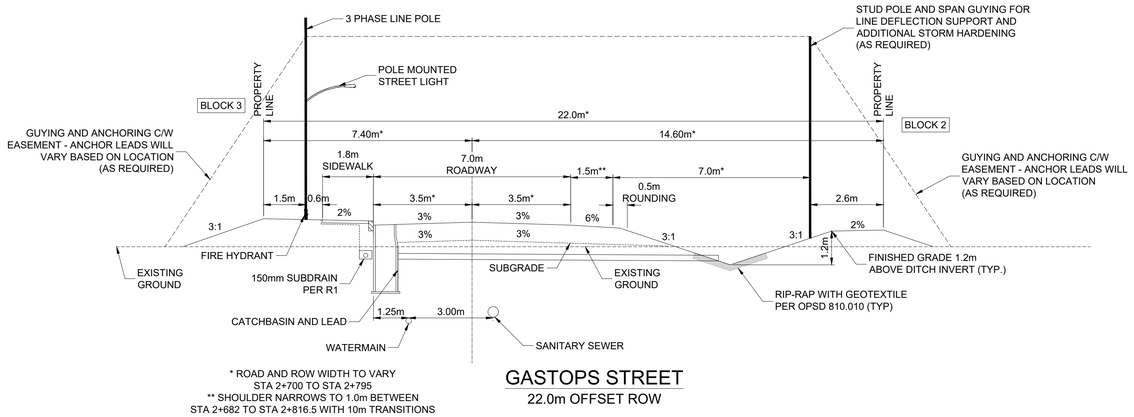
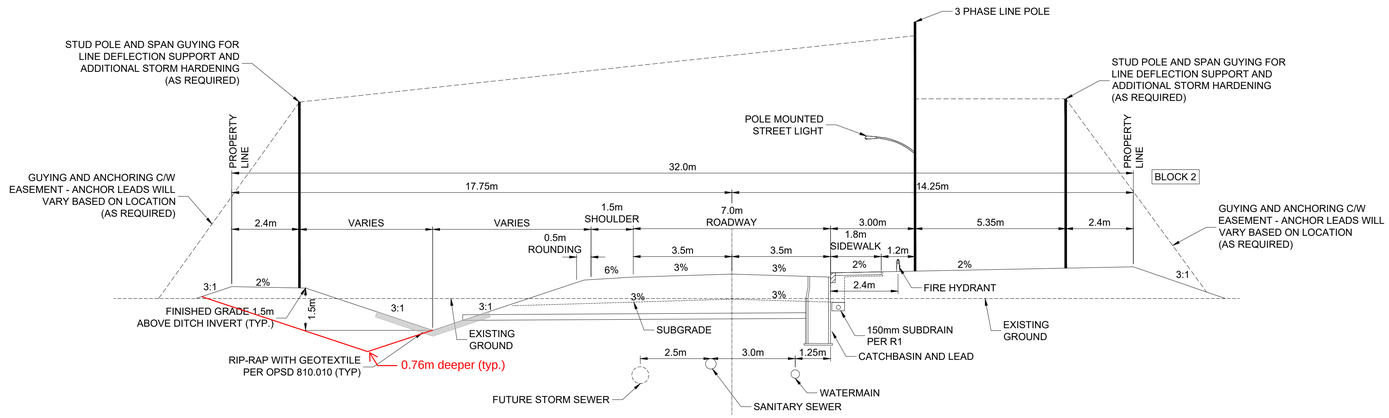
Appendix D

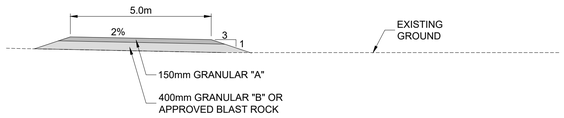


* ROAD AND ROW WIDTH TO VARY STA 2+700 TO STA 2+795
** SHOULDER NARROWS TO 1.0m BETWEEN STA 2+682 TO STA 2+816.5 WITH 10m TRANSITIONS

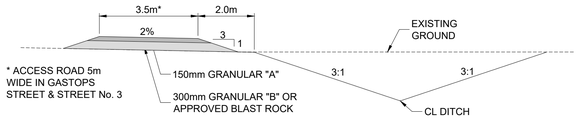
GASTOPS STREET
22.0m OFFSET ROW



MOSQUITO DRIVE
32.0m OFFSET ROW



PERMANENT GRAVEL ACCESS ROAD
(BLOCK 18)



TEMPORARY GRAVEL ACCESS ROAD
(GASTOPS STREET, STREET NO.3, MOSQUITO DRIVE)

GRAVEL ACCESS ROAD - GEOTECHNICAL NOTES

1. ROAD STRUCTURE PER PATERSON MEMO PG4958-MEMO.17

   TEMPORARY ACCESS ROAD (GASTOPS, STREET NO. 3, MOSQUITO DRIVE)
   150MM - BASE OPSS GRANULAR A OR OPSS GRANULAR B TYPE CRUSHED STONE
   300MM - SUBBASE OPSS OPSS GRANULAR B TYPE II OR APPROVED BLAST ROCK

   PERMANENT ACCESS ROAD (BLOCK 18)
   150MM - BASE OPSS GRANULAR A OR OPSS GRANULAR B TYPE CRUSHED STONE
   400MM - SUBBASE OPSS OPSS GRANULAR B TYPE II OR APPROVED BLAST ROCK

2. WHERE BLAST ROCK IS USED GEOTEXTILE TO BE PLACED BETWEEN THE SUBBASE AND BASE LAYER. WOVEN GEOTEXTILE - TERRAFIX 200W OR APPROVED EQUIVALENT
3. GRANULAR BASE AND SUBBASE TO BE PLACED IN MAXIMUM 300MM THICK LIFTS AND COMPACTED TO A MINIMUM OF 100% OF THE MATERIALS SPMDD
4. FILL USED TO RAISE THE SUBGRADE LEVEL SHALL BE COMPACTED TO A MINIMUM OF 95% OF ITS SPMDD. SITE GENERATED CLAY FILL SHALL BE COMPACTED WITH A SHEEPSFOOT ROLLER AND REVIEWED BY THE GEOTECHNICAL ENGINEER

CLIENT

Riverside South

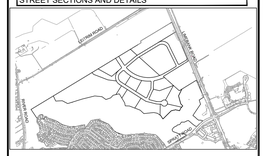
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ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION 1 FOR CITY REVIEW	2023-11-24
2	SUBMISSION 2 FOR CITY REVIEW	2024-02-21
3	ISSUED FOR TENDER	2024-02-23
4	SUBMISSION 3 FOR CITY REVIEW	2024-04-02
5	ISSUED FOR CONSTRUCTION	2024-04-25
6	REVISED PER GEOTECHNICAL MEMO	2024-04-30
7	REVISED PER CITY COMMENTS	2024-05-02
8	REISSUED FOR CONSTRUCTION	2024-05-06

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



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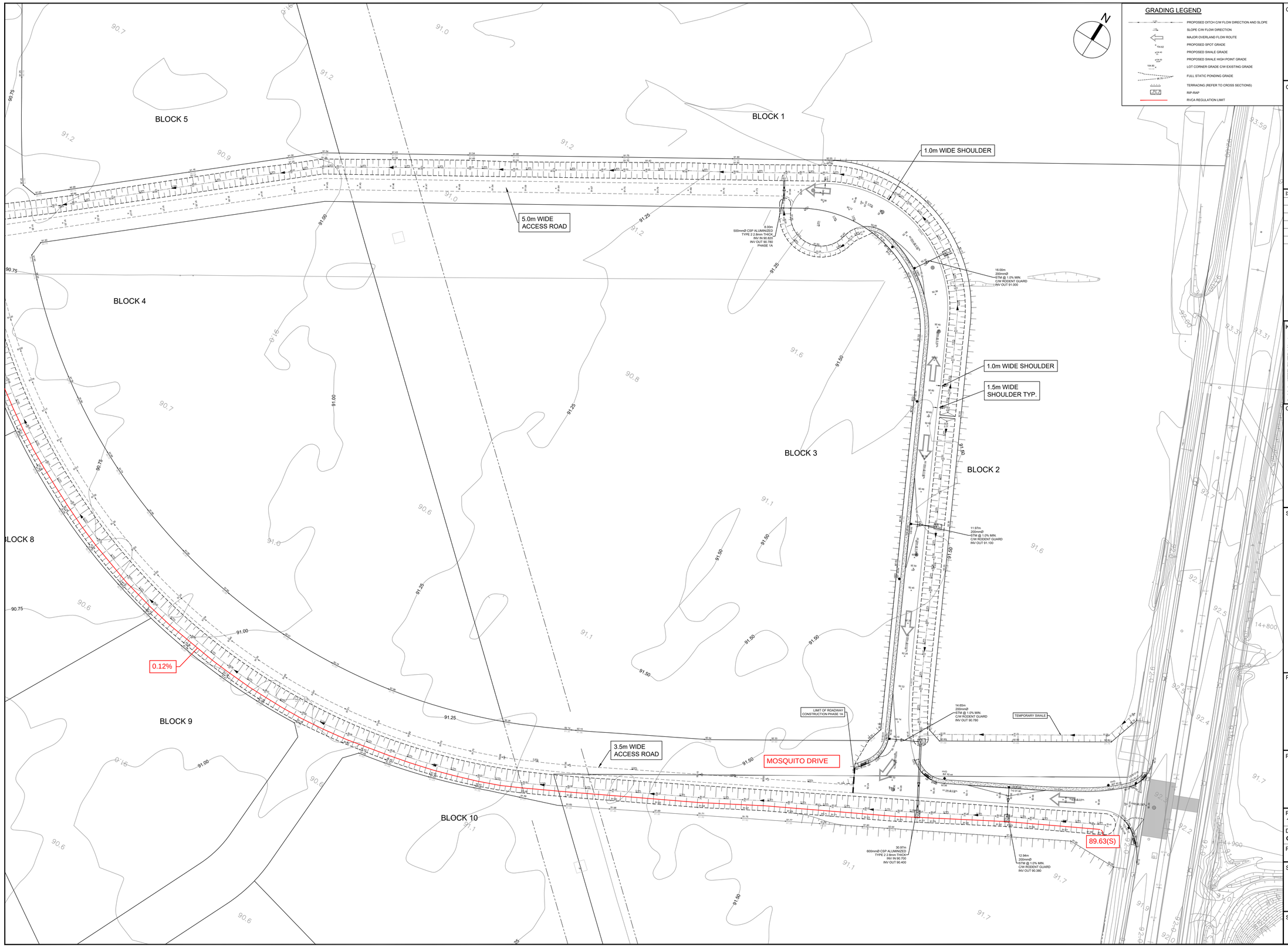
PROJECT
RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

PROJECT NO: 136974	
DRAWN BY: **C.C.**	CHECKED BY: **L.E.**
PROJECT MGR: **L.E.**	APPROVED BY: **L.E.**

SHEET TITLE
STREET SECTIONS

SHEET NUMBER	ISSUE
011	8

File Location: J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil\Sheets\011 STREET SECTIONS.dwg Last Saved: May 6, 2024, by Chris Cormier Plotted: Monday, May 6, 2024 3:05:57 PM by Chris Cormier
SCALE CHECK 1 cm 10mm
19072
D07-16-22-0014



GRADING LEGEND

- PROPOSED DITCH C/W FLOW DIRECTION AND SLOPE
- SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED SPOT GRADE
- PROPOSED SWALE GRADE
- PROPOSED SWALE HIGH POINT GRADE
- LOT CORNER GRADE C/W EXISTING GRADE
- FULL STATIC PONDING GRADE
- TERRACING (REFER TO CROSS SECTIONS)
- RIP-RAP
- RVCA REGULATION LIMIT

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1	SUBMISSION 1 FOR CITY REVIEW	2023-11-24
2	SUBMISSION 2 FOR CITY REVIEW	2024-02-21
3	ISSUED FOR TENDER	2024-02-23
4	SUBMISSION 3 FOR CITY REVIEW	2024-04-02
5	ISSUED FOR CONSTRUCTION	2024-04-25

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN



CONSULTANTS

1:750 0 7.5 22.5 37.5m

SEAL

PRIME CONSULTANT

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PROJECT

RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1A

PROJECT NO: 136974	
DRAWN BY: C.C.	CHECKED BY: L.E.
PROJECT MGR: L.E.	APPROVED BY: L.E.

