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**RESIDENTIAL SUBDIVISION  
1944 BRADLEY AVENUE  
CITY OF LONDON**

**FUNCTIONAL SERVICING REPORT**

Prepared For:

**ELITE DEVELOPMENTS**

**May 18, 2023**

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### APPENDIX A

Proposed Residential Subdivision by Weston Consulting

### APPENDIX B

External Sanitary Area Plan prepared by Development Engineering  
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Strom Sewer Design Sheet

## 1.0 BACKGROUND

The property under study is a 42.3 ha (104.5 acre) site located in the City of London, north-east of the intersection of Bradley Road and Jackson Road. The site is bound by a Parker Jackson residential subdivision to the north and west which is currently under construction, agricultural lands to the east, and Bradley Rd to the south.

Presently the site is farm land consisting of a dwelling with a barn on the southern portion and a wooded area on the northern portion. An existing hydro transmission corridor traverses the middle of the site running in south-west to north-east direction. See below Exhibit 1 for an aerial view of the existing site.



**Exhibit 1 – Site Aerial Image**

The proposed development by Elite Developments will consist of a mix of single detached homes, freehold townhouses and condo townhouses. Access to the site will be from a future road connection to the west from the neighbouring Parker Jackson Subdivision in Phase 4, currently denoted as Street N or Evans Blvd. The area of proposed development within the property is situated between the northerly woodlot and the existing hydro transmission corridor which has an area of 9.5 ha (23.5 acres). For further information regarding the proposed site layout please refer to drawings prepared by Weston Consulting in Appendix A. See Appendix A for aerial view and the proposed site plan.

This report will evaluate the serviceability of the site with respect to sanitary, water and stormwater services and also conceptual grading of the proposed development.

For detailed topography of the existing site conditions, as of September 2022, refer to the topographic survey prepared by A.T. McLaren Ltd.

## 2.0 DESIGN CONSIDERATIONS

### A) SANITARY WASTE WATER DISPOSAL

#### Existing Site

Presently there are no existing sanitary sewers adjacent to the site. A 250mm diameter sanitary sewer located within the future Street N/Evans Blvd to the west is proposed to be stubbed to the property and has allocated capacity to service the proposed development, including lands east of the subject site. Development Engineering has prepared an external sanitary tributary area plan which shows there is a population of 2,160 that has been assigned in the downstream sewer design. Please refer to Appendix B for the external sanitary tributary area plan prepared by Development Engineering.

The sewer design spreadsheet prepared by Development Engineers shows that the downstream 250mm sanitary sewer sloped at 0.33% has a capacity of 34.18 l/s and the anticipated flow from the allocated population is 20.47 l/s. The upstream area that has been allocated is 14.84ha therefore an additional 1.48 l/s of infiltration has been allocated to the connecting sewer. Since the proposed development is only 9.5 ha, the remaining 5.34 ha has been assigned to lands east of the site. Please refer to Appendix B for the downstream sewer design calculations prepared by Development Engineering.

Based on the above allocation and construction of the downstream sanitary sewer on the neighbouring lands, the proposed development will have an outlet for sanitary services.

#### Proposed Developed Site

The proposed site will consist of residential units only. The unit type breakdown is shown in the following Table 1.

<b>Proposed Residential Typology</b>	<b>No. of Units</b>
Single Detached	49
Freehold Townhomes	144
Condo Townhomes	88
<b>Total</b>	<b>281</b>

Refer to the site statistics and the site plan by Weston Consulting in Appendix A for further details.

For calculating the population for the site the following City standards for population densities and flow rates will be used. It should be noted these densities were also used by Development Engineers in calculating the downstream receiving sewers to the west.

- 3 persons/unit for Single Detached and Freehold Townhomes
- 2.4 persons/unit for Condo Townhomes
- The per capita flow rate of 230 L/person/day for residential

Based on the above information, the peak sanitary flow from the proposed development was calculated as shown below totaling 9.08 L/s.

Total Tributary Area		9.5	ha	<b>SITE DESCRIPTION:</b> Residential Subdivision 1944 Bradley Rd City of London				
Per Capita Flow (Q)		230	L/cap/day					
Infiltration Rate (i)		0.100	L/s/ha					
LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL, Freehold Townhomes/Single Detached, using 3 persons/unit	193			579	133,170	1.54		
RESIDENTIAL, Condo Townhomes, using 2.4 People/Unit	88			211	48,576	0.56		
<b>TOTAL RESIDENTIAL</b>	<b>281</b>			<b>790</b>	<b>181,746</b>	<b>2.10</b>	<b>3.86</b>	<b>8.13</b>

**TOTAL**

V1= 181,746                      Q1 = 8.13 L/s  
 Q (infil) = 0.95 L/s  
**Q (total) = 9.08 L/s**

**Notes:**

$Q = (MqP/86400) + A * i$  (L/sec)

where :

Peaking Factor (M) =  $1 + [14 / (4 + (P/1000, 1/2))]$

q = L/cap/day

P = Population

A = Gross site area

i = Infiltration rate

V1= Total Volume from Land Use in liters

Q1= Total domestic flow from Land Use (L/sec)

Q (infil) = Total flow from infiltration (L/sec)

Q (total) = Total flow (Land use + Infiltration)

As shown above, the total generated expected sanitary flow and population from the site is less than the allocated values assigned to the allocated sanitary sewer downstream within the future Phase 4 of Parker Jackson Subdivision. No changes to existing downstream design is required.

All sanitary sewers within the development will be sized at 250mm diameter which is the minimum City of London standard. Please refer to Appendix B for the conceptual sanitary servicing layout within the subdivision showing pipe slopes and invert depths.

## B) WATER DISTRIBUTION

The water servicing for the site will be provided by connecting to the future 300mm watermain which will be stubbed to the site at the connecting Street N/Evans Blvd.

Looping the municipal watermain through the site back to future Street L/Lyndsay Street through the proposed connector green spaces along the north and west boundary is proposed to maintain pressure and flows to the site and will also provide a secondary water source in case of temporary shut downs of watermains within the site. The connection to Street L/Lindsay Street will need to be made through the proposed Park Block within Phase 4 of Parker Jackson Subdivision denoted as Block 60. Please refer to the proposed servicing concept in Appendix B for the conceptual watermain layout for the proposed site.

A WaterCAD model was completed by Development Engineers for the proposed neighbouring Parker Jackson Subdivision (Parker Jackson Subdivision Water Servicing Design Report dated August 1, 2021) which included conceptual modelling for the subject site with consideration for looping to the 600mm watermain on Commissioners Rd to the north or the 600mm watermain on Bradeley Ave to the south, however due the distance to complete these connections the loop to Street L has been proposed as mentioned above. Further analysis of the looping requirements will be completed to confirm available flows within the proposed development.

### Domestic Water Demands

The domestic water demand for the site will be calculated using City of London design standards as follows.

a)	Average Day domestic demand -	using 255 L/cap/day (790 persons)	2.33 L/sec
b)	Peak day demand -	3.5 x daily demand	8.16 L/sec
c)	Peak hour demand -	7.8 x daily demand	18.17 L/sec

### Fire Protection

The required fire flow for the proposed development is typically determined by the Ontario Building Code at the building permit stage. As per City guidelines the Fire Underwriters Survey (FUS) can be used to determine preliminary fire demands however without specific dwelling unit sizes and setback requirements known at this time, demands from the City of London's Design Specification and Requirements manual are to be considered.

In modeling the site Development Engineering used a fire demand of 76 L/s for single detached dwellings and 105 L/s for townhouse units.

