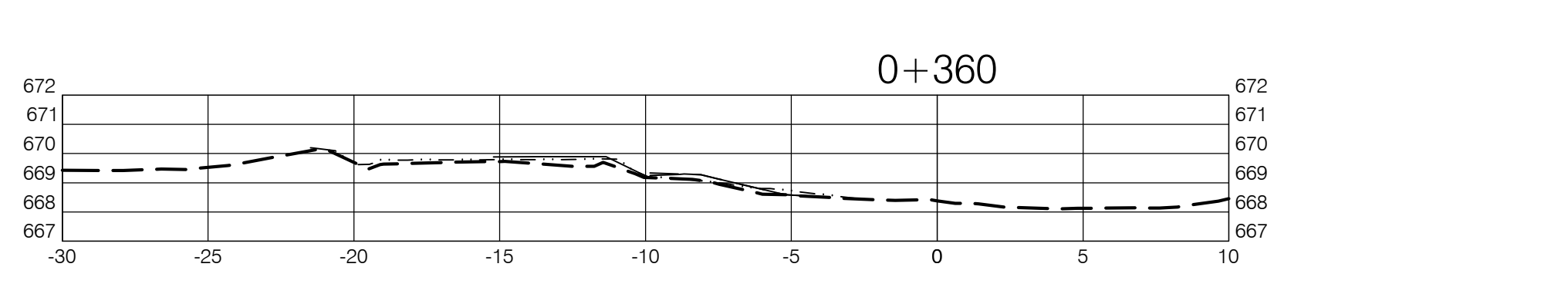
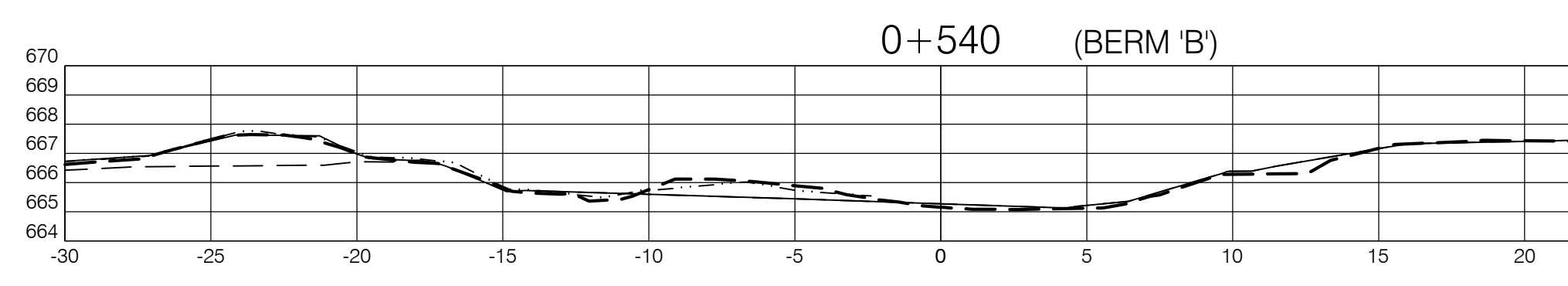
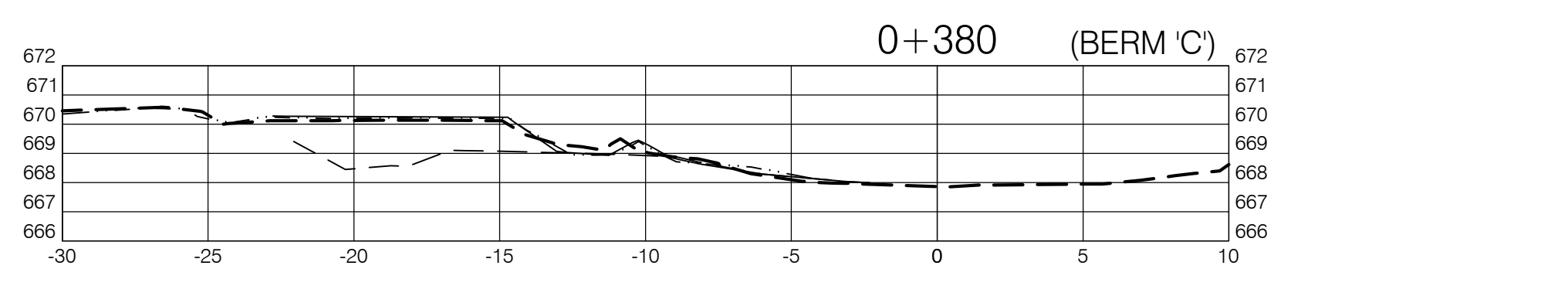
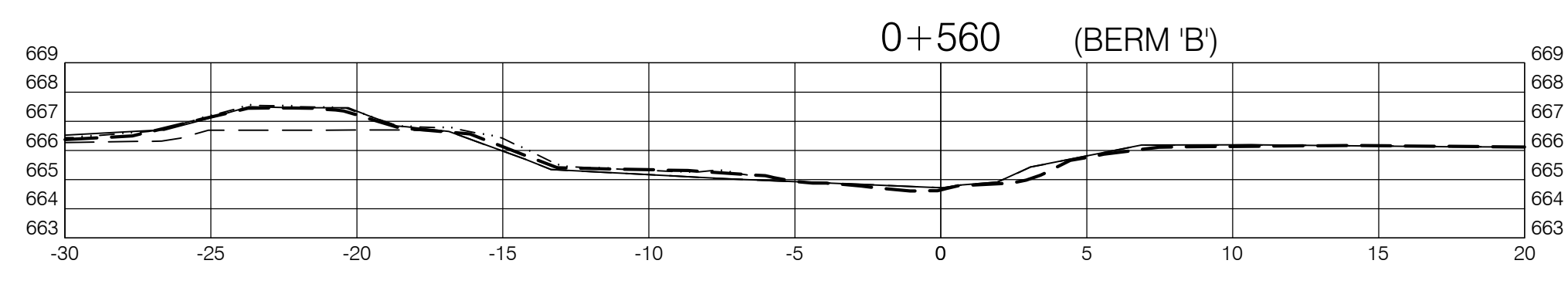
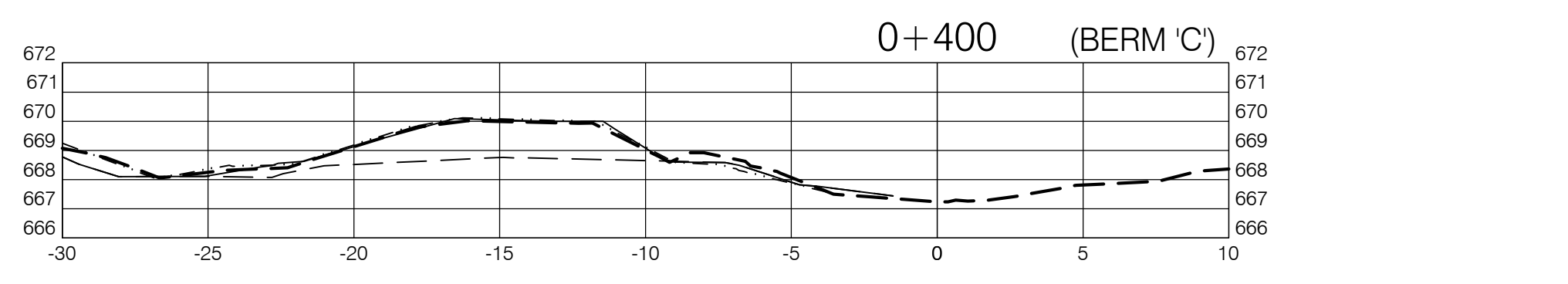
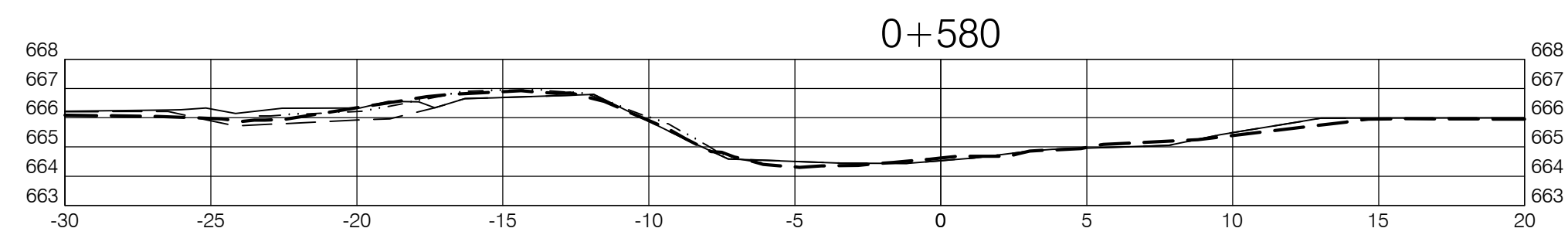
