Appendix N: Final Preferred Solutions Conceptual Designs – Whiskey Creek Watershed
THE CITY IS TO PROGRESSIVELY ACQUIRE LAND OR EASEMENTS FOR DRAINS, WATERCOURSES, AND STORAGE AREAS CROSSING OR UPON PRIVATE PROPERTY WHERE IT IS CONSIDERED IN THE CITY’S INTEREST TO DO SO (BY-LAW 90-92: TO PROHIBIT OBSTRUCTION OF DRAINS & WATERCOURSES). PROPERTY ACQUISITION VIA EASEMENT, BLOCK, LOT OR PARCEL IS TO THE CITY’S DISCRETION.

ABANDON/REMOVE EX. STM SEWER

3.1 SIDE SLOPE

PROPERTY ACQUISITION:
A) ADDRESS NOT AVAILABLE (PORTION OF) MINIMUM RECOMMENDED PROPERTY ACQUISITION SHOWN ACTUAL PROPERTY ACQUISITION TO BE CONFIRMED AT DETAILED DESIGN

MATCH TO EXISTING @ 3:1 SLOPE

SWMF DETAILS:
- BOTTOM ELEVATION = 302.00 m
- TOP ELEVATION = 304.00 m
- SURFACE AREA = 4,620 m²
- ACTIVE STORAGE = 7,180 m³

UNDERGROUND INFILTRATION SYSTEM:
- DRAINAGE AREA = 22.8 ha
- AREA = 850 m² (66 m x 13 m)
- STORAGE VOLUME = 605 m³
- PEAK DESIGN FLOW = N/A
- TARGET CONTROL VOLUME = 2.65 mm
- DEPTH OF COVER = 1.60 m
- BOTTOM ELEVATION = 299.60 m

SAFETY ALERT:
ANY DETAIL OR ELEMENT OF THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE CORPORATION OF THE CITY OF BARIE AND TATHAM ENGINEERING LTD. NOR MAY ANY DETAIL OR ELEMENT OF THIS DRAWING BE REMOVED, REPRODUCED, ELECTRONICALLY STORED OR TRANSMITTED IN ANY FORM WITH THE EXPRESS WRITTEN CONSENT OF THE CORPORATION OF THE CITY OF BARIE.

SWMF RETROFIT No. 42
PROJECT No. 67
WHISKEY CREEK WATERSHED

SCALE = 1:1,000
DATE: MARCH 2019

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HARVIE ROAD:
ROAD CLASSIFICATION = ARTERIAL
DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR

EXISTING: 600 mm ø CSP CULVERT
CONVEYANCE CAPACITY < 0.7 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY < 1:2 YEAR
DEPTH OF OVERTOPPING = 0.25 m (REGULATORY EVENT)

PROPOSED: 2100 mm x 1200 mm CONC. BOX CULVERT
CONVEYANCE CAPACITY = 3.9 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR
DEPTH OF OVERTOPPING = 0.01 m (REGULATORY EVENT)

THE SUBJECT ROAD HAS BEEN IDENTIFIED FOR FUTURE ROAD WIDENING AS PART OF THE TRANSPORTATION MASTER PLAN. THE CULVERT IMPROVEMENT SHOWN HAS BEEN DESIGNED FOR THE EXISTING ROAD WIDTH. THE CULVERT LENGTH TO BE CONFIRMED AS PART OF DETAILED DESIGN IN COORDINATION WITH THE TRANSPORTATION MASTER PLAN.

Legend:
- PR. CULVERT
- PR. STORM SEWER
- EX. SANITARY SEWER
- EX. SANITARY MAINTENANCE HOLE
- EX. STORM SEWER
- EX. CULVERT
- EX. PROPERTY LINE
- PROPERTY ACQUISITION
- WATERCOURSE

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Tatham Engineering Barrie

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION
PROJECT No. 68
CULVERT IMPROVEMENT No. 53 (HARVIE ROAD)
WHISKEY CREEK WATERSHED
SCALE = 1:500
DATE: MARCH 2019
HARVIE ROAD:
ROAD CLASSIFICATION = ARTERIAL
DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR

EXISTING: 1200 mm ø CSP CULVERT
CONVEYANCE CAPACITY = 3.4 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY = 1:10 YEAR