Fire hydrants will be distributed throughout the proposed subdivision meeting the City's hydrant spacing requirements.

## Design Considerations

The unit rate and peaking factors of water consumption, minimum pipe size and allowable pressure in line will be established from the City's Water Design Standards.

The pressures and volumes must be sufficient for peak hour conditions and under fire conditions as established by the Ontario Building Code. The minimal residual pressure under fire conditions is 140 kpa (or 20.3 psi).

According to the MOE criteria the allowable pressures are as follows:

Condition	Allowable Pressures (kpa)	
	min.	max.
1) Min. Hour	275	700
2) Peak Hour	275	700
3) Peak Day + Fire Flow	140	700

To determine the pressures that will be available to the site, the full buildout conditions were considered for the watermain connection and hydrant at the Street N/ Evans Ave connection point in Development Engineers Report. The available flow under peak day plus fire flow was determined to be 77 L/s with a pressure of 313.56 kpa (45.5 PSI) at the connection point which meets the fire flow requirement for single detached dwellings but not for townhome units. Looping options to increase flow will be further evaluated on subsequent submission upon further coordination with the neighbouring development. Please refer to excerpts of Development Engineers modelling results in Appendix B for details of the ultimate buildout conditions on the neighbouring subdivision.

### C) STORMWATER SERVICING

The existing site is located within the Dingman Creek catchment area and drains toward the Thames River through the Hampton-Scott Municipal Drain. The area of development within the subject lands has been allocated to the Parker Stormwater Management Facility located to the westward, on the east side of Jackson Street between Darnley Blvd and Evans Blvd within the Parker Jackson Subdivision. The pond was constructed by the City of London in 2019 to provide quantity and quality control for 78.1 ha of land which includes the proposed subdivision denoted as area 202e in Exhibit 2 below.



Exhibit 2 – Site Aerial Image



## **Existing Conditions**

A pre-development drainage area plan located in Appendix B has been prepared to show the detailed existing storm catchments within the proposed subdivision to confirm existing outlets surrounding the site and their contributing areas. Areas 1, 2 and 3 currently drain westward toward the neighbouring Parker Jackson Subdivision with Area 2 draining directly into the existing neighbouring woodlot. Area 4 currently drains southward toward Bradley Rd however this area has been allocated to the existing SWM pond and will be diverted in the post-development condition. No external areas are presently draining towards the proposed subdivision therefore no existing interim catchments will need to be considered in the proposed storm sewer design.

## **Proposed Conditions**

The proposed subdivision will be serviced for storm drainage by a proposed 1350mm storm sewer stub located on future Street N/Evans Blvd. The connecting sewer has been sized to accommodate the subject development and future residential lands denoted as 202f (11.637 ha) on Exhibit 2 above.

A preliminary storm sewer design is shown on the conceptual servicing plan in Appendix B which shows the storm sewers sizing and slope requirements to service the site and the future westerly developable lands. A 1050mm storm sewer will be terminated at the west limit of the site to service future development. Storm design calculations and an associated storm tributary plan is provided in Appendix B detailing all proposed pipe lengths within the development located on municipal road allowances.

The open space areas of the development between the woodlot and the proposed residential lots will remain as per existing conditions and will drain according to the existing topography. Areas draining toward the residential units will drain to proposed rear yard catchbasins whereas areas draining toward the northerly and westerly woodlot will continue to drain to their respective outlets.

The internal private condo townhouse block will be serviced with one storm outlet west of the block. Internal sewers within the block have not been detailed at this stage as the sewers will be privately owned and the block will be subject to a Site Plan Application which will detail the sewer design within the block. This block will not require any quantity or quality stormwater control as this is being managed within the downstream Parker SWM facility.

## **Grading Consideration**

Grading for the proposed site will be such that major overland flow will be directed westward through the proposed internal road network toward the connecting Street N/Evans Blvd. Overland flow beyond the property is proposed to be directed overland to the Parker SWM facility via the proposed road network.

A conceptual grading design can be found in Appendix B showing how the site will tie into existing surrounding sites and direct overland runoff to westerly lands.

## **Erosion Control**

Erosion and sediment controls for the site will be implemented according to The Ministry of Natural Resources Guidelines on Erosion and Sediment Control for Urban Construction Sites. A detailed erosion control plan will be prepared upon final design.

### 3.0 CONCLUSIONS

From our investigation the site is serviceable utilizing the future allocated sanitary, storm and watermain infrastructure that will be constructed in Phase 4 of the westerly Parker Jackson Subdivision.

A 250mm sanitary stub at the connecting Street N/Evans Blvd has an allocated population of 2,160 people of which 790 are within the proposed development, thereby providing sufficient capacity for the site.

A 300mm watermain stub has been proposed at the connecting Street N/Evans Blvd which provides sufficient flow to meet the water demand for single family dwellings however will require looping to a second watermain source to accommodate water demand for the proposed townhouse units within the development. Watermain looping options will be explored through further watermain analysis.

A 1350mm storm sewer stub at the connecting Street N/Evans Blvd will provide sufficient stormwater drainage capacity to drain stormwater from the subject development and future developable lands to the east. The existing downstream Parker SWM facility located west of the site within Parker Jackson Subdivision has allocated quantity and quality control to service the site for stormwater management purposes.

Respectfully Submitted;



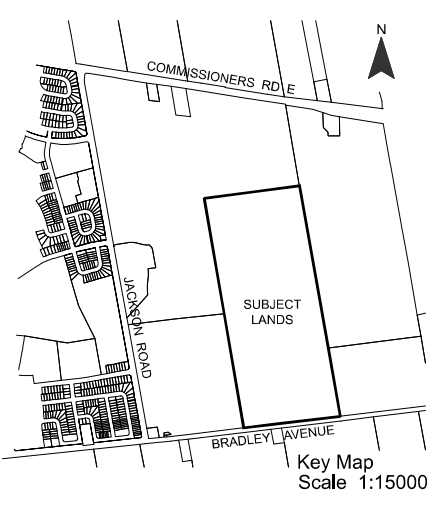
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Paul Hecimovic, P.Eng

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## **APPENDIX A**

Proposed Residential Subdivision by Weston Consulting



**DEVELOPMENT STATISTICS:**

Land Use	Lots/Blocks	Units	Area
Single Detached Residential	Lots 1-49	49 units	2,246 ha
Street Townhouses	Blks 50-72	144 units	2,748 ha
Condo Townhouse Block	Blk 73		1,862 ha
Greenspace Connector	Blk 74		0,232 ha
Future Development	Blk 75,76		17,635 ha
Hydro Easement	Blk 77,78		2,518 ha
30 m Buffer	Blk 79		1,909 ha
Environmental Protection Area	Blk 80		9,449 ha
0,3m Reserves	Blk 81,82		0,001 ha
Roads			3,517 ha
<b>TOTAL</b>		<b>193 units</b>	<b>42,117 ha</b>

**ADDITIONAL INFORMATION:**  
 [Section 51(17) of the Planning Act, R.S.O. 1990, c. P.13],  
 as amended to February 09, 2023.  
 a), b), e), f), g), & j) - on plan.  
 c) - on key plan  
 d) - see statistics  
 h) - piped municipal water supply  
 i) - silty clay and gravel  
 k) - piped communal sewage disposal  
 l) - easements as in instruments

**OWNER'S CERTIFICATE:**  
 I authorize Weston Consulting Group Inc. to prepare and submit this plan for draft approval.

Date: \_\_\_\_\_

**SURVEYOR'S CERTIFICATE:**  
 I hereby certify that the boundaries of the lands being subdivided and their correct relationship to the adjacent lands are accurately and correctly shown on this plan.