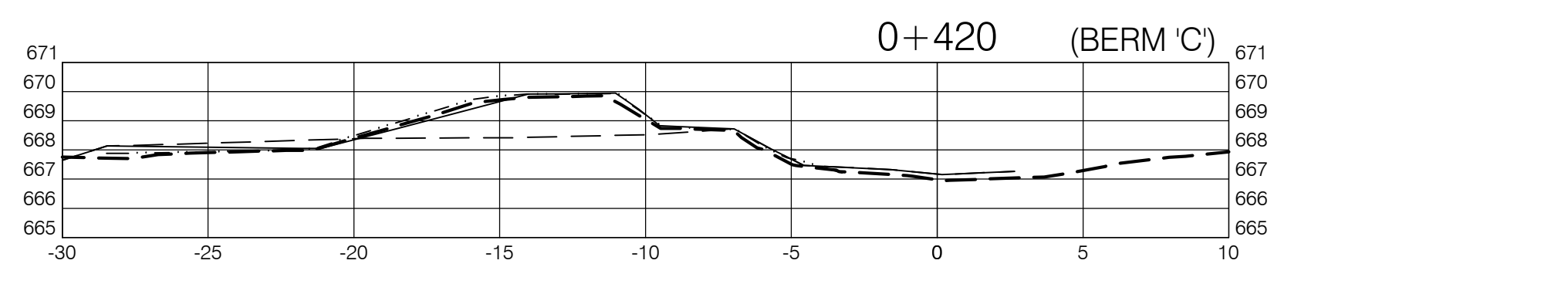
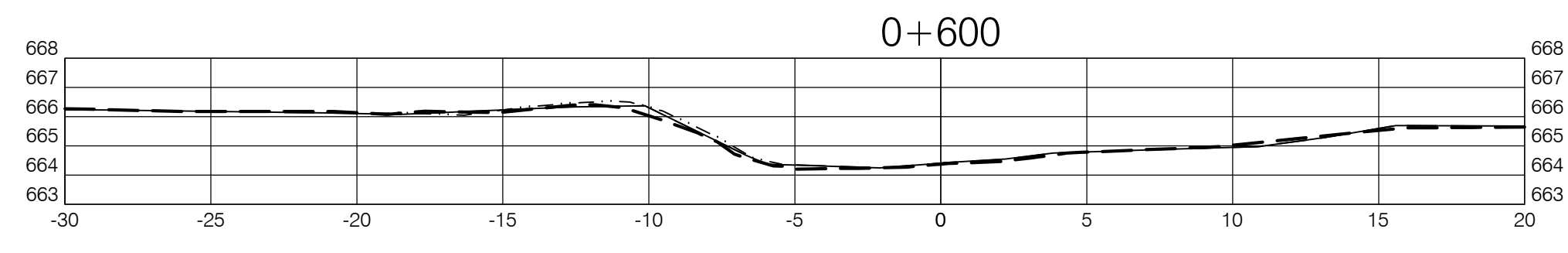
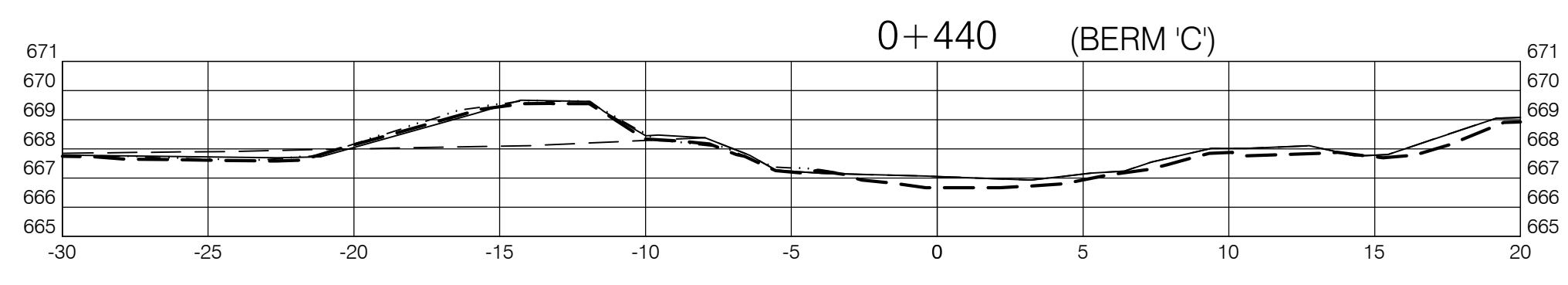
GMS WORKS #19
WILLISTON RESERVOIR TRIAL TRIBUTARIES
SIX MILE CREEK
PLAN AND PROFILE (2 OF 2)