PROPOSED: 1800 mm ø CONC. CULVERT
(EMBEDDED 300mm)
CONVEYANCE CAPACITY = 6.4 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR

THE SUBJECT ROAD HAS BEEN IDENTIFIED FOR FUTURE ROAD WIDENING AS PART OF THE TRANSPORTATION MASTER PLAN. THE CULVERT IMPROVEMENT SHOWN HAS BEEN DESIGNED FOR THE EXISTING ROAD WIDTH. THE CULVERT LENGTH TO BE CONFIRMED AS PART OF DETAILED DESIGN IN COORDINATION WITH THE TRANSPORTATION MASTER PLAN.
CONCEPTUAL DESIGNS OF THE HARVIE ROAD AND BIG BAY POINT ROAD IMPROVEMENTS HAVE BEEN PREPARED UNDER SEPARATE STUDY (HARVIE ROAD AND BIG BAY POINT ROAD NEW CROSSING – HIGHWAY 400).

CULVERT IMPROVEMENT No. 54
(SEE PROJECT No. 70)

WHISKEY CREEK
(REACH Wh-3)

REALIGN WATERCOURSE TO ACCOMMODATE FUTURE HARVIE RD. IMPROVEMENTS

CULVERT IMPROVEMENT No. 55
(SEE PROJECT No. 172)

HARVIE RD (FUTURE)

PROPERTY ACQUISITION: NONE

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION

PROJECT No. 171
WATERCOURSE IMPROVEMENT No. 15
WHISKEY CREEK WATERSHED

SCALE = 1:500

DATE: JANUARY 2019

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HIGHWAY 400:
ROAD CLASSIFICATION = PROVINCIAL HIGHWAY
DESIGN FLOOD FREQUENCY CRITERIA = 1:50 YEAR
MDP RECOMMENDED DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR

EXISTING: 1200 mm x 1200 CONC. BOX CULVERT
CONVEYANCE CAPACITY = 8.2 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR
DEPTH OF OVERTOPPING = 0.41 m (REGULATORY EVENT)

PROPOSED: 2250 mm ø CONC. CULVERT
CONVEYANCE CAPACITY = 21.2 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = REGIONAL (HURRICANE HAZEL) STORM
DEPTH OF OVERTOPPING = 0.0 m (REGULATORY EVENT)
CULVERT SIZED TO ELIMINATE INTERWATERSHED SPILL

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION
PROJECT No. 172
CULVERT IMPROVEMENT No. 55
(HIGHWAY 400)
WHISKEY CREEK WATERSHED
SCALE = 1:750

DATE: JANUARY 2019
FAIRVIEW ROAD:
ROAD CLASSIFICATION = ARTERIAL
DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR
EXISTING: 1200 mm x 1200 mm CONC. BOX CULVERT
CONVEYANCE CAPACITY = 7.4 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR (EXISTING FLOWS)
DEPTH OF OVERTOPPING = 0.35 m (REGULATORY EVENT)

PROPOSED: 1800 mm x 1200 mm CONC. BOX CULVERT
CONVEYANCE CAPACITY = 8.4 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR (FUTURE FLOWS)
DEPTH OF OVERTOPPING = 0.21 m (REGULATORY EVENT)

CULVERT SIZED TO PROVIDE SAFE ACCESS/EGRESS
BAYVIEW DRIVE:
ROAD CLASSIFICATION = COLLECTOR
DESIGN FLOOD FREQUENCY CRITERIA = 1:50 YEAR
MDP RECOMMENDED DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR

EXISTING: TWIN 1650 mm x 1050 mm ELLIPTICAL CONC. CULVERTS
CONVEYANCE CAPACITY = 6.1 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY = 1.25 YEAR
DEPTH OF OVERTOPPING = 0.70 m (REGULATORY EVENT)

PROPOSED: TWIN 2400 mm x 900 mm CONC. BOX CULVERTS
CONVEYANCE CAPACITY = 8.2 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:50 YEAR
DEPTH OF OVERTOPPING = 0.57 m (REGULATORY EVENT)

PROPOSED CULVERT SIZE TO BE REVIEWED AT DETAILED DESIGN TO REDUCE DEPTH OF OVERTOPPING

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THE SUBJECT ROAD HAS BEEN IDENTIFIED FOR FUTURE ROAD WIDENING AS PART OF THE TRANSPORTATION MASTER PLAN. THE CULVERT IMPROVEMENT SHOWN HAS BEEN DESIGNED FOR THE EXISTING ROAD WIDTH. THE CULVERT LENGTH TO BE CONFIRMED AS PART OF DETAILED DESIGN IN COORDINATION WITH THE TRANSPORTATION MASTER PLAN.