Date: \_\_\_\_\_

ELITE BRADLEY DEVELOPMENTS INC.  
 SAM SAH  
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 610 JOHN STREET SOUTH, SUITE 200  
 HAMILTON, ONTARIO L8N 2R9  
 PHONE (905) 527-8559 FAX (905) 527-0332

**DRAFT PLAN OF SUBDIVISION**  
 PART 1, PLAN OF  
 SOUTH HALF OF LOT 11  
 CONCESSION 1  
 GEOGRAPHIC  
 TOWNSHIP OF WESTMINSTER  
 CITY OF LONDON  
 COUNTY OF MIDDLESEX

SCALE  
 0 25 50 75 100m

**WESTON CONSULTING**

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**REVISIONS LIST**

Date	Description
21 FEB 2023	First Draft

File Number: 10574  
 Drawn By: SM  
 Planner: MQ  
 Scale: see scale bar  
 CAD: 10574\draft\plans\D1.dgn

Drawing Number: **D1**

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## **APPENDIX B**

External Sanitary Area Plan prepared by Development Engineering  
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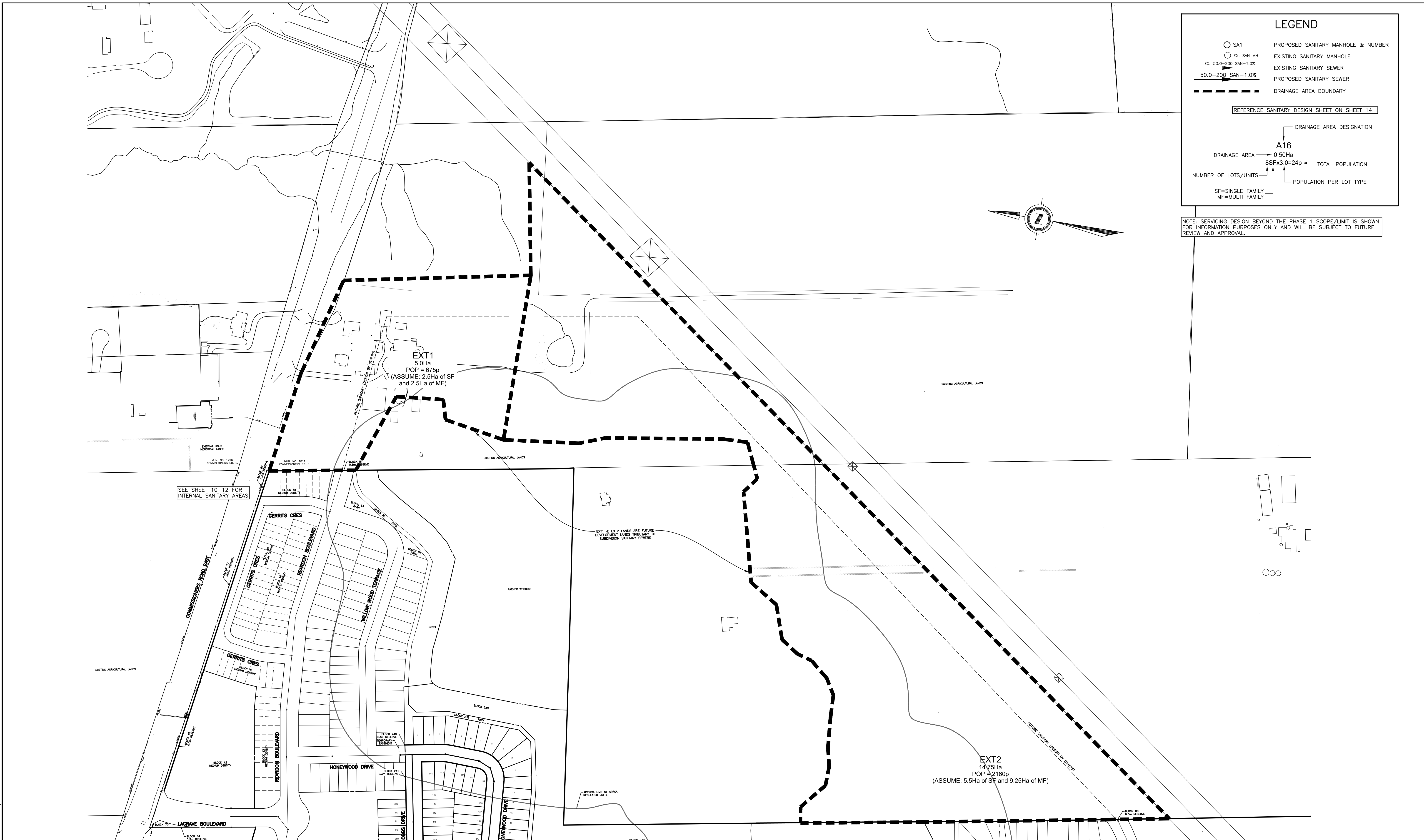
**LEGEND**

- SA1 PROPOSED SANITARY MANHOLE & NUMBER
- EX. SAN. MH. EXISTING SANITARY MANHOLE
- 50.0-200 SAN-1.0% EXISTING SANITARY SEWER
- 50.0-200 SAN-1.0% PROPOSED SANITARY SEWER
- DRAINAGE AREA BOUNDARY

REFERENCE SANITARY DESIGN SHEET ON SHEET 14

DRAINAGE AREA DESIGNATION  
**A16**  
 DRAINAGE AREA → 0.50Ha  
 8SFx3.0=24p → TOTAL POPULATION  
 NUMBER OF LOTS/UNITS →  
 SF= SINGLE FAMILY  
 MF= MULTI FAMILY

NOTE: SERVICING DESIGN BEYOND THE PHASE 1 SCOPE/LIMIT IS SHOWN FOR INFORMATION PURPOSES ONLY AND WILL BE SUBJECT TO FUTURE REVIEW AND APPROVAL.



P:\del15-090 Area Plans.dwg

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT
					DESIGN BY AB, CW	2	3RD SUBMISSION FOR APPROVAL	APR 22/21	DEVENG
					DRAWN BY CW	3	SUBMISSION FOR ECA	MAY 17/21	DEVENG
					CHECKED BY AB	4	ISSUED FOR TENDER	JUNE 11/21	DEVENG
					F.B.K. ***	5	4th SUBMISSION FOR APPROVAL	JUNE 14/21	DEVENG
						6	5th SUBMISSION FOR APPROVAL	JULY 19/21	DEVENG
						7	ISSUED FOR CONSTRUCTION	JULY 19/21	DEVENG
						8	6th SUBMISSION FOR APPROVAL	AUG 13/21	DEVENG
						9	7th SUBMISSION FOR APPROVAL	DEC 22/21	DEVENG
						10	ISSUED FOR ECA AMENDMENT	JAN 14/22	DEVENG

