



West London Dyke Master Repair Plan

Public Information Centre #3

Thursday, September 10th, 2015 4:30pm-6:30pm

The purpose of this meeting is to inform the public of the updates to the project, and to get input before the finalization of the project.

The following panels describe the **purpose** and **history** of the project, along with the **recent updates**.

Once you have reviewed the information presented here, please take a comment sheet which you can fill out and return by **Thursday September 24, 2015**. Questions relating to a panel or in regards to the project in general can be answered by either City of London, Upper Thames River Conservation Authority or Stantec staff.

INTRODUCTION

The West London Dyke is 2374 m long, comprised of both a concrete and earthen revetment, and runs along the west bank of the North Branch of the Thames River from Oxford Street to the forks of the Thames River and then along the west bank of the main branch to the west side of the Wharncliffe Road Bridge. The City of London owns the dyke and through an agreement, the Upper Thames River Conservation Authority (UTRCA) undertakes major maintenance activities. The intent of the Master Repair Plan is to develop the required strategic plan to allow the UTRCA and the City to have a method for determining when a trigger point for repair and/or replacement of a portion of the dyke is required.

STUDY UPDATE

The study was put on hold early in 2013 pending updates to flood elevation information. With this new information now available, Stantec is in the process of completing the Master Repair Plan.

PROBLEM OPPORTUNITY STATEMENT

The UTRCA and the City of London are undertaking a Master Repair Plan covering the next 20-year period to address aging infrastructure, flood protection, public use, and integration of other City initiatives. This study is being conducted in accordance with requirements of Phases 1 and 2 of the Municipal Class Environment Assessment (Class EA) which is an approved process under the Environmental Assessment Act.

West London Dyke - Study Area



Old North



St. Patrick's



Blackfriars Bridge



Blackfriars / Approaching Natural Bank



Harris Park / Approaching Phase I Replacement



Cavendish West



Cavendish East



Wharncliffe



Forks (Blackburn Memorial Fountain)



Labatt Park / Forks (Pedestrian Underpass)

Historical Information

- When London was settled in the early 1800s, the Thames River offered water, a means of transportation and a power source for mills. Both natives and early settlers had used the low riverside land to the west of the Forks for farming.
- By the late 1800s, the small settlements of London West and Kensington were growing on the banks of the Thames River from their beginnings surrounding water-powered mills. The communities experienced several floods, such as the catastrophic July 1883 flood that killed 17 people. Rather than resettling away from the hazardous areas, the response was to build a formalized dyke system.
- Construction of the West London Dyke, the first of the City's seven dykes to be built, began in the late 1880s. By the early 1900s, the dyke had been reinforced, extended and raised at least twice. The flood of April 1937 overtopped the reinforcements, though, and flooded the communities behind the dyke. Additional raising of the dyke occurred after the 1937 flood on the main branch section and before the 1947 flood. In 1947 some overtopping of the dyke on the North Branch section required evacuations, although flooding was not as deep as in 1937.
- The UTRCA was formed following the 1947 Flood and resulted in a watershed management partnership between the Province of Ontario and watershed member municipalities (including the City of London) to carry out a comprehensive watershed flood control program. Besides the London Dyke system that had existed for some time, additional flood control dams, flood plain management, and land stewardship programs were implemented to further ease the flood pressure on the dykes.



Forks of the Thames, July 2000 Flood

West London Dyke, April 1947 Flood



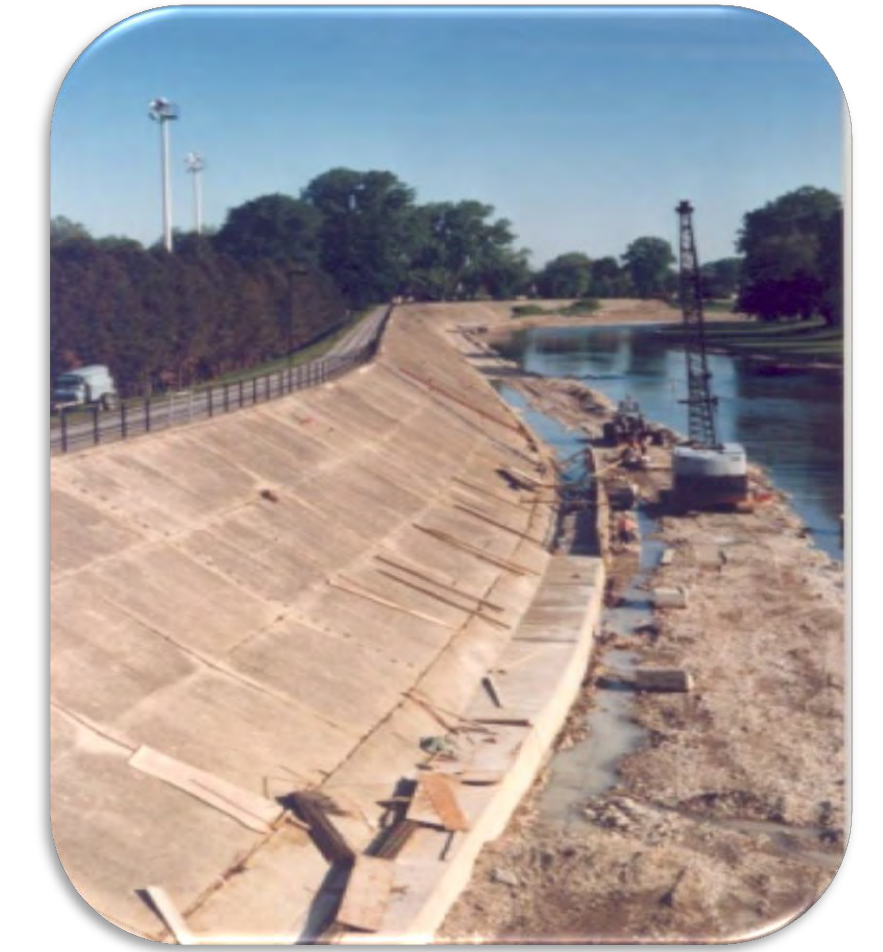
Forks of the Thames, July 2000 Flood



Source: UTRCA

Previous Work/Rehabilitation

- 1980's Investigations & Repairs
 - Geotechnical Investigation undertaken in October 1982 revealed sections of revetment (dyke) in poor condition with noticeable shifting and tilting. Abrupt changes in slope of facing noted with cracking along concrete surface.
 - Based on investigations undertaken, repair of select sections of dyke including grouting behind panels and improvements to toe structure were completed between 1983 and 1985.
- 2004 Inspection
 - In 2004, the UTRCA undertook a condition assessment of the Thames River dykes within the City, including the West London Dyke. Approximately 350 m of the dyke north from the Queens Avenue Bridge were identified as being the highest priority for repair. This portion was originally built in the 19th century in order to minimize flooding in the West London area.
- 2005 Concrete Repair Program
 - In 2005, while undertaking the initial stages of a concrete repair program on the 350 m segment identified in the 2004 study, it was concluded that a significant portion of this section had come to the end of its useful life and needed to be replaced rather than repaired.
- 2007 Phase I Dyke Replacement
 - The first phase of the project (July to December, 2007) replaced a 300 metre section of the dyke north from Queens Avenue, adjacent to Labatt Park. The new dyke structure is located entirely within the footprint of the previous dyke and provided some improvement to flood height protection.
 - Phase 1 was funded by the MNR Water and Erosion Control Infrastructure Program and the City of London. The total cost of the Phase 1 construction project was \$3,600,000.



1980's Repair Work



1980's Repair Work



2005 Concrete Repair Program



2007 Phase I Dyke Replacement

EA Master Plan Process/Public & Agency Input*

- **Environmental Assessment (EA) is a decision making process to promote good environmental assessment planning. The key features are:**

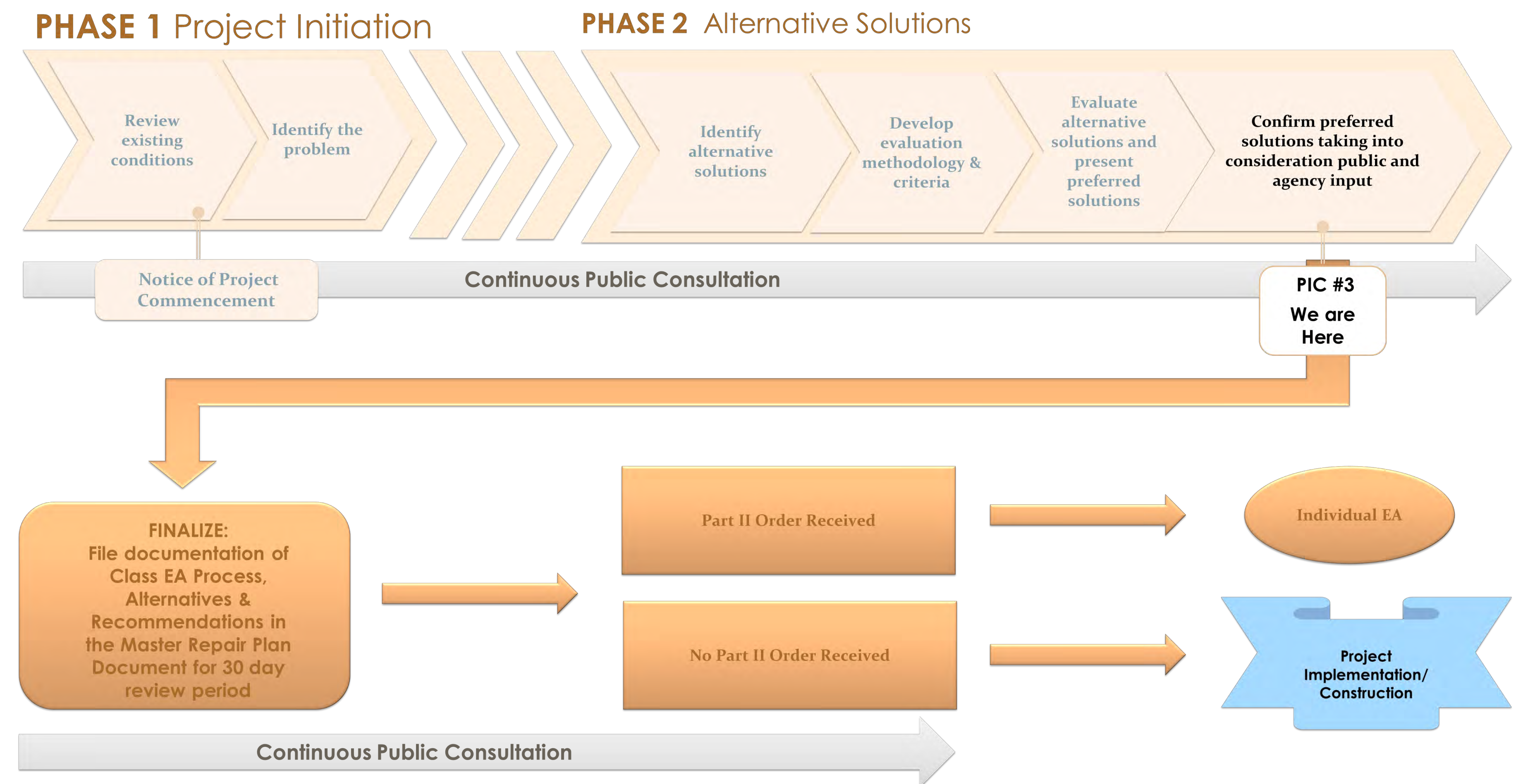
- Early consultation with all interested parties (public, agency, Aboriginal communities, and stakeholders)
- Consideration of reasonable range of alternatives
- Assessment of environmental effects
- Systematic evaluation of alternatives
- Clear documentation and traceable decision making

- **Public Involvement**

- The role of those members of the public with an interest in a study is to provide background information to advise the proponent (City of London / UTRCA) of their support and concerns, and to review and provide comments and input about the study findings
- Members of the public with an interest in the study can ask to be placed on the mailing list to receive notification of the consultation opportunities for the project.

- **Master Plans**

- The Master Plan approach was developed to recognize the benefits of considering a group of related projects over a long period
- At a minimum, Master Plans address Phases 1 and 2 of the Municipal Class EA process, and provide a framework for future projects



* As referenced in the Municipal Class EA Document

Project Drivers



Flood Risk Reduction & Public Safety

- The Master Plan will provide updates to the Damage Cost Estimates published by the UTR Watershed in 2005
- The 100-Year Design Storm repair costs are estimated at \$49 million
- The 250-Year Design Storm repair costs are estimated at \$60 million
- In addition to assessing damage costs, existing dyke elevations will be reviewed in comparison to flood levels to determine areas that may need to be raised

Functional Improvements

- The Master Plan will involve integration with other City initiatives (Bicycle Master Plan, future pedestrian pathways, etc.)
- Future rehabilitation work will have consideration for amenity, function, durability, constructability, capital costs

Environmental Enhancements

- The Master Plan will address the future management of vegetation along the dyke that currently poses a threat to the structural integrity of the dykes (Dougan & Associates, 2006)
- The Master Plan will also consider potential implementation of environmental features along and within the areas surrounding the dyke structure including the planting of trees and shrubs, aquatic planting, and the maintenance of existing vegetation

Funding Opportunities

- The Master Plan will consider the availability of Municipal, Provincial, and Federal funding opportunities
- Funding opportunities (stimulus funding programs, etc.) will be considered as a 'trigger point' for the timing of implementation of future projects

Next Steps

- Public Consultation - Comments from the public are encouraged. Please take a few minutes to complete the 'Comment Sheet' provided, and either place it in the box provided, or forward to the address provided on the form by **Thursday, September 24th 2015**.
 - All comments received will be addressed and incorporated into the final Master Repair Plan.
- Completion of the Master Repair Plan Document
 - The Master Repair Plan Document will be finalized, which will outline the a repair and implementation schedule based on the trigger points identified
 - A **Notice of Completion** will be issued, and the Master Repair Plan document will be made available for the mandatory **30 day public review period**. During this time, any comments or concerns expressed will be addressed and the document modified. If there are concerns that cannot be addressed within the 30-day review period, members of the public can contact the Minister of the Environment to request a Part II Order, bumping up the status of the project.
 - If no Part II Orders are received, the project is completed and the Master Repair Plan will serve as the framework for future work on the West London Dyke.