NO	REVISIONS	DATE	DESIGNED	INDEP CHK	DFTG	DFTG CHK	INSP	REV	ACPT
3	2019 MONITORING SURVEY	29 AUG'19	SFJ	-	PAC	-	-	-	-
2	2016 MONITORING SURVEY	30 AUG'16	SFJ	-	JL	-	-	-	-
1	RECORD DRAWING	17 SEP'14	SFJ	DNM	PAC	JN	-	SFJ	-
0	ISSUED FOR CONSTRUCTION	16 MAR'14	SFJ	DNM	BV	COT	-	SFJ	-

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

DATE	DIST	DWG NO	SIZE	R
2019-08	-	1006-C18-00064	D	3

NOT TO BE REPRODUCED WITHOUT THE PERMISSION OF BC HYDRO



LEGEND	
---	2014 PRE-CONSTRUCTION SURFACE
—	2014 POST-CONSTRUCTION SURFACE
...	2016 SURFACE
-.-	2019 SURFACE

NOTE:
1. ALL SECTIONS REFERENCES ARE DEFINED AS IF LOOKING DOWNSTREAM.



KWL KERR WOOD LEIDAL
consulting engineers

BChydro

GMS WORKS #19
WILLISTON RESERVOIR TRIAL TRIBUTARIES
SIX MILE CREEK
CROSS SECTIONS (1 OF 2)