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LEGEND
- PR. CULVERT
- PR. STORM SEWER
- PR STORM MAINTENANCE HOLE
- EX. STORM SEWER
- EX. STORM MAINTENANCE HOLE
- WATERCOURSE
- EX. SANITARY SEWER
- EX. SANITARY MAINTENANCE HOLE
- EX. WATERMAIN
- EX. CULVERT
- EX. PROPERTY LINE
- PROPERTY ACQUISITION

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION
PROJECT No. 72
CULVERT IMPROVEMENT No. 57
(BAYVIEW DRIVE)
WHISKEY CREEK WATERSHED
SCALE = 1:500
DATE: MARCH 2019
THE CITY IS TO PROGRESSIVELY ACQUIRE LAND OR EASEMENTS FOR DRAINS, WATERCOURSES AND STORAGE AREAS CROSSING OR UPON PRIVATE PROPERTY WHERE IT IS CONSIDERED IN THE CITY’S INTEREST TO DO SO (BY-LAW 90-92: TO PROHIBIT OBSTRUCTION OF DRAINS & WATERCOURSES). PROPERTY ACQUISITION VIA EASEMENT, BLOCK, LOT OR PARCEL IS TO THE CITY’S DISCRETION.

PROPERTY ACQUISITION:
A) ADDRESS NOT AVAILABLE (PORTION OF)
MINIMUM RECOMMENDED PROPERTY ACQUISITION SHOWN
ACTUAL PROPERTY ACQUISITION TO BE CONFIRMED AT DETAILED DESIGN

THE CITY IS TO PROGRESSIVELY ACQUIRE LAND OR EASEMENTS FOR DRAINS, WATERCOURSES AND STORAGE AREAS CROSSING OR UPON PRIVATE PROPERTY WHERE IT IS CONSIDERED IN THE CITY’S INTEREST TO DO SO (BY-LAW 90-92: TO PROHIBIT OBSTRUCTION OF DRAINS & WATERCOURSES). PROPERTY ACQUISITION VIA EASEMENT, BLOCK, LOT OR PARCEL IS TO THE CITY’S DISCRETION.

PROPERTY ACQUISITION:
A) ADDRESS NOT AVAILABLE (PORTION OF)
MINIMUM RECOMMENDED PROPERTY ACQUISITION SHOWN
ACTUAL PROPERTY ACQUISITION TO BE CONFIRMED AT DETAILED DESIGN

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THE CITY IS TO PROGRESSIVELY ACQUIRE LAND OR EASEMENTS FOR DRAINS, WATERCOURSES AND STORAGE AREAS CROSSING OR UPON PRIVATE PROPERTY WHERE IT IS CONSIDERED IN THE CITY'S INTEREST TO DO SO (BY-LAW 90-92: TO PROHIBIT OBSTRUCTION OF DRAINS & WATERCOURSES). PROPERTY ACQUISITION VIA EASEMENT, BLOCK, LOT OR PARCEL IS TO THE CITY’S DISCRETION.
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THE CITY IS TO PROGRESSIVELY ACQUIRE LAND OR EASEMENTS FOR DRAINS, WATERCOURSES AND STORAGE AREAS CROSSING OR UPON PRIVATE PROPERTY WHERE IT IS CONSIDERED IN THE CITY’S INTEREST TO DO SO (BY LAW 90-92: TO PROHIBIT OBSTRUCTION OF DRAINS & WATERCOURSES). PROPERTY ACQUISITION VIA EASEMENT, BLOCK, LOT OR PARCEL IS TO THE CITY’S DISCRETION.