Rick Goldt, C.E.T.
Supervisor, Water Control Structures
Upper Thames River Conservation Authority
1424 Clarke Road
London ON N5V 5B9
goldtr@thamesriver.on.ca

Chris McIntosh, P.Eng.
Environmental Services Engineer
City of London
300 Dufferin Avenue, P.O. Box 5035
London ON N6A 4L9
cmcintos@london.ca

Cameron Gorrie, P.Eng.
Project Engineer
Stantec Consulting Ltd.
600-171 Queens Avenue
London ON N6A 5J7
cameron.gorrie@stantec.com



Segment	Approximate Length (m)	Condition Rating	Type	Flood Elevation			Lowest Elevation (mASL)	Approx. # of Properties within Hazard Area	Est. Current Flood Damage 100yr/250yr	Alternatives	Compliance with Guiding Principles		Natural Environment	Social Cultural	Economic/Financial		Future Class EA Requirements	Technical Issues / Requirements	Preferred Alternative
				100 yr (mASL)	250 yr (mASL)	250 yr + 10% (mASL)					Flood Protection	Amenity/Functional Improvements			Estimated Capital Costs ²	Estimated Maintenance Costs			
Oxford North	50	2	Concrete Revetment with Toe	236.81 to 236.80	237.51 to 237.50	238.09 to 238.07	~237.4	20	\$245,000 / \$1,125,000	Alternative 1: Do Nothing	Does not provide protection to Regulatory Flood Level.	Does not provide for amenity / functional improvement opportunities including potential future pathway extension.	None identified as no work is proposed.	None identified as no work is proposed.	None identified.	Highest maintenance costs over the planning period due to concrete distress.	Not applicable.	Existing dyke may require replacement within 20 year period due to condition.	○ Not preferred as it does not meet the guiding principles for the dyke. Also, it is anticipated that structure may need replacement within 20 year horizon.
				Alternative 2: Replace w Similar Dyke (existing footprint)	Does not provide protection to Regulatory Flood Level.	Does not provide for amenity / functional improvement opportunities including potential future pathway extension.				Least impact compared to Alternatives 3 and 4.	Least impact compared to Alternatives 3 and 4 relating to construction activities.	\$590,000 (excludes pathway)	No significant maintenance costs anticipated.	Schedule B	Work within vicinity of Oxford Street Bridge. No anticipated issues noted.	○ This option not preferred as the cost/benefit is anticipated to be significantly less than Alternative 4.			
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Moderate increased impact including pathway upgrades (per 2007 Master Plan Concept).				Potential requirement to conduct work in river due to existing constraints and potential need to construct future pathway beneath Oxford St. Bridge, however impacts can be mitigated through best management practices.	Moderate increased impact compared to Alternative 2, but can be mitigated using best management practices.	\$1,840,000 (includes pathway)	No significant maintenance costs anticipated.	Schedule B	Work within vicinity of Oxford Street Bridge. In order to accommodate amenity/functional improvements, slope of dyke may be increased. In addition, extension of the dyke to the north may be required to address the enhanced flood protection.	● Viable solution, however it does not provide protection to Regulatory Level. Opportunity to incorporate active flood protection measures due to proximity to nearby road for access.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~ 0.6 m freeboard.	Allows opportunities for improvements including pathway upgrades (per 2007 Master Plan Concept).				Potential requirement to conduct work in river due to existing constraints and potential need to construct future pathway beneath Oxford St. Bridge, however impacts can be mitigated through best management practices.	Moderate increased impact compared to Alternative 2, but can be mitigated using best management practices.	\$1,950,000 (includes pathway)	No significant maintenance costs anticipated.	Schedule B	Due to limited footprint, slope of dyke would need to increase to accommodate height increase. Would need to consider impact on flood storage due to reduction in cross section area. In addition, extension of the dyke to the north may be required to address the enhanced flood protection.	● Preferred solution as it best meets the guiding principles. Impacts through construction can be mitigated through best management practices. Costs for enhancement are comparable to 100 year structure.			
St. Patrick	350	2	Concrete Revetment with Toe	236.80 to 236.47	237.50 to 237.17	238.07 to 237.77	236.9	200	\$3,531,000 / \$9,541,000	Alternative 1: Do Nothing	Currently provides up to 100 year flood protection with minimal freeboard. Does not meet Regulatory Flood Level requirements.	Does not provide for amenity / functional improvement opportunities.	None identified as no work is proposed.	None identified as no work is proposed.	None identified.	Highest maintenance costs over the planning period.	Not applicable.	Existing dyke likely to require replacement within 20 year period due to current condition.	○ Not preferred as it does not meet the guiding principles for the dyke. Existing condition of dyke would indicate that replacement versus repair is likely required within the 20 year planning period.
				Alternative 2: Replace w Similar Dyke (existing footprint)	Provides up to 100 year flood protection. Does not meet Regulatory Flood Level requirements.	Current pathway does not meet City standards. Presence of City owned land would permit potential Butterfly/Bird Watching garden.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners).	Minimal impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$5,200,000	No significant maintenance costs anticipated.	Schedule B	Construction/staging constraints.	○ This option not preferred as the cost/benefit is anticipated to be significantly less than Alternative 4.			
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Allows opportunities for improvements including potential Butterfly/Bird Watching garden near existing park (per 2007 Master Plan Concept).				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners).	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$5,200,000	No significant maintenance costs anticipated.	Schedule B	In order to accommodate amenity/functional improvements, slope of dyke may be increased. Construction staging and access may be difficult.	● Viable solution, however it does not provide protection to Regulatory Level. Opportunity exists to incorporate active flood protection measures due to proximity to nearby roads for access. However, significant measures would be necessary to accommodate length of entire section.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~ 0.6 m freeboard.	Allows opportunities for improvements including potential Butterfly/Bird Watching garden near existing park (per 2007 Master Plan Concept).				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners). Increase in elevation may require placement of structure closer to toe.	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$5,525,000	No significant maintenance costs anticipated.	Schedule B	In order to accommodate increased height to 250 year level (+ freeboard), and amenity/functional improvements, increase dyke slope may be required. Would need to consider impact on flood storage due to reduction in cross section area.	● Preferred solution as it best meets the guiding principles. Significant number of properties protected by dyke in this area, therefore passive protection to 250 year level (+ freeboard) is preferable. Cost/benefit advantage over Alternative 3 is significant.			
Blackfriars	260	2	Concrete Revetment with Toe	236.47 to 236.23	237.17 to 236.94	237.77 to 237.53	236.3	210	\$8,723,000 / \$9,730,000	Alternative 1: Do Nothing	Does not provide 100 year flood protection or meets Regulatory Flood Level requirements.	Does not provide for amenity / functional improvement opportunities. Deficiencies along pathway noted that would require action.	None identified as no work is proposed.	None identified as no work is proposed.	None identified.	Highest maintenance costs over the planning period.	Not applicable.	Existing dyke likely to require replacement within 20 year period due to current condition.	○ Not preferred as it does not meet the guiding principles for the dyke.
				Alternative 2: Replace w Similar Dyke (existing footprint)	Does not provide 100 year flood protection or meets Regulatory Flood Level requirements.	Current pathway does not meet City standards. This option would not allow additional amenity/functional improvements including lookout area and pathway beneath bridge due to proximity to adjacent lands.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners).	Moderate impact based on construction activities, but can be mitigated using best management practices. No impact to Blackfriars Bridge anticipated.	\$3,800,000 (excludes pathway)	No significant maintenance costs anticipated.	Schedule B	Construction/staging constraints.	○ This option is not preferred as the cost/benefit is anticipated to be significantly less than Alternative 4. Not preferred as structure would not meet 100 year flood protection or meet Regulatory Flood Levels.			
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Allows opportunities for improvements including pathway beneath Blackfriars Bridge and Lookout Area (per 2007 Master Plan Concept).				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners). Staging requirements may call for removal of vegetation along south boundary.	Moderate impact based on construction activities, but can be mitigated using best management practices. No impact to Blackfriars Bridge anticipated.	\$5,100,000 (includes pathway)	No significant maintenance costs anticipated. Maintenance costs associated with pathway may be higher (impact of high water level).	Potential for Schedule C EA requirement due to presence of Blackfriars Bridge and potential transportation impacts.	In order to accommodate amenity/functional improvements, slope of dyke may be increased.	● Viable solution, however it does not provide protection to Regulatory Level. Opportunity to incorporate active flood protection measures due to proximity to nearby roads for access.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~ 0.6 m freeboard.	Allows opportunities for improvements including pathway beneath Blackfriars Bridge and Lookout Area (per 2007 Master Plan Concept).				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners). Staging requirements may call for removal of vegetation along south boundary.	Moderate impact based on construction activities, but can be mitigated using best management practices. No impact to Blackfriars Bridge anticipated, but likely subject to final dyke elevation.	\$5,415,000 (includes pathway)	No significant maintenance costs anticipated. Maintenance costs associated with pathway may be higher (impact of high water level).	Potential for Schedule C EA requirement due to presence of Blackfriars Bridge and potential transportation impacts.	In order to accommodate amenity/functional improvements and increase in dyke height, slope of dyke may be increased.	● Preferred solution as it best meets the guiding principles. It is anticipated that additional increase in height of ~1.5m would be sufficient to provide 250 yr + protection. Significant number of properties protected by dyke in this area, therefore passive protection to 250 year level (+ freeboard) is preferable. Cost/benefit advantage over Alternative 3 is significant.			
Natural Bank	230	4	Concrete Revetment with Naturalized Toe	236.23 to 236.35	236.94 to 237.08	237.53 to 237.67	236.0	180	\$8,256,000 / \$9,100,000	Alternative 1: Do Nothing	Does not provide 100 year flood protection or meets Regulatory Flood Level requirements.	Does not provide for amenity / functional improvement opportunities.	None identified as no work is proposed.	None identified as no work is proposed.	None identified.	Highest maintenance costs over the planning period.	Not applicable.	None identified.	○ Not preferred as it does not meet the guiding principles for the dyke. Invasive species in area could result in further damage to the dyke. Not preferred as it does not meet 100 year flood protection or the Regulatory Flood Level.
				Alternative 2: Replace w Similar Dyke (existing footprint)	Does not provide 100 year flood protection or meets Regulatory Flood Level requirements.	Current pathway does not meet City standards. This option could still allow additional amenity/functional improvements including enhanced playground area as per 2007 Master Plan Concept behind dyke.				Potential significant impact to existing vegetated area. Could require substantial clearing and grubbing, however mostly invasive species noted. Marginal impact to river. Work in river not anticipated.	Moderate impact based on construction activities, but can be mitigated using best management practices. Work in river not anticipated.	\$3,030,000	No significant maintenance costs anticipated, however, if segment is to remain vegetated, minor vegetation control costs should be budgeted.	Schedule B	Need to determine extent of dyke (as it is partially buried by deposition), could require significant earthworks.	● This option is not preferred as the cost/benefit is anticipated to be significantly less than Alternative 3 or 4.			
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Allows opportunities for improvements including enhanced playground area and river access (per 2007 Master Plan Concept).				Potential significant impact to existing vegetated area. Could require substantial clearing and grubbing, however mostly invasive species noted. Marginal impact to river. Work in river not anticipated.	Moderate impact based on construction activities, but can be mitigated using best management practices. Work in river not anticipated.	\$3,250,000	No significant maintenance costs anticipated, however, if segment is to remain vegetated, minor vegetation control costs should be budgeted.	Schedule B	Need to determine extent of dyke (as it is partially buried by deposition), could require significant earthworks.	● Viable solution, however it does not provide protection to Regulatory Level. Would negatively impact mature vegetation along the dyke face, but could be mitigated using proper planning and best management practices.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~ 0.6 m freeboard.	Allows opportunities for improvements including enhanced playground area and river access (per 2007 Master Plan Concept).				Potential significant impact to existing vegetated area. Could require substantial clearing and grubbing, however mostly invasive species noted. Marginal impact to river. Work in river not anticipated.	Moderate impact based on construction activities, but can be mitigated using best management practices. Work in river not anticipated.	\$3,470,000	No significant maintenance costs anticipated, however, if segment is to remain vegetated, minor vegetation control costs should be budgeted.	Schedule B	Need to determine extent of dyke (as it is partially buried by deposition), could require significant earthworks.	● Preferred solution as it best meets the guiding principles. Significant number of properties protected by dyke in this area, therefore passive protection to 250 year level (+ freeboard) is preferable. Cost/benefit advantage over Alternative 3 is significant.			