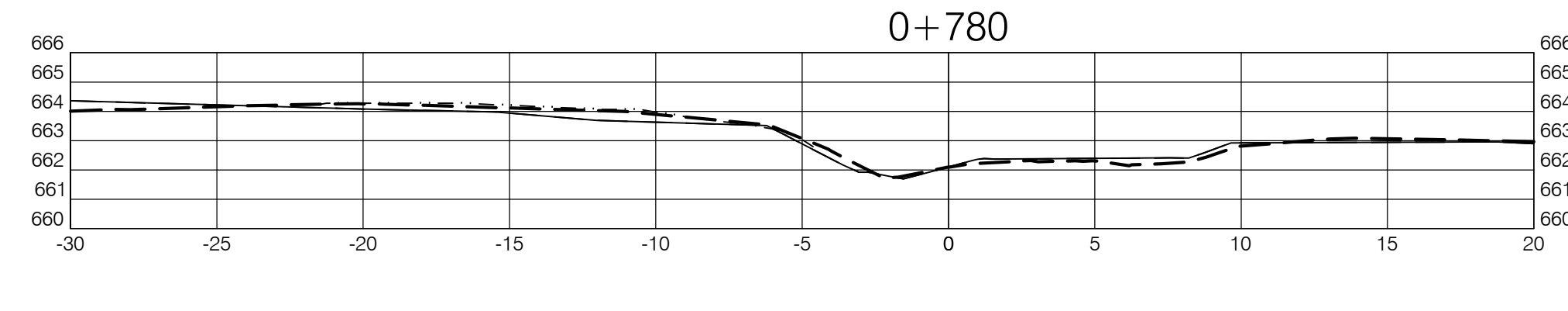
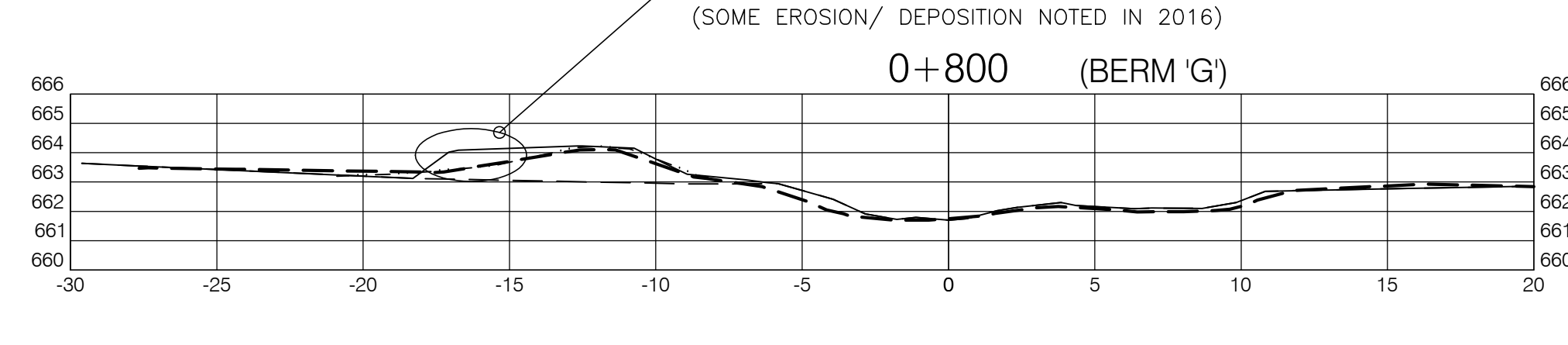
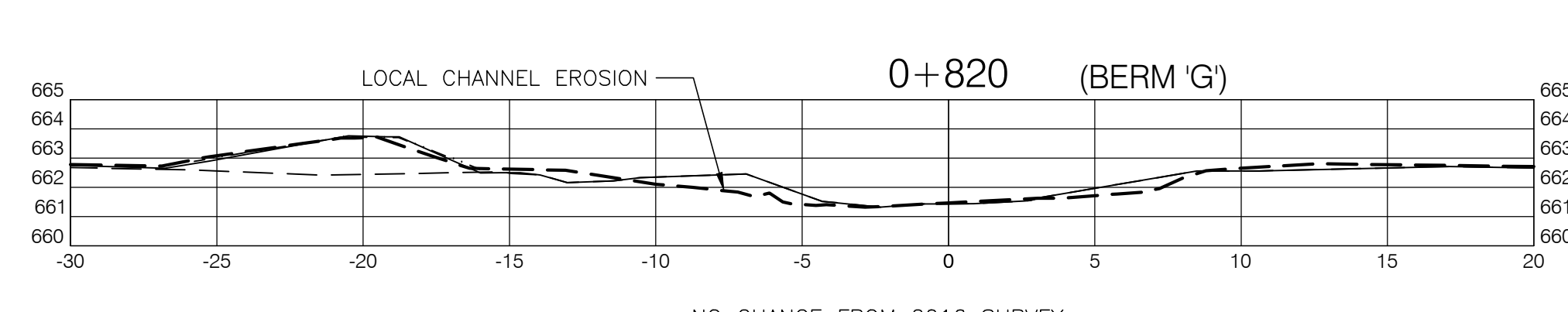
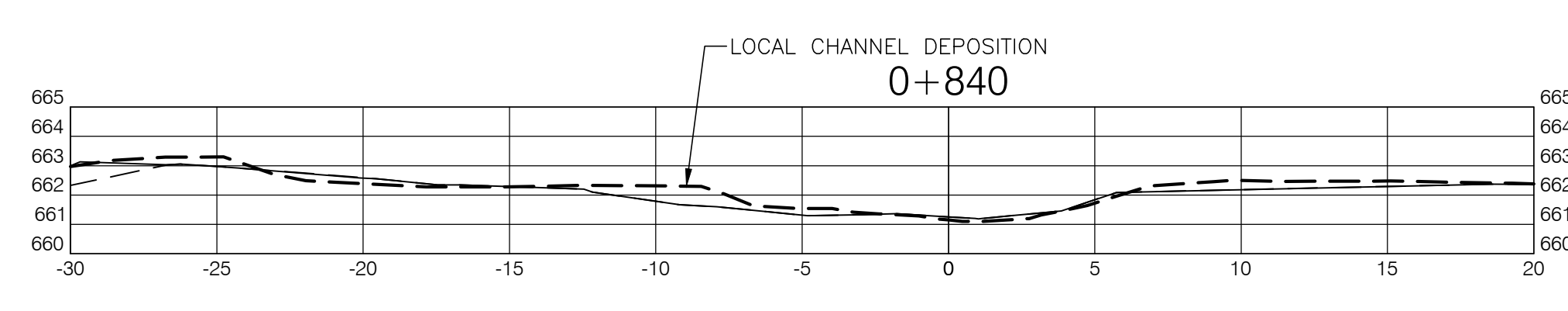