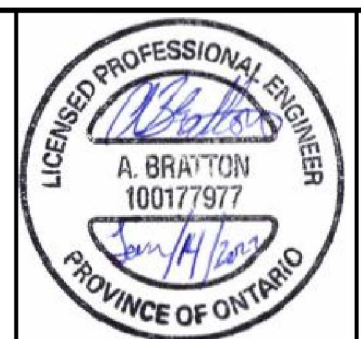
FILE: DEL15-090 AREA PLANS.DWG

CONSULTANT OR DIVISION

London Office  
41 Adelaide St. N., Unit 71  
(519) 672-5310

Paris Office  
31 Mechanic St., Unit 301  
(519) 442-1441

**development engineering**  
(London) Limited  
CONSULTING CIVIL ENGINEERS



**CORPORATION OF THE CITY OF LONDON**

London CANADA

SCALE - 1:2000

20 0 40m

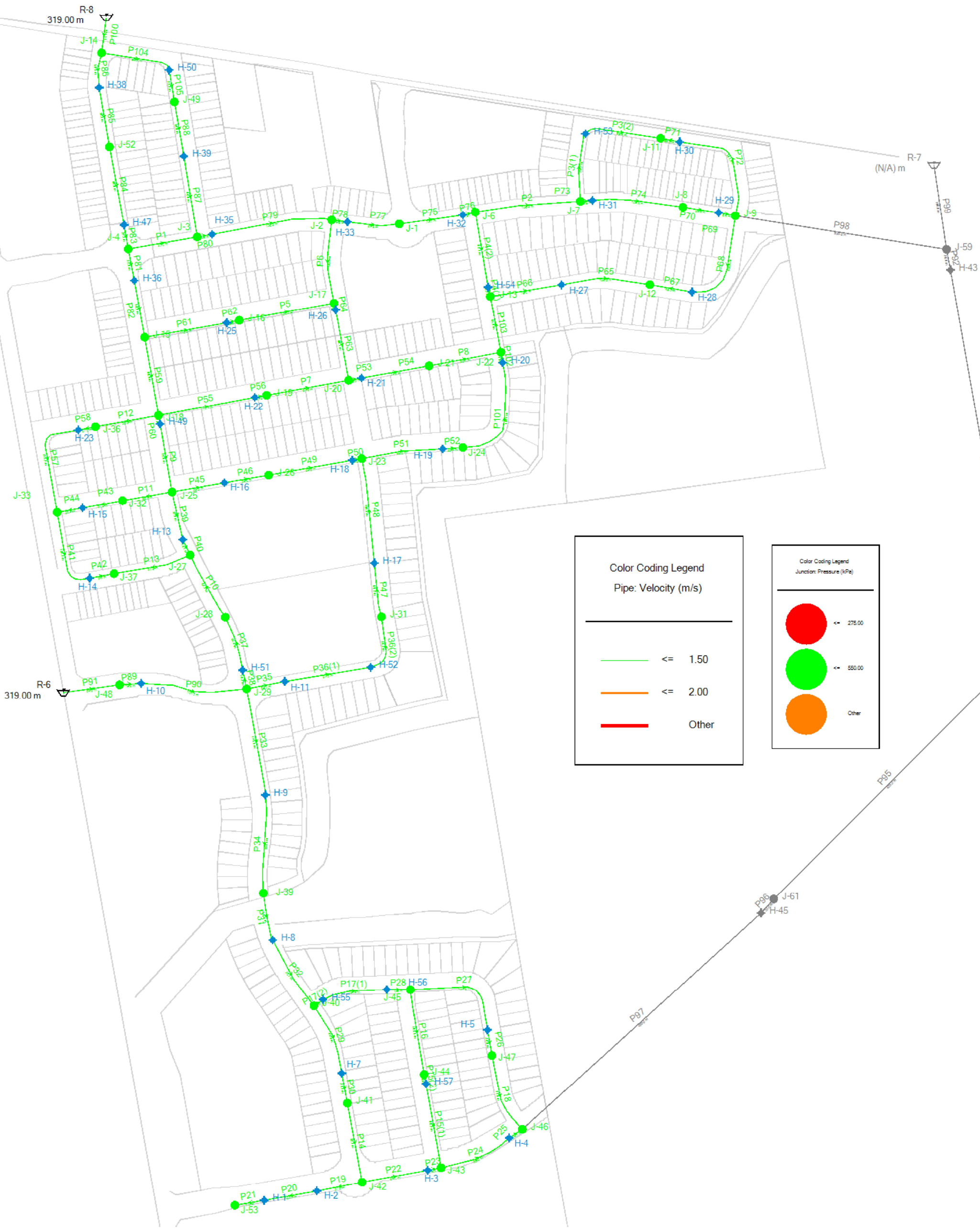
TITLE: **PARKER-JACKSON SUBDIVISION**  
PHASE 1 (39T-06507\_1) - LONDON, ONTARIO  
DREWLO HOLDINGS

PROJECT No. **DEL15-090**

SHEET No. **9**

PLAN FILE No.