Segment	Approximate Length (m)	Condition Rating	Type	Flood Elevation			Lowest Elevation (mASL)	Approx. # of Properties within Hazard Area	Est. Current Flood Damage 100yr/250yr	Alternatives	Compliance with Guiding Principles		Natural Environment	Social Cultural	Economic/Financial		Future Class EA Requirements	Technical Issues / Requirements	Preferred Alternative
				100 yr (mASL)	250 yr (mASL)	250 yr + 10% (mASL)					Flood Protection	Amenity/Functional Improvements			Estimated Capital Costs ²	Estimated Maintenance Costs			
Habbitt Park/Forks	135	3	Concrete Revetment with Toe	236.35 to 236.32	237.08 to 237.05	237.67 to 237.65	236.0	340	\$21,967,000 / \$23,522,000	Alternative 1: Do Nothing	Does not provide 100 year flood protection or meets Regulatory Flood Level requirements.	Does not provide for amenity / functional improvement opportunities.	None identified as no work is proposed.	None identified as no work is proposed.	None identified	Highest Maintenance Costs over the planning period	Not applicable	Existing dyke likely to require replacement within 20 year period due to current condition.	○ Not preferred as it does not meet the guiding principles for the dyke
				Alternative 2: Replace w Similar Dyke (existing footprint)	Does not provide 100 year flood protection or meets Regulatory Flood Level requirements.	Current pathway does not meet City standards. This option could not allow additional amenity/functional improvements including look out area to Harris Park as per 2007 Master Plan Concept behind dyke.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners). Large trees located near property line likely impacted based on existing footprint.	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$1,840,000	No significant maintenance costs anticipated.	Schedule B	Construction/staging constraints.	○ This option is not preferred as the cost/benefit is anticipated to be significantly less than Alternative 4. Not preferred as structure would not meet 100 year flood protection or meet Regulatory Flood Levels.			
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Allows opportunities for improvements including pathway widening and ability to incorporate look out area depending on alignment of wall.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners). Impact to large trees located near property line may be minimized depending on placement of wall.	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$2,275,000	No significant maintenance costs anticipated.	Schedule B	In order to accommodate amenity/functional improvements, slope of dyke may be increased.	● Viable solution, however it does not provide protection to Regulatory Level. Opportunity to incorporate active flood protection measures due to proximity to nearby roads for access.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~ 0.6 m freeboard.	Allows opportunities for improvements including pathway widening and ability to incorporate look out area depending on alignment of wall.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners). Impact to large trees located near property line may be minimized depending on placement of wall.	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$2,500,000	No significant maintenance costs anticipated.	Schedule B	Consider same type of dyke structure as Phase 1 for continuity/ connection at Rogers Ave.	● Preferred solution as it best meets the guiding principles. It is anticipated that additional increase in height of ~1.5m would be sufficient to provide 250 yr + protection. Cost/benefit advantage over Alternative 3 is significant.			
Habbitt Park/Forks	300	4	Concrete Modular Block Wall with Geogrid (2007 - 2009 Replacement Projects)	236.32 to 236.23	237.05 to 236.95	237.65 to 237.55	236.8			Alternative 1: Do Nothing	Current structure provides up to 100 year flood protection.	Amenity/functional improvements identified in 2007 construction	None identified as no work is proposed.	None identified as no work is proposed.	Not applicable	Minor maintenance required, primarily along lower pathway.	Not applicable	Not applicable	● Viable alternative.
				Alternative 2: Replace w Similar Dyke (existing footprint)	Does not meet revised Regulatory Flood Level.	Generally not applicable due to current condition of the dyke (not anticipated to need replacement within the 20 year study period). Amenities were incorporated as part of replacement phase.				Limited impact anticipated due to availability of lands for staging, etc. and setback of river to property line.	Moderate impact based on construction activities, but can be mitigated using best management practices.	\$4,440,000	No significant maintenance costs anticipated.	Schedule B	Construction/staging constraints.	✗ Not applicable. Structure constructed in 2007 and not anticipated to require replacement within 20 year planning period.			
				Alternative 3: Replace w 100 yr + Freeboard	Not applicable as current modular wall provides above 100 year limit. This option would not meet Regulatory Flood Level.	Generally not applicable due to current condition of the dyke (not anticipated to need replacement within the 20 year study period). Amenities were incorporated as part of replacement phase.				Limited impact anticipated due to availability of lands for staging, etc. and setback of river to property line.	Moderate impact based on construction activities, but can be mitigated using best management practices.	\$4,660,000	No significant maintenance costs anticipated.	Schedule B	Construction/staging constraints.	✗ Not applicable. Structure constructed in 2007 and not anticipated to require replacement within 20 year planning period.			
				Alternative 4: Replace with 250 yr + Freeboard	Current structure provides up to Regulatory Flood Level but does not provide up to the revised Regulatory Flood Level plus freeboard.	Generally not applicable due to current condition of the dyke (not anticipated to need replacement within the 20 year study period). Amenities were incorporated as part of replacement phase.				Limited impact anticipated due to availability of lands for staging, etc. and setback of river to property line.	Moderate impact based on reconstruction, but can be mitigated using best management practices.	\$5,000,000 (includes entire wall reconstruction. Cost estimate of \$245,000 for raising of the existing wall)	No significant maintenance costs anticipated.	Schedule B	Construction/staging constraints.	● Replacement not viable. Consideration given to raising of the dyke is the preferred solution.			
Habbitt Park/Forks	175	4	Natural Bank with Gabion Toe	236.23 to 236.10	236.95 to 236.77	237.55 to 237.32	236.2	0		Alternative 1: Do Nothing	Does not provide 100 year flood protection or meets Regulatory Flood Level requirements.	Does not provide for amenity / functional improvement opportunities.	None identified as no work is proposed.	None identified.	Not applicable.	Maintenance costs associated with vegetation control.	Not applicable.	Not applicable.	○ Viable alternative as amenity improvements can be integrated without dyke upgrades. Does not meet the Regulatory Flood Level, however less impacted properties in this area, therefore cost benefit of raising the structure is less.
				Alternative 2: Replace w Similar Dyke (existing footprint)											✗ This option not applicable to earth dyke segments as it is generally no different than the "Do Nothing" option or Alternative 3.				
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Forks of the Thames Phase 4 completed. Not known whether additional amenity/functional improvements are required.				No significant impact anticipated due to working area present. Return to prior natural/vegetated conditions.	None identified.	\$260,000	Depends on type of dyke selected and amenity requirements. Not anticipated to be significantly higher costs than existing dyke maintenance.	Schedule B	None identified.	● Viable solution, however it does not provide protection to the Regulatory Flood Limit. Adequate land behind dyke would make Alternative 4 more preferable.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~0.5 m freeboard.	Forks of the Thames Phase 4 completed. Not known whether additional amenity/functional improvements are required.				No significant impact anticipated due to working area present. Return to prior natural/vegetated conditions.	None identified.	\$300,000	Depends on type of dyke selected and amenity requirements. Not anticipated to be significantly higher costs than existing dyke maintenance.	Schedule B	None identified.	● Preferred solution as it best meets the guiding principles and assuming additional flood protection accomplished by means of berm enhancements. It is anticipated that additional increase in height of ~1m would be sufficient to provide 250 yr + protection. Cost/benefit advantage is marginal, however, due to smaller impacted area.			
Wharcliffe	380	4	Natural Bank with Gabion Toe	236.10 to 235.83	236.77 to 236.47	237.32 to 236.98	235.5	1	\$1,200,000 / \$1,202,000	Alternative 1: Do Nothing	Currently provides up to 100 year flood protection with little to no freeboard. Does not meet Regulatory Flood Level requirements.	Capable of implementing amenity or functional improvements separately within the area due to its size.	None identified as no work is proposed.	None identified as no work is proposed.	Not applicable	Maintenance costs associated with vegetation control.	Not applicable.	Not applicable.	○ Not preferred as it does not meet the guiding principles for the dyke
				Alternative 2: Replace w Similar Dyke (existing footprint)											✗ This option not applicable to earth dyke segments as it is generally no different than the "Do Nothing" option or Alternative 3.				
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Capable of implementing amenity or functional improvements separately within the area due to its size.				No significant impacts expected as construction could proceed out of river. Minor repairs to existing gabions may be required at rivers edge.	None identified.	\$3,800,000 (includes pathway)	Maintenance costs associated with vegetation control.	Schedule B	May need to relocate pathway.	● Viable solution, however it does not provide protection to the Regulatory Limit. Adequate land behind dyke would make Alternative 4 more preferable without a significant increase in cost.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~0.5 m freeboard.	Capable of implementing amenity or functional improvements separately within the area due to its size.				No significant impacts expected as construction could proceed out of river. Minor repairs to existing gabions may be required at rivers edge.	None identified.	\$4,330,000 (includes pathway)	Maintenance costs associated with vegetation control.	Schedule B	May need to relocate pathway.	● Preferred solution as it best meets the guiding principles and assuming additional flood protection accomplished by means of berm enhancements. It is anticipated that additional increase in height of ~1.5m would be sufficient to provide 250 yr + protection. Cost/benefit advantage is marginal, however, due to smaller impacted area.			
Cavendish East	160	3	Concrete Revetment with Toe	235.83 to 235.69	236.47 to 236.33	236.98 to 236.83	233.5	70	\$4,260,000 / \$4,820,000	Alternative 1: Do Nothing	Does not provide protection to Regulatory Flood Level.	Does not provide for amenity / functional improvement opportunities including potential future pathway extension.	None identified as no work is proposed.	None identified as no work is proposed.	Not applicable	Highest maintenance costs compared to other alternatives over the planning period.	Not applicable	Existing dyke likely to require replacement within 20 year period due to current condition.	○ Not preferred as it does not meet the guiding principles for the dyke.
				Alternative 2: Replace w Similar Dyke (existing footprint)	Does not provide protection to Regulatory Flood Level.	Does not provide for amenity / functional improvement opportunities including potential future pathway extension or construction of pathway at top of dyke.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners).	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$2,380,000	No significant maintenance costs anticipated.	Schedule B	Construction/staging constraints.	○ This option is not preferred as the cost/benefit is anticipated to be significantly less than Alternative 3 or 4.			
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Allows opportunities for improvements including pathway construction depending on alignment of wall.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners).	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$2,600,000	No significant maintenance costs anticipated. Maintenance costs associated with pathway may be higher (impact of high water level).	Schedule B	In order to accommodate amenity/functional improvements, slope of dyke may be increased.	● Viable solution, however it does not provide protection to the Regulatory Limit. Could potentially implement active flood control measures.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~0.5 m freeboard.	Allows opportunities for improvements including pathway construction depending on alignment of wall.				Potential requirement to conduct work in river due to existing constraints (proximity to adjacent landowners).	Moderate impact based on construction activities, but can be mitigated using best management practices. May require work in river.	\$2,700,000	No significant maintenance costs anticipated. Maintenance costs associated with pathway may be higher (impact of high water level).	Schedule B	In order to replace dyke to 250 yr, area available for construction may result in increased slope of dyke, similar to Phase 1 structure (also to minimize height).	● Preferred solution as it best meets the guiding principles for the dyke.			
Cavendish East	240	4	Natural Bank	235.69 to 235.57	236.33 to 236.21	236.83 to 236.71	235.8	60	\$475,000 / \$535,000	Alternative 1: Do Nothing	Currently provides protection up to the 100 year flood level. Does not provide protection to Regulatory Flood Level.	Does not provide for amenity / functional improvement opportunities.	None identified as no work is proposed.	None identified as no work is proposed.	Not applicable	Maintenance costs associated with vegetation control.	Not applicable	Not applicable	○ Not preferred as it does not meet the guiding principles for the dyke.
				Alternative 2: Replace w Similar Dyke (existing footprint)											✗ This option not applicable to earth dyke segments as it is generally no different than the "Do Nothing" option or Alternative 3.				
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Capable of implementing amenity or functional improvements (signage) within the area due to its size.				Mature trees along this section, could impose constraints on construction.	None identified.	\$2,275,000	Maintenance costs associated with vegetation control.	Schedule B	Significant mature vegetation to address during construction.	● Viable solution, however it does not provide protection to the Regulatory Limit.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~0.5 m freeboard.	Capable of implementing amenity or functional improvements (signage) within the area due to its size.				Mature trees along this section, could impose constraints on construction.	None identified.	\$2,600,000	Maintenance costs associated with vegetation control.	Schedule B	Significant mature vegetation to address during construction.	● Preferred solution as it meets the guiding principles. Would negatively impact mature vegetation along the dyke face, but could be mitigated using proper planning and best management practices.			
Cavendish West	220	4	Natural Bank with Berms	235.57 to 235.54	236.21 to 236.18	236.71 to 236.69	~236	0		Alternative 1: Do Nothing	Does not provide protection to Regulatory Flood Level.	Capable of implementing amenity or functional improvements separately within the area due to its size.	None identified as no work is proposed.	None identified as no work is proposed.	Not applicable	Maintenance costs associated with vegetation control.	Not applicable.	Not applicable.	○ Not preferred as it does not meet the guiding principles for the dyke.
				Alternative 2: Replace w Similar Dyke (existing footprint)											✗ This option not applicable to earth dyke segments as it is generally no different than the "Do Nothing" option or Alternative 3.				
				Alternative 3: Replace w 100 yr + Freeboard	Does not provide protection to Regulatory Flood Level.	Capable of implementing amenity or functional improvements separately within the area due to its size.				No significant impact anticipated due to working area present. Return to prior natural/vegetated conditions. Implement best management practices.	None identified.	\$975,000	Maintenance costs associated with vegetation control.	Schedule B	None identified, however extension of the dyke may be required to address the enhanced flood protection requirements.	● Viable solution, however it does not provide protection to the Regulatory Level.			
				Alternative 4: Replace with 250 yr + Freeboard	Provides protection to Regulatory Flood Level with ~0.5 m freeboard.	Capable of implementing amenity or functional improvements separately within the area due to its size.				No significant impact anticipated due to working area present. Return to prior natural/vegetated conditions. Implement best management practices.	None identified.	\$1,200,000	Maintenance costs associated with vegetation control.	Schedule B	None identified, however extension of the dyke may be required to address the enhanced flood protection requirements.	● Preferred solution as only moderate increase in the dyke height is required in order to achieve Regulatory Flood Level. Sufficient space available to integrate height increase.			

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - KEY MAP.dwg
2015/09/09 4:08 PM By: Brown, David



ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project

UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

Figure No.

1.1

Title

NORTH BRANCH
KEY PLAN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - KEY MAP.dwg
2015/09/09 4:08 PM By: Brown, David



ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project

UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

Figure No.

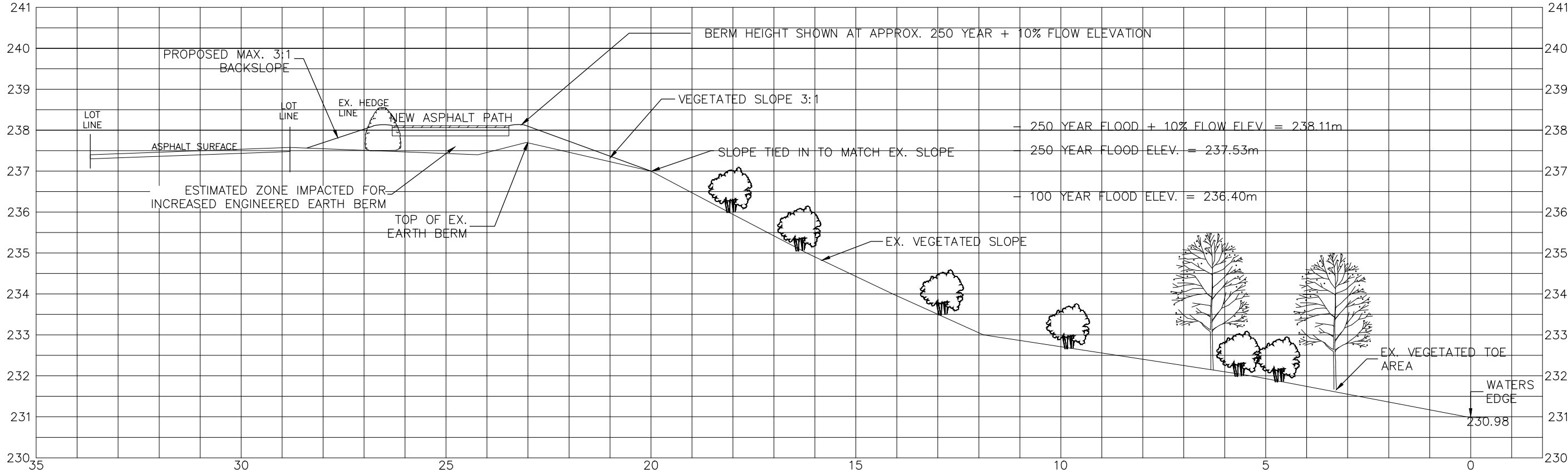
1.2

Title

MAIN BRANCH
KEY PLAN

Dyke Cross Section Section 1 - Oxford North

APPROXIMATE STATION -0+015



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

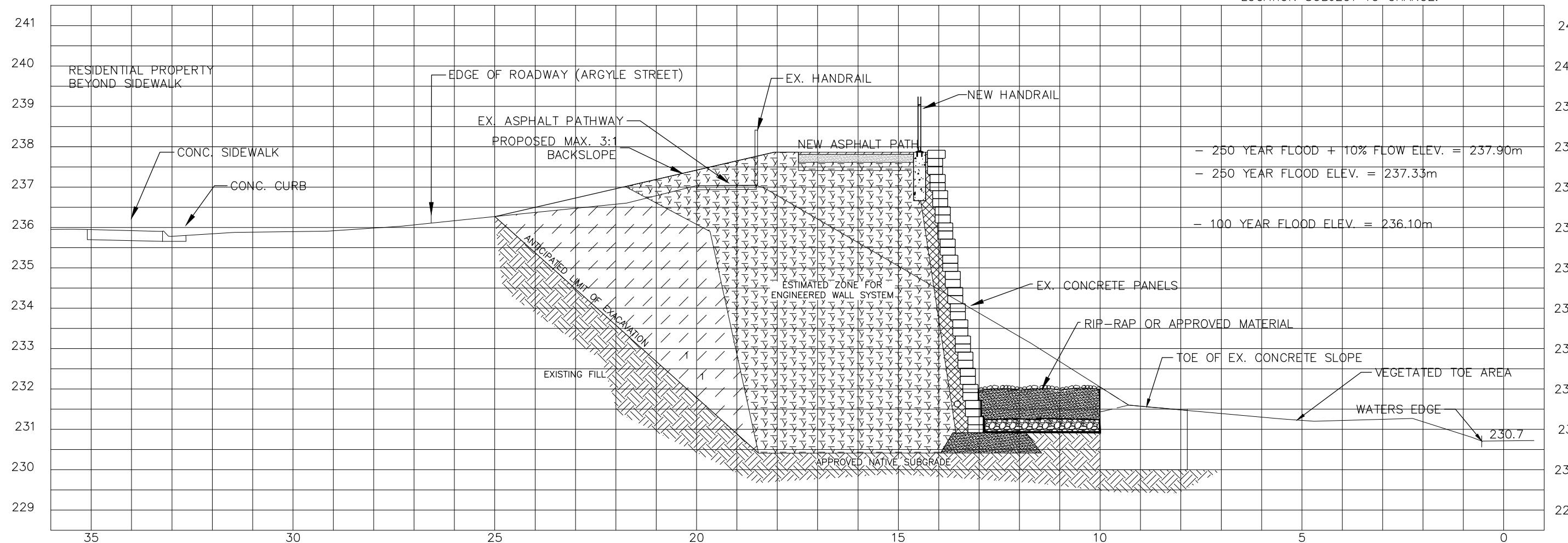
Notes

Client/Project
UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN
Figure No.
1.3
Title
SECTION 1 - OXFORD NORTH

Dyke Cross Section Section 2 - St. Patrick

APPROXIMATE STATION 0+130

CONCEPTUAL WALL PLACED IN APPROX.
CENTER OF EXISTING STRUCTURE.
LOCATION SUBJECT TO CHANGE.



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project

UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

Figure No.

