

Proposed Commercial Development
7391 - 7411 County Road 91,
207, 209 Quebec Street, 1018 County Road 42 and
200 Sutherland St South

Natural Hazard Assessment

Stayner Community, Township of Clearview, ON

August 2024



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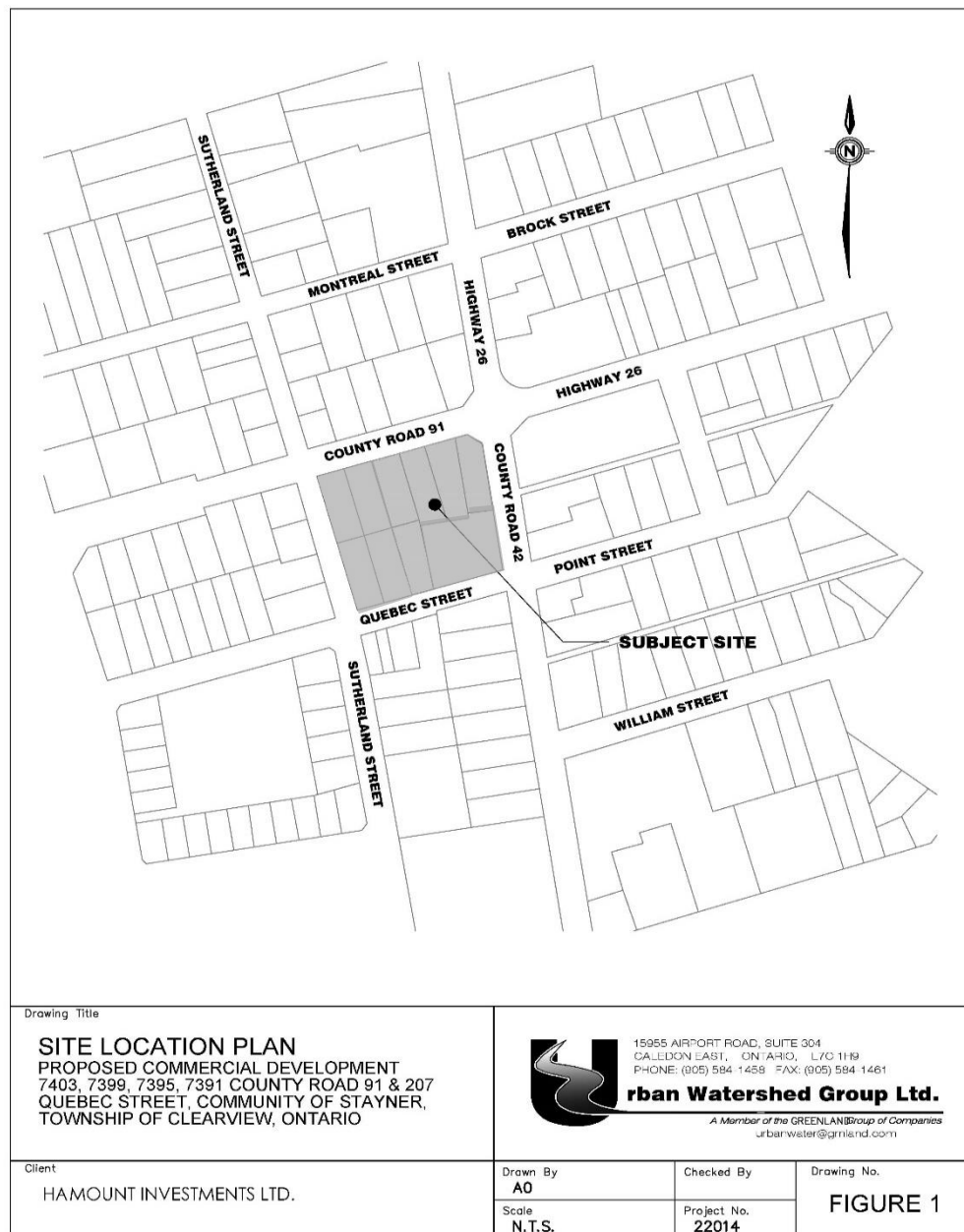
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1.0 INTRODUCTION

The following Report has been prepared to evaluate the existing flood hazard for the Proposed Commercial Development to be located at 7411, 7407, 7403, 7399, 7395, 7391 County Road 91, 207, 209 Quebec Street, 1018 County Road 42 and 200 Sutherland St South in the Stayner Community of the Township of Clearview ('the Subject Lands'). The subject lands are shown on **Figure 1 - Site Location Plan** below.



The subject lands are located west of Count Road 42 (Previously King Street) between Highway 91/ Main Street intersection and Quebec Street. The owner of the subject lands is proposing a commercial development proceeding through the official plan amendment, zoning by-law amendment, and site plan approval processes. As part of the pre-consultation with the Town, the site was identified as being regulated for flood hazard and is located in the Lamont Creek two zone floodplain policy area. The Nottawasaga Valley Conservation Authority (NVCA) has requested a natural hazard assessment which delineates the developable area in accordance with the two zone floodplain policy.

1.1 Two Zone Floodplain Policy

The two zone flood plain policy divides the floodplain into two zones; (1) the flood way which is the portion of the flood plain where development and site alteration would cause a danger to public health and safety or property damage and (2) the flood fringe which is the outer portion of the flood plain between the flood way and flooding hazard limit. The flood fringe has flow depths and velocities that are less severe than the flood way. When the two zone flood policy was originally implemented in Ontario, the flood way was defined as the extent of the 1:100 year flood line and the flood fringe was determined as the area between the 1:100 year flood line and the regional storm flood line. Guidance on delineating the flood way from the flood fringe has been updated and is now based on depth, velocity and depth velocity product. The NVCA *Natural Hazard Technical Guide* (2013) states that where planning documents do not specify flood fringe criteria, the flood fringe may be defined based on the criteria outlined in the Ministry of Natural Resources (MNR) *Natural Hazards Technical Guides for River and Stream Systems* (2002) which identifies flows in excess of 1 m/s and/ or 1m in depth as significant hazards to development. The technical guide does have acceptable risk criteria for development of lots of record that are appropriately zoned allowing development in areas with flood depths less than 0.8m, velocities less than or equal to 1.7 m/s and a depth velocity product of 0.4 m²/s or less.

The Township of Clearview *Official Plan* (Consolidated January 2019) and the NVCA *Planning and Regulations Guidelines* (2009) were reviewed and no specific criteria were found for defining the flood way or flood fringe therefore, this report will use the NVCA acceptable risk criteria for delineating the flood fringe.

1.2 Previous Modelling and Reporting

The flood hazard identified on site is caused by the regional flows along the County Road 42 known as the King Street Drain; a watercourse running south to north along the west side of County Road 42. The latest flood study completed for the King Street Drain was the *Floodline Study Update Stayner Area - West End* prepared by Ainley and Associates Limited dated October 1996 ('the Ainley Report') enclosed in **Appendix A**. This report updated an older Cumming-Cockburn & Associates Ltd. flood study for this area completed in 1985. The 1996 report updated the delineation of the tributary drainage area to the King Street Drain, recalculated tributary flows and updated the Cumming-Cockburn HEC-2 model of the drainage system adding new culverts and additional survey information. A copy of the model converted from HEC-2 to HEC-RAS file format was received from the NVCA; the model as received could not be executed. Reviewing the Ainley model and **Drawings 196152-1 & 196152-2** included in the Ainley report, the King Street Drain was a 1.8m wide by 1.8m deep ditch on the west side of County Road 42. In the vicinity of the subject site there were 1520mm x 1830mm concrete box culvert crossings of Quebec Street and 1018 County Road 42's driveway. The culvert crossing at Main Street was not detailed in the report and north of Main Street the HEC-2 converted model does not appear to be displaying the correct culvert crossing information. Given the significant changes to the drainage system surround the site discussed below along with the state of the existing model, a new model was built to simulate the flooding condition on the subject site as opposed to updating the existing model.

The Ainley report used OTTHYMO-89 to compute peak flows for the King Street Drain. **Table 1** below summarizes the flows from the report at Main Street which will be used in this study as the flows tributary to the site.

Table 1. Existing Condition Peak Flows at Main Street

Return Frequency	Peak Flow (m ³ /s)
1:2 Year	0.85
1:5 Year	1.36
1:10 Year	1.67
1:25 Year	2.15
1:50 Year	2.55
1:100 Year	2.96
Regional (Timmins)	7.42

Engineering Drawings dated 2002 have been provided by the Town of Clearview, enclosed in **Appendix B**, for the reconstruction of Highway 26 and County Road 42 between Wyant Road and Margaret Street. These drawings show that in 2002, the existing culvert crossing of Main Street was a 1000mm x 1650 mm CSPA. It also shows the drainage path north of Main Street where flows drained north to Montreal Street, crossed east under Highway 26 via a box culvert (size unknown) and then north under Brock Street via a 1500 mm diameter CSP culvert ultimately draining to Lamont Creek.

2.0 EXISTING CONDITIONS

As mentioned, in the **Section 1**, Highway 26 and County Road 42 were reconstructed in the early 2000's. Included in the reconstruction was the installation of a 1500mm diameter concrete storm sewer connecting the King Street Drain south of Quebec Street to an outlet north of Brock Street.

This new infrastructure would significantly change flooding on the subject site but it does not appear to have been accounted for in the NVCA flood hazard mapping which closely mirrors Ainley's 1996 mapping. North of Quebec Street, the 1.8m x 1.8m King Street Drain ditch has been filled in.

3.0 HYDRAULICS

The flooding expected to impact the site will occur when the 1500 mm diameter concrete pipe draining from south of Quebec Street to north of Brock Street is over capacity. The invert of the existing 1500mm diameter storm sewer at the Quebec Street inlet is 216.40masl (m). The centerline elevation of Quebec Street where overtopping is expected is 218.67m. Therefore, 2.27m (1.51H/D) of head can build up on the pipe inlet before flow spilling across Quebec Street to the subject site. MTO *Drainage Manual Design Chart 2.31 Inlet Control: Circular Pipes* nomograph was used to quantify the capacity of the pipe system and the peak flow conveyed across the subject lands. The nomograph, enclosed in **Appendix C**, shows the pipe system can convey at least 5.5m³/s of the 7.42m³/s regional storm flow under inlet control. It is assumed the remaining 1.92m³/s of peak flow spills across the site, however, this assumption is conservative as it does not account for ponding above the road centerline which will act as a weir, or any spill across County Road 42 which appears to be substantial. A second scenario will be developed with the spill flow quantified across County Road 42, through the addition of a lateral weir in the model. In addition to the peak flow conveyed to the site under existing conditions, a 50% blockage

scenario ($5.5\text{m}^3/\text{s} / 2 = 2.75 \text{ m}^3/\text{s}$) will also be modeled for each scenario (conservative flow without weir, and flow with weir).

A one (1) dimensional subcritical hydraulic model was built in HEC-RAS using a combination of site topographic surveys collected by Raikes Geomatics Inc. on March 15, 2023, January 24, 2023 and December 20, 2022 (enclosed in **Appendix D**), a TIN surface created from 20m grid points and break lines provided by NVCA and centerline and ditch grades from the Highway 26 and County Road 42 road reconstruction drawings. The NVCA TIN surface was raised by 0.48m to better align with the observed site survey elevations across the study area. A model schematic is shown on **Figure 2 – HEC-RAS Model Schematic** below and model cross sections are enclosed in **Appendix E**.



Figure 2 - HEC-RAS Schematic

The east boundary of the model was set as the centerline of County Road 42 where the sections are extended vertically to contain the existing spill. This is a conservative approach in determining flooding on the subject site as it will overestimate the flood elevations. The downstream boundary condition was set as normal depth at 0.5% which is the centreline grade of Highway 26 at the north extent of the model four (4) cross sections downstream of the subject site. The upstream boundary of the model was set as the centreline of Quebec Street. The west extent of the model was extended to contain flows in the section or at the limit of the topographic surveys where flows could not be contained in the section. Manning 'n' values for the left overbank and channel were

set at 0.05 which is the high end of the range for lawns per **Table 3.4** of the NVCA *Natural Hazard Technical Guide* (2013). The right overbank Manning 'n' value, which is for the west half of County Road 42 and Highway 26, was set to 0.013 and is representative of asphalt. Contraction and expansion coefficients were set at 0.3 and 0.5 respectively. As mentioned above, four (4) scenarios were modeled, (1) the regional flows of $1.92\text{m}^3/\text{s}$ that overtops the existing 1500mm diameter storm sewer all directed towards the subject site (without weir), (2) the regional flows of $1.92\text{m}^3/\text{s}$ that overtops the sewer and spills across County Rd 42 and the subject site (with weir) and (3,4) the regional flow of $4.67\text{m}^3/\text{s}$ overtopping the 1500mm diameter storm sewer with 50% inlet blockage for each of the previous scenarios. An output table for the four (4) scenarios and corresponding depth velocity product calculations are enclosed herein **Appendix B**. The extent and depth of flooding for the four (4) scenarios are shown on **Figures 3 - 6** below. Model output files as well as depth velocity product calculations are enclosed herein **Appendix E**. All flooding in the study area is less than 0.8m depth with the exception of the west roadside ditch between river stations 140 and 159, however, this depth of flooding is within the right of way and will have no impact on the subject site. Velocity and depth velocity products on site (left overbank and channel) are all less than $1.07\text{m}/\text{s}$ and $0.4\text{m}^2/\text{s}$ respectively. There are some exceedances of the NVCA acceptable risk criteria for depth velocity product on County Road 42 (right overbank) in the 50% block scenario however, these are the result of the sections terminating the centreline of the road which overestimates the flow depth and do not impact the subject site, as observed in the scenarios when the lateral weir along County Rd 42 has been introduced.

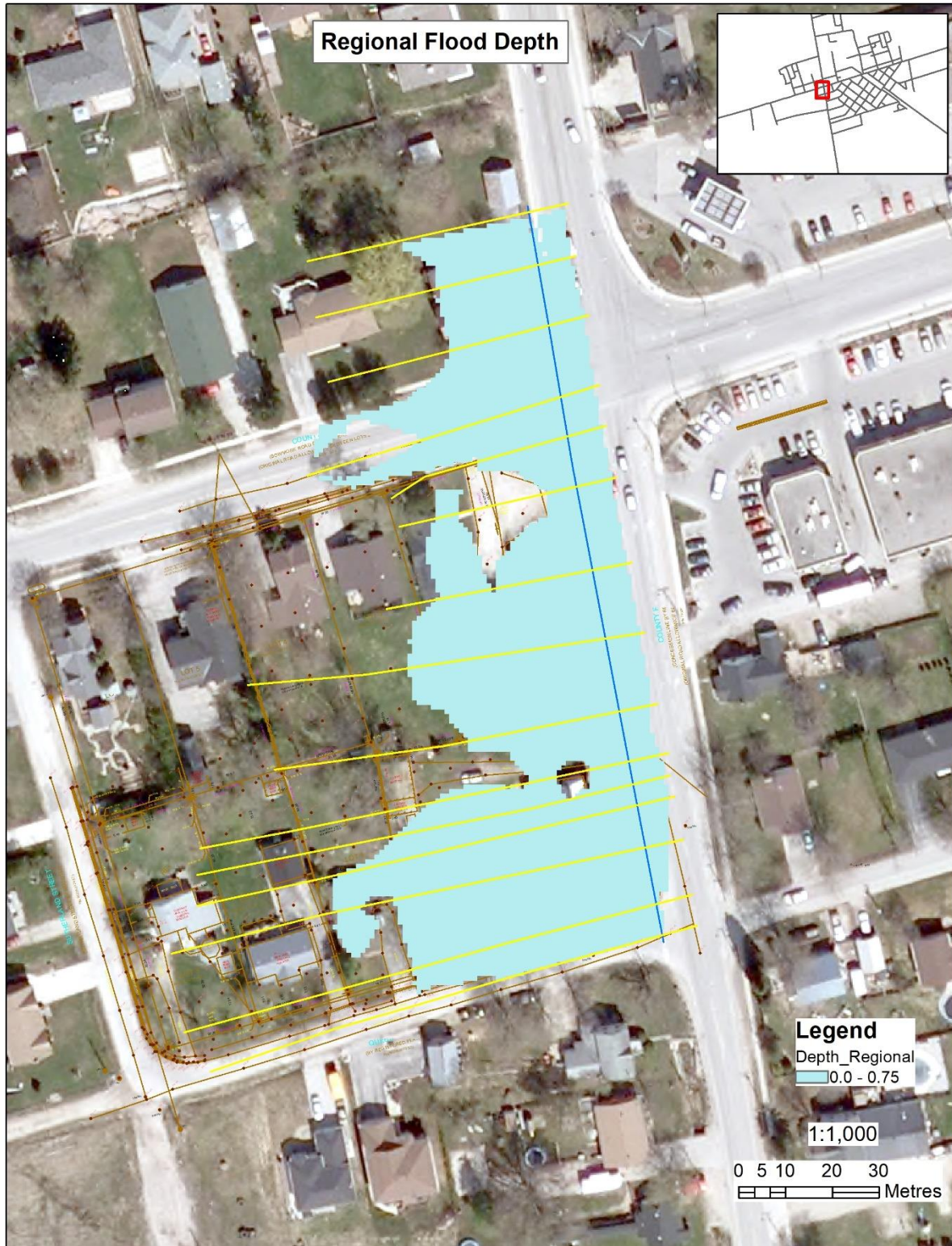


Figure 3 - Regional Storm Flood Map – no Lateral Weir

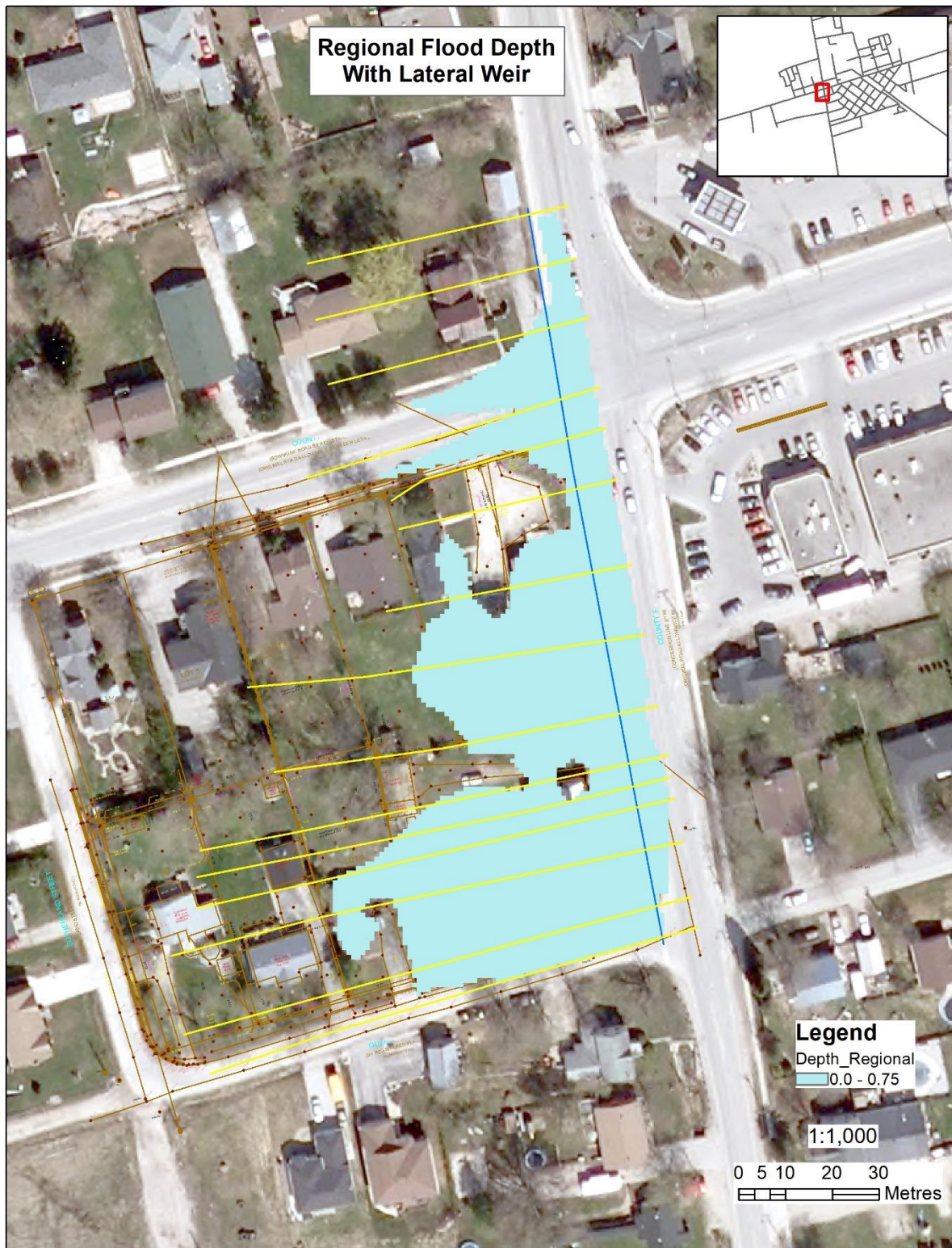


Figure 4 - Regional Storm Flood Map – with Lateral Weir

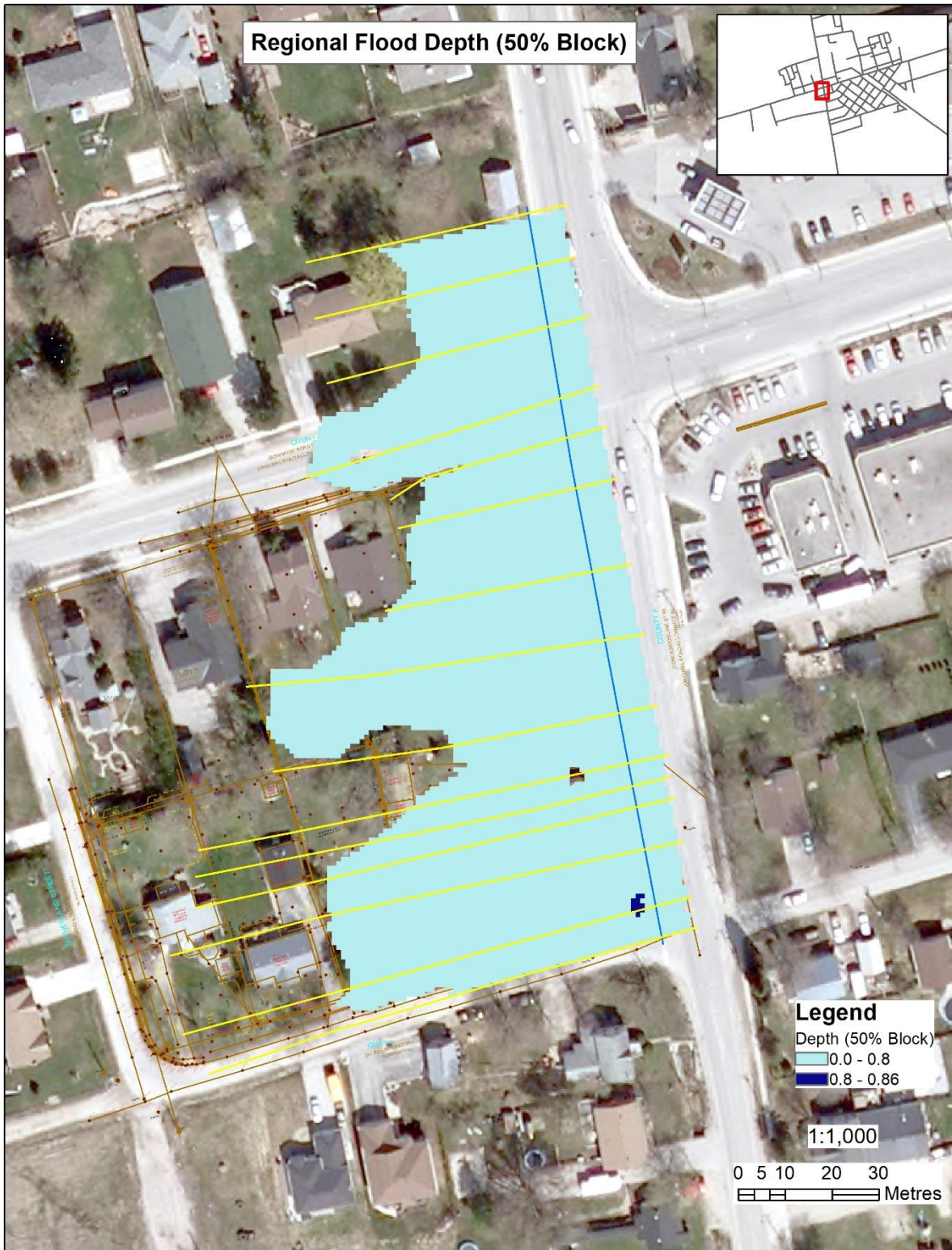


Figure 5 - Regional Storm With 50% Blockage Flood Map – no Lateral Weir

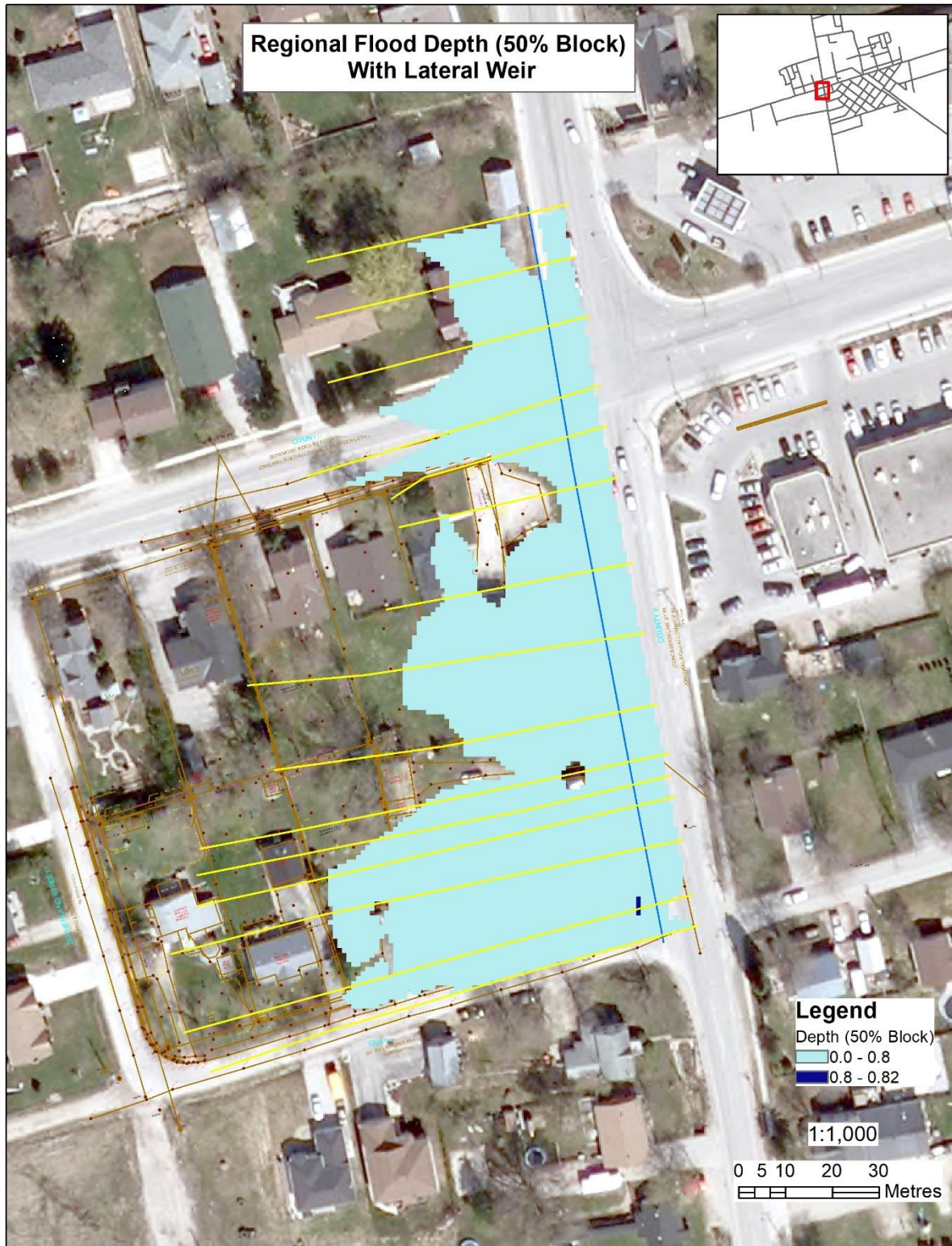


Figure 6 - Regional Storm With 50% Blockage Flood Map – with Lateral Weir

4.0 CONCLUSIONS

As demonstrated in the preceding sections of this report, the existing condition flooding on the subject site is less than 0.8m in depth during all four (4) regional storm and regional storm with 50% blockage scenarios. Velocity and depth velocity products on site (left overbank and channel) are all less than 1.07 m/s and $0.4\text{m}^2/\text{s}$, respectively. Given the depth of flooding and velocities observed on site during the regional storm and regional storm with 50% blockage scenarios, the entire subject site is located in the flood fringe and may be developed in accordance with the two zone floodplain policy. Additionally, the older and more stringent definition of the flood fringe, the area between the 1:100 year and regional storm flood lines also places the entire site in the flood fringe as the 1:100 year storm peak flow can be conveyed entirely in the 1500mm diameter storm sewer between Quebec Street and Brock Street. As part of the detailed design of the proposed commercial development, a proposed condition flood model should be prepared to demonstrate the impact of the development of upstream and downstream flooding. The development must also demonstrate that it is floodproofed and provides for safe access and egress in accordance with the NVCA *Natural Hazard Technical Guide* (2013).

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Appendix A
Floodline Study Update Stayner Area – West End (1996)

**TOWNSHIP OF CLEARVIEW
FLOODLINE STUDY UPDATE
STAYNER AREA - WEST END**

CLIENT:

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**October, 1996
File No. 196152**

-- approved Nov 15/96
-- 2nd copy in file (including drawings + disk)

**TOWNSHIP OF CLEARVIEW
FLOODLINE STUDY UPDATE
STAYNER AREA - WEST END**

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1. INTRODUCTION

Ainley & Associates Limited, in partnership with the Nottawasaga Valley Conservation Authority (N.V.C.A.) was retained by the Township of Clearview to carry out a three-part Floodline Study Update for parts of the west end of Stayner.

The first component of the study includes an update of the Lamont Creek floodline mapping for the area upstream of Highway #26 (King Street). The second component of the study involves a similar update of the King Street Drain floodline mapping for the area upstream of Main Street (Highways 26/91). Over the years, development and changes in the drainage patterns have necessitated an update of the previous floodline studies.

The third component of the drainage study includes a drainage investigation of the southwest quadrant of the Stayner area. This investigation provides recommendations with respect to road and land drainage requirements as they relate to future development in the area. The findings of this investigation are provided under a separate report.

A significant component of this project is the preparation of up-to-date 1:2000 base mapping for the Stayner area (1996 aerial photography) by Northway Map Technology Ltd. This mapping has been used to develop the floodline mapping for the study area.

2. STUDY AREA

Floodline mapping has been carried out for the Lamont Creek, from Highway 26 to the former Town limits. Ainley & Associates previously conducted a floodline mapping study for this stretch of the Lamont Creek in 1973.

Floodline mapping has also been carried out for the King Street Drain, from Main Street southward to the former Town limits. Cumming-Cockburn & Associates Ltd. carried out a flood study in this area in 1985.

3. DRAINAGE AREAS

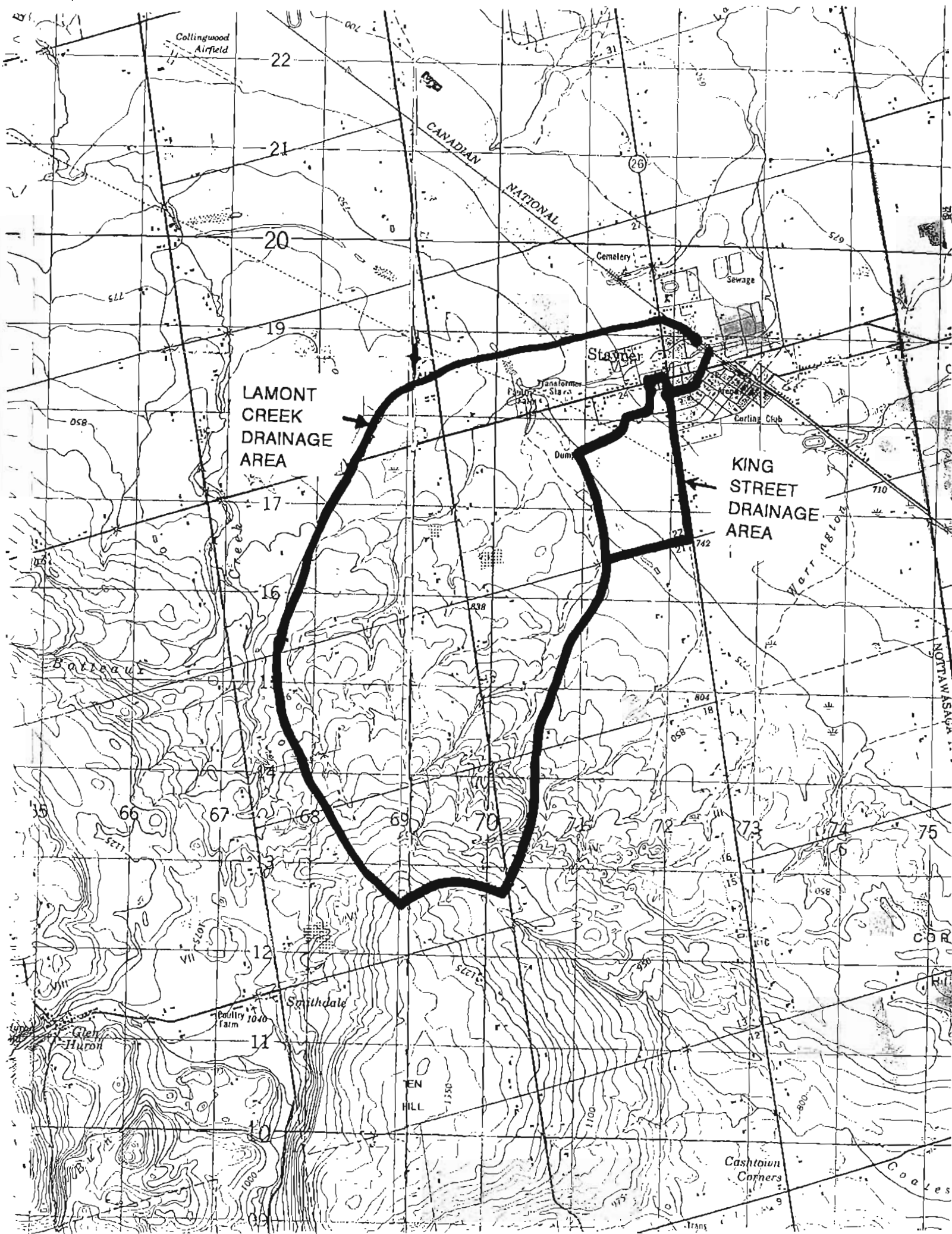
The confluence of the Lamont Creek and the King Street drain is located immediately upstream of the CNR culvert crossing in the Town of Stayner. As indicated in the previous drainage/flood studies, the CNR culvert acts as a hydraulic control on upstream flood levels on the Lamont Creek and the King Street Drain. The confluence of these two streams has been set as the reference point for this study.

The drainage areas for the two drainage courses are indicated on Figure 1. The drainage area for the Lamont Creek at the CNR culvert is approximately 1716 hectares. The drainage area for the King Street Drain is approximately 193 hectares.

The updated study was required in part to assess the floodlines based on present-day drainage patterns, some of which have been altered since the previous investigations were carried out.

These altered drainage patterns include:

- culvert under County Road 42 in Lot 20, diverting approximately 351 hectares from the King Street Drain and Lamont Creek to Warrington Creek
- culvert under County Road 42 at the 21/22 Sideroad diverting approximately 236 hectares from the King Street Drain and Lamont Creek to Warrington Creek.



- culverts under Highway 91 diverting approximately 90 hectares from the King Street Drain to Lamont Creek.
- larger concrete box culverts installed along the King Street Drain.
- development along Lamont Creek, upstream of Highway 26.
- new road crossings on the Lamont Creek upstream of Highway 26.

4. HYDROLOGY

The OTTHYMO-89 computer program was used to model the study areas. For the purposes of this study, the confluence of the Lamont Creek and the King Street Drain immediately upstream of the CNR culvert was considered as the hydrologic reference point. The Lamont Creek and the King Street Drain were each modelled as separate sub-drainage areas. The hydrograph for the reference point is based on the combined hydrographs of the two sub-drainage areas.

The design storms analyzed for the study areas included 1:2, 1:5, 1:10, 1:25, 1:50, 1:100 year storm. These storms are based on the 6 hour duration, Soil Conservation Service (SCS) Type II distribution storm. The 6 hour storm duration is consistent with the storm duration used for the previous King Street Drain modelling.

Rainfall data for the above-noted design storms are based on the Owen Sound Intensity - Duration - Frequency (I-D-F) curves prepared by the Atmospheric Environment Service - Environment Canada.

In addition to the above noted design storms, the Regulatory Storm (Timmins Storm) was also modelled. The Timmins Regional Storm is a 12 hour duration storm with a total rainfall amount of 193 mm.

The percentage of urban areas in the Lamont Creek drainage area was estimated to be 5%. The percentage of urban areas for the King Street drainage area was estimated to be 15%.

Estimated percentages of land use (other than urban areas) for each sub-drainage area are as follows:

	Lamont <u>Creek</u>	King Street <u>Drain</u>
Crop	60%	15%
Pasture	35%	65%
Wood	5%	20%

The CALIB NASHYD sub-routine in the OTTHYMO program was used to model the peak flows for the predominantly rural Lamont and King Street drainage areas. The initial abstraction parameter, Ia, was conservatively estimated to be 2.0 mm.

Catchment areas for the two sub-drainage areas are less than 25 km². Therefore, no areal reduction factors were applied to the rainfall.

There are no major tributaries connecting into either the Lamont Creek or the King Street drain within the reaches of the study area. Peak flow rates for intermediate points in the

study area were calculated using the formula:

$$Q_2 = Q_1 \left(\frac{A_2}{A_1} \right)^{0.75} \quad (\text{MTO Drainage Manual Eq - H4.3})$$

Times of concentration, Tc, were calculated using the Airport Formula as:

$$T_c = \frac{3.26 (1.1 - C)(L)^{0.5}}{(S)^{0.333}} \quad (\text{MTO Drainage Manual Eq. B4.3})$$

The overall watershed slopes were calculated using the 85/10 Average Slope method:

$$S(\%) = \frac{(H_{85} - H_{10}) \times 100\%}{0.75 (L)} \quad (\text{MTO Drainage Manual Eq. B2.2})$$

Soil Mapping for Simcoe County was consulted to determine the types of soil present in each sub-drainage area. A copy of the soil mapping for the area is enclosed in the Appendices. Based on the extent of each soil type, weighted run-off coefficients, C and soil curve numbers, CN, were calculated for each sub-drainage area. Hydrologic Calculation Summary Sheets for each sub-drainage area are provided in the Appendices. CN numbers are based on unmodified normal antecedent moisture conditions (AMC II).

A summary of the design peak flow rates for the two subdrainage areas is provided below. Supporting hydrologic calculations and OTTHYMO outputs have been provided in the Appendices.

TOWNSHIP OF CLEARVIEW
FLOODLINE STUDY UPDATE
STAYNER –WEST END

DESIGN FLOW SUMMARY
LAMONT CREEK
KING STREET DRAIN

LOCATION	AREA (ha.)	DESIGN STORM						
		REG. (cms)	100 YR. (cms)	50 YR. (cms)	25 YR. (cms)	10 YR. (cms)	5 YR. (cms)	2 YR. (cms)
CNR CULVERT (CONFLUENCE OF LAMONT CREEK & KING STREET DRAIN)	1909	87.09	34.00	29.50	25.24	19.86	16.37	10.38
LAMONT CREEK @ CNR CULVERT	1716	78.64	30.78	26.73	22.90	18.05	14.90	9.47
LAMONT CREEK @ STAYNER STR.	1634	75.80	29.67	25.77	22.07	17.40	14.36	9.13
KING STREET DRAIN @ CNR CULVERT	193	8.83	3.52	3.03	2.56	1.99	1.62	1.01
KING STREET DRAIN @ MAIN STR.	153	7.42	2.96	2.55	2.15	1.67	1.36	0.85
KING STREET DRAIN @ MARGARET STR.	135	6.75	2.69	2.32	1.96	1.52	1.24	0.77

5. HYDRAULICS

a) Lamont Creek

The HEC-2 computer program (Revision 4.6, February, 1991) was used to hydraulically model the Lamont Creek. The HEC-2 water surface profile program uses the standard step method to determine the change in velocity head and head losses from cross-section to cross-section. Results of the HEC-2 modelling, in the form of water surface elevations for each cross-section, were then used to develop floodline mapping for the study area.

As noted previously, the calculated peak flows for the 2-Year, 5-Year, 10-Year, 25-Year, 50-Year and the 100-Year flood and the Regional Storm (Timmins) were used in the hydraulic analysis of the Lamont Creek.

The cross-sections used in the HEC-2 analysis are based on a survey of the site carried out by Ainley & Associates Limited in June, 1996. The survey included approximately 20 cross-sections of the Lamont Creek as well as measurements of the various road crossings. In addition, information from 1:2000 scale contour mapping was used to supplement the site survey. All elevations are based on Canadian Geodetic Datum (CGD).

The locations of the HEC-2 cross-sections are indicated on the floodplain mapping.

The CNR culvert, the private stream crossing on Reinhart Vinegar's property, and the various road crossing structures were modelled using the HEC-2 SPECIAL BRIDGE and SPECIAL CULVERT sub-routines. The SPECIAL BRIDGE and SPECIAL CULVERT

sub-routine methods calculate the water surface elevations through the bridges/culverts for low flow, pressure flow, weir flow, or for a combination of flow conditions. The corrugated steel pipe arches at Stayner Street and East Street were modelled as equivalent rectangular openings using the SPECIAL CULVERT routine. The SPECIAL CULVERT routine is not able to directly model "arch" pipes.

The CNR culvert was used as the starting point for the HEC-2 analysis of the Lamont Creek. Stationing for cross-section data is read from left to right, looking downstream. Chainages and cross-section locations are in metres and are measured in terms of distance upstream from the starting point (CNR culvert). Starting chainage for the CNR culvert was set at 1+000.

As noted in the earlier study, there is a broad spill zone along the north bank of the Lamont Creek in the vicinity of East Street and Stayner Street. When the water level overtops the north bank of the Lamont creek in the spill zone, the floodwater spills over a broad zone in a north-eastward direction. The previous study found that floodwaters in the spill zone would flow to an adjacent watercourse to the north.

The HEC-2 Split Flow subroutine was used to model the spill zone along the Lamont Creek. The "dividing line" between the spill zone and the main channel is located approximately at the high point along the north bank of the Lamont Creek. The Manning's roughness co-efficient for the spill zone was estimated to be approximately 0.080. The energy slope of flow in the spill zone was conservatively set at 0.002 m/m.

Based on topography changes due to development in the area, the 1996 contour mapping

indicates that the floodwater will spill mainly to the east through the residential area and will eventually spill across Highway 26 to return to the Lamont Creek. It is probable that a small portion of the floodwaters may flow northward across North Street to an adjacent watercourse as indicated in the previous study. The Split Flow model reduces the flow rates in the main channel by the calculated rate of spill flow. The spill flows are reintroduced to the model at Highway 26 (Cross-section 1615).

Results indicate that spilling will occur along the north bank primarily during the Regional Storm. There is a potential for very minor spillage at East Street during the 100-Year and the 50-Year Storms. The calculated spill rates are as follows:

	<u>SPILL RATE</u>	<u>PERCENTAGE OF TOTAL FLOW</u>
Regional Storm	16.62 m ³ /s	21 %
100-Year Storm	0.16 m ³ /s	< 1 %

The majority of the spilling occurs along the north bank of the Lamont Creek immediately upstream and downstream of East Street. There is also minor spilling along the north bank downstream of Stayner Street (Cross-section 1786) during the Regional Storm.

Considering the broad shallow zone of spill and the nature of the residential development in the spill zones, the exact extent and depth of flooding within these areas is almost impossible to predict.

We note that the estimated Regional Storm spill rate under existing conditions is less than spill rate calculated in the 1973 Study ($18 \text{ m}^3/\text{s}$). This reduction can likely be attributed to development along the creek in the Stayner Street and East Street areas. Contour information suggests that in some areas, the grades along the north side of the creek have been raised. The higher bank elevations reduce the estimated amount of spill from the main channel.

It is evident that residential development has had an impact on the characteristics of the spill zone during the Regional Storm. A greater percentage of the peak flow is directed eastward along the Lamont Creek rather than northward to the adjacent watercourse.