**DEL15-090-WaterDistModel.wtg**  
**Scenario: Peak Hour - Ultimate**



**Color Coding Legend**  
 Pipe: Velocity (m/s)

	<= 1.50
	<= 2.00
	Other

**Color Coding Legend**  
 Junction: Pressure (kPa)

	<= 275.00
	<= 550.00
	Other

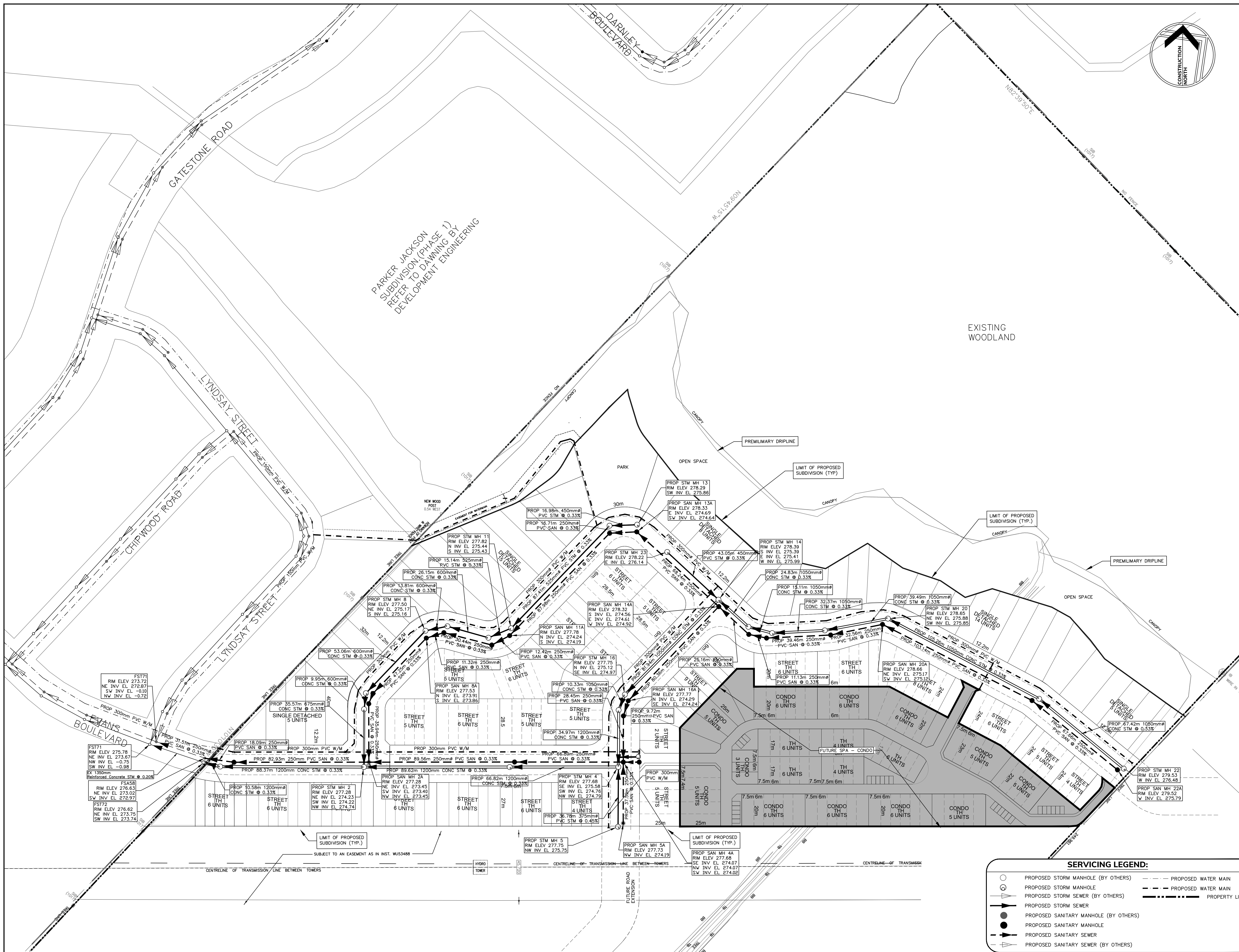


**DEL15-090-WaterDistModel.wtg**

**Max Day + FF - Ultimate**

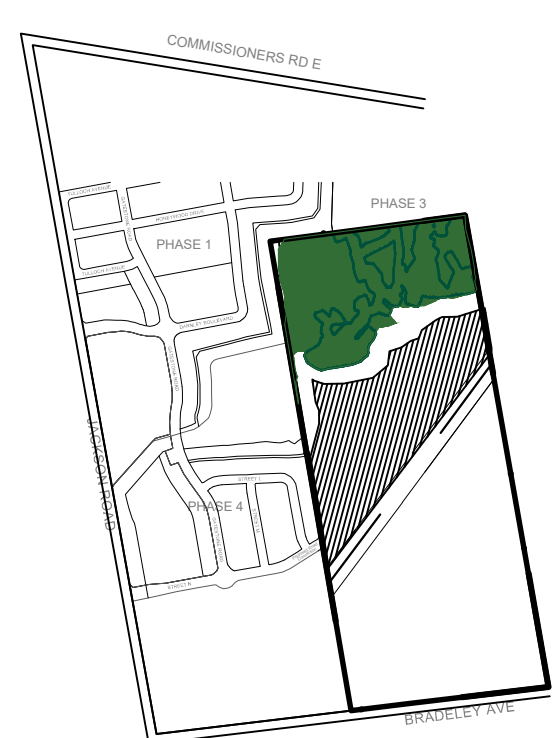
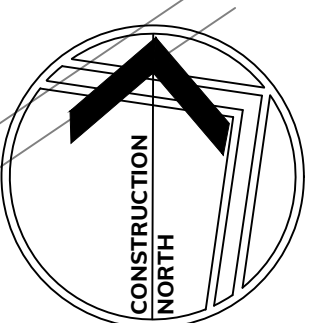
**Fire Flow Report - Time: 0.00 hours**

Label	Satisfies Fire Flow Constraints?	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (m/s)
H-1	True	76.000	77.000	331.32	321.56	J-47	P34	1.34
H-2	True	76.000	77.000	342.28	321.56	J-47	P34	1.34
H-3	True	76.000	77.000	338.79	318.23	J-47	P34	1.34
H-4	True	76.000	77.000	330.79	313.56	J-47	P34	1.34
H-5	True	76.000	77.000	224.61	242.24	J-47	P18	2.31
H-7	True	76.000	77.000	351.90	327.10	J-47	P34	1.34
H-8	True	76.000	77.000	372.00	336.48	J-24	P34	1.34
H-9	True	76.000	77.000	393.77	336.48	J-24	P33	1.34
H-10	True	105.000	106.000	397.15	337.20	J-24	P91	1.37
H-11	True	76.000	77.000	358.18	333.71	J-24	P35	1.83
H-13	True	76.000	77.000	376.65	335.24	J-24	P100	0.89
H-14	True	105.000	106.000	295.02	300.58	J-37	P13	2.40
H-15	True	76.000	77.000	346.88	334.87	J-24	P11	1.58
H-16	True	76.000	77.000	349.45	330.81	J-24	P45	1.73
H-17	True	76.000	77.000	312.54	325.19	H-19	P48	1.38
H-18	True	76.000	77.000	317.01	321.21	H-19	P50	1.45
H-19	True	76.000	77.000	304.29	307.04	J-24	P51	1.28
H-20	True	76.000	77.000	315.97	316.03	J-22	P102	1.67
H-21	True	76.000	77.000	329.14	321.79	J-21	P53	1.62
H-22	True	76.000	77.000	343.12	329.89	J-21	P55	1.35
H-23	True	76.000	77.000	341.35	334.79	J-24	P12	1.84
H-25	True	76.000	77.000	348.96	332.26	J-21	P61	1.37
H-26	True	76.000	77.000	346.60	329.13	J-21	P64	1.40
H-27	True	76.000	77.000	305.42	311.10	J-12	P66	1.54
H-28	True	76.000	77.000	305.53	302.83	J-12	P68	1.40
H-29	True	105.000	106.000	308.36	299.29	J-12	P100	1.26
H-30	True	105.000	106.000	286.48	287.23	J-11	P100	1.26
H-31	True	105.000	106.000	317.06	303.78	J-12	P100	1.26
H-32	True	105.000	106.000	331.77	312.10	J-12	P100	1.27
H-33	True	105.000	106.000	348.78	321.21	J-12	P100	1.28
H-35	True	76.000	77.000	371.17	334.72	J-22	P100	1.04
H-36	True	105.000	106.000	368.72	329.50	J-21	P100	1.27
H-38	True	105.000	106.000	372.42	338.15	J-22	P100	1.51
H-39	True	76.000	77.000	354.05	338.14	J-22	P87	1.32
H-47	True	105.000	106.000	369.08	331.14	J-21	P100	1.32
H-49	True	76.000	77.000	375.67	334.64	J-21	P100	0.95
H-50	True	76.000	77.000	352.56	340.28	J-22	P104	1.52
H-51	True	105.000	106.000	392.52	331.12	J-24	P91	1.15
H-52	True	76.000	77.000	328.21	326.80	J-31	P36(1)	1.48
H-53	True	76.000	77.000	327.24	322.64	J-11	P3(1)	1.03
H-54	True	76.000	77.000	319.53	322.43	J-22	P4(1)	3.13
H-55	True	76.000	77.000	350.68	329.10	J-47	P17(2)	2.13
H-56	True	76.000	77.000	313.95	313.35	J-45	P17(1)	1.58
H-57	True	76.000	77.000	271.35	273.74	J-44	P15(1)	2.35