1.4

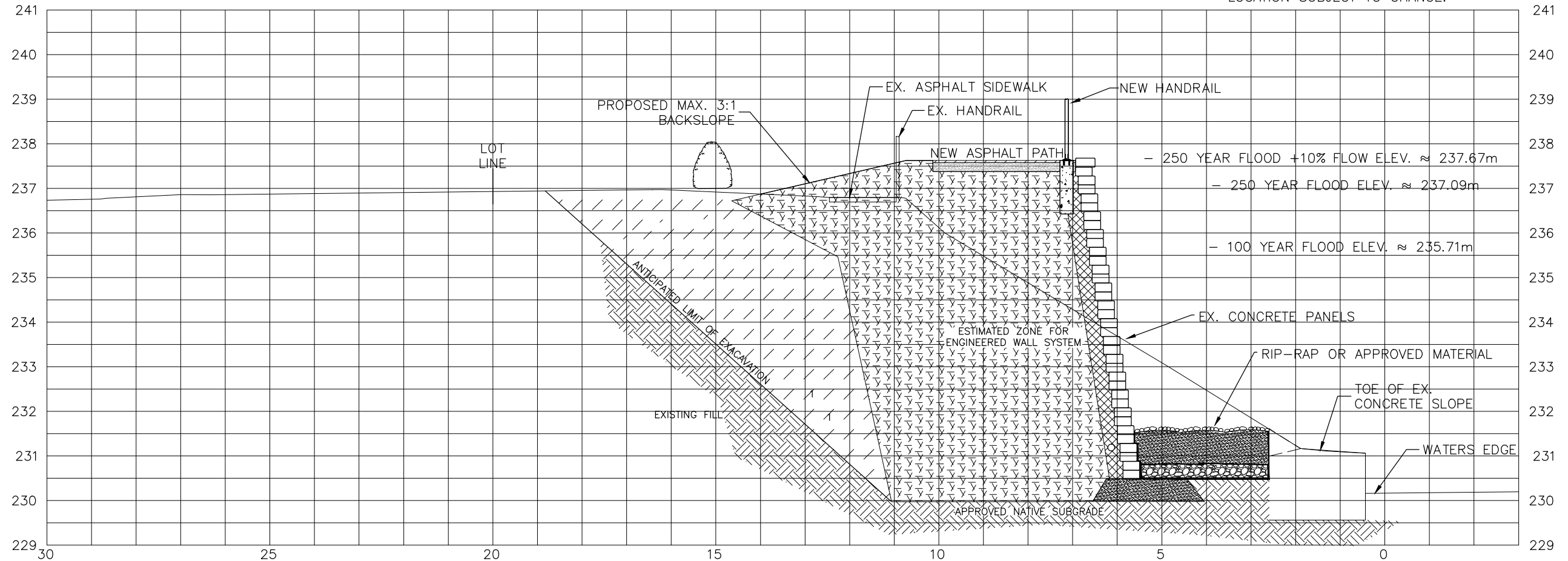
Title

SECTION 2 - ST. PATRICK

Dyke Cross Section Section 3 - Blackfriars

APPROXIMATE STATION 0+565

CONCEPTUAL WALL PLACED IN APPROX.
CENTER OF EXISTING STRUCTURE.
LOCATION SUBJECT TO CHANGE.



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project

UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

Figure No.

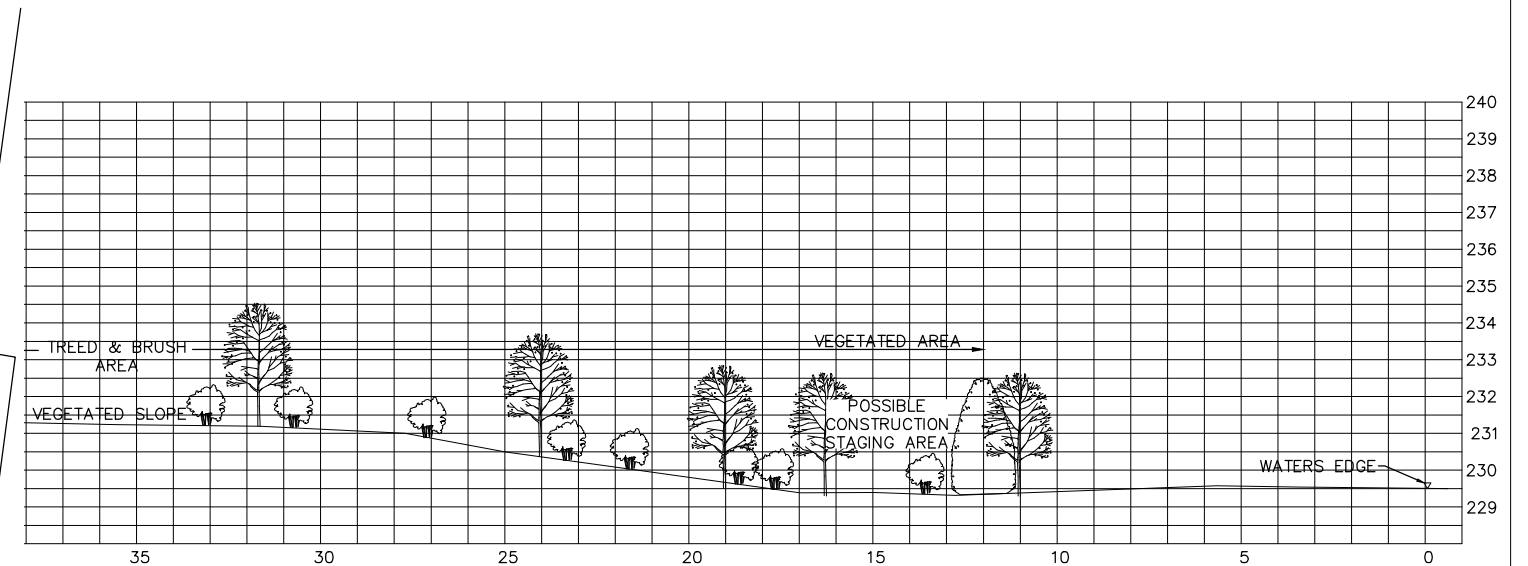
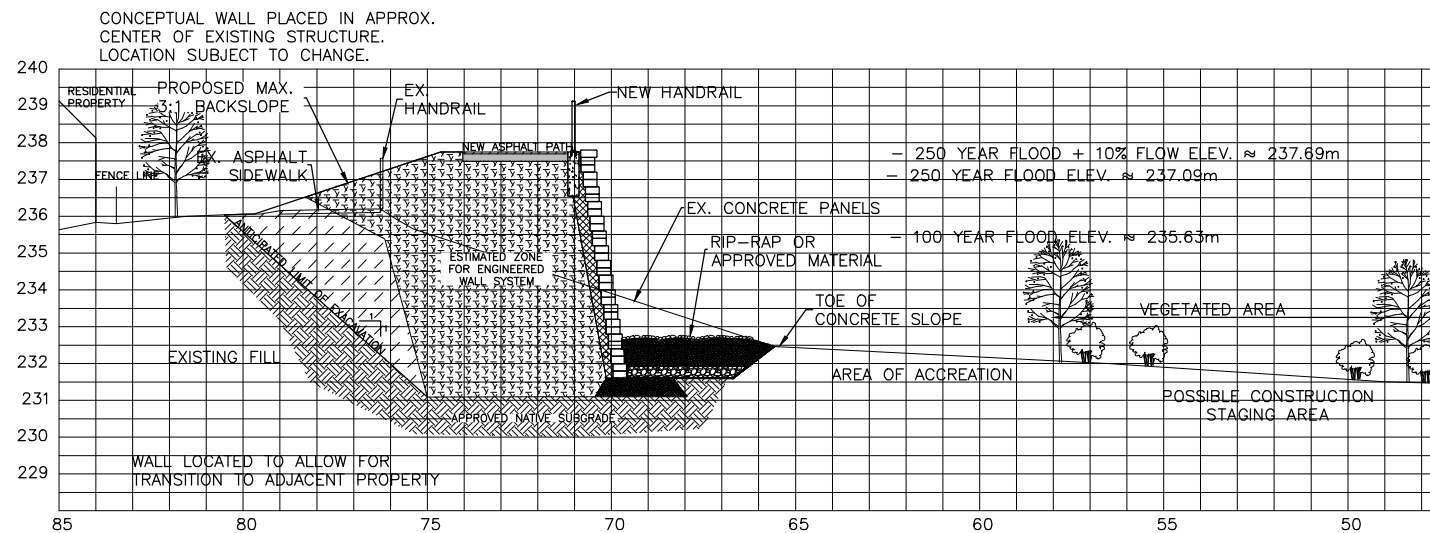
1.5

Title

SECTION 3 - BLACKFRIARS

Dyke Cross Section Section 4 - Natural Bank

APPROXIMATE STATION 0+810



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project

UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

Figure No.

1.6

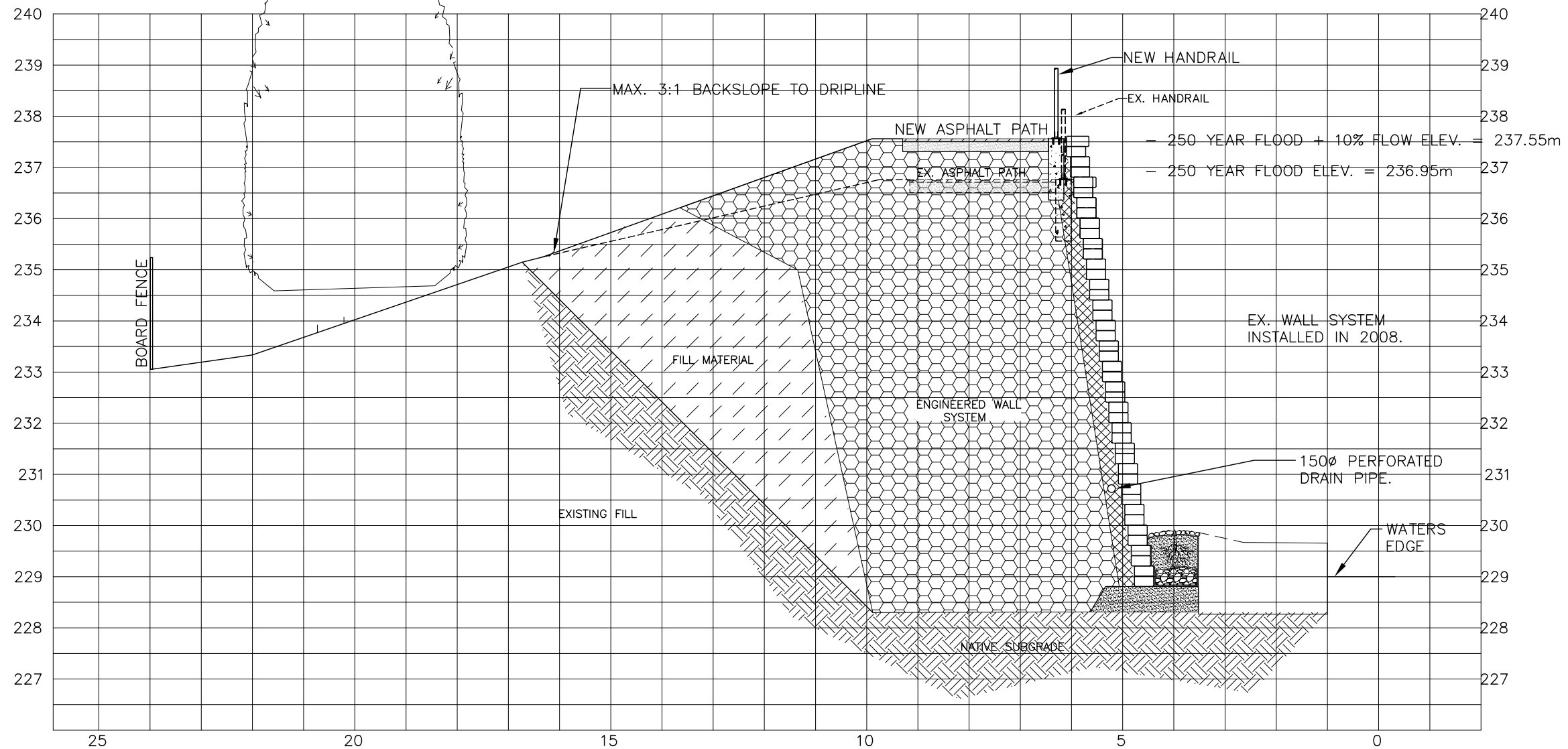
Title

SECTION 4 - NATURAL BANK

Dyke Cross Section Section 5 - Forks/Labatt Park

(revised to show existing structure height)

APPROXIMATE STATION 1+250



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



Legend

Notes

Client/Project
UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

Figure No.

1.7

Title

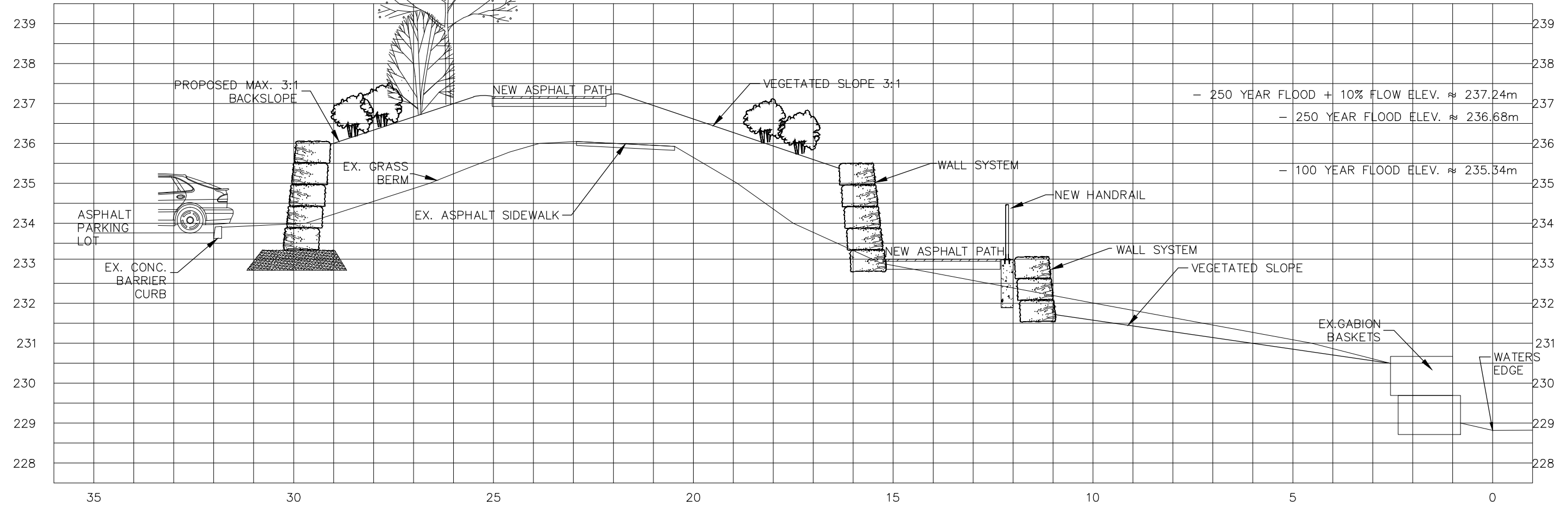
SECTION 5 - FORKS/LABATT PARK

171 Queens Avenue, 6th Floor
London ON
www.stantec.com

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/14 1:45 PM By: Brown, David

Dyke Cross Section Section 6 - Wharncliffe

APPROXIMATE STATION 1+750



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project
UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

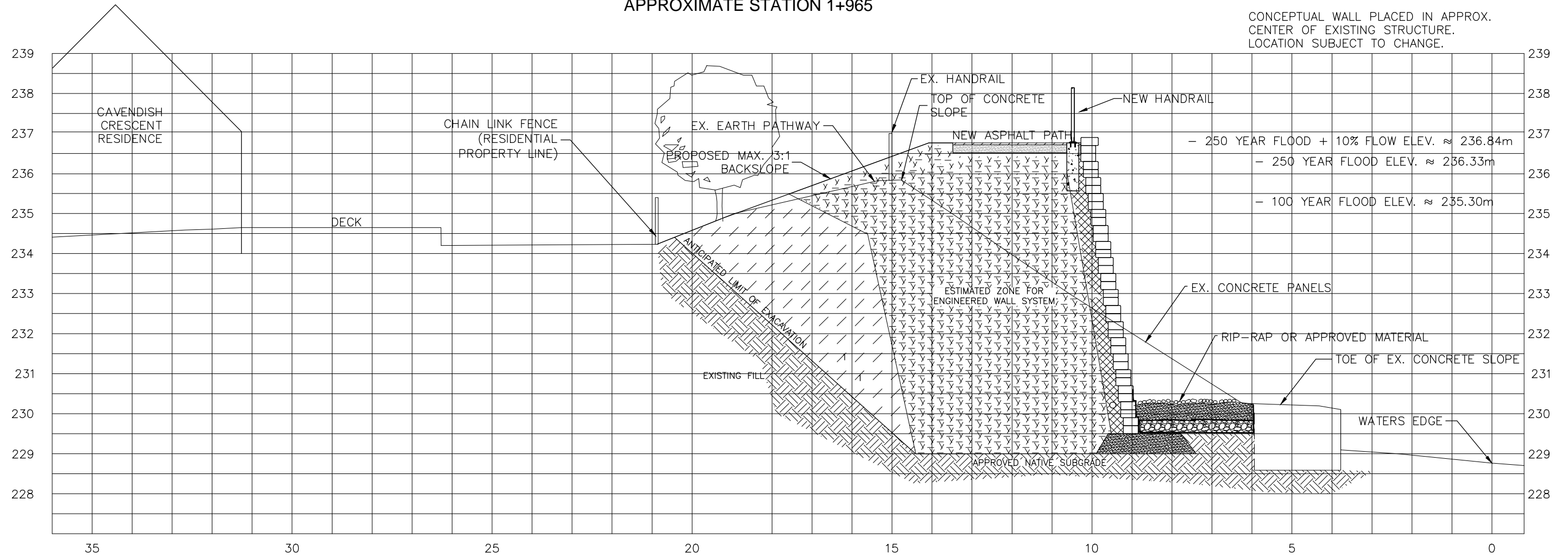
Figure No.
1.8

Title
SECTION 6 - WHARNCLIFFE

Dyke Cross Section Section 7 - Cavendish East

APPROXIMATE STATION 1+965

CONCEPTUAL WALL PLACED IN APPROX.
CENTER OF EXISTING STRUCTURE.
LOCATION SUBJECT TO CHANGE.