SHEET TITLE

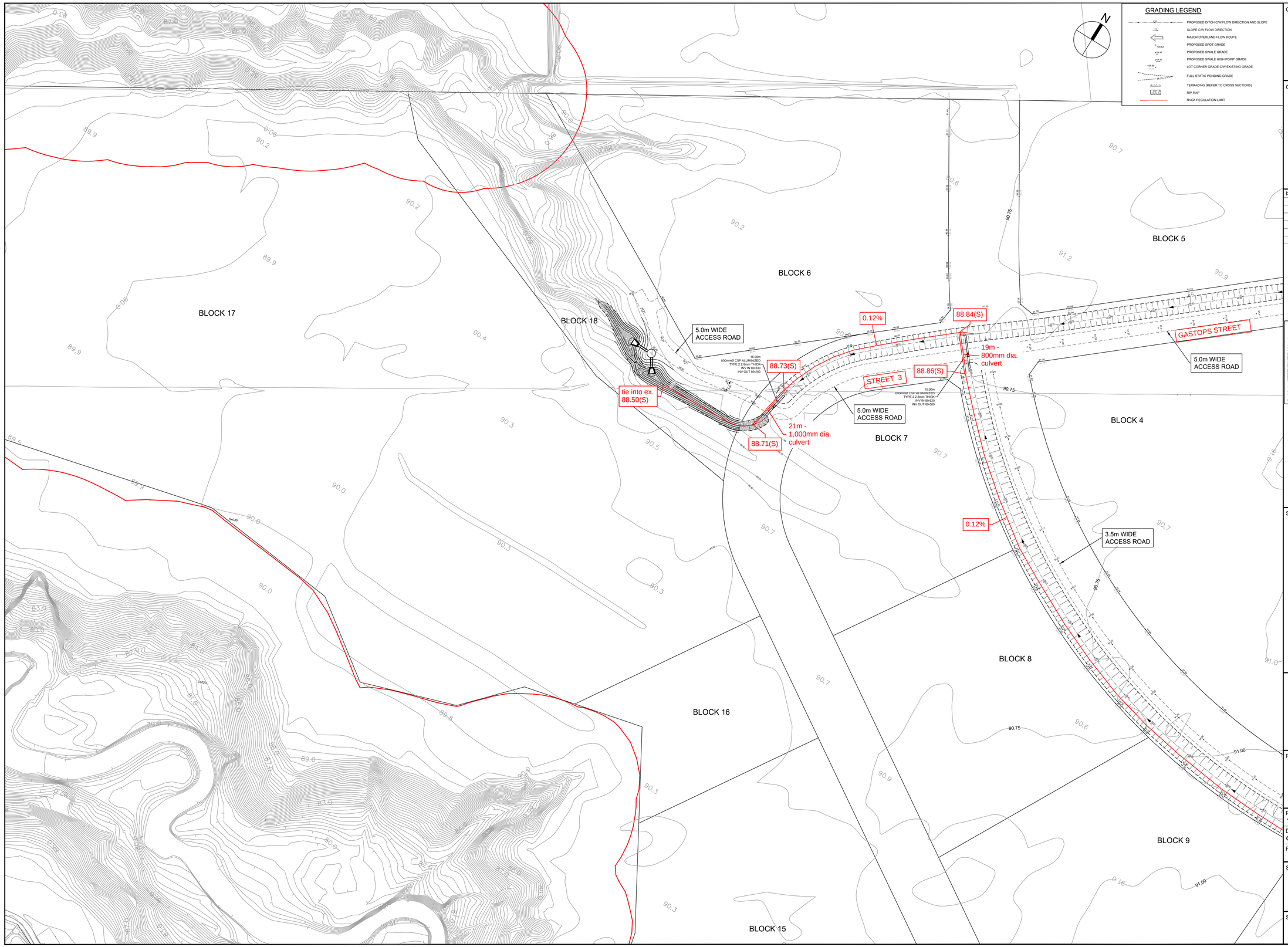
1A GRADING

SHEET NUMBER	ISSUE
200	5

SCALE CHECK 1 in 19072 50mm

D07-16-22-0014

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GRADING LEGEND

- PROPOSED DITCH C/W FLOW DIRECTION AND SLOPE
- SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED SPOT GRADE
- PROPOSED SWALE GRADE
- PROPOSED SWALE HIGH POINT GRADE
- LOT CORNER GRADE C/W EXISTING GRADE
- FULL STATIC PONDING GRADE
- TERRACING (REFER TO CROSS SECTIONS)
- RIP-RAP
- RVCA REGULATION LIMIT

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ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION 1 FOR CITY REVIEW	2023-11-24
2	SUBMISSION 2 FOR CITY REVIEW	2024-02-21
3	ISSUED FOR TENDER	2024-02-23
4	SUBMISSION 3 FOR CITY REVIEW	2024-04-02
5	ISSUED FOR CONSTRUCTION	2024-04-25

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



1:750 0 7.5 22.5 37.5m

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PROJECT

RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1A

PROJECT NO: 136974	
DRAWN BY: C.C.	CHECKED BY: L.E.
PROJECT MGR: L.E.	APPROVED BY: ####

SHEET TITLE

1A GRADING

SHEET NUMBER	ISSUE
201	5

SCALE CHECK 1 cm 10mm 19072

D07-16-22-0014

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4.5.4 Results of Hydraulic Evaluation

Resulting water levels are contained within the Phase 1 right of way. Should individual site plans incorporate building elements such as depressed loading a corresponding minimum building elevation 0.3 m above adjacent 100 year surface elevation should be considered.

Flow and water levels through culverts for the 100-year storm event are tabulated in Table 4-3 below. Water surface elevations are also indicated on the ditch profiles on **Drawings 136974-100-105**. The 100 year depth of flow throughout the subdivision ditch network ranges from 0.29 m to 1.06 m, with an average depth of 0.69 m. Through Block 18 (the outlet), the 100 year water level falls from 89.66 m to 88.74 m at the tie-in to Tributary 4. Adequate freeboard to the top of bank is maintained through the outlet block, with the top of bank ranging from 90.00 m to 90.25 m.

During the 100-year storm event, culverts 4C-30-1, 4C-28-1, 4C-24-1, 4C-10-1, and 4C-05-2 are surcharged; however, there are no locations where road overtopping occurs.

Table 4-3 Summary of flow and water levels through proposed culverts

Location	PCSWMM Conduit	Material	Geometry		100 Year Peak Flow (l/s)	Proposed Centerline Grade (m)	100 Year Water Surface Elevation (m)	
							U/S	D/S
Crossing Mosquito Drive, just west of Limebank	4C-33	CSP	Circular	0.6 m	238	92.10	91.22	91.00
On Mosquito Drive, in vicinity of hydro corridor	4C-30-1	CSP	Circular	0.6 m	263	91.75	91.00	90.88
On Mosquito Drive, at future Street 2	4C-28-1	CSP	Circular	0.6 m	342	91.55	90.87	90.70
Crossing Gastops at Mosquito Drive	4C-24-1	CSP	Circular	0.6 m	445	91.15	90.68	90.42
Crossing Mosquito Drive at Gastops	4C-10-1	CSP	Circular	0.6 m	269	91.10	90.67	90.42

Location	PCSWMM Conduit	Material	Geometry		100 Year Peak Flow (l/s)	Proposed Centerline Grade (m)	100 Year Water Surface Elevation (m)	
							U/S	D/S
On Mosquito Drive upstream of outlet	4C-05-2	CSP	Circular	0.8 m	877	91.00	90.39	89.81

J:\136974_RSS_Employme\7.0_Production\7.03_Design\27_Water\Sheets\136974-Figure 4.1-Drainage Area Plan.dwg Layout Name: Layout1 Plot Style: ---- Plot Scale: 1:2.5849 Plotted At: 3/28/2023 10:30 AM Last Saved By: svukic Last Saved At: Mar. 28, 23

RIDEAU RIVER
RIVER ROAD
TRIBUTARY 4
MOSQUITO CREEK
LIMEBANK ROAD
LEITRIM ROAD
TRIBUTARY 3
SPRATT ROAD
LIMEBANK ROAD
N

4_S12 4.09 93
4_S13 8.19 92
4_S14 11.55 84
4_S16 15.86 93
4_S19 7.61 [28]
4_S20A 7.71 [63]
4_S20B 2.80 [41]
4_S21 11.03 93
4_S17 14.52 91
4_S18 20.36 93
4_S15 3.75 93
4_B1 4.21 93
4_B2 2.56 93
4_B3 4.28 93
4_B4 3.16 93
4_B5 1.71 93
4_B6 3.17 93
4_B7 2.09 93
4_B8 4.20 93
4_B9 1.23 93
4_B10 2.49 93
4_B11 2.25 93
4_B12 0.61 40
4_B13 7.27 93
4_R1_1-1 0.26 70
4_R1_1-2 0.27 70
4_R1_2-1 0.23 70
4_R1_2-2 0.24 70
4_R2_1-1 0.11 70
4_R2_1-2 0.11 70
4_R2_2-1 0.14 70
4_R2_2-2 0.15 70
4_R3_1-1 0.31 70
4_R3_1-2 0.30 70
4_R3_2-1 0.36 70
4_R3_2-2 0.39 70
4_R3_3-1 0.30 70
4_R3_3-2 0.29 70
4_R4_1 0.34 70
4_R4_2 0.80 70
4_R4_3 0.49 70
4_R4_4 0.33 70

LEGEND:

- SUBJECT SITE DRAINAGE AREAS
- EXTERNAL TRIBUTARY DRAINAGE AREAS TO TRIBUTARY 4 - EMPLOYMENT AND SPECIAL DISTRICT
- EXTERNAL TRIBUTARY DRAINAGE AREAS TO TRIBUTARY 4 - NATURAL ENVIRONMENT AREA
- EXTERNAL DRAINAGE AREAS
- 4_B1 / 5.36 | 83 — AREA ID; IMPERVIOUS VALUE (%) / [TIME OF CONCENTRATION (min)]; AREA (h)
- TOTAL FLOW CONNECTIVITY
- PROPOSED DITCH WITH FLOW DIRECTION
- PROPOSED CULVERT
- EXISTING CULVERT
- RVCA REGULATION LIMIT
- GEO Morphix (July 2019): MEANDER BELT WIDTH
- Paterson Group (June 2020): TOP OF SLOPE; STABLE SLOPE ALLOWANCE; TOE EROSION ALLOWANCE; EROSION ACCESS ALLOWANCE; LIMIT OF HAZARD LANDS

IBI

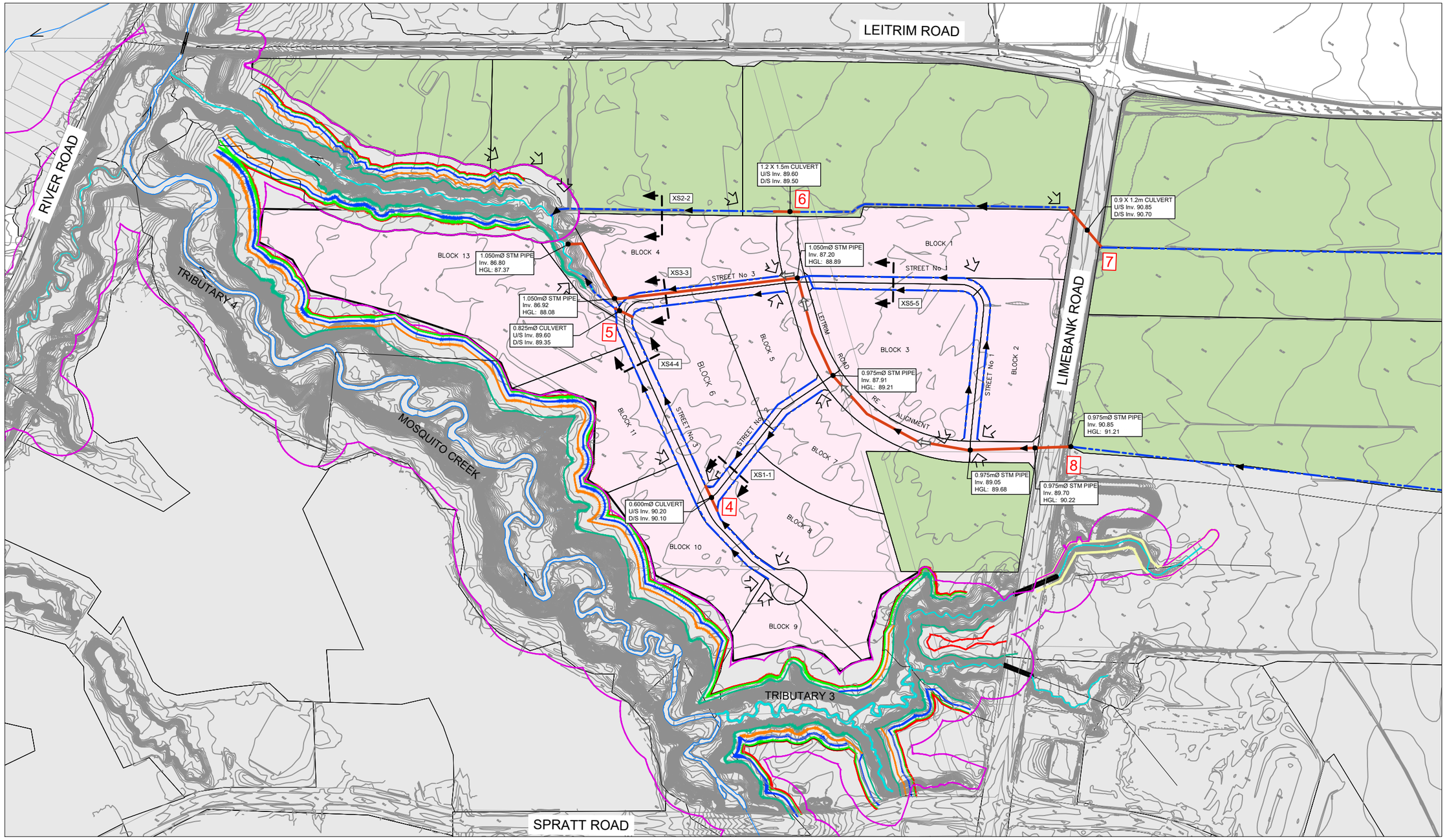
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Project Title: RIVERSIDE SOUTH
3700 TWIN FALLS PLACE

Drawing Title: STORM DRAINAGE AREA PLAN

Sheet No.: FIGURE 4.1

J:\136974_RSS_Employme\7.0_Production\7.03_Design\27_Water\Sheets\136974-Figure 4.2- Cross sections Plan View.dwg Layout: Layout1 Plot Style: ----- Plot Scale: 1:2.5849 Plotted At: 3/28/2023 3:29 PM Last Saved By: svukic Last Saved At: Mar. 28, 23



LEGEND:

- SUBJECT SITE DRAINAGE AREAS
- EXTERNAL DRAINAGE AREAS TO TRIBUTARY 4 - EMPLOYMENT AND SPECIAL DISTRICT
- EXTERNAL DRAINAGE AREAS TO TRIBUTARY 4 - NATURAL ENVIRONMENT AREA
- EXTERNAL DRAINAGE AREAS
- PROPOSED DITCH WITH FLOW DIRECTION
- PROPOSED CULVERT / STORM PIPE
- EXISTING CULVERT
- 8 PROPOSED CULVERT ID
- XS1-1 CROSS SECTION ID
- TOTAL FLOW CONNECTIVITY
- MAJOR FLOW CONNECTIVITY
- RVCA REGULATION LIMIT

GEO Morphix (July 2019)

- MEANDER BELT WIDTH

Paterson Group (June 2020)

- TOP OF SLOPE
- STABLE SLOPE ALLOWANCE
- TOE EROSION ALLOWANCE
- EROSION ACCESS ALLOWANCE
- LIMIT OF HAZARD LANDS

NOTE:

