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Technical Memorandum

To/Attention	Mark Fraser City of Ottawa 110 Laurier Avenue West Ottawa, Ontario K1P 1J1	**Date**	January 31, 2018
From	James I. Moffatt, P. Eng.	**Project No**	114326-5.3.1.5
cc	Reagan Chi, Turner Fleischer		
Subject	Municipal Services Buildings 14 & 15 Site Plan Application Tanger Outlets Centre, Ottawa 333 Huntmar Drive City of Ottawa File No. DXX-XX-XX-XXXX		

1. Background

1.1 Existing Conditions

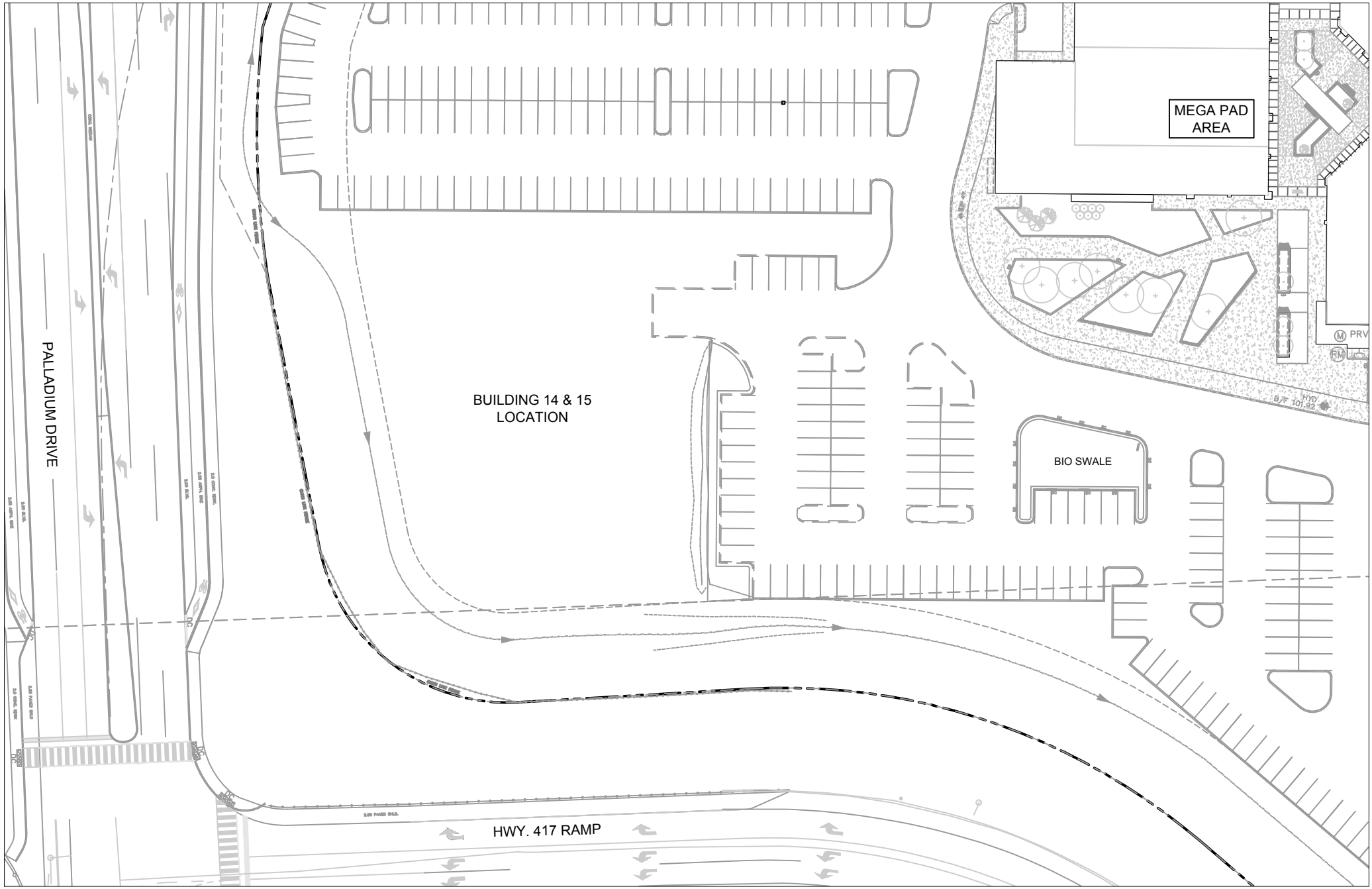
The Tanger Outlets Centre (TOC) in Ottawa consists of a large parking lot that rings a mega pad which includes 13 buildings. The Owners, Riocan Management Inc. received site plan approval for these buildings in 2013 and started construction and opened for business in October 2014.

Part of the development of TOC included construction of municipal infrastructure including watermains and sewers. All the municipal infrastructure on the TOC site is currently in place and in service.

1.2 Proposed Site Plan

The original plan from 2013 indicated a future out building to be located in the south western portion of the site. The original municipal services design included service pipes sized to service the future building. The Owners are now proposing two separate buildings (buildings 14 and 15) for this area and are now planning to submit a Site Plan Approval application for the new development extension. **Figure 1.1** shows the current building development in the vicinity of the proposed buildings 14 and 15.

This Technical Memorandum is in support of the new Site Plan Application for the addition of two new buildings to the TOC in Ottawa. **Figure 1.2** shows the new site plan. The application includes development of buildings 14 and 15. This report will demonstrate how the new buildings can be serviced with a water supply, wastewater disposal and management of storm runoff. The proposal will necessitate minor regrading and the removal of some curb and asphalt in the existing parking lot.



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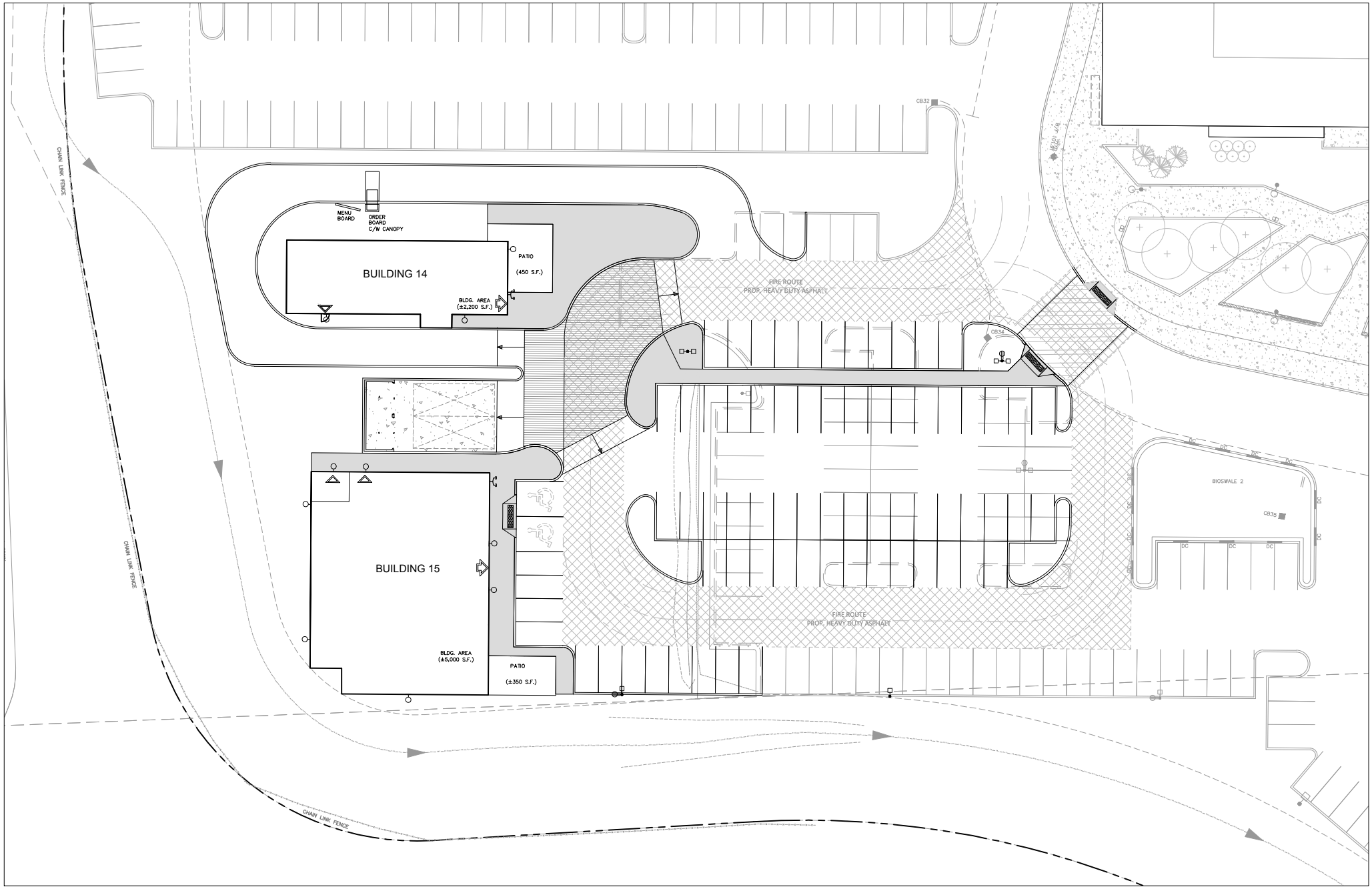
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	EXISTING SITE DEVELOPMENT	FIGURE 1.1



Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	SITE PLAN	FIGURE 1.2

2. Watermains

2.1 Existing Conditions

The watermain network for the TOC essentially consists of a ring watermain around the mega pad. The ring main includes hydrants and building service connections. **Figure 2.1** shows the existing water plan in the vicinity of the site plan.

As part of the original watermain construction, all buildings, either existing or proposed, are serviced with watermains. The 200 mm diameter water services for the future buildings are presently dropped near the proposed new building footprints. All water service pipes include a shut off valve.

2.2 Proposed Water Plan

The existing water plant designed to service the proposed expansion will remain in place but will have a small portion removed to facilitate the installation of a new hydrant directly off the existing water service. The new hydrant will be installed east of building 14 in order to ensure both buildings' siamese connections are within 45m of a hydrant. **Figure 2.2** shows the distances from the proposed hydrant to the proposed siamese connections. These distances are 16.27 m to Building 14 and 31.36 m to Building 15.