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project

UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

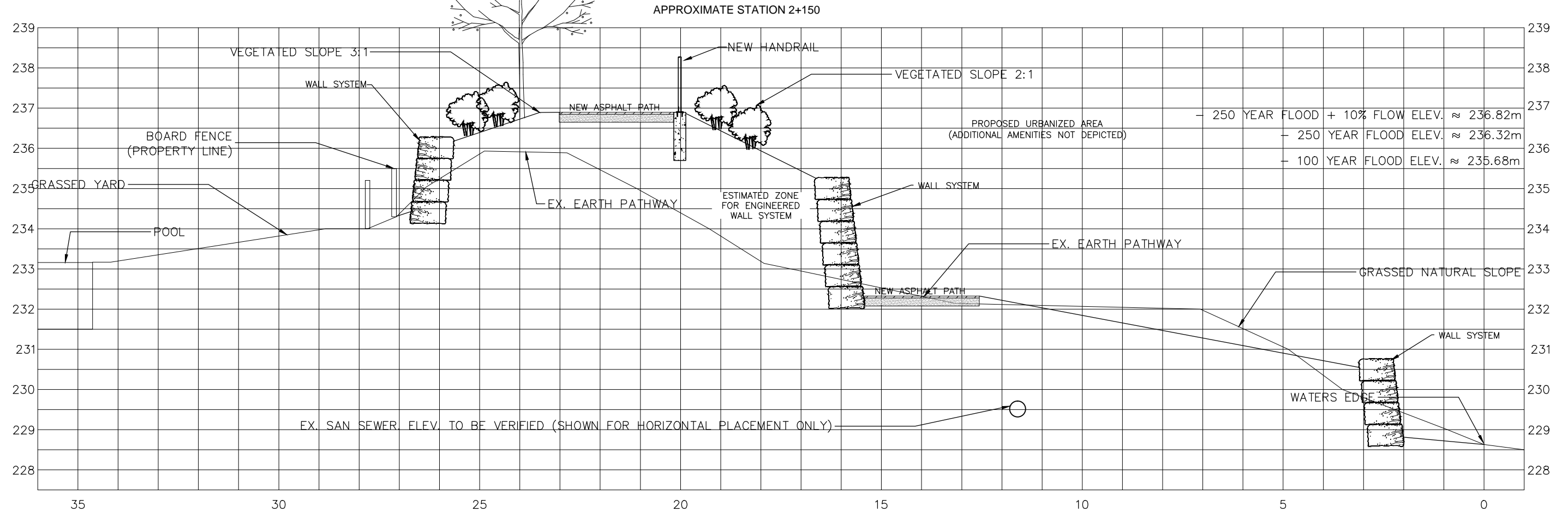
Figure No.

1.9

Title

SECTION 7 - CAVENDISH EAST

Dyke Cross Section Section 8 - Cavendish East



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

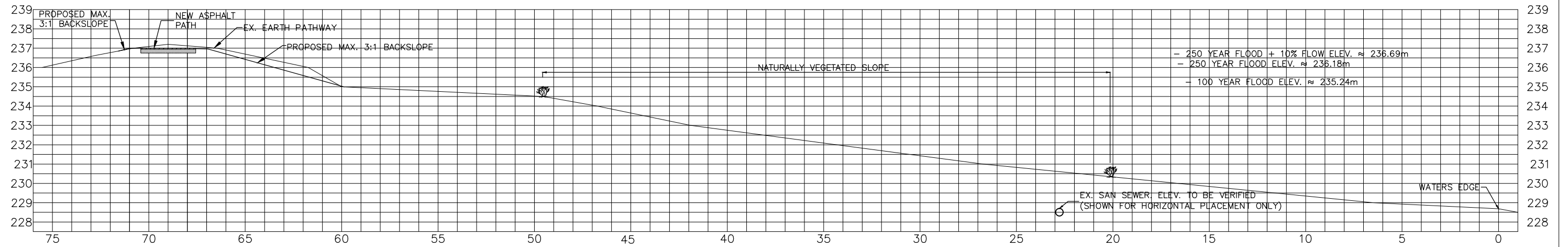
Legend

Notes

Client/Project
UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN
Figure No.
1.10
Title
SECTION 8 - CAVENDISH EAST

Dyke Cross Section Section 9 - Cavendish West

APPROXIMATE STATION 2+385



NOTE:
ARCHITECTURAL CONCEPT ONLY. FINAL CONFIGURATION
TO BE DETERMINED DURING DETAILED DESIGN

V:\01656\active\165630035\planning\drawing\CAD\TOPO_CofL - Xsec - July 2015_rev2.dwg
2015/09/09 4:17 PM By: Brown, David

ORIGINAL SHEET - ANSI B

JULY, 2015
165630035



171 Queens Avenue, 6th Floor
London ON
www.stantec.com

Legend

Notes

Client/Project

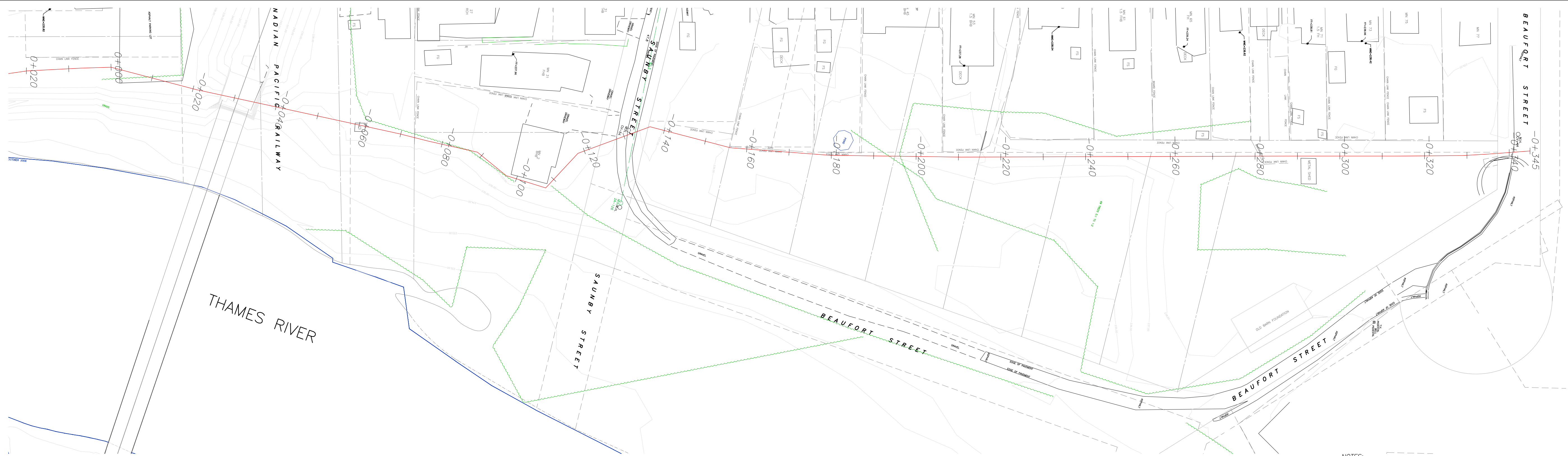
UTRCA
WEST LONDON DYKE
MASTER REPAIR PLAN

Figure No.

1.11

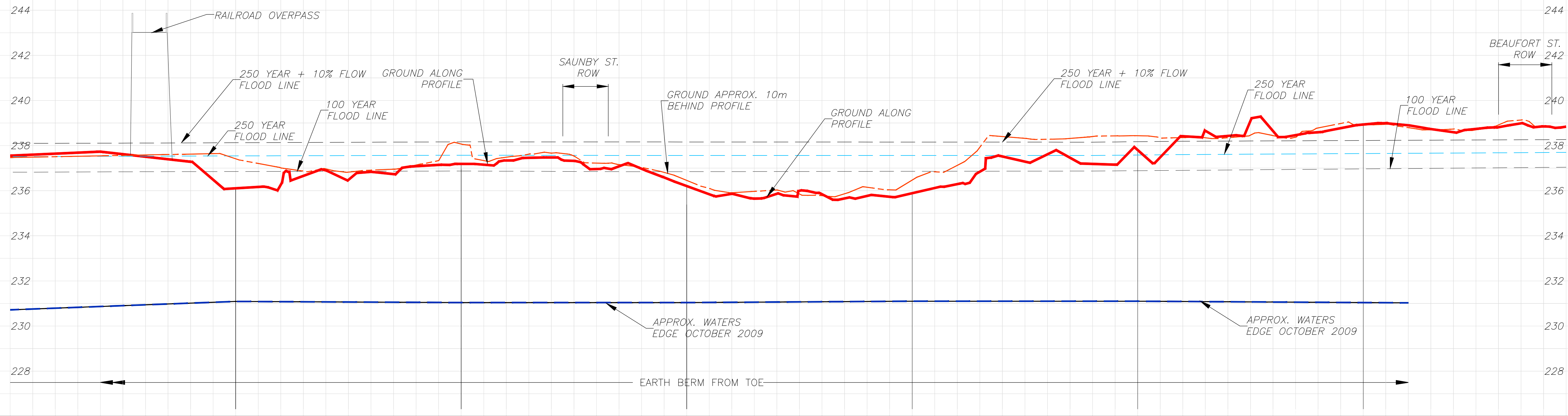
Title

SECTION 9 - CAVENDISH WEST



NORTH OXFORD AREA

NOTES:
 1. PLAN AND PROFILE DRAWINGS PREPARED BASED ON INFORMATION SUPPLIED BY THE UPPER THAMES RIVER CONSERVATION AUTHORITY AND CITY OF LONDON OBM MAPPING.
 2. ALTERNATE ROUTES TO BE INVESTIGATED DURING DESIGN STAGE.

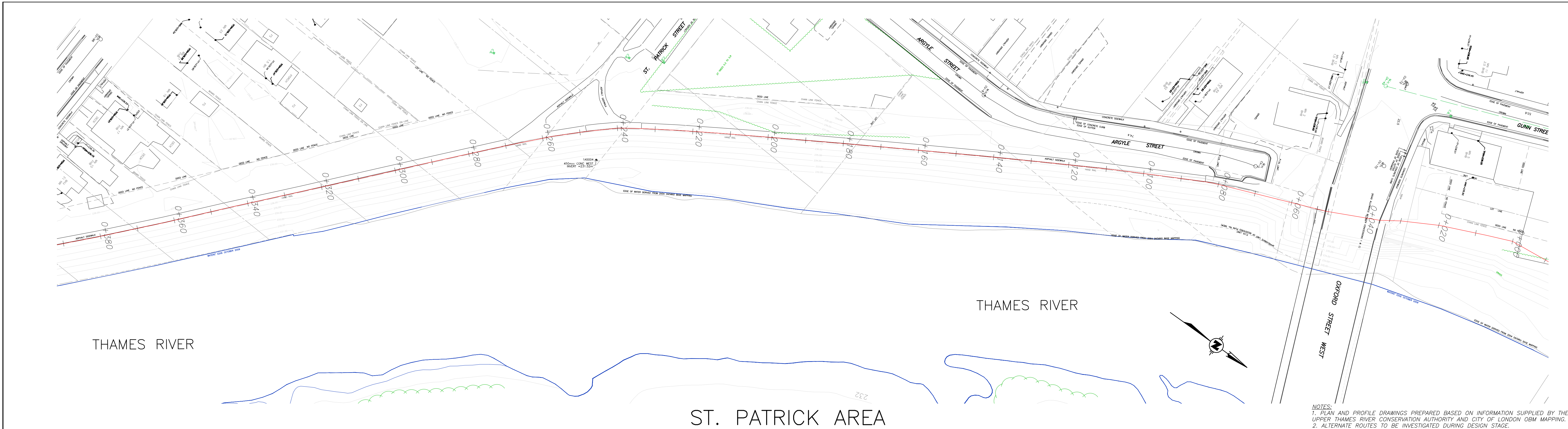


STATION	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+340
TOP OF DYKE	231.72		231.09	231.04	231.04	231.04	231.05	231.05	231.05	231.10	231.13	231.13	231.13	231.01	231.01	231.01	231.01
APPROX. TOP OF DYKE	237.47		237.41	237.41	237.41	237.41	237.46	237.46	237.46	237.47	237.44	237.44	237.44	237.44	237.44	237.44	237.44
TOP OF EXISTING DYKE	237.6		237.53	237.53	237.53	237.53	237.56	237.56	237.56	237.59	237.56	237.56	237.56	237.60	237.60	237.60	237.69

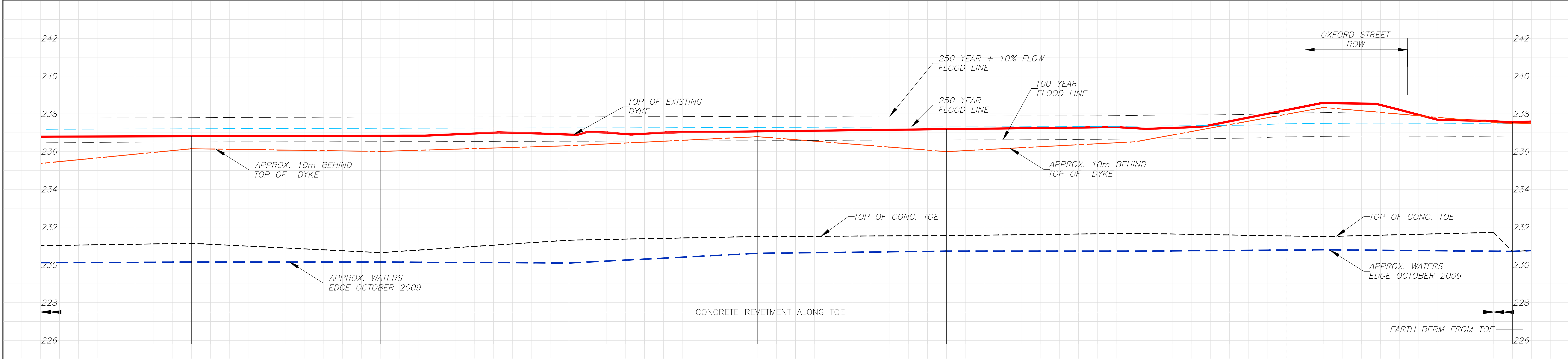
EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	CONSULTANT OR DIVISION	ENGINEER'S STAMP	SCALE HORZ 1:500	TITLE WEST LONDON DYKE UPPER THAMES RIVER CONSERVATION AUTHORITY OXFORD NORTH AREA STATION -0+310 TO 0+000	PROJECT No. SHEET No. 1 PLAN FILE No.
					DESIGN S.D. DRAWN BY D.S. CHECKED C.C. APPROVED N.G. DATE SEPT. 2, 2015					Stantec Consulting Ltd. 171 Queens Avenue London ON Canada N6A 5J7 Tel. 519.645.2007 Fax. 519.645.6575 www.stantec.com				

Job No. DWG No. JOB NAME





NOTES:
 1. PLAN AND PROFILE DRAWINGS PREPARED BASED ON INFORMATION SUPPLIED BY THE UPPER THAMES RIVER CONSERVATION AUTHORITY AND CITY OF LONDON OBM MAPPING.
 2. ALTERNATE ROUTES TO BE INVESTIGATED DURING DESIGN STAGE.