LEGEND
- PR STORM MAINTENANCE HOLE
- PR. STORM SEWER
- EX. SANITARY SEWER
- EX. SANITARY MAINTENANCE HOLE
- PR. LID
- EX. WATERMAIN
- EX. STORM MAINTENANCE HOLE
- EX. STORM SEWER
- EX. WATERCOURSE
- EX. PROPERTY LINE
- PROPERTY ACQUISITION

UNDERGROUND INFILTRATION SYSTEM:
- DRAINAGE AREA = 6.9 ha
- AREA = 140 m² (28 m X 5 m)
- STORAGE VOLUME = 194 m³
- PEAK DESIGN FLOW = 0.39 m³/s (25 mm STORM)
- TARGET CONTROL VOLUME = 2.86 mm (25 mm STORM)
- DEPTH OF COVER = 6.25 m
- BOTTOM ELEVATION = 274.25 m

SWMF CREATION FOR WATER QUALITY TREATMENT:
- LEVEL 1 “ENHANCED” TREATMENT (80% TSS REMOVAL)
- PHOSPHORUS REDUCTION = 33.6 kg/year

PROPERTY ACQUISITION:
A) 43 CHIEFTAIN CR
MINIMUM RECOMMENDED PROPERTY ACQUISITION SHOWN ACTUAL PROPERTY ACQUISITION TO BE CONFIRMED AT DETAILED DESIGN

DATE: MARCH 2019

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION
PROJECT No. 75
SWMF RETROFIT No. 40
WHISKEY CREEK WATERSHED
SCALE = 1:1,250
DATE: MARCH 2019
IMPLEMENT STEP-POOL SEQUENCE TO STABILIZE CHANNEL BED (SEE DETAILS)

UTILIZE BIO-ENGINEERED BANK TREATMENT TO STABILIZE CONFLUENCE OF TRIBUTARY AND MAIN CHANNEL (SEE DETAILS)

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION
PROJECT No. 76
WATERCOURSE IMPROVEMENT No. 17
WHISKEY CREEK WATERSHED
SCALE = 1:750
DATE: MARCH 2019

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PROPERTY ACQUISITION: NONE
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LEGEND
- BANK EROSION
- BED EROSION/ KNICKPOINT
- INFRASTRUCTURE AT RISK
- PR. STORM MAINTENANCE HOLE
- EX. STORM MAINTENANCE HOLE
- EX. SANITARY SEwer
- EX. WATERCOURSE
- EX. WATERMAIN
- EX. STORM SEWER
- EX. PROPERTY LINE
- PROPERTY ACQUISITION:
  - NONE

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION
PROJECT No. 77
WATERCOURSE IMPROVEMENT No. 18
WHISKEY CREEK WATERSHED
SCALE = 1:1,000
DATE: MARCH 2019
CULVERT IMPROVEMENT No. 60
(SEE PROJECT No. 80)

HEADWALL/WINGWALLS
PR. 22.0 m - TWIN 1800 mm ø CONC. CULVERTS

WHISKEY CREEK
(REACH Wh-7b)

EX. TWIN 1950 mm X 1200 mm HE CONC. CULVERT
(TO BE REMOVED)

LITTLE AVE
HURONIA RD

PROPERTY ACQUISITION:
NONE

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LEGEND
- PR. CULVERT
- PR. STORM SEWER
- PR STORM MAINTENANCE HOLE
- EX. STORM SEWER
- EX. STORM MAINTENANCE HOLE
- WATERCOURSE
- EX. SANITARY SEWER
- EX. SANITARY MAINTENANCE HOLE
- EX. WATERMAIN
- EX. CULVERT
- EX. PROPERTY LINE
- PROPERTY ACQUISITION

PROJECT No. 78
CULVERT IMPROVEMENT No. 147
(BCRY RAILWAY)
WHISKEY CREEK WATERSHED
SCALE = 1:500
DATE: MARCH 2019

BCRY RAILWAY:
DESIGN FLOOD FREQUENCY CRITERIA = 1:50 YEAR
MDP RECOMMENDED DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR

EXISTING: TWIN 1350 mm x 1200 mm ELLIPTICAL CONC. CULVERTS
CONVEYANCE CAPACITY = 7.6 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY = 1:5 YEAR
DEPTH OF OVERTOPPING = 0.50 m (REGULATORY EVENT)

PROPOSED: TWIN 1800 mm ø CONC. CULVERTS
CONVEYANCE CAPACITY = 29.2 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR
DEPTH OF OVERTOPPING = 0.33 m (REGULATORY EVENT)