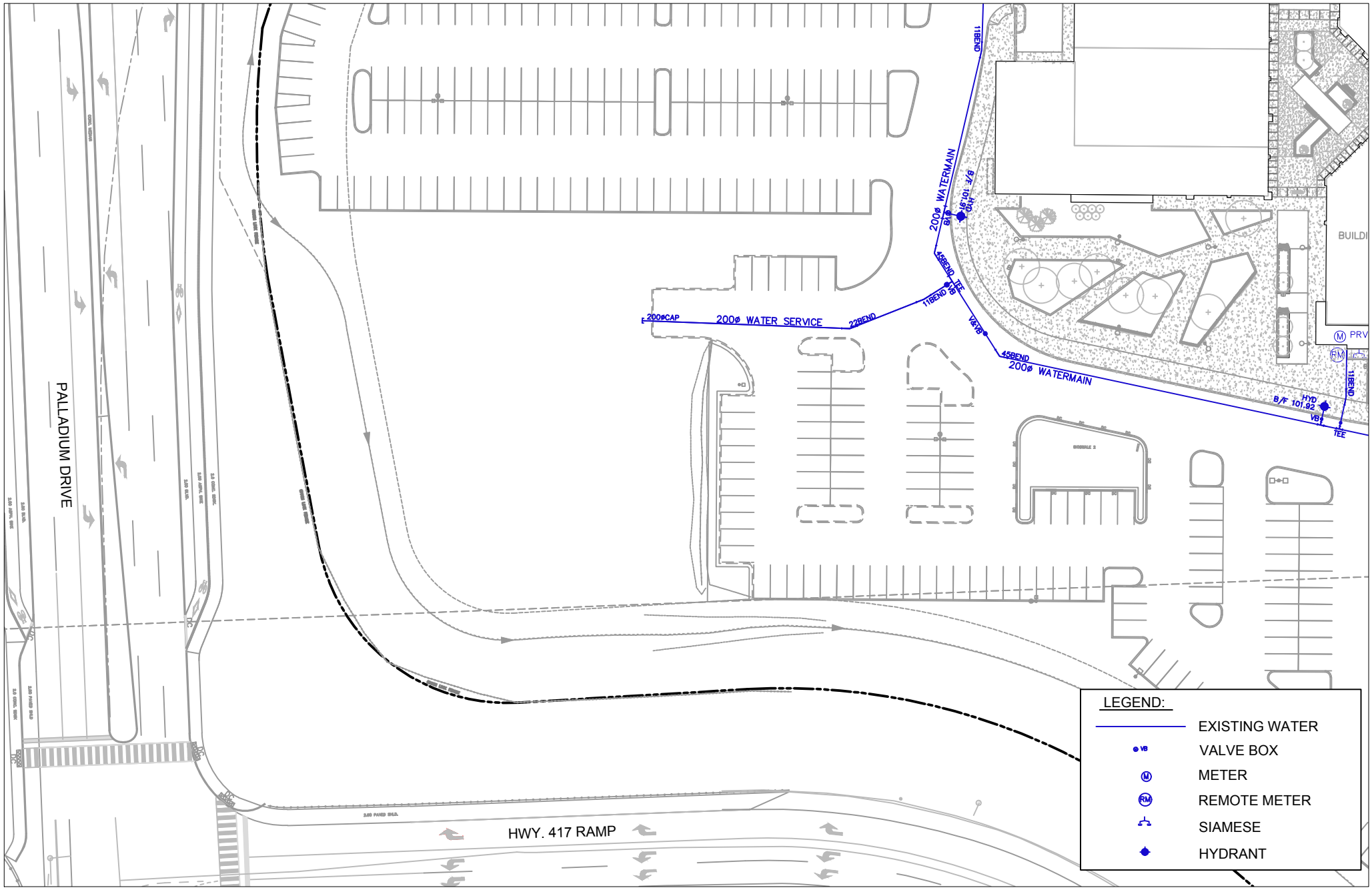
The original ringed watermain around the mega pad is proposed to remain since it is not impacted by the new site plan. **Figure 2.3** schematically shows the proposed water plan. The existing water service will be extended through the site to feed the west sides of both buildings 14 and 15 – near the location of the proposed mechanical rooms. Each building will have its own shut off valve. The design drawing **C-100,** which among other things, shows the proposed water plan, is included for reference in **Appendix A**.

2.3 Hydraulic Analysis

A hydraulic analysis of the watermain system servicing the Tanger site was conducted in the Design Brief, Tanger Outlet Centres, 333 Huntmar Drive by IBI Group, June 2013. In the analysis the water demand for the TOC site was calculated at the conservative value of 50,000 l/gross ha/d. For a site area of 15.5 ha, the average daily water demand used in the 2013 hydraulic analysis was therefore 8.97 l/s. Since the building areas are known, the water demand can now be calculated using the rate of 2,500 l/(1000 m^2/d) for shopping centres as indicated in Table 4.2 of the Ottawa Design Guidelines – Water Distribution. The total floor area for all the existing and proposed buildings, including the subject buildings, is 38,395 square meters. Therefore, based on the City's Guidelines, the average daily water demand is calculated to be 1.11 l/s which is significantly less than the 8.97 l/s used in the 2013 hydraulic analysis.

In the 2013 Design Brief, a fire flow analysis was conducted for the TOC with a fire flow demand of 13,000 l/min. The new buildings do not increase the fire demand as they are similar in size, type of construction and use as the existing buildings. The 2013 Design Brief recommends pressure reducing valves for all buildings because the pressures under the maximum pressure check scenario are above 552 kPa (80 psi). The new buildings will have maximum pressures above 552 kPa and therefore will require pressure reducing valves.

Since the 200 mm watermain loop is not altered by the new buildings and the water demands and fire flow demands are not increased, the water hydraulic analysis in the 2013 Design Brief is still valid.



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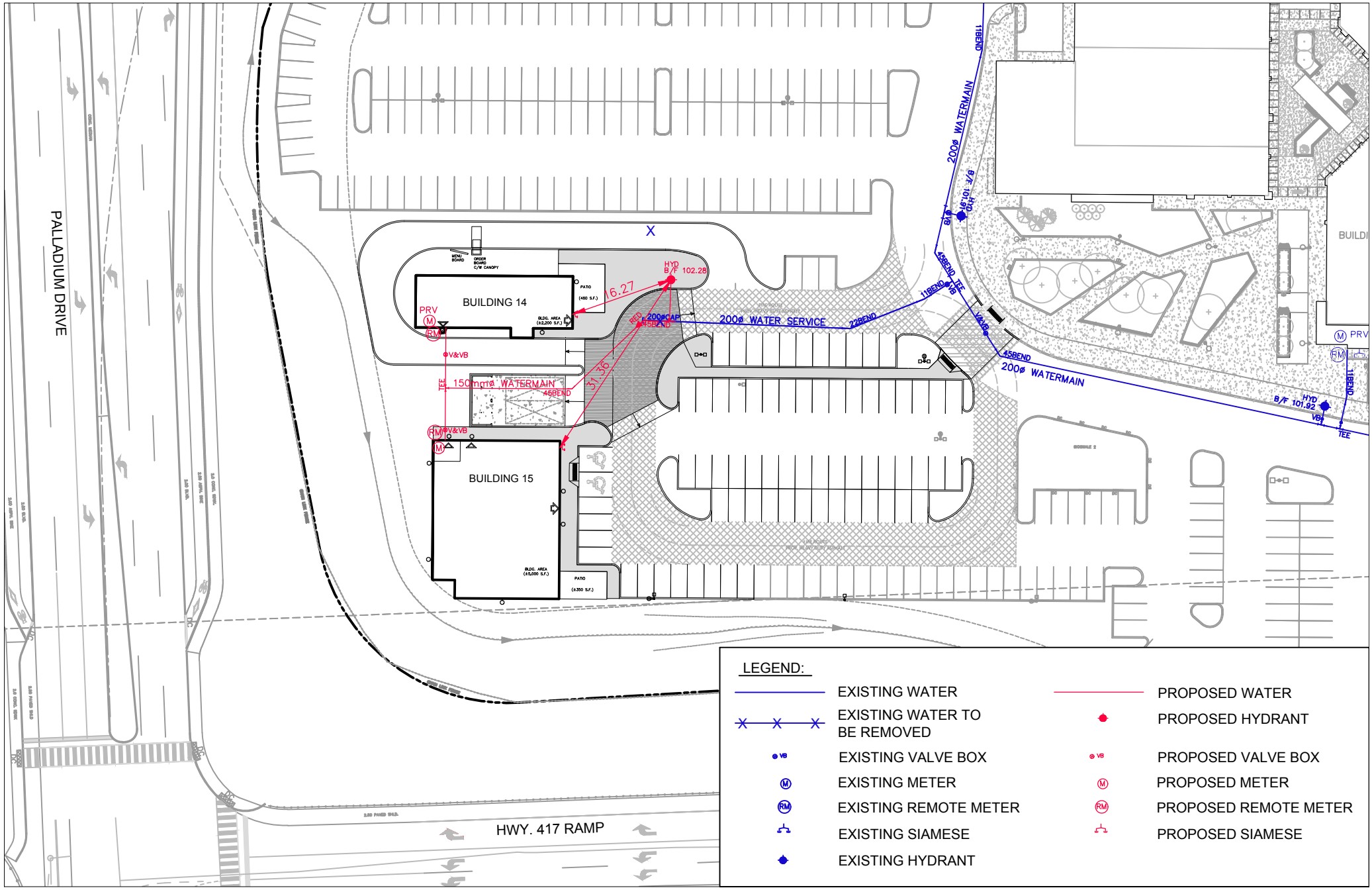
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	EXISTING WATER PLAN	FIGURE 2.1



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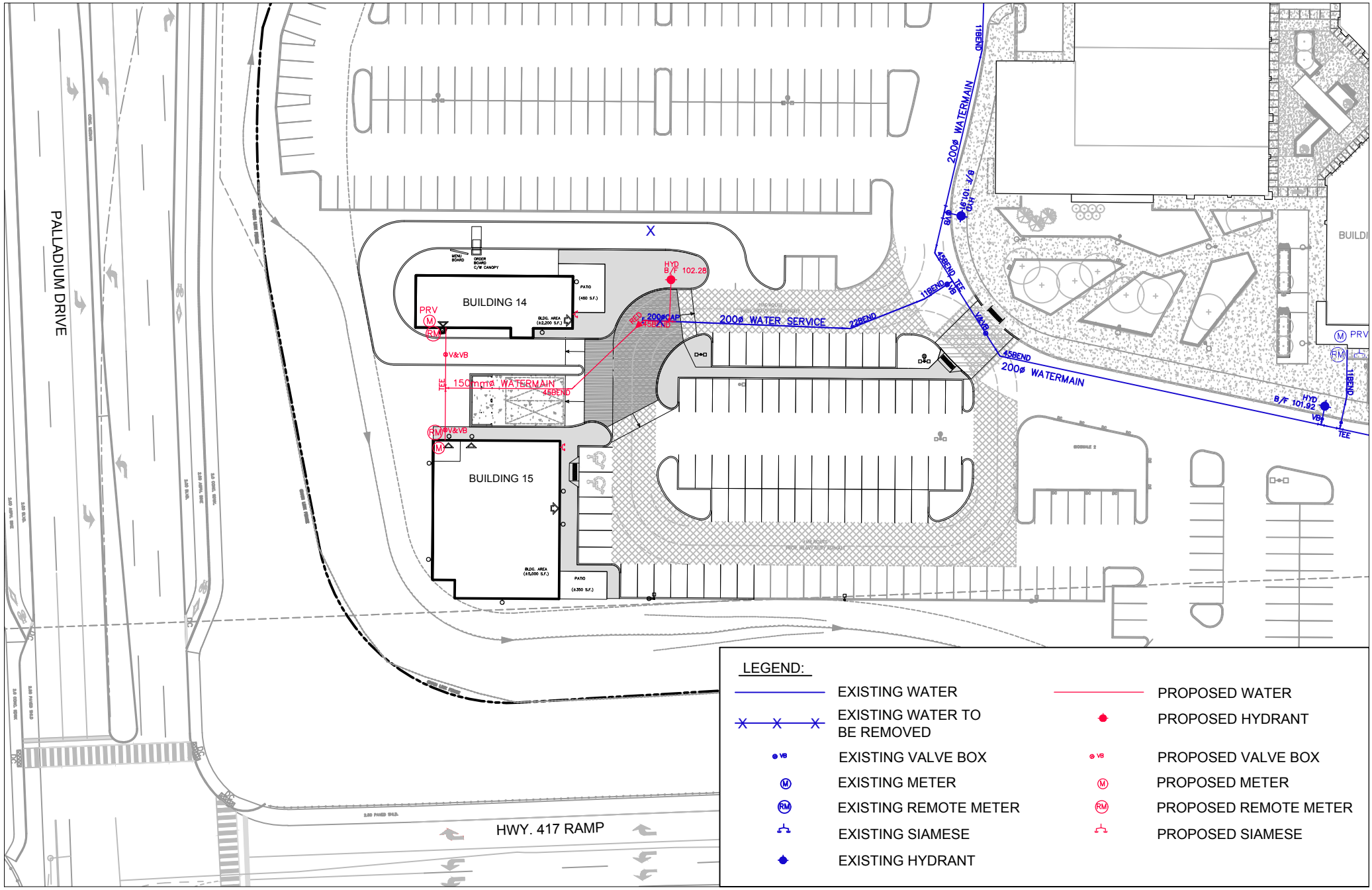
Scale	Project Title	Drawing Title	Sheet No.
IBI N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	LENGTHS TO SIAMESE CONNECTION	FIGURE 2.2



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Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	PROPOSED WATER PLAN	FIGURE 2.3

3. Sanitary Sewers

3.1 Existing Conditions

Similar to the watermain network, there is an existing sanitary sewer system around the mega pad. That sewer system included a 250 mm diameter sanitary sewer that is presently capped near the proposed new building footprints. **Figure 3.1** schematically shows the existing sanitary sewer in the vicinity of the proposed buildings.