FOR PROPOSED LIMEBANK CROSSING CULVERT "7" AND "8" REFER TO FIGURE 4.3 AND 4.4

FOR CROSS SECTIONS REFER TO FIGURE 4.5

IBI

Scale: N.T.S

Project Title: RIVERSIDE SOUTH
3700 TWIN FALLS PLACE

Drawing Title: CROSS SECTIONS
PLAN VIEW

Sheet No.: FIGURE 4.2

CATCH BASIN DATA

STATION	OFFSET	CATCH BASIN TYPE	T/G ELEVATION	CATCH BASIN LEAD LENGTH (1)	LENGTH (2)	INVERT (1)	INVERT (2)
4+735.00	11.75 L	OPSD 705.010 - S3,S22,S23	92.87	15.86	8.25	91.27	91.27
4+741.12	11.75 R	OPSD 705.020 - S3,S22,S23	92.84	6.91	8.25	91.24	91.24
4+784.95	11.75 L	OPSD 705.020 - S3,S22,S23	92.66	15.86	8.25	91.06	91.06
4+787.01	11.75 R	OPSD 705.010 - S3,S22,S23	92.66	6.91	8.25	91.06	91.06
4+829.99	11.75 L	OPSD 705.010 - S3,S22,S23	92.47	15.86	8.25	90.87	90.87
4+830.99	11.75 R	OPSD 705.020 - S3,S22,S23	92.47	6.91	8.25	90.87	90.87
4+875.03	11.75 L	OPSD 705.010 - S3,S22,S23	92.29	15.86	8.25	90.69	90.69
4+877.00	11.75 R	OPSD 705.020 - S3,S22,S23	92.28	6.91	8.25	90.68	90.68
4+914.99	11.75 L	OPSD 705.020 - S3,S22,S23	92.12	15.75	8.25	90.52	90.52

SUBDRAIN INSERT LOCATION TO ACCOMMODATE 200mm DIA. LEAD

CATCH BASIN DATA

NO.	STATION	OFFSET	CATCH BASIN TYPE	T/G ELEVATION	CATCH BASIN LEAD LENGTH (1)	LENGTH (2)	INVERT (1)	INVERT (2)
CB 62	14+921.00	11.75 R	OPSD 705.010 - S3,S22,S23	92.10	6.82	8.25	90.50	90.50
CB 63	14+954.96	12.00 L	OPSD 705.010 - S3,S22,S23	91.95	16.61	8.25	90.35	90.35
CB 64	14+965.98	12.25 R	OPSD 705.020 - S3,S22,S23	91.90	6.72	8.25	90.30	90.30
*CB 65	14+994.98	12.75 L	OPSD 705.020 - S3,S22,S23	91.77	17.81	8.25(E)	90.17	90.11(E&S)
*CB 66	15+011.00	13.00 R	OPSD 705.020 - S3,S22,S23	91.71	6.94	8.25(W)	90.11	89.86(S&W)
*CB 67	15+034.69	13.50 L	OPSD 705.010 - S3,S22,S23	91.60	18.77	39.00(N)	90.00	90.30(N)

NOTES:
- CATCH BASIN OFFSETS ARE FROM ALIGNMENT CONTROL LINE TO FACE OF CURB .
- CB LEAD NOTE (1) DENOTES CB LEAD LENGTH AND INVERT ELEVATION FOR FINAL CONNECTION TO THE STORM SEWER. CATCH BASIN LEAD TO BE CAPPED WITH SPIGOT PLUG. ALL CATCH BASIN LEADS TO STORM SEWER SHALL BE 200mm DIA. PVC SDR 35 INSTALLED AT 2% SLOPE UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.
- CB LEAD NOTE (2) DENOTES CB LEAD LENGTH AND INVERT ELEVATION FOR INTERIM CONNECTION TO THE DRAINAGE DITCH. ALL CATCH BASIN LEADS SHALL OUTLET AT BOTTOM OF DITCH; SLOPE OF EACH LEAD TO BE ADJUSTED ACCORDINGLY.
- REFER TO GENERAL ARRANGEMENT DRAWINGS BY MORRISON HERSHFIELD FOR CULVERT INSTALLATION DETAILS.

STORM MAINTENANCE HOLE DATA

NO.	STRUCTURE TYPE / SIZE	COORDINATES NORTHING	COORDINATES EASTING
ST 205	OPSD 701.011 - 1200mm Ø C/W SAFETY PLATFORM	5017512.291	369490.943
ST 206	OPSD 701.011 - 1200mm Ø C/W SAFETY PLATFORM	5017416.549	369531.556
ST 207	1520mm x 1830mm BOX MH C/W SAFETY PLATFORM	5017343.806	369562.369
ST 208	OPSD 701.011 - 1500mm Ø C/W SAFETY PLATFORM	5017260.463	369596.359

SANITARY MAINTENANCE HOLE DATA

NO.	STRUCTURE TYPE / SIZE	COORDINATES NORTHING	COORDINATES EASTING
SA 21	OPSD 701.010 - 1200mm Ø C/W SAFETY PLATFORM	5017458.133	369509.583
SA 21A	OPSD 701.010 - 1200mm Ø	5017437.048	369518.936
SA 22	OPSD 701.010 - 1200mm Ø	5017348.620	369556.389
SA 23	OPSD 701.010 - 1200mm Ø	5017237.505	369601.845

J.L.Richards
ENGINEERS·ARCHITECTS·PLANNERS
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

NO.	REVISIONS	BY	DATE
0	ISSUED FOR TENDER	JB	12/06/08
1	ISSUED FOR CONSTRUCTION	JB	03/06/09
2	ISSUED WITH CCN # 7	JB	09/08/09
3	'AS BUILT' INFORMATION ADDED	JB	10/25/12

NOTE: The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

LIMEBANK ROAD WIDENING
BALMORAL DRIVE TO SPRATT ROAD

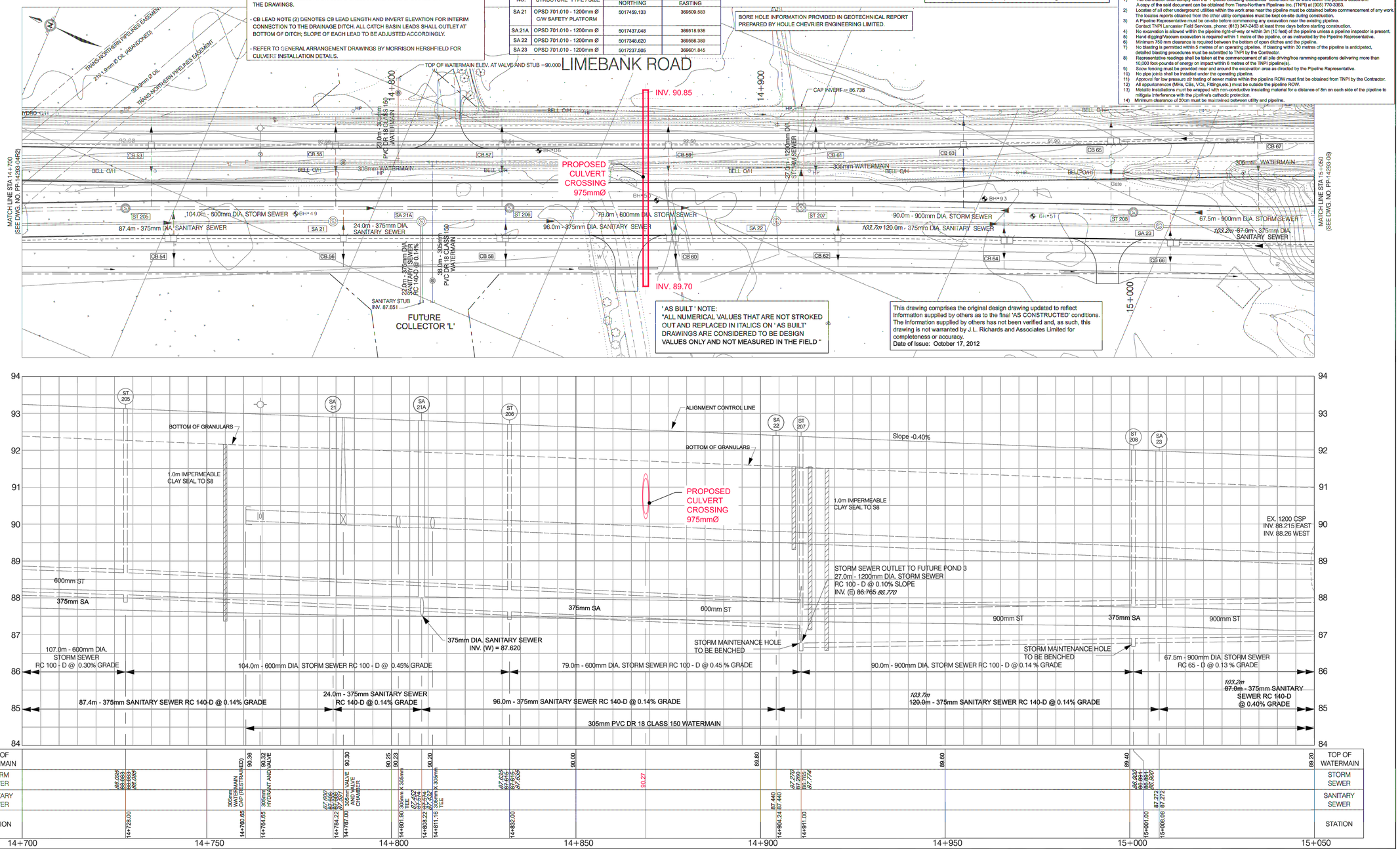
PLAN AND PROFILE
STA.14+700 TO STA. 15+050

Ottawa
CONTRACT NO.
ISB07-5047
DWG. NO.
PP -14293 -05R2
SHEET 54 OF 149
Date: OCTOBER 2008
Scale: 0m 5 10 20

W. NEWELL, P. Eng
Director Infrastructure Services
Des: MF, MGB Chkd: PDR

ZIAD A. GHADBAN, P. Eng.
Manager Construction Services - Development
Des: KD , JB Chkd: PDR

Trans-Northern Pipeline Crossing
1) The Contractor shall comply with the "Pipeline Crossing Guidelines" document for all work within the pipeline easement. A copy of the said document can be obtained from Trans-Northern Pipelines Inc. (TNPI) at (905) 770-3353.
2) Locates of all other underground utilities within the work area near the pipeline must be obtained before commencement of any work. The locates reports obtained from the other utility companies must be kept on-site during construction.
3) A Pipeline Representative must be on-site before commencing any excavation near the existing pipeline. Contact TNPI Lancaster Field Services, phone: (613) 347-2463 at least three days before starting construction.
4) No excavation is allowed within the pipeline right-of-way or within 3m (10 feet) of the pipeline unless a pipeline inspector is present.
5) Hand digging/Vacuum excavation is required within 1 metre of the pipeline, or as instructed by the Pipeline Representative.
6) Minimum 750 mm clearance is required between the bottom of open ditches and the pipeline.
7) No blasting is permitted within 5 metres of an operating pipeline. If blasting within 30 metres of the pipeline is anticipated, detailed blasting procedures must be submitted to TNPI by the Contractor.
8) Representative readings shall be taken at the commencement of all pile driving/hoe ramming operations delivering more than 10,000 foot-pounds of energy on impact within 6 metres of the TNPI pipeline(s).
9) Snow fencing must be provided near and around the excavation area as directed by the Pipeline Representative.
10) No pipe joints shall be installed under the operating pipeline.
11) Approval for low pressure air testing of sewer mains within the pipeline ROW must first be obtained from TNPI by the Contractor.
12) All appurtenances (MHs, CBs, VCs, Fittings,etc.) must be outside the pipeline ROW.
13) Metallic installations must be wrapped with non-conductive insulating material for a distance of 8m on each side of the pipeline to mitigate interference with the pipeline's cathodic protection.
14) Minimum clearance of 30cm must be maintained between utility and pipeline.



LEGEND:
PROPOSED CULVERT

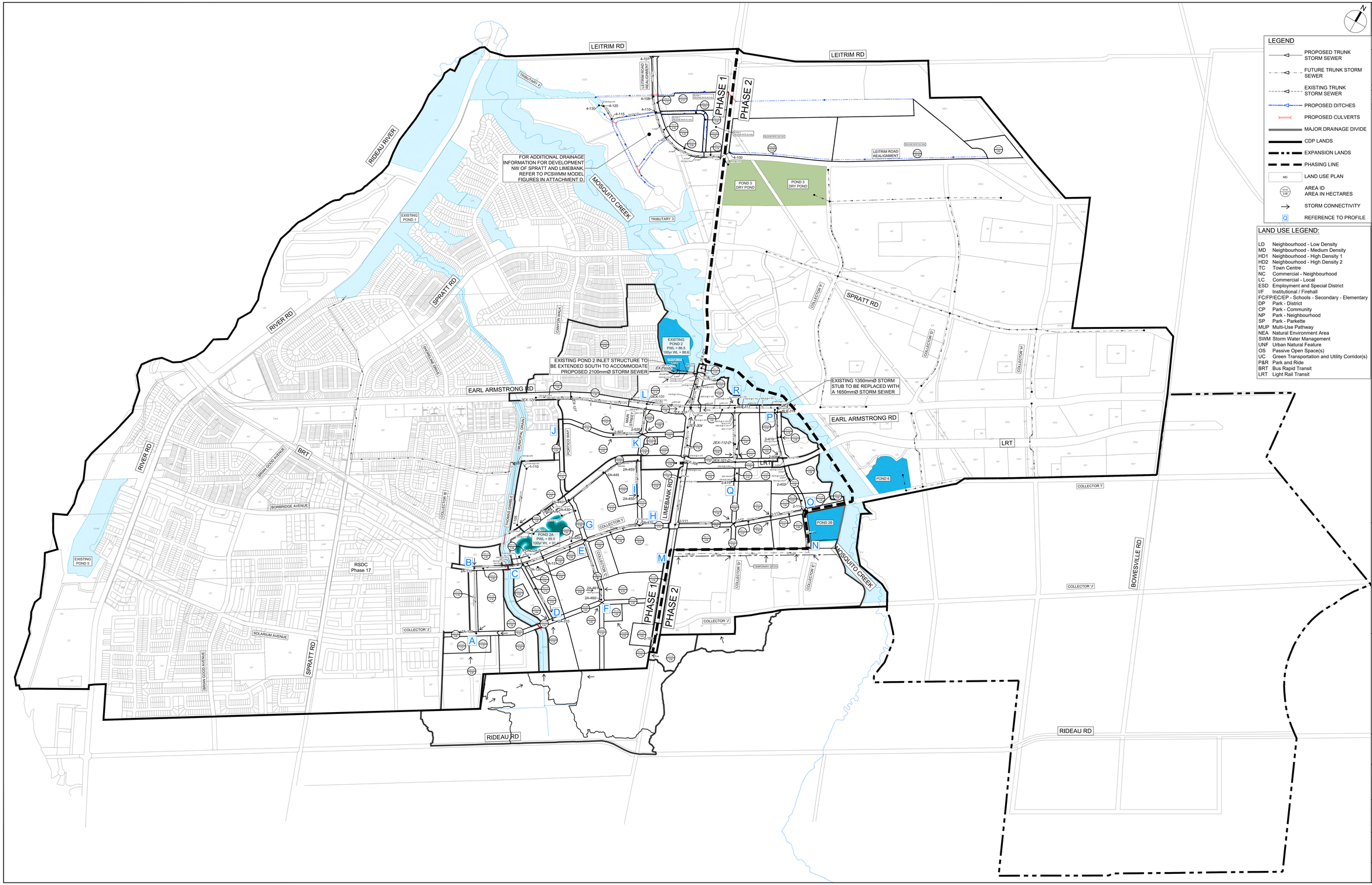
Scale

Project Title
RIVERSIDE SOUTH
3700 TWIN FALLS PLACE

Drawing Title
PROPOSED LIMEBANK ROAD CROSSING (SOUTH)