The HEC-2 model identified a small spill zone along the south side of the Lamont Creek near the intersection of Stayner Street and Montreal Street during the Regional Storm event. Floodwaters in this minor spill zone would spill south-eastward from the Montreal Street/Stayner Street intersection toward Highway 26 roadside ditches (King Street Drain). Because spill flow eventually returns to the Lamont Creek, the HEC-2 Split Flow model re-introduces these south spill rates to the main model at Highway 26 (Cross-section 1615).

HEC-2 modelling confirms that the CNR culvert at Cross-section 1000 acts as an hydraulic control on the watercourse during most design flood events. We note that concrete repairs and re-surfacing on the CNR culvert wingwalls has further reduced the hydraulic capacity of the system. During the Regional Storm event, the backwater effect of the CNR culvert extends upstream of Highway 26 (Cross-section 1615).

Modelling results indicate that floodwaters will overtop Stayner Street during floods greater than an or equal to the 5-Year event. This overtopping is primarily caused by the low approach road grades relative to the floodplain.

Modelling results show that floodwaters will overtop Stayner Street over a broad zone to the south of the culvert. The topography of the land between Stayner Street and Highway 26 results in a divided flow condition. The divided flow condition is also partly the result of the position of the Reinhart Vinegar's plant. The model indicates a main channel in the north (Lamont Creek) and a lesser overland route through residential and vacant land south of the Reinhart Vinegar's plant. During flood conditions, a portion of the floodwater will overtop Stayner Street and flow along the overland route to Highway 26, even though the main channel downstream may be able to convey the full flow. A separate HEC-2 model was used to determine the approximate flood elevations in the south overland route between Highway 26 and Stayner Street (Cross-sections 1615 to 1995). Contour mapping indicates that flood levels in the south overland channel will be independent of the main channel between Stayner Street and Sutherland Street (Cross-sections 1856-1995). Flow rates used in the south overland route are based on the HEC-2 - calculated weir flow rates at the Stayner Street culvert (Cross-section 2015). Similarly, flow rates in the main channel were reduced by the same wier flow rates between Cross-sections 1856 to 1995.

In the Sutherland Street area of the South overland flow zone, contours suggest that floodwaters would flow north (back to the main Lamont channel) and east (overland to Highway 26). Therefore, water surface elevations for the south overland flow route between Sutherland Street and Highway 26 are based on the higher of flood elevation

calculated by the main channel model or the south overland route model.

A copy of the HEC-2 input files and summary files has been included in the Appendices to this report.

The calculated water surface profile information for each cross-section was translated to the 1:2000 contour mapping by the Nottawasaga Valley Conservation Authority to delineate the calculated flood elevations and the extent of flooding for design storm events.

b) KING STREET DRAIN

As noted previously, Cumming Cockburn & Associates Ltd. carried out a flood study of the King Street Drainage area in 1985. The Cumming Cockburn study used the HEC-2 program to model existing conditions as well as anticipated conditions, assuming "improved culverts" along King Street South. The Nottawasaga Valley Conservation Authority has disk copies of the HEC-2 modelling used by Cumming Cockburn. According to the terms of reference for the current study, the updated peak flow rates (based on the reduced upstream catchment area) were to be inserted into the previously prepared "improved culvert" HEC-2 model.

Upon detailed review of the model, it became evident that the "improved culvert" model did not reflect present conditions. Some of the modelling inconsistencies included:

- the previous model assumed all culverts south of the Main St. intersection to be 1000 mm x 2000 mm box culverts. In fact, all existing culverts with the

exception of the Centre Street culvert (1250 mm x 1950 mm) are 1520 mm x 1830 mm box culverts.

- the existing ditch grades are approximately 0.6 m - 0.7 m lower than the ditch grades used for the previous model.
- there is an extra culvert crossing at #243 King St. which was not included in the previous model.
- The previous model incorrectly included two additional cross-sections (Cross-sections 775 and 780) which were out of sequence and incorrectly extended the overall length of the ditch by 53 metres.

For this flood study update, Ainley & Associates carried out additional survey work along King Street South. For modelling purposes, the additional survey included obtaining the following data:

- lengths and sizes of pre-cast concrete box culverts
- upstream and downstream culvert invert elevations
- King Street centreline of road elevations at each culvert
- driveway profile for each culvert
- typical ditch cross-section at three locations along the study area

This updated culvert and ditch survey information was inserted directly into the cross-section data used in the previous Cumming Cockburn HEC-2 model.

Manning's roughness co-efficients and expansion and contraction co-efficients are based on the parameters used in the previous Cumming-Cockburn model.

A summary of HEC-2 input parameters used for the King Street portion of the model is as follows:

Roughness Co-efficient, n , - main channel	0.030 - 0.040
Roughness Co-efficient n , - over-bank areas	0.030 - 0.040
Contraction Co-efficient (Open Channel - Abrupt Transition)	0.3
Expansion Co-efficient (Open Channel - Abrupt Transition)	0.5
Contraction Co-efficient (Bridges/Culverts)	0.3
Expansion Co-efficient (Bridges/Culverts)	0.5

The previous study identified an extensive spill zone along the length of King Street. During peak flooding conditions (Regional Storm), the previous study noted that floodwaters would spill eastward across King Street and subject a large commercial and residential area to a high potential flood hazard. The study found that the floodwaters in the spill zone eventually return to the main channel of the Lamont Creek upstream of the CNR culvert.

The HEC-2 model used for the previous study conservatively assumed that each cross-section in the model had to convey the full peak design flow. This method of modelling

did not reduce the rate of flow in the main channel along King Street by the calculated rate of spill across King Street along the length of the drain.

The updated HEC-2 model of the King Street Drain uses the Split-Flow Option for the section of the Drain south of the King Street/Main Street intersection. The HEC-2 Split-Flow Option more accurately models flow conditions along the main channel during 'spill' conditions. The split-flow model is based on the assumption that as the calculated water levels reach the centreline of road elevations, floodwater will begin to spill eastward across King Street. The King Street centreline was set as the dividing point for the split flow modelling. The energy slope of the spill area was conservatively estimated to be 0.002 m/m, based on the results of the analysis of the spill zone carried out during the previous study. The Manning's roughness co-efficient for the spill zone was conservatively assumed to be 0.1. As indicated in the previous report, floodwater in the spill zone eventually outlets to the Lamont Creek, upstream of the CNR culvert. The split-flow model reduces the flow rates in the main channel by the calculated rate of spill that flows eastward across King Street.

In the previous Cumming Cockburn study, the HEC-2 SPECIAL BRIDGE subroutine was used to model the various crossings. The current study uses the HEC-2 SPECIAL CULVERT sub-routine to model the precast concrete box culverts along the King Street Drain. The SPECIAL CULVERT sub-routine is able to more accurately model the entrance loss conditions for standard culverts (i.e., no wingwalls or bevels). For the purposes of the SPECIAL CULVERT modelling, the gabion walls at the ends of most of the box culvert were not considered as wingwalls. An equivalent opening area of 1.52 m x 1.78 m was used to model the existing 1.52 m x 1.83 m box culverts with

chamfered corners.

The modelling results indicate that, under ideal hydraulic conditions, the existing ditch/culvert system along most of King Street South is capable of conveying all flows up to and including the 100 year event. The results also indicate that the system is capable of conveying most of the Regional Storm flow with some spillage across King Street at various locations. The calculated spill rate is as follows:

	<u>SPILL RATE ACROSS KING STREET</u>	<u>PERCENTAGE OF TOTAL FLOW</u>
Regional Storm	1.48 m ³ /s	20%

The extent of estimated spilling and the associated flood hazard potential is less than what was estimated in the previous study. The majority of the spill would occur in the vicinity of the King Street/Main Street intersection. Modelling results indicate that the floodlines follow the top of the King Street Drain through most of the study area. Contour information suggests that, during the Regional Storm event, floodwater would overtop the west bank of the drain in areas north of Quebec Street and south of Centre Street. Flooding in these overbank areas is relatively shallow, with depths estimated to be less than 0.5 metres.

It should be noted that the hydraulic model of the King Street Drain is based on ideal conditions (i.e., no blockages, debris or ice jams). In the event of such a blockage anywhere along King Street, floodwaters would be expected to spill across King Street and flow north-eastward to the Lamont Creek at the CNR culvert, along the general flow path identified in the previous study.

As with the Lamont Creek floodline study, the calculated water surface profile information for each cross-section was translated to the 1:2000 contour mapping to delineate the elevation and the extent of flooding for the design storm event.

6. CONCLUSIONS

Significant alternations/modification have been made within the floodplains of the Lamont Creek and the King Street Drain since the original floodline studies were carried out.

This study was carried out so that the existing out-of-date floodline mapping for the Lamont Creek and King Street Drain could be updated to reflect current conditions in the floodplain.

With respect to the Lamont Creek west of Highway 26, there has been significant residential and industrial development along the watercourse. Additional road crossings have been placed across the creek. Based on contour information, the position of the creek itself has been relocated in the Sutherland Street area. Contour information also suggests that fill has been placed within the floodplain at various locations along the creek, primarily between Highway 26 and East Street. The changes in the floodplain have resulted in an increase in flood levels during the Regional Storm event compared to the previous study. The increases in flood depth range from 0.1 m to 0.59 m. The greatest increase in flood levels is noted at the East Street and Stayner Street crossing. The filling and development along the north of the Creek has reduced the estimated volume of spill to the north, thus contributing to an increase in flow rates and flow levels downstream of East Street.

Modelling results confirm that the CNR culvert acts as a hydraulic control on the Lamont Creek system. During the Regional Storm, the backwater effects of the CNR culvert extend upstream of Highway 26.

With respect to the King Street Drain, the modelling results indicate that the channel improvement projects and upstream drainage diversions have significantly reduced the risk of flooding along King Street, south of Highway 26. During Regional Storm events, floodwaters would spill across King Street but the volume and extent of the "spill" is significantly less than the estimates provided in the previous flood study.

It is our understanding that the Township of Clearview and the Nottawasaga Valley Conservation Authority are considering the implementation of a Two Zone Floodplain Policy for some areas of the Stayner Planning Area. It is recommended that this report and the updated floodline mapping be incorporated into the Two Zone Policy documentation for the study area.



Respectfully submitted,

AINLEY & ASSOCIATES LIMITED

A handwritten signature in black ink, appearing to be "T. Gorman", written over a horizontal line.

T. Gorman, P. Eng.

TRG/sm/#41

APPENDIX 1

HYDROLOGIC INPUT CALCULATIONS

HYDROLOGY CALCULATIONS

-> DRAINAGE AREA : LAMONT CREEK @ CNR CROSSING

-> TOTAL DRAINAGE AREA: 1716 hectares

-> TOTAL WATERSHED LENGTH: 10700 metres

-> WATERSHED SLOPE - "85/10" METHOD

MAX. ELEV. 395 m @L85, h= 310 m

MIN. ELEV: 212 m @L10, h= 217.5 m

SLOPE= 1.153 %

-> RUNOFF COEFFICIENT CALCULATION:

LAND USE TYPE: 60 % CROP
35 % PAST
5 % WOOD

SUBAREA #	PERCENTAGE OF TOTAL	SOIL TYPE	TOPO-GRAPHY	LAND USE	LAND USE FRACTION (%)	SUBAREA TOTAL (%)	SUBAREA COEFF.	WEIGHTED COEFF.
1	55 %	Hs	FLAT/ ROLLING	CROP	60	33.00	0.40	0.132
		LOAM/		PAST	35	19.25	0.32	0.061
		SILT-LOAM		WOOD	5	2.75	0.28	0.008
2	15 %	Hi	FLAT/ ROLLING	CROP	60	9.00	0.40	0.036
		LOAM/		PAST	35	5.25	0.32	0.017
		SILT-LOAM		WOOD	5	0.75	0.28	0.002
3	14 %	Smsc	FLAT	CROP	60	8.40	0.55	0.046
		CLAY-LOAM		PAST	35	4.90	0.40	0.020
		CLAY		WOOD	5	0.70	0.35	0.002
4	7 %	Ans	FLAT	CROP	60	4.20	0.22	0.009
		OPEN SAND		PAST	35	2.45	0.10	0.002
		LOAM		WOOD	5	0.35	0.08	0.000
5	2 %	Pal	FLAT	CROP	60	1.20	0.35	0.004
		LOAM		PAST	35	0.70	0.28	0.002
		SILT-LOAM		WOOD	5	0.10	0.25	0.000
6	2 %	Stsl	FLAT	CROP	60	1.20	0.22	0.003
		OPEN SAND		PAST	35	0.70	0.10	0.001
		LOAM		WOOD	5	0.10	0.08	0.000
7	5 %	URBAN				5.00	0.50	0.025
TOTALS						100.00 %	AVE. C=	0.37

-> TIME OF CONCENTRATION, T_c (AIRPORT METHOD)

$T_c =$ 234.94 minutes
or 3.92 hours

$T_p = 2/3 T_c =$ 156.63 minutes
or 2.61 hours

-> WEIGHTED CN VALUE CALCULATION:

LAND USE TYPE: 60 % CROP
35 % PAST
5 % WOOD

SUBAREA #	PERCENTAGE OF TOTAL	SOIL TYPE	HSG	LAND USE	LAND USE FRACTION (%)	SUBAREA TOTAL (%)	SUBAREA CN	WEIGHTED CN
1	55 %	Hs LOAM/ SILT-LOAM	BC	CROP	60	33.00	78	25.740
				PAST	35	19.25	71	13.668
				WOOD	5	2.75	65	1.788
2	15 %	HI LOAM/ SILT-LOAM	BC	CROP	60	9.00	78	7.020
				PAST	35	5.25	71	3.728
				WOOD	5	0.75	65	0.488
3	14 %	SmSc CLAY-LOAM CLAY	CD	CROP	60	8.40	84	7.056
				PAST	35	4.90	79	3.871
				WOOD	5	0.70	74	0.518
4	7 %	Ans OPEN SAND LOAM	AB	CROP	60	4.20	70	2.940
				PAST	35	2.45	62	1.519
				WOOD	5	0.35	54	0.189
5	2 %	Pal LOAM SILT-LOAM	BC	CROP	60	1.20	78	0.936
				PAST	35	0.70	71	0.497
				WOOD	5	0.10	65	0.065
6	2 %	Stsl OPEN SAND LOAM	AB	CROP	60	1.20	70	0.840
				PAST	35	0.70	62	0.434
				WOOD	5	0.10	54	0.054
7	5 %	URBAN				5.00	82	4.100

TOTALS 100.00 % AVE. CN: 75.45
(SAY CN = 76)

HYDROLOGY CALCULATIONS

-> DRAINAGE AREA : KING STREET DRAIN @ CNR CULVERT

-> TOTAL DRAINAGE AREA: 193 hectares

-> TOTAL WATERSHED LENGTH: 3000 metres

-> WATERSHED SLOPE – "85/10" METHOD

MAX. ELEV.	239 m	@L85, h=	230 m
MIN. ELEV:	211 m	@L10, h=	214 m
		SLOPE=	0.711 %

-> RUNOFF COEFFICIENT CALCULATION:

LAND USE TYPE:	15 % CROP
	65 % PAST
	20 % WOOD

SUBAREA #	PERCENTAGE OF TOTAL	SOIL TYPE	TOPO-GRAPHY	LAND USE	LAND USE FRACTION (%)	SUBAREA TOTAL (%)	SUBAREA COEFF.	WEIGHTED COEFF.
1	20 %	Ans OPEN SAND LOAM	FLAT	CROP	15	3.00	0.22	0.007
				PAST	65	13.00	0.10	0.013
				WOOD	20	4.00	0.08	0.003
2	35 %	M MUCK/ CLAY	FLAT	CROP	15	5.25	0.35	0.018
				PAST	65	22.75	0.28	0.064
				WOOD	20	7.00	0.25	0.018
3	15 %	Sts) OPEN SAND LOAM	FLAT	CROP	15	2.25	0.22	0.005
				PAST	65	9.75	0.10	0.010
				WOOD	20	3.00	0.08	0.002
4	15 %	Hs LOAM SILT-LOAM	FLAT	CROP	15	2.25	0.35	0.008
				PAST	65	9.75	0.28	0.027
				WOOD	20	3.00	0.25	0.008
5	15 %	URBAN				15.00	0.50	0.075
TOTALS						100.00 %	AVE. C=	0.26

-> TIME OF CONCENTRATION, T_c (AIRPORT METHOD)

T_c = 168.42 minutes
or 2.81 hours

T_p = 2/3 T_c = 112.28 minutes
or 1.87 hours

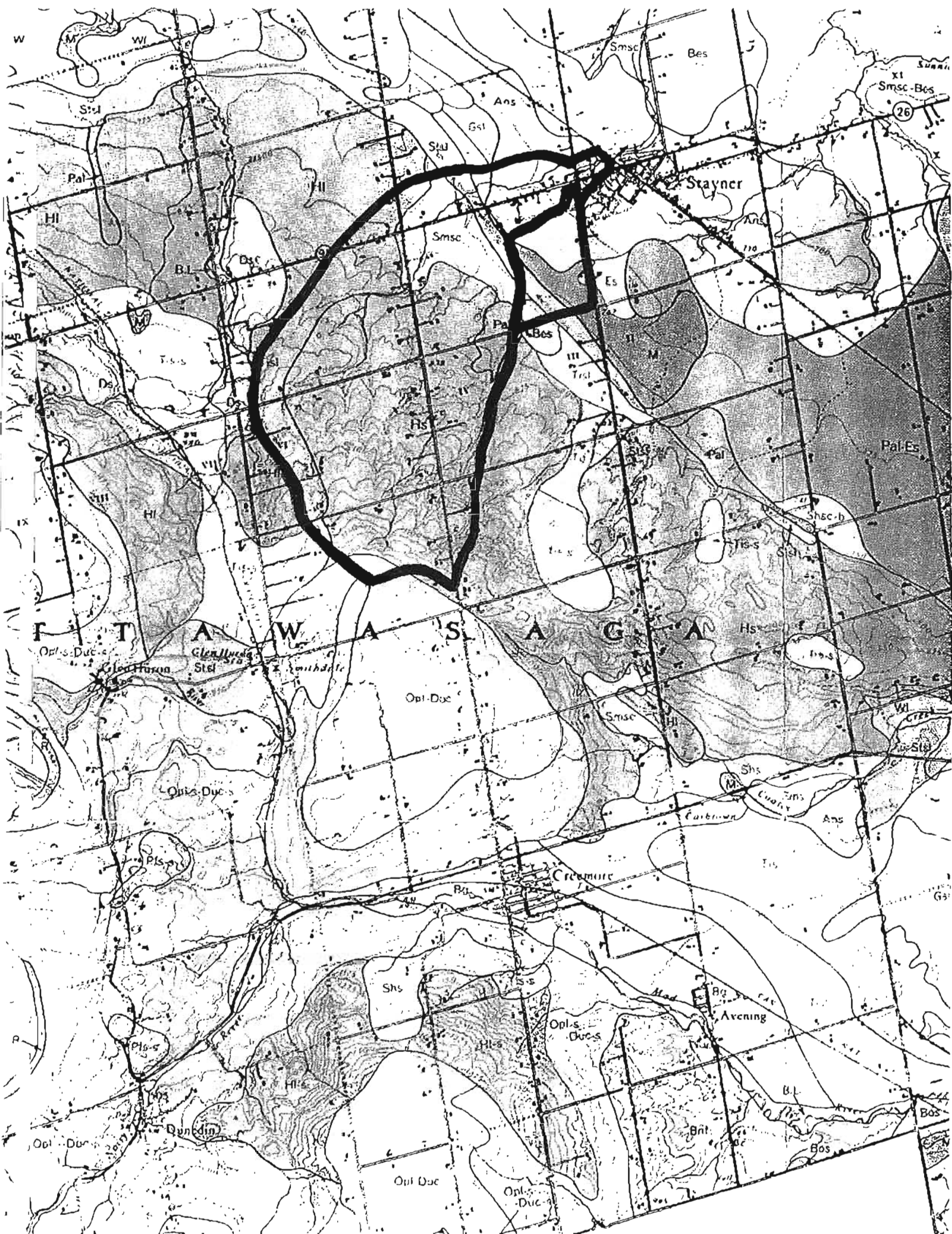
-> WEIGHTED CN VALUE CALCULATION:

LAND USE TYPE: 15 % CROP
65 % PAST
20 % WOOD

SUBAREA #	PERCENTAGE OF TOTAL	SOIL TYPE	HSG	LAND USE	LAND USE FRACTION (%)	SUBAREA TOTAL (%)	SUBAREA CN	WEIGHTED CN
1	20 %	Ans	AB	CROP	15	3.00	70	2.100
		OPEN SAND		PAST	65	13.00	62	8.060
		LOAM		WOOD	20	4.00	54	2.160
2	35 %	M	B	CROP	15	5.25	74	3.885
		MUCK/		PAST	65	22.75	65	14.788
		CLAY		WOOD	20	7.00	58	4.060
3	15 %	Stsl	AB	CROP	15	2.25	70	1.575
		OPEN SAND		PAST	65	9.75	62	6.045
		LOAM		WOOD	20	3.00	54	1.620
4	15 %	Hs	BC	CROP	15	2.25	78	1.755
		LOAM		PAST	65	9.75	71	6.923
		SILT-LOAM		WOOD	20	3.00	65	1.950
5	15 %	URBAN				15.00	82	12.300
TOTALS						100.00 %	AVE. CN: 67.22 (SAY CN = 67.5)	

APPENDIX 2

SOIL MAPPING - STUDY AREA



APPENDIX 3

OTTHYMO OUTPUT FILES

OTTHYMO INPUT FILE: LAMONT.INP

OTTHYMO

OWEN SOUND I-D-F --- SCS TYPE 6 HR. STORM

10 min interval

METRIC UNITS

CLEARVIEW TOWNSHIP - LAMONT CREEK & KING STREET DRAIN

AT 0.0 HOURS METOUT=0 NSTORM=1 NRUN=1

OS6_2.STM

READ STORM

STORM.001

TOTAL LAMONT CREEK DRAINAGE AREA AT CNR CULVERT

CALIB NASHYD

ID	NHYD	DT	AREA	DWF	CN	IA	N	TP	END
1	101	10.0	1716	0	76.0	2.0	3	2.61	-1

TOTAL KING STREET DRAINAGE AREA AT CNR CULVERT

CALIB NASHYD

ID	NHYD	DT	AREA	DWF	CN	IA	N	TP	END
2	102	10.0	193	0	67.5	2.0	3	1.87	-1

ADD HYD

ID	NHYD	IDone	IDtwo
3	103	1	2

START

AT 0.0 HOURS METOUT=0 NSTORM=1 NRUN=2
OS6 5.STM

START

AT 0.0 HOURS METOUT=0 NSTORM=1 NRUN=3
OS6 10.STM

START

AT 0.0 HOURS METOUT=0 NSTORM=1 NRUN=4
OS6 25.STM

START

AT 0.0 HOURS METOUT=0 NSTORM=1 NRUN=5
OS6 50.STM

START

AT 0.0 HOURS METOUT=0 NSTORM=1 NRUN=6
OS6 100.STM

START

AT 0.0 HOURS METOUT=0 NSTORM=1 NRUN=7
TIMMINS.STM

FINISH

LAMONT.SUM - SUMMARY FILE

```

      000      TTTT  TTTT  H  H  Y  Y  M  M      000      I N T E R H Y M O
      O  O      T      T  H  H  Y  Y  M M M M  O  O      * * * 1989b * * *
      O  O      T      T  H H H H H      Y      M M M  O  O
      O  O      T      T  H  H      Y      M  M  O  O
      000      T      T  H  H      Y      M  M      000      CH-315570500005
  
```

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 LICENSED TO: Ainley and Associates Ltd., Barrie

***** S U M M A R Y O U T P U T *****

Input filename: lamont.inp
 Output filename: lamont.out
 Summary filename: lamont.sum

DATE: 06-13-1996

TIME: 14:45:18

USER: _____

===<comment>=== TOWNSHIP OF CLEARVIEW

===<comment>=== FLOODLINE STUDY UPDATE

===<comment>=== LAMONT CREEK / KING STREET DRAIN

 ** SIMULATION NUMBER: 1 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ .00 hrs								

READ STORM		15.0						
[Ptot= 37.30 mm]								
fname :056_2.STM								
remark:2 YEAR STORM	OWEN SOUND	6 HOUR	SCS TYPE II					

CALIB NASHYD	0101	1	10.0	1716.00	9.47	6.00	10.79	.29
[CN=76.0								.000
[N= 3.0:Tp= 2.61]								

CALIB NASHYD	0102	2	10.0	193.00	1.01	5.17	7.91	.21
[CN=67.5								.000
[N= 3.0:Tp= 1.87]								

ADD [0101 + 0102]	0103	3	10.0	1909.00	10.38	5.83	10.50	n/a

** END OF SIMULATION : 1

 ** SIMULATION NUMBER: 2 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
-------------	--------	-----------	------------	--------------	--------------	------------	------	--------------

START @ .00 hrs

 READ STORM 15.0

[Ptot= 48.30 mm]

fname : OS6_5.STM

remark: 5 YEAR STORM OWEN SOUND 6 HOUR SCS TYPE II

CALIB NASHYD	0101	1	10.0	1716.00	14.90	6.00	16.94	.35	.000
[CN=76.0									
[N= 3.0:Tp= 2.61]									

CALIB NASHYD	0102	2	10.0	193.00	1.62	5.17	12.71	.26	.000
[CN=67.5									
[N= 3.0:Tp= 1.87]									

ADD [0101 + 0102]	0103	3	10.0	1909.00	16.37	5.83	16.52	n/a	.000
-------------------	------	---	------	---------	-------	------	-------	-----	------

 ** END OF SIMULATION : 2

 ** SIMULATION NUMBER: 3 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
-------------	--------	-----------	------------	--------------	--------------	------------	------	--------------

START @ .00 hrs

 READ STORM 15.0

[Ptot= 54.10 mm]

fname : OS6_10.STM

remark: 10 YEAR STORM OWEN SOUND 6 HOUR SCS TYPE II

CALIB NASHYD	0101	1	10.0	1716.00	18.05	6.00	20.52	.38	.000
[CN=76.0									
[N= 3.0:Tp= 2.61]									

CALIB NASHYD	0102	2	10.0	193.00	1.99	5.17	15.56	.29	.000
[CN=67.5									
[N= 3.0:Tp= 1.87]									

ADD [0101 + 0102]	0103	3	10.0	1909.00	19.86	5.83	20.01	n/a	.000
-------------------	------	---	------	---------	-------	------	-------	-----	------

 ** END OF SIMULATION : 3

** SIMULATION NUMBER: 4 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ .00 hrs								

READ STORM		15.0						
[Ptot= 62.50 mm]								
fname :OS6_25.STM								
remark:25 YEAR STORM OWEN SOUND 6 HOUR SCS TYPE II								

CALIB NASHYD	0101	1	10.0	1716.00	22.90	6.00	26.01 .42	.000
[CN=76.0								
[N= 3.0:Tp= 2.61]								

CALIB NASHYD	0102	2	10.0	193.00	2.56	5.00	30.00 .32	.000
[CN=67.5								
[N= 3.0:Tp= 1.87]								

ADD [0101 + 0102]	0103	3	10.0	1909.00	25.24	5.83	25.41 n/a	.000

** END OF SIMULATION : 4								

** SIMULATION NUMBER: 5 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ .00 hrs								

READ STORM		15.0						
[Ptot= 68.80 mm]								
fname :OS6_50.STM								
remark:50 YEAR STORM OWEN SOUND 6 HOUR SCS TYPE II								

CALIB NASHYD	0101	1	10.0	1716.00	26.73	6.00	30.35 .44	.000
[CN=76.0								
[N= 3.0:Tp= 2.61]								

CALIB NASHYD	0102	2	10.0	193.00	3.03	5.00	23.60 .34	.000
[CN=67.5								
[N= 3.0:Tp= 1.87]								

ADD [0101 + 0102]	0103	3	10.0	1909.00	29.50	5.83	29.67 n/a	.000

** END OF SIMULATION : 5								

** SIMULATION NUMBER: 6 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
-------------	--------	-----------	------------	--------------	--------------	------------	------	--------------

START @ 1.00 hrs

READ STORM 15.0

[Ptot= 75.20 mm]

fname :056_100.STM

remark:100 YEAR STORM OWEN SOUND 6 HOUR SCE TYPE II

CALIB NASHYD	0101	1	10.0	1716.00	30.78	5.83	34.93	.46	.000
[CN=76.0									
[N= 3.0:Tp= 2.61]									

CALIB NASHYD	0102	2	10.0	193.00	8.52	5.00	27.41	.36	.000
[CN=67.5									
[N= 3.0:Tp= 1.87]									

ADD [0101 + 0102]	0103	3	10.0	1909.00	34.00	5.83	34.17	n/a	.000
-------------------	------	---	------	---------	-------	------	-------	-----	------

** END OF SIMULATION : 6

** SIMULATION NUMBER: 7 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
-------------	--------	-----------	------------	--------------	--------------	------------	------	--------------

START @ 1.00 hrs

READ STORM 15.0

[Ptot=193.00 mm]

fname :TIMMINS.STM

remark:TIMMINS STORM TOTAL RAINFALL = 193 mm

CALIB NASHYD	0101	1	10.0	1716.00	78.64	10.50	134.51	.70	.000
[CN=76.0									
[N= 3.0:Tp= 2.61]									

CALIB NASHYD	0102	2	10.0	193.00	8.83	9.67	116.44	.60	.000
[CN=67.5									
[N= 3.0:Tp= 1.87]									

ADD [0101 + 0102]	0103	3	10.0	1909.00	87.09	10.33	132.68	n/a	.000
-------------------	------	---	------	---------	-------	-------	--------	-----	------

FINISH

=====

APPENDIX 4

HEC-2 OUTPUT FILES

LAMONTI.DAT HEC:

MODEL FOR THE
LAMONT CREEK

TN	NORTH SPILL ZONE FROM					
NS	2	2523	2586	1615	0.080	0.002
NG	0	223.49	60	224.68		
TN	NORTH SPILL ZONE FROM	2405 TO	2523			
NS	2	2405	2523	1615	0.080	0.002
NG	0	222.32	125	223.49		
TN	NORTH SPILL ZONE FROM	2365 TO	2405			
NS	2	2365	2405	1615	0.080	0.002
NG	0	221.72	35	222.32		
TN	NORTH SPILL ZONE FROM	2285 TO	2365			
NS	2	2285	2365	1615	0.080	0.002
NG	0	221.69	90	221.72		
TN	NORTH SPILL ZONE FROM	2250 TO	2285			
NS	2	2250	2285	1615	0.080	0.002
NG	0	221.36	25	221.69		
TN	NORTH SPILL ZONE FROM	2230 TO	2250			
NS	2	2230	2250	1615	0.080	0.002
NG	0	221.1	20	221.36		
TN	NORTH SPILL ZONE FROM	2215 TO	2230			
NS	2	2215	2230	1615	0.080	0.002
NG	0	221.1	15	221.1		
TN	NORTH SPILL ZONE FROM	2180 TO	2215			
NS	2	2180	2215	1615	0.080	0.002
NG	0	220.64	25	221.1		
TN	NORTH SPILL ZONE FROM	2105 TO	2180			
NS	2	2105	2180	1615	0.080	0.002
NG	0	220.47	85	220.64		
TN	NORTH SPILL ZONE FROM	2065 TO	2105			
NS	2	2065	2105	1615	0.080	0.001
NG	0	220.2	50	220.47		
TN	SOUTH SPILL ZONE FROM	2015 TO	2065 ACROSS MONTREAL STREET			
NS	2	2015	2065	1615	0.080	0.002
NG	0	219.1	50	220.2		
TN	SOUTH SPILL ZONE FROM	1995 TO	2015 ACROSS MONTREAL STREET			
NS	2	1995	2015	1615	0.080	0.002
NG	0	219.1	20	219.1		
TN	SOUTH SPILL ZONE FROM	1960 TO	1995 ACROSS MONTREAL STREET			
NS	2	1960	1995	1615	0.080	0.002
NG	0	218.9	38	220.0		
TN	NORTH SPILL ZONE FROM	1918 TO	1960			
NS	2	1918	1960	1615	0.080	0.002
NG	0	218.67	42	218.7		
TN	NORTH SPILL ZONE FROM	1856 TO	1918			
NS	2	1856	1918	1615	0.080	0.002
NG	0	218.6	10	218.67		
TN	NORTH SPILL ZONE FROM	1851 TO	1856			
NS	2	1851	1856	1615	0.080	0.002
NG	0	218.6	5	218.6		
TN	NORTH SPILL ZONE FROM	1786 TO	1851			
NS	2	1786	1851	1615	0.080	0.002
NG	0	217.53	77	218.6		
TN	NORTH SPILL ZONE FROM	1708 TO	1786			
NS	2	1708	1786	1615	0.080	0.002
NG	0	218.13	65	217.53		
TN	NORTH SPILL ZONE FROM	1658 TO	1708			
NS	2	1658	1708	1615	0.080	0.002
NG	0	216.93	50	218.13		

EE
T1 TOWNSHIP OF CLEARVIEW
T2 STAYNER WEST-END FLOODLINE STUDY UPDATE LAMONT CREEK
T3 REGIONAL STORM

[illegible]

* CROSS-SECTION REINHART'S

HC	0.060	0.080	0.045							
X1	1708	22	141.15	150.97	50	45	50			
X3	10							216.35	216.83	
BR	218.19	88.4	218.19	88.45	217.29	94.6	216.67	101.99	216.35	141.15
BR	215.31	142.95	214.61	144.9	214.25	148.83	214.63	147.07	215.25	148.51
BR	216.83	150.97	217.09	159.04	217.53	159.2	227	159.2	227	220
BR	217	278	217	241	216.5	283	216.6	300	216.4	320
BR	217.0	345	217.49	370						

* CROSS SECTION @ APPROX. SUTHERLAND STREET ALIGNMENT

X1	1786	21	141.92	152.7	65	85	78			
X3	10							217.45	217.23	
BR	217.33	86.0	217.53	87.0	217.53	87.11	217.39	123.43	217.45	141.92
BR	215.21	145.05	215.32	145.69	215.16	147.94	215.13	148.5	215.66	149.32
BR	215.78	150.27	217.23	152.7	217.34	154.74	227	154.74	227	219
BR	217.5	210	217.69	235.73	217.41	266.23	217.61	314.88	218.43	389.7
BR	218.2	500								

* DOWNSTREAM FACE OF PRIVATE CROSSING - REINHART'S

X1	1851	17	195.89	201.51	77	5	35			
X3	10							217.4	217.1	
BR	216.6	134.0	218.6	134.69	218.61	134.44	217	125.89	217	134.5
BR	215.55	198.6	215.55	199.1	217	201.3	217	199.54	217.47	199.86
BR	217.14	211.55	217.27	221.14	217.5	240	217.5	270	218.7	260
BR	218.5	377	218.7	390						

* DOWNSTREAM FACE OF PRIVATE CROSSING - REINHART'S

BR	215.5	1.55	215	1.5	215	6	215	1.4	215.55	215.58
X1	1856					5				
X3	10			217	217.41					
BR	217	134.6	218.6	134.69	218.61	134.44	217	125.89	217	134.5
BR	215.55	198.6	215.55	199.1	217	201.3	217	199.54	217.47	199.86
BR	217.14	211.55	217.27	221.14	217.5	240	217.5	270	218.7	260
BR	218.5	377	218.7	390						
BR	215.5	1.55	215	1.5	215	6	215	1.4	215.55	215.58
X1	1856					5				
X3	10			217	217.41					
BR	217	134.6	218.6	134.69	218.61	134.44	217	125.89	217	134.5
BR	215.55	198.6	215.55	199.1	217	201.3	217	199.54	217.47	199.86
BR	217.14	211.55	217.27	221.14	217.5	240	217.5	270	218.7	260
BR	218.5	377	218.7	390						

* CROSS SECTION BETWEEN PRIVATE CROSSING & STAYNER STREET

X1	1950	19	94.5	102.5	40	42	42			
X3	10							217.5	217.5	
BR	218.7	0	218.5	28	216.0	74	217.5	94.5	217.0	95.5
BR	216.5	92.5	216.3	98.5	216.5	100.0	217.0	101.0	217.5	103.5
BR	218.0	105.5	218.5	113.5	218.8	136	218.5	144	218.0	162
BR	217.9	175	218.0	171	218.5	203	218.88	240		
BR	219.5	510								
BR	216.7	165.4	218.67	165.5	217.01	156.41	217.11	118.37	217.1	122.1
BR	215.37	230.4	214.35	231.75	216.77	234.47	215.11	217.71	215.31	217.45
BR	216.63	240.28	217.57	246.24	217.18	263.04	218.37	258.40	217.76	216.71
BR	217.47	309.28	217.5	325.19	217.88	342.11	218.57	316.37	219.37	348.28
BR	219.5	510								

* CROSS-SECTION (CONTOUR) BETWEEN PRIVATE CROSSING & STAYNER STREET

X1	1950	19	94.5	102.5	40	42	42			
X3	10							217.5	217.5	
BR	218.7	0	218.5	28	216.0	74	217.5	94.5	217.0	95.5
BR	216.5	92.5	216.3	98.5	216.5	100.0	217.0	101.0	217.5	103.5
BR	218.0	105.5	218.5	113.5	218.8	136	218.5	144	218.0	162
BR	217.9	175	218.0	171	218.5	203	218.88	240		

* DOWNSTREAM FACE OF STAYNER ST. CULVERT

HC	0.080	0.060	0.045	0.6	0.8					
X1	1995	23	247.16	250.71	38	36	35			
X3	10							218.0	218.0	
BR	220.0	185.77	219.77	215.27	218.71	227.88	218.3	240.11	217.73	244.77
BR	215.1	244.9	216.11	246.33	216.65	247.11	217.74	248.75	216.68	249.15
BR	216.58	250.61	216.71	250.91	217.10	261.25	218.03	260.35	218.84	260.77
BR	217.32	255.3	217.58	256.35	218.85	258.95	219.07	270.77	218.58	270.75
BR	218.75	341.06	219.06	304.32	220.47	310.3				

* BT	7	78.64	30.78	26.73	22.9	18.05	14.9	9.47		
* UPSTREAM FACE OF STAYNER STREET CULVERT										
* CROSS - USE EQUIV. 2.4m x 3.45m BOX CULVERT										
SC	1.018	0.8	1.5	2.4	3.45	20	10.1	216.67	216.67	
XL	2015			20	20	20				
X2			2	219.07	218.79					
X3	10						219.78	218.78		
BY	-23	185.77	270.0	215.77	219.80		277.80	219.91		
BT		242.16	219.83	244.27	219.89		244.64	219.89		
BY		246.75	219.91	247.16	219.91		248.55	219.91		
BT		249.13	219.91	250.61	219.91		250.91	219.91		
BT		251.25	219.91	252.16	219.91		253.25	219.88		
BT		255.3	219.88	256.35	219.85		268.86	219.80		
BT		285.29	219.44	308.78	219.20		343.08	218.79		
BT		384.32	219.08	519.0	220.47					

* FLOW RATES UPSTREAM OF STAYNER STREET										
BT	7	75.00	29.67	25.77	22.17	17.40	14.35	9.17		
* CROSS-SECTION (LOWWATER) BEHIND STAYNER STREET AND ELEV. 186.1										
BT	0.000	0.000	0.045							
X1	0063	18	14.5	24.0	50	50	50			
X3	10						219.5	218.5		
BR	-20.0	0	200.0	4	218.5	15	219.0	15	218.5	15.0
GP	118.0	16.0	217.5	19.5	217.2	19.8	217.5	21.0	218.0	11.0
BP	216.5	14	217.0	22	215.0	47	216.2	20	217.0	20
BR	211.5	13.5	209.0	247	209.7	154				

* FLOW RATES DOWNSTREAM OF STAYNER STREET										
BT	0.000	0.000	0.045	0.1	0.5					
X1	2105	19	254.3	51.35	50	45	45			
X3	10						217.57	216.2		
GP	118.5	16.0	217.5	19.5	217.0	19.8	217.5	21.0	218.0	11.0
BP	216.5	14	217.0	22	215.0	47	216.2	20	217.0	20
BR	211.5	13.5	209.0	247	209.7	154				

* FLOW RATES BEHIND STAYNER STREET										
BT	0.000	0.000	0.045	0.1	0.5					
X1	2105	19	254.3	51.35	50	45	45			
X3	10						217.57	216.2		
GP	118.5	16.0	217.5	19.5	217.0	19.8	217.5	21.0	218.0	11.0
BP	216.5	14	217.0	22	215.0	47	216.2	20	217.0	20
BR	211.5	13.5	209.0	247	209.7	154				

* FLOW RATES BEHIND STAYNER STREET										
BT	0.000	0.000	0.045	0.1	0.5					
X1	2105	19	254.3	51.35	50	45	45			
X3	10						217.57	216.2		
GP	118.5	16.0	217.5	19.5	217.0	19.8	217.5	21.0	218.0	11.0
BP	216.5	14	217.0	22	215.0	47	216.2	20	217.0	20
BR	211.5	13.5	209.0	247	209.7	154				

* FLOW RATES BEHIND STAYNER STREET										
BT	0.000	0.000	0.045	0.1	0.5					
X1	2105	19	254.3	51.35	50	45	45			
X3	10						217.57	216.2		
GP	118.5	16.0	217.5	19.5	217.0	19.8	217.5	21.0	218.0	11.0
BP	216.5	14	217.0	22	215.0	47	216.2	20	217.0	20
BR	211.5	13.5	209.0	247	209.7	154				

* FLOW RATES BEHIND STAYNER STREET										
BT	0.000	0.000	0.045	0.1	0.5					
X1	2105	19	254.3	51.35	50	45	45			
X3	10						217.57	216.2		
GP	118.5	16.0	217.5	19.5	217.0	19.8	217.5	21.0	218.0	11.0
BP	216.5	14	217.0	22	215.0	47	216.2	20	217.0	20
BR	211.5	13.5	209.0	247	209.7	154				

12	100	NEAR STURCH							
11	0	2	0	-1	1	0	0	0	0
10	0	0	-1						
9	50	NEAR STURCH							
8	0	1	-1						
7	0	0	-1						
6	20	NEAR STURCH							
5	0	0	-1						
4	0	0	-1						
3	10	NEAR STURCH							
2	0	0	-1						
1	0	0	-1						
0	0	0	-1						
12	5	NEAR STURCH							
11	0	0	-1						
10	0	0	-1						
9	0	0	-1						
8	0	0	-1						
7	0	0	-1						
6	0	0	-1						
5	0	0	-1						
4	0	0	-1						
3	0	0	-1						
2	0	0	-1						
1	0	0	-1						
0	0	0	-1						

ER

HEC-2
MODEL - OVERLAND
FLOW ROUTE FOR
STAYNER CREEK
TO HWY 26

8

SOUTH.DAT

54

0 213

TOWNSHIP OF CLEARVIEW

STAYNER WEST-END FLOODLINE STUDY UPDATE LAMONT CREEK

REGIONAL STORM

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81	1770	177	255.77	210.00	38	38	20			
83	10									
GR	220.09	105.77	219.19	215.77	216.71	227.88	218.37	242.18	217.93	244.27
GR	217.17	244.64	214.71	246.35	215.51	247.18	216.55	248.55	216.37	249.75
GR	216.45	250.11	216.71	250.21	217.00	251.15	218.03	252.15	218.83	253.25
GR	217.51	255.17	215.18	254.15	218.51	255.54	219.07	255.29	218.58	258.18
GR	218.79	245.08	219.04	244.12	20.47	510.16				

EO

E1

E2

Y3		100	YEAR	STORM						
Y1	0	0	0	0	0	1	1	0	0	0
Y2	2	0	0	1						

E1

E2

Y5		50	YEAR	STORM						
Y1	0	4	0	0	0	1	0	0	0	0
Y2	5	0	1							

E1

E2

Y3		25	YEAR	STORM						
Y1	0	0	0	0	0	1	0	0	0	0
Y2	0	0	0	1						

E1

E2

Y5		10	YEAR	STORM						
Y1	0	0	0	0	0	1	1	0	0	0
Y2	0	0	0	1						

E1

E2

Y7		0.1	YEAR	STORM						
Y1	0	7	0	0	0	1	1	0	0	0
Y2	0	0	0	1						

E1

E2

Y2		2	YEAR	STORM						
Y1	0	0	0	0	0	0	1	0	0	0
Y2	0	0	0	1						

PA

KINGUPD.*

5F					
TN EAST spill from 1455 to 1530					
NS	2	1455	1530	-1	0.10 0.002
NG	0	221.5	75	221.5	
TN East spill from 1341 to 1455					
NS	2	1341	1455	1	0.10 0.002
NG	0	220.8	114	221.5	
TN East spill from 1340 to 1341					
NS	2	1340	1341	1	0.10 0.002
NG	0	220.8	1	220.8	
TN East spill from 1335 to 1340					
NS	2	1335	1340	1	0.10 0.002
NG	0	220.7	5.0	220.7	
TN East spill from 1330 to 1335					
NS	2	1330	1335	1	0.10 0.002
NG	0	220.66	5	220.7	
TN East spill from 1324 to 1330					
NS	2	1324	1330	1	0.10 0.002
NG	0	220.66	5	220.66	
TN East spill from 1300 to 1324					
NS	2	1300	1324	1	0.10 0.002
NG	0	220.48	25	220.66	
TN East spill from 1288 to 1300					
NS	2	1288	1300	1	0.10 0.002
NG	0	220.41	12	220.48	
TN East spill from 1292 to 1288					
NS	2	1292	1288	1	0.10 0.002
NG	0	220.4	0	220.41	
TN East spill from 1292 to 1292					
NS	2	1292	1292	1	0.10 0.002
NG	0	220.22	30	220.4	
TN EAST spill from 1247 to 1252					
NS	2	1247	1252	1	0.10 0.002
NG	0	220.22	5	220.22	
TN EAST spill from 1247 to 1247					
NS	2	1247	1247	1	0.10 0.002
NG	0	220.08	0	220.22	
TN EAST spill from 122 to 1247					
NS	2	122	1247	1	0.10 0.002
NG	0	220.08	19	220.08	
TN EAST spill from 1209 to 1227					
NS	2	1209	1227	1	0.10 0.002
NG	0	220.04	13	220.08	
TN EAST spill from 1195 to 1209					
NS	2	1195	1209	1	0.10 0.002
NG	0	219.94	14	220.01	
TN EAST spill from 1188 to 1195					
NS	2	1188	1195	1	0.10 0.002
NG	0	219.94	5	219.94	
TN EAST spill from 1179 to 1188					
NS	2	1179	1188	1	0.10 0.002
NG	0	219.86	9	219.94	
TN EAST spill from 1172 to 1179					
NS	2	1172	1179	1	0.10 0.002
NG	0	219.82	7	219.86	
TN EAST spill from 1165 to 1172					
NS	2	1165	1172	1	0.10 0.002
NG	0	219.82	5	219.82	
TN EAST spill from 1150 to 1165					
NS	2	1150	1165	1	0.10 0.002
NG	0	219.69	15	219.82	
TN EAST spill from 1141 to 1150					
NS	2	1141	1150	1	0.10 0.002

UPDATED HEC-2 MODEL
FOR THE KING STREET
DRAIN.