3.2 Proposed Sanitary Plan

Buildings 14 and 15 will be serviced with an extension of the existing 250 mm diameter sanitary sewer. It is proposed to install a new sanitary manhole (MH 200A) at the location of the existing 250 mm diameter cap and feed both new buildings with 150 mm diameter sanitary services connecting directly to the new manhole. Proposed new sanitary sewers are schematically indicated on **Figure 3.2**.

The design drawing **C-100**, which also shows the location of the existing 250 mm sanitary sewer, is included in **Appendix A**. Because there is no change needed to the existing sanitary sewer and because the overall drainage area is not changing, it is proposed to leave the existing sanitary sewer between the new MH 200A and MH 22A in place. For reference, a copy of the original sanitary sewer design sheet is also included in **Appendix B** and that sewer section is highlighted. The analysis demonstrates that there is sufficient capacity in the existing sewer to accommodate the new buildings.

4. Storm Sewers

4.1 Existing Conditions

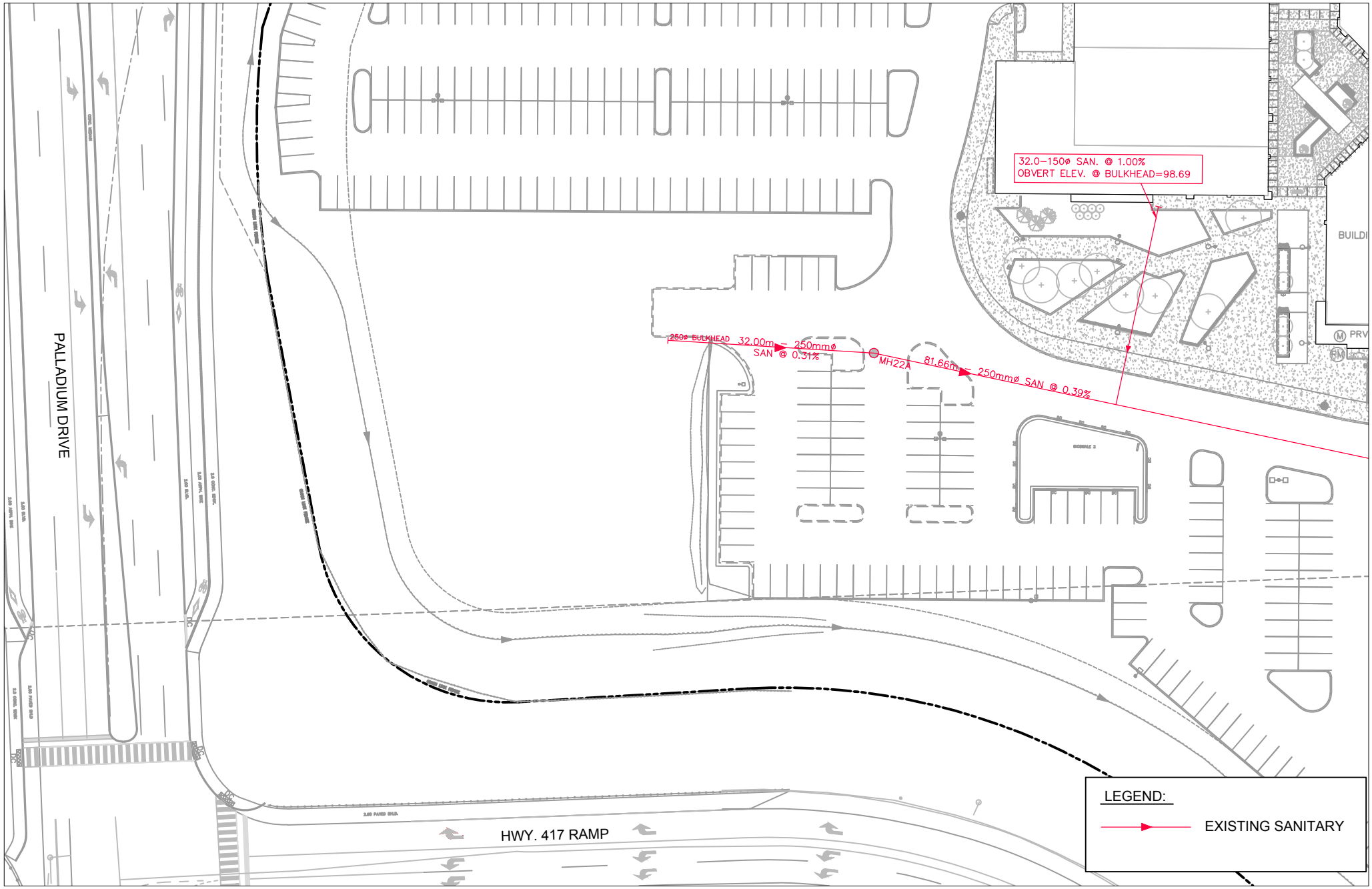
Similar to the watermain and sanitary sewer system, there is an existing storm sewer system around the mega pad. There is a 300 mm diameter storm sewer that is presently capped near the proposed new building footprints. This storm sewer was designed in anticipation of development of the proposed Building 14 & 15 drainage area. **Figure 4.1** schematically shows the existing storm sewer in the vicinity of the new site plan.

4.2 Proposed Storm Sewer Plan

It is proposed to install a new storm manhole (MH 200) at the location of the existing 300 mm diameter cap and extend the sewer to the west in order to service the new proposed buildings and allow for the connection of three proposed catch basins which will drain the drive aisle around building 14. New 200 mm diameter service laterals are proposed for both buildings 14 and 15. All proposed new storm sewers are schematically indicated on **Figure 4.2**.

The design drawing **C-100**, which also shows the location of the existing 300 mm storm sewer, is included in **Appendix A**. Because there is no change needed to the existing storm sewer and because the overall drainage area is not changing, it is proposed to leave the existing storm sewer between the new MH 200A and existing MH 22. For reference, a copy of the original storm sewer design sheet is also included in **Appendix C** and that sewer section is highlighted. The analysis demonstrates that there is sufficient capacity in the existing sewer to accommodate the proposed buildings 14 & 15.

The only change to the existing stormwater system needed to accommodate the expansion is the relocation of existing CB34 because of the reconfiguration of the existing parking lot islands. The catch basin will connect to the same storm sewer so in terms of stormwater management and treatment, the changes are considered minor.



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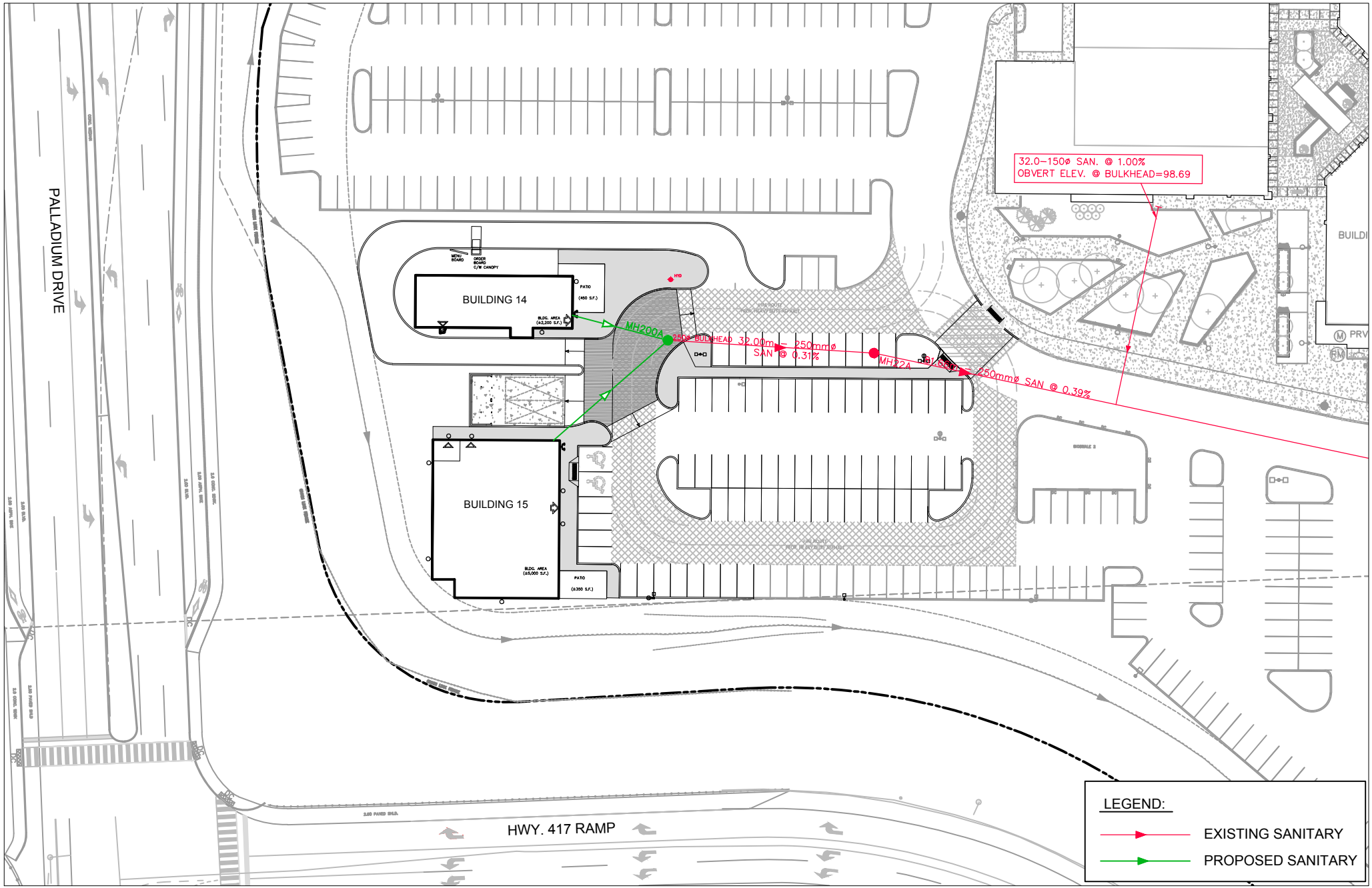
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	EXISTING SANITARY PLAN	FIGURE 3.1