PROPOSED CULVERT SIZE TO BE REVIEWED AT DETAILED DESIGN TO REDUCE DEPTH OF OVERTOPPING
**PR. OPEN BOTTOM SPAN STRUCTURE**
SPAN = 10.67 m
LENGTH = 27 m
CLEAR HEIGHT = 1.2 m

**HEADWALL/WINGWALLS**

**WATERCOURSE IMPROVEMENT No. 31**
(SEE PROJECT No. 81)

**WHISKEY CREEK**
(REACH Wh-7b)

**PR. OPEN BOTTOM SPAN STRUCTURE**
SPAN = 10.67 m
LENGTH = 27 m
CLEAR HEIGHT = 1.2 m

**PROPOSED CULVERT SIZE TO BE REVIEWED AT DETAILED DESIGN TO REDUCE DEPTH OF OVERTOPPING**

**LEGEND**

- **PR. CULVERT**
- **PR. STORM SEWER**
- **PR STORM MAINTENANCE HOLE**
- **EX. SANITARY WATERCOURSE IMPROVEMENTS**
- **EX. SANITARY MAINTENANCE HOLE**
- **EX. SANITARY SEWER**
- **EX. WATERMAIN**
- **EX. CULVERT**
- **EX. PROPERTY LINE**
- **PROPERTY ACQUISITION**

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**DRAINAGE MASTER PLAN**
**FINAL PREFERRED ALTERNATIVE SOLUTION**

**PROJECT No. 80**
**CULVERT IMPROVEMENT No. 60**
(HURONIA ROAD)

**WHISKEY CREEK WATERSHED**

**SCALE** = 1:500

**DATE:** MARCH 2019
THE CITY IS TO PROGRESSIVELY ACQUIRE LAND OR EASEMENTS FOR DRAINS, WATERCOURSES AND STORAGE AREAS CROSSING OR UPON PRIVATE PROPERTY WHERE IT IS CONSIDERED IN THE CITY’S INTEREST TO DO SO (BY-LAW 90-92: TO PROHIBIT OBSTRUCTION OF DRAINS & WATERCOURSES). PROPERTY ACQUISITION VIA EASEMENT, BLOCK, LOT OR PARCEL IS TO THE CITY’S DISCRETION.
SWMF RETROFIT FOR WATER QUALITY TREATMENT:
LEVEL 1 "ENHANCED" TREATMENT (80% TSS REMOVAL)
PHOSPHORUS REDUCTION = 7.2 kg/year

SWMF DETAILS:
BOTTOM ELEVATION = 236.40 m
PERMANENT POOL ELEVATION = 236.70
TOP ELEVATION = 237.00 m
SURFACE AREA = 2,960 m²
PERMANENT POOL VOLUME = 750 m³

PROPOSED SWMF OUTLET CONTROLS:
1) 1 - 10 m WIDE OVERFLOW SPILLWAY
   (5:1 SIDE SLOPES, INV. = 236.70 m)

OIL GRIT SEPARATOR
(DESIGN FLOW RATE = 0.26 m³/s)
375 mm ø STM

OIL GRIT SEPARATOR
(DESIGN FLOW RATE = 0.49 m³/s)
600 mm ø STM

PROPOSED DITCH

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**LITTLE AVENUE:**
- **ROAD CLASSIFICATION:** ARTERIAL
- **DESIGN FLOOD FREQUENCY CRITERIA:** 1:100 YEAR

**EXISTING:**
- 6000 mm x 1200 mm CONC. BOX CULVERT
- **CONVEYANCE CAPACITY:** 16.3 m³/s (EXISTING FLOWS)
- **DESIGN FLOOD FREQUENCY:** 1:25 YEAR
- **DEPTH OF OVERTOPPING:** 0.83 m (REGULATORY EVENT)

**PROPOSED:**
- TWIN 7.36 OPEN BOTTOM SPAN STRUCTURES
- **CONVEYANCE CAPACITY:** 27.1 m³/s (FUTURE FLOWS)
- **DESIGN FLOOD FREQUENCY:** 1:25 YEAR
- **DEPTH OF OVERTOPPING:** 0.60 m (REGULATORY EVENT)