TN EAST spill from 1133 to 1141					
NS	2	1133	1141	-1	0.10 0.002
NG	0	219.64	8.7	219.64	
TN EAST spill from 1106 to 1133					
NS	2	1106	1133	-1	0.10 0.002
NG	0	219.42	32	219.42	
TN EAST spill from 1083 to 1106					
NS	2	1083	1133	-1	0.10 0.002
NG	0	219.34	18	219.42	
TN EAST spill from 1077 to 1083					
NS	2	1077	1083	1	0.10 0.002
NG	0	219.34	5	219.34	
TN EAST spill from 1059 to 1077					
NS	2	1059	1077	-1	0.10 0.002
NG	0	219.33	18	219.34	
TN EAST spill from 1039 to 1059					
NS	2	1039	1059	1	0.10 0.002
NG	0	219.23	20	219.33	
TN EAST spill from 1034 to 1039					
NS	2	1034	1039	1	0.10 0.002
NG	0	219.23	5	219.23	
TN EAST spill from 1026 to 1034					
NS	2	1026	1034	-1	0.10 0.002
NG	0	219.16	8	219.23	
TN EAST spill from 1020 to 1026					
NS	2	1020	1026	1	0.10 0.002
NG	0	219.17	6	219.16	
TN EAST spill from 1015 to 1020					
NS	2	1015	1020	1	0.10 0.002
NG	0	219.13	5	219.13	
TN EAST spill from 1005 to 1015					
NS	2	1005	1015	1	0.10 0.002
NG	0	219.12	10	219.13	
TN EAST spill from 994 to 1005					
NS	2	994	1005	-1	0.10 0.002
NG	0	219.09	11	219.12	
TN EAST spill from 989 to 994					
NS	2	989	994	-1	0.10 0.002
NG	0	219.09	5	219.09	
TN EAST spill from 980 to 989					
NS	2	980	989	-1	0.10 0.002
NG	0	219.17	9	219.09	
TN EAST spill from 968.6 to 989					
NS	2	968.6	980	-1	0.10 0.002
NG	0	219.15	11	219.17	
TN EAST spill from 942 to 968.6					
NS	2	942	968.6	-1	0.10 0.002
NG	0	219.15	14.9	219.15	
TN EAST spill from 940 to 952					
NS	2	940	952	1	0.10 0.002
NG	0	219.02	12	219.15	
TN EAST spill from 929.1 to 940					
NS	2	929.1	940	-1	0.10 0.002
NG	0	218.99	4	219.02	
TN EAST spill from 914 to 929.1					
NS	2	914	929.1	-1	0.10 0.002
NG	0	218.99	19.8	218.99	
TN EAST spill from 899 to 914					
NS	2	899	914	-1	0.10 0.002
NG	0	218.79	15	218.99	
TN EAST spill from 875.3 to 899					
NS	2	875.3	899	1	0.10 0.002
NG	0	218.67	24	218.79	
TN EAST spill from 870 to 875.3					
NS	2	870	875.3	1	0.10 0.002

TN EAST spill from 854 to 870

NS 2 854 870 -1 0.10 0.002

NG 0 218.59 16 218.67

TN EAST spill from 839.4 to 854

NS 2 839.4 854 1 0.10 0.002

NG 0 218.49 15 218.59

TN EAST spill from 833 to 839.4

NS 2 833 839.4 -1 0.10 0.002

NG 0 218.49 5 218.49

TN EAST spill from 825 to 833

NS 2 825 833 -1 0.10 0.002

NG 0 218.47 5 218.49

TN EAST spill from 780 to 825

NS 2 780 825 -1 0.10 0.002

NG 0 218.47 35 218.47

11

11 NOTTAWASAGA VALLEY CONSERVATION AUTHORITY

11 KING STREET FLOOD RELIEF STUDY (TOWN OF SATHURPA 2001-2002)

11 KING STREET DITCH PROFILE: TURNING STONE CATCH BASIN 100% CROSS SECTION

11

11 KING STREET FLOODLINE UPDATE - SOURCE: 2005-06 SURVEY 1-3

11 UPDATED SURVEY INFORMATION FOR KING STREET SOUTH DITCHED

11 INTO PREVIOUS COMBING ROCKHORN DEP. MODEL

11 0 2 0 0 -1 1 218.51 0

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11 0.005 10.0 0.078 0.05 0.05 0.05 0.05 0.05 0.05 0.05

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	X1	253.0	0	0	0	8.	2.	8.	0.8	0.2	
	X1	259.0	13	41.	42.28	6.	3.	6.			
	X7	10							214.1	214.0	
	BP	216.0	0.	214.5	6.	214.2	40.	214.1	41.	212.6	41.01
	BR	217.8	47.27	214.1	42.28	214.2	43.	214.0	48.	214.0	83.
	BR	219.4	90.	215.0	121.	216.0	155.				
	X1	260.0	0.	0.	0.	1.	1.	1.			
	BP	13	0.	216.0	216.0	6.	214.5	216.5	40.	214.2	214.2
	BP		41.	214.2	214.1	41.01	214.2	214.1	42.27	214.0	214.1
	BP		47.28	214.2	214.1	43.	214.2	214.2	48.	214.0	214.0
	BP		83.	214.0	214.0	96.	214.4	214.0	121.	215.0	215.0
	BP		155.	216.0	216.0						
	X1	292.0	0	0	0	58.	28.	43.			
	X7										
	X1	304.0	0	0	0	1.	1.	1.			
	X5	10							214.2	214.0	
	X1	314.0	10	73.	75.11	10.	10.	10.			
	X7	10							214.2	214.2	
	BP	316.0	5.	215.5	6.	215.0	5.	214.4	2.	214.	73.
	BP	317.5	11.01	212.2	15.1	214.2	15.11	214.4	7.	214.4	13.
	BP	314.5	17.	215.0	146.	214.2	185.				
	X1	316.0	0	0	0	1.	1.	1.			
	BP	13	0.	216.0	216.0	6.	211.5	215.5	40.	215.0	215.0
	BP		73.	214.1	214.4	13.	214.4	14.	211.1	214.1	214.1
	BP		25.1	214.4	214.	5.11	214.4	214.	7.	214.1	214.4
	BP		11.	215.5	214.2	10.	214.5	214.5	146.	215.0	215.0
	BP		17.	216.2	216.0						
	X1	272.0	0	0	0	1.	1.	1.			
	X7										
	X1	316.0	0	0	0	1.	1.	1.			
	X7	10							214.4	214.4	
	BP	317.5	11.01	212.2	15.1	214.2	15.11	214.4	7.	214.4	13.
	BP	314.5	17.	215.0	146.	214.2	185.				
	X1	316.0	0	0	0	1.	1.	1.			
	BP	13	0.	216.0	216.0	6.	211.5	215.5	40.	215.0	215.0
	BP		73.	214.1	214.4	13.	214.4	14.	211.1	214.1	214.1
	BP		25.1	214.4	214.	5.11	214.4	214.	7.	214.1	214.4
	BP		11.	215.5	214.2	10.	214.5	214.5	146.	215.0	215.0
	BP		17.	216.2	216.0						
	X1	272.0	0	0	0	1.	1.	1.			
	X7										
	X1	316.0	0	0	0	1.	1.	1.			
	X7	10							214.4	214.4	
	BP	317.5	11.01	212.2	15.1	214.2	15.11	214.4	7.	214.4	13.
	BP	314.5	17.	215.0	146.	214.2	185.				
	X1	316.0	0	0	0	1.	1.	1.			
	BP	13	0.	216.0	216.0	6.	211.5	215.5	40.	215.0	215.0
	BP		73.	214.1	214.4	13.	214.4				

BT	155.01	217.4	217.2	156.23	217.4	217.2	156.24	217.4	217.2
BT	157.	217.4	217.4	206.	218.0	218.0			
X1 607.0	0	0	0	8.	8.	8.			
X2						1			
X3 609.0	0	0	0	2.	2.	2.			
X3 10							216.5	217.4	
X1 629.0	13	241.	243.53	40.	10.	20.			
X3 10							217.5	217.4	
GF 217.0	0.	218.5	20.	218.0	150.	217.7	240.	217.5	241.
GF 215.2	241.01	215.8	243.5	217.5	243.51	217.7	244.	217.4	215.
GF 217.5	326.	217.5	410.	219.0	413.				
X1 630.0	0	0	0	1.	1.	1.			
B1 13	0.	219.0	219.0	20.	218.5	218.5	100.	218.0	218.0
BT	240.	217.7	217.7	241.	217.7	217.5	241.01	217.7	217.5
BT	243.5	217.7	217.5	243.51	217.7	217.5	244.	217.7	217.7
B1	215.	217.4	217.4	326.	217.5	217.5	410.	217.5	217.5
BT	411.	219.0	219.0						
X1 636.0	0	0	0	1.	1.	1.			
X2						1			
X3 637.0	0	0	0	1.	1.	1.			
X 10							217.7	217.4	
GR 610.05	9.040	0.005	0.03	0.05					
X1 639.0	14	319.	308.	1.	120.	80.			
GR 215.7	0.	219.0	41.	218.5	140.	218.5	100.	218.0	218.0
GF 217.8	304.	217.3	219.	215.0	370.	217.6	327.8	217.9	217.0
GR 217.5	370.	217.3	415.	216.5	218.	216.7	100.		
X1 640.0	0	0	0	20.	20.	20.	100.	217.4	
BT	2.42	217.0	217.5	217.5	100.	100.	100.		
Y R10 MAIN CIRCLE (MF) (MF) 8 R100									
X1 700.0	17	241.	2198	10.	20.	20.			
X 10							217.7	217.4	
GR 217.0	2.	217.0	210.	130.5	107.	217.3	240.	217.5	217.0
BT 217.2	241.01	218.5	247.77	217.3	217.3	130.	236.	217.5	217.0
GR 217.7	350.	217.0	300.	219.7	50.				
X1 700.0	0	0	0	100.	100.	100.			
BT 13	0.	217.4	12.4	117.	117.	117.0	217.	217.5	217.0
BT	240.	218.7	218.3	141.	18.3	217.0	217.0	217.0	217.0
B1	217.5	218.	217.5	217.5	217.5	217.5	217.5	217.5	217.5
B1	217.5	218.5	217.5	217.5	217.5	217.5	217.5	217.5	217.5
X1 700.0	0	0	0	100.	100.	100.			
X1 700.0	1.	217.0	217.0	100.	100.	100.			
GR 217.0	218.41	217.0	217.0	217.0	217.0	217.0	217.0	217.0	217.0
GR 217.0	218.41	217.0	217.0	217.0	217.0	217.0	217.0	217.0	217.0
GR 217.0	218.41	217.0	217.0	217.0	217.0	217.0	217.0	217.0	217.0
X1 700.0	10	218.41	217.0	217.0	217.0	217.0	217.0	217.0	217.0
X 10							218.41	217.0	
BT 217.0	404	218.49	404	218.49	404	218.49	404	218.49	404
GR 217.0	404	218.49	404	218.49	404	218.49	404	218.49	404
GR 217.0	404	218.49	404	218.49	404	218.49	404	218.49	404
Y R100 MAIN CIRCLE (MF) (MF) 8 R100									
X1 700.0	0.5	217.0	0	1.52	1.52	1.52	1.52	217.0	217.0
X1 700.0	0	0	0	0	0	0			
X2			218.49	218.49					
X3 10							218.49	218.49	
BT 13	404	218.49		404	218.49		404	218.49	
BT	404	218.49		404	218.49		404	218.49	
B1	218.49	218.49		218.49	218.49		218.49	218.49	
B1	218.49	218.49		218.49	218.49		218.49	218.49	
BT	0	218.49		0	218.49		0	218.49	
BT	0	218.49		0	218.49		0	218.49	
X1 800.0	13	275.01	276.77	16	16	16			
X3 10							218.49	218.49	
GR 217.0	168	218.49	0.5	218.49	0.5	218.49	0.5	218.49	0.5
GR 217.0	275.01	218.49	276.77	218.49	276.80	218.49	281.5	218.49	276.77
GR 217.0	275.01	218.49	276.77	218.49	276.80	218.49	281.5	218.49	276.77

SC	1.013	0.5	1.39	0	1.52	1.78	10.0	10.1	218.80	218.73
X1	875.3	0	0	0	10.0	10.0	10.0			
X2			2	218.32	218.53					
X3	10							218.53	218.53	
BT	-13	268	218.67		269	218.67		273	218.53	
BT		274	218.53		275.0	218.53		275.01	218.53	
BT		276.79	218.53		276.80	218.53		276.80	218.53	
BT		358	219.0		390	219.0		433	219.0	
BT		486	220.0							
RC	0.040	0.040	0.030							
X1	872.0				24	24	24		0.08	
X1	914.0	12	243.01	244.79	15	15	15			
X3	10							219.4	219.4	
GR218.99		236	218.9	239	218.79	242	218.75	243	218.84	19.001
GR218.86		244.79	218.79	244.80	218.79	246	218.75	247.56	217.4	19.001
GR	218.5	388	220.0	445						
#	BT	80X	CULVERT @ 8'x20'x11	RT149	BT					
SL	1.000	0.5	1.39	0	1.52	1.78	10.0	10.1	218.80	218.73
X1	914.0	0	0	0	1.52	1.78	10.0			
X2			2	218.5	218.75					
X3	10							218.75	218.75	
BT	-13	236	218.99		239	218.79		243	218.84	
BT		243	218.79		244.80	218.75		247.56	217.4	
BT		244.80	218.75		246	218.75		247.56	217.4	
BT		312	219.0		390	219.0		433	219.0	
BT		486	220.0							
X1	914.0	1	243.01	244.79	15	15	15			
X3	10							218.75	218.75	
GR218.99		236	218.99	239	218.79	242	218.75	243	218.84	19.001
GR218.86		244.79	218.79	244.80	218.79	246	218.75	247.56	217.4	19.001
GR	218.5	388	220.0	445						
#	BT	80X	CULVERT @ 8'x20'x11	RT149	BT					
SL	1.000	0.5	1.39	0	1.52	1.78	10.0	10.1	218.80	218.73
X1	914.0	0	0	0	1.52	1.78	10.0			
X2			2	218.5	218.75					
X3	10							218.75	218.75	
BT	-13	236	218.99		239	218.79		243	218.84	
BT		243	218.79		244.80	218.75		247.56	217.4	
BT		244.80	218.75		246	218.75		247.56	217.4	
BT		312	219.0		390	219.0		433	219.0	
BT		486	220.0							
X1	914.0	1	243.01	244.79	15	15	15			
X3	10							218.75	218.75	
GR218.99		236	218.99	239	218.79	242	218.75	243	218.84	19.001
GR218.86		244.79	218.79	244.80	218.79	246	218.75	247.56	217.4	19.001
GR	218.5	388	220.0	445						
#	BT	80X	CULVERT @ 8'x20'x11	RT149	BT					
SL	1.000	0.5	1.39	0	1.52	1.78	10.0	10.1	218.80	218.73
X1	914.0	0	0	0	1.52	1.78	1			

[illegible]

446	445	444	443	442	441	440	439	438	437	436	435	434	433	432	431	430	429	428	427	426	425	424	423	422	421	420	419	418	417	416	415	414	413	412	411	410	409	408	407	406	405	404	403	402	401	400	399	398	397	396	395	394	393	392	391	390	389	388	387	386	385	384	383	382	381	380	379	378	377	376	375	374	373	372	371	370	369	368	367	366	365	364	363	362	361	360	359	358	357	356	355	354	353	352	351	350	349	348	347	346	345	344	343	342	341	340	339	338	337	336	335	334	333	332	331	330	329	328	327	326	325	324	323	322	321	320	319	318	317	316	315	314	313	312	311	310	309	308	307	306	305	304	303	302	301	300	299	298	297	296	295	294	293	292	291	290	289	288	287	286	285	284	283	282	281	280	279	278	277	276	275	274	273	272	271	270	269	268	267	266	265	264	263	262	261	260	259	258	257	256	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225	224	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193	192	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177	176	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20	-21	-22	-23	-24	-25	-26	-27	-28	-29	-30	-31	-32	-33	-34	-35	-36	-37	-38	-39	-40	-41	-42	-43	-44	-45	-46	-47	-48	-49	-50	-51	-52	-53	-54	-55	-56	-57	-58	-59	-60	-61	-62	-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88	-89	-90	-91	-92	-93	-94	-95	-96	-97	-98	-99	-100
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LAMONTI. SMP
SUMMARY OUTPUT FILE

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|          S U M P O          |
|                               |
| Interactive Summary Printout |
| for MS/PC-DOS micro computers |
|      May 1991              |
|                               |
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NOTE - Asterisk (*) at left of profile number
indicates message in summary of errors
list

REGIONAL STORM

Summary Printout

	SECNO	CWSEL	CRIWS	Q	EG	DEPTH	TOPWID	ELMIN
*	982.00	212.81	212.81	87.09	212.82	3.10	148.87	209.71
*	982.00	212.85	212.85	34.00	212.85	3.14	150.74	209.71
*	982.00	212.85	212.85	29.50	212.85	3.14	150.74	209.71
*	982.00	212.85	212.85	25.24	212.85	3.14	150.74	209.71
*	982.00	211.81	211.81	19.86	212.87	2.10	2.07	209.71
*	982.00	211.55	211.55	16.37	212.49	1.84	2.07	209.71
*	982.00	211.08	211.08	10.38	211.76	1.37	2.07	209.71
*	1000.00	216.80	.00	87.09	216.80	7.09	591.55	209.71
*	1000.00	214.04	.00	34.00	214.77	4.33	2.07	209.71
*	1000.00	213.62	.00	29.50	214.30	3.91	2.07	209.71
*	1000.00	213.33	.00	25.24	213.91	3.62	2.07	209.71
*	1000.00	212.48	211.80	19.86	213.10	2.77	2.07	209.71
*	1000.00	212.16	211.56	16.37	212.69	2.45	2.07	209.71
*	1000.00	211.56	211.07	10.38	211.94	1.85	2.07	209.71
*	1050.00	216.80	212.48	87.09	216.80	6.67	105.63	210.13
*	1050.00	215.00	.00	34.00	215.00	4.87	99.70	210.13
*	1050.00	214.50	.00	29.50	214.50	4.37	98.68	210.13
*	1050.00	214.08	.00	25.24	214.09	3.95	97.82	210.13
*	1050.00	213.29	.00	19.86	213.30	3.16	93.15	210.13
*	1050.00	212.86	.00	16.37	212.86	2.73	78.95	210.13
*	1050.00	212.09	.00	10.38	212.10	1.96	53.42	210.13
	1330.00	216.81	214.56	78.64	216.81	4.00	461.88	212.81
*	1330.00	215.01	.00	30.78	215.01	2.20	236.77	212.81
*	1330.00	214.51	.00	26.73	214.54	1.70	139.87	212.81
*	1330.00	214.22	214.22	22.90	214.30	1.41	43.02	212.81
*	1330.00	214.23	214.23	18.05	214.28	1.42	44.02	212.81
*	1330.00	214.20	214.20	14.90	214.24	1.39	41.86	212.81
*	1330.00	213.83	213.83	9.47	214.35	1.02	2.90	212.81
	1348.00	216.81	.00	78.64	216.81	4.00	462.26	212.81
	1348.00	215.00	.00	30.78	215.01	2.19	200.37	212.81
	1348.00	214.62	.00	26.73	214.66	1.81	133.79	212.81
*	1348.00	214.60	.00	22.90	214.64	1.79	131.34	212.81
	1348.00	214.56	.00	18.05	214.58	1.75	123.56	212.81

*	1348.00	214.53	.00	14.90	214.55	1.72	117.99	212.81
*	1348.00	214.45	.00	9.47	214.46	1.64	105.72	212.81
*	1598.00	216.77	216.23	78.64	216.89	3.41	279.25	213.36
*	1598.00	215.09	.00	30.78	215.62	1.73	5.48	213.36
*	1598.00	215.30	.00	26.73	215.62	1.94	5.48	213.36
*	1598.00	215.17	.00	22.90	215.44	1.81	5.48	213.36
*	1598.00	215.01	.00	18.05	215.22	1.65	5.48	213.36
*	1598.00	214.90	.00	14.90	215.06	1.54	5.48	213.36
*	1598.00	214.68	.00	9.47	214.77	1.32	5.48	213.36
	1615.00	216.77	.00	78.64	216.89	3.41	280.11	213.36
*	1615.00	215.88	.00	30.78	216.13	2.52	5.48	213.36
*	1615.00	215.80	.00	26.73	216.01	2.44	5.48	213.36
	1615.00	215.51	.00	22.90	215.70	2.15	5.48	213.36
	1615.00	215.26	.00	18.05	215.41	1.90	5.48	213.36
	1615.00	215.09	.00	14.90	215.21	1.73	5.48	213.36
	1615.00	214.78	.00	9.47	214.85	1.42	5.48	213.36
*	1658.00	216.92	216.76	62.02	217.01	3.12	199.74	213.80
*	1658.00	216.08	216.08	30.62	216.56	2.28	15.38	213.80
*	1658.00	215.93	215.93	26.72	216.43	2.13	9.01	213.80
*	1658.00	215.81	215.81	22.84	216.28	2.01	8.43	213.80
*	1658.00	215.66	215.66	18.05	216.08	1.86	7.69	213.80
*	1658.00	215.53	215.53	14.90	215.92	1.73	7.07	213.80
*	1658.00	215.27	215.27	9.47	215.60	1.47	5.78	213.80
	1708.00	217.11	216.85	62.02	217.15	2.89	189.20	214.22
*	1708.00	216.84	.00	30.62	216.88	2.62	134.70	214.22
*	1708.00	216.78	.00	26.72	216.88	2.56	50.18	214.22
*	1708.00	216.65	.00	22.84	216.77	2.43	45.29	214.22
*	1708.00	216.45	.00	18.05	216.57	2.23	21.39	214.22
*	1708.00	216.31	.00	14.90	216.42	2.09	8.93	214.22
*	1708.00	215.99	.00	9.47	216.07	1.77	7.90	214.22
*	1786.00	217.75	217.75	62.19	217.95	2.62	194.88	215.13
*	1786.00	216.94	.00	30.62	217.36	1.81	9.35	215.13
*	1786.00	217.09	.00	26.72	217.34	1.96	9.83	215.13
*	1786.00	217.00	.00	22.84	217.22	1.87	9.55	215.13
	1786.00	216.84	.00	18.05	217.02	1.71	8.95	215.13
	1786.00	216.69	.00	14.90	216.85	1.56	8.43	215.13
*	1786.00	216.36	.00	9.47	216.50	1.23	7.26	215.13
	1851.00	218.10	217.89	62.54	218.17	2.55	160.89	215.55
*	1851.00	217.75	.00	30.62	217.85	2.20	124.21	215.55
	1851.00	217.63	217.61	26.72	217.80	2.08	109.23	215.55
*	1851.00	217.57	217.57	22.84	217.75	2.02	103.29	215.55
	1851.00	217.35	217.10	18.05	217.63	1.80	28.28	215.55
	1851.00	217.22	216.97	14.90	217.49	1.67	15.30	215.55
	1851.00	216.95	.00	9.47	217.14	1.40	5.46	215.55
	1856.00	218.10	.00	62.54	218.17	2.55	161.65	215.55
	1856.00	217.75	.00	30.62	217.85	2.20	123.49	215.55
	1856.00	217.70	.00	26.72	217.80	2.15	118.88	215.55
	1856.00	217.62	.00	22.84	217.75	2.07	108.65	215.55
	1856.00	217.36	.00	18.05	217.63	1.81	30.33	215.55
	1856.00	217.32	.00	14.90	217.53	1.77	26.28	215.55
	1856.00	217.07	.00	9.47	217.22	1.52	5.62	215.55
	1918.00	218.26	217.29	23.50	218.26	2.15	151.91	216.11

*	1918.00	217.98	.00	20.64	217.99	1.87	124.15	216.11
*	1918.00	217.93	.00	18.69	217.94	1.82	118.77	216.11
*	1918.00	217.89	.00	16.84	217.90	1.78	114.25	216.11
*	1918.00	217.83	.00	15.00	217.84	1.72	106.58	216.11
*	1918.00	217.73	.00	14.00	217.75	1.62	92.63	216.11
*	1918.00	217.46	.00	10.00	217.51	1.35	29.64	216.11
*	1960.00	218.26	217.88	23.50	218.31	1.96	105.10	216.30
*	1960.00	217.96	217.82	20.64	218.14	1.66	48.13	216.30
*	1960.00	217.92	217.76	18.69	218.09	1.62	36.48	216.30
*	1960.00	217.88	.00	16.84	218.04	1.58	26.19	216.30
*	1960.00	217.84	.00	15.00	217.98	1.54	23.99	216.30
*	1960.00	217.77	.00	14.00	217.93	1.47	20.70	216.30
*	1960.00	217.61	.00	10.00	217.75	1.31	13.30	216.30
*	1995.00	218.34	218.00	23.50	218.61	1.68	10.26	216.66
	1995.00	218.22	.00	20.64	218.47	1.56	9.51	216.66
	1995.00	218.16	.00	18.69	218.39	1.50	9.17	216.66
	1995.00	218.11	.00	16.84	218.32	1.45	8.87	216.66
	1995.00	218.06	.00	15.00	218.23	1.40	8.52	216.66
	1995.00	218.01	.00	14.00	218.18	1.35	8.22	216.66
	1995.00	217.89	.00	10.00	218.17	1.23	3.45	216.66
*	2015.00	219.37	.00	62.64	219.41	2.71	200.10	216.66
*	2015.00	219.12	.00	30.62	219.16	2.46	163.98	216.66
*	2015.00	219.07	.00	26.72	219.11	2.41	154.31	216.66
*	2015.00	219.07	.00	22.84	219.10	2.41	154.75	216.66
*	2015.00	218.98	.00	18.05	219.01	2.32	125.50	216.66
*	2015.00	218.88	.00	14.90	218.91	2.22	93.35	216.66
*	2015.00	218.26	.00	9.47	218.41	1.60	3.45	216.66
*	2065.00	219.49	219.47	60.04	219.67	2.29	117.44	217.20
*	2065.00	219.21	219.19	29.51	219.38	2.01	86.64	217.20
*	2065.00	219.15	219.15	25.76	219.33	1.95	79.83	217.20
*	2065.00	219.13	218.95	22.01	219.27	1.93	77.53	217.20
*	2065.00	219.03	218.67	17.40	219.18	1.83	66.57	217.20
*	2065.00	218.93	.00	14.36	219.08	1.73	33.52	217.20
*	2065.00	218.53	.00	9.13	218.69	1.33	7.76	217.20
*	2105.00	220.28	220.28	60.04	220.36	2.76	119.94	217.52
*	2105.00	219.48	.00	29.51	219.91	1.96	8.32	217.52
	2105.00	219.44	.00	25.76	219.79	1.92	8.21	217.52
	2105.00	219.37	.00	22.01	219.66	1.85	8.00	217.52
	2105.00	219.28	.00	17.40	219.49	1.76	7.74	217.52
	2105.00	219.19	.00	14.36	219.36	1.67	7.46	217.52
	2105.00	218.93	.00	9.13	219.05	1.41	6.71	217.52
*	2180.00	220.73	220.73	60.13	220.96	2.63	117.90	218.10
*	2180.00	220.46	.00	29.51	220.61	2.36	41.30	218.10
*	2180.00	220.32	.00	25.76	220.50	2.22	36.08	218.10
	2180.00	220.18	.00	22.01	220.38	2.08	30.69	218.10
	2180.00	219.98	.00	17.40	220.20	1.88	12.85	218.10
	2180.00	219.85	.00	14.36	220.06	1.75	11.57	218.10
*	2180.00	219.60	.00	9.13	219.78	1.50	9.02	218.10
	2215.00	220.96	220.76	60.16	221.32	2.67	48.43	218.29
	2215.00	220.60	.00	29.51	220.77	2.31	27.01	218.29
*	2215.00	220.52	.00	25.76	220.67	2.23	18.48	218.29
*	2215.00	220.46	.00	22.01	220.57	2.17	14.54	218.29
	2215.00	220.22	.00	17.40	220.56	1.93	3.45	218.29

*	2215.00	220.09	.00	14.36	220.36	1.80	3.45	218.29
*	2215.00	219.86	.00	9.13	220.00	1.57	3.45	218.29
*	2230.00	221.60	.00	60.80	221.68	3.31	146.40	218.29
*	2230.00	221.27	.00	29.55	221.31	2.98	74.00	218.29
*	2230.00	221.15	.00	25.77	221.19	2.86	62.30	218.29
*	2230.00	221.22	.00	22.02	221.25	2.93	69.05	218.29
*	2230.00	220.86	.00	17.40	220.90	2.57	41.58	218.29
	2230.00	220.44	.00	14.36	220.63	2.15	3.45	218.29
	2230.00	220.04	.00	9.13	220.15	1.75	3.45	218.29
*	2250.00	221.62	221.61	63.01	221.87	2.78	107.89	218.84
*	2250.00	221.28	220.48	29.67	221.44	2.44	70.07	218.84
*	2250.00	221.16	.00	25.77	221.31	2.32	16.00	218.84
*	2250.00	221.22	.00	22.07	221.33	2.38	39.60	218.84
*	2250.00	220.87	.00	17.40	220.97	2.03	9.01	218.84
	2250.00	220.65	.00	14.36	220.74	1.81	8.65	218.84
*	2250.00	220.11	.00	9.13	220.23	1.27	7.44	218.84
*	2285.00	222.00	221.62	64.74	222.08	3.11	132.39	218.89
	2285.00	221.49	.00	29.67	221.59	2.60	86.81	218.89
	2285.00	221.31	.00	25.77	221.44	2.42	62.75	218.89
	2285.00	221.32	.00	22.07	221.42	2.43	67.67	218.89
	2285.00	220.98	.00	17.40	221.08	2.09	9.19	218.89
	2285.00	220.77	.00	14.36	220.86	1.88	8.74	218.89
	2285.00	220.35	.00	9.13	220.42	1.46	8.13	218.89
	2365.00	222.15	221.31	74.29	222.26	2.52	133.06	219.63
*	2365.00	221.68	.00	29.67	221.73	2.05	46.76	219.63
*	2365.00	221.57	.00	25.77	221.61	1.94	40.52	219.63
*	2365.00	221.51	.00	22.07	221.54	1.88	37.49	219.63
*	2365.00	221.20	.00	17.40	221.24	1.57	18.46	219.63
	2365.00	221.01	.00	14.36	221.05	1.38	17.79	219.63
	2365.00	220.65	.00	9.13	220.69	1.02	16.59	219.63
*	2405.00	222.32	222.32	75.80	222.80	2.37	56.55	219.95
*	2405.00	221.67	.00	29.67	221.92	1.72	17.37	219.95
*	2405.00	221.57	.00	25.77	221.80	1.62	16.40	219.95
*	2405.00	221.51	.00	22.07	221.70	1.56	15.89	219.95
*	2405.00	221.23	.00	17.40	221.45	1.28	13.33	219.95
*	2405.00	221.05	.00	14.36	221.31	1.10	11.60	219.95
*	2405.00	220.83	220.83	9.13	221.06	.88	9.67	219.95
*	2523.00	223.44	223.22	75.80	223.63	2.55	184.28	220.89
	2523.00	222.56	.00	29.67	222.74	1.67	12.92	220.89
	2523.00	222.45	.00	25.77	222.62	1.56	12.52	220.89
	2523.00	222.32	.00	22.07	222.48	1.43	12.03	220.89
*	2523.00	222.22	.00	17.40	222.34	1.33	11.69	220.89
*	2523.00	222.16	.00	14.36	222.26	1.27	11.46	220.89
*	2523.00	221.95	.00	9.13	222.01	1.06	10.68	220.89
	2586.00	223.76	223.36	75.80	224.07	2.30	22.40	221.46
	2586.00	223.02	.00	29.67	223.19	1.56	17.27	221.46
	2586.00	222.91	.00	25.77	223.08	1.45	16.78	221.46
	2586.00	222.80	.00	22.07	222.96	1.34	16.30	221.46
*	2586.00	222.67	.00	17.40	222.82	1.21	15.66	221.46
*	2586.00	222.57	.00	14.36	222.71	1.11	15.21	221.46
*	2586.00	222.35	.00	9.13	222.49	.89	14.26	221.46
	2641.00	224.31	224.18	75.80	224.50	2.54	119.39	221.77

	2641.00	223.53	.00	29.67	223.78	1.76	15.25	221.77
	2641.00	223.44	.00	25.77	223.68	1.67	14.16	221.77
	2641.00	223.36	.00	22.07	223.57	1.59	13.05	221.77
	2641.00	223.23	.00	17.40	223.42	1.46	11.40	221.77
	2641.00	223.14	.00	14.36	223.30	1.37	10.12	221.77
*	2641.00	222.96	.00	9.13	223.06	1.19	8.63	221.77
	2741.00	224.86	224.45	75.80	224.97	2.24	78.02	222.62
*	2741.00	224.29	.00	29.67	224.37	1.67	66.66	222.62
*	2741.00	224.19	.00	25.77	224.28	1.57	64.81	222.62
*	2741.00	224.08	.00	22.07	224.18	1.46	56.75	222.62
*	2741.00	223.94	.00	17.40	224.03	1.32	23.63	222.62
*	2741.00	223.82	.00	14.36	223.90	1.20	21.58	222.62
	2741.00	223.57	.00	9.13	223.65	.95	17.33	222.62
*	2826.00	225.24	225.24	75.80	225.76	2.15	31.99	223.09
*	2826.00	224.65	.00	29.67	224.92	1.56	17.60	223.09
*	2826.00	224.58	.00	25.77	224.81	1.49	16.72	223.09
*	2826.00	224.51	.00	22.07	224.71	1.42	15.85	223.09
*	2826.00	224.39	.00	17.40	224.56	1.30	15.18	223.09
*	2826.00	224.30	.00	14.36	224.45	1.21	14.92	223.09
	2826.00	224.13	.00	9.13	224.24	1.04	14.48	223.09
*	2871.00	226.00	225.48	75.80	226.17	2.56	50.40	223.44
*	2871.00	225.17	.00	29.67	225.32	1.73	34.23	223.44
*	2871.00	225.07	.00	25.77	225.22	1.63	32.01	223.44
	2871.00	224.97	.00	22.07	225.11	1.53	22.49	223.44
	2871.00	224.83	.00	17.40	224.95	1.39	17.71	223.44
	2871.00	224.74	.00	14.36	224.85	1.30	15.04	223.44
	2871.00	224.49	.00	9.13	224.59	1.05	9.82	223.44
*	2971.00	226.53	226.25	75.80	226.64	2.03	87.33	224.50
*	2971.00	226.03	.00	29.67	226.13	1.53	64.38	224.50
*	2971.00	225.98	.00	25.77	226.08	1.48	61.34	224.50
*	2971.00	225.93	.00	22.07	226.03	1.43	55.13	224.50
*	2971.00	225.84	.00	17.40	225.95	1.34	46.83	224.50
*	2971.00	225.77	.00	14.36	225.88	1.27	40.00	224.50
*	2971.00	225.61	225.61	9.13	225.76	1.11	23.09	224.50

SOUTH1.SMP

SUMMARY OUTPUT FILE

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|          S U M P O          |
|                               |
| Interactive Summary Printout |
| for MS/PC-DOS micro computers |
|           May 1991           |
|                               |
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NOTE - Asterisk (*) at left of profile number
indicates message in summary of errors
list

REGIONAL STORM

Summary Printout

	SECNO	CWSEL	CRIWS	Q	EG	DEPTH	TOPWID	ELMIN
*	1615.00	216.59	216.59	39.00	216.68	.29	182.74	216.30
*	1615.00	216.46	216.46	10.00	216.50	.16	110.81	216.30
*	1615.00	216.44	216.44	8.00	216.48	.14	104.29	216.30
*	1615.00	216.42	216.42	6.00	216.46	.12	97.25	216.30
*	1615.00	216.39	216.39	3.00	216.42	.09	77.68	216.30
*	1615.00	216.35	216.35	1.00	216.37	.05	51.53	216.30
*	1615.00	216.35	216.35	1.00	216.37	.05	51.53	216.30
*	1658.00	217.17	216.75	39.00	217.18	1.17	160.11	216.00
*	1658.00	216.86	.00	10.00	216.87	.86	116.82	216.00
*	1658.00	216.82	.00	8.00	216.83	.82	106.57	216.00
*	1658.00	216.76	.00	6.00	216.76	.76	95.67	216.00
*	1658.00	216.66	.00	3.00	216.66	.66	68.52	216.00
*	1658.00	216.48	.00	1.00	216.48	.48	33.09	216.00
*	1658.00	216.48	.00	1.00	216.48	.48	33.09	216.00
	1708.00	217.32	216.74	39.00	217.33	1.32	147.03	216.00
	1708.00	216.95	.00	10.00	216.95	.95	97.60	216.00
	1708.00	216.90	.00	8.00	216.91	.90	91.19	216.00
	1708.00	216.83	.00	6.00	216.83	.83	81.46	216.00
*	1708.00	216.71	.00	3.00	216.71	.71	64.70	216.00
	1708.00	216.51	.00	1.00	216.51	.51	38.77	216.00
	1708.00	216.51	.00	1.00	216.51	.51	38.77	216.00
*	1786.00	217.83	217.77	39.00	217.90	.42	131.50	217.41
*	1786.00	217.63	217.63	10.00	217.68	.22	96.03	217.41
*	1786.00	217.61	217.61	8.00	217.66	.20	89.35	217.41
*	1786.00	217.59	217.59	6.00	217.63	.18	79.03	217.41
*	1786.00	217.55	217.55	3.00	217.58	.14	58.07	217.41
*	1786.00	217.50	217.50	1.00	217.52	.09	33.24	217.41
*	1786.00	217.50	217.50	1.00	217.52	.09	33.24	217.41
*	1851.00	218.18	217.69	39.00	218.19	1.04	166.65	217.14
*	1851.00	217.82	.00	10.00	217.83	2.27	132.73	215.55
*	1851.00	217.78	.00	8.00	217.78	2.23	127.70	215.55
*	1851.00	217.73	.00	6.00	217.73	2.18	122.42	215.55
*	1851.00	217.63	.00	3.00	217.64	2.08	110.67	215.55

*	1851.00	217.54	.00	1.00	217.54	1.99	99.48	215.55
*	1851.00	217.54	.00	1.00	217.54	1.99	99.48	215.55
*	1918.00	218.30	217.92	39.00	218.33	.90	100.45	217.40
*	1918.00	217.89	.00	10.00	217.90	.49	67.65	217.40
*	1918.00	217.84	.00	8.00	217.85	.44	62.97	217.40
*	1918.00	217.78	.00	6.00	217.79	.38	56.79	217.40
*	1918.00	217.66	.00	3.00	217.67	.26	45.58	217.40
*	1918.00	217.54	.00	1.00	217.55	.14	27.84	217.40
*	1918.00	217.54	.00	1.00	217.55	.14	27.84	217.40
*	1960.00	218.60	218.45	39.00	218.68	.70	71.80	217.90
*	1960.00	218.24	.00	10.00	218.29	.34	43.31	217.90
*	1960.00	218.20	.00	8.00	218.25	.30	41.37	217.90
*	1960.00	218.17	.00	6.00	218.21	.27	39.41	217.90
*	1960.00	218.11	.00	3.00	218.12	.21	35.85	217.90
*	1960.00	218.10	218.00	1.00	218.10	.20	35.00	217.90
*	1960.00	218.10	218.00	1.00	218.10	.20	35.00	217.90
	1995.00	219.20	219.06	39.00	219.24	.62	137.18	218.58
	1995.00	218.96	.00	10.00	218.98	.38	87.56	218.58
	1995.00	218.93	.00	8.00	218.95	.35	77.86	218.58
	1995.00	218.88	.00	6.00	218.90	.30	65.76	218.58
	1995.00	218.79	.00	3.00	218.81	.21	46.09	218.58
*	1995.00	218.69	218.69	1.00	218.72	.11	23.69	218.58
*	1995.00	218.69	218.69	1.00	218.72	.11	23.69	218.58

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|          S U M P O          |
|                               |
| Interactive Summary Printout |
| for MS/PC-DOS micro computers |
|      May 1991              |
|                               |
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KINGUPD.SMP
SUMMARY OUTPUT FILE

NOTE - Asterisk (*) at left of profile number
indicates message in summary of errors
list

KING STREET DITCH PROFIL

Summary Printout

	SECNO	CWSEL	CRIWS	Q	EG	DEPTH	TOPWID	ELMIN
*	42.00	211.38	211.38	7.35	211.64	.88	9.29	210.50
*	42.00	211.11	211.11	3.52	211.30	.61	5.59	210.50
*	42.00	211.04	211.04	3.03	211.24	.54	4.58	210.50
*	42.00	211.00	211.00	2.56	211.18	.50	4.01	210.50
*	42.00	210.94	210.94	1.99	211.09	.44	3.69	210.50
*	42.00	210.89	210.89	1.62	211.03	.39	3.46	210.50
*	42.00	210.80	210.80	1.01	210.91	.30	3.00	210.50
*	92.00	211.76	.00	7.35	211.92	1.06	9.04	210.70
*	92.00	211.49	.00	3.52	211.58	.79	6.88	210.70
*	92.00	211.45	.00	3.03	211.53	.75	6.60	210.70
*	92.00	211.39	.00	2.56	211.46	.69	6.20	210.70
*	92.00	211.32	.00	1.99	211.38	.62	5.56	210.70
*	92.00	211.27	.00	1.62	211.32	.57	5.13	210.70
*	92.00	211.16	.00	1.01	211.20	.46	4.25	210.70
*	129.00	212.05	.00	7.35	212.07	.95	38.36	211.10
	129.00	211.70	.00	3.52	211.75	.60	18.87	211.10
*	129.00	211.63	.00	3.03	211.70	.53	14.77	211.10
*	129.00	211.57	.00	2.56	211.65	.47	11.31	211.10
*	129.00	211.51	211.50	1.99	211.61	.41	7.00	211.10
*	129.00	211.47	211.47	1.62	211.56	.37	6.45	211.10
*	129.00	211.41	211.41	1.01	211.48	.31	5.34	211.10
*	185.00	212.14	.00	7.35	212.24	.84	29.45	211.30
	185.00	211.96	.00	3.52	212.04	.66	6.65	211.30
	185.00	211.94	.00	3.03	212.00	.64	6.56	211.30
*	185.00	211.92	.00	2.56	211.98	.62	6.36	211.30
*	185.00	211.89	.00	1.99	211.93	.59	6.16	211.30
*	185.00	211.84	.00	1.62	211.87	.54	5.80	211.30
*	185.00	211.74	.00	1.01	211.77	.44	5.05	211.30
*	215.00	212.83	212.83	7.35	213.51	1.33	1.52	211.50
*	215.00	212.32	212.32	3.52	212.73	.82	1.52	211.50
*	215.00	212.24	212.24	3.03	212.61	.74	1.52	211.50
*	215.00	212.16	212.16	2.56	212.49	.66	1.52	211.50
*	215.00	212.06	212.06	1.99	212.34	.56	1.51	211.50