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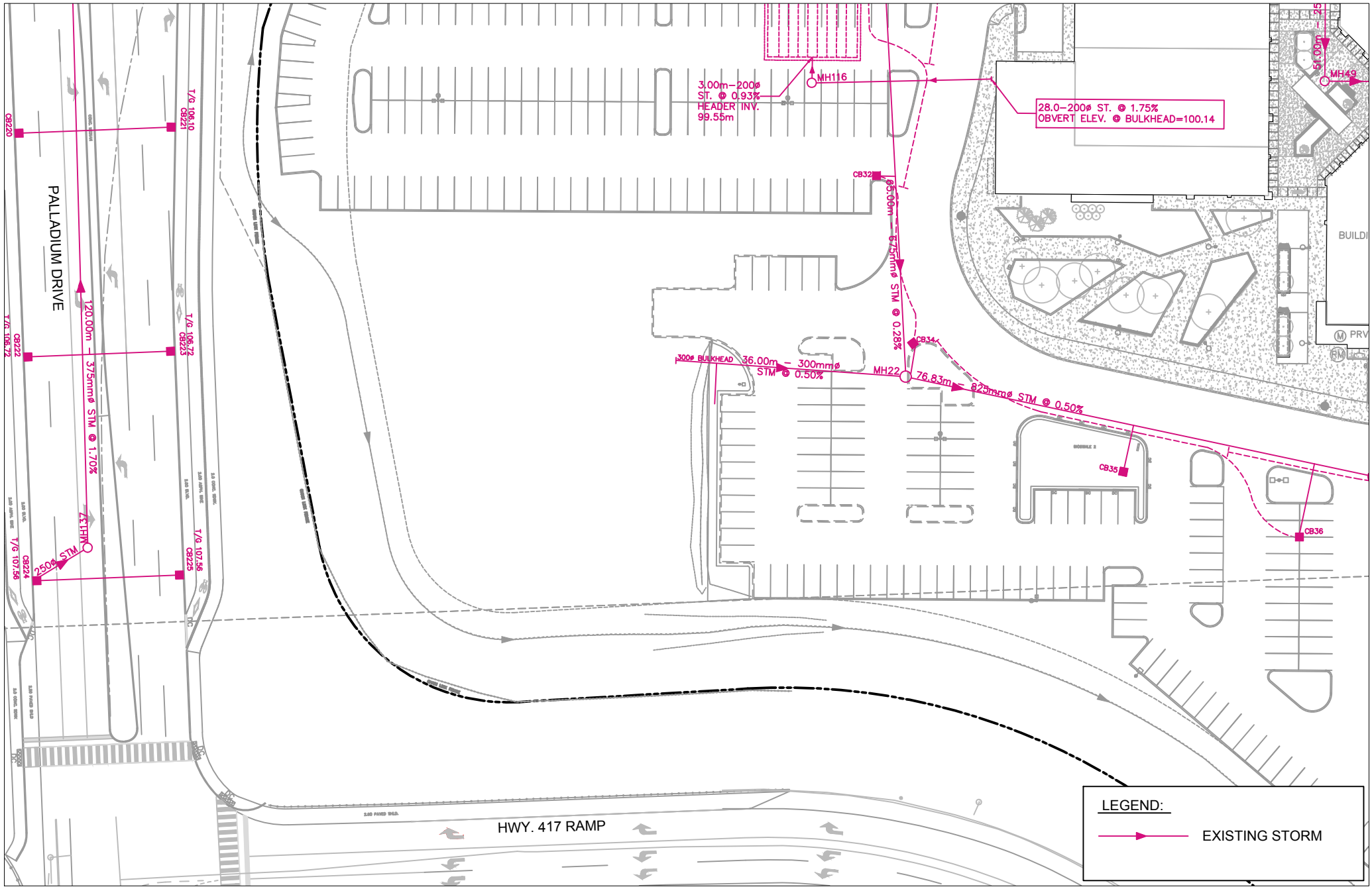
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	PROPOSED SANITARY PLAN	FIGURE 3.2



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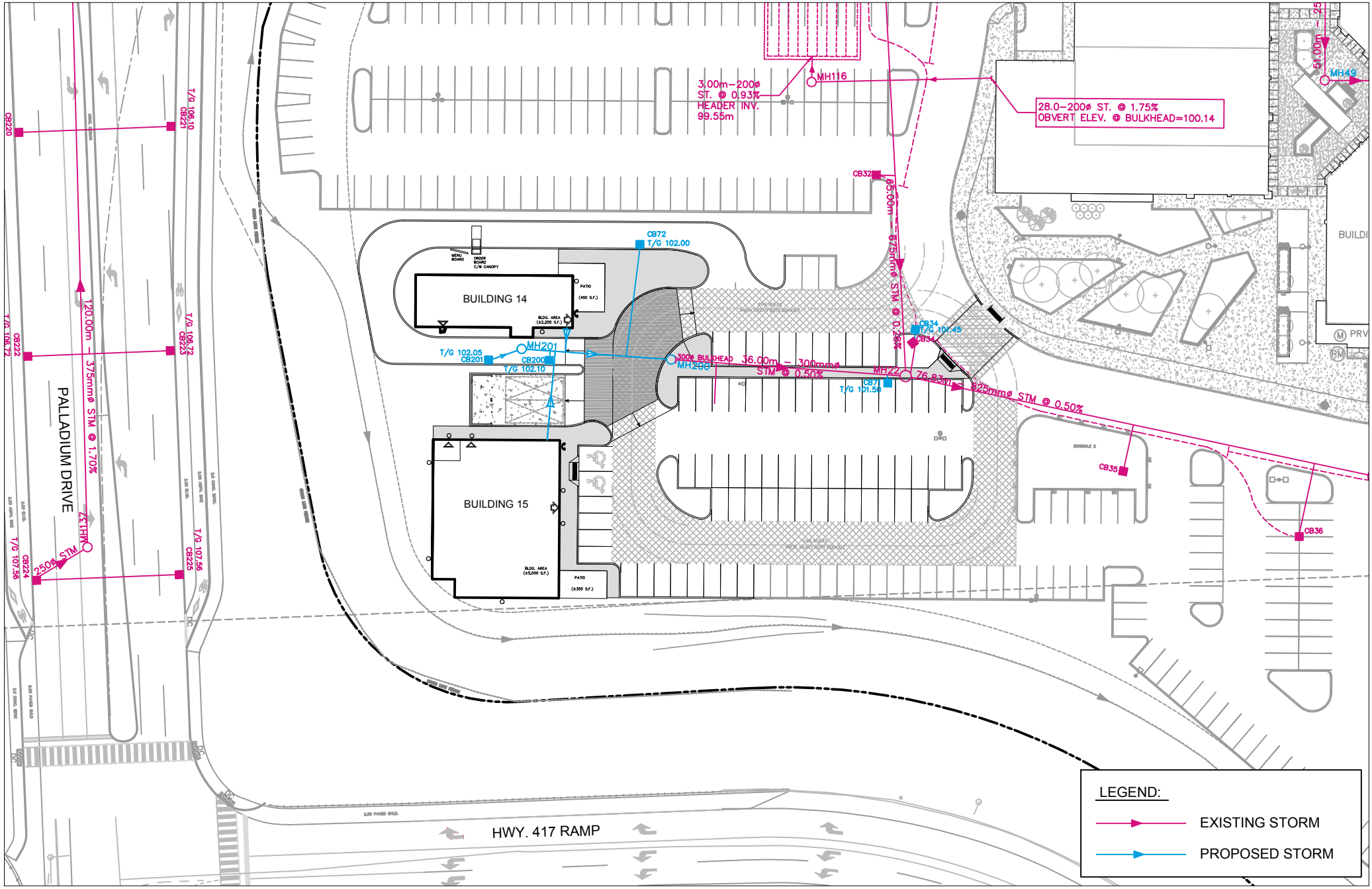
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	EXISTING STORM PLAN	FIGURE 4.1



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Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	TANGER OUTLETS CENTRE BUILDINGS 14 & 15	PROPOSED STORM PLAN	FIGURE 4.2

4.3 Stormwater Management

All surface runoff from the proposed Buildings 14 & 15 is tributary to the local storm sewer system which outlets to an existing stormwater management facility. The treatment facility, known as the Pond 6 East SWM facility provides water quality and water quantity control of stormwater runoff from the tributary drainage area, which includes the Tanger Outlets Centre and the proposed Building 14 & 15 area. The Pond 6 East SWM facility was previously design to accommodate the drainage area for Buildlings 14 & 15.

The design and construction of the Tanger site included infiltration galleries to satisfy infiltration targets for the site as outlined within the Kanata West Master Servicing Study (Stantec, June 2006). Those approved and constructed infiltration galleries have been sized to accommodate the entire Tanger development including the proposed Buildings 14 & 15 area. Therefore, no additional infiltration galleries will be required as a result of the development of Buildings 14 & 15.

Additionally, the previous design and construction of the Tanger site included Bioswales incorporated in select areas of the parking lot. The bio-swales were provided as an enhanced feature only, and did not form a functional portion of the stormwater management servicing strategy for the site nor do they serve any infiltration or treatment function requirements. Additionally, due to the layout and construction phasing of the existing parking lot, the proposed bio-swale was not installed at this location as part of the previous works. Therefore, it is proposed that with the development of Buildings 14 & 15 the bio-swale in this location not be installed. The Ministry of the Environment and Climate Change has been consulted on this item. It is understood that an administrative amendment to the existing ECA (8617-AHGRV5) will be required to remove the proposed bio-swale from the ECA.

5. Erosion and Sedimentation Control Plan

Development of a site such as the proposed expansion can potentially create deleterious material which can enter the natural environment and gain access to fish habitat. In order to prevent site generated sediments from entering the environment, a sediment and erosion control plan will be implemented prior to development. The sediment and erosion control drawing **C-900**, is included in **Appendix D**.

The erosion and sedimentation strategy for the subject site will include erection of silt fences around most of the site perimeter where practical. The silt fences will ensure protection of both adjacent developments and the natural environment including Feedmill Creek. Silt sacs placed inside existing CBs and manhole frames and covers and silt socks placed around the existing Bioswale 2 will also help protect the environment. Mud pads can help clean construction vehicles prior to exiting the site.

6. Site Grading

The design drawing **C-100** and the grading drawing **C-200** indicate how the existing site municipal infrastructure can be extended to accommodate the new buildings.

The existing parking lot will not need to be re-graded as the expanded parking lot area will tie into the existing edge of asphalt. As noted earlier, the new site plan does not impact the existing ring road, except for the placement of a Tactile Walking Surface Indicator and a painted crosswalk, providing pedestrian access to the new site. The grading drawing **C-200** shows that the new buildings and site plan can tie into the existing grading and ensure positive drainage for the site. Drawing **C-200** is included in **Appendix E**.

It is therefore recommended that the proposed changes to the municipal infrastructure as shown on the revised drawings be completed. The proposed changes include the extension of portions of the existing watermain and storm sewers, minor site re-grading, and minor changes to the site drainage system.