Sheet No.
FIGURE 4.4

J:\13974_BSS_Employee\7.0_Production\7.03_Design\27_Water\Sheets\139374-Figure 4.4 Proposed Limebank Road Crossing (South).dwg Layout Name: A4 Plot Style: ----- Plot Scale: 1.2584 Plotted At: 3/28/2023 11:57 AM Last Saved By: svaikk Last Saved At: Mar. 28, 23



LEGEND

- PROPOSED TRUNK STORM SEWER
- FUTURE TRUNK STORM SEWER
- EXISTING TRUNK STORM SEWER
- PROPOSED DITCHES
- PROPOSED CULVERTS
- MAJOR DRAINAGE DIVIDE
- CDP LANDS
- EXPANSION LANDS
- PHASING LINE
- MD — LAND USE PLAN
- AREA ID / AREA IN HECTARES
- STORM CONNECTIVITY
- Q — REFERENCE TO PROFILE

LAND USE LEGEND:

LD	Neighbourhood - Low Density
MD	Neighbourhood - Medium Density
HD1	Neighbourhood - High Density 1
HD2	Neighbourhood - High Density 2
TC	Town Centre
NC	Commercial - Neighbourhood
LC	Commercial - Local
ESD	Employment and Special District
I/F	Institutional / Firehall
FC/FP/EC/EP	Schools - Secondary - Elementary
DP	Park - District
CP	Park - Community
NP	Park - Neighbourhood
SP	Park - Parkette
MUP	Multi-Use Pathway
NEA	Natural Environment Area
SWM	Storm Water Management
UNF	Urban Natural Feature
OS	Passive Open Space(s)
UC	Green Transportation and Utility Corridor(s)
P&R	Park and Ride
BRT	Bus Rapid Transit
LRT	Light Rail Transit

CLIENT

Ottawa

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ISSUES

No.	DESCRIPTION	DATE
1	ISSU PH 1 SUBMISSION 1	2022-12-02
2	ISSU PH 1 SUBMISSION 2	2023-05-24
3	ISSU PH 1 SUBMISSION 3	2023-08-18

CONSULTANTS

1:4000 0 40 80 160 240m

SEAL

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Ottawa ON K1S 0N4 Canada
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ibigroup.com

PROJECT
RIVERSIDE SOUTH COMMUNITY INFRASTRUCTURE SERVICING STUDY UPDATE PHASE 1
MOSQUITO CREEK STUDY AREA

PROJECT NO: 125127

DRAWN BY: C.C.	CHECKED BY: L.E.
PROJECT MGR: M.B.	APPROVED BY: R.W.

SHEET TITLE
STORM DRAINAGE AREA PLAN

SHEET NUMBER 500 | ISSUE 3

File location: J:\125127_Riverside\02_Cad\Planning\02-Design\Key_Plan\Phase1\125127-500.dwg Last Saved: May 24, 2023 by Chris Cormier Plotted: Wednesday, May 24, 2023 11:34:37 AM by Chris Cormier

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STORM SEWER DESIGN SHEET

RSS ISSU Phase 1 Mosquito Creek Study Area
City of Ottawa

LOCATION				AREA (Ha)												RATIONAL DESIGN FLOW																SEWER DATA									
				2 YEAR						5 YEAR				10 YEAR	100 YEAR	2 YEAR		5 YEAR		10 YEAR		100 YEAR																			
STREET	AREA ID	FROM	TO	C=	C=	C=	C=	C=	C=	C=	C=	C=	C=	C=	C=	C=	C=	IND	CUM	IND	CUM	IND	CUM	IND	CUM	INLET	TIME	TOTAL	i (2)	i (5)	i (10)	i (100)	2yr PEAK	5yr PEAK	10yr PEAK	100yr PEAK	FIXED FLOW		DESIGN	CAPACITY	LENGTH	PIPE SIZE (mm)			SLOPE	VELOCITY	AVAIL CAP	
				0.20	0.30	0.45	0.60	0.70	0.85	0.60	0.70	0.85	0.90	0.70	0.67	2.78AC	2.78AC	2.78AC	2.78AC	2.78AC	2.78AC	2.78AC	2.78AC	(min)	IN PIPE	(min)	(mm/hr)	(mm/hr)	(mm/hr)	(mm/hr)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	FLOW (L/s)	IND	CUM	FLOW (L/s)	(L/s)	(m)	DIA	W	H	(%)	(m/s)	(L/s)	(%)
Limebank Road		2-303	2-302													0.00	41.52	0.00	5.18	0.00	9.34	0.00	0.00	20.72	1.21	21.93	50.90	68.71	80.39	117.29	2,113.12	355.64	750.95		0.00	0.00	3,219.71	5,720.16	116.02	2100			0.10	1.600	2500.44	43.71%
		2-302	2-301													0.00	41.52	0.00	5.18	0.00	9.34	0.00	0.00	21.93	0.64	22.57	49.12	66.28	77.55	113.11	2,039.27	343.09	724.34		0.00	0.00	3,106.70	5,720.16	61.72	2100			0.10	1.600	2613.46	45.69%
		2-301	2-301A													0.00	41.52	0.00	5.18	0.00	9.34	0.00	0.00	22.57	0.43	23.00	48.23	65.07	76.12	111.02	2,002.28	336.80	711.02		0.00	0.00	3,050.10	5,720.16	40.88	2100			0.10	1.600	2670.05	46.68%
		2-301A	2-300													0.00	41.52	0.00	5.18	0.00	9.34	0.00	0.00	23.00	0.84	23.84	47.66	64.29	75.21	109.68	1,978.59	332.78	702.49		0.00	0.00	3,013.86	5,720.16	80.68	2100			0.10	1.600	2706.29	47.31%
		2-300	EX-Pond2C													0.00	41.52	0.00	5.18	0.00	9.34	0.00	0.00	23.84	0.13	23.97	46.57	62.81	73.47	107.15	1,933.63	325.14	686.31		0.00	0.00	2,945.08	5,720.16	12.34	2100			0.10	1.600	2775.07	48.51%
3700 TWIN FALLS PLACE																																													
Leitrim Road	ESD4-100A, ESD4-100B, OS4-100	4-100	4-101	2.80												1.56	1.56	0.00	0.00	0.00	0.00	0.00	0.00	99.29	0.81	100.10	16.84	22.53	26.27	38.11	26.21	0.00	0.00		383.90	383.90	410.11	739.33	46.80	975			0.10	0.959	329.21	44.53%
	RD4-101	4-101	4-102												0.34	0.00	1.56	0.00	0.00	0.66	0.66	0.00	0.00	100.10	2.06	102.16	16.73	22.39	26.10	37.87	26.05	0.00	17.27		0.00	383.90	427.22	739.33	118.59	975			0.10	0.959	312.10	42.21%
		4-102	4-103													0.00	1.56	0.00	0.00	0.00	0.66	0.00	0.00	102.16	1.12	103.28	16.48	22.04	25.70	37.28	25.65	0.00	17.00		0.00	383.90	426.55	739.33	64.64	975			0.10	0.959	312.77	42.31%
	ESD4-103, RD4-103	4-103	4-104												0.80	0.00	1.56	0.00	0.00	1.56	2.22	0.00	0.00	103.28	1.72	105.00	16.34	21.86	25.48	36.97	25.44	0.00	56.53		47.19	431.09	513.06	739.33	98.94	975			0.10	0.959	226.27	30.60%
		4-104	4-105													0.00	1.56	0.00	0.00	0.00	2.22	0.00	0.00	105.00	1.61	106.61	16.13	21.58	25.16	36.50	25.12	0.00	55.82		0.00	431.09	512.02	739.33	92.55	975			0.10	0.959	227.30	30.74%
	RD4-105	4-105	4-106												0.49	0.00	1.56	0.00	0.00	0.95	3.17	0.00	0.00	106.61	1.33	107.94	15.95	21.33	24.87	36.07	24.83	0.00	78.87		0.00	431.09	534.79	739.33	76.76	975			0.10	0.959	204.53	27.66%
		4-106	4-110													0.00	1.56	0.00	0.00	0.00	3.17	0.00	0.00	107.94	1.43	109.38	15.80	21.13	24.63	35.72	24.59	0.00	78.12		0.00	431.09	533.80	739.33	82.53	975			0.10	0.959	205.52	27.80%
Leitrim Road	RD4-108	4-107	4-108												1.10	0.00	0.00	0.00	0.00	2.14	2.14	0.00	0.00	10.00	3.28	13.28	76.81	104.19	122.14	178.56	0.00	0.00	261.46		0.00	0.00	261.46	350.85	236.80	600			0.30	1.202	89.39	25.48%
		4-108	4-110													0.00	0.00	0.00	0.00	0.00	2.14	0.00	0.00	13.28	1.32	14.60	66.14	89.55	104.90	153.24	0.00	0.00	224.55		0.00	0.00	224.55	350.85	94.85	600			0.30	1.202	126.30	36.00%
Sreet No. 3	ESD4-110A, ESD4-110B, RD4-110A, RD4-110B	4-110	4-115					1.00								1.95	3.50	0.00	0.00	0.00	5.31	0.00	0.00	109.38	4.05	113.43	15.64	20.91	24.38	35.36	54.77	0.00	129.51		74.47	505.56	689.85	1,286.19	267.83	1200			0.10	1.102	596.35	46.37%
Block 12		4-115	4-120													0.00	3.50	0.00	0.00	0.00	5.31	0.00	0.00	113.43	1.37	114.80	15.21	20.33	23.70	34.37	53.27	0.00	125.92		0.00	505.56	684.74	1,286.19	90.47	1200			0.10	1.102	601.45	46.76%
		4-120	4-130													0.00	3.50	0.00	0.00	0.00	5.31	0.00	0.00	114.80	0.42	115.22	15.07	20.15	23.48	34.05	52.78	0.00	124.75		0.00	505.56	683.09	1,286.19	27.92	1200			0.10	1.102	603.11	46.89%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: LME
Checked:
Dwg. Reference: 125127-500

No.	Revision	Date
1.	RSS ISSU Phase 1 Mosquito Creek Study Area - Submission No. 1	2022-12-02
2.	RSS ISSU Phase 1 Mosquito Creek Study Area - Submission No. 2	2023-05-24

File Reference: 125127-6.04.04
Date: 2023-05-18
Sheet No: 1 of 1

Inlet Time

Node	Length of Pipe Upstream (m)	Velocity (m/s)	Travel Time (min)	Inlet Time (min)
2A-100	500	1.70	4.90	14.90
2A-310	250	1.70	2.45	12.45
2A-460	400	1.70	3.92	13.92
2A-410	150	1.70	1.47	11.47
2A-450	200	1.70	1.96	11.96
2-114	220	1.70	2.16	12.16
2-405	350	1.70	3.43	13.43
2EX-100-D	300	1.70	2.94	12.94
2-507	500	1.70	4.90	14.90

	Impervious	Pervious	Gravel
C	0.9	0.2	0.8

Overall Runoff Coefficient Calculations

Development Condition	Impervious Area (ha)	Pervious Area (ha)	Gravel Area (ha)	Total Area (ha)	C	C (100 YR)
PRE-SITE		13.92		13.92	0.20	0.25
POST-SITE	10.3	3.1		13.35	0.74	0.92
OFF-SITE DITCH	0.17	0.41		0.58	0.41	0.51

Notes:

1. Total pre-site area based on area draining to Limebank Rd. crossing, does not include south half of realigned Leitrim Rd.
2. Off-site ditch includes north half of realigned Leitrim Rd.
2. Runoff Coefficients: Cimp=0.90, Cper=0.20, Cgravel=0.50
3. C (100 YR) = C + 25% (to a maximum of 1.0)

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Time of Concentration - Uplands Method

Pre-Development Area

L =	672	m
Upstream Elev. =	93.19	m
Dnstream Elev. =	90.93	m
Slope =	0.0034	m/m
V/sqrt(S) =	2.3	short grass pasture
V =	0.13	m/s
Tc =	**84**	**min**

Table 3.9 $V/S^{0.5}$ relationship for various land covers

Land Cover	$V/S^{0.5}$ (m/s)
Forest with heavy ground litter, hay meadow (overland flow)	0.6
Trash fallow or minimum tillage cultivation, contour, strip cropped woodland (overland flow)	1.5
Short grass pasture (overland flow)	2.3
Cultivated, straight row (overland flow)	2.7
Nearly bare and untilled (overland flow) or alluvial fans in Western mountain regions	3.0
Grassed waterway	4.6
Paved areas (sheet flow); small upland gullies	6.1

Source: Handbook of Steel Drainage & Highway Construction Products (Canadian Edition)

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Pre-Development Flow Calculations

Given:

Area (ha) = 13.92

C = 0.20

C (100 YR) = 0.25

Return Period	Time of Concentration (min)	Rainfall Intensity, i (mm/hr)	Flow, Q (L/s)
2 Year	84	19.1	148.0
5 Year	84	25.6	198.2
100 Year	84	43.4	419.5

Notes:

1. Rainfall intensity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method (Q = 2.78CiA).
3. C (100 YR) = C + 25% (to a maximum of 1.0)
4. Time of concentration based on Uplands Method

Rainfall (mm)	Runoff Volume (m3)
25	696

Notes:

1. 25mm 4hr Chicago Storm

Leitrim Rural ROW

Given:

Area (ha) = 0.58
C = 0.41
C (100 YR) = 0.51

Return Period	Time of Concentration (min)	Intensity[*1], i (mm/hr)	Flow[*2], Q (L/s)
2 Year	10	76.8	49.93
5 Year	10	104.2	67.74
100 Year	10	178.6	145.10

Notes:

1. Area for realigned Leitrim Rd. that will drain to northside ditch and through Limebank Rd. crossing.
2. Rainfall intensity calculated using City of Ottawa IDF curve equations.
3. Flow calculated using the Rational Method (Q = 2.78CiA).