*	215.00	211.99	211.99	1.62	212.23	.49	1.51	211.50
*	215.00	211.85	211.85	1.01	212.03	.35	1.51	211.50
*	218.00	213.71	212.84	7.35	213.71	2.21	71.15	211.50
*	218.00	212.61	212.32	3.52	212.83	1.11	1.52	211.50
*	218.00	212.51	212.24	3.03	212.71	1.01	1.52	211.50
*	218.00	212.41	212.16	2.56	212.59	.91	1.52	211.50
*	218.00	212.28	212.06	1.99	212.42	.78	1.52	211.50
*	218.00	212.18	211.99	1.62	212.31	.68	1.52	211.50
*	218.00	212.01	.00	1.01	212.10	.51	1.51	211.50
	228.00	213.71	.00	7.35	213.71	2.21	71.18	211.50
	228.00	212.78	.00	3.52	212.95	1.28	1.52	211.50
	228.00	212.67	.00	3.03	212.82	1.17	1.52	211.50
	228.00	212.55	.00	2.56	212.68	1.05	1.52	211.50
	228.00	212.40	.00	1.99	212.51	.90	1.52	211.50
	228.00	212.30	.00	1.62	212.39	.80	1.52	211.50
	228.00	212.10	.00	1.01	212.16	.60	1.51	211.50
	231.00	213.71	.00	7.35	213.71	2.21	71.31	211.50
	231.00	212.81	.00	3.52	212.97	1.31	1.52	211.50
	231.00	212.69	.00	3.03	212.84	1.19	1.52	211.50
	231.00	212.58	.00	2.56	212.70	1.08	1.52	211.50
	231.00	212.43	.00	1.99	212.53	.93	1.52	211.50
	231.00	212.32	.00	1.62	212.41	.82	1.52	211.50
	231.00	212.12	.00	1.01	212.18	.62	1.51	211.50
	237.00	213.70	.00	7.35	213.72	1.60	24.21	212.10
	237.00	212.92	.00	3.52	213.02	.82	6.50	212.10
	237.00	212.73	.00	3.03	212.90	.63	3.74	212.10
*	237.00	212.63	212.63	2.56	212.83	.53	3.40	212.10
*	237.00	212.56	212.56	1.99	212.74	.46	3.16	212.10
*	237.00	212.51	212.51	1.62	212.67	.41	2.97	212.10
*	237.00	212.41	212.41	1.01	212.54	.31	2.62	212.10
*	245.00	213.69	.00	7.35	213.74	1.39	18.00	212.30
*	245.00	212.94	212.94	3.52	213.16	.64	3.77	212.30
*	245.00	212.88	212.88	3.03	213.10	.58	3.59	212.30
*	245.00	212.83	212.83	2.56	213.03	.53	3.41	212.30
*	245.00	212.76	212.76	1.99	212.94	.46	3.16	212.30
*	245.00	212.71	212.71	1.62	212.87	.41	2.97	212.30
*	245.00	212.61	212.61	1.01	212.74	.31	2.62	212.30
*	253.00	213.71	213.71	7.35	213.97	1.21	8.58	212.50
*	253.00	213.36	213.36	3.52	213.61	.86	4.32	212.50
*	253.00	213.26	213.26	3.03	213.54	.76	3.14	212.50
*	253.00	213.20	213.20	2.56	213.45	.70	2.43	212.50
*	253.00	213.11	213.11	1.99	213.33	.61	2.22	212.50
*	253.00	213.05	213.05	1.62	213.25	.55	2.08	212.50
*	253.00	212.92	212.92	1.01	213.08	.42	1.80	212.50
*	259.00	214.14	214.14	7.35	214.25	1.54	45.20	212.60
*	259.00	213.52	213.52	3.52	213.98	.92	1.27	212.60
*	259.00	213.43	213.43	3.03	213.85	.83	1.27	212.60
*	259.00	213.34	213.34	2.56	213.72	.74	1.27	212.60
*	259.00	213.23	213.23	1.99	213.55	.63	1.27	212.60
*	259.00	213.15	213.15	1.62	213.43	.55	1.27	212.60
	259.00	213.02	.00	1.01	213.20	.42	1.27	212.60
*	260.00	214.27	214.15	7.35	214.28	1.67	58.96	212.60

	260.00	213.76	.00	3.52	214.06	1.16	1.28	212.60
	260.00	213.66	.00	3.03	213.92	1.06	1.27	212.60
	260.00	213.55	.00	2.56	213.78	.95	1.27	212.60
	260.00	213.41	.00	1.99	213.60	.81	1.27	212.60
	260.00	213.31	.00	1.62	213.48	.71	1.27	212.60
	260.00	213.10	.00	1.01	213.23	.50	1.27	212.60
* 1	299.00	214.33	.00	7.35	214.34	1.73	68.94	212.60
* 1	299.00	214.23	.00	3.52	214.24	1.63	53.86	212.60
* 1	299.00	214.15	.00	3.03	214.16	1.55	45.41	212.60
* 1	299.00	214.05	213.35	2.56	214.11	1.45	39.25	212.60
* 1	299.00	213.87	.00	1.99	213.95	1.27	1.28	212.60
* 1	299.00	213.72	.00	1.62	213.79	1.12	1.27	212.60
* 1	299.00	213.45	.00	1.01	213.50	.85	1.27	212.60
	304.00	214.33	.00	7.35	214.35	1.73	69.05	212.60
	304.00	214.23	.00	3.52	214.24	1.63	54.40	212.60
	304.00	214.15	.00	3.03	214.17	1.55	45.15	212.60
	304.00	214.06	214.02	2.56	214.12	1.46	39.28	212.60
	304.00	213.87	.00	1.99	213.95	1.27	1.28	212.60
	304.00	213.72	.00	1.62	213.79	1.12	1.27	212.60
	304.00	213.46	.00	1.01	213.50	.85	1.27	212.60
* 1	314.00	214.17	.00	7.35	214.56	1.27	2.11	212.90
* 1	314.00	214.21	.00	3.52	214.29	1.31	2.19	212.90
	314.00	214.14	.00	3.03	214.21	1.24	2.11	212.90
	314.00	214.09	.00	2.56	214.15	1.19	2.11	212.90
* 1	314.00	213.95	.00	1.99	213.99	1.05	2.11	212.90
* 1	314.00	213.79	.00	1.62	213.82	.89	2.10	212.90
	314.00	213.50	.00	1.01	213.53	.60	2.10	212.90
	315.00	214.21	.00	7.35	214.58	1.31	2.12	212.90
	315.00	214.21	.00	3.52	214.30	1.31	2.19	212.90
	315.00	214.14	.00	3.03	214.21	1.24	2.11	212.90
	315.00	214.09	.00	2.56	214.15	1.19	2.11	212.90
	315.00	213.95	.00	1.99	213.99	1.05	2.11	212.90
	315.00	213.79	.00	1.62	213.83	.89	2.10	212.90
	315.00	213.50	.00	1.01	213.53	.60	2.10	212.90
	322.00	214.37	213.97	7.35	214.74	1.47	3.68	212.90
	322.00	214.25	.00	3.52	214.33	1.35	2.56	212.90
	322.00	214.17	.00	3.03	214.23	1.27	2.11	212.90
	322.00	214.11	.00	2.56	214.16	1.21	2.11	212.90
	322.00	213.96	.00	1.99	214.00	1.06	2.11	212.90
	322.00	213.80	.00	1.62	213.84	.90	2.10	212.90
	322.00	213.51	.00	1.01	213.55	.61	2.10	212.90
* 1	323.00	214.85	.00	7.35	214.85	1.95	103.05	212.90
	323.00	214.26	.00	3.52	214.34	1.36	2.11	212.90
	323.00	214.17	.00	3.03	214.23	1.27	2.11	212.90
	323.00	214.11	.00	2.56	214.16	1.21	2.11	212.90
	323.00	213.96	.00	1.99	214.00	1.06	2.11	212.90
	323.00	213.80	.00	1.62	213.84	.90	2.10	212.90
	323.00	213.52	.00	1.01	213.55	.62	2.10	212.90
* 1	360.00	214.85	.00	7.35	214.85	1.25	59.77	213.60
* 1	360.00	214.38	.00	3.52	214.38	.78	44.79	213.60
* 1	360.00	214.28	.00	3.03	214.28	.68	43.59	213.60
* 1	360.00	214.20	.00	2.56	214.21	.60	42.67	213.60
	360.00	214.06	.00	1.99	214.07	.46	40.85	213.60

*	360.00	213.93	213.92	1.62	213.98	.33	25.78	213.60
*	360.00	213.87	213.87	1.01	213.93	.27	16.48	213.60
*	440.00	214.85	.00	7.35	214.88	1.05	33.78	213.80
*	440.00	214.40	.00	3.52	214.44	.60	10.02	213.80
*	440.00	214.31	.00	3.03	214.36	.51	9.15	213.80
*	440.00	214.26	.00	2.56	214.31	.46	8.60	213.80
*	440.00	214.22	.00	1.99	214.26	.42	8.18	213.80
*	440.00	214.28	.00	1.62	214.29	.48	8.75	213.80
*	440.00	214.20	.00	1.01	214.21	.40	8.01	213.80
*	452.00	214.86	.00	7.35	214.91	.86	19.13	214.00
*	452.00	214.44	.00	3.52	214.53	.44	9.16	214.00
*	452.00	214.38	.00	3.03	214.48	.38	8.26	214.00
*	452.00	214.34	.00	2.56	214.44	.34	7.69	214.00
*	452.00	214.30	.00	1.99	214.39	.30	7.11	214.00
*	452.00	214.30	.00	1.62	214.36	.30	7.25	214.00
*	452.00	214.22	.00	1.01	214.27	.22	6.11	214.00
*	470.00	215.10	215.10	7.35	215.24	.60	20.46	214.50
*	470.00	214.93	214.93	3.52	215.05	.43	13.27	214.50
*	470.00	214.91	214.91	3.03	215.01	.41	12.52	214.50
*	470.00	214.85	214.85	2.56	214.98	.35	9.64	214.50
*	470.00	214.82	214.82	1.99	214.92	.32	7.90	214.50
*	470.00	214.79	214.79	1.62	214.88	.29	6.86	214.50
*	470.00	214.73	214.73	1.01	214.81	.23	5.73	214.50
*	497.00	215.52	215.52	7.35	215.69	.62	15.26	214.90
*	497.00	215.32	215.32	3.52	215.46	.42	10.76	214.90
*	497.00	215.29	215.29	3.03	215.42	.39	10.14	214.90
*	497.00	215.28	.00	2.56	215.38	.38	9.99	214.90
*	497.00	215.24	.00	1.99	215.32	.34	9.11	214.90
*	497.00	215.21	.00	1.62	215.28	.31	8.49	214.90
*	497.00	215.16	.00	1.01	215.21	.26	7.25	214.90
*	569.00	216.24	216.24	7.35	216.49	.84	8.34	215.40
*	569.00	216.05	.00	3.52	216.18	.65	5.67	215.40
*	569.00	216.01	.00	3.03	216.13	.61	5.21	215.40
*	569.00	215.95	.00	2.56	216.07	.55	4.72	215.40
*	569.00	215.89	.00	1.99	215.99	.49	4.37	215.40
*	569.00	215.85	.00	1.62	215.93	.45	4.10	215.40
*	569.00	215.76	.00	1.01	215.82	.36	3.59	215.40
*	577.00	216.44	216.44	7.35	216.69	.84	8.35	215.60
*	577.00	216.17	216.17	3.52	216.36	.57	4.85	215.60
*	577.00	216.13	216.13	3.03	216.31	.53	4.60	215.60
*	577.00	216.09	216.09	2.56	216.25	.49	4.34	215.60
*	577.00	216.03	216.03	1.99	216.17	.43	3.99	215.60
*	577.00	215.98	215.98	1.62	216.12	.38	3.72	215.60
*	577.00	215.89	215.89	1.01	216.00	.29	3.21	215.60
*	587.00	216.54	216.54	7.35	216.79	.84	8.35	215.70
*	587.00	216.34	.00	3.52	216.48	.64	5.46	215.70
*	587.00	216.30	.00	3.03	216.43	.60	4.97	215.70
*	587.00	216.26	.00	2.56	216.37	.56	4.73	215.70
*	587.00	216.20	.00	1.99	216.29	.50	4.37	215.70
*	587.00	216.15	.00	1.62	216.23	.45	4.11	215.70
*	587.00	216.06	.00	1.01	216.12	.36	3.61	215.70
*	597.00	216.86	216.58	7.35	216.87	1.16	154.98	215.70

*	597.00	216.55	216.55	3.52	216.58	.85	154.34	215.70
*	597.00	216.55	216.55	3.03	216.57	.85	154.34	215.70
*	597.00	216.45	216.45	2.56	216.84	.75	1.23	215.70
*	597.00	216.34	216.34	1.99	216.67	.64	1.23	215.70
*	597.00	216.26	216.26	1.62	216.54	.56	1.23	215.70
*	597.00	216.11	216.11	1.01	216.32	.41	1.23	215.70
*	599.00	216.86	.00	7.35	216.87	1.16	155.00	215.70
*	599.00	216.61	216.61	3.52	216.64	.91	154.47	215.70
*	599.00	216.60	216.60	3.03	216.63	.90	154.44	215.70
*	599.00	216.96	216.57	2.56	216.96	1.26	155.21	215.70
*	599.00	216.76	216.34	1.99	216.77	1.06	154.79	215.70
*	599.00	216.63	216.26	1.62	216.63	.93	154.49	215.70
*	599.00	216.26	216.11	1.01	216.37	.56	1.23	215.70
	607.00	216.87	.00	7.35	216.87	1.17	155.00	215.70
*	607.00	216.66	.00	3.52	216.67	.96	154.56	215.70
*	607.00	216.65	.00	3.03	216.66	.95	154.54	215.70
	607.00	216.96	.00	2.56	216.96	1.26	155.21	215.70
	607.00	216.77	.00	1.99	216.77	1.07	154.79	215.70
	607.00	216.63	.00	1.62	216.64	.93	154.50	215.70
	607.00	216.37	.00	1.01	216.45	.67	1.23	215.70
*	609.00	216.87	.00	7.35	216.87	1.17	155.00	215.70
*	609.00	216.67	.00	3.52	216.67	.97	154.58	215.70
*	609.00	216.66	.00	3.03	216.66	.96	154.56	215.70
*	609.00	216.96	.00	2.56	216.96	1.26	155.21	215.70
*	609.00	216.77	.00	1.99	216.77	1.07	154.79	215.70
*	609.00	216.64	.00	1.62	216.64	.94	154.51	215.70
	609.00	216.38	.00	1.01	216.46	.68	1.23	215.70
*	629.00	216.76	216.76	7.35	217.24	.96	2.50	215.80
*	629.00	216.62	.00	3.52	216.77	.82	2.50	215.80
*	629.00	216.62	.00	3.03	216.73	.82	2.50	215.80
*	629.00	216.94	.00	2.56	216.98	1.14	2.50	215.80
*	629.00	216.75	.00	1.99	216.79	.95	2.50	215.80
*	629.00	216.63	.00	1.62	216.66	.83	2.50	215.80
*	629.00	216.50	.00	1.01	216.51	.70	2.50	215.80
	630.00	217.01	.00	7.35	217.31	1.21	2.50	215.80
	630.00	216.62	.00	3.52	216.77	.82	2.50	215.80
	630.00	216.63	.00	3.03	216.74	.83	2.50	215.80
	630.00	216.94	.00	2.56	216.99	1.14	2.50	215.80
	630.00	216.75	.00	1.99	216.79	.95	2.50	215.80
	630.00	216.63	.00	1.62	216.66	.83	2.50	215.80
	630.00	216.50	.00	1.01	216.51	.70	2.50	215.80
	636.00	217.12	.00	7.35	217.38	1.32	2.51	215.80
	636.00	216.69	.00	3.52	216.82	.89	2.50	215.80
	636.00	216.67	.00	3.03	216.77	.87	2.50	215.80
	636.00	216.95	.00	2.56	216.99	1.15	2.50	215.80
	636.00	216.76	.00	1.99	216.80	.96	2.50	215.80
	636.00	216.64	.00	1.62	216.67	.84	2.50	215.80
	636.00	216.50	.00	1.01	216.52	.70	2.50	215.80
	637.00	217.13	.00	7.35	217.38	1.33	2.51	215.80
	637.00	216.70	.00	3.52	216.82	.90	2.50	215.80
	637.00	216.67	.00	3.03	216.77	.87	2.50	215.80
	637.00	216.96	.00	2.56	217.00	1.16	2.50	215.80
	637.00	216.76	.00	1.99	216.80	.96	2.50	215.80

	637.00	216.64	.00	1.62	216.67	.84	2.50	215.80
	637.00	216.50	.00	1.01	216.52	.70	2.50	215.80
*	679.00	217.53	.00	7.35	217.55	1.53	102.58	216.00
	679.00	216.95	.00	3.52	217.01	.95	5.55	216.00
	679.00	216.88	.00	3.03	216.94	.88	5.24	216.00
	679.00	217.03	.00	2.56	217.05	1.03	5.88	216.00
	679.00	216.84	.00	1.99	216.86	.84	5.06	216.00
	679.00	216.71	.00	1.62	216.74	.71	4.54	216.00
*	679.00	216.56	.00	1.01	216.58	.56	3.84	216.00
*	702.00	217.88	217.88	7.35	218.01	1.48	24.32	216.40
*	702.00	217.28	217.28	3.52	217.57	.88	2.62	216.40
*	702.00	217.21	217.21	3.03	217.48	.81	2.48	216.40
*	702.00	217.15	217.15	2.56	217.40	.75	2.34	216.40
*	702.00	217.05	217.05	1.99	217.28	.65	2.14	216.40
*	702.00	216.99	216.99	1.62	217.19	.59	2.00	216.40
*	702.00	216.85	216.85	1.01	217.02	.45	1.71	216.40
*	722.00	218.43	218.43	5.94	218.52	1.53	69.34	216.90
	722.00	217.75	.00	2.96	217.91	.85	1.98	216.90
	722.00	217.68	.00	2.55	217.82	.78	1.98	216.90
	722.00	217.60	.00	2.15	217.72	.70	1.98	216.90
	722.00	217.50	.00	1.67	217.60	.60	1.97	216.90
	722.00	217.42	.00	1.36	217.51	.52	1.97	216.90
	722.00	217.27	.00	.85	217.34	.37	1.97	216.90
*	780.00	218.61	.00	5.94	218.61	1.71	144.06	216.90
	780.00	218.41	.00	2.96	218.44	1.51	58.60	216.90
	780.00	218.37	217.45	2.55	218.43	1.47	40.29	216.90
	780.00	218.20	.00	2.15	218.27	1.30	2.79	216.90
	780.00	217.97	.00	1.67	218.01	1.07	2.31	216.90
*	780.00	217.74	.00	1.36	217.77	.84	1.98	216.90
*	780.00	217.55	.00	.85	217.57	.65	1.97	216.90
*	825.00	218.62	.00	6.56	218.62	2.04	62.59	216.58
*	825.00	218.46	.00	2.96	218.46	1.88	48.62	216.58
*	825.00	218.45	.00	2.55	218.45	1.87	47.08	216.58
*	825.00	218.30	.00	2.15	218.31	1.72	32.63	216.58
*	825.00	218.04	.00	1.67	218.04	1.46	11.70	216.58
*	825.00	217.79	.00	1.36	217.80	1.21	5.45	216.58
*	825.00	217.59	.00	.85	217.59	1.01	4.69	216.58
*	833.00	218.51	217.84	6.59	218.73	1.78	11.82	216.73
*	833.00	218.44	.00	2.96	218.49	1.71	1.80	216.73
*	833.00	218.43	.00	2.55	218.47	1.70	1.80	216.73
*	833.00	218.29	.00	2.15	218.32	1.56	1.78	216.73
*	833.00	218.03	.00	1.67	218.05	1.30	1.78	216.73
*	833.00	217.78	.00	1.36	217.81	1.05	1.78	216.73
*	833.00	217.58	.00	.85	217.60	.85	1.78	216.73
	839.40	218.52	.00	6.60	218.73	1.79	16.53	216.73
	839.40	218.48	.00	2.96	218.53	1.75	1.80	216.73
	839.40	218.47	.00	2.55	218.50	1.74	1.80	216.73
	839.40	218.31	.00	2.15	218.34	1.58	1.78	216.73
	839.40	218.03	.00	1.67	218.05	1.30	1.78	216.73
	839.40	217.78	.00	1.36	217.81	1.05	1.78	216.73
	839.40	217.58	.00	.85	217.60	.85	1.78	216.73
	854.00	218.55	.00	6.60	218.78	1.72	1.80	216.83

854.00	218.49	.00	2.96	218.54	1.66	1.80	216.83
854.00	218.47	.00	2.55	218.51	1.64	1.80	216.83
854.00	218.31	.00	2.15	218.35	1.48	1.80	216.83
854.00	218.03	.00	1.67	218.06	1.20	1.79	216.83
854.00	217.79	.00	1.36	217.82	.96	1.79	216.83
854.00	217.59	.00	.85	217.61	.76	1.79	216.83
* 870.00	218.78	.00	6.64	218.85	2.05	50.78	216.73
870.00	218.50	.00	2.96	218.55	1.77	1.80	216.73
870.00	218.49	.00	2.55	218.52	1.76	1.80	216.73
870.00	218.33	.00	2.15	218.36	1.60	1.78	216.73
870.00	218.05	.00	1.67	218.07	1.32	1.78	216.73
870.00	217.81	.00	1.36	217.84	1.08	1.78	216.73
870.00	217.60	.00	.85	217.62	.87	1.78	216.73
875.30	218.78	.00	6.76	218.85	2.05	53.24	216.73
875.30	218.54	.00	2.96	218.59	1.81	10.77	216.73
875.30	218.52	.00	2.55	218.56	1.79	1.78	216.73
875.30	218.35	.00	2.15	218.38	1.62	1.78	216.73
875.30	218.05	.00	1.67	218.07	1.32	1.78	216.73
875.30	217.81	.00	1.36	217.84	1.08	1.78	216.73
875.30	217.60	.00	.85	217.62	.87	1.78	216.73
899.00	218.77	217.96	6.91	218.92	1.96	38.53	216.81
899.00	218.55	.00	2.96	218.60	1.74	1.80	216.81
899.00	218.53	.00	2.55	218.57	1.72	1.80	216.81
899.00	218.36	.00	2.15	218.39	1.55	1.80	216.81
899.00	218.06	.00	1.67	218.08	1.25	1.79	216.81
899.00	217.82	.00	1.36	217.85	1.01	1.79	216.81
899.00	217.61	.00	.85	217.63	.80	1.79	216.81
914.00	218.76	.00	6.91	218.97	1.90	3.04	216.86
914.00	218.56	.00	2.96	218.60	1.70	1.80	216.86
914.00	218.53	.00	2.55	218.57	1.67	1.80	216.86
914.00	218.36	.00	2.15	218.39	1.50	1.78	216.86
914.00	218.06	.00	1.67	218.09	1.20	1.78	216.86
914.00	217.83	.00	1.36	217.86	.97	1.78	216.86
914.00	217.62	.00	.85	217.64	.76	1.78	216.86
929.10	218.76	.00	6.92	218.97	1.90	3.63	216.86
929.10	218.61	.00	2.96	218.66	1.75	1.78	216.86
929.10	218.58	.00	2.55	218.61	1.72	1.78	216.86
929.10	218.36	.00	2.15	218.39	1.50	1.78	216.86
929.10	218.06	.00	1.67	218.09	1.20	1.78	216.86
929.10	217.83	.00	1.36	217.86	.97	1.78	216.86
929.10	217.62	.00	.85	217.64	.76	1.78	216.86
940.00	218.76	.00	6.92	218.98	1.87	1.80	216.89
940.00	218.62	.00	2.96	218.66	1.73	1.80	216.89
940.00	218.58	.00	2.55	218.61	1.69	1.80	216.89
940.00	218.36	.00	2.15	218.40	1.47	1.80	216.89
940.00	218.06	.00	1.67	218.10	1.17	1.79	216.89
940.00	217.83	.00	1.36	217.86	.94	1.79	216.89
940.00	217.62	.00	.85	217.64	.73	1.79	216.89
952.00	218.77	.00	6.92	219.03	1.73	1.80	217.04
952.00	218.62	.00	2.96	218.67	1.58	1.80	217.04
952.00	218.58	.00	2.55	218.62	1.54	1.78	217.04
952.00	218.36	.00	2.15	218.41	1.32	1.78	217.04
952.00	218.06	.00	1.67	218.11	1.02	1.78	217.04

	952.00	217.83	.00	1.36	217.88	.79	1.78	217.04
*	952.00	217.62	.00	.85	217.66	.58	1.78	217.04
	968.60	218.81	.00	6.92	219.06	1.77	1.78	217.04
	968.60	218.64	.00	2.96	218.69	1.60	1.78	217.04
	968.60	218.59	.00	2.55	218.63	1.55	1.78	217.04
	968.60	218.36	.00	2.15	218.41	1.32	1.78	217.04
	968.60	218.06	.00	1.67	218.11	1.02	1.78	217.04
	968.60	217.83	.00	1.36	217.88	.79	1.78	217.04
	968.60	217.62	.00	.85	217.66	.58	1.78	217.04
	980.00	218.83	.00	6.92	219.08	1.77	1.80	217.06
	980.00	218.64	.00	2.96	218.70	1.58	1.80	217.06
	980.00	218.59	.00	2.55	218.64	1.53	1.80	217.06
	980.00	218.37	.00	2.15	218.41	1.31	1.79	217.06
	980.00	218.07	.00	1.67	218.12	1.01	1.79	217.06
	980.00	217.85	.00	1.36	217.89	.79	1.79	217.06
	980.00	217.64	.00	.85	217.67	.58	1.79	217.06
	989.00	218.81	.00	6.92	219.15	1.50	1.78	217.31
	989.00	218.64	.00	2.96	218.72	1.33	1.78	217.31
	989.00	218.59	.00	2.55	218.65	1.28	1.78	217.31
*	989.00	218.36	.00	2.15	218.43	1.05	1.78	217.31
*	989.00	218.07	.00	1.67	218.14	.76	1.78	217.31
*	989.00	217.84	.00	1.36	217.94	.53	1.78	217.31
*	989.00	217.62	.00	.85	217.74	.31	1.78	217.31
	993.80	218.90	.00	6.92	219.20	1.59	1.78	217.31
	993.80	218.64	.00	2.96	218.72	1.33	1.78	217.31
	993.80	218.59	.00	2.55	218.65	1.28	1.78	217.31
	993.80	218.36	.00	2.15	218.43	1.05	1.78	217.31
	993.80	218.08	.00	1.67	218.16	.77	1.78	217.31
*	993.80	217.97	.00	1.36	218.04	.66	1.78	217.31
*	993.80	217.82	.00	.85	217.86	.51	1.78	217.31
	1005.00	218.93	.00	6.92	219.24	1.59	1.80	217.34
	1005.00	218.65	.00	2.96	218.73	1.31	1.79	217.34
	1005.00	218.60	.00	2.55	218.66	1.26	1.79	217.34
	1005.00	218.38	.00	2.15	218.44	1.04	1.79	217.34
	1005.00	218.10	.00	1.67	218.18	.76	1.79	217.34
	1005.00	218.00	.00	1.36	218.06	.66	1.79	217.34
	1005.00	217.84	.00	.85	217.89	.50	1.79	217.34
	1015.00	218.98	.00	6.92	219.27	1.62	1.80	217.36
	1015.00	218.66	.00	2.96	218.74	1.30	1.78	217.36
	1015.00	218.61	.00	2.55	218.67	1.25	1.78	217.36
	1015.00	218.39	.00	2.15	218.46	1.03	1.78	217.36
	1015.00	218.12	.00	1.67	218.20	.76	1.78	217.36
	1015.00	218.02	.00	1.36	218.09	.66	1.78	217.36
	1015.00	217.86	.00	.85	217.91	.50	1.78	217.36
	1020.00	218.98	.00	6.92	219.27	1.62	1.78	217.36
	1020.00	218.71	.00	2.96	218.79	1.35	1.78	217.36
	1020.00	218.65	.00	2.55	218.71	1.29	1.78	217.36
	1020.00	218.43	.00	2.15	218.50	1.07	1.78	217.36
	1020.00	218.18	.00	1.67	218.24	.82	1.78	217.36
	1020.00	218.07	.00	1.36	218.13	.71	1.78	217.36
	1020.00	217.90	.00	.85	217.94	.54	1.78	217.36
	1026.00	219.00	.00	6.92	219.29	1.61	1.80	217.39

1026.00	218.71	.00	2.96	218.79	1.32	1.80	217.39
1026.00	218.65	.00	2.55	218.72	1.26	1.79	217.39
1026.00	218.44	.00	2.15	218.50	1.05	1.79	217.39
1026.00	218.18	.00	1.67	218.26	.79	1.79	217.39
1026.00	218.08	.00	1.36	218.14	.69	1.79	217.39
1026.00	217.90	.00	.85	217.95	.51	1.79	217.39
1034.00	219.01	.00	6.92	219.32	1.58	1.80	217.43
1034.00	218.72	.00	2.96	218.80	1.29	1.78	217.43
1034.00	218.66	.00	2.55	218.73	1.23	1.78	217.43
1034.00	218.44	.00	2.15	218.52	1.01	1.78	217.43
1034.00	218.20	.00	1.67	218.27	.77	1.78	217.43
1034.00	218.09	.00	1.36	218.16	.66	1.78	217.43
1034.00	217.92	.00	.85	217.97	.49	1.78	217.43
1039.00	219.01	.00	6.92	219.32	1.58	1.78	217.43
1039.00	218.72	.00	2.96	218.80	1.29	1.78	217.43
1039.00	218.66	.00	2.55	218.73	1.23	1.78	217.43
1039.00	218.44	.00	2.15	218.52	1.01	1.78	217.43
1039.00	218.20	.00	1.67	218.27	.77	1.78	217.43
1039.00	218.09	.00	1.36	218.16	.66	1.78	217.43
1039.00	217.92	.00	.85	217.97	.49	1.78	217.43
1059.00	219.06	.00	6.92	219.39	1.53	1.80	217.53
1059.00	218.74	.00	2.96	218.83	1.21	1.79	217.53
1059.00	218.67	.00	2.55	218.75	1.14	1.79	217.53
1059.00	218.47	.00	2.15	218.55	.94	1.79	217.53
1059.00	218.23	.00	1.67	218.32	.70	1.79	217.53
1059.00	218.13	.00	1.36	218.21	.60	1.79	217.53
1059.00	217.96	.00	.85	218.03	.43	1.79	217.53
1077.00	219.12	.00	6.92	219.46	1.49	1.78	217.63
1077.00	218.76	.00	2.96	218.87	1.13	1.78	217.63
1077.00	218.69	.00	2.55	218.78	1.06	1.78	217.63
1077.00	218.49	.00	2.15	218.59	.86	1.78	217.63
1077.00	218.28	.00	1.67	218.38	.65	1.78	217.63
1077.00	218.18	.00	1.36	218.28	.55	1.78	217.63
1077.00	218.03	.00	.85	218.10	.40	1.78	217.63
1083.00	219.17	.00	6.92	219.49	1.54	1.78	217.63
1083.00	218.76	.00	2.96	218.87	1.13	1.78	217.63
1083.00	218.69	.00	2.55	218.78	1.06	1.78	217.63
1083.00	218.49	.00	2.15	218.59	.86	1.78	217.63
1083.00	218.33	.00	1.67	218.42	.70	1.78	217.63
1083.00	218.24	.00	1.36	218.32	.61	1.78	217.63
1083.00	218.09	.00	.85	218.14	.46	1.78	217.63
* 1106.00	219.58	.00	6.92	219.60	1.70	22.96	217.88
1106.00	218.87	.00	2.96	218.92	.99	4.62	217.88
1106.00	218.78	.00	2.55	218.83	.90	4.38	217.88
1106.00	218.58	.00	2.15	218.65	.70	3.85	217.88
* 1106.00	218.40	.00	1.67	218.51	.52	3.34	217.88
* 1106.00	218.31	218.30	1.36	218.44	.43	3.09	217.88
* 1106.00	218.22	218.22	.85	218.32	.34	2.76	217.88
* 1133.00	219.46	.00	7.18	219.78	1.46	1.97	218.00
1133.00	218.89	.00	2.96	219.04	.89	1.95	218.00
1133.00	218.81	.00	2.55	218.95	.81	1.95	218.00
1133.00	218.67	.00	2.15	218.81	.67	1.95	218.00
* 1133.00	218.58	.00	1.67	218.69	.58	1.95	218.00

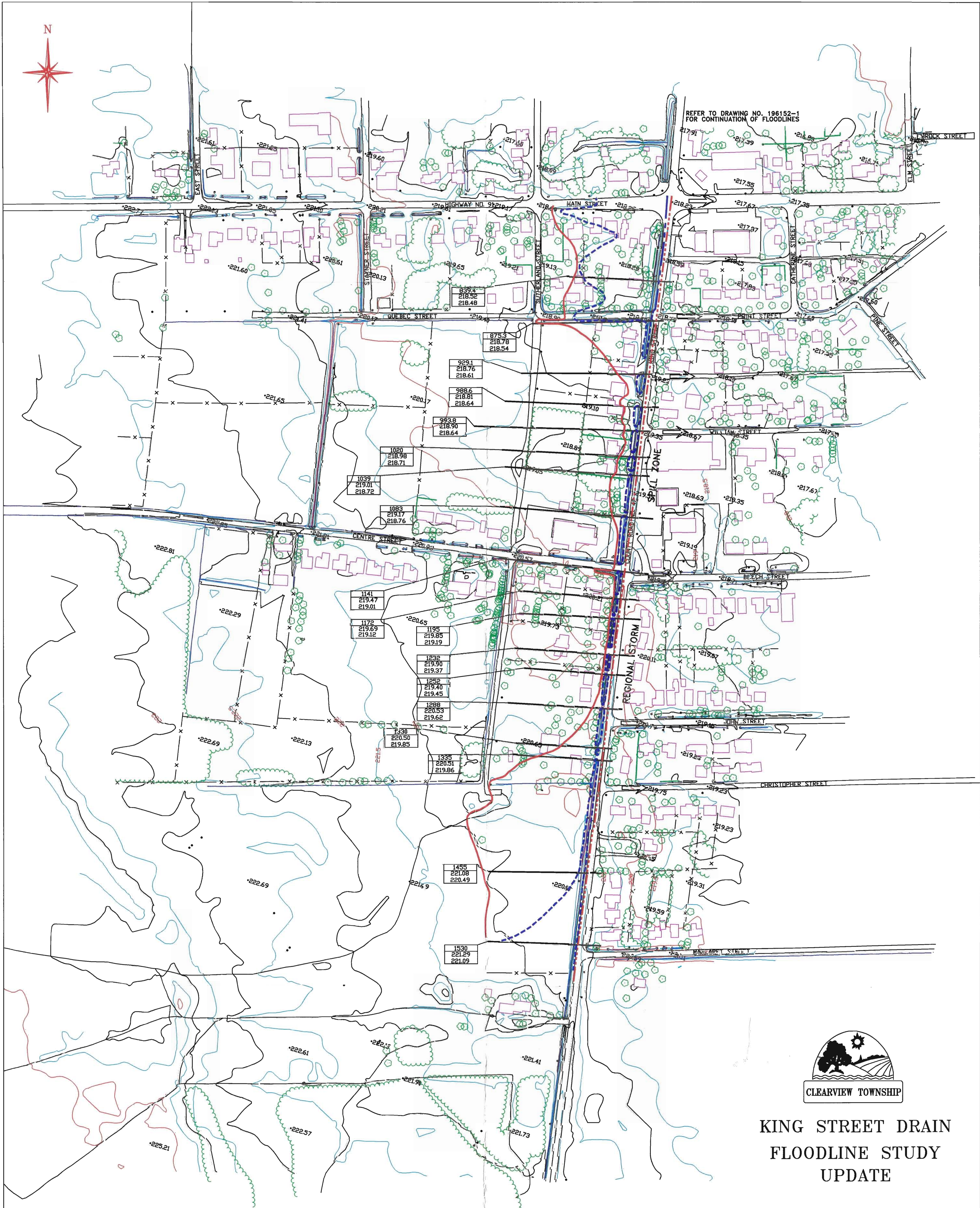
* *	1133.00	218.56	.00	1.36	218.64	.56	1.95	218.00
* *	1133.00	218.45	.00	.85	218.50	.45	1.95	218.00
	1141.00	219.47	.00	7.18	219.78	1.47	1.97	218.00
	1141.00	219.01	.00	2.96	219.12	1.01	1.95	218.00
	1141.00	218.92	.00	2.55	219.02	.92	1.95	218.00
* *	1141.00	218.83	.00	2.15	218.92	.83	1.95	218.00
* *	1141.00	218.71	.00	1.67	218.78	.71	1.95	218.00
	1141.00	218.64	.00	1.36	218.70	.64	1.95	218.00
	1141.00	218.49	.00	.85	218.53	.49	1.95	218.00
	1150.00	219.49	.00	7.18	219.82	1.44	1.97	218.05
	1150.00	219.02	.00	2.96	219.15	.97	1.96	218.05
	1150.00	218.94	.00	2.55	219.05	.89	1.96	218.05
	1150.00	218.84	.00	2.15	218.94	.79	1.96	218.05
	1150.00	218.73	.00	1.67	218.81	.68	1.96	218.05
	1150.00	218.65	.00	1.36	218.72	.60	1.96	218.05
	1150.00	218.51	.00	.85	218.55	.46	1.96	218.05
	1165.00	219.53	.00	7.18	219.90	1.49	1.78	218.04
	1165.00	219.05	.00	2.96	219.19	1.01	1.78	218.04
	1165.00	218.97	.00	2.55	219.09	.93	1.78	218.04
	1165.00	218.87	.00	2.15	218.98	.83	1.78	218.04
	1165.00	218.76	.00	1.67	218.85	.72	1.78	218.04
	1165.00	218.68	.00	1.36	218.76	.64	1.78	218.04
	1165.00	218.54	.00	.85	218.59	.50	1.78	218.04
	1172.00	219.69	.00	7.18	219.99	1.65	1.78	218.04
	1172.00	219.12	.00	2.96	219.24	1.08	1.78	218.04
	1172.00	219.02	.00	2.55	219.13	.98	1.78	218.04
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	1172.00	218.80	.00	1.67	218.88	.76	1.78	218.04
	1172.00	218.72	.00	1.36	218.78	.68	1.78	218.04
	1172.00	218.56	.00	.85	218.61	.52	1.78	218.04
	1179.00	219.70	.00	7.18	220.02	1.62	1.80	218.08
	1179.00	219.13	.00	2.96	219.26	1.05	1.79	218.08
	1179.00	219.03	.00	2.55	219.15	.95	1.79	218.08
	1179.00	218.94	.00	2.15	219.04	.86	1.79	218.08
	1179.00	218.82	.00	1.67	218.90	.74	1.79	218.08
	1179.00	218.73	.00	1.36	218.80	.65	1.79	218.08
	1179.00	218.57	.00	.85	218.62	.49	1.79	218.08
	1188.00	219.72	.00	7.18	220.05	1.58	1.80	218.14
	1188.00	219.14	.00	2.96	219.28	1.00	1.78	218.14
	1188.00	219.05	.00	2.55	219.18	.91	1.78	218.14
	1188.00	218.95	.00	2.15	219.07	.81	1.78	218.14
	1188.00	218.83	.00	1.67	218.93	.69	1.78	218.14
	1188.00	218.75	.00	1.36	218.83	.61	1.78	218.14
	1188.00	218.59	.00	.85	218.65	.45	1.78	218.14
	1195.00	219.85	.00	7.18	220.13	1.71	1.78	218.14
	1195.00	219.19	.00	2.96	219.32	1.05	1.78	218.14
	1195.00	219.10	.00	2.55	219.21	.96	1.78	218.14
	1195.00	219.00	.00	2.15	219.10	.86	1.78	218.14
	1195.00	218.87	.00	1.67	218.96	.73	1.78	218.14
	1195.00	218.79	.00	1.36	218.86	.65	1.78	218.14
	1195.00	218.63	.00	.85	218.68	.49	1.78	218.14
	1209.00	219.87	.00	7.18	220.17	1.66	1.80	218.21

1209.00	219.21	.00	2.96	219.35	1.00	1.79	218.21
1209.00	219.12	.00	2.55	219.25	.91	1.79	218.21
1209.00	219.03	.00	2.15	219.14	.82	1.79	218.21
1209.00	218.90	.00	1.67	219.00	.69	1.79	218.21
1209.00	218.82	.00	1.36	218.90	.61	1.79	218.21
1209.00	218.66	.00	.85	218.72	.45	1.79	218.21
1222.00	219.90	.00	7.18	220.22	1.62	1.80	218.28
1222.00	219.24	.00	2.96	219.39	.96	1.78	218.28
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1222.00	218.94	.00	1.67	219.04	.66	1.78	218.28
1222.00	218.85	.00	1.36	218.94	.57	1.78	218.28
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1232.00	219.90	.00	7.18	220.22	1.62	1.80	218.28
1232.00	219.37	.00	2.96	219.49	1.09	1.78	218.28
1232.00	219.28	.00	2.55	219.38	1.00	1.78	218.28
1232.00	219.18	.00	2.15	219.27	.90	1.78	218.28
1232.00	219.06	.00	1.67	219.13	.78	1.78	218.28
1232.00	218.97	.00	1.36	219.03	.69	1.78	218.28
* 1232.00	218.81	.00	.85	218.85	.53	1.78	218.28
1247.00	219.92	.00	7.18	220.30	1.48	1.80	218.44
1247.00	219.39	.00	2.96	219.55	.95	1.79	218.44
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1247.00	219.20	.00	2.15	219.33	.76	1.79	218.44
1247.00	219.08	.00	1.67	219.19	.64	1.79	218.44
* 1247.00	218.99	.00	1.36	219.09	.55	1.78	218.44
* 1247.00	218.83	.00	.85	218.91	.39	1.78	218.44
* 1252.00	219.40	.00	7.18	220.30	.96	1.78	218.44
1252.00	219.45	.00	2.96	219.59	1.01	1.78	218.44
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1252.00	219.26	.00	2.15	219.37	.82	1.78	218.44
1252.00	219.14	.00	1.67	219.23	.70	1.78	218.44
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* 1282.00	220.51	219.70	7.19	220.61	1.99	68.71	218.52
1282.00	219.52	.00	2.96	219.66	1.00	1.78	218.52
1282.00	219.43	.00	2.55	219.56	.91	1.78	218.52
1282.00	219.34	.00	2.15	219.45	.82	1.78	218.52
1282.00	219.22	.00	1.67	219.31	.70	1.78	218.52
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1282.00	218.98	.00	.85	219.04	.46	1.78	218.52
1288.00	220.53	.00	7.23	220.61	2.01	74.61	218.52
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1288.00	219.53	.00	2.55	219.63	1.01	1.78	218.52
1288.00	219.43	.00	2.15	219.52	.91	1.78	218.52
1288.00	219.31	.00	1.67	219.38	.79	1.78	218.52
1288.00	219.22	.00	1.36	219.28	.70	1.78	218.52
1288.00	219.06	.00	.85	219.10	.54	1.78	218.52
* 1300.00	220.63	.00	7.23	220.64	1.70	74.48	218.93
* 1300.00	219.69	.00	2.96	219.78	.76	4.21	218.93
* 1300.00	219.56	.00	2.55	219.67	.63	3.84	218.93
* 1300.00	219.45	.00	2.15	219.58	.52	3.50	218.93
* 1300.00	219.34	219.34	1.67	219.49	.41	3.18	218.93