IBI GROUP

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Associate

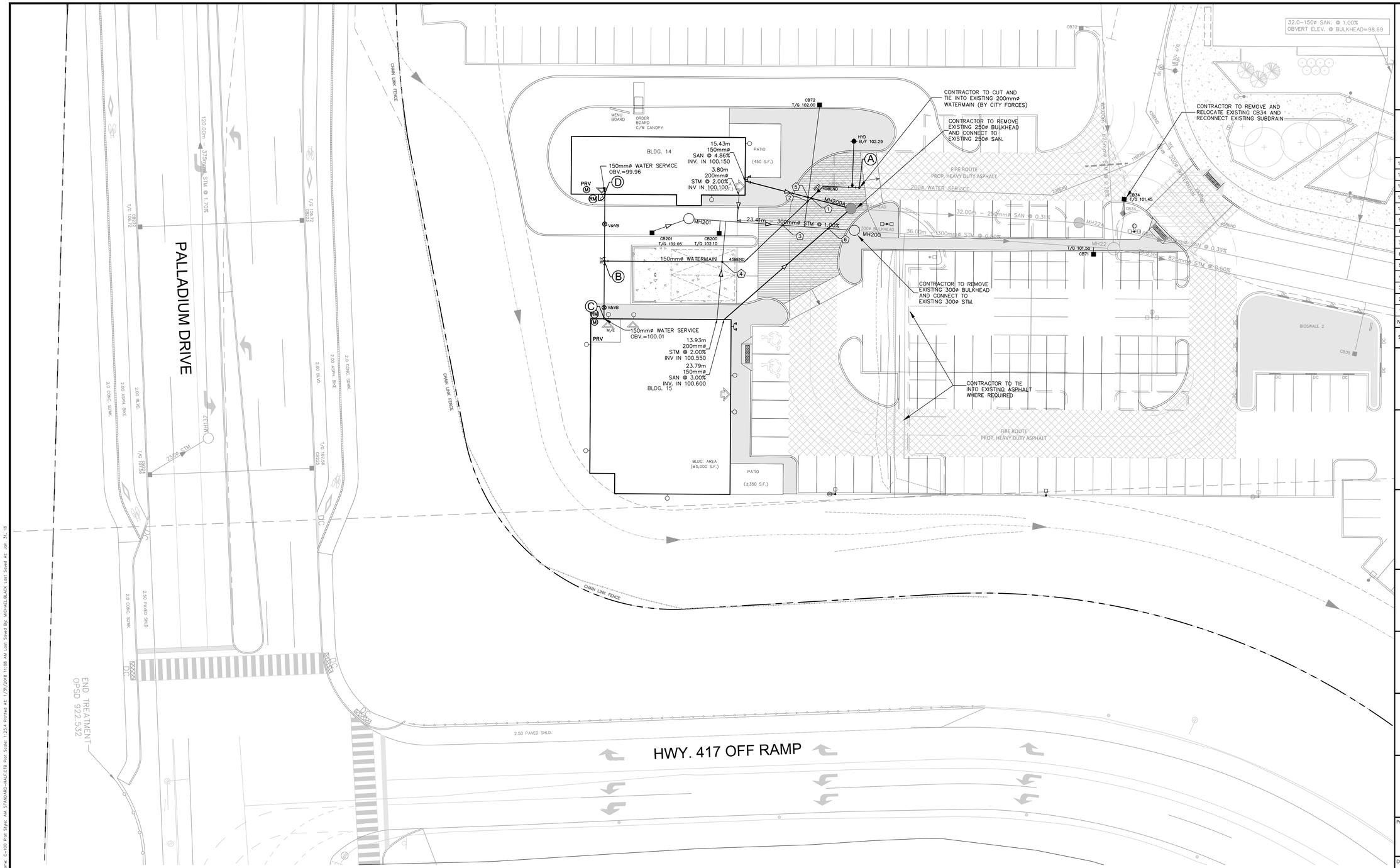
Michael Black

JIM/ks

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
Jan 31/18
PROVINCE OF ONTARIO

APPENDIX A

C-100 – SITE SERVICING PLAN



WATERMAIN SCHEDULE

	STATION	DESCRIPTION	FINISHED GRADE	TOP OF WATERMAIN	AS-BUILT WATERMAIN
A	0+000.0	CUT & CONNECT TO EXISTING 200ø W/M	102.14	*EX.99.68*	*EX.99.68*
	0+001.0	HYDRANT TEE	102.17	99.68	
	0+005.5	200ø 45°BEND	102.29	99.77	
	0+006.5	200ø TO 150ø REDUCER	102.28	99.76	
	0+020.5	150ø 45°BEND	102.45	99.96	
B	0+040.3	150ø x 150ø TEE	102.81	100.32	
B	0+000.0	150ø x 150ø TEE	102.81	100.32	
	0+006.6	150ø V&VB	102.86	100.37	
C	0+008.1	CONNECT TO BUILDING 15	102.90	100.41	
B	0+049.1	150ø x 150ø TEE	102.81	100.32	
	0+005.2	150ø V&VB	102.23	99.74	
D	0+009.4	CONNECT TO BUILDING 14	102.45	99.96	

REVISED 2018-01-31

STORM STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
MH200	102.17	SW99.466			*NE98.660*	1200ø OPSD 701.010
MH201	102.17	SW100.247		NE99.700		1200ø OPSD 701.010

SANITARY STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
MH200A	102.13	S99.886 SW99.400			*NE97.840*	1200ø OPSD 701.010

CROSSING SCHEDULE

1	150ø SAN 0.55m CLEARANCE OVER 150ø W/M
2	200ø CB LEAD 1.03m CLEARANCE OVER 150ø W/M
3	300ø STM 0.55m CLEARANCE OVER 150ø W/M
4	200ø STM 0.55m CLEARANCE OVER 150ø W/M
5	200ø CB LEAD 0.30m CLEARANCE OVER 150ø SAN
6	150ø SAN 0.20m CLEARANCE OVER 300ø STM

PAVEMENT STRUCTURE

LIGHT DUTY

50mm 12.5 SUPERPAVE
150mm GRANULAR 'A'
400mm GRANULAR 'B'

HEAVY DUTY

40mm 12.5 SUPERPAVE
50mm 19.0 SUPERPAVE
150mm GRANULAR 'A'
450mm GRANULAR 'B'

APPROVED ☐ REFUSED ☐

THIS____DAY OF _____, 20_____

DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

No.	REVISIONS	By	Date
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1	ISSUED FOR SITE PLAN APPROVAL	JIM	18:01:31

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(416) 646 8330

TangerOutlets

Project :
TANGER OUTLETS KANATA
BUILDINGS 14 & 15
KANATA, ONTARIO

Drawing Name :
SITE SERVICING PLAN

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2018/01/31
PROVINCE OF ONTARIO

114326	JAN. 2018
D.P.S.	1:250
J.I.M.	M.B.

C-100

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APPENDIX B

SANITARY SEWER DESIGN SHEET
C-400 – SANITARY DRAINAGE AREA PLAN

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: TANGER OUTLET CENTRES
LOCATION: CITY OF OTTAWA
CLIENT: RIO-CAN MANAGEMENT INC

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			TOTAL	PROPOSED SEWER DESIGN						
				UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW	FLOW	CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
													INSTITUTIONAL		HIGH PROFILE EMPLO		PRESTIGE BUSINESS P											(full)		
STREET	AREA ID	FROM MH	TO MH	SF	SD	TH	APT	(Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	L/s	(%)
Tanger Site		1A	2A						0.0		4.00	0.00			2.21	2.21			1.92	2.21	2.21	0.62	2.54	37.22	50.16	250	0.36	0.735	34.69	93.18
Tanger Site		2A	3A						0.0		4.00	0.00			0.92	3.13			2.72	0.92	3.13	0.88	3.59	38.24	52.42	250	0.38	0.755	34.65	90.60
Tanger Site		3A	7A						0.0		4.00	0.00			1.03	4.16			3.61	1.03	4.16	1.16	4.78	39.72	91.80	250	0.41	0.784	34.95	87.98
Tanger Site		7A	8A						0.0		4.00	0.00			1.03	5.19			4.51	1.03	5.19	1.45	5.96	38.24	57.25	250	0.38	0.755	32.28	84.42
Tanger Site		8A	8Anew						0.0		4.00	0.00			0.00	5.19			4.51	0.00	5.19	1.45	5.96	36.70	10.00	250	0.35	0.724	30.74	83.77
Tanger Site		9A	8Anew						0.0		4.00	0.00			0.64	0.64			0.56	0.64	0.64	0.18	0.73	87.96	42.20	250	2.01	1.736	87.22	99.16
Tanger Site		8Anew	23B						0.0		4.00	0.00			0.00	5.83			5.06	0.00	5.83	1.63	6.69	35.64	53.46	250	0.33	0.703	28.95	81.22
Tanger Site		23B	602A						0.0		4.00	0.00			0.00	5.83			5.06	0.00	5.83	1.63	6.69	39.24	36.60	250	0.40	0.774	32.54	82.94
Tanger Site		BLKHD	22A						0.0		4.00	0.00			0.77	0.77			0.67	0.77	0.77	0.22	0.88	34.54	32.00	250	0.31	0.682	33.66	97.44
Tanger Site		22A	21A						0.0		4.00	0.00			0.82	1.59			1.38	0.82	1.59	0.45	1.83	38.74	81.66	250	0.39	0.765	36.92	95.29
Tanger Site		21A	20A						0.0		4.00	0.00			2.32	3.91			3.39	2.32	3.91	1.09	4.49	35.64	99.28	250	0.33	0.703	31.15	87.40
Tanger Site		20A	19A						0.0		4.00	0.00			0.00	3.91			3.39	0.00	3.91	1.09	4.49	34.54	35.14	250	0.31	0.682	30.05	87.00
Tanger Site		19A	18A						0.0		4.00	0.00			1.52	5.43			4.71	1.52	5.43	1.52	6.23	36.17	93.44	250	0.34	0.714	29.94	82.77
Tanger Site		18A	17A						0.0		4.00	0.00			0.00	5.43			4.71	0.00	5.43	1.52	6.23	31.63	19.26	250	0.26	0.624	25.40	80.29
Hotel Site		103A	102A						0.0		4.00	0.00			0.66	0.66			0.57	0.66	0.66	0.18	0.76	NOT CONSTRUCTED						
Hotel Site		102A	101A						0.0		4.00	0.00			1.42	2.08			1.81	1.42	2.08	0.58	2.39							
Hotel Site		101A	100A						0.0		4.00	0.00			0.06	2.14			1.86	0.06	2.14	0.60	2.46							
Feedmill Creek Crossing		100A	17A						0.0		4.00	0.00			0.17	2.31			2.01	0.17	2.31	0.65	2.65	45.12	98.75	300	0.20	0.618	42.46	94.12
Tanger Site		17A	16A						0.0		4.00	0.00			0.29	8.03			6.97	0.29	8.03	2.25	9.22	43.97	67.35	300	0.19	0.603	34.75	79.04
Tanger Site		16A	15A						0.0		4.00	0.00			0.18	8.21			7.13	0.18	8.21	2.30	9.43	46.23	33.06	300	0.21	0.634	36.80	79.61
Tanger Site		15A	14A						0.0		4.00	0.00			0.00	8.21			7.13	0.00	8.21	2.30	9.43	48.38	25.97	300	0.23	0.663	38.96	80.52
Tanger Site		13A	14A						0.0		4.00	0.00			0.55	0.55			0.48	0.55	0.55	0.15	0.63	62.04	69.00	250	1.00	1.224	61.41	98.98
Tanger Site		14A	12A						0.0		4.00	0.00			0.13	8.89			7.72	0.13	8.89	2.49	10.21	47.32	59.08	300	0.22	0.648	37.11	78.43
Tanger Site		12A	11A						0.0		4.00	0.00			1.68	10.57			9.18	1.68	10.57	2.96	12.13	54.33	93.58	300	0.29	0.745	42.19	77.66
Huntmar Drive		11A	302A						0.0		4.00	0.00			0.00	10.57			9.18	0.00	10.57	2.96	12.13	50.44	12.11	300	0.25	0.691	38.31	75.94
Huntmar Drive		302A	301A						0.0		4.00	0.00			0.29	10.86			9.43	0.29	10.86	3.04	12.47	37.75	36.63	300	0.14	0.517	25.28	66.97
Huntmar Drive		301A	600A						0.0		4.00	0.00			0.37	11.23			9.75	0.37	11.23	3.14	12.89	45.12	118.25	300	0.20	0.618	32.22	71.42
External (West)			604A						0.0		4.00	0.00					52.66	52.66	32.00	52.66	52.66	14.74	46.74							
External (North)		BULKHEAD	604A						0.0		4.00	0.00					4.76	4.76	2.89	4.76	4.76	1.33	4.23	46.43	23.97	250	0.56	0.916	42.20	90.90
Campeau Drive		604A	603A						0.0		4.00	0.00					0.44	57.86	35.16	0.44	57.86	16.20	51.36	62.19	102.12	300	0.38	0.852	10.83	17.41
External (North)		BULKHEAD	603A						0.0		4.00	0.00					5.14	5.14	3.12	5.14	5.14	1.44	4.56	31.63	22.98	250	0.26	0.624	27.07	85.58
Campeau Drive		603A	602A						0.0		4.00	0.00					0.50	63.50	38.59	0.50	63.50	17.78	56.37	103.47	105.24	375	0.32	0.908	47.11	45.53
Campeau Drive		602A	601A						0.0		4.00	0.00			0.00	5.83	0.50	64.00	43.95	0.50	69.83	19.55	63.50	109.75	107.73	375	0.36	0.963	46.24	42.14
External (North)		BULKHEAD	601A						0.0		4.00	0.00					5.00	5.00	3.04	5.00	5.00	1.40	4.44	31.63	29.00	250	0.26	0.624	27.20	85.97
Campeau Drive		601A	600A						0.0		4.00	0.00			0.00	5.83	0.39	69.39	47.22	0.39	75.22	21.06	68.29	109.75	106.95	375	0.36	0.963	41.46	37.78
Campeau Drive		600A	Ex.						0.0		4.00	0.00			0.00	17.06	0.00	69.39	56.97	0.00	86.45	24.21	81.18	68.44	21.40	375	0.14	0.600	-12.74	-18.62