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Flow and Storage Volume Calculations

Given:

Area (ha) = 13.92

C = 0.72

C (100 YR)[*3] = 0.90

Return Period	Time of Concentration (min)	Intensity[*1], i (mm/hr)	Flow[*2], Q (L/s)	Allowable Release Rate[*4] (L/s)	Net Runoff to be Stored (L/s)	Storage Required (m^3)
2 Year	55	26.2	733.3	159.72	573.5	1893
	60	24.6	688.1	159.72	528.4	1902
	65	23.2	648.7	159.72	488.9	1907
	70	**21.9**	**614.0**	**159.72**	**454.2**	**1908**
	75	20.8	583.2	159.72	423.4	1905
	80	19.8	555.6	159.72	395.9	1900
5 Year	75	27.9	781.4	159.72	621.7	2798
	80	26.6	744.2	159.72	584.5	2806
	85	25.4	710.8	159.72	551.1	2811
	90	**24.3**	**680.5**	**159.72**	**520.8**	**2812**
	95	23.3	653.0	159.72	493.3	2812
	100	22.4	627.8	159.72	468.1	2809
100 Year	180	23.9	837.2	159.72	677.4	7316
	185	23.4	819.1	159.72	659.4	7320
	190	**22.9**	**802.0**	**159.72**	**642.2**	**7322**
	195	22.4	785.6	159.72	625.9	7322
	200	22.0	769.9	159.72	610.2	7322
	205	21.6	754.9	159.72	595.2	7321

Notes:

1. Rainfall intensity calculated using City of Ottawa IDF curve equations.
2. Flow calculated using the Rational Method (Q = 2.78CiA).
3. C (100 YR) = C + 25% (Max. 1.0)
4. Allowable Release Rate = 159.72 L/s per ISSU

Rainfall (mm)	Runoff Volume (m3)
25	2520

Notes:

1. 25mm 4hr Chicago Storm

LOCATION		PROPOSED SEWER CROSSING LIMEBANK									
DRAINAGE AREA	CONTROLLED PEAK FLOW (L/s)	PIPE DIA. (mm)	UPSTREAM INV.	DNSTREAM INV.	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min)	DEPTH OF FLOW (m, above upstream inv.)	PERCENT FULL
SITE, EDS4-100A, OS4-100	555.2	914	89.88	89.75	0.2	67	822	1.25	0.89	90.43	68%
SITE, EDS4-100A, OS4-100	555.2	914	89.69	89.65	0.2	21	822	1.25	0.28	90.24	68%

Design Parameters

Notes:
1. Rainfall intensity calculated using City of Ottawa IDF curve equations.
2. Peak flow based on ISSU for subject site and upstream lands (410.11 L/s) plus off-site areas (north side of realigned Leitrim ROW; 145.10 L/s under 100yr storm). Total 555.21 L/s
3. Manning's roughness coefficient = 0.013
4. Full flow velocity: MIN 0.8 m/s; MAX 3.0 m/s (City of Ottawa Sewer Design Guidelines, v.2012)

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Ditch Calculation

Open Channel Flow - Triangle
Manning's Equation

Leitrim ROW Rural Ditch East of Limebank

Slope (m/m)	0.0015	
Side slope (run for 1m rise)	3	
Bottom width (m)	0	
Manning's n	0.03	based on OSDG App. 6-C.1

Depth of flow (m)	Flow Capacity (L/s)	Velocity (m/s)
0.10	1.8	0.06
0.20	14.7	0.12
0.30	49.6	0.18
0.40	117.6	0.24
0.50	229.6	0.31
0.60	396.8	0.37
0.68	**577.6**	**0.42**
0.70	630.1	0.43
0.80	940.6	0.49
0.90	1339.3	0.55
1.00	1837.1	0.61
1.10	2445.2	0.67
1.20	3174.5	0.73
1.30	4036.1	0.80
1.40	5041.0	0.86
1.50	6200.3	0.92

Notes:
1. Required ditch capacity based on ISSU for subject site and upstream lands (410.11 L/s) plus realigned Leitrim Rd. temporary rural cross-section (145.10 L/s under 100yr storm). Total 555.21 L/s

Leitrim ROW Ditch West of Limebank (Mosquito Drive in 3700 Twin Falls)

Slope (m/m)	0.0012	
Side slope (run for 1m rise)	3	
Bottom width (m)	0	
Manning's n	0.03	based on OSDG App. 6-C.1

Depth of flow (m)	Flow Capacity (L/s)	Velocity (m/s)
0.10	1.6	0.05
0.20	13.1	0.11
0.30	44.4	0.16
0.40	105.2	0.22
0.50	205.4	0.27
0.60	354.9	0.33
0.70	563.6	0.38
0.80	**841.3**	**0.44**
0.85	**1009.1**	**0.47**
0.90	1197.9	0.49
1.00	1643.2	0.55
1.10	2187.1	0.60
1.20	2839.4	0.66
1.30	3610.0	0.71
1.40	4508.9	0.77
1.50	5545.7	0.82

Notes:

1. Minimum ditch capacity based on upstream peak flow (555 L/s) plus 3700 Twin Falls Phase 1 Design Brief (263 L/s). Total 818 L/s

2. Maximum ditch capacity based on upstream peak flow (555 L/s) plus 3700 Twin Falls Phase 1 Design Brief (445 L/s). Total 1,000 L/s

Street 3 Access Road in 3700 Twin Falls

Slope (m/m)	0.0012	
Side slope (run for 1m rise)	3	
Bottom width (m)	0	
Manning's n	0.03	based on OSDG App. 6-C.1

Depth of flow (m)	Flow Capacity (L/s)	Velocity (m/s)
0.10	1.6	0.05
0.20	13.1	0.11
0.30	44.4	0.16
0.40	105.2	0.22
0.50	205.4	0.27
0.60	354.9	0.33
0.70	563.6	0.38
0.80	841.3	0.44
0.90	1197.9	0.49
0.96	**1453.8**	**0.53**
1.00	1643.2	0.55
1.10	2187.1	0.60
1.20	2839.4	0.66
1.30	3610.0	0.71
1.40	4508.9	0.77
1.50	5545.7	0.82

Notes:

1. Required ditch capacity based on upstream peak flow (555 L/s) plus 3700 Twin Falls Phase 1 Design Brief (877 L/s). Total 1,432 L/s

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Access Road to Tributary 4 Outlet in 3700 Twin Falls

Slope (m/m)	0.0047	
Side slope (run for 1m rise)	3	
Bottom width (m)	0	
Manning's n	0.03	based on OSDG App. 6-C.1

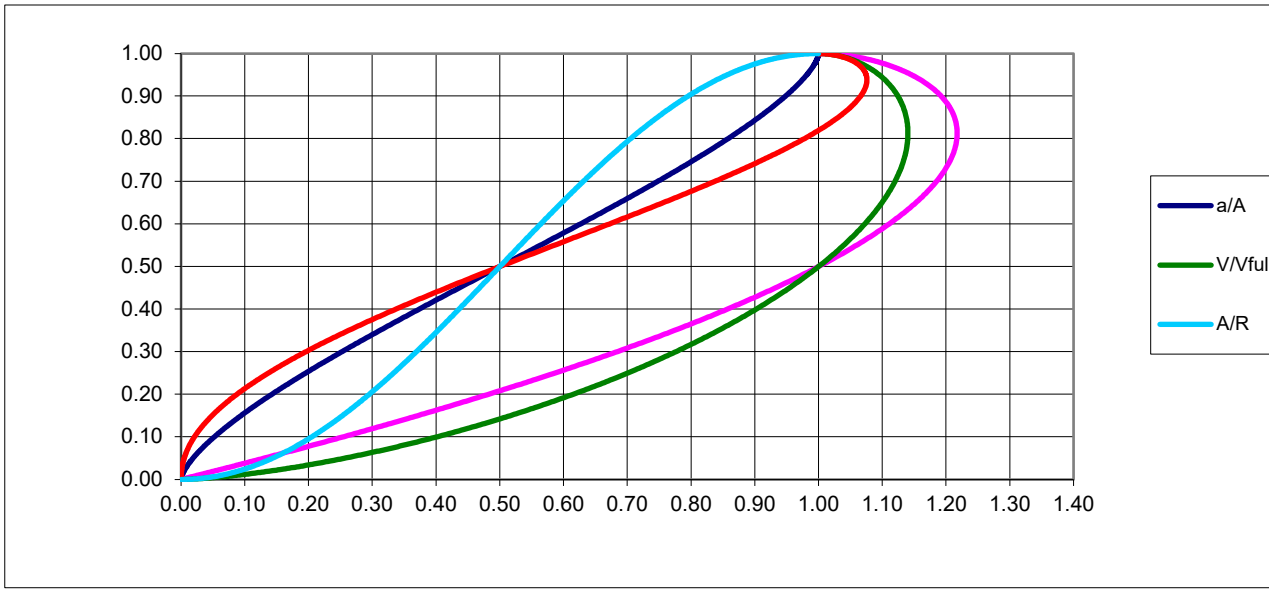
Depth of flow (m)	Flow Capacity (L/s)	Velocity (m/s)
0.10	3.3	0.11
0.20	13.1	0.11
0.30	44.4	0.16
0.40	105.2	0.22
0.50	205.4	0.27
0.60	354.9	0.33
0.70	563.6	0.38
0.80	841.3	0.44
0.90	1197.9	0.49
0.96	**1453.8**	**0.53**
1.00	1643.2	0.55
1.10	2187.1	0.60
1.20	2839.4	0.66
1.30	3610.0	0.71
1.40	4508.9	0.77
1.50	5545.7	0.82

Notes:

1. Required ditch capacity based on upstream peak flow (555 L/s) plus 3700 Twin Falls Phase 1 Design Brief (877 L/s). Total 1,432 L/s

Hydraulic Elements Table

Source: Open-Channel Hydraulics (Ven Te Chow, 1959)



d/D	a/A	r/R	Q/Q_{full}	V/V_{full}	A/R	d/D
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0001	0.0000	0.0014	0.0028	0.0000
0.0001	0.0000	0.0002	0.0000	0.0035	0.0056	0.0001
0.0002	0.0000	0.0005	0.0000	0.0059	0.0083	0.0002
0.0003	0.0000	0.0008	0.0000	0.0087	0.0111	0.0003
0.0005	0.0000	0.0013	0.0000	0.0117	0.0139	0.0005
0.0007	0.0000	0.0018	0.0000	0.0149	0.0167	0.0007
0.0009	0.0000	0.0025	0.0000	0.0184	0.0194	0.0009
0.0012	0.0001	0.0032	0.0000	0.0219	0.0222	0.0012
0.0015	0.0001	0.0041	0.0000	0.0256	0.0250	0.0015
0.0019	0.0001	0.0051	0.0000	0.0295	0.0278	0.0019
0.0023	0.0002	0.0061	0.0000	0.0335	0.0306	0.0023
0.0027	0.0002	0.0073	0.0000	0.0376	0.0333	0.0027
0.0032	0.0003	0.0086	0.0000	0.0418	0.0361	0.0032
0.0037	0.0004	0.0099	0.0000	0.0462	0.0389	0.0037
0.0043	0.0005	0.0114	0.0000	0.0506	0.0417	0.0043
0.0049	0.0006	0.0129	0.0000	0.0551	0.0444	0.0049
0.0055	0.0007	0.0146	0.0000	0.0598	0.0472	0.0055
0.0062	0.0008	0.0164	0.0001	0.0645	0.0500	0.0062
0.0069	0.0010	0.0182	0.0001	0.0693	0.0528	0.0069
0.0076	0.0011	0.0202	0.0001	0.0741	0.0556	0.0076
0.0084	0.0013	0.0222	0.0001	0.0791	0.0583	0.0084
0.0092	0.0015	0.0244	0.0001	0.0841	0.0611	0.0092
0.0100	0.0017	0.0266	0.0002	0.0892	0.0639	0.0100
0.0109	0.0019	0.0290	0.0002	0.0944	0.0667	0.0109
0.0119	0.0022	0.0314	0.0002	0.0996	0.0694	0.0119
0.0128	0.0025	0.0340	0.0003	0.1049	0.0722	0.0128
0.0138	0.0027	0.0366	0.0003	0.1102	0.0750	0.0138
0.0149	0.0031	0.0393	0.0004	0.1157	0.0778	0.0149
0.0159	0.0034	0.0422	0.0004	0.1211	0.0806	0.0159
0.0170	0.0038	0.0451	0.0005	0.1266	0.0833	0.0170
0.0182	0.0041	0.0481	0.0005	0.1322	0.0861	0.0182
0.0194	0.0045	0.0512	0.0006	0.1379	0.0889	0.0194
0.0206	0.0050	0.0544	0.0007	0.1435	0.0917	0.0206