*	1300.00	219.30	219.30	1.36	219.43	.37	3.06	218.93
*	1300.00	219.21	219.21	.85	219.32	.28	2.82	218.93
	1324.00	220.50	.00	7.42	220.79	1.74	1.80	218.76
	1324.00	219.74	.00	2.96	219.89	.98	1.78	218.76
*	1324.00	219.65	.00	2.55	219.78	.89	1.78	218.76
*	1324.00	219.59	.00	2.15	219.70	.83	1.78	218.76
*	1324.00	219.54	.00	1.67	219.62	.78	1.78	218.76
*	1324.00	219.49	.00	1.36	219.55	.73	1.78	218.76
*	1324.00	219.38	.00	.85	219.41	.62	1.78	218.76
	1330.00	220.50	.00	7.42	220.79	1.74	1.78	218.76
	1330.00	219.85	.00	2.96	219.97	1.09	1.78	218.76
	1330.00	219.74	.00	2.55	219.85	.98	1.78	218.76
	1330.00	219.67	.00	2.15	219.76	.91	1.78	218.76
	1330.00	219.59	.00	1.67	219.65	.83	1.78	218.76
	1330.00	219.52	.00	1.36	219.58	.76	1.78	218.76
	1330.00	219.40	.00	.85	219.43	.64	1.78	218.76
	1335.00	220.51	219.98	7.42	220.81	1.73	9.11	218.78
	1335.00	219.86	.00	2.96	219.98	1.08	1.78	218.78
	1335.00	219.75	.00	2.55	219.86	.97	1.78	218.78
	1335.00	219.68	.00	2.15	219.77	.90	1.78	218.78
	1335.00	219.60	.00	1.67	219.66	.82	1.78	218.78
	1335.00	219.53	.00	1.36	219.58	.75	1.78	218.78
	1335.00	219.40	.00	.85	219.43	.62	1.78	218.78
	1340.00	220.51	.00	7.42	220.81	1.73	9.34	218.78
	1340.00	219.94	.00	2.96	220.04	1.16	1.78	218.78
	1340.00	219.83	.00	2.55	219.92	1.05	1.78	218.78
	1340.00	219.74	.00	2.15	219.82	.96	1.78	218.78
	1340.00	219.64	.00	1.67	219.70	.86	1.78	218.78
	1340.00	219.57	.00	1.36	219.61	.79	1.78	218.78
	1340.00	219.42	.00	.85	219.45	.64	1.78	218.78
	1341.00	220.51	.00	7.42	220.81	1.73	1.78	218.78
	1341.00	219.94	.00	2.96	220.05	1.16	1.78	218.78
	1341.00	219.83	.00	2.55	219.93	1.05	1.78	218.78
	1341.00	219.74	.00	2.15	219.82	.96	1.78	218.78
	1341.00	219.64	.00	1.67	219.70	.86	1.78	218.78
	1341.00	219.57	.00	1.36	219.61	.79	1.78	218.78
	1341.00	219.42	.00	.85	219.45	.64	1.78	218.78
	1455.00	221.08	220.82	6.75	221.17	1.08	43.58	220.00
*	1455.00	220.49	220.49	2.69	220.68	.49	3.73	220.00
*	1455.00	220.45	220.45	2.32	220.62	.45	3.59	220.00
*	1455.00	220.40	220.40	1.96	220.57	.40	3.44	220.00
*	1455.00	220.35	220.35	1.52	220.49	.35	3.23	220.00
*	1455.00	220.31	220.31	1.24	220.43	.31	3.09	220.00
*	1455.00	220.23	220.23	.77	220.33	.23	2.82	220.00
*	1530.00	221.29	.00	6.75	221.30	.79	63.00	220.50
*	1530.00	221.09	.00	2.69	221.12	.59	38.54	220.50
*	1530.00	221.06	.00	2.32	221.11	.56	35.53	220.50
*	1530.00	221.04	220.90	1.96	221.09	.54	32.39	220.50
*	1530.00	220.99	.00	1.52	221.04	.49	3.95	220.50
*	1530.00	220.94	.00	1.24	220.99	.44	3.75	220.50
*	1530.00	220.83	.00	.77	220.87	.33	3.36	220.50

APPENDIX 5

1:2000 FLOODLINE MAPPING



KING STREET DRAIN FLOODLINE STUDY UPDATE

LEGEND:		REGIONAL STORM FLOODLINE
		REGIONAL STORM SPILL ZONE
		100 YEAR FLOODLINE
		100 YEAR SPILL ZONE
	DIRECTION OF OVERLAND FLOW (SPILL ZONE)	
1455	CROSS SECTION NO.	
221.08	REGIONAL STORM FLOOD ELEVATION	
220.49	100 YEAR STORM FLOOD ELEVATION	

Notes:
Contour Base Mapping prepared by Northway Map Technology from aerial photography (May, 1996)
Floodlines are based on Floodline Study updated and prepared by Ainley & Associates Limited (October, 1996)



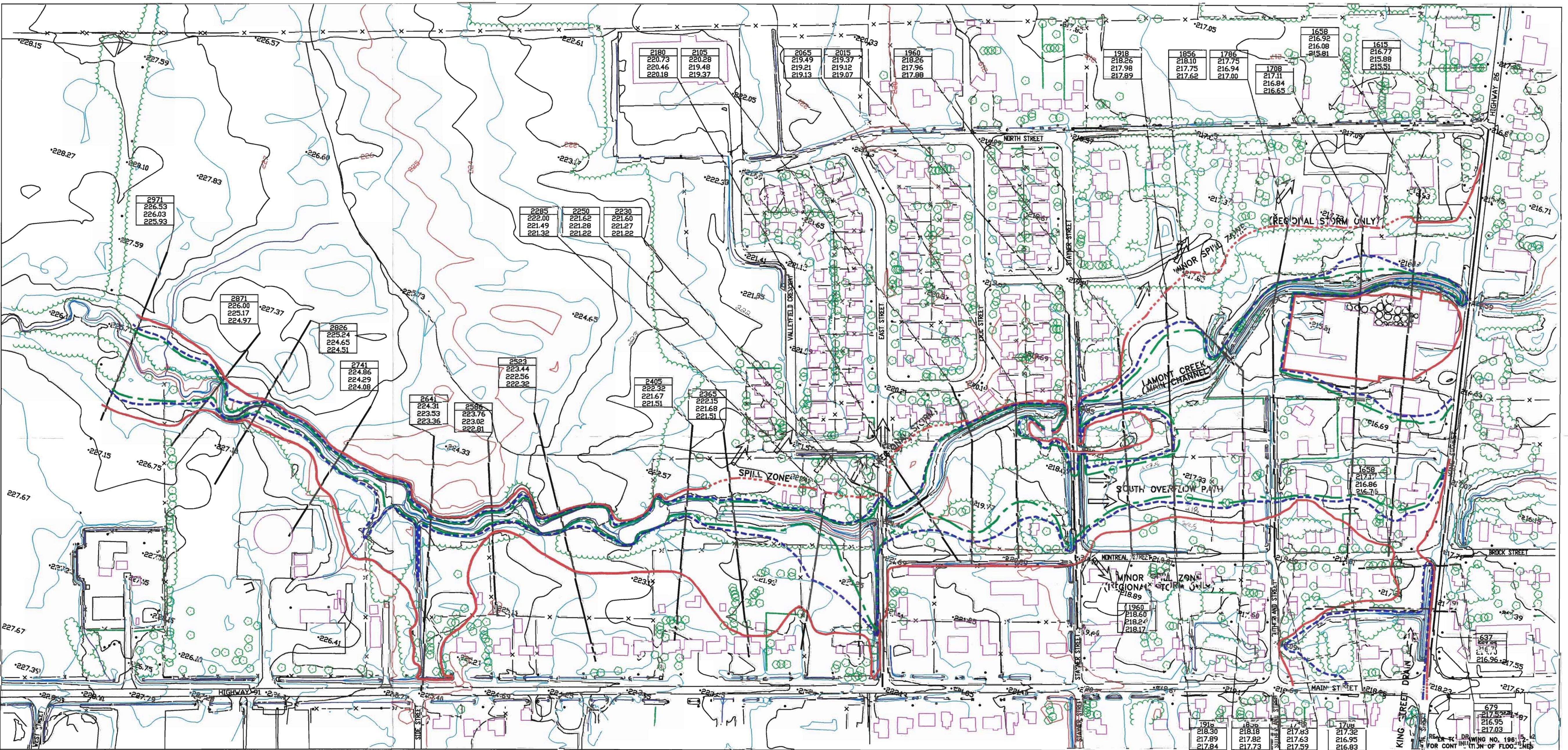
Ainley & Associates Limited
Consulting Engineers and Planners
Collingwood - Barrie - Belleville - Ottawa



**Nottawasaga Valley
Conservation Authority**

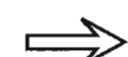
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TECHNICAL SERVICES SECTION

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MODIFIED BY:	H.M.	SCALE:	1:2,000
DATE:	Nov. 14, 1996	DRAWING NO.:	196152-2



LEGEND:

- REGIONAL STORM FLOODLINES
- REGIONAL STORM SPILL ZONE
- 100 YEAR STORM FLOODLINES
- 100 YEAR STORM SPILL ZONE
- 25 YEAR STORM FLOODLINES



DIRECTION OF OVERLAND FLOW
(SPILL ZONE)

2641	CROSS SECTION NO.
224.31	REGIONAL STORM FLOODLINE ELEVATION
223.53	100 YEAR STORM FLOODLINE ELEVATION
223.36	25 YEAR STORM FLOODLINE ELEVATION

Notes:
Contour Base Mapping prepared by Northway Map Technology from aerial photography (May, 1996)
Floodlines are based on Floodline Study updated and prepared by Ainley & Associates Limited (October, 1996)



Ainley & Associates Limited
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Collingwood - Barrie - Belleville - Ottawa



CLEARVIEW TOWNSHIP

LAMONT CREEK FLOODLINE STUDY UPDATE



**Nottawasaga Valley
Conservation Authority**

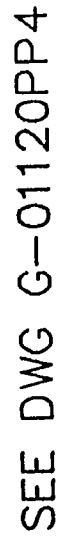
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DATE:	Nov. 14, 1996	DRAWING NO.	196152-1

APPENDIX 6

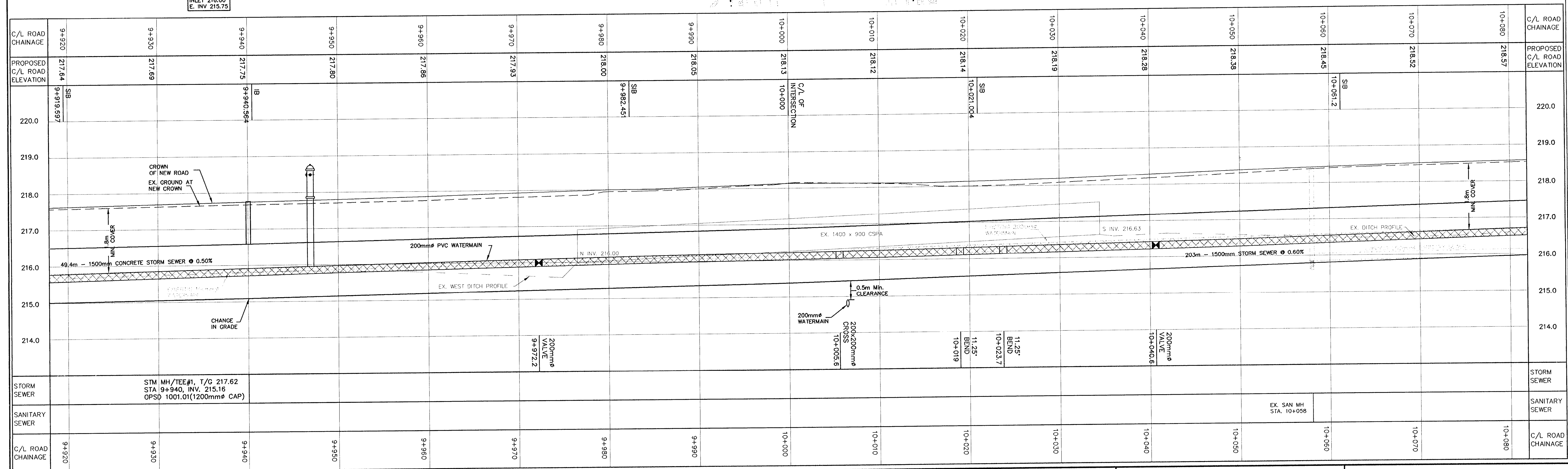
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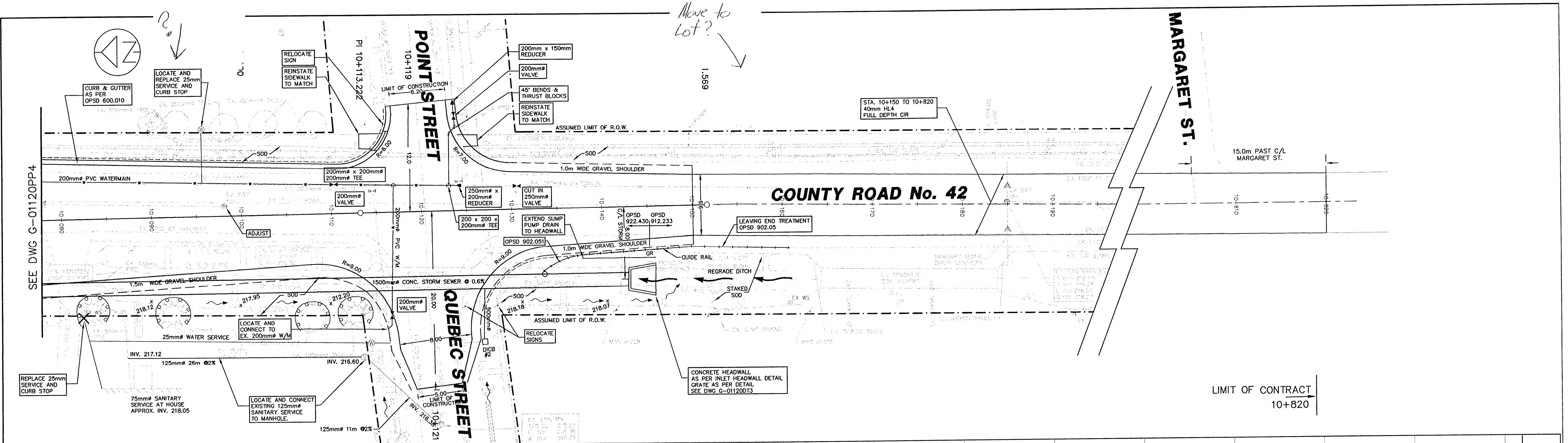
Appendix B
Highway 26 and County Road 42 Engineering Drawings



SEE DWG G-01120PP4

	R. J. Burnside & Associates Limited ENGINEERS – HYDROGEOLOGISTS – ENVIRONMENTAL CONSULTANTS GEORGIAN BAY OFFICE, 3 RONELL CRESCENT, COLLINGWOOD, ONTARIO L9Y 4A6 TELEPHONE: (705)-448-0515 FAX: (705)-448-2399 E-MAIL: collingwood@burnside.com	
	DRAWN J.O.	DRAWING NO. G-01120PP3
DESIGNED G.C.	SCALE HORZ. 1:200 VERT. 1:50	
REVIEWED T.M.P.	DATE MAY 9, 2002	

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C/L ROAD CHAINAGE	10+080	10+090	10+100	10+110	10+120	10+130	10+140	10+150	10+160	10+170	10+180	10+190	10+810	10+820		C/L ROAD CHAINAGE
PROPOSED C/L ROAD ELEVATION	218.57	218.61	218.65	218.70	218.74	218.79	218.84	218.89								PROPOSED C/L ROAD ELEVATION
221.0																221.0
220.0																220.0
219.0																219.0
218.0																218.0
217.0																217.0
216.0																216.0
215.0																215.0
214.0																214.0
STORM SEWER																STORM SEWER
SANITARY SEWER																SANITARY SEWER
C/L ROAD CHAINAGE	10+080	10+090	10+100	10+110	10+120	10+130	10+140	10+150	10+160	10+170	10+180	10+190	10+810	10+820		C/L ROAD CHAINAGE

NOTES

TEMPORARY BENCHMARK, TOP NUT FH, E. SIDE OF KING ST. @ HOUSE #7440, OPPOSITE REINHART FOODS. ELEV. 217.466

TEMPORARY BENCHMARK, SIB @ N.W. CORNER REMAX PROPERTY S. SIDE MONTREAL ST @ KING ST. ELEV. 217.068

TEMPORARY BENCHMARK, TOP OF N.W. CORNER OF SOUTH CONC. FOOTING FOR 'BEER STORE' SIGN, N. SIDE MAIN ST., 70m E. OF KING ST. ELEV. 217.740

TEMPORARY BENCHMARK, TOP OF N.E. BOLT, TRAFFIC LIGHT @ S.E. CORNER OF KING ST. & MAIN ST. ELEV. 218.093

TEMPORARY BENCHMARK, SPIKE IN N.W. FACE OF HP ON S.E. CORNER OF KING ST. & WILLIAM ST. ELEV. 219.229

PROFESSIONAL ENGINEER
REGISTERED
T. M. PROKOPEC
PROVINCE OF ONTARIO

PROFESSIONAL ENGINEER
L. H. BURGDOERFF
PROVINCE OF ONTARIO

4/5
June 2002

NO.

REVISIONS

DATE

APPROVED

TOWNSHIP OF CLEARVIEW

CLIENT
COMMUNITY OF STAYNER
HIGHWAY 26 (CONNECTING LINK)

TITLE
NEW CONSTRUCTION
STA. 10+080 TO STA. 10+240

R. J. Burnside & Associates Limited
ENGINEERS - HYDROLOGISTS - ENVIRONMENTAL CONSULTANTS
GEORGIAN BAY OFFICE, 3 RIVINGTON CRESCENT, COLLINGWOOD, ONTARIO L9Y 4J6
TELEPHONE: (705)-446-0515 FAX: (705)-446-2399
E-MAIL: collingwood@burnside.com

DRAWN
J.O.

DESIGNED
L.B.

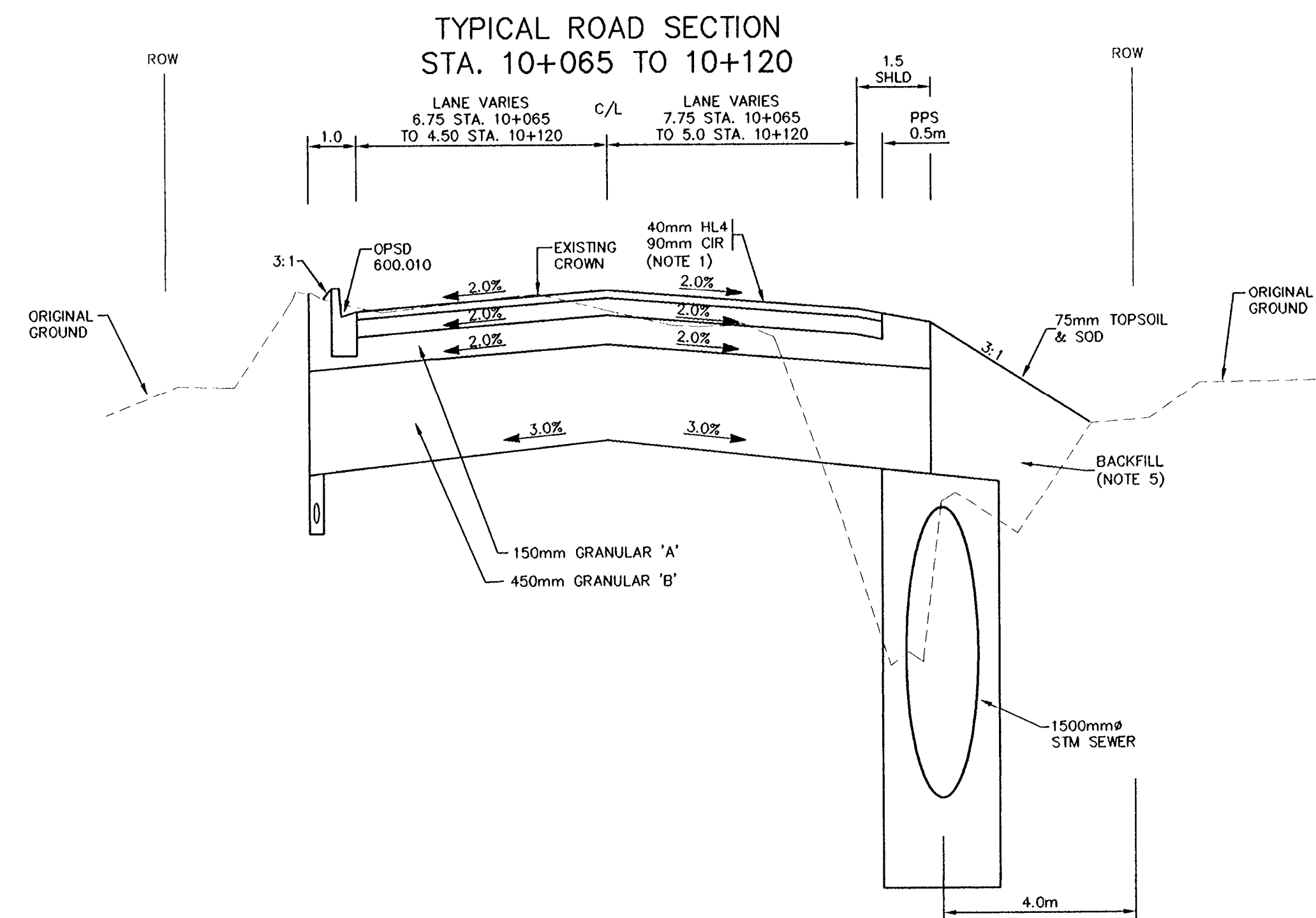
REVIEWED
T.M.P.

DRAWING NO.
C-01120PP5

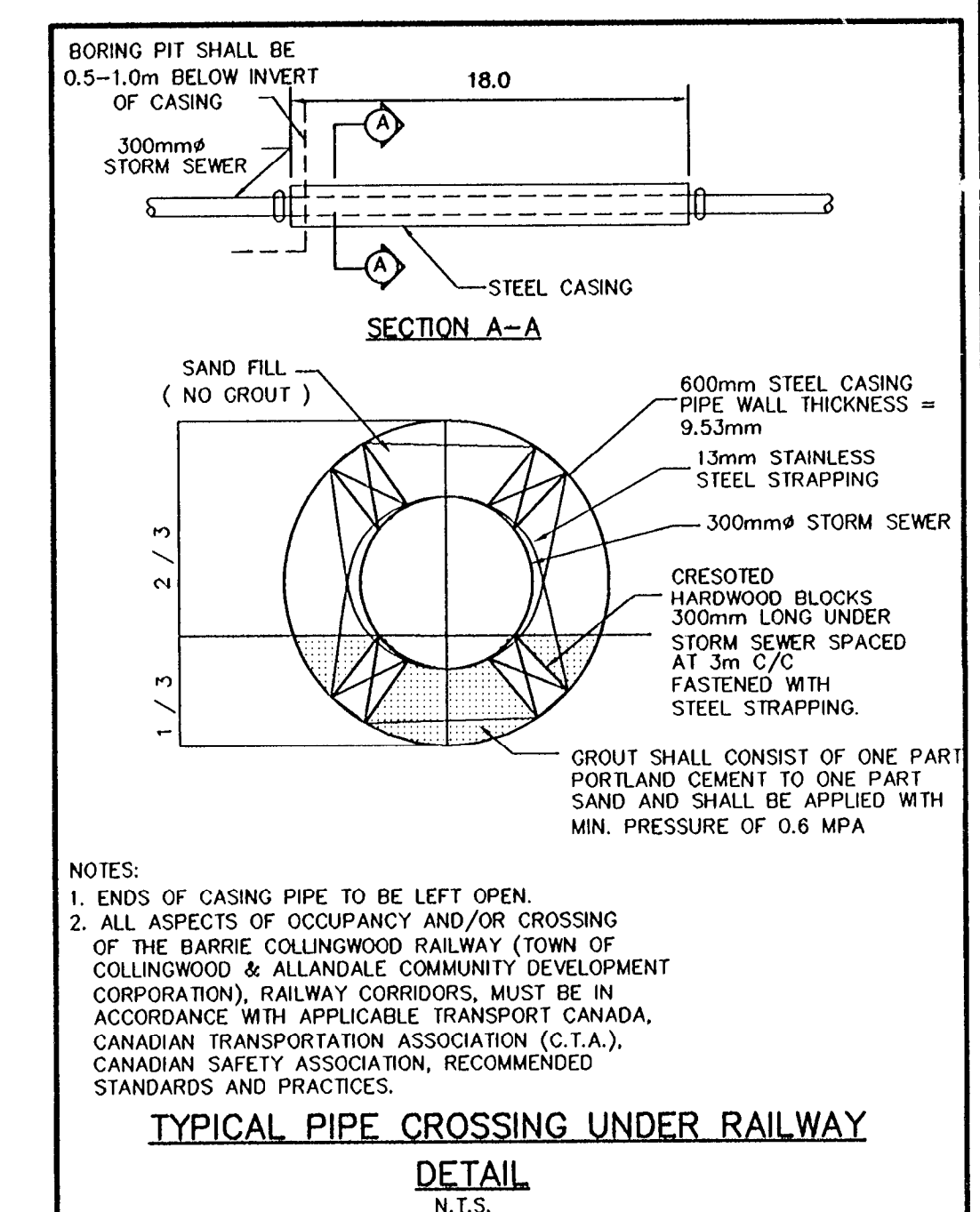
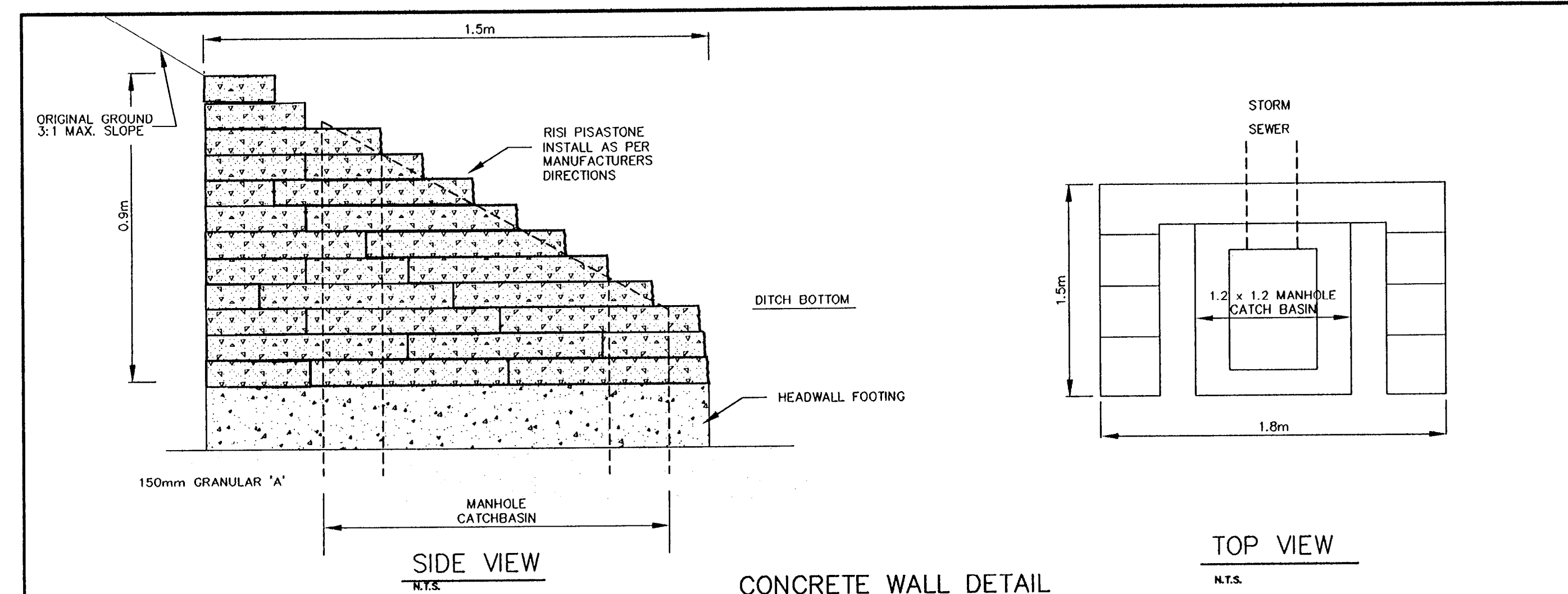
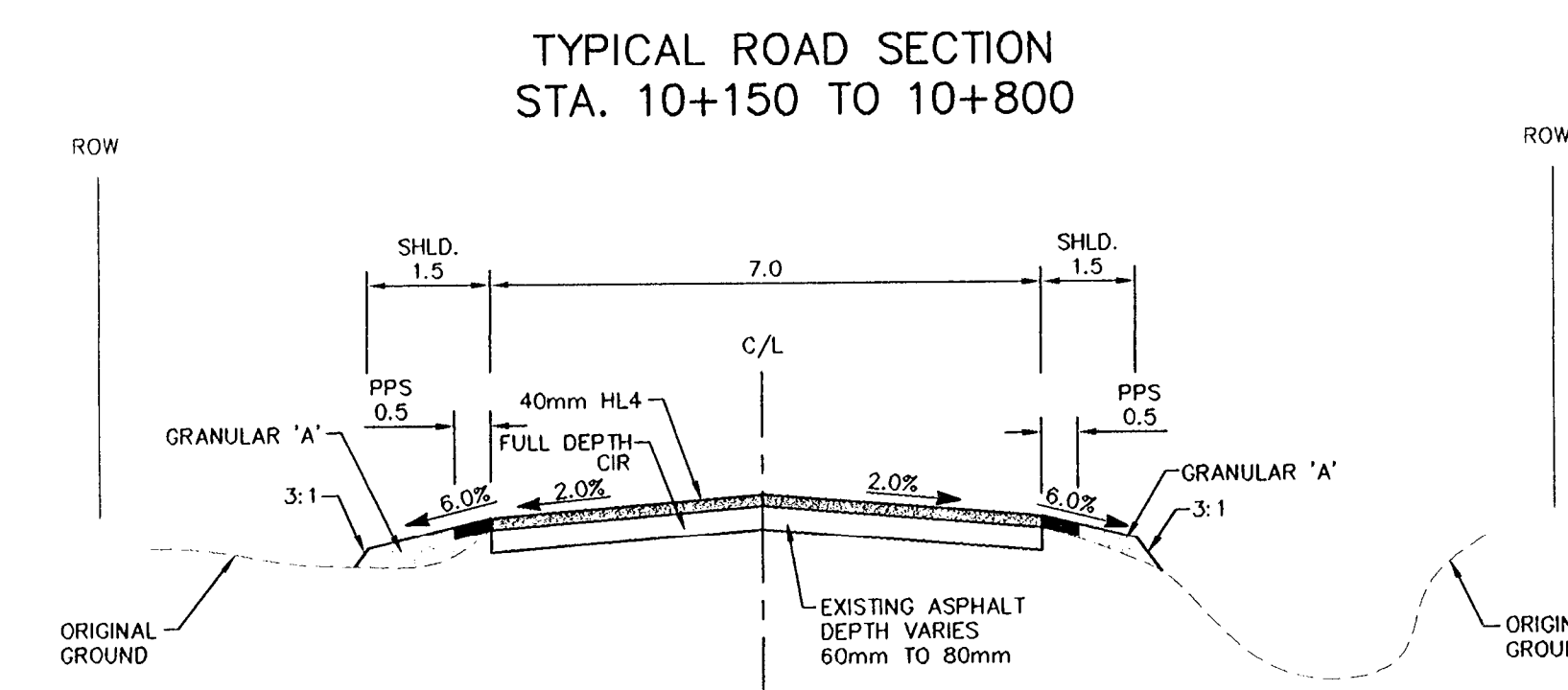
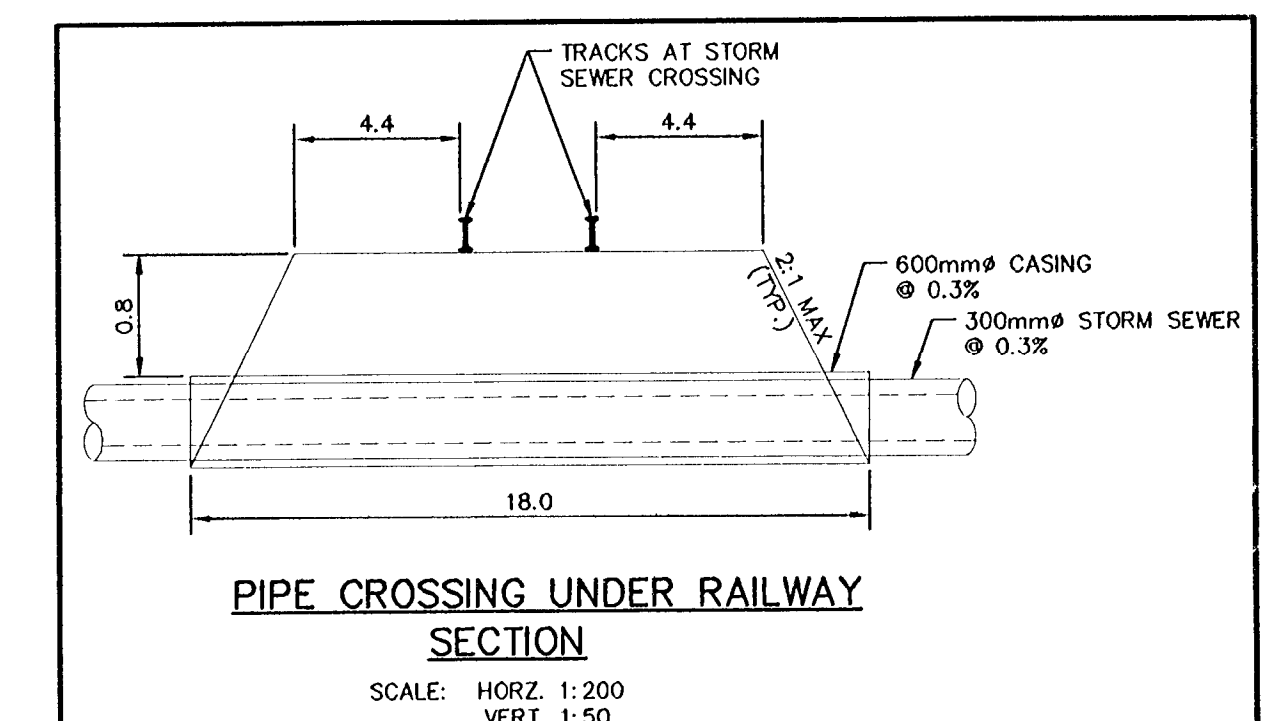
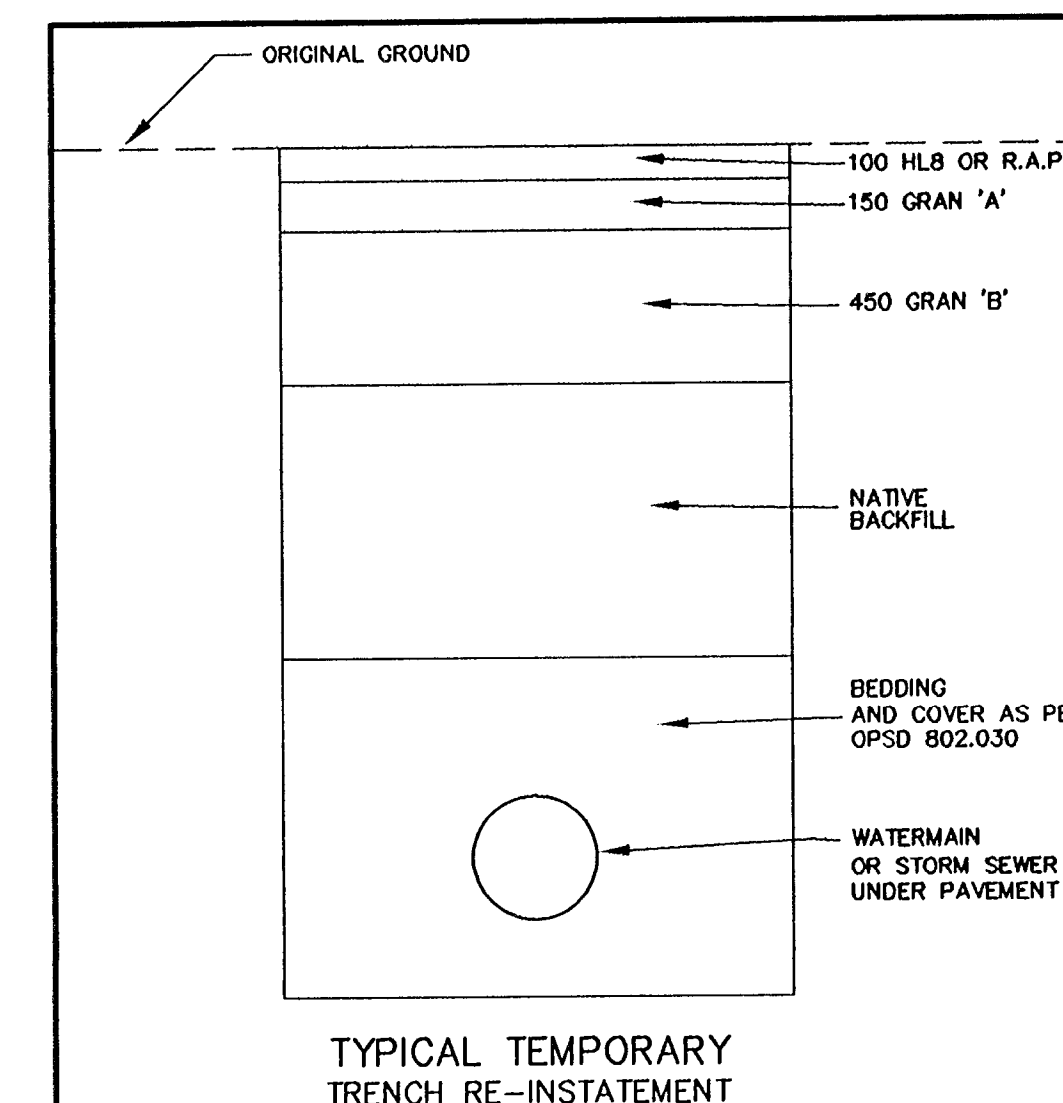
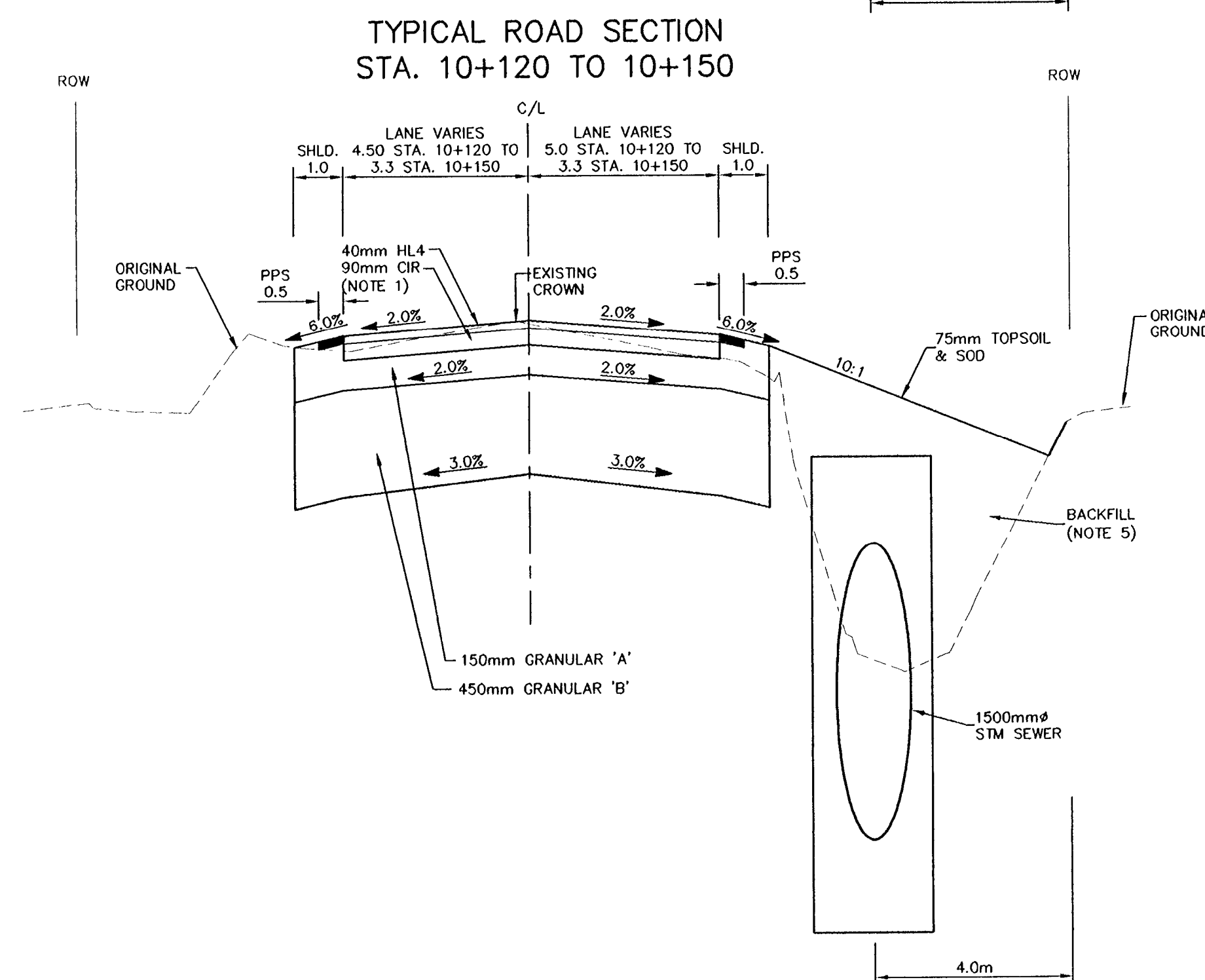
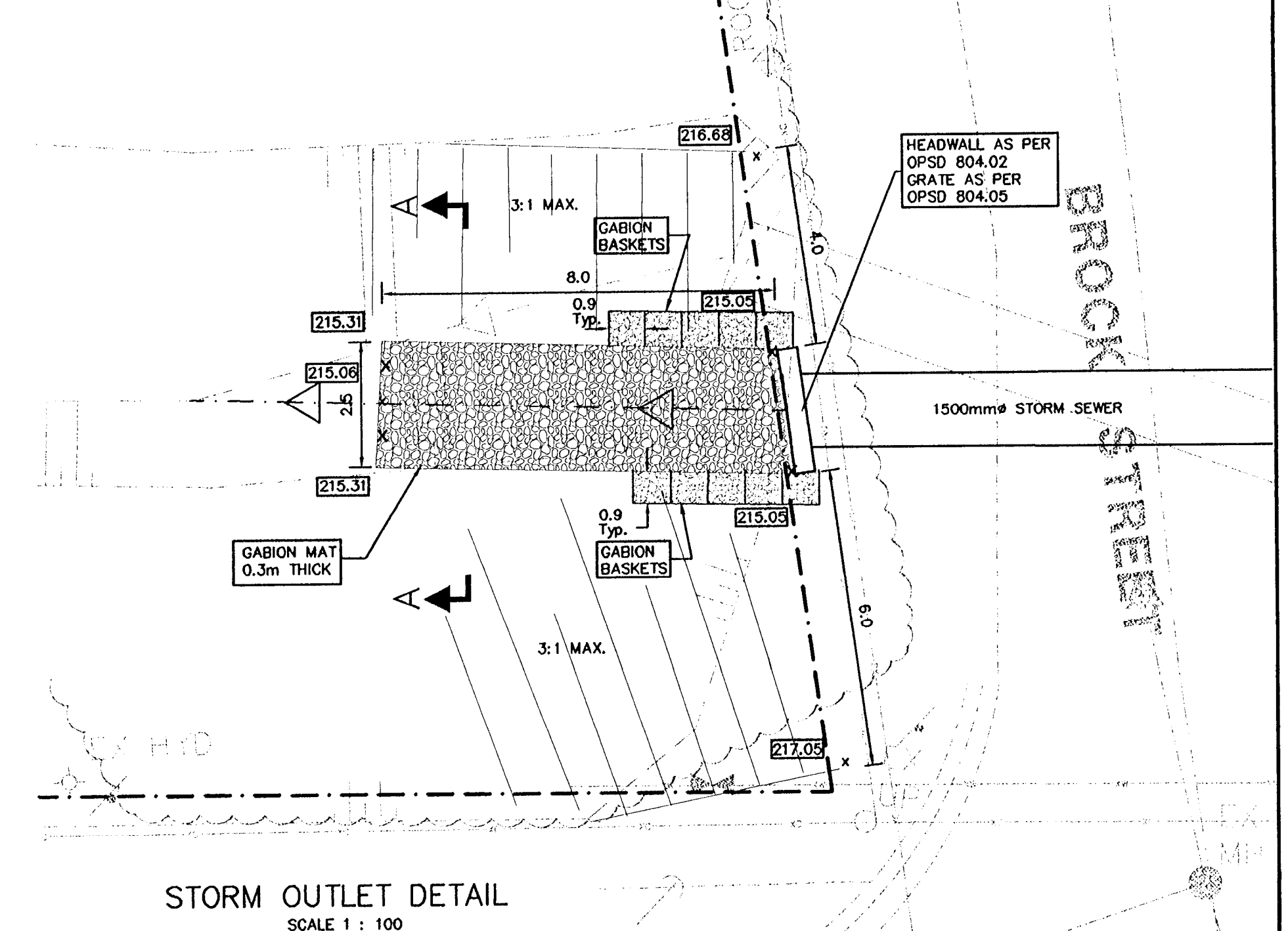
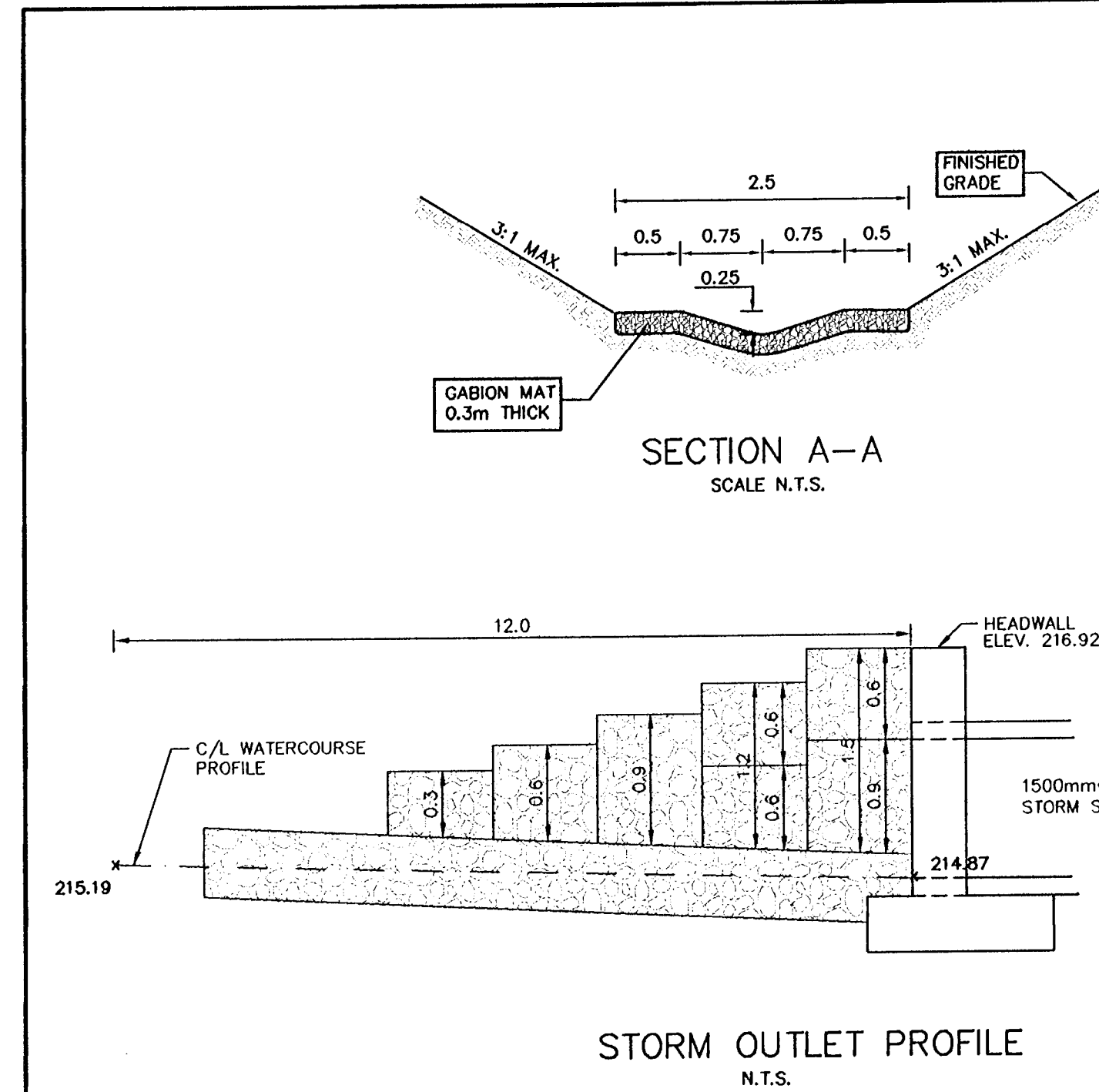
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HORIZ. 1:200
VERT. 1:50

DATE
MAY 10, 2002

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NOTES:
1) STA 10+065 TP 10+150 90mm CIR
MIX IS OBTAINED FROM ADJACENT
ROAD SECTION.