Design Parameters:

Residential			ICI Areas			Peak Factor
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	INST	50,000	L/Ha/day	1.5
APT	2.3	p/p/u	EMP	50,000	L/Ha/day	1.5
Other	60	p/p/Ha	BUSS	35,000	L/Ha/day	1.5

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5))
   where P = population in thousands

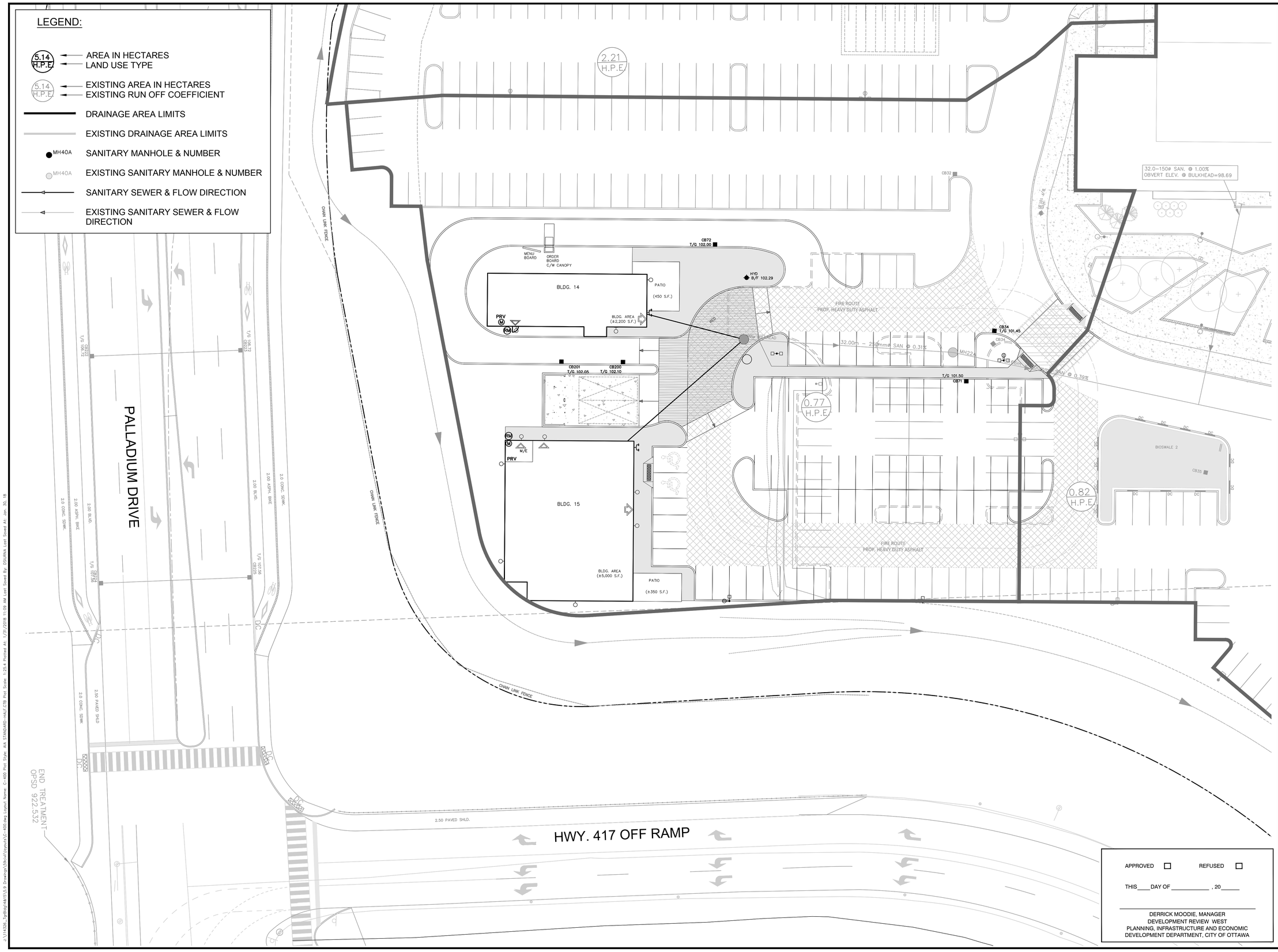
Designed: J.I.M.

Checked: M.B.

Dwg. Reference: 39449 - C-501

No.	Revision	Date
1.	1st Submission for Site Plan Application	30/01/2013
2.	2nd Submission for Site Plan Application	20/05/2013
3.	Submitted For MOE Application	25/06/2013
4.	Revised external pipe lengths	17/09/2013
5.	Revised Per New Building 7/12 Site Plan	2/7/2014
6.	Revised pipe data	11/8/2014
7.	As-built	2/2/2015
8.	Buildings 14 and 15 Site Plan Application (Tanger Expansion)	1/31/2018

File Reference:	Date:	Sheet No:
114326-5.7.1	25/01/2013	1 of 1



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No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	ISSUED FOR SITE PLAN APPROVAL	JIM	18:01:31

SCALE 0m 5 10 15m

PROJECT ARCHITECT
TURNER FLEISCHER
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DEVELOPER
Tanger Outlets
Tanger Outlets
3200 Northline Avenue, Suite 360
Greensboro, North Carolina
27408

Project :
TANGER OUTLETS KANATA
BUILDINGS 14 & 15
KANATA, ONTARIO

Drawing Name :
SANITARY DRAINAGE AREA PLAN

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2018/01/31
PROVINCE OF ONTARIO

Proj no.:	114326	Date :	JAN. 2018
Drawn by :	D.P.S.	Scale :	1:250
Checked by :	J.I.M.	Design :	M.B.

True North
FOR CONSTRUCTION

Drawing No :
C-400

D07-XX-XX-XXXX

#------

J:\114326_Tgt\Bldg14&15\3-9 Drawings\Site\civil\plans\C-400.dwg Layout Name: C-400 Plot Style: AIA STANDARD-HALF CTB Plot Scale: 1:25.4 Plotted At: 1/31/2018 11:09 AM Last Saved By: DSURNA Last Saved At: Jan. 30, 18

APPENDIX C

STORM SEWER DESIGN SHEET
C-500 – STORM DRAINAGE AREA PLAN

IBI GROUP
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Ottawa, Ontario K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

ORIGINAL

STORM SEWER DESIGN SHEET

Tanger Outlets Centre
City of Ottawa
Rio-Can Management Inc.