PARKER JACKSON  
SUBDIVISION (PHASE 1)  
REFER TO DRAWING BY  
DEVELOPMENT ENGINEERING

EXISTING  
WOODLAND



**KEY PLAN**  
Scale: N.T.S.

**SUBJECT LANDS**

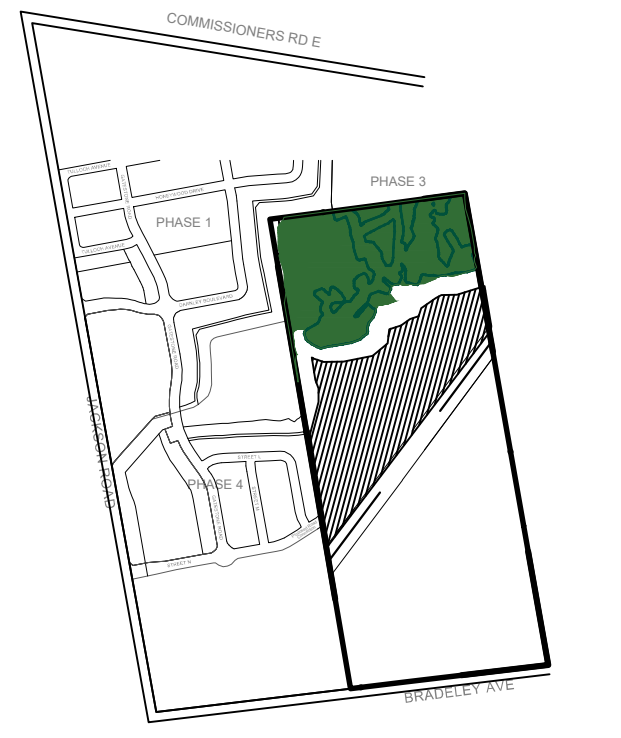
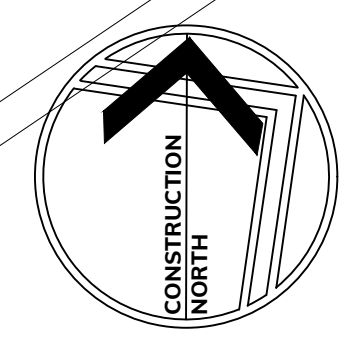
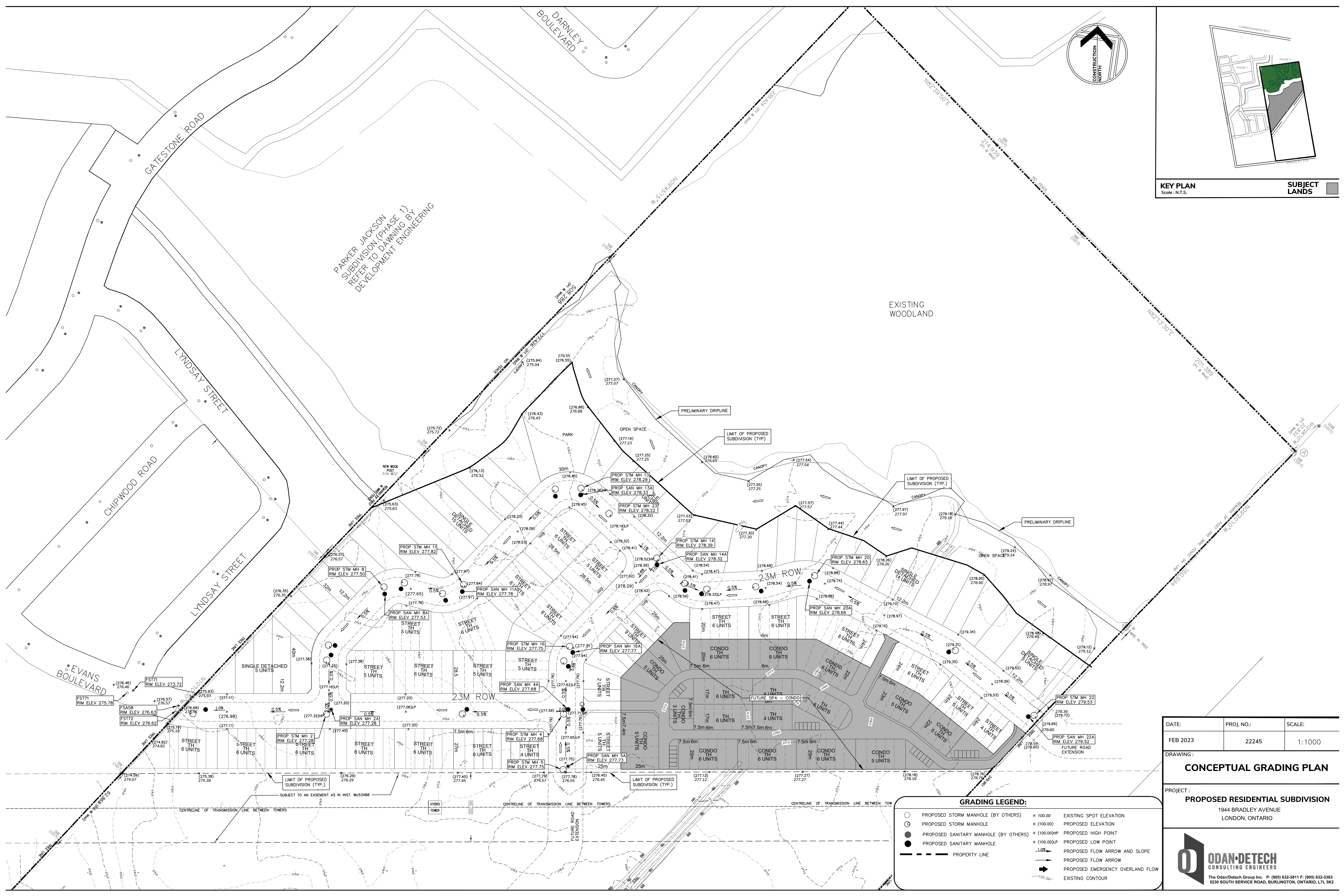
**SERVICING LEGEND:**

	PROPOSED STORM MANHOLE (BY OTHERS)		PROPOSED WATER MAIN
	PROPOSED STORM MANHOLE		PROPOSED WATER MAIN
	PROPOSED STORM SEWER		PROPERTY LINE
	PROPOSED SANITARY MANHOLE (BY OTHERS)		
	PROPOSED SANITARY MANHOLE		
	PROPOSED SANITARY SEWER		
	PROPOSED SANITARY SEWER (BY OTHERS)		

DATE:	PROJ. NO.:	SCALE:
FEB 2023	22245	1:1000
DRAWING:		
<b>CONCEPTUAL SERVICING PLAN</b>		
PROJECT:		
<b>PROPOSED RESIDENTIAL SUBDIVISION</b> 1944 BRADLEY AVENUE LONDON, ONTARIO		

**ODAN-DETECH**  
CONSULTING ENGINEERS

The Odan/Detech Group Inc. P. (905) 632-3811 F. (905) 632-3363  
5230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 5K2



**KEY PLAN**  
Scale: N.T.S.

**SUBJECT LANDS**

PARKER JACKSON  
SUBDIVISION (PHASE 1)  
REFER TO DAMNING BY  
DEVELOPMENT ENGINEERING

EXISTING  
WOODLAND

**GRADING LEGEND:**

○	PROPOSED STORM MANHOLE (BY OTHERS)	x 100.00	EXISTING SPOT ELEVATION
●	PROPOSED STORM MANHOLE	x (100.00)	PROPOSED ELEVATION
⊗	PROPOSED SANITARY MANHOLE (BY OTHERS)	x (100.00)HP	PROPOSED HIGH POINT
⊗	PROPOSED SANITARY MANHOLE	x (100.00)LP	PROPOSED LOW POINT
→		-1.0%	PROPOSED FLOW ARROW AND SLOPE
→			PROPOSED FLOW ARROW
→			PROPOSED EMERGENCY OVERLAND FLOW
—			EXISTING CONTOUR
---	PROPERTY LINE		

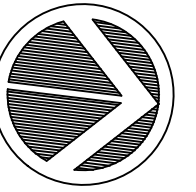
DATE:	PROJ. NO.:	SCALE:
FEB 2023	22245	1:1000