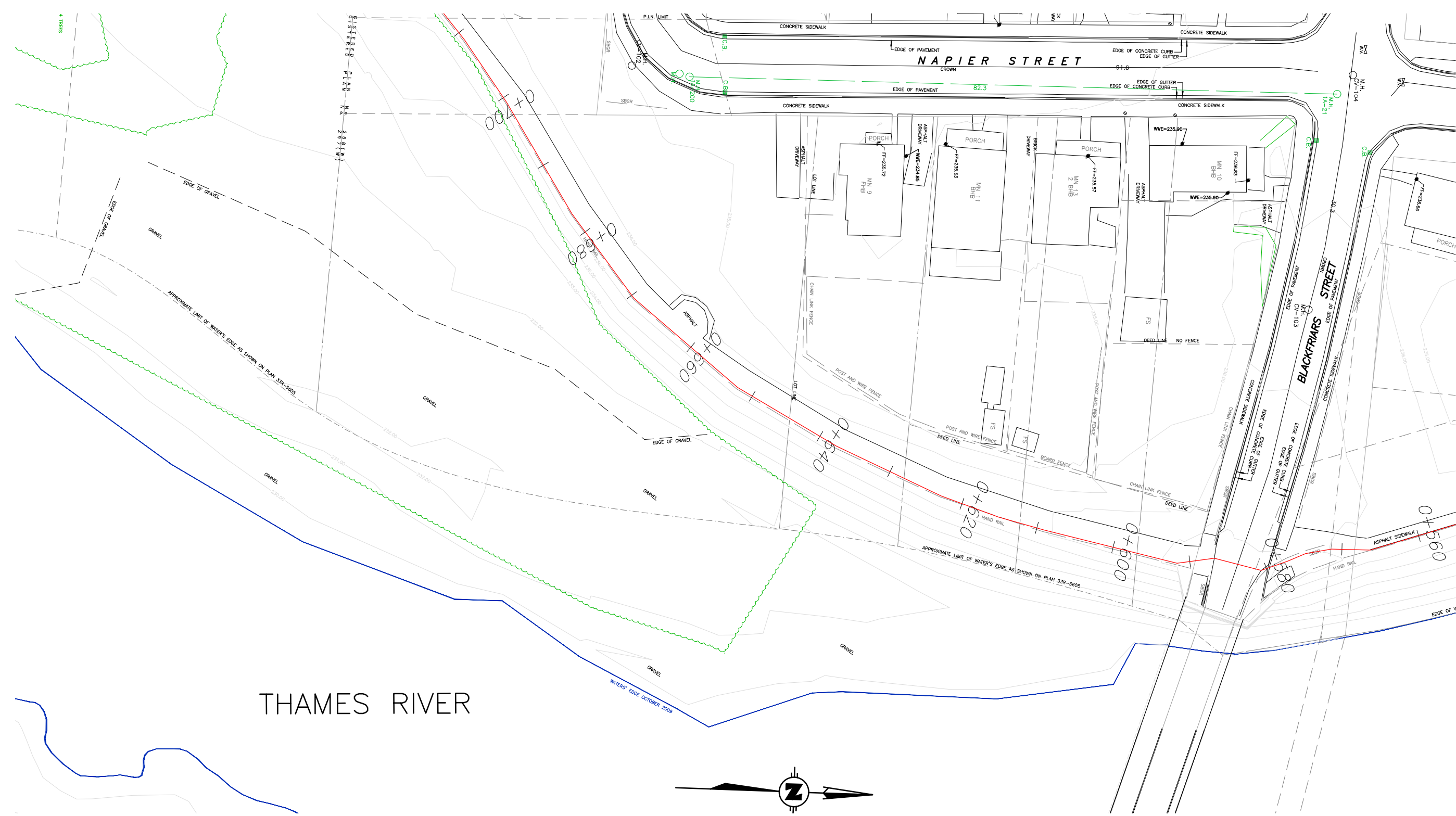


TOP OF EXISTING DYKE	236.8	236.8	236.9	237.1	237.2	237.2	237.6	237.6	237.6
100 YEAR FLOOD LINE	237.22	237.26	237.26	237.33	237.40	237.48	237.51	237.50	237.50
APPROX. 10m BEHIND TOP OF DYKE	236.00	236.01	236.36	236.79	236.00	236.52	236.34	237.47	237.47
TOP OF CONC. TOE	231.14	230.65	231.28	231.51	231.55	231.67	231.50	231.72	231.72
APPROX. WATERS EDGE OCTOBER 2009	231.80	231.80	231.80	231.80	231.80	231.80	231.80	231.80	231.80

STATION	EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	CONSULTANT OR DIVISION	ENGINEER'S STAMP	SCALE	TITLE	PROJECT No.
0+180						DESIGN S.J.					 Stantec Consulting Ltd. 171 Queens Avenue London ON Canada N6A 5J7 Tel. 519.645.2007 Fax. 519.645.6575 www.stantec.com	SCALE HORZ 1:500	WEST LONDON DYKE UPPER THAMES RIVER CONSERVATION AUTHORITY ST. PATRICK AREA STATION 0+000 TO 0+380	0+180	
0+160					DRAWN BY D.B.					0+160					
0+140					CHECKED C.G.					0+140					
0+120					APPROVED N.G.					0+120					
0+100					DATE SEPT. 2, 2015					0+100					
0+000						165630035								2	

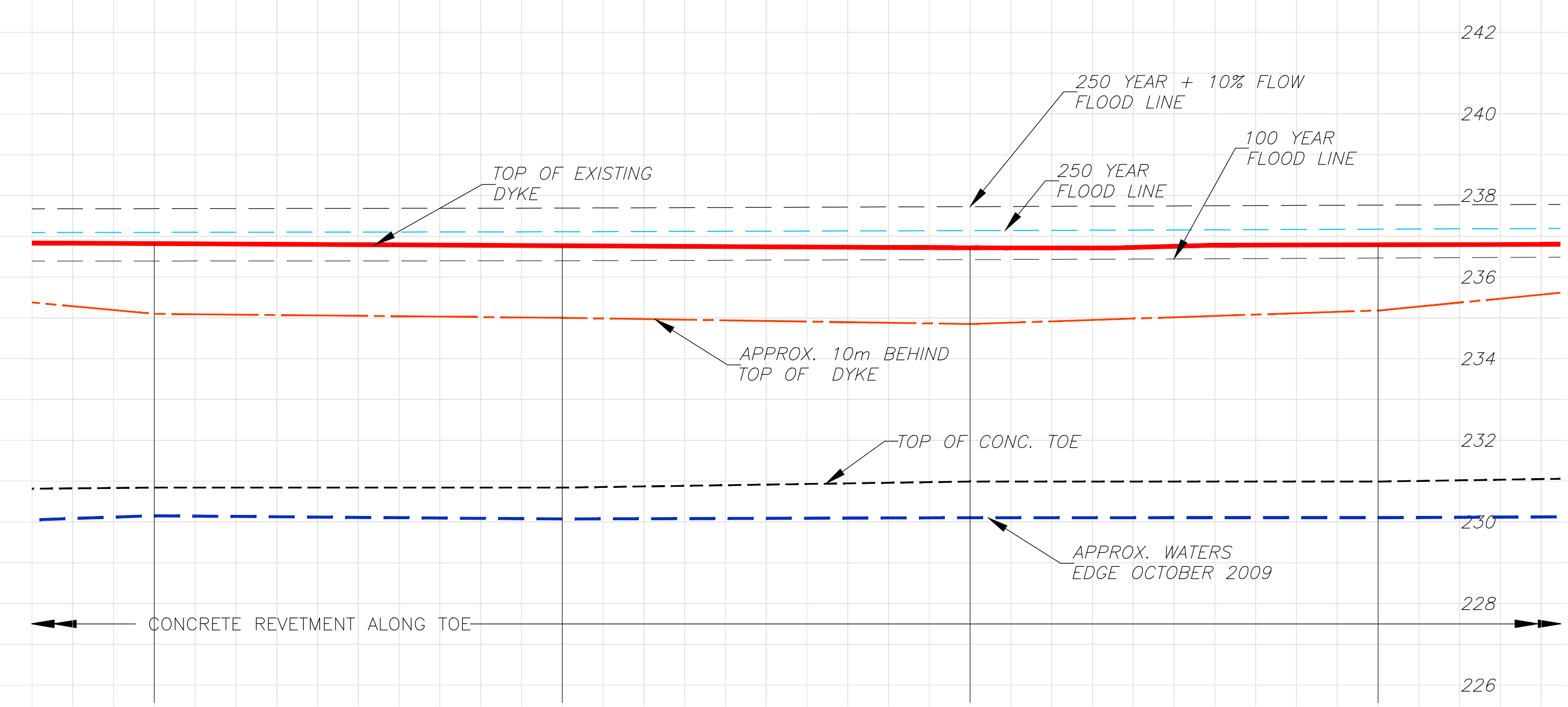
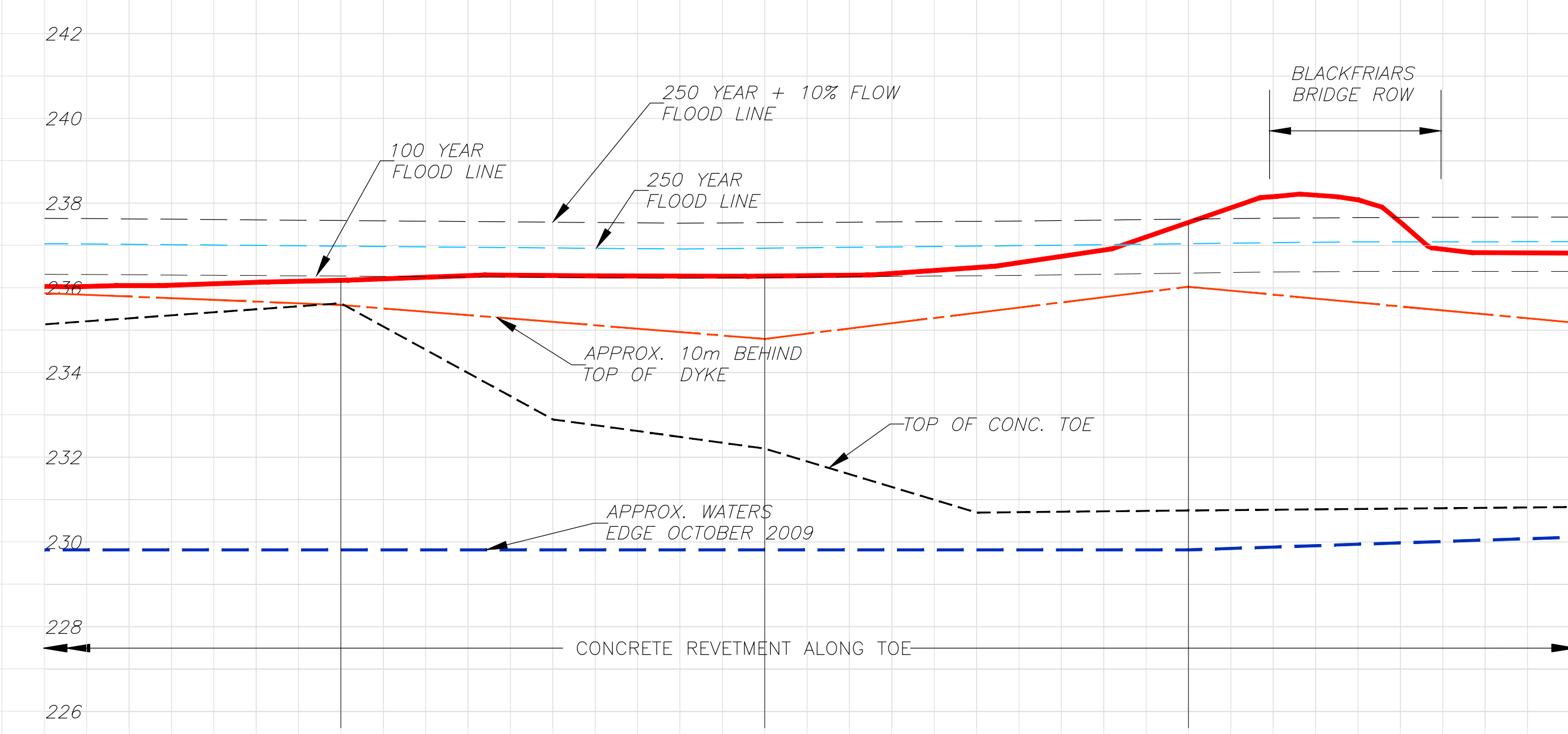
Job No. DWG No. JOB NAME

PLAN FILE No.



NOTES:
 1. PLAN AND PROFILE DRAWINGS PREPARED BASED ON INFORMATION SUPPLIED BY THE UPPER THAMES RIVER CONSERVATION AUTHORITY AND CITY OF LONDON OBM MAPPING.
 2. ALTERNATE ROUTES TO BE INVESTIGATED DURING DESIGN STAGE.