**PROPOSED CULVERT SIZE TO BE REVIEWED AT DETAILED DESIGN TO REDUCE DEPTH OF OVERTOPPING**

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PROPERTY ACQUISITION:
A) 322 LITTLE AVE.
MINIMUM RECOMMENDED PROPERTY ACQUISITION SHOWN ACTUAL PROPERTY ACQUISITION TO BE CONFIRMED AT DETAILED DESIGN

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THE SUBJECT ROAD HAS BEEN IDENTIFIED FOR FUTURE ROAD WIDENING AS PART OF THE TRANSPORTATION MASTER PLAN. THE CULVERT IMPROVEMENT SHOWN HAS BEEN DESIGNED FOR THE EXISTING ROAD WIDTH. THE CULVERT LENGTH TO BE CONFIRMED AS PART OF DETAILED DESIGN IN COORDINATION WITH THE TRANSPORTATION MASTER PLAN.

YONGE STREET:
ROAD CLASSIFICATION = ARTERIAL
DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR

EXISTING: 2400 mm x 1800 mm CONC. BOX CULVERT
CONVEYANCE CAPACITY = 18.5 m³/s (EXISTING FLOWS)
DEPTH OF OVERTOPPING = 0.52 m (REGULATORY EVENT)

PROPOSED: TWIN 3000 mm x 1800 mm CONC. BOX CULVERTS
CONVEYANCE CAPACITY = 38.9 m³/s (FUTURE FLOWS)
DEPTH OF OVERTOPPING = 0.35 m (REGULATORY EVENT)

PROPOSED CULVERT SIZE TO BE REVIEWED AT DETAILED DESIGN TO REDUCE DEPTH OF OVERTOPPING.

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HURST DRIVE:
ROAD CLASSIFICATION = ARTERIAL
DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR
EXISTING: 1200 mm ø CSP AND 1800 mm ø CSP CULVERTS
CONVEYANCE CAPACITY = 19.2 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY = 1:50 YEAR
DEPTH OF OVERTOPPING = 0.84 m (REGULATORY EVENT)
PROPOSED: 3600 mm x 2100 mm CONC. BOX CULVERT
CONVEYANCE CAPACITY = 38.3 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR
DEPTH OF OVERTOPPING = 0.62 m (REGULATORY EVENT)
CULVERT DESIGNED TO MAXIMIZE FLOOD PLAIN
STORAGE USED UPSTREAM DURING THE 1:100 YEAR
STORM WITHOUT OVERTOPPING THE ROADWAY

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THE BOULEVARD:
ROAD CLASSIFICATION = URBAN LOCAL
DESIGN FLOOD FREQUENCY CRITERIA = 1:50 YEAR
MDP RECOMMENDED DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR

EXISTING 1790 mm x 1000 mm CSPA CULVERT
CONVEYANCE CAPACITY < 3.0 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY < 1:2 YEAR
DEPTH OF OVERTOPPING = 1.44 m (REGULATORY EVENT)

PROPOSED 10.67 m OPEN BOTTOM SPAN STRUCTURE
CONVEYANCE CAPACITY = 37.3 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR
DEPTH OF OVERTOPPING = 0.67 m (REGULATORY EVENT)

PROPOSED CULVERT SIZE TO BE REVIEWED AT DETAILED DESIGN TO REDUCE DEPTH OF OVERTOPPING

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LEGEND
- BANK EROSION
- BED EROSION/KNICKPOINT
- INFRASTRUCTURE AT RISK
- PR. STORM MAINTENANCE HOLE
- EX. SANITARY SEWER
- EX. WATERCOURSE
- EX. WATERMAIN
- EX. STORM MAINTENANCE HOLE
- EX. STORM SEWER
- EX. PROPERTY LINE
- PROPERTY ACQUISITION

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION
PROJECT No. 175
WATERCOURSE IMPROVEMENT No. 20
WHISKEY CREEK WATERSHED
SCALE = 1:500
DATE: MARCH 2019

CULVERT IMPROVEMENT No. 66
(SEE PROJECT No. 176)

CULVERT IMPROVEMENT No. 65
(SEE PROJECT No. 174)

EXISTING RESIDENCE
(TO BE REMOVED)