NOTES:

1. ENDS OF CASING PIPE TO BE LEFT OPEN.
2. ALL ASPECTS OF OCCUPANCY AND/OR CROSSING OF THE BARRIE COLLINGWOOD RAILWAY (TOWN OF COLLINGWOOD & ALLANDALE COMMUNITY DEVELOPMENT CORPORATION), RAILWAY CORRIDORS, MUST BE IN ACCORDANCE WITH APPLICABLE TRANSPORT CANADA, CANADIAN TRANSPORTATION ASSOCIATION (C.T.A.), CANADIAN SAFETY ASSOCIATION, RECOMMENDED STANDARDS AND PRACTICES.

NOTES

BENCHMARK

TEMPORARY BENCHMARK. ELEV. 217.466
TOP NUT FR. SIDE OF KING ST. @ HOUSE #7440, OPPOSITE
REINHART FOODS

TEMPORARY BENCHMARK. ELEV. 217.068
SIB @ N.W. CORNER REMAX PROPERTY S. SIDE MONTREAL ST @
KING ST.

TEMPORARY BENCHMARK. ELEV. 217.740
TOP OF N.W. CORNER OF SOUTH CONC. FOOTING FOR "BEER
STORE" SIGN, N. SIDE MAIN ST., 70m E. OF KING ST.

TEMPORARY BENCHMARK. ELEV. 218.093
TOP OF N.E. BOLT, TRAFFIC LIGHT @ S.E. CORNER OF KING ST.
& MAIN ST.

TEMPORARY BENCHMARK. ELEV. 219.229
TIE IN N.W. FACE OF HP ON S.E. CORNER OF KING ST. &
WILLIAM ST.

[illegible]

TOWNSHIP
OF
CLEARVIEW

CLIENT
COMMUNITY OF STAYNER
HIGHWAY 26 (CONNECTING LINK)

TITLE

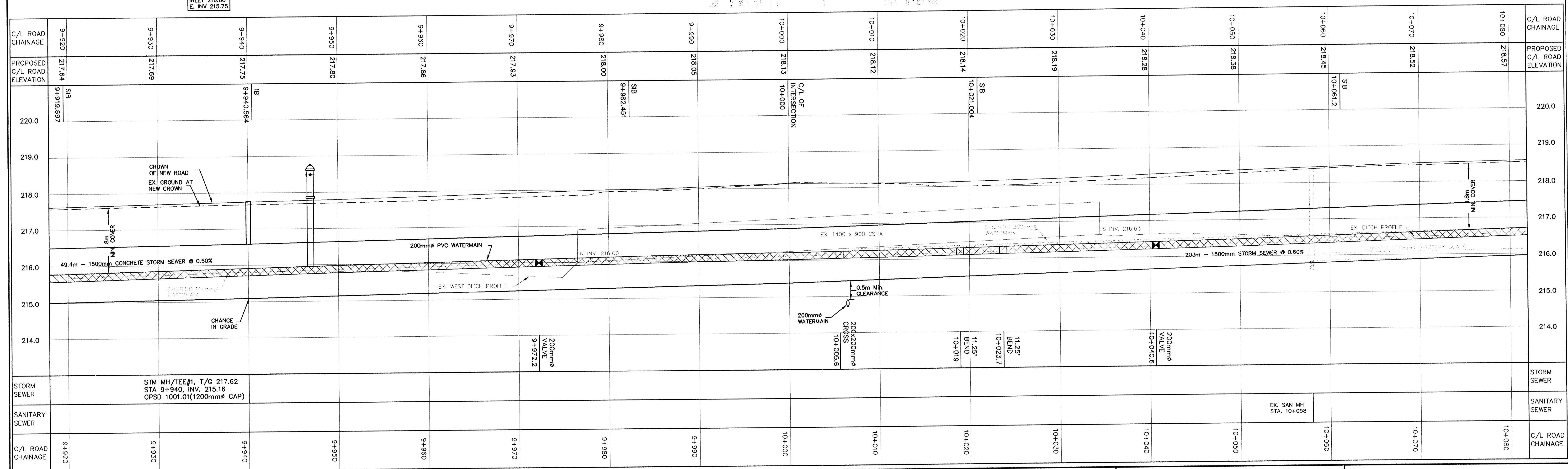
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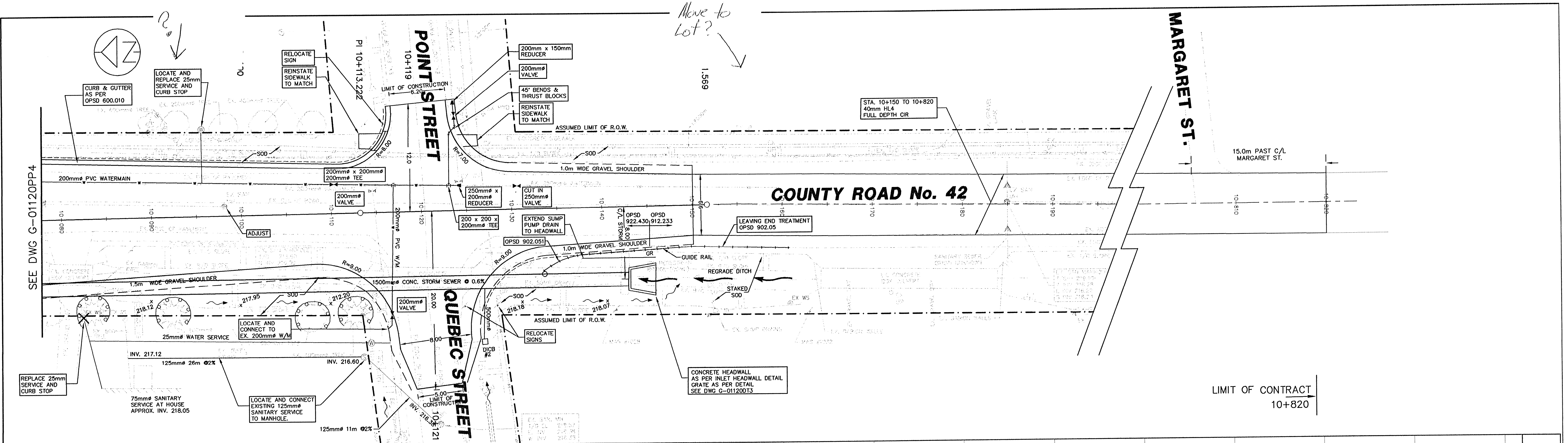
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DRAWN	T.D.L.
DESIGNED	L.H.B.
REVIEWED	T.M.P.

DRAWING NO.	G-01120DT2
SCALE	1: 1000
DATE	MAY 14, 2002



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C/L ROAD CHAINAGE	10+080	10+090	10+100	10+110	10+120	10+130	10+140	10+150	10+160	10+170	10+180	10+190	10+810	10+820	C/L ROAD CHAINAGE
PROPOSED C/L ROAD ELEVATION	218.57	218.61	218.65	218.70	218.74	218.79	218.84	218.89							PROPOSED C/L ROAD ELEVATION
221.0															221.0
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219.0															219.0
218.0															218.0
217.0															217.0
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215.0															215.0
214.0															214.0
STORM SEWER															STORM SEWER
SANITARY SEWER															SANITARY SEWER
C/L ROAD CHAINAGE	10+080	10+090	10+100	10+110	10+120	10+130	10+140	10+150	10+160	10+170	10+180	10+190	10+810	10+820	C/L ROAD CHAINAGE

NOTES

BENCHMARK
TEMPORARY BENCHMARK, TOP NUT FH, E. SIDE OF KING ST. @ HOUSE #7440, OPPOSITE REINHART FOODS
ELEV. 217.466
TEMPORARY BENCHMARK, SIB @ N.W. CORNER REMAX PROPERTY S. SIDE MONTREAL ST @ KING ST.
ELEV. 217.068
TEMPORARY BENCHMARK, TOP OF N.W. CORNER OF SOUTH CONC. FOOTING FOR 'BEER STORE' SIGN, N. SIDE MAIN ST., 70m E. OF KING ST.
ELEV. 217.740
TEMPORARY BENCHMARK, TOP OF N.E. BOLT, TRAFFIC LIGHT @ S.E. CORNER OF KING ST. & MAIN ST.
ELEV. 218.093
TEMPORARY BENCHMARK, SPIKE IN N.W. FACE OF HP ON S.E. CORNER OF KING ST. & WILLIAM ST.
ELEV. 219.229

PROFESSIONAL ENGINEER
T. M. PROKOPEC
PROVINCE OF ONTARIO

PROFESSIONAL ENGINEER
L. H. BORGDOFF
PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	APPROVED

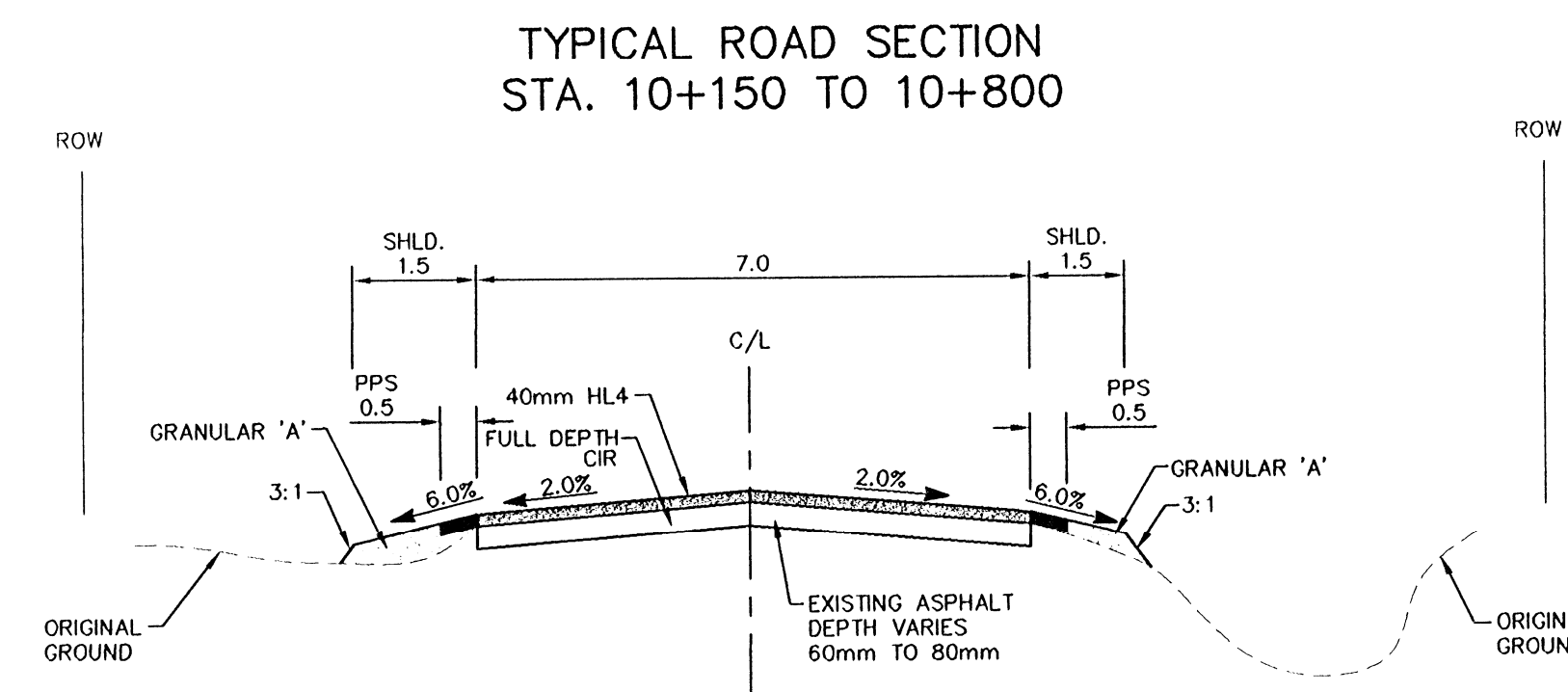
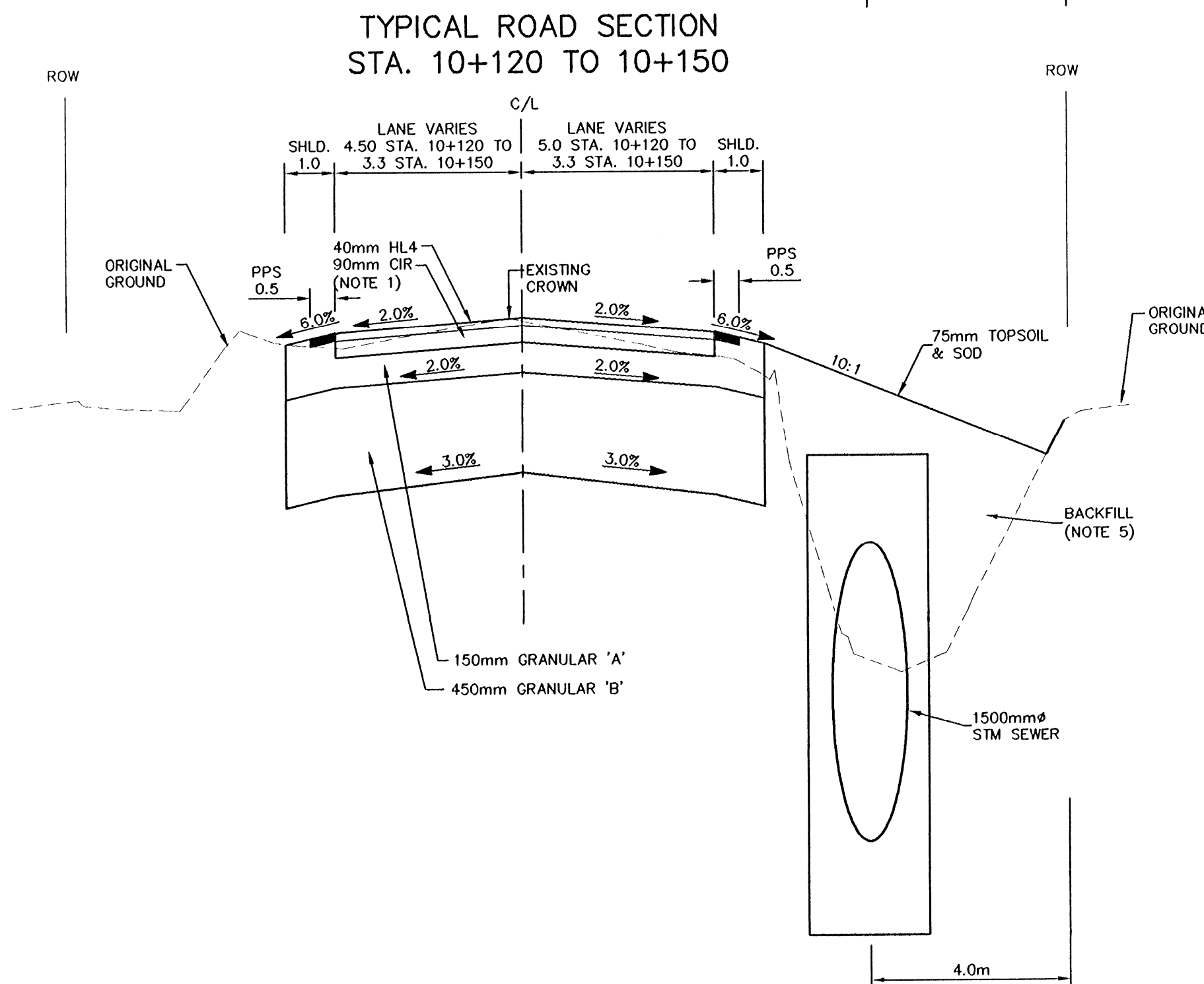
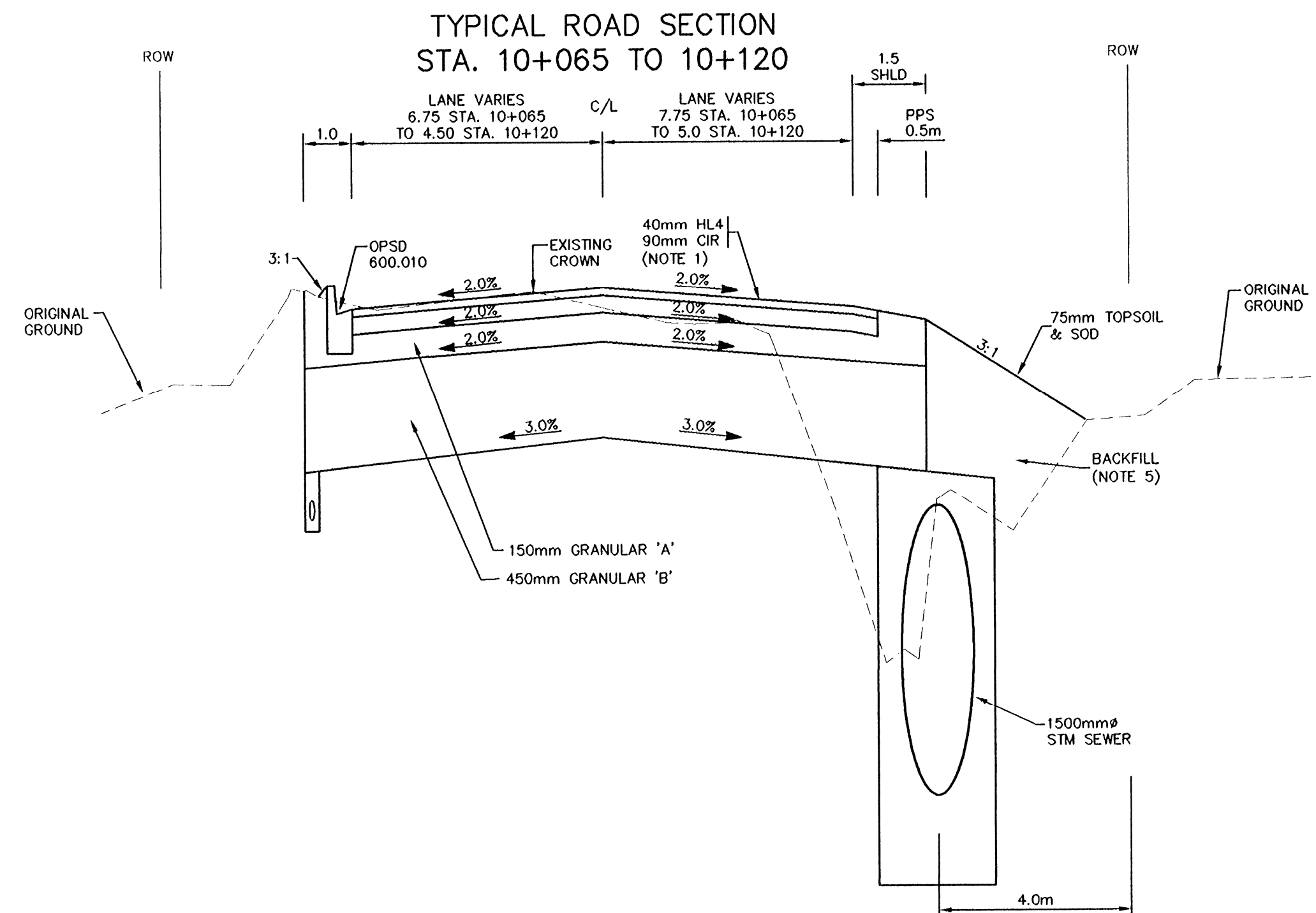
TOWNSHIP OF CLEARVIEW

CLIENT
COMMUNITY OF STAYNER
HIGHWAY 26 (CONNECTING LINK)

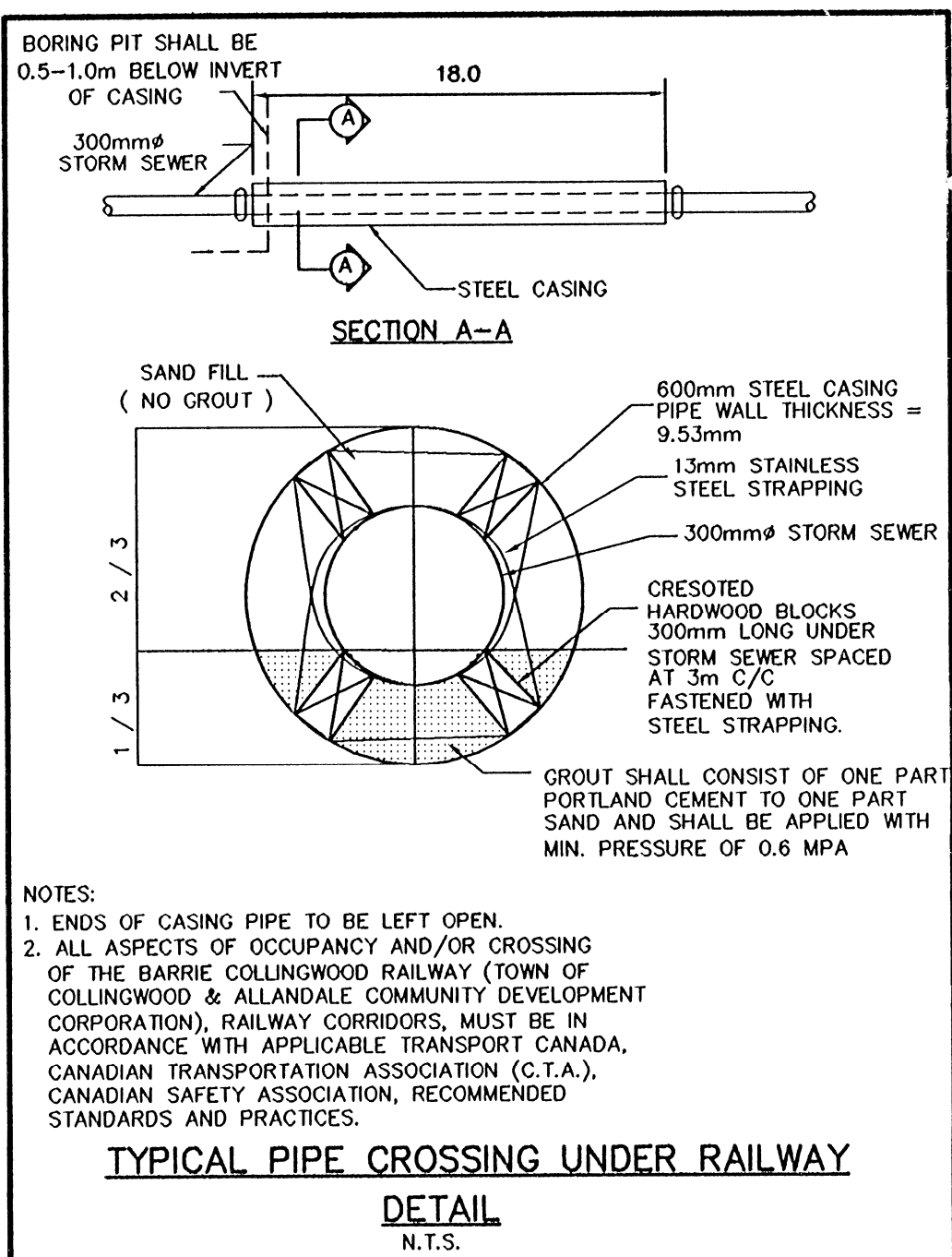
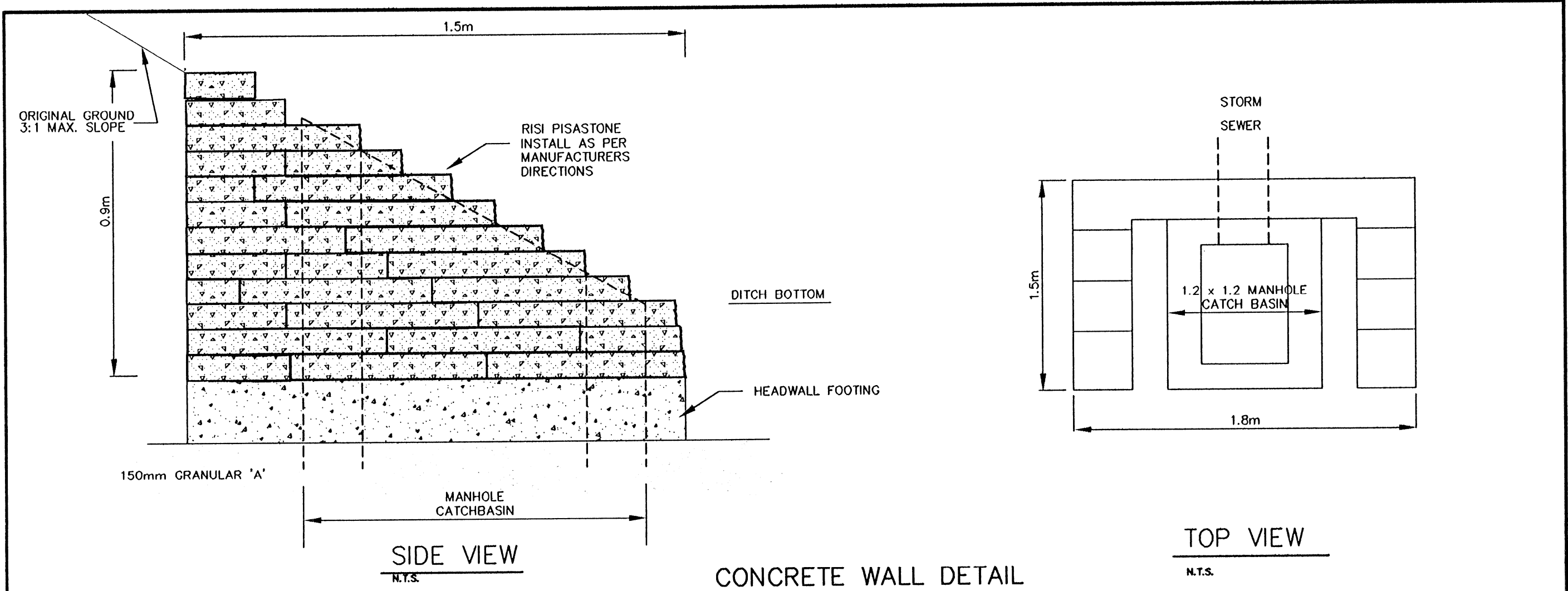
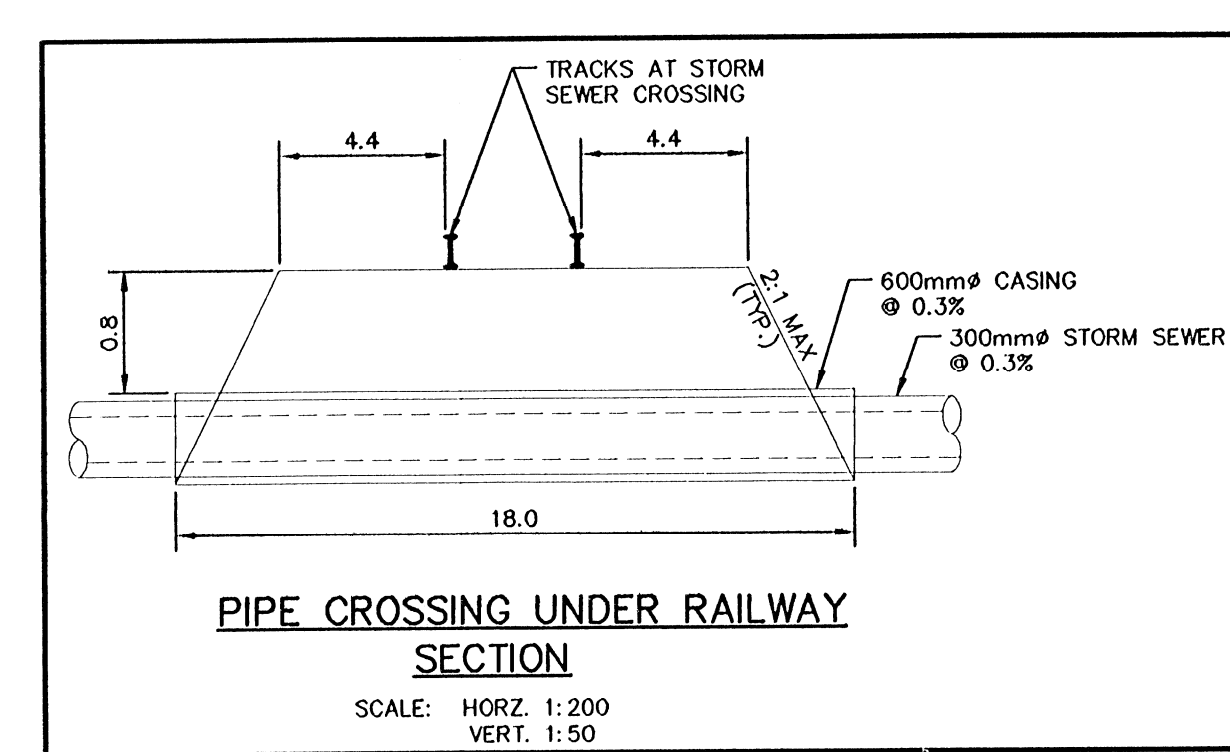
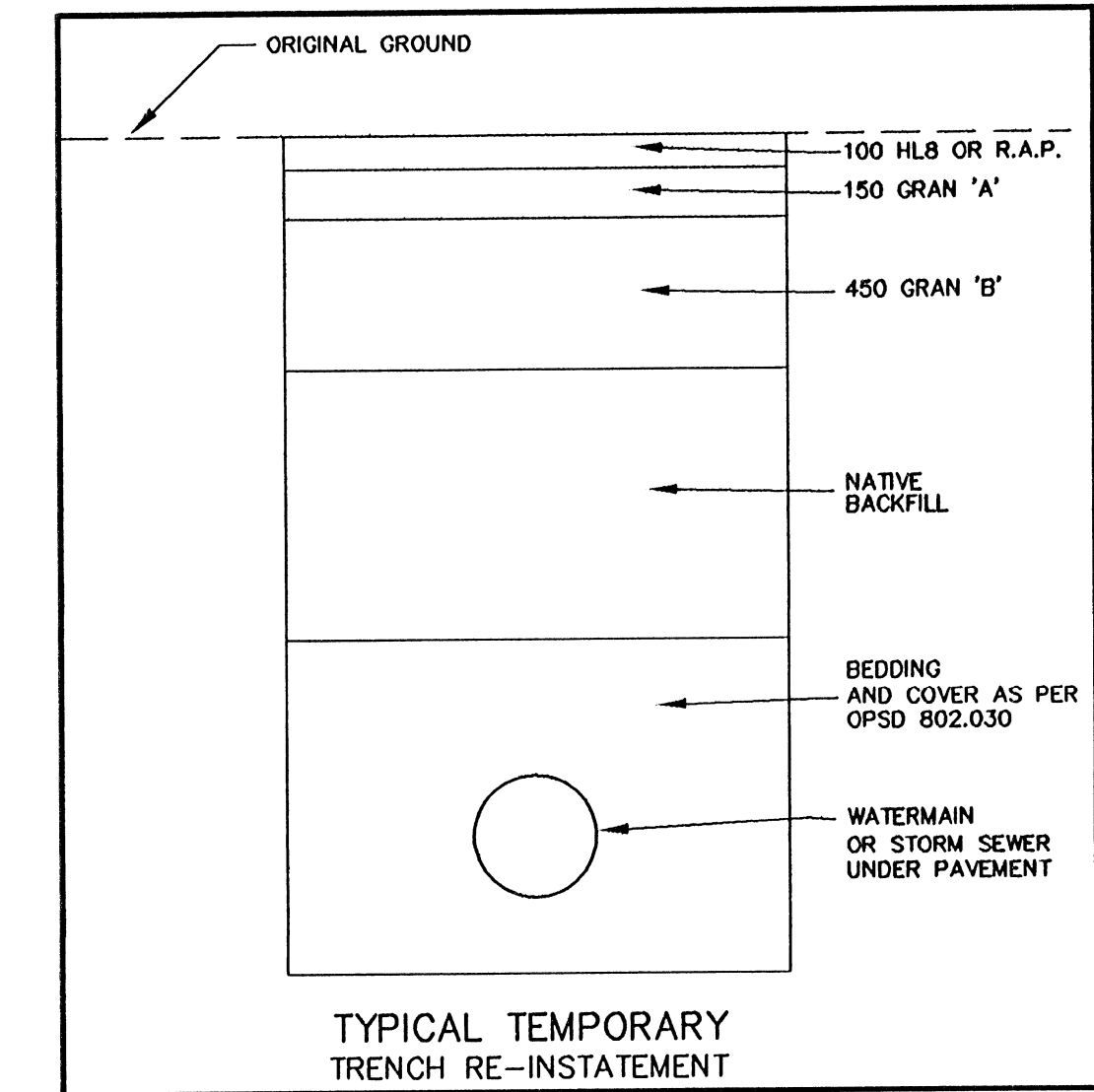
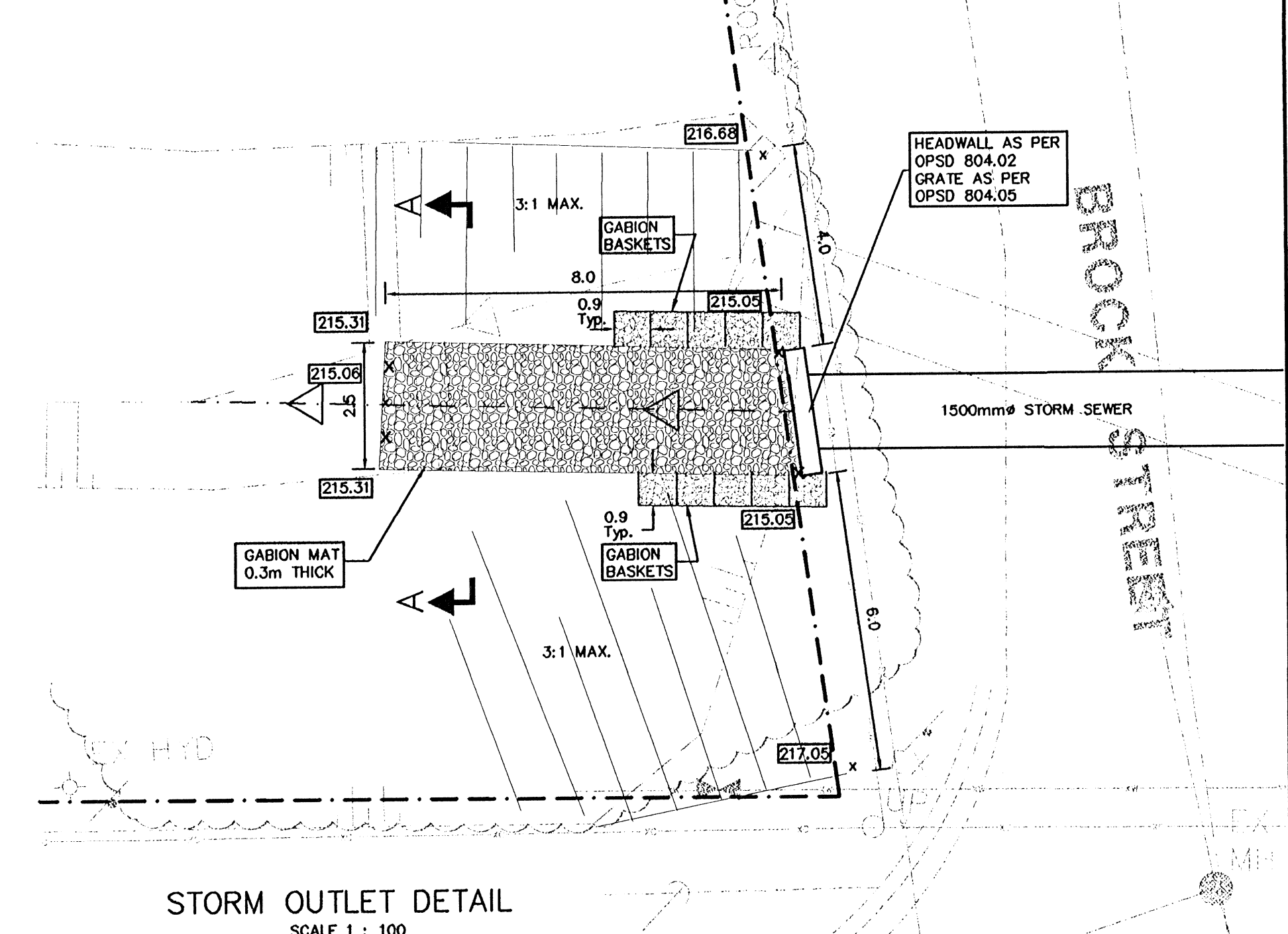
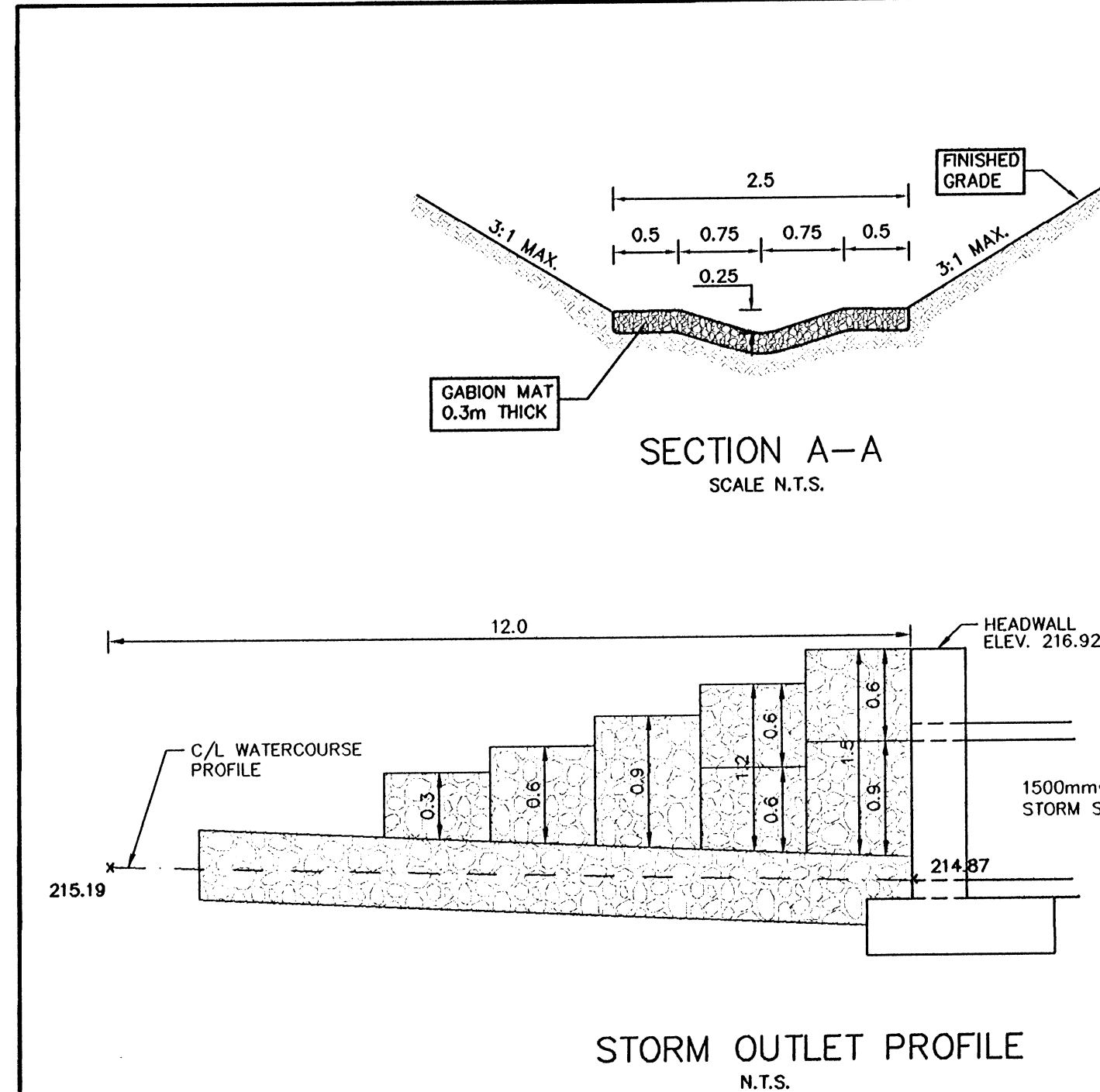
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NEW CONSTRUCTION
STA. 10+080 TO STA. 10+240

R. J. Burnside & Associates Limited
ENGINEERS - HYDROLOGISTS - ENVIRONMENTAL CONSULTANTS
GEORGIAN BAY OFFICE, 3 RONEILL CRESCENT, COLLINGWOOD, ONTARIO L9Y 4J6
TELEPHONE: (705)-446-0515 FAX: (705)-446-2399
E-MAIL: collingwood@burnside.com

DRAWN	J.O.	DRAWING NO.	G-01120PP5
DESIGNED	L.B.	SCALE	HORZ. 1:200 VERT. 1:50
REVIEWED	T.M.P.	DATE	MAY 10, 2002

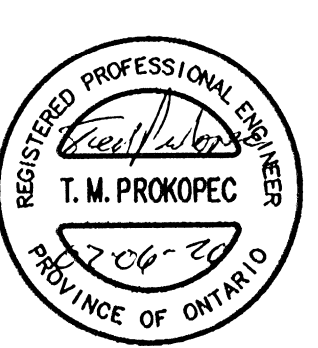


NOTES:
1) STA 10+065 TO 10+150 90mm CIR
MIX IS OBTAINED FROM ADJACENT
ROAD SECTION.