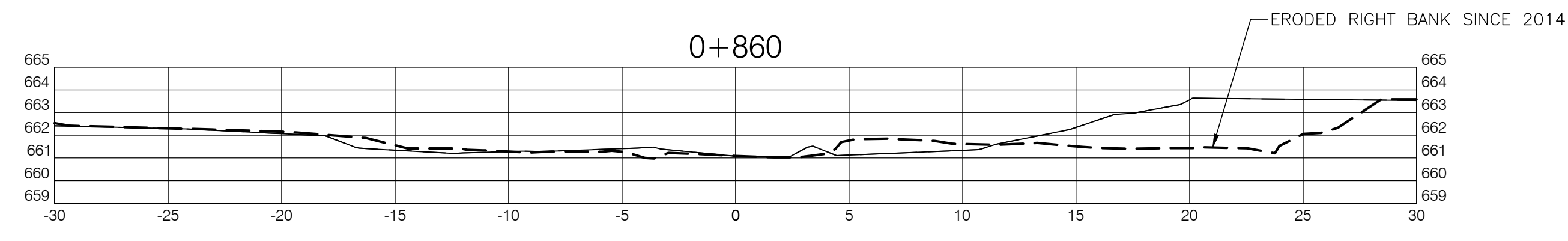
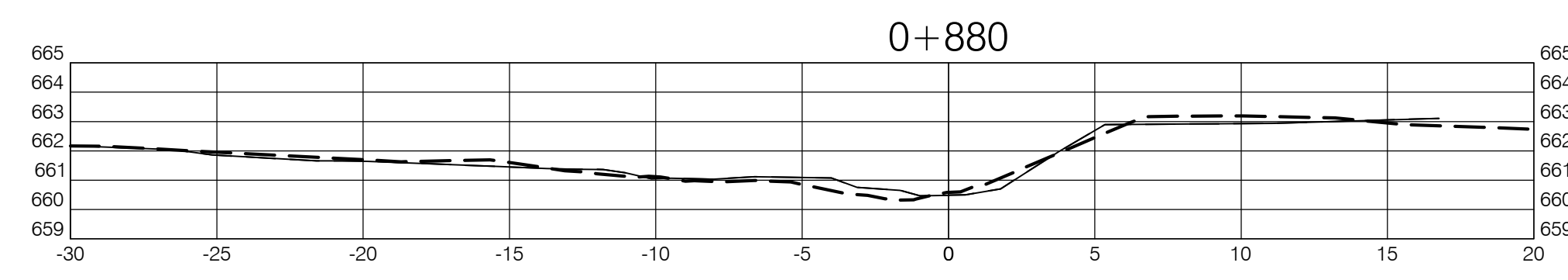
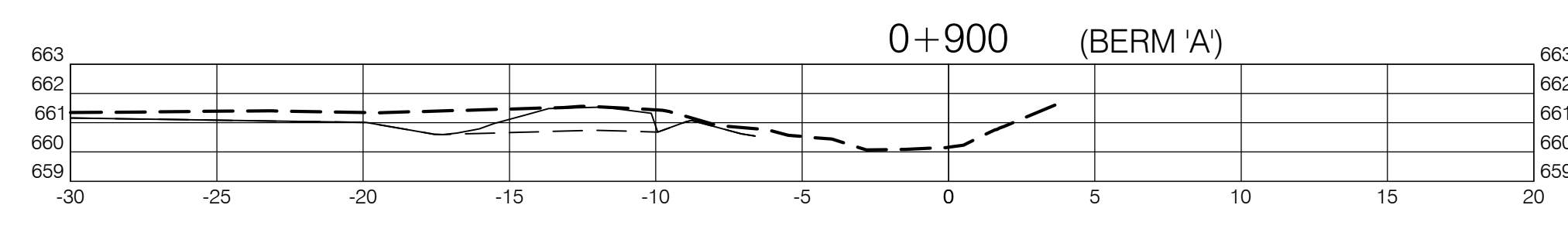
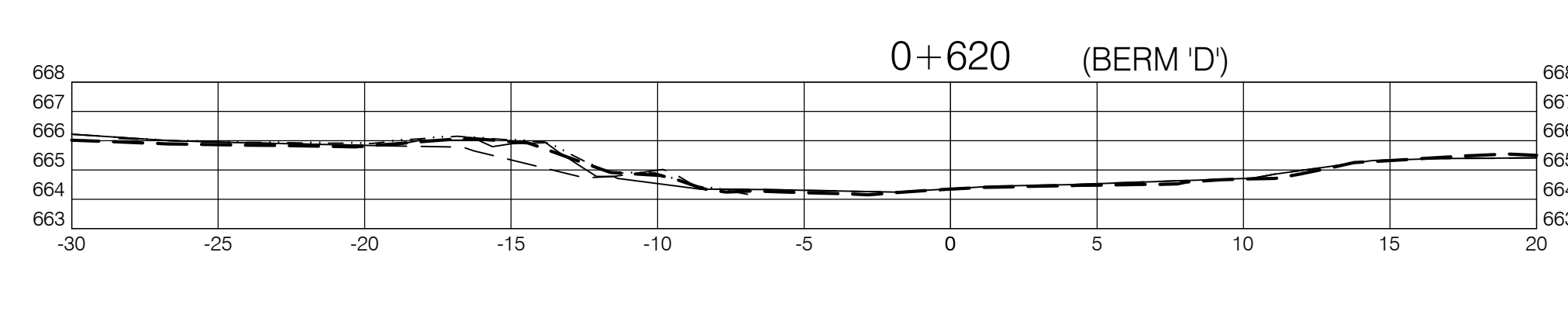