TRUNK STORM SEWER No. 13
(SEE PROJECT No. 90A)

PROPERTY ACQUISITION:
A) 7 BRENNAN AVE.
B) 199 THE BOULEVARD (PORTION OF)

MINIMUM RECOMMENDED
PROPERTY ACQUISITION SHOWN
ACTUAL PROPERTY ACQUISITION TO
BE CONFIRMED AT DETAILED DESIGN

REGRADE/RESHAPE WATERCOURSE
FROM BRENNAN AVE. TO THE BOULEVARD @ 0.0%

PROPERTY ACQUISITION:
A) 7 BRENNAN AVE.
B) 199 THE BOULEVARD (PORTION OF)
PR. TWIN OPEN BOTTOM SPAN STRUCTURES
SPANS = 9.14 m
CLEAR HEIGHT = 1.4 m (WEST)
CLEAR HEIGHT = 1.2 m (EAST)
LENGTH = 12.4 m

HEADWALL/WINGWALLS

HEADWALL/WINGWALLS

EX. 3650 mm x 1800 mm BOX CULVERT
(SEE PROJECT No. 177)

WATERCOURSE
IMPROVEMENT No. 21
(See Project No. 175)

WATERCOURSE
IMPROVEMENT No. 20
(SEE PROJECT No. 177)

BRENNAN AVENUE:
ROAD CLASSIFICATION = URBAN LOCAL
DESIGN FLOOD FREQUENCY CRITERIA = 1:50 YEAR
MDP RECOMMENDED DESIGN FLOOD FREQUENCY CRITERIA = 1:100 YEAR
EXISTING 3650 x 1800 mm CONC. BOX CULVERT CONVEYANCE CAPACITY = 9.8 m³/s (EXISTING FLOWS)
DESIGN FLOOD FREQUENCY = 1:5 YEAR
DEPTH OF OVERTOPPING = 1.41 m (REGULATORY EVENT)
PROPOSED TWIN 9.14 m OPEN BOTTOM SPAN STRUCTURES CONVEYANCE CAPACITY = 37.4 m³/s (FUTURE FLOWS)
DESIGN FLOOD FREQUENCY = 1:100 YEAR
DEPTH OF OVERTOPPING = 1.05 m (REGULATORY EVENT)
PROPOSED CULVERT SIZE TO BE REVIEWED AT DETAILED DESIGN TO REDUCE DEPTH OF OVERTOPPING

EX. 3650 mm x 1800 mm BOX CULVERT (TO BE REMOVED)

LIMIT OF ROAD GRADING

WHITE OAKS RD
BRENNAN AVE

DATE: MARCH 2019

PROPERTY ACQUISITION:
NONE

PROJECT No. 176
CULVERT IMPROVEMENT No. 66
(BRENNAN AVE.)
WHISKEY CREEK WATERSHED
SCALE = 1:500

DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION

PROPERTY LINE

HOUSEHOLD HOLE

Tatham
ENGINEERING
Barrie

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LEGEND

- PR. CULVERT
- PR. STORM SEWER
- PR STORM MAINTENANCE HOLE
- EX. STORM SEWER
- EX. STORM MAINTENANCE HOLE
- WATERCOURSE
- EX. SANITARY SEWER
- EX. SANITARY MAINTENANCE HOLE
- EX. WATERMAIN
- EX. CULVERT
- EX. PROPERTY LINE
- PROPERTY ACQUISITION
PROPERTY ACQUISITION: NONE

LEGEND

- BANK EROSION
- BED EROSION/KNICKPOINT
- INFRASTRUCTURE AT RISK
- PR. STORM MAINTENANCE HOLE
- PR. STORM SEWER
- EX. SANITARY MAINTENANCE HOLE
- EX. SANITARY SEWER
- EX. WATERCOURSE
- EX. WATERMAIN
- EX. STORM MAINTENANCE HOLE
- EX. STORM SEWER
- EX. PROPERTY LINE
- PROPERTY ACQUISITION

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DRAINAGE MASTER PLAN
FINAL PREFERRED ALTERNATIVE SOLUTION

PROJECT No. 177
WATERCOURSE IMPROVEMENT No. 21
WHISKEY CREEK WATERSHED

SCALE = 1:500

DATE: MARCH 2019