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW													SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.57	C= 0.65	C= 0.69	C= 0.70	C= 0.85	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
														TC to MH 604 is 15 min (see Section4.3 in Design Brief) plus credit of 2 min for future upstream storm sewer in Campeau Drive																					
Campeau Drive			604										6.18	15.46	15.46	17.00			77.61	90.86	132.63	1,199.99													
Campeau Drive			604									1.91		4.51	4.51	17.00		17.00	77.61	90.86	132.63		410.06			1,610.05	1,911.03		1050			0.45	2.138	300.98	15.75%
Campeau Drive		DI2	604										4.76	11.91	11.91	14.79	0.14	14.93	84.24	98.66	144.08	1,003.28				1,003.28	2,073.93	15.00	1200			0.26	1.776	1070.65	51.62%
Campeau Drive		604	603											0.00	27.37	17.00			77.61	90.86	132.63	1,319.32													
Campeau Drive		604	603									0.44		1.04	5.55	17.00	0.75	17.75	77.61	90.86	132.63		504.52			1,823.84	3,340.91	101.49	1350			0.36	2.261	1517.06	45.41%
Campeau Drive		BULKHEAD	603										5.14	12.86	12.86	14.75	0.33	15.08	84.37	98.81	144.30	1,085.07				1,085.07	1,363.92	18.02	1350			0.06	0.923	278.85	20.44%
Campeau Drive		603	602											0.00	40.23	17.75			75.62	88.51	129.20	3,042.18													
Campeau Drive		603	602									0.26		0.61	6.17	17.75	0.71	18.46	75.62	88.51	129.20		545.91			3,588.09	3,971.29	92.77	1500			0.29	2.177	383.21	9.65%
Campeau Drive		602	601A											0.00	40.23	18.46			73.83	86.41	126.11	2,970.23													
Campeau Drive		602	601A									0.32		0.76	6.92	18.46	0.49	18.95	73.83	86.41	126.11		598.29			3,568.52	4,605.38	74.50	1500			0.39	2.525	1036.86	22.51%
Campeau Drive		600	601A									0.78		1.84	1.84	10.00	1.58	11.58	104.19	122.14	178.56		225.12			225.12	429.61	110.08	675			0.24	1.163	204.48	47.60%
Campeau Drive		BULKHEAD	601A										5.00	12.51	12.51	12.51	0.18	12.69	92.57	108.46	158.46	1,158.08				1,158.08	1,772.90	16.00	1200			0.19	1.519	614.81	34.68%
Campeau Drive		601A	601B											0.00	52.74	18.95			72.64	85.02	124.07	3,831.35													
Campeau Drive		601A	601B											0.00	8.77	18.95	0.20	19.15	72.64	85.02	124.07		745.36			4,576.71	9,316.42	50.95	1650			0.96	4.221	4739.71	50.87%
Tanger Site		601B	9											0.00	52.74	19.15			72.17	84.47	123.26	3,806.44													
Tanger Site		601B	9											0.00	8.77	19.15	0.24	19.39	72.17	84.47	123.26		740.49			4,546.93	9,505.48	43.50	1950			0.41	3.083	4958.55	52.17%
Tanger Site		1	2										0.90	2.25	2.25	10.00	1.42	11.42	104.19	122.14	178.56	234.62				234.62	361.57	83.45	675			0.17	0.979	126.95	35.11%
Tanger Site		BLDG 05	117																						14.40	14.40	41.63	35.60	200			1.48	1.284	27.23	65.41%
Tanger Site		117	GALLERY																						14.40	14.40	40.49	3.15	200			1.40	1.248	26.09	64.43%
Tanger Site		GALLERY	2																						14.40	14.40	81.19	6.22	200			5.63	2.504	66.79	82.26%
Tanger Site		2	3										0.62	1.55	3.80	11.42	0.66	12.08	97.24	113.96	166.54	369.82			14.40	384.22	568.97	49.20	750			0.24	1.248	184.76	32.47%
Tanger Site		BLDG 09	118																						25.20	25.20	118.85	7.35	250			3.67	2.346	93.65	78.80%
Tanger Site		118	119																						25.20	25.20	50.40	29.00	250			0.66	0.995	25.20	50.00%
Tanger Site		119	120																						25.20	25.20	44.74	66.00	250			0.52	0.883	19.54	43.67%
Tanger Site		120	GALLERY																						25.20	25.20	48.85	4.50	250			0.62	0.964	23.65	48.41%
Tanger Site		GALLERY	3																						25.20	25.20	142.01	17.00	250			5.24	2.803	116.81	82.26%
Tanger Site		3	4										0.19	0.48	4.28	12.08	0.50	12.58	94.36	110.57	161.56	403.73			39.60	443.33	677.21	44.37	750			0.34	1.485	233.89	34.54%
Tanger Site		5	6											0.00	0.00	10.00	0.62	10.62	104.19	122.14	178.56	0.00				0.00	172.56	56.15	375			0.89	1.514	172.56	100.00%
Tanger Site		BLDG 06	121																						7.20	7.20	49.58	18.10	200			2.10	1.529	42.38	85.48%
Tanger Site		121	GALLERY																						7.20	7.20	31.55	13.00	200			0.85	0.973	24.35	77.18%
Tanger Site		GALLERY	6																						7.20	7.20	43.87	8.00	250			0.50	0.866	36.67	83.59%
Tanger Site		6	4										0.17	0.43	0.43	10.62	0.18	10.80	101.04	118.42	173.10	42.97			7.20	50.17	228.46	15.15	450			0.59	1.392	178.29	78.04%
Tanger Site		4	7										0.30	0.75	5.45	12.58	0.65	13.23	92.30	108.14	158.00	503.46			46.80	550.26	686.24	48.60	825			0.21	1.244	135.98	19.81%
Tanger Site		BLDG 07	122																						18.00	18.00	41.91	36.00	200			1.50	1.292	23.91	57.05%
Tanger Site		122	GALLERY																						18.00	18.00	28.01	2.00	200			0.67	0.864	10.01	35.73%
Tanger Site		GALLERY	7																						18.00	18.00	75.97	7.00	200			4.93	2.343	57.97	76.31%
Tanger Site		7	8										1.06	2.65	8.11	13.23	1.03	14.26	89.76	105.15	153.60	727.63			64.80	792.43	981.98	110.20	825			0.43	1.780	189.55	19.30%
Tanger Site		8	9											0.00	8.11	14.26	0.07	14.33	86.03	100.76	147.16	697.39			64.80	762.19	1,305.49	10.51	825			0.76	2.366	543.30	41.62%
Tanger Site		9	12											0.00	60.85	19.39			71.63	83.83	122.32	4,358.42													
Tanger Site		9	12											0.00	8.77	19.39	0.82	20.21	71.63	83.83	122.32		734.89		64.80	5,158.12	5,352.46	85.59	1950			0.13	1.736	194.35	3.63%
Tanger Site		CB17	CBMH18										0.27	0.68	0.68	10.00	0.55	10.55	104.19	122.14	178.56	70.39				70.39	100.38	45.40	300			0.99	1.376	29.99	29.88%
Tanger Site		CBMH18	11										0.19	0.48	1.15	10.55	0.67	11.22	101.37	118.82	173.68	116.67				116.67	161.54	56.60	375			0.78	1.417	44.87	27.78%
Tanger Site	Bioswale	CB19	11										0.71	1.78	1.78	15.00	0.26	15.26	83.56	97.85	142.89	148.43				148.43	159.83	34.60	300			2.51	2.190	11.39	7.13%
Tanger Site		CBMH21	11										0.16	0.40	0.40	10.00	0.27	10.27	104.19	122.14	178.56	41.71				41.71	197.85	28.30	375			1.17	1.735	156.14	78.92%
Tanger Site		11	25										0.25	0.63	3.95	11.22	0.61	11.83	98.18	115.06	168.16	388.13				388.13	470.71	59.40	600			0.54	1.613	82.59	17.54%
Tanger Site		25	26										0.23	0.58	4.53	11.83	0.56	12.38	95.43	111.82	163.40	432.16				432.16	568.97	41.55	750			0.24	1.248	136.81	24.05%
Tanger Site		26	12											0.00	4.53	12.38	0.16	12.54	93.08	109.06	159.35	421.54				421.54	506.25	10.50	750			0.19	1.110	84.70	16.73%
Tanger Site		12	13											0.00	65.38	20.21			69.80	81.68	119.17	4,563.19													
Tanger Site		12	13											0.00	8.77	20.21	0.21	20.42	69.80	81.68	119.17	611.90			64.80	611.90	6,470.81	26.67	1950			0.19	2.099	5858.91	90.54%

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 = 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: P.K.
Checked:
Dwg. Reference: 32862 - C-500/C-500A

No.	Revision	Date
1.	As-built	2/2/2015
2.	Buildings 14 and 15 Site Plan Application (Tanger Expansion)	1/31/2018

File Reference:	Date:	Sheet No:
114326.5.7.1	17/12/2014	1 of 2

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ORIGINAL

STORM SEWER DESIGN SHEET

Tanger Outlets Centre
City of Ottawa
Rio-Can Management Inc.

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW													SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.57	C= 0.65	C= 0.69	C= 0.70	C= 0.85	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
Tanger Site		24	23										0.83	2.08	2.08	10.00	0.94	10.94	104.19	122.14	178.56	216.37				216.37	228.77	58.00	525			0.26	1.024	12.40	5.42%
Tanger Site		BLDG 04	116																						10.80	10.80	45.26	28.00	200			1.75	1.396	34.46	76.14%
Tanger Site		116	GALLERY																						10.80	10.80	33.00	3.00	200			0.93	1.018	22.20	67.27%
Tanger Site		GALLERY	23																						10.80	10.80	114.15	9.70	200			11.13	3.520	103.35	90.54%
Tanger Site		23	22										0.67	1.68	3.75	10.94	0.86	11.81	99.46	116.56	170.36	373.26			10.80	384.06	464.03	65.00	675			0.28	1.256	79.97	17.23%
Tanger Site		BULKHEAD	22										0.23	0.58	0.58	10.00	0.61	10.61	104.19	122.14	178.56	59.96				59.96	71.33	36.00	300			0.50	0.978	11.38	15.95%
Tanger Site		22	21										0.79	1.98	6.31	11.81	0.82	12.63	95.53	111.94	163.57	602.32				602.32	860.25	76.83	825			0.33	1.559	257.93	29.98%
Tanger Site		21	20										0.71	1.78	8.08	12.63	1.37	14.00	92.10	107.90	157.64	744.27				744.27	935.18	99.99	975			0.16	1.213	190.91	20.41%
Tanger Site		BLDG 03	115																						14.40	14.40	34.22	34.00	200			1.00	1.055	19.82	57.92%
Tanger Site		115	GALLERY																						14.40	14.40	30.98	10.00	200			0.82	0.955	16.58	53.53%
Tanger Site		GALLERY	20																						14.40	14.40	79.29	8.00	200			5.37	2.445	64.89	81.84%
Tanger Site		20	19										0.35	0.88	8.96	14.00	0.52	14.53	86.93	101.82	148.71	778.63			25.20	803.83	935.18	38.18	975			0.16	1.213	131.35	14.04%
Tanger Site		19	18										0.24	0.60	9.56	14.53	1.32	15.84	85.12	99.69	145.59	813.56			25.20	838.76	842.96	86.41	975			0.13	1.094	4.20	0.50%
Tanger Site		18	16										0.09	0.23	9.78	15.84	1.05	16.90	80.93	94.76	138.36	791.73			25.20	816.93	1,237.13	101.50	975			0.28	1.605	420.20	33.97%
Tanger Site		16	15										0.20	0.50	10.28	16.90	0.39	17.28	77.89	91.19	133.12	800.98			25.20	826.18	1,533.10	46.00	975			0.43	1.989	706.91	46.11%
Tanger Promenade		30	31										0.10	0.25	0.25	10.00	2.39	12.39	104.19	122.14	178.56	26.07				26.07	59.68	117.50	300			0.35	0.818	33.61	56.32%
Tanger Promenade		32	31										0.04	0.10	0.10	10.00	0.48	10.48	104.19	122.14	178.56	10.43				10.43	68.24	38.85	250			1.21	1.347	57.81	84.72%
Tanger Promenade		31	34										0.04	0.10	0.45	12.39	0.80	13.19	93.05	109.02	159.28	41.90				41.90	98.50	41.50	375			0.29	0.864	56.60	57.46%
Tanger Promenade		34	35										0.06	0.15	0.60	13.19	0.39	13.58	89.88	105.29	153.82	53.97				53.97	136.30	19.38	450			0.21	0.830	82.33	60.40%
Tanger Promenade		36	35										0.04	0.10	0.10	10.00	0.63	10.63	104.19	122.14	178.56	10.43				10.43	43.43	32.50	250			0.49	0.857	33.00	75.99%
Tanger Promenade		35	37										0.03	0.08	0.78	13.58	1.95	15.53	88.43	103.58	151.31	68.59				68.59	155.42	81.42	525			0.12	0.696	86.83	55.87%
Tanger Promenade		37	38										0.06	0.15	0.93	15.53	1.76	17.30	81.87	95.87	139.98	75.79				75.79	179.46	85.00	525			0.16	0.803	103.67	57.77%
Tanger Promenade		38	39										0.04	0.10	1.03	17.30	1.19	18.49	76.80	89.90	131.23	78.78			5.40	84.18	195.57	62.50	525			0.19	0.875	111.38	56.96%
Tanger Promenade		50	49										0.03	0.08	0.08	10.00	0.97	10.97	104.19	122.14	178.56	7.82				7.82	44.30	51.10	250			0.51	0.874	36.48	82.35%
Tanger Promenade		49	48										0.06	0.15	0.23	10.97	1.08	12.06	99.31	116.40	170.12	22.36				22.36	66.92	59.50	300			0.44	0.917	44.55	66.58%
Tanger Promenade		48	46										0.03	0.08	0.30	12.06	0.45	12.51	94.46	110.68	161.73	28.36				28.36	348.14	57.48	450			1.37	2.121	319.78	91.85%
Tanger Promenade		47	46										0.04	0.10	0.10	10.00	0.26	10.26	104.19	122.14	178.56	10.43				10.43	95.51	29.54	250			2.37	1.885	85.08	89.08%
Tanger Promenade		46	44										0.03	0.08	0.48	12.51	0.65	13.16	92.58	108.47	158.48	44.01				44.01	89.23	21.30	450			0.09	0.544	45.22	50.68%
Tanger Promenade		45	44										0.08	0.20	0.20	10.00	0.99	10.99	104.19	122.14	178.56	20.86				20.86	41.62	49.00	250			0.45	0.821	20.76	49.89%
Tanger Promenade		44	441											0.00	0.68	13.16	0.10	13.26	90.01	105.45	154.04	60.81				60.81	249.80	6.54	525			0.31	1.118	188.99	75.66%
Tanger Promenade		441	43										0.03	0.08	0.75	13.26	0.88	14.14	89.64	105.01	153.40	67.29				67.29	228.77	54.00	525			0.26	1.024	161.48	70.59%
Tanger Promenade		43	401										0.04	0.10	0.85	14.14	1.28	15.42	86.45	101.26	147.89	73.54				73.54	212.45	56.00	600			0.11	0.728	138.91	65.38%
Tanger Promenade		401	40											0.00	0.85	15.42	0.05	15.47	82.23	96.29	140.60	69.95				69.95	424.90	4.50	600			0.44	1.456	354.95	83.54%
Tanger Promenade		41	40										0.03	0.08	0.08	10.00	1.09	11.09	104.19	122.14	178.56	7.82				7.82	42.53	55.00	250			0.47	0.839	34.71	81.61%
Tanger Promenade		42	40										0.03	0.08	0.08	10.00	0.63	10.63	104.19	122.14	178.56	7.82				7.82	41.62	31.00	250			0.45	0.821	33.80	81.21%
Tanger Promenade		40	39										0.03	0.08	1.08	15.47	0.71	16.18	82.07	96.10	140.32	88.29			5.40	93.69	338.95	49.50	600			0.28	1.161	245.26	72.36%
Tanger Promenade		39	15											0.00	2.10	18.49	0.54	19.03	73.75	86.32	125.98	155.00			10.80	165.80	500.29	55.50	600			0.61	1.714	334.49	66.86%
Tanger Site		15	14											0.00	12.38	19.03	0.38	19.41	72.46	84.80	123.75	897.38			36.00	933.38	1,366.23	34.63	1050			0.23	1.529	432.85	31.68%
Tanger Site		14	13											0.00	12.38	19.41	0.04	19.45	71.58	83.77	122.24	886.53			36.00	922.53	2,034.45	5.90	1050			0.51	2.276	1111.91	54.65%
Tanger Site		13	POND											0.00	77.76	20.42			69.34	81.14	118.39	5,392.26													
Tanger Site		13	POND											0.00	8.77	20.42	0.03	20.45	69.34	81.14	118.39		711.36		100.80	6,204.42	14,011.46	6.70	2100			0.60	3.919	7807.04	55.72%