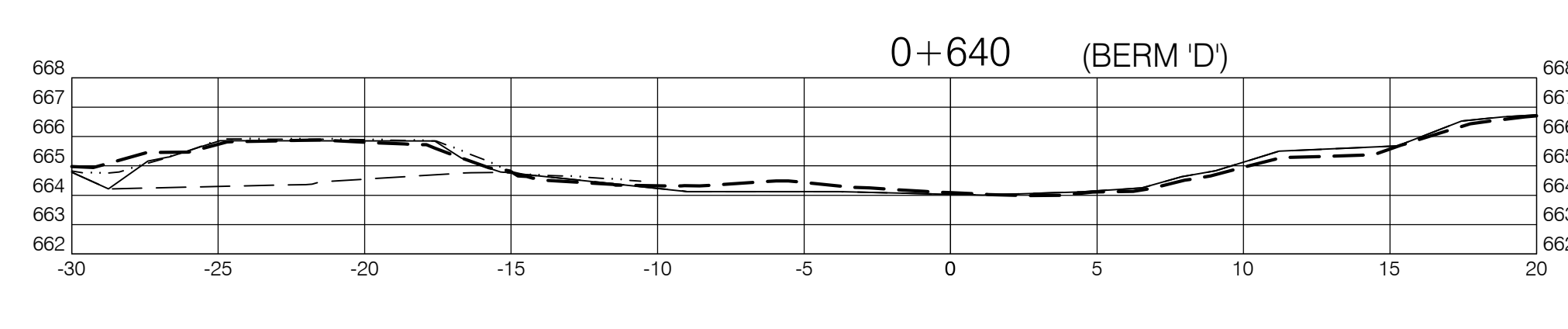
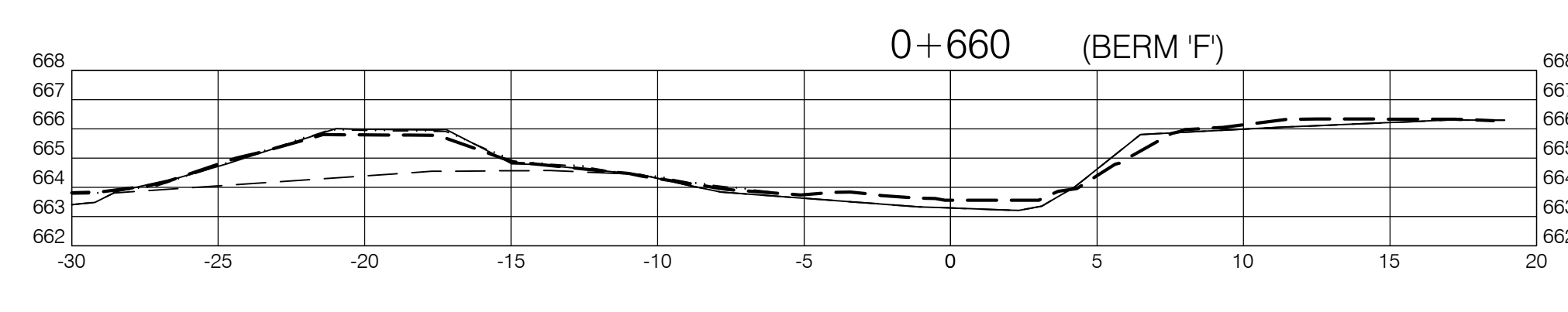
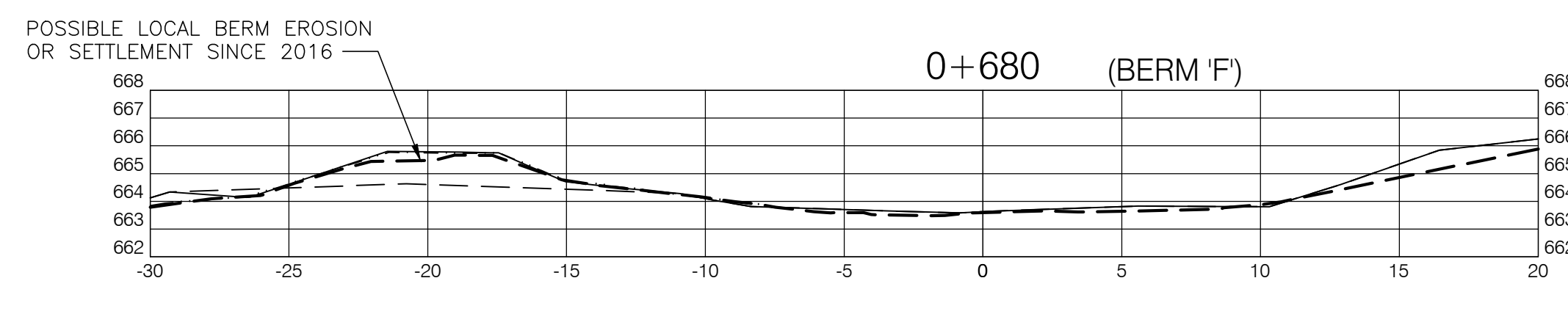
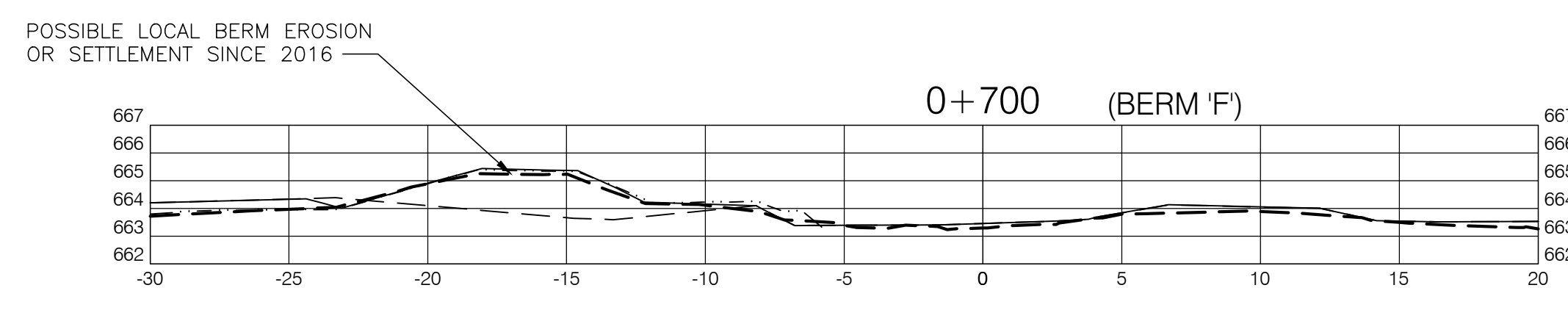