DRAWING:  
**CONCEPTUAL GRADING PLAN**

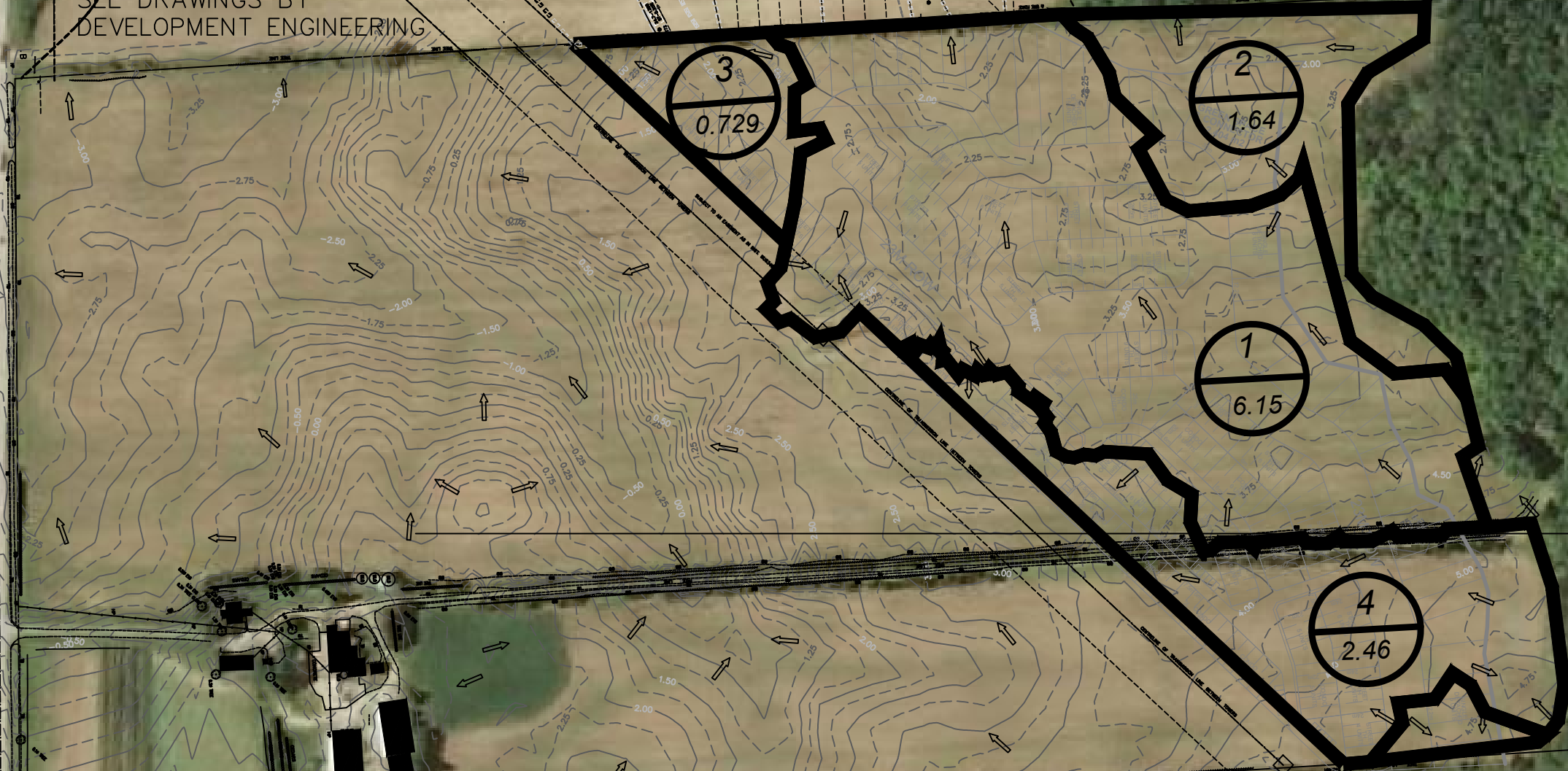
PROJECT:  
**PROPOSED RESIDENTIAL SUBDIVISION**  
1944 BRADLEY AVENUE  
LONDON, ONTARIO

**ODAN-DETECH**  
CONSULTING ENGINEERS



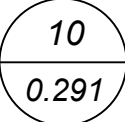

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PARKER JACKSON SUBDIVISION  
(PHASE 1)  
SEE DRAWINGS BY  
DEVELOPMENT ENGINEERING



**LEGEND:**

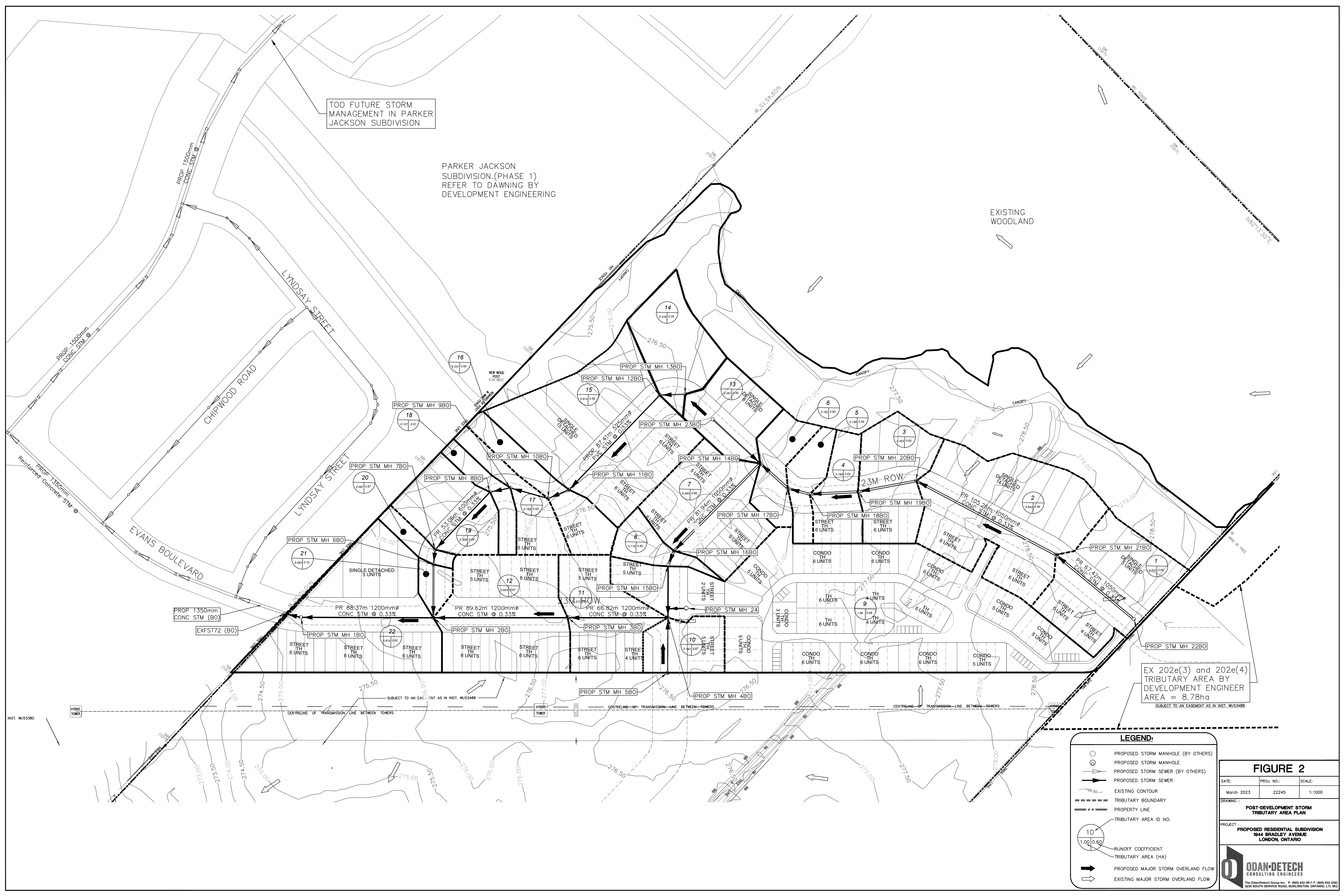
-  DRAINAGE AREA BOUNDARY
-  OVERLAND FLOW ROUT
-  TRIBUTARY AREA ID
-  TRIBUTARY AREA