0.0218	0.0054	0.0577	0.0008	0.1493	0.0944	0.0218
0.0231	0.0059	0.0610	0.0009	0.1550	0.0972	0.0231
0.0245	0.0065	0.0645	0.0010	0.1609	0.1000	0.0245
0.0258	0.0070	0.0681	0.0012	0.1667	0.1028	0.0258
0.0272	0.0076	0.0717	0.0013	0.1726	0.1056	0.0272
0.0287	0.0082	0.0755	0.0015	0.1786	0.1083	0.0287
0.0302	0.0088	0.0793	0.0016	0.1845	0.1111	0.0302
0.0317	0.0095	0.0832	0.0018	0.1906	0.1139	0.0317
0.0332	0.0102	0.0872	0.0020	0.1966	0.1167	0.0332
0.0348	0.0109	0.0913	0.0022	0.2027	0.1194	0.0348
0.0364	0.0117	0.0954	0.0024	0.2088	0.1222	0.0364
0.0381	0.0125	0.0997	0.0027	0.2150	0.1250	0.0381
0.0397	0.0133	0.1040	0.0029	0.2212	0.1278	0.0397
0.0415	0.0142	0.1084	0.0032	0.2274	0.1306	0.0415
0.0432	0.0151	0.1129	0.0035	0.2336	0.1333	0.0432
0.0450	0.0160	0.1175	0.0038	0.2399	0.1361	0.0450
0.0468	0.0170	0.1222	0.0042	0.2462	0.1389	0.0468
0.0487	0.0180	0.1269	0.0045	0.2526	0.1417	0.0487
0.0506	0.0190	0.1317	0.0049	0.2589	0.1444	0.0506
0.0525	0.0201	0.1366	0.0053	0.2653	0.1472	0.0525
0.0545	0.0212	0.1416	0.0058	0.2717	0.1500	0.0545
0.0565	0.0224	0.1467	0.0062	0.2781	0.1528	0.0565
0.0585	0.0236	0.1518	0.0067	0.2845	0.1556	0.0585
0.0606	0.0249	0.1570	0.0072	0.2910	0.1583	0.0606
0.0627	0.0261	0.1622	0.0078	0.2975	0.1611	0.0627
0.0648	0.0275	0.1676	0.0083	0.3040	0.1639	0.0648
0.0670	0.0288	0.1730	0.0090	0.3105	0.1667	0.0670
0.0692	0.0302	0.1785	0.0096	0.3170	0.1694	0.0692
0.0714	0.0317	0.1840	0.0103	0.3236	0.1722	0.0714
0.0737	0.0332	0.1897	0.0110	0.3301	0.1750	0.0737
0.0760	0.0347	0.1954	0.0117	0.3367	0.1778	0.0760
0.0783	0.0363	0.2011	0.0125	0.3433	0.1806	0.0783
0.0807	0.0379	0.2069	0.0133	0.3499	0.1833	0.0807
0.0831	0.0396	0.2128	0.0141	0.3565	0.1861	0.0831
0.0855	0.0413	0.2188	0.0150	0.3631	0.1889	0.0855
0.0879	0.0431	0.2248	0.0159	0.3697	0.1917	0.0879
0.0904	0.0449	0.2309	0.0169	0.3763	0.1944	0.0904
0.0929	0.0467	0.2370	0.0179	0.3830	0.1972	0.0929
0.0955	0.0486	0.2432	0.0189	0.3896	0.2000	0.0955
0.0981	0.0506	0.2494	0.0200	0.3962	0.2028	0.0981
0.1007	0.0526	0.2557	0.0212	0.4029	0.2056	0.1007
0.1033	0.0546	0.2621	0.0224	0.4095	0.2083	0.1033
0.1060	0.0567	0.2685	0.0236	0.4162	0.2111	0.1060
0.1087	0.0588	0.2750	0.0249	0.4229	0.2139	0.1087
0.1114	0.0610	0.2815	0.0262	0.4295	0.2167	0.1114
0.1142	0.0632	0.2881	0.0276	0.4362	0.2194	0.1142
0.1170	0.0655	0.2947	0.0290	0.4428	0.2222	0.1170
0.1198	0.0678	0.3014	0.0305	0.4495	0.2250	0.1198
0.1226	0.0702	0.3081	0.0320	0.4561	0.2278	0.1226
0.1255	0.0726	0.3148	0.0336	0.4628	0.2306	0.1255
0.1284	0.0751	0.3216	0.0352	0.4694	0.2333	0.1284
0.1314	0.0776	0.3285	0.0369	0.4761	0.2361	0.1314
0.1343	0.0801	0.3354	0.0387	0.4827	0.2389	0.1343
0.1373	0.0827	0.3423	0.0405	0.4894	0.2417	0.1373
0.1403	0.0854	0.3493	0.0424	0.4960	0.2444	0.1403

0.1434	0.0881	0.3563	0.0443	0.5026	0.2472	0.1434
0.1464	0.0908	0.3634	0.0463	0.5092	0.2500	0.1464
0.1495	0.0936	0.3705	0.0483	0.5158	0.2528	0.1495
0.1527	0.0965	0.3776	0.0504	0.5224	0.2556	0.1527
0.1558	0.0994	0.3848	0.0526	0.5290	0.2583	0.1558
0.1590	0.1023	0.3920	0.0548	0.5356	0.2611	0.1590
0.1622	0.1053	0.3992	0.0571	0.5421	0.2639	0.1622
0.1654	0.1084	0.4064	0.0595	0.5487	0.2667	0.1654
0.1687	0.1115	0.4137	0.0619	0.5552	0.2694	0.1687
0.1720	0.1146	0.4210	0.0644	0.5618	0.2722	0.1720
0.1753	0.1178	0.4284	0.0669	0.5683	0.2750	0.1753
0.1786	0.1210	0.4357	0.0696	0.5748	0.2778	0.1786
0.1820	0.1243	0.4431	0.0723	0.5812	0.2806	0.1820
0.1853	0.1277	0.4506	0.0750	0.5877	0.2833	0.1853
0.1887	0.1310	0.4580	0.0779	0.5942	0.2861	0.1887
0.1922	0.1345	0.4654	0.0808	0.6006	0.2889	0.1922
0.1956	0.1379	0.4729	0.0837	0.6070	0.2917	0.1956
0.1991	0.1415	0.4804	0.0868	0.6134	0.2944	0.1991
0.2026	0.1450	0.4879	0.0899	0.6198	0.2972	0.2026
0.2061	0.1486	0.4954	0.0931	0.6261	0.3000	0.2061
0.2096	0.1523	0.5030	0.0963	0.6325	0.3028	0.2096
0.2132	0.1560	0.5105	0.0996	0.6388	0.3056	0.2132
0.2168	0.1597	0.5181	0.1031	0.6451	0.3083	0.2168
0.2204	0.1635	0.5257	0.1065	0.6514	0.3111	0.2204
0.2240	0.1674	0.5333	0.1101	0.6576	0.3139	0.2240
0.2277	0.1713	0.5409	0.1137	0.6638	0.3167	0.2277
0.2314	0.1752	0.5485	0.1174	0.6700	0.3194	0.2314
0.2350	0.1792	0.5561	0.1212	0.6762	0.3222	0.2350
0.2388	0.1832	0.5637	0.1250	0.6824	0.3250	0.2388
0.2425	0.1873	0.5713	0.1289	0.6885	0.3278	0.2425
0.2462	0.1914	0.5789	0.1329	0.6946	0.3306	0.2462
0.2500	0.1955	0.5865	0.1370	0.7007	0.3333	0.2500
0.2538	0.1997	0.5941	0.1411	0.7067	0.3361	0.2538
0.2576	0.2039	0.6017	0.1453	0.7127	0.3389	0.2576
0.2614	0.2082	0.6093	0.1496	0.7187	0.3417	0.2614
0.2653	0.2125	0.6169	0.1540	0.7247	0.3444	0.2653
0.2691	0.2169	0.6245	0.1584	0.7306	0.3472	0.2691
0.2730	0.2212	0.6321	0.1630	0.7365	0.3500	0.2730
0.2769	0.2257	0.6397	0.1675	0.7424	0.3528	0.2769
0.2808	0.2301	0.6473	0.1722	0.7483	0.3556	0.2808
0.2847	0.2346	0.6548	0.1769	0.7541	0.3583	0.2847
0.2887	0.2392	0.6624	0.1818	0.7599	0.3611	0.2887
0.2927	0.2438	0.6699	0.1866	0.7656	0.3639	0.2927
0.2966	0.2484	0.6774	0.1916	0.7713	0.3667	0.2966
0.3006	0.2530	0.6849	0.1966	0.7770	0.3694	0.3006
0.3046	0.2577	0.6924	0.2017	0.7827	0.3722	0.3046
0.3087	0.2625	0.6999	0.2069	0.7883	0.3750	0.3087
0.3127	0.2672	0.7073	0.2121	0.7939	0.3778	0.3127
0.3167	0.2720	0.7148	0.2175	0.7994	0.3806	0.3167
0.3208	0.2768	0.7222	0.2228	0.8049	0.3833	0.3208
0.3249	0.2817	0.7296	0.2283	0.8104	0.3861	0.3249
0.3290	0.2866	0.7369	0.2338	0.8159	0.3889	0.3290
0.3331	0.2915	0.7443	0.2394	0.8213	0.3917	0.3331
0.3372	0.2965	0.7516	0.2451	0.8266	0.3944	0.3372
0.3413	0.3014	0.7589	0.2508	0.8320	0.3972	0.3413

0.3455	0.3065	0.7661	0.2566	0.8373	0.4000	0.3455
0.3496	0.3115	0.7734	0.2624	0.8425	0.4028	0.3496
0.3538	0.3166	0.7806	0.2684	0.8478	0.4056	0.3538
0.3580	0.3217	0.7877	0.2743	0.8529	0.4083	0.3580
0.3622	0.3268	0.7949	0.2804	0.8581	0.4111	0.3622
0.3664	0.3319	0.8019	0.2865	0.8632	0.4139	0.3664
0.3706	0.3371	0.8090	0.2927	0.8682	0.4167	0.3706
0.3748	0.3423	0.8160	0.2989	0.8733	0.4194	0.3748
0.3790	0.3475	0.8230	0.3052	0.8782	0.4222	0.3790
0.3833	0.3527	0.8300	0.3115	0.8832	0.4250	0.3833
0.3875	0.3580	0.8369	0.3179	0.8881	0.4278	0.3875
0.3918	0.3633	0.8438	0.3244	0.8929	0.4306	0.3918
0.3960	0.3686	0.8506	0.3309	0.8977	0.4333	0.3960
0.4003	0.3739	0.8574	0.3375	0.9025	0.4361	0.4003
0.4046	0.3793	0.8642	0.3441	0.9073	0.4389	0.4046
0.4089	0.3846	0.8709	0.3508	0.9119	0.4417	0.4089
0.4132	0.3900	0.8775	0.3575	0.9166	0.4444	0.4132
0.4175	0.3954	0.8841	0.3642	0.9212	0.4472	0.4175
0.4218	0.4008	0.8907	0.3711	0.9257	0.4500	0.4218
0.4261	0.4062	0.8972	0.3779	0.9303	0.4528	0.4261
0.4304	0.4117	0.9037	0.3848	0.9347	0.4556	0.4304
0.4347	0.4171	0.9101	0.3918	0.9391	0.4583	0.4347
0.4391	0.4226	0.9165	0.3987	0.9435	0.4611	0.4391
0.4434	0.4281	0.9228	0.4058	0.9479	0.4639	0.4434
0.4477	0.4336	0.9291	0.4128	0.9522	0.4667	0.4477
0.4521	0.4391	0.9353	0.4199	0.9564	0.4694	0.4521
0.4564	0.4446	0.9415	0.4271	0.9606	0.4722	0.4564
0.4608	0.4501	0.9476	0.4342	0.9647	0.4750	0.4608
0.4651	0.4556	0.9536	0.4414	0.9688	0.4778	0.4651
0.4695	0.4612	0.9596	0.4487	0.9729	0.4806	0.4695
0.4738	0.4667	0.9656	0.4559	0.9769	0.4833	0.4738
0.4782	0.4722	0.9715	0.4632	0.9809	0.4861	0.4782
0.4826	0.4778	0.9773	0.4705	0.9848	0.4889	0.4826
0.4869	0.4833	0.9831	0.4779	0.9887	0.4917	0.4869
0.4913	0.4889	0.9888	0.4852	0.9925	0.4944	0.4913
0.4956	0.4944	0.9944	0.4926	0.9963	0.4972	0.4956
0.5000	0.5000	1.0000	0.5000	1.0000	0.5000	0.5000
0.5044	0.5056	1.0055	0.5074	1.0037	0.5028	0.5044
0.5087	0.5111	1.0110	0.5148	1.0073	0.5056	0.5087
0.5131	0.5167	1.0164	0.5223	1.0109	0.5083	0.5131
0.5174	0.5222	1.0217	0.5297	1.0144	0.5111	0.5174
0.5218	0.5278	1.0270	0.5372	1.0179	0.5139	0.5218
0.5262	0.5333	1.0322	0.5447	1.0214	0.5167	0.5262
0.5305	0.5388	1.0373	0.5522	1.0247	0.5194	0.5305
0.5349	0.5444	1.0424	0.5597	1.0281	0.5222	0.5349
0.5392	0.5499	1.0474	0.5671	1.0314	0.5250	0.5392
0.5436	0.5554	1.0524	0.5746	1.0346	0.5278	0.5436
0.5479	0.5609	1.0572	0.5821	1.0378	0.5306	0.5479
0.5523	0.5664	1.0620	0.5896	1.0409	0.5333	0.5523
0.5566	0.5719	1.0668	0.5971	1.0440	0.5361	0.5566
0.5609	0.5774	1.0714	0.6046	1.0471	0.5389	0.5609
0.5653	0.5829	1.0760	0.6120	1.0501	0.5417	0.5653
0.5696	0.5883	1.0806	0.6195	1.0530	0.5444	0.5696
0.5739	0.5938	1.0850	0.6270	1.0559	0.5472	0.5739
0.5782	0.5992	1.0894	0.6344	1.0588	0.5500	0.5782