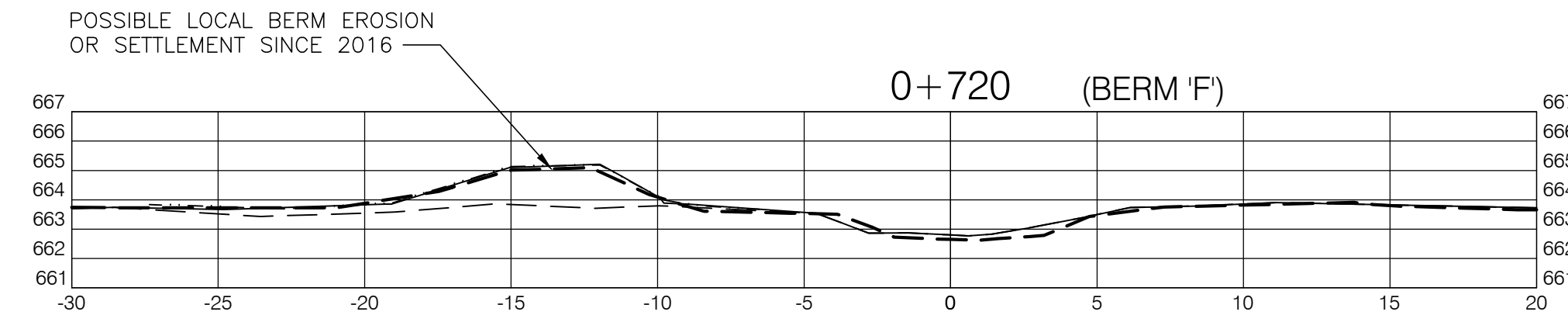
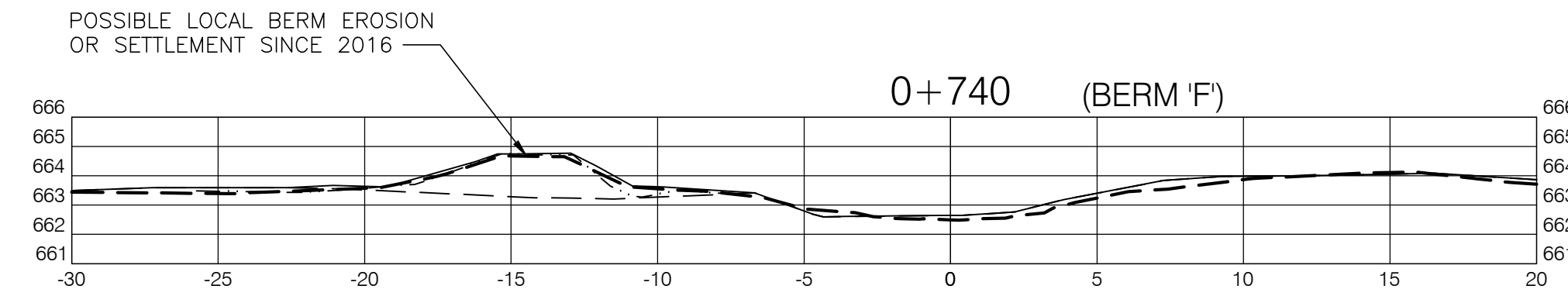
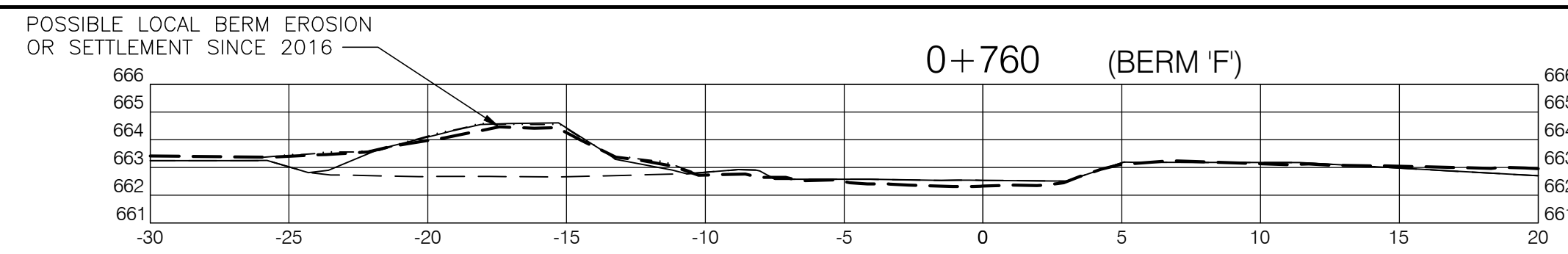
CROSS SECTIONS
SCALE: 1:200