BLACKFRIARS AREA



STATION	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060	1+080	1+100	1+120	1+140	1+160	1+180	1+200
TOP OF EXISTING DYKE	236.2	236.3	236.3	237.00	237.5	237.07	237.09	237.09	236.8	236.8	236.7	236.8	236.7	236.8	236.8	236.7	236.8	236.7	236.8	236.8	236.7	236.8	236.8	236.8	236.8
APPROX. 10m BEHIND TOP OF DYKE	236.60	236.92	236.92	237.00	237.5	237.07	237.09	237.09	236.8	236.8	236.7	236.8	236.7	236.8	236.8	236.7	236.8	236.7	236.8	236.8	236.7	236.8	236.8	236.8	236.8
TOP OF CONC. TOE	235.64	235.80	235.80	236.03	236.03	235.10	235.10	235.10	234.84	234.84	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85
APPROX. WATERS EDGE OCTOBER 2009	235.64	235.80	235.80	236.03	236.03	235.10	235.10	235.10	234.84	234.84	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85	234.85

Job No. DWG No. JOB NAME

EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT
					DESIGN S.J.				
					DRAWN BY D.B.				
					CHECKED C.C.				
					APPROVED N.G.				
					DATE SEPT. 2, 2015				
						165630035			

CONSULTANT OR DIVISION

Stantec Consulting Ltd.
 171 Queens Avenue
 London ON Canada
 N6A 5J7
 Tel. 519.645.2007
 Fax. 519.645.6575
 www.stantec.com

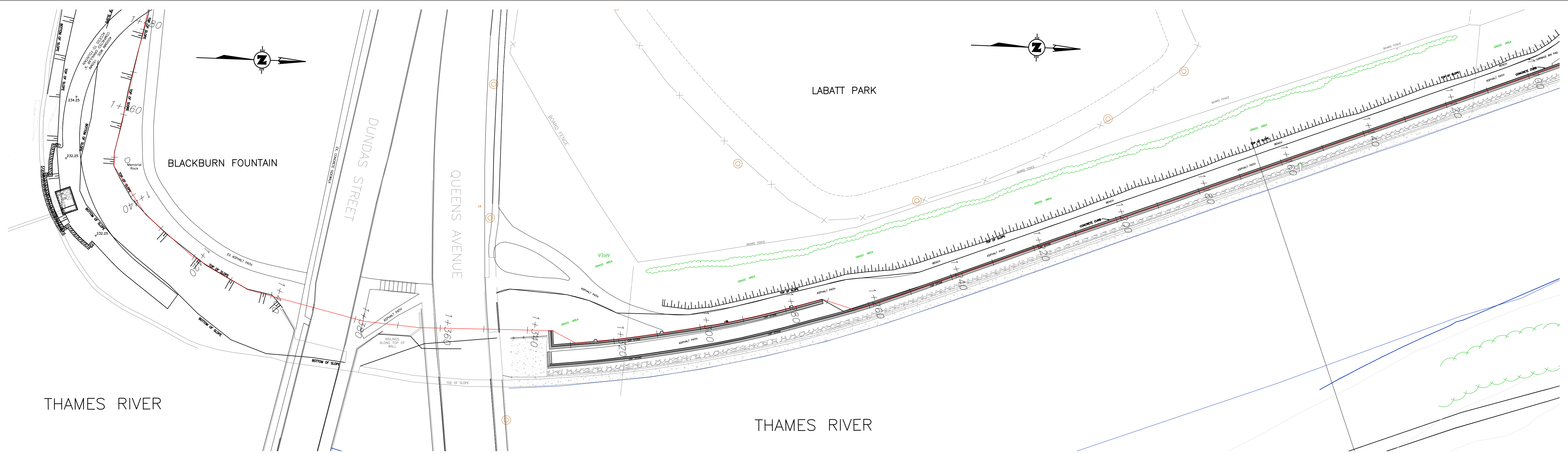
ENGINEER'S STAMP

CORPORATION OF THE CITY OF LONDON

SCALE
 HORZ 1:500
 VERT 1:50

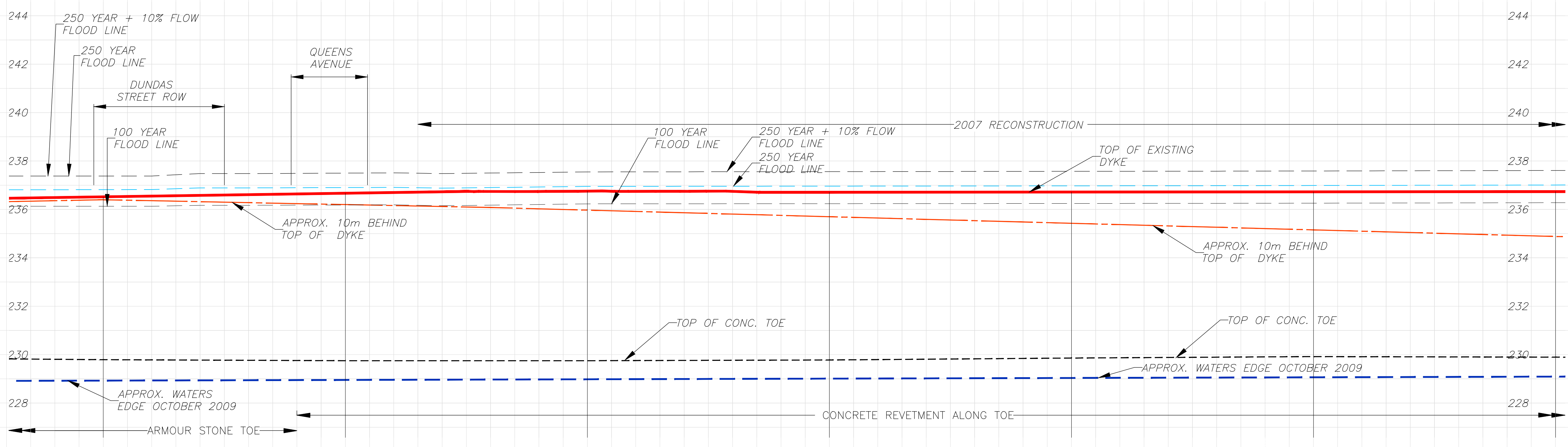
TITLE
 WEST LONDON DYKE
 UPPER THAMES RIVER CONSERVATION AUTHORITY
 BLACKFRIARS AREA
 STA 0+380 TO 0+720

PROJECT No.
 SHEET No.
 3
 PLAN FILE No.



LABATT PARK/FORKS

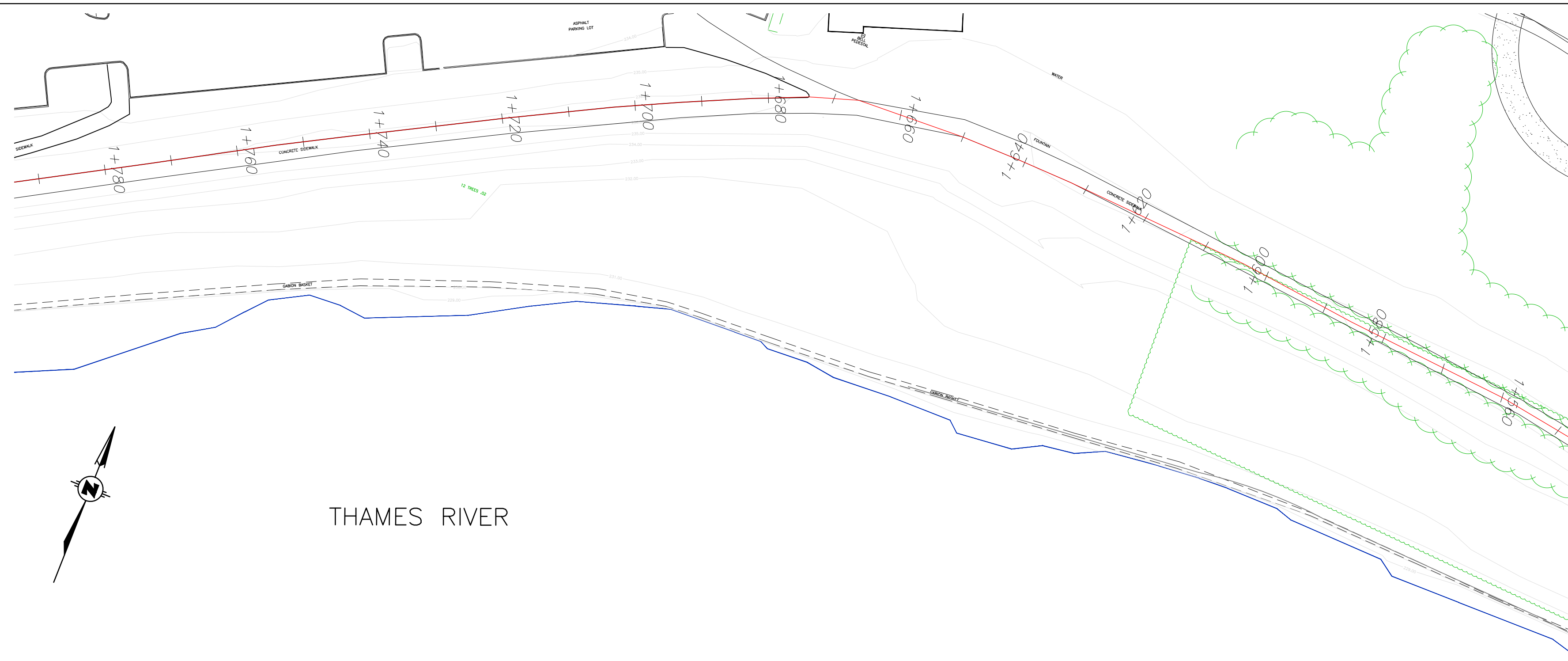
NOTES:
 1. PLAN AND PROFILE DRAWINGS PREPARED BASED ON INFORMATION SUPPLIED BY THE UPPER THAMES RIVER CONSERVATION AUTHORITY AND CITY OF LONDON OBM MAPPING.
 2. ALTERNATE ROUTES TO BE INVESTIGATED DURING DESIGN STAGE.



STATION	1+420	1+400	1+380	1+360	1+340	1+320	1+300	1+280	1+260	1+240	1+220	1+200	1+180	1+160	1+140	1+120	1+100
TOP OF EXISTING DYKE		236.5		236.7		236.8		236.7		236.7		236.7		236.7		236.7	
APPROX. 10m BEHIND TOP OF DYKE	236.81		236.82	236.89	236.89		236.91	236.88						236.88		237.00	
TOP OF CONC. TOE		236.40		236.75		236.08	235.97	235.70		236.43		236.43		235.15		234.95	
APPROX. WATERS EDGE OCTOBER 2009		229.21		229.75		229.75	229.97	229.70		229.86		229.86		229.92		229.88	

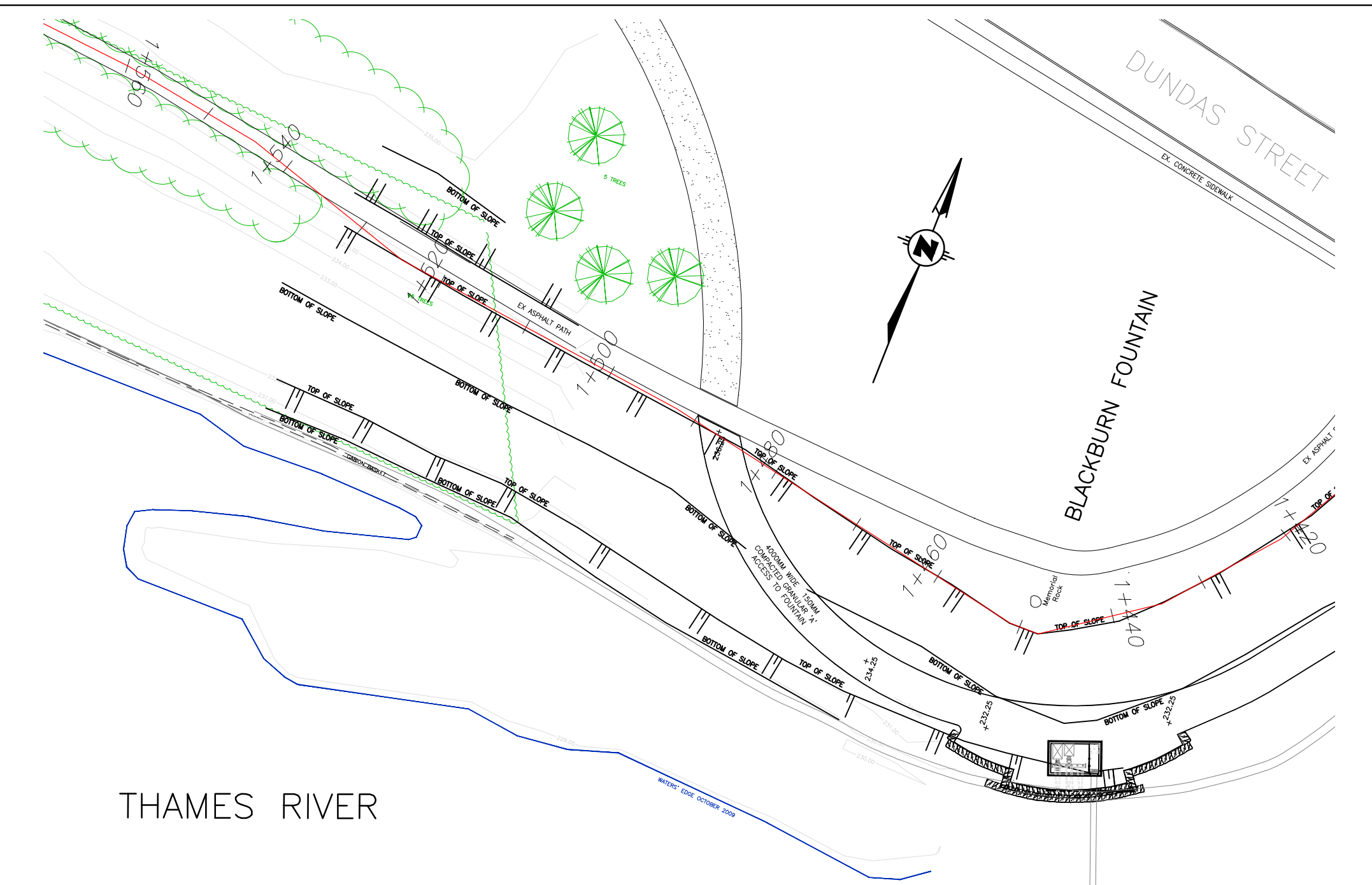
EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	CONSULTANT OR DIVISION	ENGINEER'S STAMP	SCALE HORZ 1:500 VERT 1:50	TITLE WEST LONDON DYKE UPPER THAMES RIVER CONSERVATION AUTHORITY LABATT PARK/FORKS AREA STA 1+100 TO 1+420	PROJECT No. SHEET No. 5 PLAN FILE No.
					DESIGN S.J. DRAWN BY D.B. CHECKED C.C. APPROVED N.G. DATE SEPT. 2, 2015					Stantec Consulting Ltd. 171 Queens Avenue London ON Canada N6A 5J7 Tel. 519.645.2007 Fax. 519.645.6575 www.stantec.com				
					165630035									