0.5825	0.6046	1.0937	0.6418	1.0616	0.5528	0.5825
0.5868	0.6100	1.0980	0.6492	1.0643	0.5556	0.5868
0.5911	0.6154	1.1022	0.6566	1.0670	0.5583	0.5911
0.5954	0.6207	1.1063	0.6640	1.0696	0.5611	0.5954
0.5997	0.6261	1.1103	0.6713	1.0722	0.5639	0.5997
0.6040	0.6314	1.1142	0.6786	1.0748	0.5667	0.6040
0.6082	0.6367	1.1181	0.6859	1.0773	0.5694	0.6082
0.6125	0.6420	1.1219	0.6932	1.0797	0.5722	0.6125
0.6167	0.6473	1.1257	0.7004	1.0821	0.5750	0.6167
0.6210	0.6525	1.1293	0.7076	1.0845	0.5778	0.6210
0.6252	0.6577	1.1329	0.7148	1.0867	0.5806	0.6252
0.6294	0.6629	1.1364	0.7219	1.0890	0.5833	0.6294
0.6336	0.6681	1.1399	0.7290	1.0912	0.5861	0.6336
0.6378	0.6732	1.1432	0.7361	1.0933	0.5889	0.6378
0.6420	0.6783	1.1465	0.7431	1.0954	0.5917	0.6420
0.6462	0.6834	1.1497	0.7501	1.0975	0.5944	0.6462
0.6504	0.6885	1.1529	0.7570	1.0995	0.5972	0.6504
0.6545	0.6935	1.1559	0.7639	1.1014	0.6000	0.6545
0.6587	0.6986	1.1589	0.7707	1.1033	0.6028	0.6587
0.6628	0.7035	1.1618	0.7775	1.1052	0.6056	0.6628
0.6669	0.7085	1.1646	0.7843	1.1070	0.6083	0.6669
0.6710	0.7134	1.1674	0.7910	1.1087	0.6111	0.6710
0.6751	0.7183	1.1701	0.7976	1.1104	0.6139	0.6751
0.6792	0.7232	1.1727	0.8042	1.1120	0.6167	0.6792
0.6833	0.7280	1.1752	0.8107	1.1136	0.6194	0.6833
0.6873	0.7328	1.1777	0.8172	1.1152	0.6222	0.6873
0.6913	0.7375	1.1801	0.8236	1.1167	0.6250	0.6913
0.6954	0.7423	1.1824	0.8300	1.1182	0.6278	0.6954
0.6994	0.7470	1.1846	0.8363	1.1196	0.6306	0.6994
0.7034	0.7516	1.1868	0.8425	1.1209	0.6333	0.7034
0.7073	0.7562	1.1888	0.8487	1.1222	0.6361	0.7073
0.7113	0.7608	1.1908	0.8548	1.1235	0.6389	0.7113
0.7153	0.7654	1.1928	0.8608	1.1247	0.6417	0.7153
0.7192	0.7699	1.1946	0.8668	1.1259	0.6444	0.7192
0.7231	0.7743	1.1964	0.8727	1.1270	0.6472	0.7231
0.7270	0.7788	1.1981	0.8785	1.1280	0.6500	0.7270
0.7309	0.7831	1.1997	0.8842	1.1291	0.6528	0.7309
0.7347	0.7875	1.2013	0.8899	1.1300	0.6556	0.7347
0.7386	0.7918	1.2028	0.8955	1.1310	0.6583	0.7386
0.7424	0.7961	1.2042	0.9010	1.1319	0.6611	0.7424
0.7462	0.8003	1.2055	0.9065	1.1327	0.6639	0.7462
0.7500	0.8045	1.2067	0.9119	1.1335	0.6667	0.7500
0.7538	0.8086	1.2079	0.9172	1.1342	0.6694	0.7538
0.7575	0.8127	1.2090	0.9224	1.1349	0.6722	0.7575
0.7612	0.8168	1.2101	0.9275	1.1356	0.6750	0.7612
0.7650	0.8208	1.2111	0.9326	1.1362	0.6778	0.7650
0.7686	0.8248	1.2119	0.9376	1.1367	0.6806	0.7686
0.7723	0.8287	1.2128	0.9425	1.1372	0.6833	0.7723
0.7760	0.8326	1.2135	0.9473	1.1377	0.6861	0.7760
0.7796	0.8365	1.2142	0.9520	1.1381	0.6889	0.7796
0.7832	0.8403	1.2148	0.9566	1.1385	0.6917	0.7832
0.7868	0.8440	1.2154	0.9612	1.1389	0.6944	0.7868
0.7904	0.8477	1.2158	0.9657	1.1392	0.6972	0.7904
0.7939	0.8514	1.2162	0.9701	1.1394	0.7000	0.7939
0.7974	0.8550	1.2166	0.9743	1.1396	0.7028	0.7974

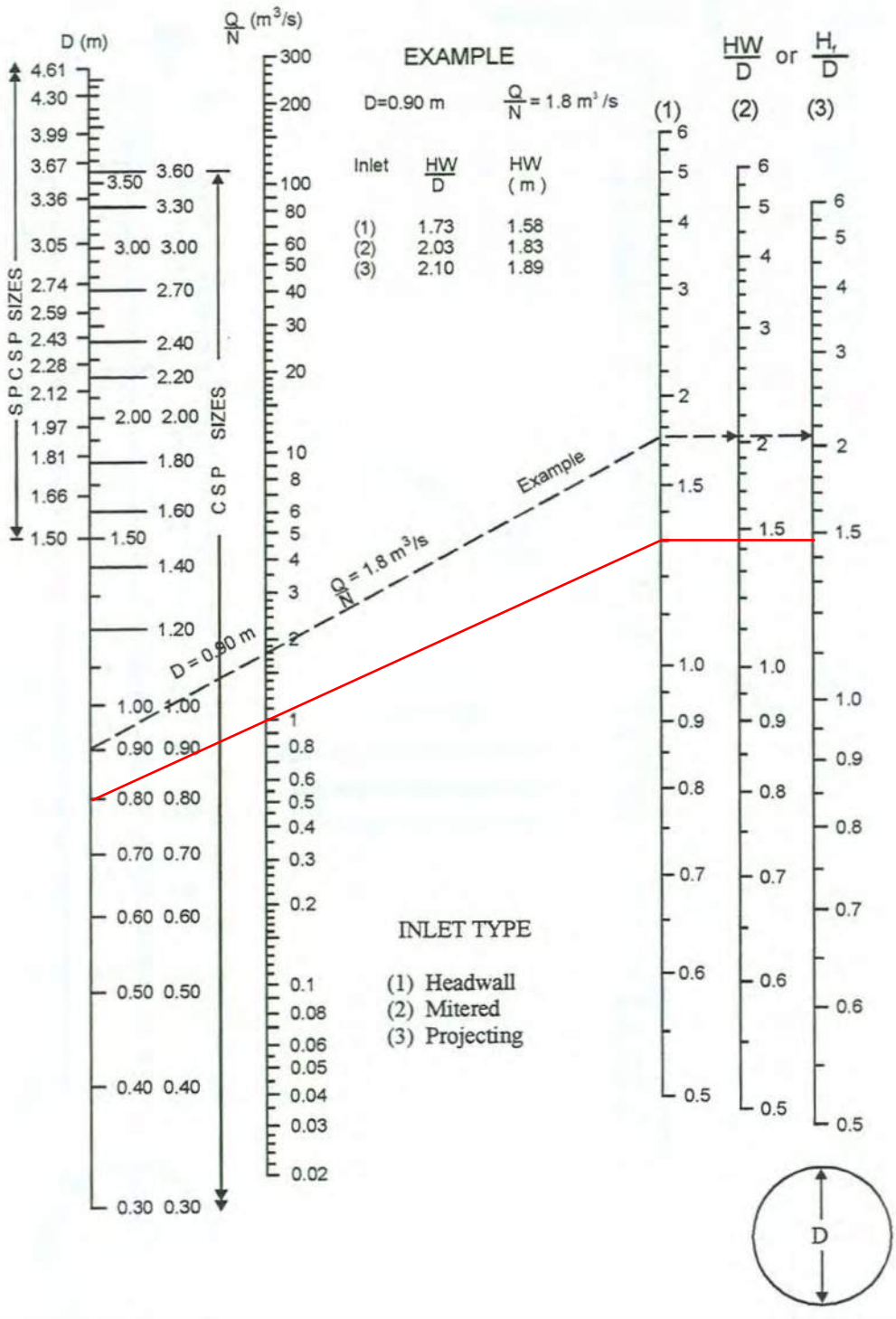
0.8009	0.8585	1.2168	0.9786	1.1398	0.7056		0.8009
0.8044	0.8621	1.2170	0.9827	1.1399	0.7083		0.8044
0.8078	0.8655	1.2172	0.9867	1.1400	0.7111		0.8078
0.8113	0.8690	1.2172	0.9906	1.1400	0.7139		0.8113
0.8147	0.8723	1.2172	0.9945	1.1400	0.7167		0.8147
0.8180	0.8757	1.2172	0.9983	1.1400	0.7194		0.8180
0.8214	0.8790	1.2170	1.0019	1.1399	0.7222		0.8214
0.8247	0.8822	1.2168	1.0055	1.1398	0.7250		0.8247
0.8280	0.8854	1.2166	1.0090	1.1396	0.7278		0.8280
0.8313	0.8885	1.2162	1.0124	1.1394	0.7306		0.8313
0.8346	0.8916	1.2158	1.0157	1.1392	0.7333		0.8346
0.8378	0.8947	1.2154	1.0189	1.1389	0.7361		0.8378
0.8410	0.8977	1.2149	1.0220	1.1386	0.7389		0.8410
0.8442	0.9006	1.2143	1.0251	1.1382	0.7417		0.8442
0.8473	0.9035	1.2137	1.0280	1.1378	0.7444		0.8473
0.8505	0.9064	1.2130	1.0309	1.1374	0.7472		0.8505
0.8536	0.9092	1.2122	1.0336	1.1369	0.7500		0.8536
0.8566	0.9119	1.2114	1.0363	1.1364	0.7528		0.8566
0.8597	0.9146	1.2105	1.0388	1.1358	0.7556		0.8597
0.8627	0.9173	1.2096	1.0413	1.1352	0.7583		0.8627
0.8657	0.9199	1.2086	1.0437	1.1346	0.7611		0.8657
0.8686	0.9224	1.2076	1.0460	1.1340	0.7639		0.8686
0.8716	0.9249	1.2065	1.0482	1.1333	0.7667		0.8716
0.8745	0.9274	1.2053	1.0504	1.1326	0.7694		0.8745
0.8774	0.9298	1.2041	1.0524	1.1318	0.7722		0.8774
0.8802	0.9322	1.2028	1.0543	1.1310	0.7750		0.8802
0.8830	0.9345	1.2015	1.0562	1.1302	0.7778		0.8830
0.8858	0.9368	1.2002	1.0579	1.1293	0.7806		0.8858
0.8886	0.9390	1.1987	1.0596	1.1285	0.7833		0.8886
0.8913	0.9412	1.1973	1.0612	1.1275	0.7861		0.8913
0.8940	0.9433	1.1958	1.0627	1.1266	0.7889		0.8940
0.8967	0.9454	1.1942	1.0641	1.1256	0.7917		0.8967
0.8993	0.9474	1.1926	1.0655	1.1246	0.7944		0.8993
0.9019	0.9494	1.1909	1.0667	1.1235	0.7972		0.9019
0.9045	0.9514	1.1892	1.0679	1.1225	0.8000		0.9045
0.9071	0.9533	1.1875	1.0689	1.1214	0.8028		0.9071
0.9096	0.9551	1.1857	1.0699	1.1202	0.8056		0.9096
0.9121	0.9569	1.1838	1.0709	1.1191	0.8083		0.9121
0.9145	0.9587	1.1819	1.0717	1.1179	0.8111		0.9145
0.9169	0.9604	1.1800	1.0724	1.1167	0.8139		0.9169
0.9193	0.9621	1.1780	1.0731	1.1154	0.8167		0.9193
0.9217	0.9637	1.1760	1.0737	1.1142	0.8194		0.9217
0.9240	0.9653	1.1740	1.0742	1.1129	0.8222		0.9240
0.9263	0.9668	1.1719	1.0746	1.1115	0.8250		0.9263
0.9286	0.9683	1.1698	1.0750	1.1102	0.8278		0.9286
0.9308	0.9698	1.1676	1.0753	1.1088	0.8306		0.9308
0.9330	0.9712	1.1654	1.0755	1.1074	0.8333		0.9330
0.9352	0.9725	1.1632	1.0756	1.1060	0.8361		0.9352
0.9373	**0.9739**	**1.1609**	**1.0757**	**1.1046**	**0.8389**	**Breakpoint for Q/Q_{full}**	0.9373
0.9394	0.9751	1.1586	1.0757	1.1031	0.8417		0.9394
0.9415	0.9764	1.1563	1.0756	1.1016	0.8444		0.9415
0.9435	0.9776	1.1539	1.0755	1.1001	0.8472		0.9435
0.9455	0.9788	1.1515	1.0753	1.0986	0.8500		0.9455
0.9475	0.9799	1.1491	1.0750	1.0970	0.8528		0.9475
0.9494	0.9810	1.1466	1.0746	1.0955	0.8556		0.9494

0.9513	0.9820	1.1441	1.0742	1.0939	0.8583	0.9513
0.9532	0.9830	1.1416	1.0738	1.0923	0.8611	0.9532
0.9550	0.9840	1.1390	1.0732	1.0907	0.8639	0.9550
0.9568	0.9849	1.1365	1.0726	1.0890	0.8667	0.9568
0.9585	0.9858	1.1339	1.0720	1.0874	0.8694	0.9585
0.9603	0.9867	1.1313	1.0713	1.0857	0.8722	0.9603
0.9619	0.9875	1.1286	1.0705	1.0840	0.8750	0.9619
0.9636	0.9883	1.1260	1.0697	1.0823	0.8778	0.9636
0.9652	0.9891	1.1233	1.0688	1.0806	0.8806	0.9652
0.9668	0.9898	1.1206	1.0679	1.0788	0.8833	0.9668
0.9683	0.9905	1.1178	1.0669	1.0771	0.8861	0.9683
0.9698	0.9912	1.1151	1.0659	1.0753	0.8889	0.9698
0.9713	0.9918	1.1123	1.0648	1.0735	0.8917	0.9713
0.9728	0.9924	1.1095	1.0636	1.0718	0.8944	0.9728
0.9742	0.9930	1.1068	1.0625	1.0700	0.8972	0.9742
0.9755	0.9935	1.1039	1.0613	1.0681	0.9000	0.9755
0.9769	0.9941	1.1011	1.0600	1.0663	0.9028	0.9769
0.9782	0.9946	1.0983	1.0587	1.0645	0.9056	0.9782
0.9794	0.9950	1.0954	1.0574	1.0626	0.9083	0.9794
0.9806	0.9955	1.0926	1.0560	1.0608	0.9111	0.9806
0.9818	0.9959	1.0897	1.0546	1.0589	0.9139	0.9818
0.9830	0.9962	1.0868	1.0531	1.0571	0.9167	0.9830
0.9841	0.9966	1.0839	1.0516	1.0552	0.9194	0.9841
0.9851	0.9969	1.0810	1.0501	1.0533	0.9222	0.9851
0.9862	0.9973	1.0781	1.0485	1.0514	0.9250	0.9862
0.9872	0.9975	1.0752	1.0470	1.0495	0.9278	0.9872
0.9881	0.9978	1.0723	1.0453	1.0476	0.9306	0.9881
0.9891	0.9981	1.0694	1.0437	1.0457	0.9333	0.9891
0.9900	0.9983	1.0664	1.0420	1.0438	0.9361	0.9900
0.9908	0.9985	1.0635	1.0403	1.0419	0.9389	0.9908
0.9916	0.9987	1.0606	1.0386	1.0400	0.9417	0.9916
0.9924	0.9989	1.0576	1.0369	1.0381	0.9444	0.9924
0.9931	0.9990	1.0547	1.0351	1.0361	0.9472	0.9931
0.9938	0.9992	1.0518	1.0334	1.0342	0.9500	0.9938
0.9945	0.9993	1.0488	1.0316	1.0323	0.9528	0.9945
0.9951	0.9994	1.0459	1.0298	1.0304	0.9556	0.9951
0.9957	0.9995	1.0430	1.0280	1.0285	0.9583	0.9957
0.9963	0.9996	1.0401	1.0261	1.0265	0.9611	0.9963
0.9968	0.9997	1.0371	1.0243	1.0246	0.9639	0.9968
0.9973	0.9998	1.0342	1.0224	1.0227	0.9667	0.9973
0.9977	0.9998	1.0313	1.0206	1.0208	0.9694	0.9977
0.9981	0.9999	1.0284	1.0187	1.0189	0.9722	0.9981
0.9985	0.9999	1.0255	1.0168	1.0170	0.9750	0.9985
0.9988	0.9999	1.0227	1.0150	1.0150	0.9778	0.9988
0.9991	1.0000	1.0198	1.0131	1.0131	0.9806	0.9991
0.9993	1.0000	1.0169	1.0112	1.0112	0.9833	0.9993
0.9995	1.0000	1.0141	1.0093	1.0094	0.9861	0.9995
0.9997	1.0000	1.0112	1.0075	1.0075	0.9889	0.9997
0.9998	1.0000	1.0084	1.0056	1.0056	0.9917	0.9998
0.9999	1.0000	1.0056	1.0037	1.0037	0.9944	0.9999
1.0000	1.0000	1.0028	1.0019	1.0019	0.9972	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000