NO	REMARKS	DATE	DESIGNED	INDEP CHK	DFTG	DFTG CHK	INSP	REV	ACPT
1	2019 MONITORING SURVEY	29 AUG '19	SFJ	-	PAC	-	-	-	-
0	2016 MONITORING SURVEY	30 AUG '16	SFJ	-	PAC	-	-	-	-

DSGN	SFJ
INDEP CHK	
DFTG	PAC
DFTG CHK	
INSP	
REV	
ACPT	

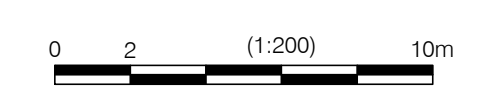
DATE	2019-08	DIST	-	DWG NO	1006-C18-00067	SIZE	D	R	1
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LEGEND	
---	2014 PRE-CONSTRUCTION SURFACE
—	2014 POST-CONSTRUCTION SURFACE
...	2016 SURFACE
-.-	2019 SURFACE

NOTE:
1. ALL SECTIONS REFERENCES ARE DEFINED AS IF LOOKING DOWNSTREAM.



CROSS SECTIONS
SCALE: 1:200



DSGN	SFJ
INDEP CHK	
DFTG	PAC
DFTG CHK	
INSP	
REV	
ACPT	

BChydro
GMS WORKS #19
WILLISTON RESERVOIR TRIAL TRIBUTARIES
SIX MILE CREEK
CROSS SECTIONS (2 OF 2)

NO	REMARKS	DATE	DESIGNED	INDEP CHK	DFTG	DFTG CHK	INSP	REV	ACPT
1	2019 MONITORING SURVEY	29 AUG '19	SFJ	-	PAC	-	-	-	-
0	2016 MONITORING SURVEY	30 AUG '16	SFJ	-	PAC	-	-	-	-

DATE	2019-08	DIST	-	DWG NO	1006-C18-00068	SIZE	D	R	1
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