Job No. DWG No. JOB NAME



THAMES RIVER

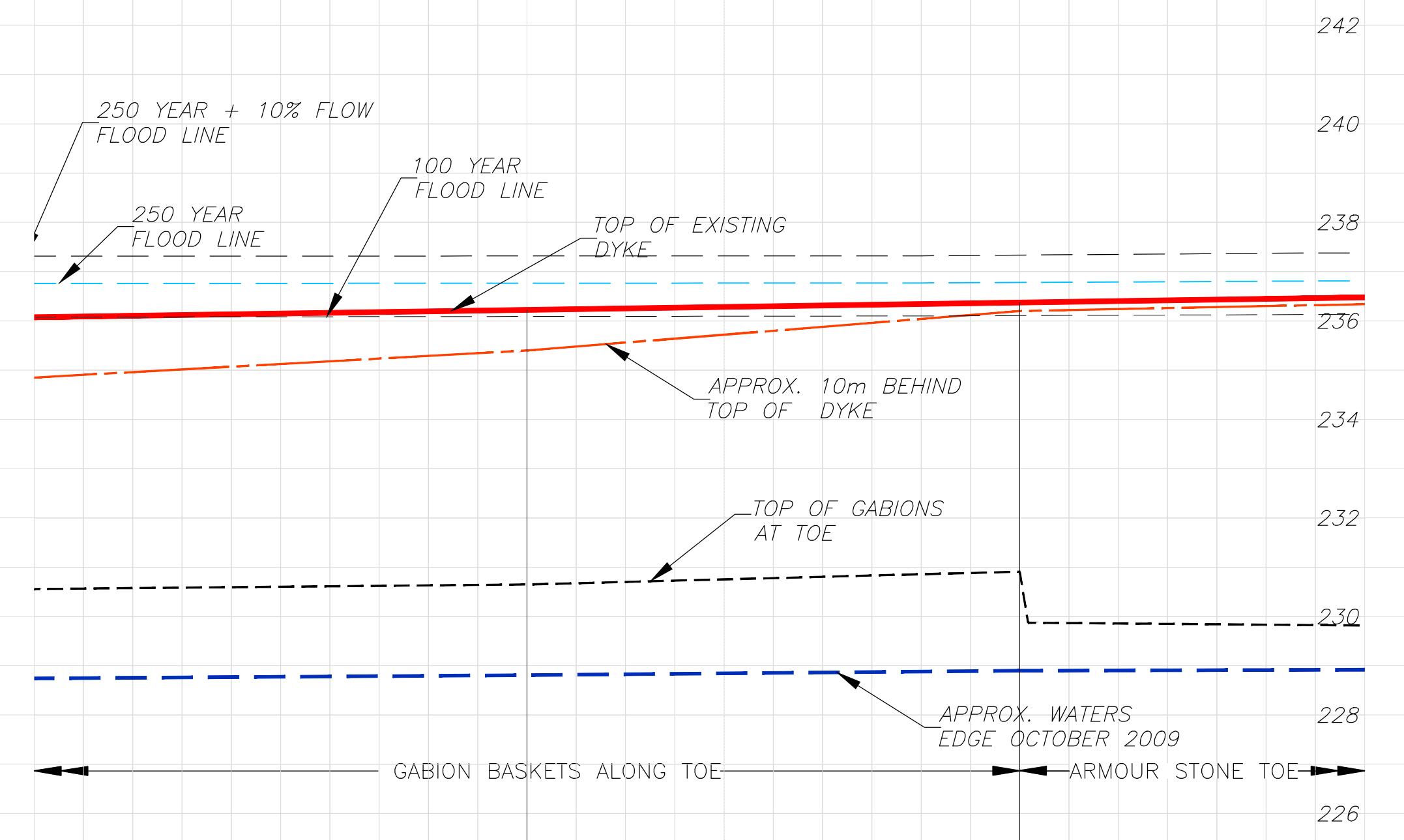
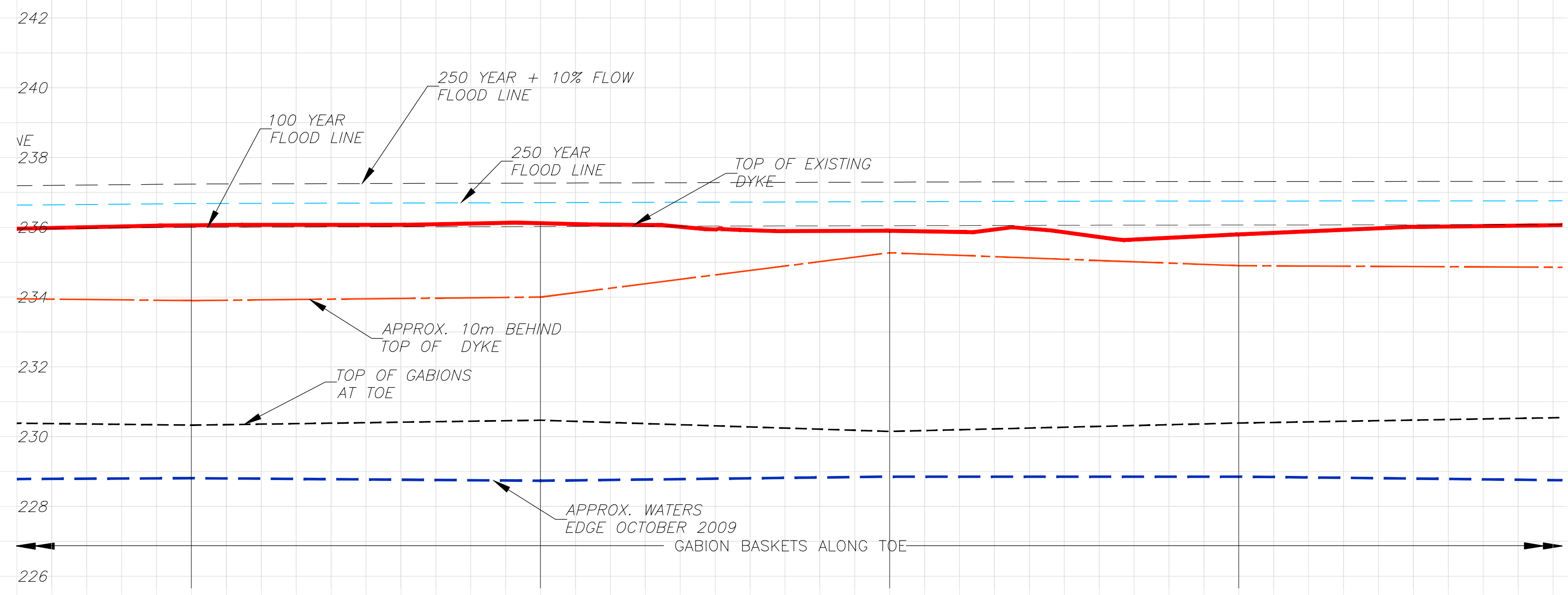
WHARNCLIFFE



THAMES RIVER

LABATT PARK/FORKS

NOTES:
 1. PLAN AND PROFILE DRAWINGS PREPARED BASED ON INFORMATION SUPPLIED BY THE UPPER THAMES RIVER CONSERVATION AUTHORITY AND CITY OF LONDON OBM MAPPING.
 2. ALTERNATE ROUTES TO BE INVESTIGATED DURING DESIGN STAGE.



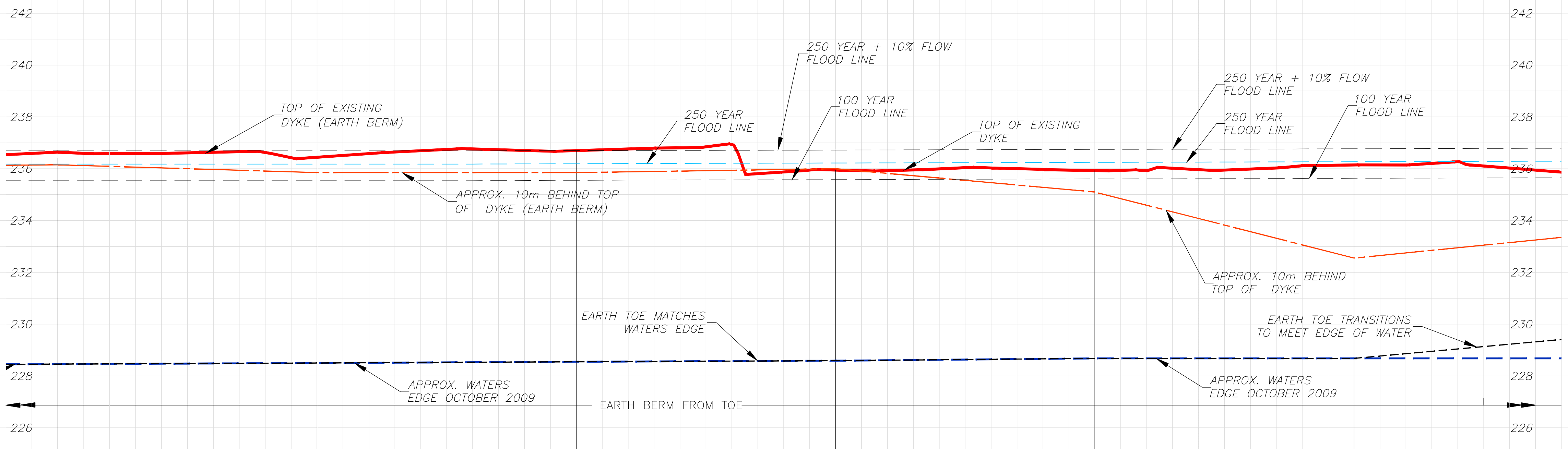
TOP OF EXISTING DYKE	236.1	236.1	235.9	235.8	236.1	236.2	236.4	236.81
APPROX. 10m BEHIND FLOOD LINE	233.90	233.90	234.00	236.75	234.85	236.40	236.77	236.81
APPROX. 10m BEHIND TOP OF DYKE	233.33	233.90	234.00	235.30	234.90	236.40	236.91	236.20
TOP OF DYKE	230.33	233.47	235.30	230.15	234.90	230.54	230.91	236.20

STATION	EXISTING SERVICES	DRAWING #.	SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	CONSULTANT OR DIVISION	ENGINEER'S STAMP	SCALE	TITLE	PROJECT No.	SHEET No.	PLAN FILE No.
1+780							DESIGN S.D.						Stantec Consulting Ltd. 171 Queens Avenue London ON Canada N6A 5J7 Tel. 519.645.2007 Fax. 519.645.6575 www.stantec.com	HORIZ 1:500 VERT 1:50	WEST LONDON DYKE UPPER THAMES RIVER CONSERVATION AUTHORITY WHARNCLIFFE & LABATT PARK/ FORKS AREA STA 1+420 TO 1+780	6	6	
1+760						DRAWN BY D.B.												
1+740						CHECKED C.C.												
1+720						APPROVED N.G.												
1+700						DATE SEPT. 2, 2015												
1+680																		
1+660																		
1+640																		
1+620																		
1+600																		
1+580																		
1+560																		
1+540																		
1+520																		
1+500																		
1+480																		
1+460																		
1+440																		
1+420																		

Job No. DWG No. JOB NAME



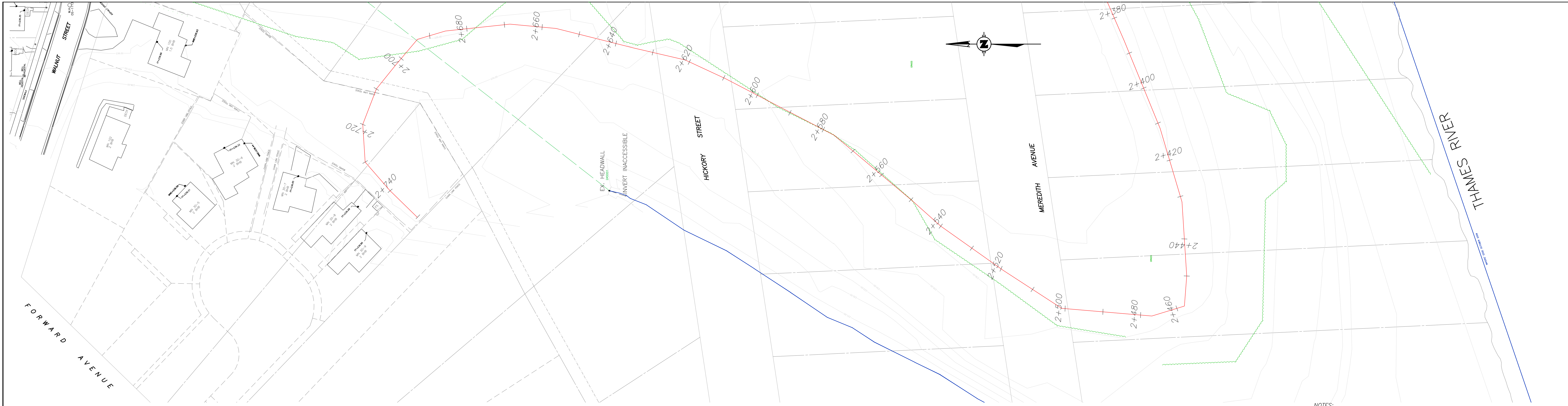
NOTES:
 1. PLAN AND PROFILE DRAWINGS PREPARED BASED ON INFORMATION SUPPLIED BY THE UPPER THAMES RIVER CONSERVATION AUTHORITY AND CITY OF LONDON OBM MAPPING.
 2. ALTERNATE ROUTES TO BE INVESTIGATED DURING DESIGN STAGE.



TOP OF EXISTING DYKE	236.6	236.4	236.7	235.9	235.9	236.1
250 YEAR FLOOD LINE	236.18	236.21				
APPROX. 10m BEHIND TOP OF DYKE	236.20	236.80	236.65	236.00	235.10	232.50
TOP OF DYKE	228.48	228.50	228.52	228.59	228.66	228.63
STATION	2+460	2+440	2+420	2+400	2+380	2+360

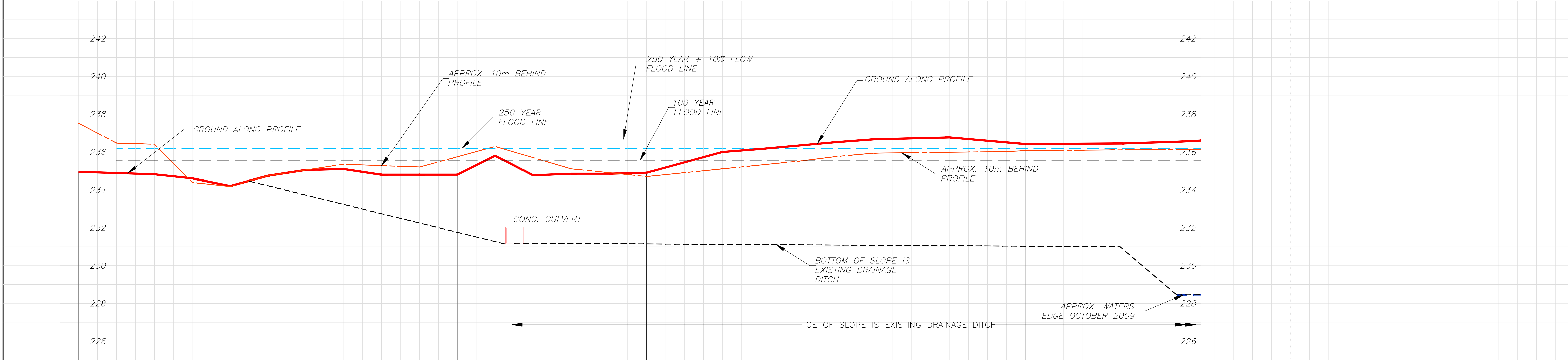
EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	CONSULTANT OR DIVISION	ENGINEER'S STAMP	SCALE HORZ 1:500 VERT 1:50	TITLE WEST LONDON DYKE UPPER THAMES RIVER CONSERVATION AUTHORITY CAVENDISH EAST & CAVENDISH WEST AREA STA 2+160 TO 2+460	PROJECT No. SHEET No. 8 PLAN FILE No.
					DESIGN S.J. DRAWN BY D.B. CHECKED C.G. APPROVED N.G. DATE SEPT. 2, 2015					Stantec Consulting Ltd. 171 Queens Avenue London ON Canada N6A 5J7 Tel. 519.645.2007 Fax. 519.645.6575 www.stantec.com				

Job No. DWG No. JOB NAME



CAVENDISH WEST

NOTES:
 1. PLAN AND PROFILE DRAWINGS PREPARED BASED ON INFORMATION SUPPLIED BY THE UPPER THAMES RIVER CONSERVATION AUTHORITY AND CITY OF LONDON OBM MAPPING.
 2. ALTERNATE ROUTES TO BE INVESTIGATED DURING DESIGN STAGE.



TOP OF EXISTING DYKE	234.95		234.75		234.80		234.95		236.66		236.4					
APPROX. 10m BEHIND TOP OF DYKE	237.50	236.18	234.76		235.75	236.18	234.95		235.75		236.18					
TOP OF DYKE																
STATION	2+750	2+740	2+720	2+700	2+680	2+660	2+640	2+620	2+600	2+580	2+560	2+540	2+520	2+500	2+480	2+460

<table border="1"> <tr> <th>EXISTING SERVICES</th> <th>DRAWING #, SOURCE</th> <th>DATE</th> <th>CONSTRUCTED SERVICES</th> <th>COMPLETION</th> <th>DETAILS</th> <th>No.</th> <th>REVISIONS</th> <th>DATE</th> <th>CONSULTANT</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>DESIGN S.J. DRAWN BY D.B. CHECKED C.G. APPROVED N.G. DATE SEPT. 2, 2015</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT						DESIGN S.J. DRAWN BY D.B. CHECKED C.G. APPROVED N.G. DATE SEPT. 2, 2015					<p>CONSULTANT OR DIVISION</p> <p>Stantec Consulting Ltd. 171 Queens Avenue London ON Canada N6A 5J7 Tel. 519.645.2007 Fax. 519.645.6575 www.stantec.com</p>	<p>ENGINEER'S STAMP</p> <p>CORPORATION OF THE CITY OF LONDON</p>	<p>SCALE HORZ 1:500 VERT 1:50</p>	<p>TITLE</p> <p>WEST LONDON DYKE UPPER THAMES RIVER CONSERVATION AUTHORITY</p> <p>CAVENDISH EAST & CAVENDISH WEST AREA STA 2+460 TO 2+750</p>	<p>PROJECT No.</p> <p>SHEET No.</p> <p>9</p> <p>PLAN FILE No.</p>
EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT																
					DESIGN S.J. DRAWN BY D.B. CHECKED C.G. APPROVED N.G. DATE SEPT. 2, 2015																				

Job No. DWG No. JOB NAME