NOTES

BENCHMARK
TEMPORARY BENCHMARK, ELEV. 217.466
TOP NUT FH, E. SIDE OF KING ST. @ HOUSE #7440, OPPOSITE
REINHART FOODS
TEMPORARY BENCHMARK, ELEV. 217.068
SIB @ N.W. CORNER REMAX PROPERTY S. SIDE MONTREAL ST @
KING ST.
TEMPORARY BENCHMARK, ELEV. 217.740
TOP OF N.W. CORNER OF SOUTH CONC. FOOTING FOR 'BEER
STORE' SIGN, N. SIDE MAIN ST., 70m E. OF KING ST.
TEMPORARY BENCHMARK, ELEV. 218.093
TOP OF N.E. BOLT, TRAFFIC LIGHT @ S.E. CORNER OF KING ST. &
MAIN ST.
TEMPORARY BENCHMARK, ELEV. 219.229
SPIKE IN N.W. FACE OF HP ON S.E. CORNER OF KING ST. &
WILLIAM ST.



NO.	REVISIONS	DATE	APPROVED

**TOWNSHIP
OF
CLEARVIEW**

**COMMUNITY OF STAYNER
HIGHWAY 26 (CONNECTING LINK)**

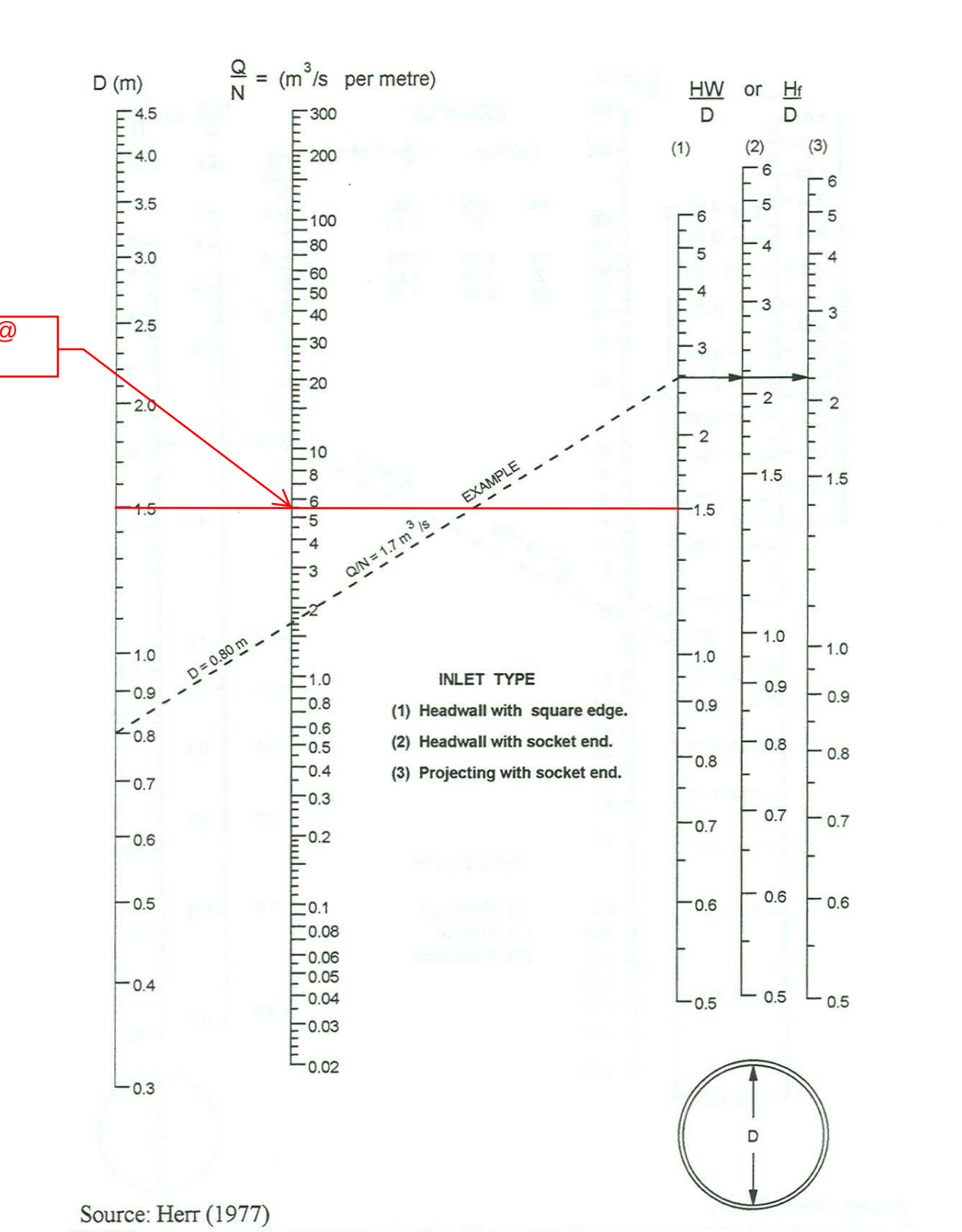
DETAIL SHEET

R. J. Burnside & Associates Limited
ENGINEERS - HYDROLOGISTS - ENVIRONMENTAL CONSULTANTS
GEORGIAN BAY OFFICE, 3 RONELL CRESCENT, COLLINGWOOD, ONTARIO L9Y 4J6
TELEPHONE: (705)-446-6915 FAX: (705)-446-2399
E-MAIL: collingwood@burnside.com

DRAWN	T.D.L.	DRAWING NO.	G-01120DT2
DESIGNED	L.H.B.	SCALE	1: 1000
REVIEWED	T.M.P.	DATE	MAY 14, 2002

Appendix C
Inlet Control Nomograph

Design Chart 2.31: Inlet Control: Circular Pipes



Appendix D

Site Survey

COUNTY ROAD 91
(BOWMORE ROAD BY REGISTERED PLAN 103)
(ORIGINAL ROAD ALLOWANCE BETWEEN LOTS 24 & 25)
PIN 58239 - 0278

PLAN OF SURVEY SHOWING TOPOGRAPHIC FEATURES
OF PART OF
LOT 1
AND OF ALL OF
LOTS 2 TO 4
SOUTH SIDE OF BOWMORE ROAD
AND ALL OF
LOTS 1 TO 3
NORTH SIDE OF QUEBEC STREET
AND ALL OF
LOTS 14 & 15
WEST SIDE OF CONCESSION LINE
REGISTERED PLAN 103
(GEOGRAPHIC TOWNSHIP OF NOTTAWASAGA)
TOWNSHIP OF CLEARVIEW
COUNTY OF SIMCOE

SCALE 1 : 250
5 4 3 2 1 0 5 10 15 Metres

RAIKES GEOMATICS INC.
2023

METRIC
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING NOTE
BEARINGS HEREON ARE UTM GRID BEARINGS AND ARE DERIVED FROM OBSERVED REFERENCE POINTS (ORPs), A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°W IN ZONE 17 BASED ON NAD83 (CSRS) (2010 EPOCH).

BEARING ROTATION
FOR BEARING COMPARISONS, A ROTATION OF 0°38'00" COUNTERCLOCKWISE WAS APPLIED TO SURVEYORS REAL PROPERTY REPORT BY M.W. KNISLEY DATED OCTOBER 11 1994 (P2), AND PLAN 51R-40 (P3).

DISTANCE NOTE
DISTANCES SHOWN ON THIS PLAN ARE HORIZONTAL GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999635.

ELEVATION NOTE
ELEVATIONS ARE GEODETIC IN ORIGIN AND WERE DERIVED FROM GNSS OBSERVATIONS AND THE PRECISE POINT POSITIONING (PPP) SERVICE AND ARE REFERRED TO THE CGVD28 (HTV2.0) DATUM.

SITE BENCHMARK
TOP OF NAIL IN UTILITY POLE AS ILLUSTRATED HEREON HAVING AN ELEVATION OF 218.64 METERS.

- LEGEND**
- DENOTES FOUND MONUMENT
 - DENOTES PLANTED MONUMENT
 - IB DENOTES IRON BAR
 - SIB DENOTES STANDARD IRON BAR
 - PB DENOTES PLASTIC BAR
 - CP DENOTES CONCRETE PIN
 - DIST DENOTES DISTURBED
 - FD DENOTES FOUND
 - WIT DENOTES WITNESS
 - MEAS DENOTES MEASURED
 - MTO DENOTES MINISTRY OF TRANSPORTATION
 - ZUMO DENOTES ZUBEK, EMO, PATTEN & THOMSEN LTD.
 - 615 DENOTES J.H. DIAMOND, OLS
 - 738 DENOTES R.C. KIRKPATRICK, OLS
 - 824 DENOTES A.T. MCLAREN, OLS
 - 1390 DENOTES P.R. KITCHEN, OLS
 - 1403 DENOTES W. DOUGLAS SMITH SURVEYING LTD.
 - 1649 DENOTES M.W. KNISLEY, OLS
 - 1841 DENOTES RAIKES GEOMATICS INC.
 - 1115 DENOTES R.J. EMO, OLS
 - P1 DENOTES PLAN 51R-4124
 - P2 DENOTES SURVEYORS REAL PROPERTY REPORT BY M.W. KNISLEY, OLS DATED OCTOBER 11 1994
 - P3 DENOTES PLAN 51R-40
 - P4 DENOTES PLAN OF SURVEY BY R.J. EMO, OLS DATED JANUARY 20 1974
 - P5 DENOTES REGISTERED PLAN 103
 - P6 DENOTES PLAN OF SURVEY BY R.C. KIRKPATRICK, OLS DATED SEPTEMBER 27 1980
 - UP DENOTES UTILITY POLE
 - UPLS DENOTES UTILITY POLE & LIGHT STANDARD
 - OH DENOTES OVERHEAD HYDRO
 - GUY DENOTES GUY WIRE
 - BB DENOTES BELL BOX
 - LS DENOTES LIGHT STANDARD
 - CB DENOTES LIGHT STANDARD
 - SAN MH DENOTES SANITARY MANHOLE
 - STM MH DENOTES STORM MANHOLE

SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 20th DAY OF DECEMBER, 2022.

MONTH ##, 2023
DATE PETER T. RAIKES, BSc., CLS, MRICS, P.Surv
ONTARIO LAND SURVEYOR

NOTE:
THIS PLAN IS AN UPDATE OF PLAN OF SURVEY SHOWING TOPOGRAPHIC FEATURES, PROJECT 226292, SIGNED JUNE 3, 2022 TO ADD LOTS 2 & 3, NORTH SIDE OF QUEBEC STREET AND LOTS 14 & 15, WEST SIDE OF CONCESSION LINE.

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DRAWN BY: MGK & RJP PROJECT No. 226292
CHECKED BY: RAF

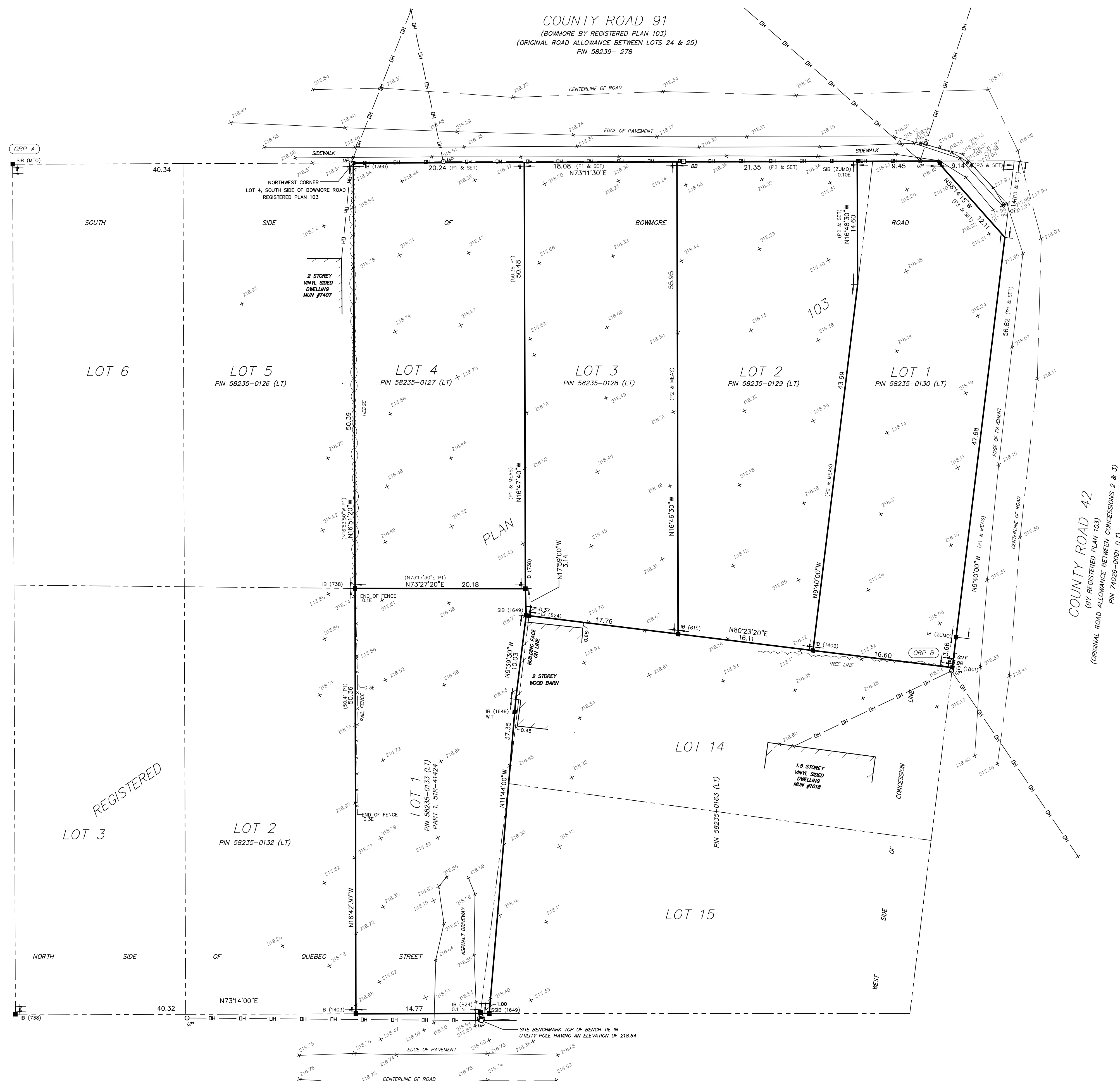
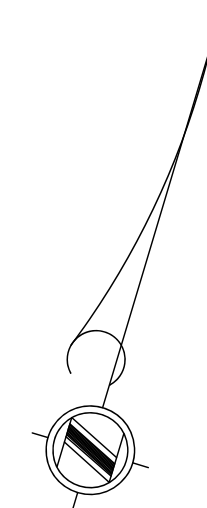
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GEOMATICS INC.

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ASSOCIATION OF ONTARIO
LAND SURVEYORS
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In accordance with
Regulation 1006, Section 29(3).

REVISIONS TABLE		
DATE	BY	COMMENT
2023-01-17	RJP	RELEASED FOR CLIENT REVIEW

OBSERVED REFERENCE POINTS (ORPs) ARE DERIVED FROM GNSS OBSERVATIONS USING THE CAN-NET VRS NETWORK, UTM ZONE 17 (81° LONGITUDE) NAD83 CSRS (2010 EPOCH) COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG 216/10		
UTM NAD83 CSRS COORDINATE TABLE		
POINT ID	NORTHING	EASTING
ORP A	4918688.26	571847.11
ORP B	4918662.96	571970.74
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN		



PLAN OF SURVEY SHOWING TOPOGRAPHIC FEATURES
OF ALL OF
LOTS 1 TO 4
SOUTH SIDE OF BOWMORE ROAD
AND PART OF
LOT 1
NORTH SIDE OF QUEEN STREET
AND PART OF
LOT 14
WEST SIDE OF CONCESSION LINE
REGISTERED PLAN 103
(GEOGRAPHIC TOWN OF STAYNER)
TOWNSHIP OF CLEARVIEW
COUNTY OF SIMCOE

SCALE 1 : 250
5 4 3 2 1 0 5 10 15 Metres
RAIKES GEOMATICS INC.
2022.

METRIC
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND
CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING NOTE
BEARINGS HEREON ARE UTM GRID BEARINGS AND ARE DERIVED FROM
OBSERVED REFERENCE POINTS (ORPs), A AND B, BY REAL TIME NETWORK (RTN)
OBSERVATIONS AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°W IN
ZONE 17 BASED ON NAD83 (CSRS) (2010 EPOCH).

BEARING ROTATION
FOR BEARING COMPARISONS, A ROTATION OF 0°38'00" COUNTERCLOCKWISE
WAS APPLIED TO SURVEYORS REAL PROPERTY REPORT BY M.W. KNISLEY
DATED OCTOBER 11 1994 (P2), AND PLAN 51R-40 (P3).

DISTANCE NOTE
DISTANCES SHOWN ON THIS PLAN ARE HORIZONTAL GROUND DISTANCES AND
CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED
SCALE FACTOR OF 0.999635.

ELEVATION NOTE
ELEVATIONS ARE GEODETIC IN ORIGIN AND WERE DERIVED FROM GNSS
OBSERVATIONS AND THE PRECISE POINT POSITIONING (PPP) SERVICE AND
ARE REFERRED TO THE CGVD28 (HTV2.0) DATUM.

- LEGEND**
- DENOTES FOUND MONUMENT
 - DENOTES PLANTED MONUMENT
 - IB DENOTES IRON BAR
 - SIB DENOTES STANDARD IRON BAR
 - PB DENOTES PLASTIC BAR
 - RES DENOTES RESTORED IN ACCORDANCE WITH SECTION 1.5 OF THE NATIONAL STANDARDS FOR THE SURVEY OF CANADA LANDS
 - MEAS DENOTES MEASURED
 - MTD DENOTES MINISTRY OF TRANSPORTATION
 - ZUBO DENOTES ZUBEK, ENO, PATTEN & THOMSEN LTD.
 - 619 DENOTES J.H. DIAMOND, OLS
 - 738 DENOTES R.C. KIRKPATRICK, OLS
 - 824 DENOTES A.T. MCCLAREN, OLS
 - 1390 DENOTES R.R. KITCHEN, OLS
 - 1403 DENOTES W. DOUGLAS SMITH SURVEYING LTD.
 - 1649 DENOTES KNISLEY, OLS
 - 1841 DENOTES RAIKES GEOMATICS INC.
 - P1 DENOTES PLAN 51R-41424
 - P2 DENOTES SURVEYORS REAL PROPERTY REPORT BY M.W. KNISLEY, OLS DATED OCTOBER 11 1994
 - P3 DENOTES REGISTERED PLAN 51R-40
 - UP DENOTES UTILITY POLE
 - OH DENOTES OVERHEAD HYDRO
 - GUY DENOTES GUY WIRE
 - BB DENOTES BELL BOX

OBSERVED REFERENCE POINTS (ORPs) ARE DERIVED FROM GNSS OBSERVATIONS USING THE CAN-NET VRS NETWORK, UTM ZONE 17 (81° LONGITUDE) NAD83 CSRS (2010 EPOCH) COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O-REG 216/10		
UTM NAD83 CSRS COORDINATE TABLE		
POINT ID	NORTHING	EASTING
ORP A	4918688.26	571847.11
ORP B	4918662.96	571970.74
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN		

SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH
THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS
MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 24th DAY OF FEBRUARY, 2022.

DATE PETER T. RAIKES, BSc., OLS, MRICS, P.Surv
ONTARIO LAND SURVEYOR

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DRAWN BY: MKR
CHECKED BY: PTR
PROJECT No. 226292

ASSOCIATION OF ONTARIO
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PLAN SUBMISSION FORM

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REVISIONS TABLE		
DATE	BY	COMMENT
2022-03-15	EKJ	DRAFT RELEASE FOR DESIGN

COUNTY ROAD 91
(BOWMORE ROAD BY REGISTERED PLAN 103)
(ORIGINAL ROAD ALLOWANCE BETWEEN LOTS 24 & 25)
PIN 58239 - 0278 (LT)

PLAN OF SURVEY SHOWING TOPOGRAPHIC FEATURES
OF PART OF
LOT 1
AND OF ALL OF
LOTS 2 TO 6
SOUTH SIDE OF BOWMORE ROAD
AND ALL OF
LOTS 1 TO 3
NORTH SIDE OF QUEBEC STREET
AND ALL OF
LOTS 14 & 15
WEST SIDE OF CONCESSION LINE
REGISTERED PLAN 103
(GEOGRAPHIC TOWNSHIP OF NOTTAWASAGA)
TOWNSHIP OF CLEARVIEW
COUNTY OF SIMCOE

SCALE 1 : 250
5 4 3 2 1 0 5 10 15 Metres

RAIKES GEOMATICS INC.
2023

METRIC
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND
CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING NOTE
BEARINGS HEREON ARE UTM GRID BEARINGS AND ARE DERIVED FROM
OBSERVED REFERENCE POINTS (ORPs), A AND B, BY REAL TIME NETWORK (RTN)
OBSERVATIONS AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°W IN
ZONE 17 BASED ON NAD83 (CSRS) (2010 EPOCH).

BEARING ROTATION
FOR BEARING COMPARISONS, A ROTATION OF 0°38'00" COUNTERCLOCKWISE
WAS APPLIED TO SURVEYORS REAL PROPERTY REPORT BY M.W. KINSELY
DATED OCTOBER 11 1994 (P2), AND PLAN 51R-40 (P3).

DISTANCE NOTE
DISTANCES SHOWN ON THIS PLAN ARE HORIZONTAL GROUND DISTANCES AND
CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY THE COMBINED
SCALE FACTOR OF 0.999635.

ELEVATION NOTE
ELEVATIONS ARE GEODETIC IN ORIGIN AND WERE DERIVED FROM GNSS
OBSERVATIONS AND THE PRECISE POINT POSITIONING (PPP) SERVICE AND
ARE REFERRED TO THE CGVD28 (HTV2.0) DATUM.

SITE BENCHMARK
TOP OF NAIL IN UTILITY POLE AS ILLUSTRATED HEREON HAVING AN
ELEVATION OF 218.64 METERS.

LEGEND

■	DENOTES FOUND MONUMENT
□	DENOTES PLANTED MONUMENT
IB	DENOTES IRON BAR
SIB	DENOTES STANDARD IRON BAR
PB	DENOTES PLASTIC BAR
CP	DENOTES CONCRETE PIN
DIST	DENOTES DISTURBED
FD	DENOTES FOUND
PROP	DENOTES PROPORTIONED
WT	DENOTES WITNESS
MEAS	DENOTES MEASURED
MTO	DENOTES MINISTRY OF TRANSPORTATION
ZUMO	DENOTES ZUBEK, EMO, PATTEN & THOMSEN LTD.
615	DENOTES J.H. DIAMOND, OLS
238	DENOTES R.C. KIRKPATRICK, OLS
824	DENOTES A.T. MCLEAREN, OLS
1390	DENOTES P.R. KITCHEN, OLS
1403	DENOTES W. DOUGLAS SMITH SURVEYING LTD.
1649	DENOTES M.W. KINSELY, OLS
1841	DENOTES RAIKES GEOMATICS INC.
1115	DENOTES R.J. EMO, OLS
P1	DENOTES PLAN 51R-41424
P2	DENOTES SURVEYORS REAL PROPERTY REPORT BY M.W. KINSELY, OLS DATED OCTOBER 11 1994
P3	DENOTES PLAN 51R-40
P4	DENOTES PLAN OF SURVEY BY R.J. EMO, OLS DATED JANUARY 20 1974
P5	DENOTES REGISTERED PLAN 103
P6	DENOTES PLAN OF SURVEY BY R.C. KIRKPATRICK, OLS DATED SEPTEMBER 27 1980
UP	DENOTES UTILITY POLE
UPLS	DENOTES UTILITY POLE & LIGHT STANDARD
OH	DENOTES OVERHEAD HYDRO
GUY	DENOTES GUY WIRE
BB	DENOTES BELL BOX
LS	DENOTES LIGHT STANDARD
CB	DENOTES CATCH BASIN
SAN MH	DENOTES SANITARY MANHOLE
STM MH	DENOTES STORM MANHOLE
BOL	DENOTES BOLLARD
HM	DENOTES HYDROMETER
FH	DENOTES FIRE HYDRANT
TOH	DENOTES TOP OF HYDRANT
WV	DENOTES WATER VALVE
+	DENOTES EXISTING ELEVATION

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
- THE SURVEY WAS COMPLETED ON THE 7th DAY OF MARCH, 2023.

DATE PETER T. RAIKES, B.Sc., C.LS, MRICS, P.Surv
ONTARIO LAND SURVEYOR

NOTE:
THIS PLAN IS AN UPDATE OF PLAN OF SURVEY SHOWING TOPOGRAPHIC FEATURES,
PROJECT 226292, SIGNED JUNE 3, 2022 TO ADD LOTS 2 & 3, NORTH SIDE OF
QUEBEC STREET, LOTS 14 & 15, WEST SIDE OF CONCESSION LINE, AND LOTS 5 & 6
SOUTH SIDE OF BOWMORE ROAD.

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DRAWN BY: MGK & RJP PROJECT No. 226292
CHECKED BY: RAF



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REVISIONS TABLE		
DATE	BY	COMMENT
2023-03-21	RJP	RELEASED FOR CLIENT REVIEW

QUEBEC STREET
(BY REGISTERED PLAN 103)
PIN 58235-0082 (LT)

SUTHERLAND STREET SOUTH
(SUTHERLAND STREET, BY REGISTERED PLAN 103)
PIN 58235-0124 (LT)

COUNTY ROAD 42
(CONCESSION LINE BY REGISTERED PLAN 103)
(ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 2 & 3)
PIN 74026-0001 (LT)

LOT 4
PIN 58235-0127 (LT)

LOT 3
PIN 58235-0128 (LT)

LOT 2
PIN 58235-0129 (LT)

LOT 1
PIN 58235-0130 (LT)

LOT 6
PIN 58235-0125 (LT)

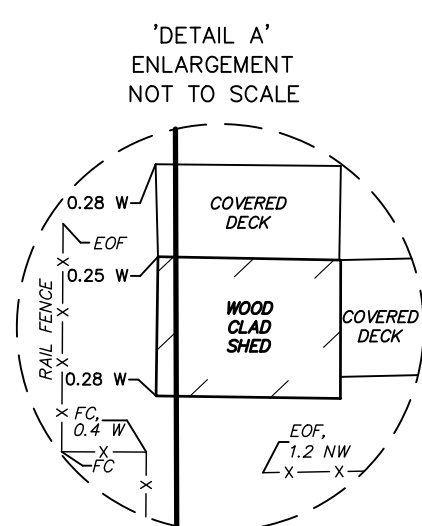
LOT 5
PIN 58235-0126 (LT)

LOT 2
PIN 58235-0132 (LT)

LOT 1
PIN 58235-0133 (LT)

LOT 14

LOT 15



Appendix E
HEC-RAS Output, Cross Sections and Depth Velocity Product Calculations

NO LATERAL WEIR

HEC-RAS Plan: 1 River: River 1 Reach: Reach 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Vel Left	Vel Chnl	Vel Right	Hydr Depth L	Hydr Depth C	Hydr Depth L
			(m3/s)	(m)	(m)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)
Reach 1	159	Regional	1.92	218.52	218.64	0.7	0.89		0.05	0.08	0.05
Reach 1	159	Regional 50% Blo	4.67	218.52	218.69	0.92	1.06	0.16	0.09	0.11	0.09
Reach 1	152	Regional	1.92	217.8	218.54	0.08	0.1	0.04	0.35	0.59	0.35
Reach 1	152	Regional 50% Blo	4.67	217.8	218.65	0.14	0.2	0.15	0.37	0.7	0.37
Reach 1	140	Regional	1.92	217.9	218.54	0.08	0.09	0.07	0.38	0.5	0.38
Reach 1	140	Regional 50% Blo	4.67	217.9	218.64	0.13	0.17	0.22	0.41	0.61	0.41
Reach 1	131	Regional	1.92	218.17	218.53	0.12	0.13	0.19	0.22	0.24	0.22
Reach 1	131	Regional 50% Blo	4.67	218.17	218.64	0.19	0.2	0.44	0.31	0.35	0.31
Reach 1	127	Regional	1.92	218.28	218.53	0.18	0.18	0.32	0.18	0.2	0.18
Reach 1	127	Regional 50% Blo	4.67	218.28	218.63	0.24	0.27	0.68	0.26	0.3	0.26
Reach 1	122	Regional	1.92	218.26	218.47	0.52	0.88	1.52	0.05	0.12	0.05
Reach 1	122	Regional 50% Blo	4.67	218.26	218.58	0.42	0.62	1.57	0.12	0.23	0.12
Reach 1	111	Regional	1.92	218.12	218.42	0.27	0.28	0.34	0.19	0.2	0.19
Reach 1	111	Regional 50% Blo	4.67	218.12	218.57	0.3	0.33	0.77	0.3	0.35	0.3
Reach 1	95	Regional	1.92	218.1	218.39	0.2	0.25	0.6	0.14	0.2	0.14
Reach 1	95	Regional 50% Blo	4.67	218.1	218.55	0.18	0.27	0.81	0.19	0.36	0.19
Reach 1	80	Regional	1.92	218.12	218.35	0.16	0.23	0.87	0.12	0.2	0.12
Reach 1	80	Regional 50% Blo	4.67	218.12	218.53	0.19	0.25	0.95	0.24	0.38	0.24
Reach 1	62	Regional	1.92	218	218.29	0.08	0.28	1.12	0.03	0.21	0.03
Reach 1	62	Regional 50% Blo	4.67	218	218.41	0.17	0.41	1.6	0.09	0.33	0.09
Reach 1	51	Regional	1.92	217.99	218.29	0.12	0.27	0.85	0.08	0.27	0.08
Reach 1	51	Regional 50% Blo	4.67	217.99	218.34	0.22	0.53	1.68	0.09	0.32	0.09
Reach 1	42	Regional	1.92	218.16	218.25	0.08	0.18	0.98	0.02	0.06	0.02
Reach 1	42	Regional 50% Blo	4.67	218.16	218.32	0.16	0.29	1.33	0.06	0.14	0.06
Reach 1	27	Regional	1.92	217.88	218.11	0.21	0.36	1.27	0.08	0.18	0.08
Reach 1	27	Regional 50% Blo	4.67	217.88	218.21	0.32	0.48	1.73	0.15	0.28	0.15
Reach 1	14	Regional	1.92	217.8	218	0.24	0.38	1.41	0.07	0.14	0.07
Reach 1	14	Regional 50% Blo	4.67	217.8	218.09	0.33	0.5	1.85	0.13	0.24	0.13
Reach 1	3	Regional	1.92	217.73	217.88	0.32	0.35	1.11	0.11	0.12	0.11
Reach 1	3	Regional 50% Blo	4.67	217.73	217.96	0.35	0.48	1.63	0.12	0.2	0.12

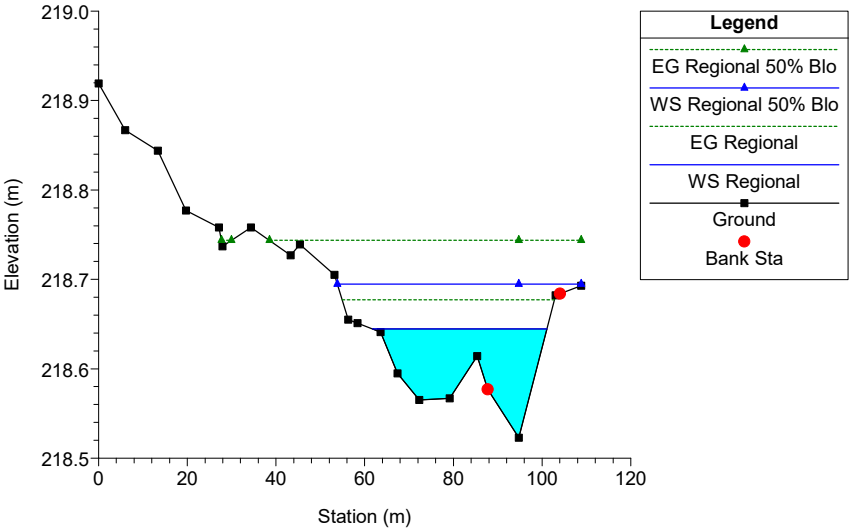
WITH LATERAL WEIR

HEC-RAS Plan: LWeir River: River 1 Reach: Reach 1

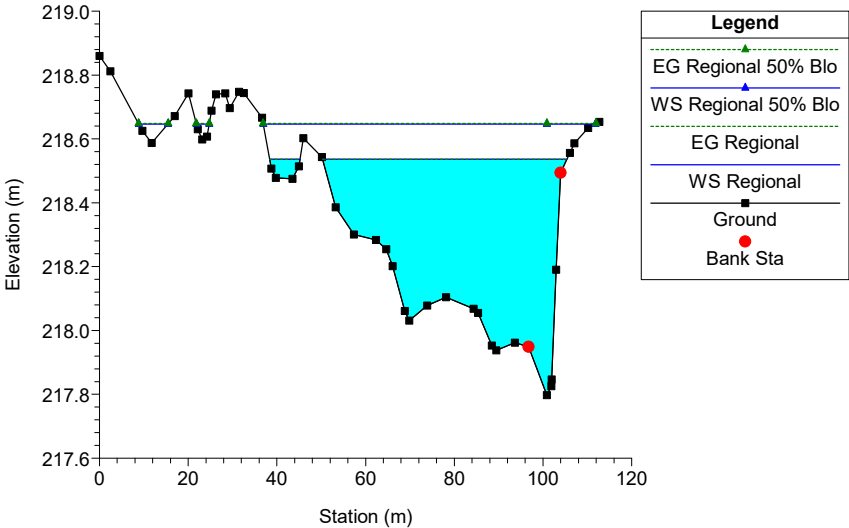
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Vel Left	Vel Chnl	Vel Right	Hydr Depth L	Hydr Depth C	Hydr Depth R
			(m3/s)	(m)	(m)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)
Reach 1	159	Regional	1.92	218.52	218.64	0.7	0.89		0.05	0.08	
Reach 1	159	Regional 50% Blo	4.67	218.52	218.7	0.91	1.04	0.18	0.09	0.11	0.01
Reach 1	158.8 158	Lat Struct									
Reach 1	152	Regional	1.92	217.8	218.54	0.08	0.1	0.04	0.35	0.59	0.02
Reach 1	152	Regional 50% Blo	4.67	217.8	218.61	0.16	0.22	0.15	0.36	0.66	0.05
Reach 1	140	Regional	1.92	217.9	218.54	0.08	0.09	0.07	0.38	0.5	0.04
Reach 1	140	Regional 50% Blo	4.57	217.9	218.61	0.15	0.17	0.19	0.4	0.57	0.09
Reach 1	131	Regional	1.92	218.17	218.53	0.12	0.13	0.19	0.22	0.24	0.06
Reach 1	131	Regional 50% Blo	4.18	218.17	218.6	0.19	0.21	0.42	0.28	0.31	0.12
Reach 1	127	Regional	1.92	218.28	218.53	0.18	0.18	0.32	0.18	0.2	0.06
Reach 1	127	Regional 50% Blo	3.88	218.28	218.6	0.24	0.26	0.61	0.23	0.26	0.13
Reach 1	122	Regional	1.92	218.26	218.47	0.52	0.88	1.53	0.05	0.12	0.04
Reach 1	122	Regional 50% Blo	3.72	218.26	218.51	0.62	0.99	1.89	0.08	0.16	0.06
Reach 1	111	Regional	1.92	218.12	218.41	0.28	0.3	0.35	0.18	0.19	0.03
Reach 1	111	Regional 50% Blo	3.69	218.12	218.46	0.39	0.41	0.68	0.22	0.25	0.07
Reach 1	95	Regional	1.88	218.1	218.37	0.23	0.29	0.64	0.13	0.18	0.08
Reach 1	95	Regional 50% Blo	3.34	218.1	218.42	0.3	0.37	0.95	0.16	0.22	0.12
Reach 1	80	Regional	1.59	218.12	218.27	0.26	0.33	1.26	0.08	0.12	0.12
Reach 1	80	Regional 50% Blo	2.31	218.12	218.3	0.28	0.37	1.41	0.09	0.15	0.15
Reach 1	62	Regional	0.94	218	218.2	0.03	0.22	0.92	0.01	0.12	0.14
Reach 1	62	Regional 50% Blo	1.24	218	218.25	0.05	0.22	0.88	0.02	0.17	0.19
Reach 1	51	Regional	0.56	217.99	218.2	0.07	0.15	0.41	0.06	0.19	0.12
Reach 1	51	Regional 50% Blo	1.07	217.99	218.25	0.08	0.19	0.58	0.06	0.24	0.17
Reach 1	42	Regional	0.36	218.16	218.18		0.06	0.59		0.01	0.04
Reach 1	42	Regional 50% Blo	1.02	218.16	218.22	0.02	0.11	0.8	0	0.03	0.08
Reach 1	27	Regional	0.28	217.88	217.99	0.1	0.22	0.75	0.02	0.07	0.06
Reach 1	27	Regional 50% Blo	1.02	217.88	218.06	0.15	0.31	1.05	0.05	0.13	0.11
Reach 1	14	Regional	0.28	217.8	217.89		0.22	0.84		0.05	0.05
Reach 1	14	Regional 50% Blo	1.02	217.8	217.95	0.17	0.31	1.13	0.04	0.1	0.09
Reach 1	3	Regional	0.28	217.73	217.8	0.18	0.16	0.58	0.05	0.04	0.03
Reach 1	3	Regional 50% Blo	1.02	217.73	217.85	0.27	0.28	0.82	0.08	0.09	0.06

NO LATERAL WEIR

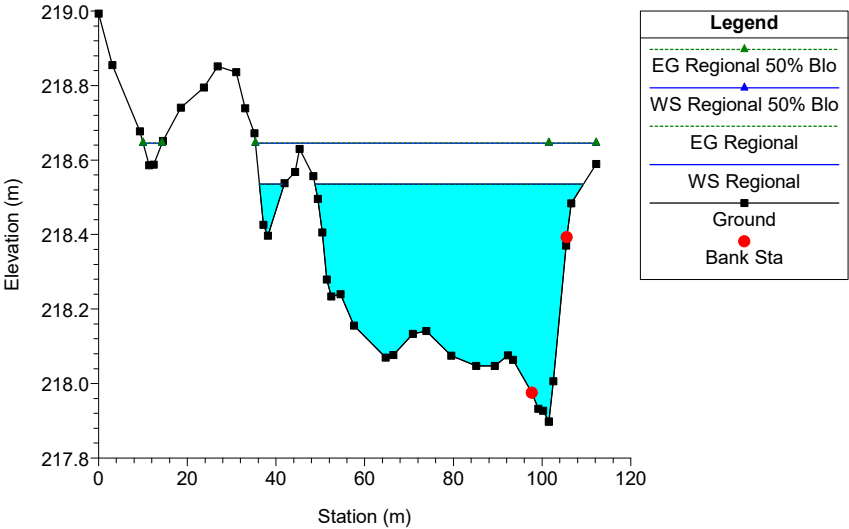
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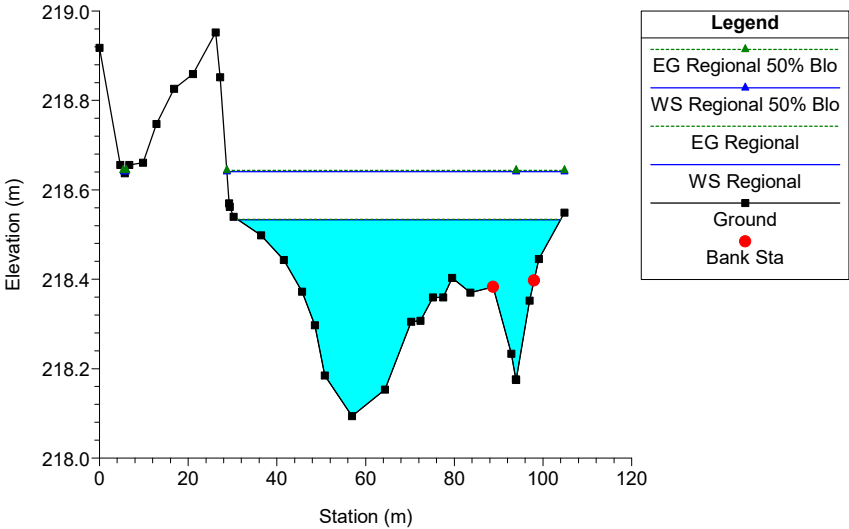
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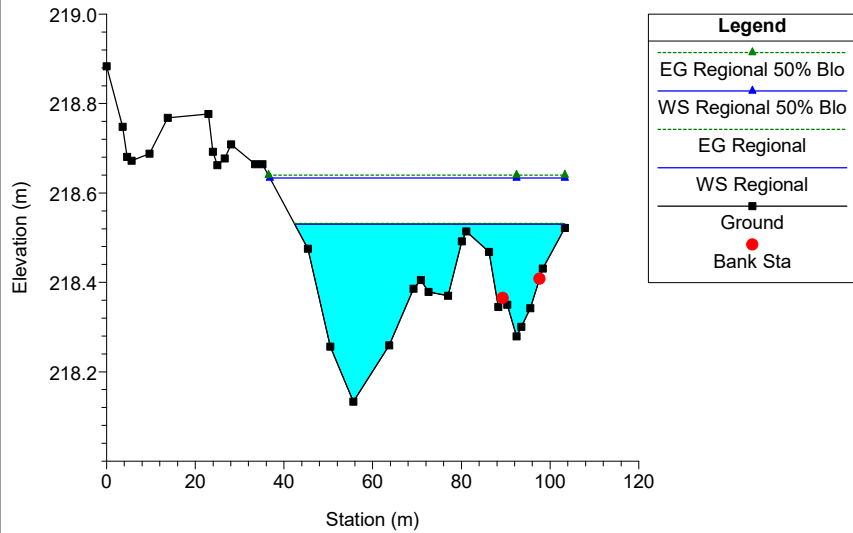
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



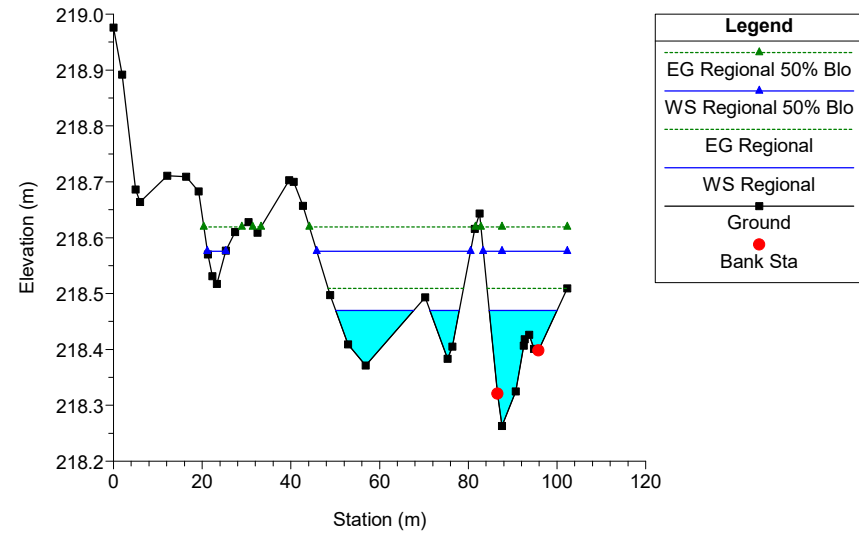
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



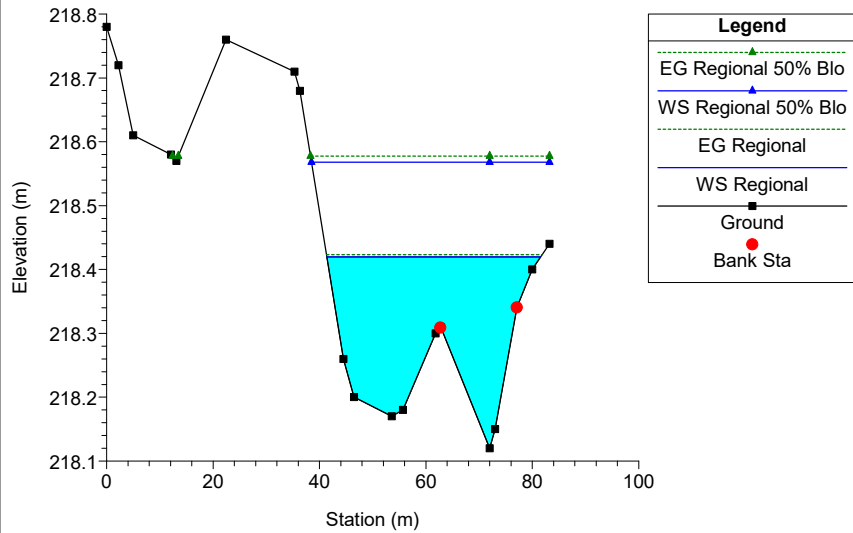
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