r/R
ll
Q/Qfull

Culvert #3 - Mosquito Drive, 3700 Twin Falls crossing Gastops Street
Peak Flow

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts

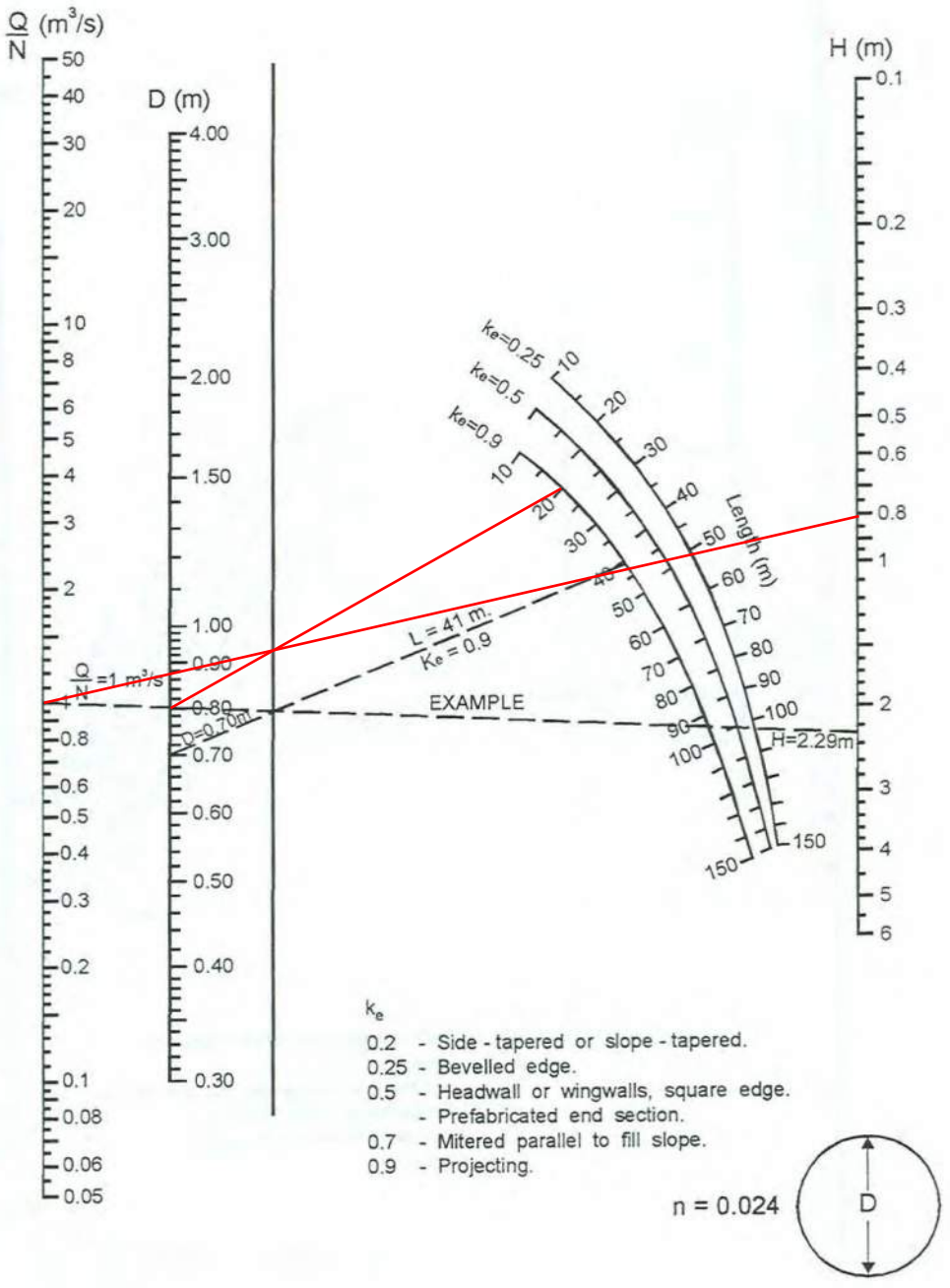


Source: Herr (1977)

Maximum Q = 3700 Twin Falls Phase 1 Design Brief (445 L/s) plus west of Limebank upstream peak flow (555 L/s)
Maximum Q = 1,000 L/s
D = 800mm Culvert

Culvert #3 - Mosquito Drive, 3700 Twin Falls crossing Gastops Street
Peak Flow

Design Chart 2.35: Outlet Control: CSP Culvert - Flowing Full

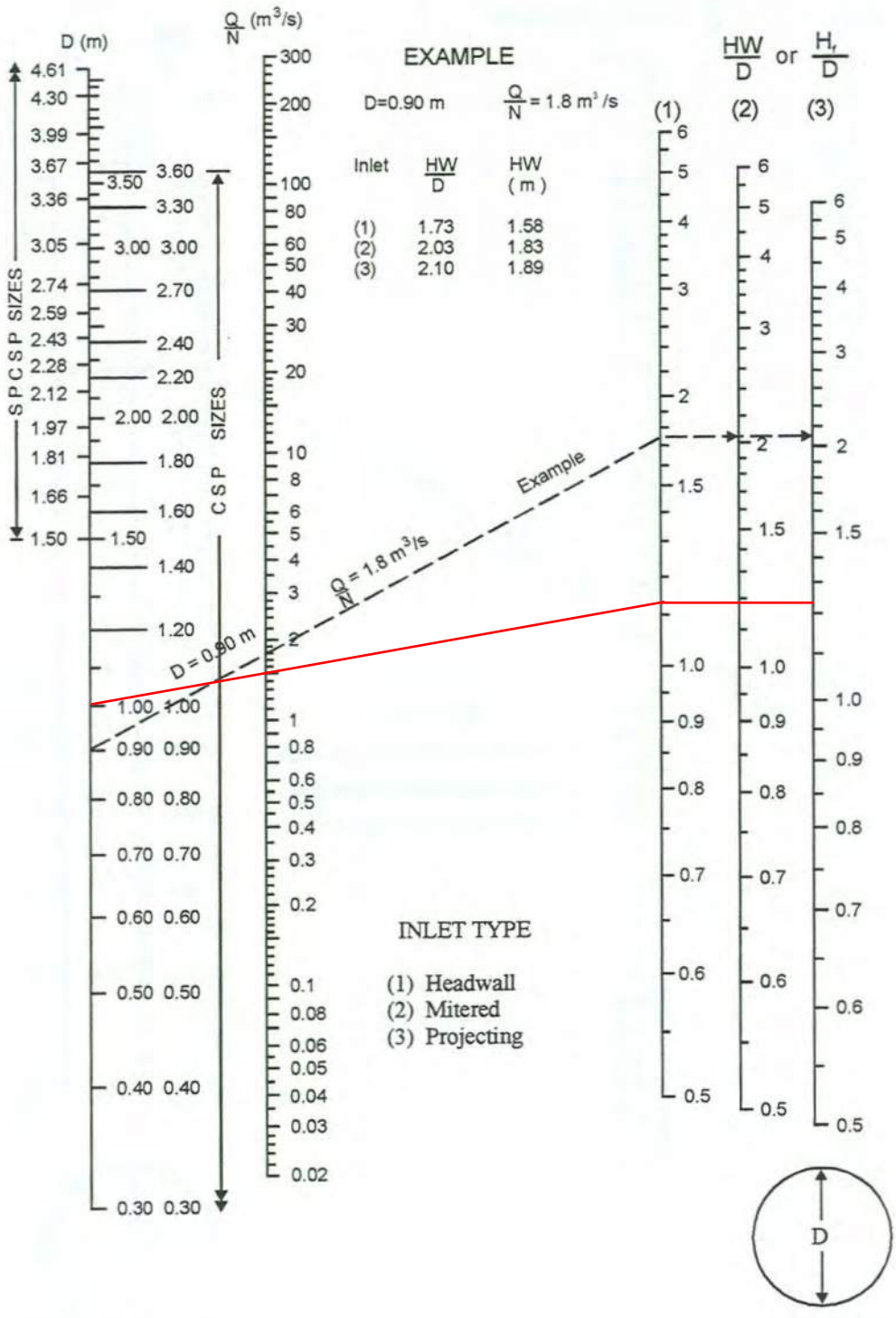


Source: Herr (1977)

Maximum Q = 3700 Twin Falls Phase 1 Design Brief (445 L/s) plus west of Limebank upstream peak flow (555 L/s)
Maximum Q = 1,000 L/s
D = 800mm Culvert

Culvert #1 - Street 3, 3700 Twin Falls crossing
Access Road
Peak Flow

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts

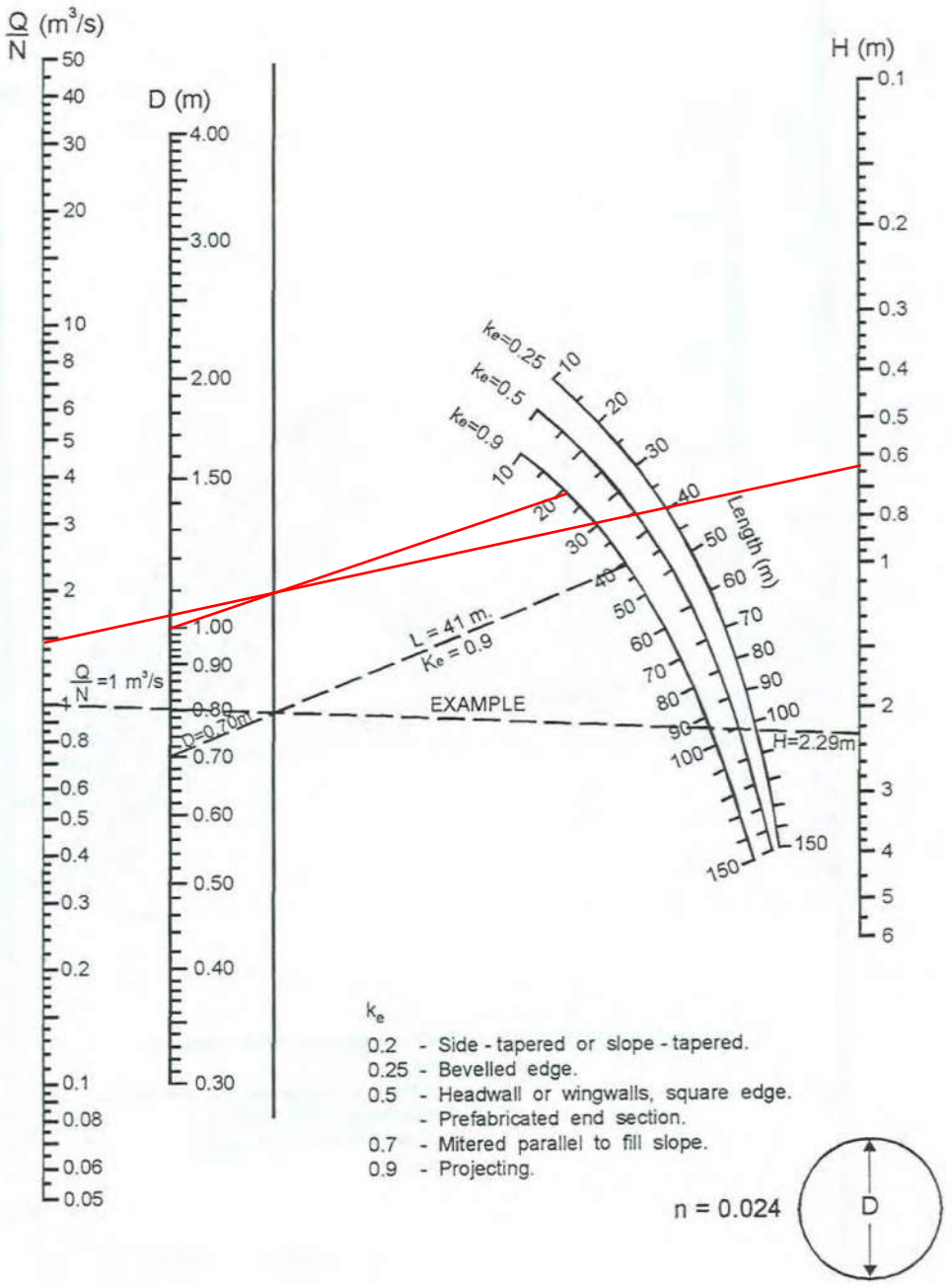


Source: Herr (1977)

Maximum Q = 3700 Twin Falls Phase 1 Design Brief (877 L/s) plus west of Limebank upstream peak flow (555 L/s)
Maximum Q = 1,432 L/s
D = 1000mm Culvert

Culvert #1 - Street 3, 3700 Twin Falls crossing
Access Road
Peak Flow

Design Chart 2.35: Outlet Control: CSP Culvert - Flowing Full



Source: Herr (1977)

Maximum Q = 3700 Twin Falls Phase 1 Design Brief (877 L/s) plus west of Limebank upstream peak flow (610 L/s)
Maximum Q = 1,432 L/s
D = 1000mm Culvert