**FIGURE 1**

DATE:	PROJ. NO.:	SCALE:
FEBURARY 2023	22245	3000

DRAWING :  
**PRE DEVELOPMENT  
STORM TRIBUTARY AREAS**

PROJECT :  
**PROPOSED RESIDENTIAL SUBDIVISION**  
1944 BRADLEY AVENUE  
LONDON, ONTARIO



TOO FUTURE STORM  
MANAGEMENT IN PARKER  
JACKSON SUBDIVISION

PARKER JACKSON  
SUBDIVISION (PHASE 1)  
REFER TO DAWNING BY  
DEVELOPMENT ENGINEERING

EXISTING  
WOODLAND

EX 202e(3) and 202e(4)  
TRIBUTARY AREA BY  
DEVELOPMENT ENGINEER  
AREA = 8.78ha  
SUBJECT TO AN EASEMENT AS IN INST. WJ53488

**LEGEND:**

- PROPOSED STORM MANHOLE (BY OTHERS)
- PROPOSED STORM MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM OVERLAND FLOW
- EXISTING MAJOR STORM OVERLAND FLOW
- EXISTING CONTOUR
- - - TRIBUTARY BOUNDARY
- PROPERTY LINE
- TRIBUTARY AREA ID NO.
- 10  
1.00 0.60  
RUNOFF COEFFICIENT  
TRIBUTARY AREA (HA)

**FIGURE 2**

DATE:	PROJ. NO.:	SCALE:
March 2023	22245	1:1000

DRAWING: POST-DEVELOPMENT STORM TRIBUTARY AREA PLAN

PROJECT: PROPOSED RESIDENTIAL SUBDIVISION  
1844 BRADLEY AVENUE  
LONDON, ONTARIO

**ODAN-DETECH**  
CONSULTING ENGINEERS

The Odan/Detech Group Inc. P: (888) 632-3811 F: (888) 632-3362  
6230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 6K2

## STORM SEWER DESIGN SHEET



Project: Proposed Residential Subdivision  
 Project No.: 22245  
 Location: 1944 BRADLEY AVENUE  
 Municipality: City of London

DESIGNED BY: M.A.A.  
 CHECKED BY  
 DATE: Feb. 24-2023

RAINFALL Return Period 2-years  
 $I = 1290 / (Tc+8.5)^{0.86}$   
 PIPE ROUGHNESS:  $n = 0.013$  For Manning's Equation  
 % of Full Flow: Peak Flow / Full Flow Capacity

$V_{min} = 1.0$  m/s  
 $V_{max} = 4.5$  m/s, for  $\leq 825$  mm  
 $V_{max} = 6.0$  m/s, for  $\geq 900$  mm

LOCATION			STORMWATER ANALYSIS								STORM SEWER DATA					
Tributary ID No.	From Manhole	To Manhole	A Area ha	C Runoff Coeff.	A*C	Accumulated A*C	Time of Concentration (min)	Flow Time (min)	Rainfall Intensity (mm/hr)	Peak Flow (l/s)	Pipe Length (m)	Pipe Size (mm)	Pipe Slope (%)	Pipe Full Flow Capacity (l/s)	Pipe Full Flow Velocity (m/s)	Percent of Full Flow Capacity (%)
External			8.78	0.60	5.268	5.268	20.30		71.70	1050		1050	0.33	1569	1.81	67
1	Pr. MH 22	Pr. MH 21	0.533	0.60	0.320	5.588	20.30	0.62	71.70	1114	67.42	1050	0.33	1569	1.81	71
2	Pr. MH 21	Pr. MH 20	0.843	0.59	0.497	6.085	20.92	0.97	70.40	1191	105.26	1050	0.33	1569	1.81	76
3	Pr. MH 20	Pr. MH 19	0.353	0.60	0.212	6.297	21.89	0.36	68.46	1198	39.49	1050	0.33	1569	1.81	76
4	Pr. MH 19	Pr. MH 18	0.196	0.62	0.122	6.418	22.25	0.30	67.77	1209	32.4	1050	0.33	1569	1.81	77
5	Pr. MH 18	Pr. MH 17	0.138	0.59	0.081	6.500	22.55	0.14	67.21	1214	15.1	1050	0.33	1569	1.81	77
6	Pr. MH 17	Pr. MH 14	0.182	0.60	0.109	6.609	22.69	0.23	66.95	1230	24.8	1050	0.33	1569	1.81	78
							22.92									
13	Pr. MH 23	Pr. MH 14	0.261	0.60	0.216	0.216	10.00	0.70	104.91	63	43	450	0.33	164	1.03	38
							10.70									
7	Pr. MH 14	Pr. MH 16	0.483	0.60	0.290	7.115	22.92	0.75	66.53	1316	81.94	1050	0.33	1569	1.81	84
8	Pr. MH 16	Pr. MH 15	0.118	0.60	0.071	7.186	23.67	0.10	65.19	1302	10.33	1050	0.33	1569	1.81	83
9	Pr. MH 15	Pr. MH 4	1.96	0.66	1.294	8.409	23.77	0.38	65.02	1520	45.3	1200	0.33	2240	1.98	68
							24.15									
10	Pr. MH 5	Pr. MH 4	0.191	0.67	0.128	0.128	10.00	0.58	104.91	37	36.8	375	0.45	118	1.06	32
							10.58									
11	Pr. MH 4	Pr. MH3	0.372	0.67	0.249	8.786	24.15	0.56	64.37	1572	66.82	1200	0.33	2240	1.98	70
12	Pr. MH3	Pr. MH2	0.624	0.67	0.418	9.204	24.71	0.75	63.43	1623	89.62	1200	0.33	2240	1.98	72
							25.46									
14	Pr. MH 13	Pr. MH 12	0.316	0.28	0.088	0.088	10.00	0.28	104.91	26	17	450	0.33	164	1.03	16
15	Pr. MH 12	Pr. MH 11	0.914	0.58	0.530	0.619	10.28	1.28	103.59	178	87.4	525	0.33	247	1.14	72
16	Pr. MH 11	Pr. MH 10	0.237	0.60	0.142	0.761	11.55	0.22	97.89	207	15.14	525	0.33	247	1.14	84
17	Pr. MH 10	Pr. MH 9	0.189	0.63	0.119	0.880	11.77	0.35	96.97	237	26.15	600	0.33	353	1.25	67
18	Pr. MH 9	Pr. MH8	0.107	0.61	0.065	0.945	12.12	0.18	95.56	251	13.8	600	0.33	353	1.25	71
19	Pr. MH8	Pr. MH7	0.308	0.59	0.182	1.127	12.31	0.71	94.83	297	53	600	0.33	353	1.25	84
20	Pr. MH7	Pr. MH6	0.067	0.67	0.045	1.172	13.01	0.13	92.14	300	10	600	0.33	353	1.25	85
21	Pr. MH6	Pr. MH2	0.063	0.70	0.044	1.216	13.15	0.44	91.65	310	35.6	675	0.33	483	1.35	64
							13.59									
22	Pr. MH2	FST 72	0.815	0.62	0.505	10.925	25.46	0.83	62.22	1890	99	1200	0.33	2240	1.98	84