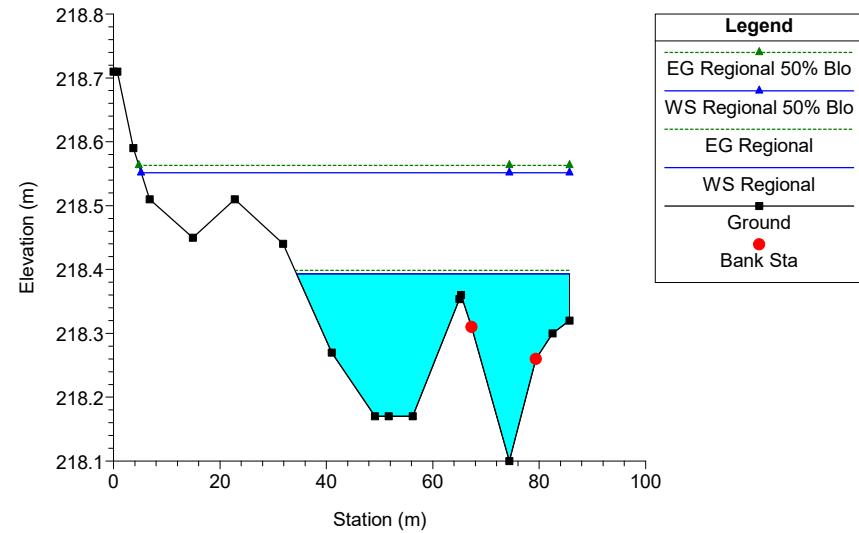
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



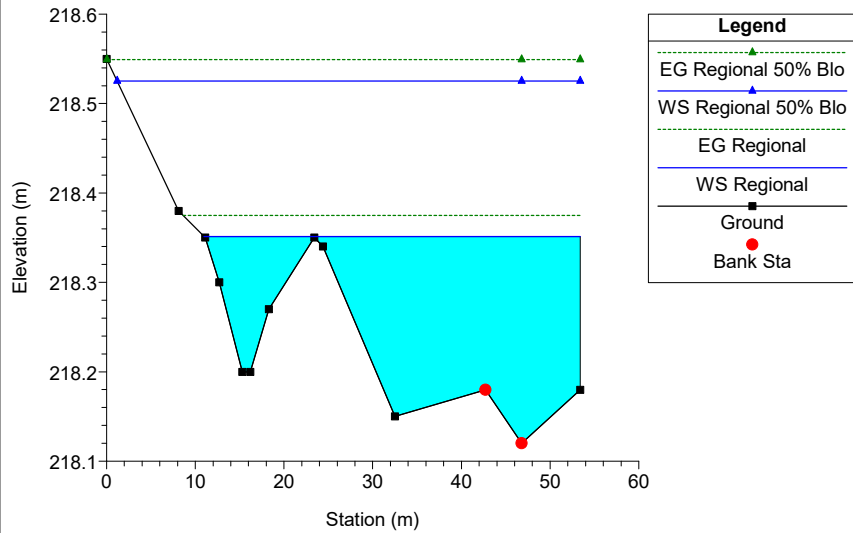
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



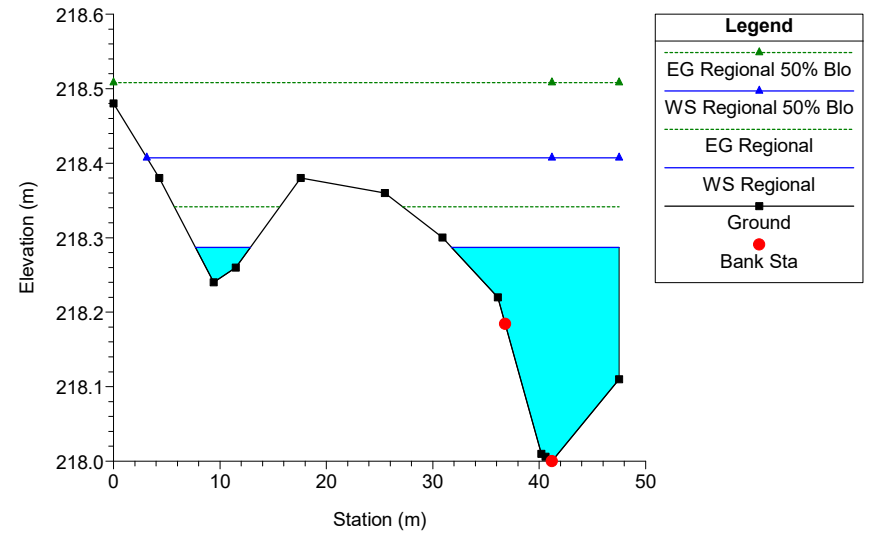
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



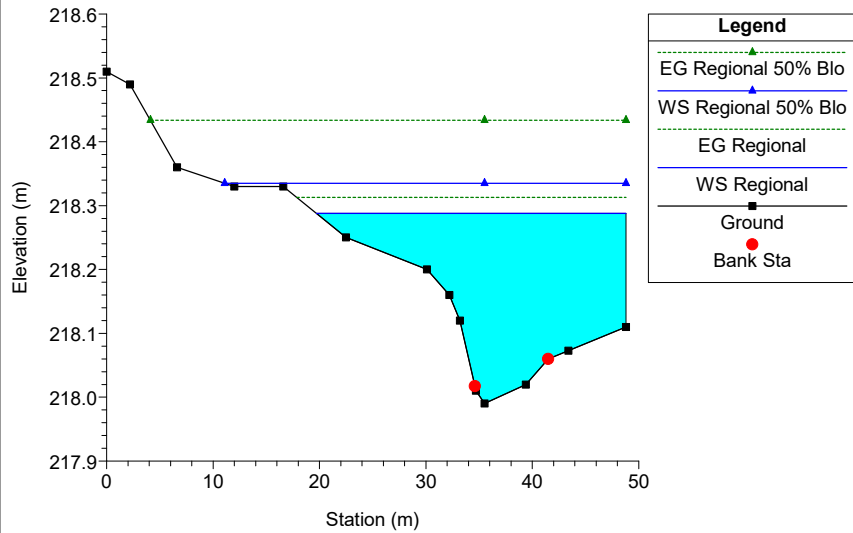
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



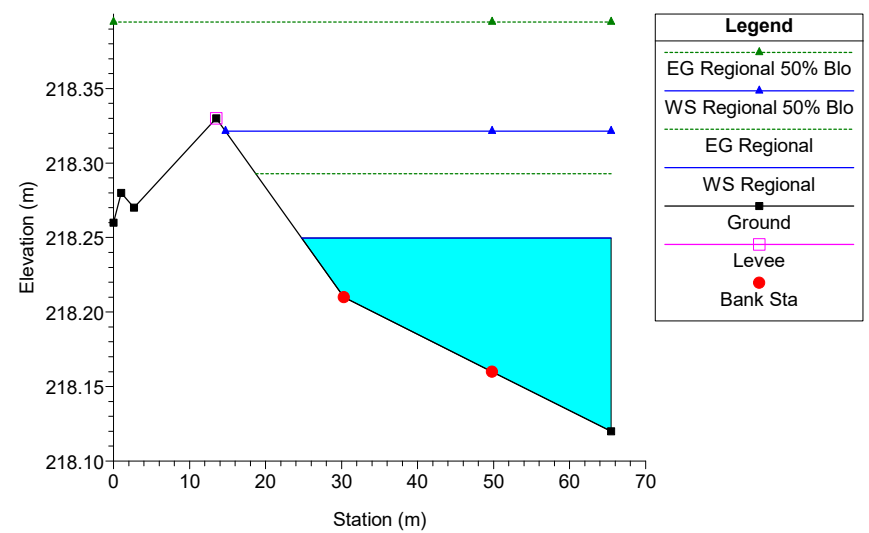
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



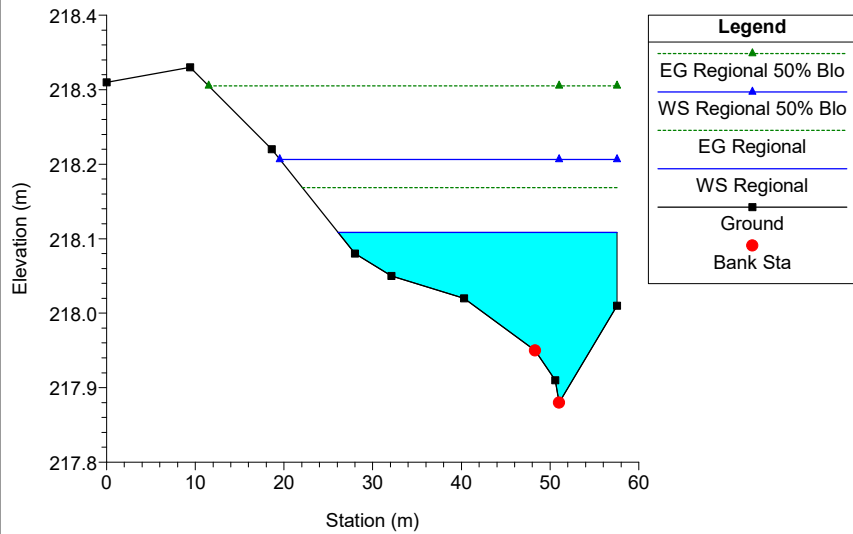
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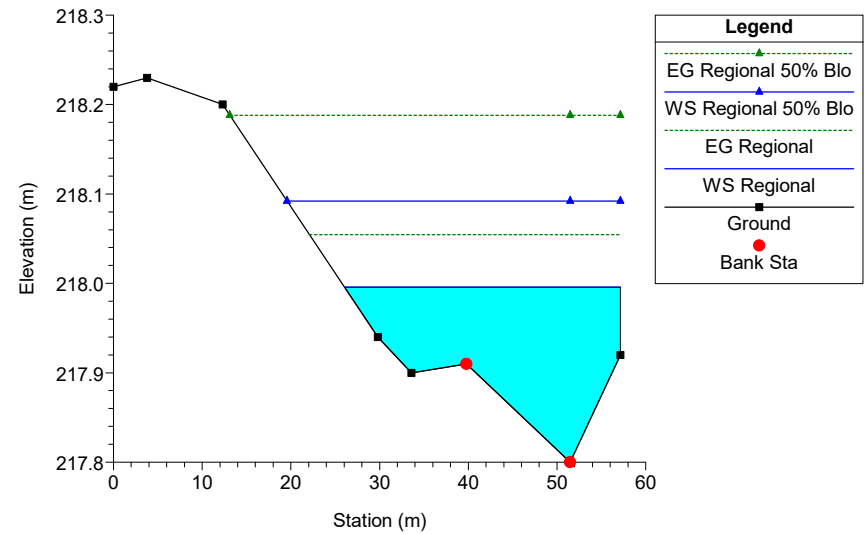
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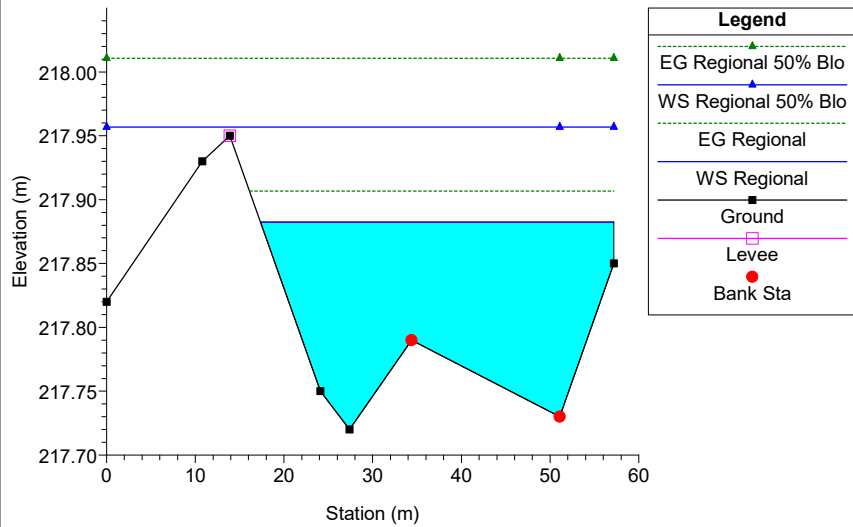
22014 - Stayner Commercial Plan: 1) 1 1/26/2023



22014 - Stayner Commercial Plan: 1) 1 1/26/2023

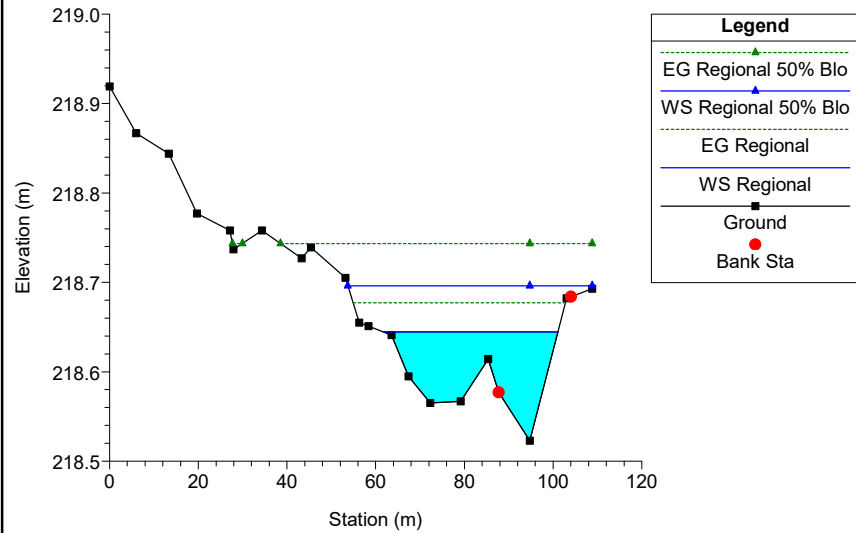


22014 - Stayner Commercial Plan: 1) 1 1/26/2023

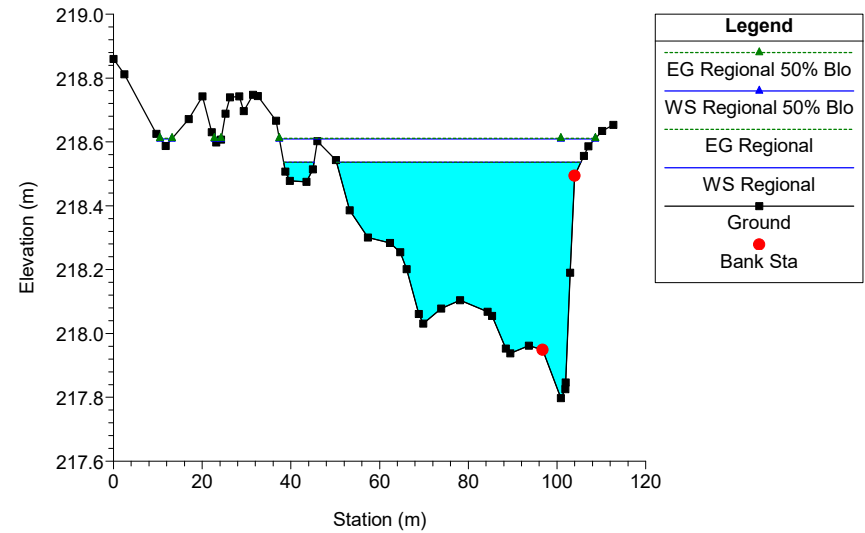


WITH LATERAL WEIR

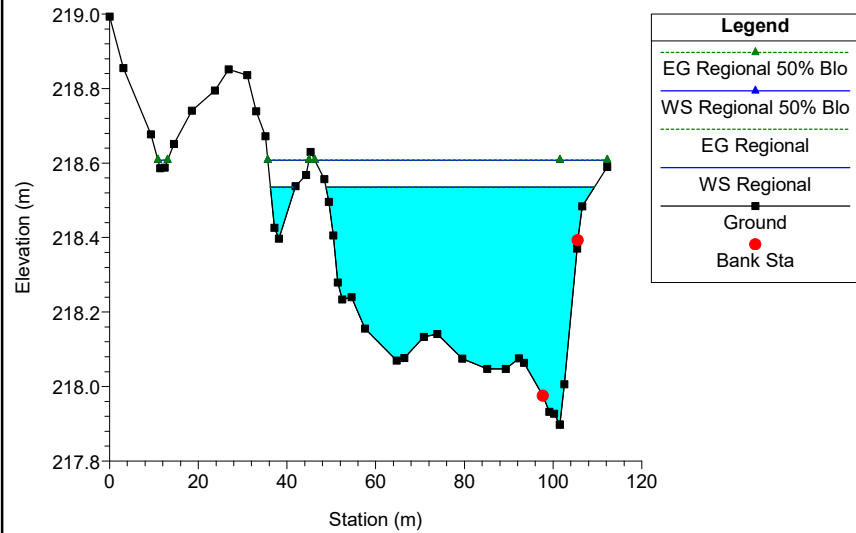
22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023



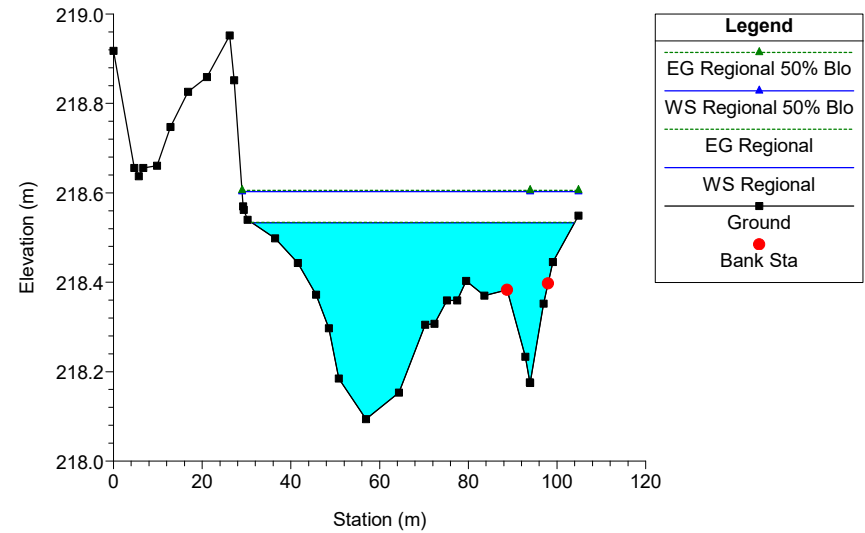
22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023



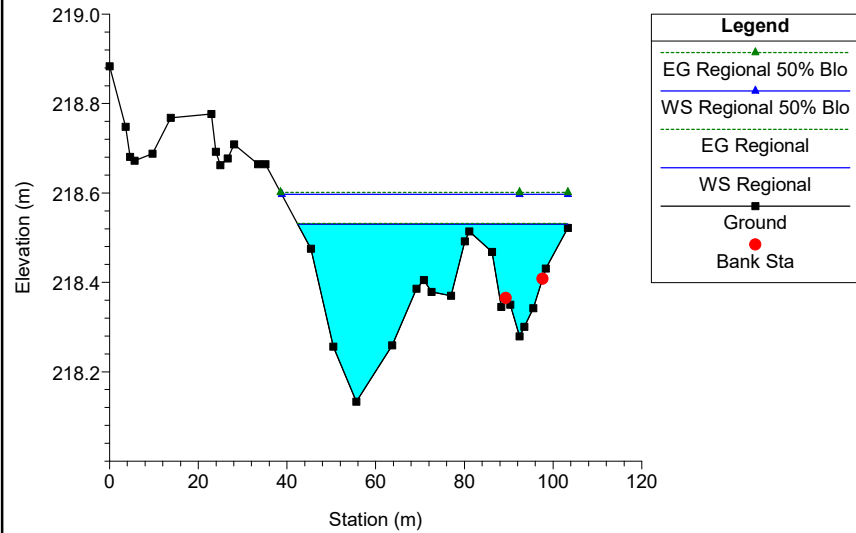
22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023



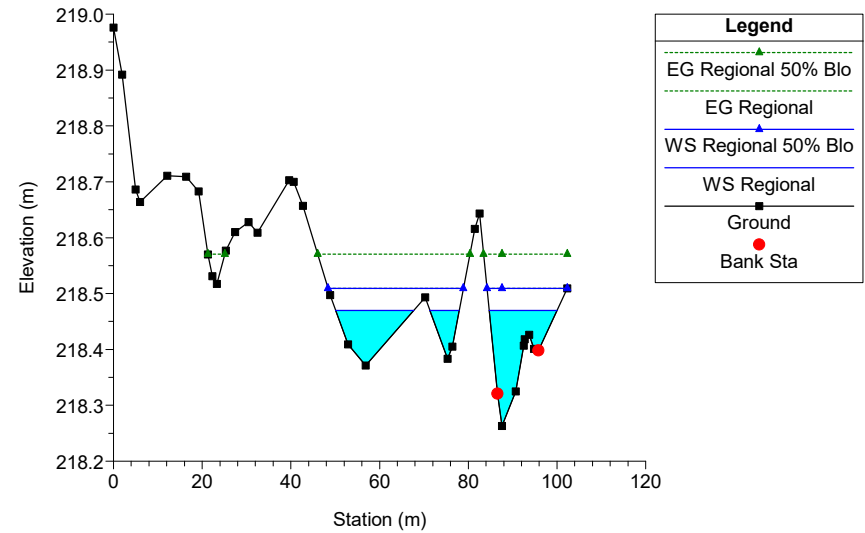
22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023



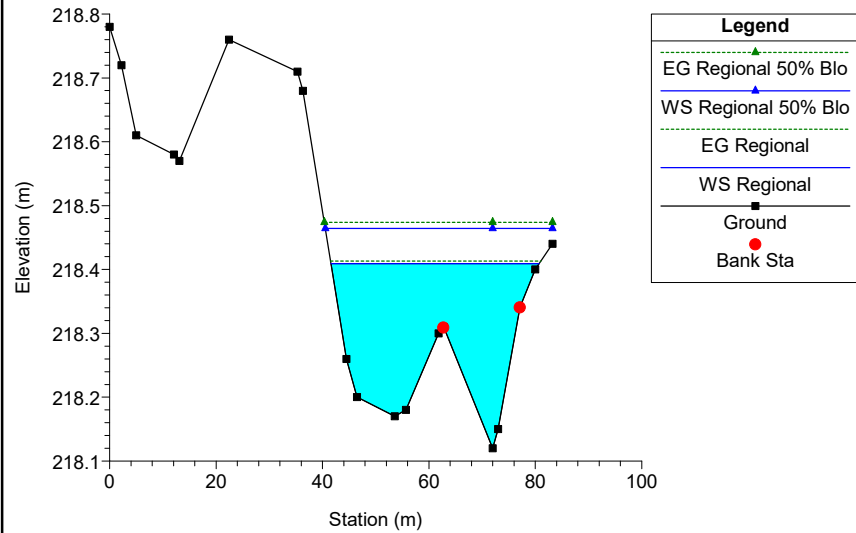
22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023



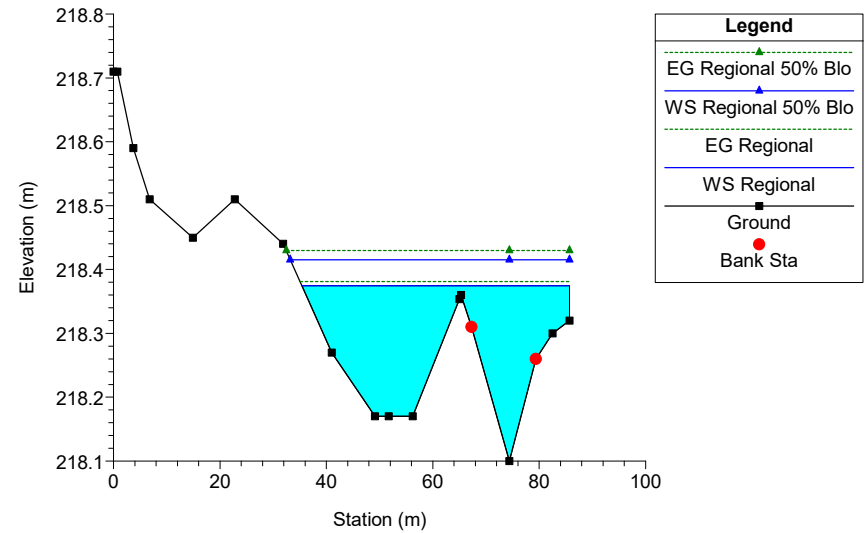
22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023

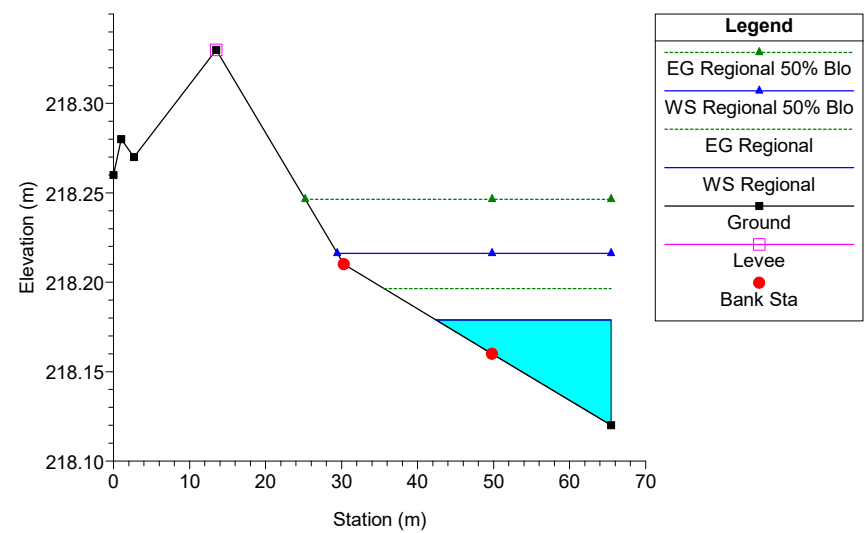
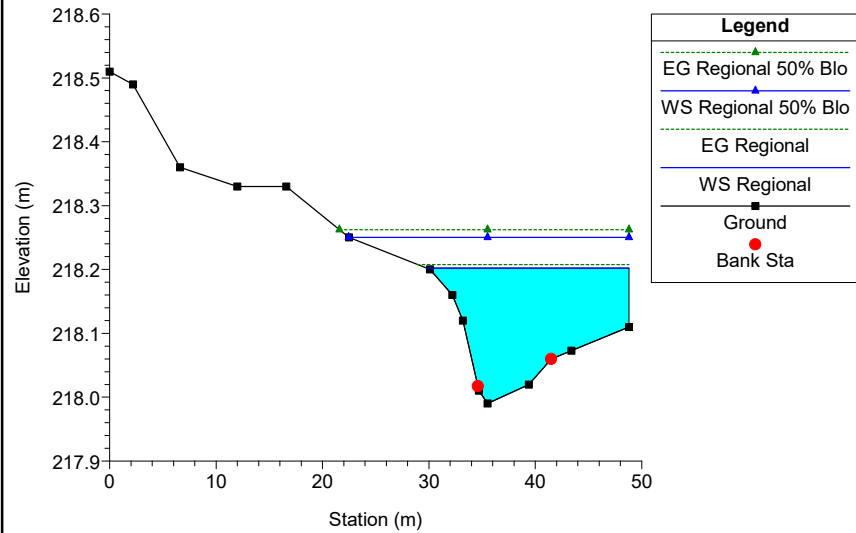
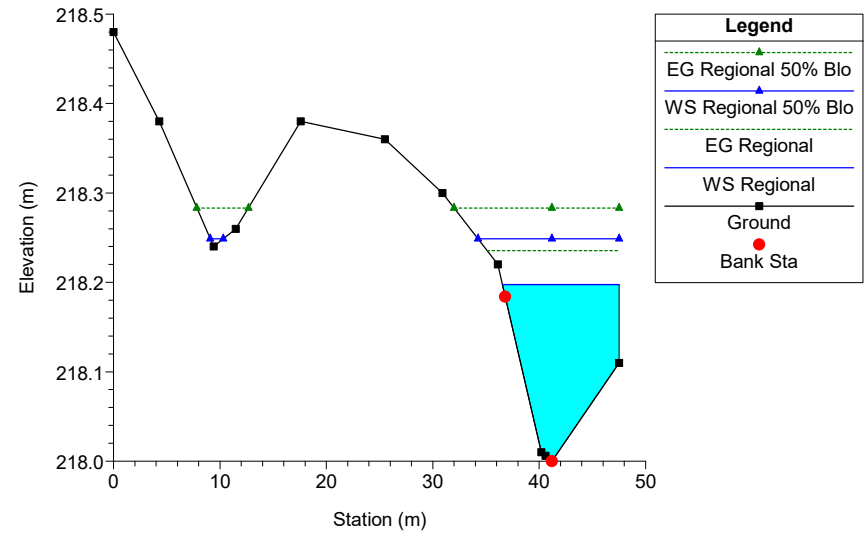
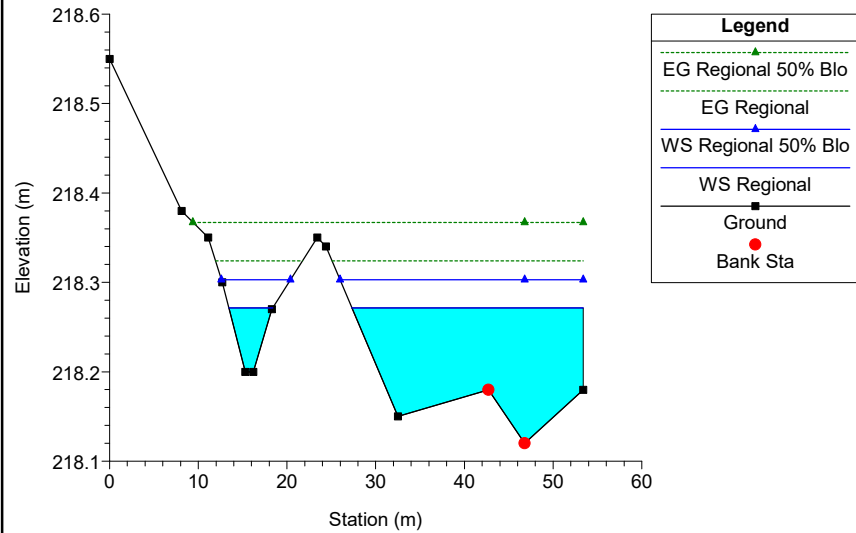


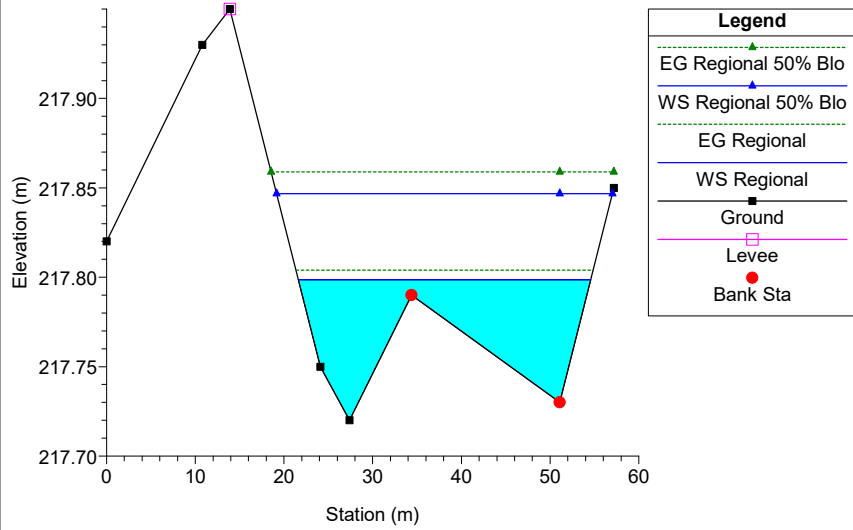
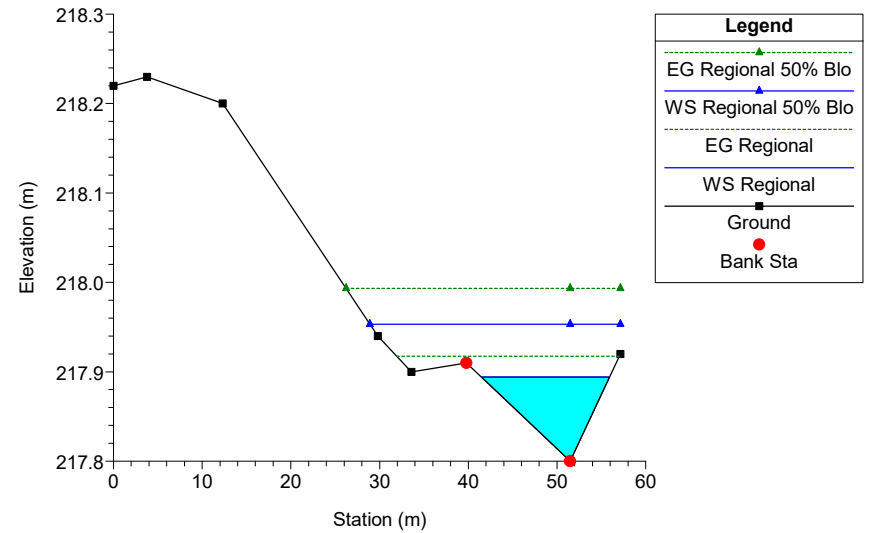
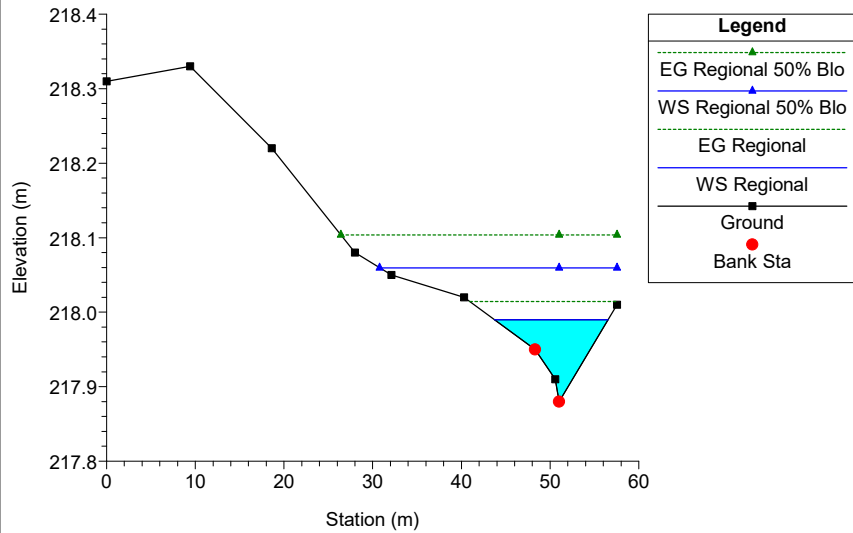
22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023



22014 - Stayner Commercial Plan: 22014 - Existing Conditions_withLWeir 1/26/2023







NO LATERAL WEIR

HEC-RAS Plan: 1 River: River 1 Reach: Reach 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Vel Left (m/s)	Vel Chnl (m/s)	Vel Right (m/s)	Hydr Depth L (m)	Hydr Depth C (m)	Hydr Depth L (m)	Depth Velocity	Depth	Depth
												Product Left (m ² /s)	Velocity Product Channel (m ² /s)	Velocity Product Right (m ² /s)
Reach 1	159	Regional	1.92	218.52	218.64	0.7	0.89		0.05	0.08	0.05	0.04	0.07	0.00
Reach 1	159	Regional 50% Blo	4.67	218.52	218.69	0.92	1.06	0.16	0.09	0.11	0.09	0.08	0.12	0.01
Reach 1	152	Regional	1.92	217.8	218.54	0.08	0.1	0.04	0.35	0.59	0.35	0.03	0.06	0.01
Reach 1	152	Regional 50% Blo	4.67	217.8	218.65	0.14	0.2	0.15	0.37	0.7	0.37	0.05	0.14	0.06
Reach 1	140	Regional	1.92	217.9	218.54	0.08	0.09	0.07	0.38	0.5	0.38	0.03	0.05	0.03
Reach 1	140	Regional 50% Blo	4.67	217.9	218.64	0.13	0.17	0.22	0.41	0.61	0.41	0.05	0.10	0.09
Reach 1	131	Regional	1.92	218.17	218.53	0.12	0.13	0.19	0.22	0.24	0.22	0.03	0.03	0.04
Reach 1	131	Regional 50% Blo	4.67	218.17	218.64	0.19	0.2	0.44	0.31	0.35	0.31	0.06	0.07	0.14
Reach 1	127	Regional	1.92	218.28	218.53	0.18	0.18	0.32	0.18	0.2	0.18	0.03	0.04	0.06
Reach 1	127	Regional 50% Blo	4.67	218.28	218.63	0.24	0.27	0.68	0.26	0.3	0.26	0.06	0.08	0.18
Reach 1	122	Regional	1.92	218.26	218.47	0.52	0.88	1.52	0.05	0.12	0.05	0.03	0.11	0.08
Reach 1	122	Regional 50% Blo	4.67	218.26	218.58	0.42	0.62	1.57	0.12	0.23	0.12	0.05	0.14	0.19
Reach 1	111	Regional	1.92	218.12	218.42	0.27	0.28	0.34	0.19	0.2	0.19	0.05	0.06	0.06
Reach 1	111	Regional 50% Blo	4.67	218.12	218.57	0.3	0.33	0.77	0.3	0.35	0.3	0.09	0.12	0.23
Reach 1	95	Regional	1.92	218.1	218.39	0.2	0.25	0.6	0.14	0.2	0.14	0.03	0.05	0.08
Reach 1	95	Regional 50% Blo	4.67	218.1	218.55	0.18	0.27	0.81	0.19	0.36	0.19	0.03	0.10	0.15
Reach 1	80	Regional	1.92	218.12	218.35	0.16	0.23	0.87	0.12	0.2	0.12	0.02	0.05	0.10
Reach 1	80	Regional 50% Blo	4.67	218.12	218.53	0.19	0.25	0.95	0.24	0.38	0.24	0.05	0.10	0.23
Reach 1	62	Regional	1.92	218	218.29	0.08	0.28	1.12	0.03	0.21	0.03	0.00	0.06	0.03
Reach 1	62	Regional 50% Blo	4.67	218	218.41	0.17	0.41	1.6	0.09	0.33	0.09	0.02	0.14	0.14
Reach 1	51	Regional	1.92	217.99	218.29	0.12	0.27	0.85	0.08	0.27	0.08	0.01	0.07	0.07
Reach 1	51	Regional 50% Blo	4.67	217.99	218.34	0.22	0.53	1.68	0.09	0.32	0.09	0.02	0.17	0.15
Reach 1	42	Regional	1.92	218.16	218.25	0.08	0.18	0.98	0.02	0.06	0.02	0.00	0.01	0.02
Reach 1	42	Regional 50% Blo	4.67	218.16	218.32	0.16	0.29	1.33	0.06	0.14	0.06	0.01	0.04	0.08
Reach 1	27	Regional	1.92	217.88	218.11	0.21	0.36	1.27	0.08	0.18	0.08	0.02	0.06	0.10
Reach 1	27	Regional 50% Blo	4.67	217.88	218.21	0.32	0.48	1.73	0.15	0.28	0.15	0.05	0.13	0.26
Reach 1	14	Regional	1.92	217.8	218	0.24	0.38	1.41	0.07	0.14	0.07	0.02	0.05	0.10
Reach 1	14	Regional 50% Blo	4.67	217.8	218.09	0.33	0.5	1.85	0.13	0.24	0.13	0.04	0.12	0.24
Reach 1	3	Regional	1.92	217.73	217.88	0.32	0.35	1.11	0.11	0.12	0.11	0.04	0.04	0.12
Reach 1	3	Regional 50% Blo	4.67	217.73	217.96	0.35	0.48	1.63	0.12	0.2	0.12	0.04	0.10	0.20

WITH LATERAL WEIR

HEC-RAS Plan:LWeir River: River 1 Reach: Reach 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Vel Left (m/s)	Vel Chnl (m/s)	Vel Right (m/s)	Hydr Depth L (m)	Hydr Depth C (m)	Hydr Depth R (m)	Depth Velocity Product Left (m ² /s)	Depth Velocity Product Channel (m ² /s)	Depth Velocity Product Right (m ² /s)
Reach 1	159	Regional	1.92	218.52	218.64	0.7	0.89		0.05	0.08		0.04	0.07	0.00
Reach 1	159	Regional 50% Blo	4.67	218.52	218.7	0.91	1.04	0.18	0.09	0.11	0.01	0.08	0.11	0.00
Reach 1	158.8	158	Lat Struct											
Reach 1	152	Regional	1.92	217.8	218.54	0.08	0.1	0.04	0.35	0.59	0.02	0.03	0.06	0.00
Reach 1	152	Regional 50% Blo	4.67	217.8	218.61	0.16	0.22	0.15	0.36	0.66	0.05	0.06	0.15	0.01
Reach 1	140	Regional	1.92	217.9	218.54	0.08	0.09	0.07	0.38	0.5	0.04	0.03	0.05	0.00
Reach 1	140	Regional 50% Blo	4.57	217.9	218.61	0.15	0.17	0.19	0.4	0.57	0.09	0.06	0.10	0.02
Reach 1	131	Regional	1.92	218.17	218.53	0.12	0.13	0.19	0.22	0.24	0.06	0.03	0.03	0.01
Reach 1	131	Regional 50% Blo	4.18	218.17	218.6	0.19	0.21	0.42	0.28	0.31	0.12	0.05	0.07	0.05
Reach 1	127	Regional	1.92	218.28	218.53	0.18	0.18	0.32	0.18	0.2	0.06	0.03	0.04	0.02
Reach 1	127	Regional 50% Blo	3.88	218.28	218.6	0.24	0.26	0.61	0.23	0.26	0.13	0.06	0.07	0.08
Reach 1	122	Regional	1.92	218.26	218.47	0.52	0.88	1.53	0.05	0.12	0.04	0.03	0.11	0.06
Reach 1	122	Regional 50% Blo	3.72	218.26	218.51	0.62	0.99	1.89	0.08	0.16	0.06	0.05	0.16	0.11
Reach 1	111	Regional	1.92	218.12	218.41	0.28	0.3	0.35	0.18	0.19	0.03	0.05	0.06	0.01
Reach 1	111	Regional 50% Blo	3.69	218.12	218.46	0.39	0.41	0.68	0.22	0.25	0.07	0.09	0.10	0.05
Reach 1	95	Regional	1.88	218.1	218.37	0.23	0.29	0.64	0.13	0.18	0.08	0.03	0.05	0.05
Reach 1	95	Regional 50% Blo	3.34	218.1	218.42	0.3	0.37	0.95	0.16	0.22	0.12	0.05	0.08	0.11
Reach 1	80	Regional	1.59	218.12	218.27	0.26	0.33	1.26	0.08	0.12	0.12	0.02	0.04	0.15
Reach 1	80	Regional 50% Blo	2.31	218.12	218.3	0.28	0.37	1.41	0.09	0.15	0.15	0.03	0.06	0.21
Reach 1	62	Regional	0.94	218	218.2	0.03	0.22	0.92	0.01	0.12	0.14	0.00	0.03	0.13
Reach 1	62	Regional 50% Blo	1.24	218	218.25	0.05	0.22	0.88	0.02	0.17	0.19	0.00	0.04	0.17
Reach 1	51	Regional	0.56	217.99	218.2	0.07	0.15	0.41	0.06	0.19	0.12	0.00	0.03	0.05
Reach 1	51	Regional 50% Blo	1.07	217.99	218.25	0.08	0.19	0.58	0.06	0.24	0.17	0.00	0.05	0.10
Reach 1	42	Regional	0.36	218.16	218.18		0.06	0.59		0.01	0.04	0.00	0.00	0.02
Reach 1	42	Regional 50% Blo	1.02	218.16	218.22	0.02	0.11	0.8	0	0.03	0.08	0.00	0.00	0.06
Reach 1	27	Regional	0.28	217.88	217.99	0.1	0.22	0.75	0.02	0.07	0.06	0.00	0.02	0.05
Reach 1	27	Regional 50% Blo	1.02	217.88	218.06	0.15	0.31	1.05	0.05	0.13	0.11	0.01	0.04	0.12
Reach 1	14	Regional	0.28	217.8	217.89		0.22	0.84		0.05	0.05	0.00	0.01	0.04
Reach 1	14	Regional 50% Blo	1.02	217.8	217.95	0.17	0.31	1.13	0.04	0.1	0.09	0.01	0.03	0.10
Reach 1	3	Regional	0.28	217.73	217.8	0.18	0.16	0.58	0.05	0.04	0.03	0.01	0.01	0.02
Reach 1	3	Regional 50% Blo	1.02	217.73	217.85	0.27	0.28	0.82	0.08	0.09	0.06	0.02	0.03	0.05