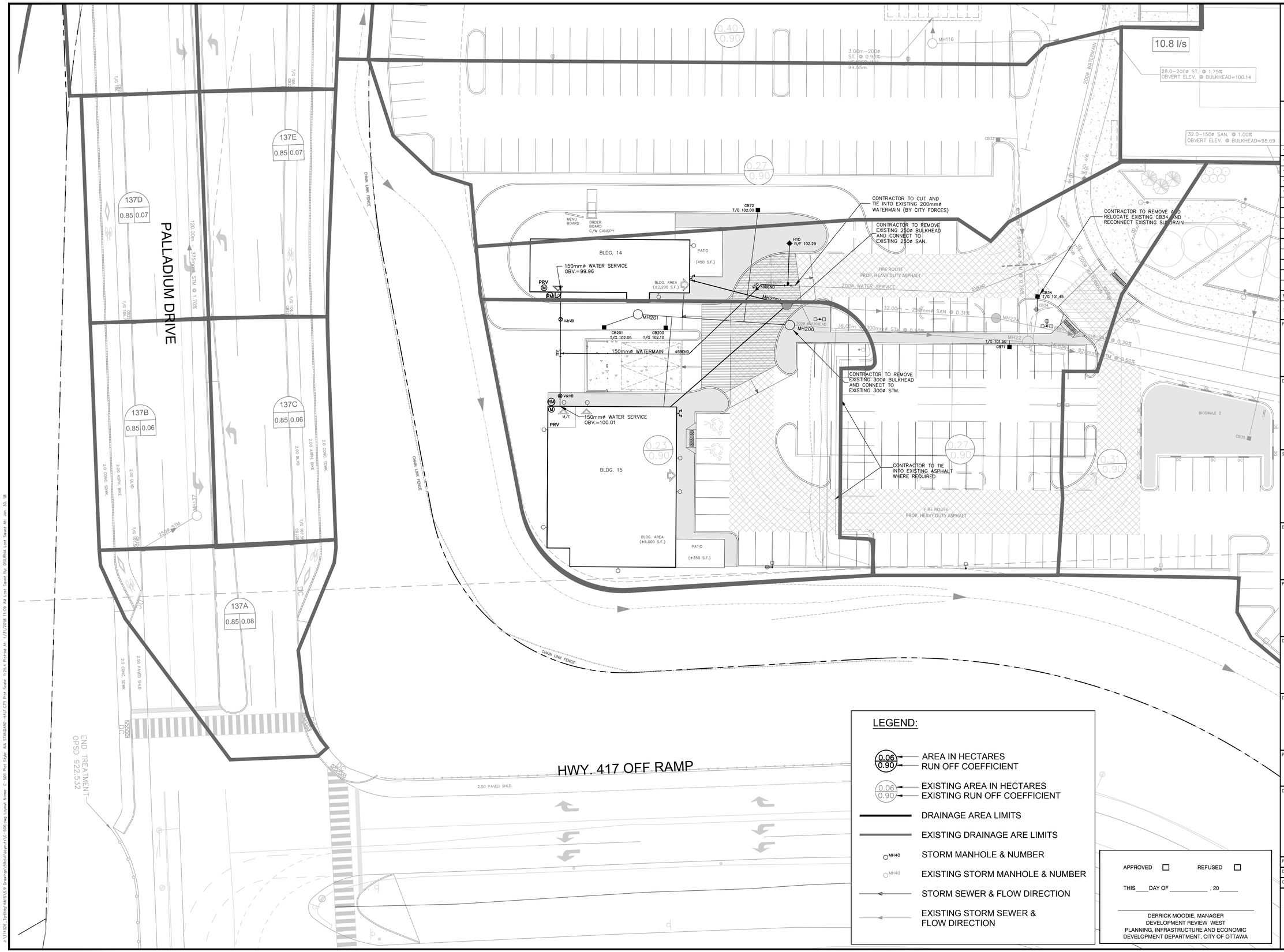
Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: P.K.
Checked: 0
Dwg. Reference: 32862 - C-500/C-500A

No.	Revision	Date
1.	As-built	2/2/2015
2.	Buildings 14 and 15 Site Plan Application (Tanger Expansion)	1/31/2018

File Reference:	Date:	Sheet No:
114326.5.7.1	17/12/2014	2 of 2



LEGEND:

0.06 / 0.90	AREA IN HECTARES / RUN OFF COEFFICIENT
0.06 / 0.90	EXISTING AREA IN HECTARES / EXISTING RUN OFF COEFFICIENT
	DRAINAGE AREA LIMITS
	EXISTING DRAINAGE ARE LIMITS
MH40	STORM MANHOLE & NUMBER
MH40	EXISTING STORM MANHOLE & NUMBER
	STORM SEWER & FLOW DIRECTION
	EXISTING STORM SEWER & FLOW DIRECTION

APPROVED ☐ REFUSED ☐

THIS____ DAY OF _____ , 20_____

DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

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1	ISSUED FOR SITE PLAN APPROVAL	JIM	18:01:31

SCALE 0m 5 10 15m

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(416) 646 8330

DEVELOPER

Tanger Outlets
Tanger Outlets
3200 Northline Avenue, Suite 360
Greensboro, North Carolina
27408

Project :

TANGER OUTLETS KANATA
BUILDINGS 14 & 15

KANATA, ONTARIO

Drawing Name :

STORM DRAINAGE AREA PLAN

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2018/01/31
PROVINCE OF ONTARIO

Proj no. :	114326	Date :	JAN. 2018
Drawn by :	D.P.S.	Scale :	1:250
Checked by :	J.I.M.	Design :	M.B.

TRUE NORTH
GRID NORTH
NAD 83 (CSRS) 76 UTM ZONE 18

Drawing No :

C-500

D07-xx-xx-xxxx

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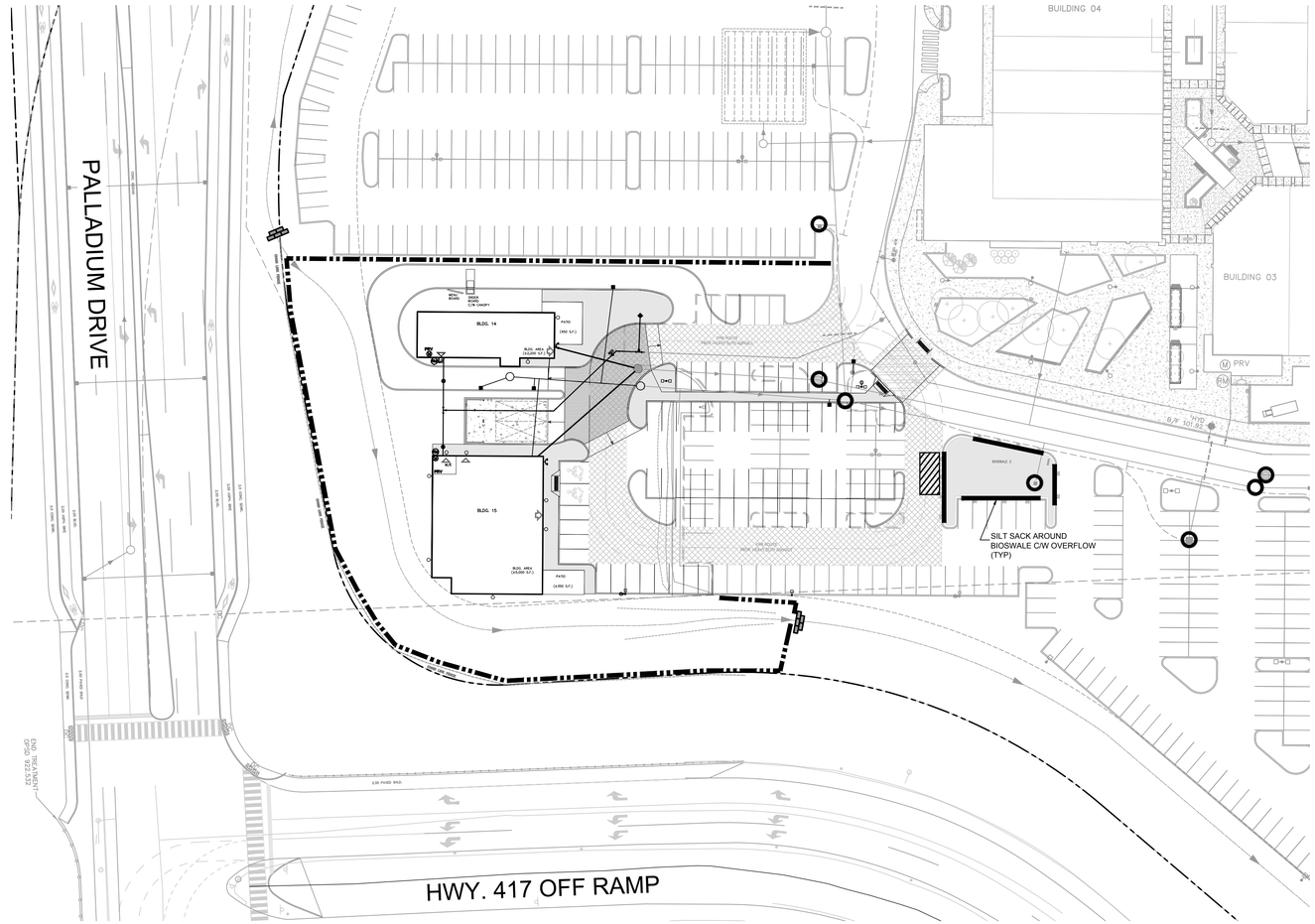
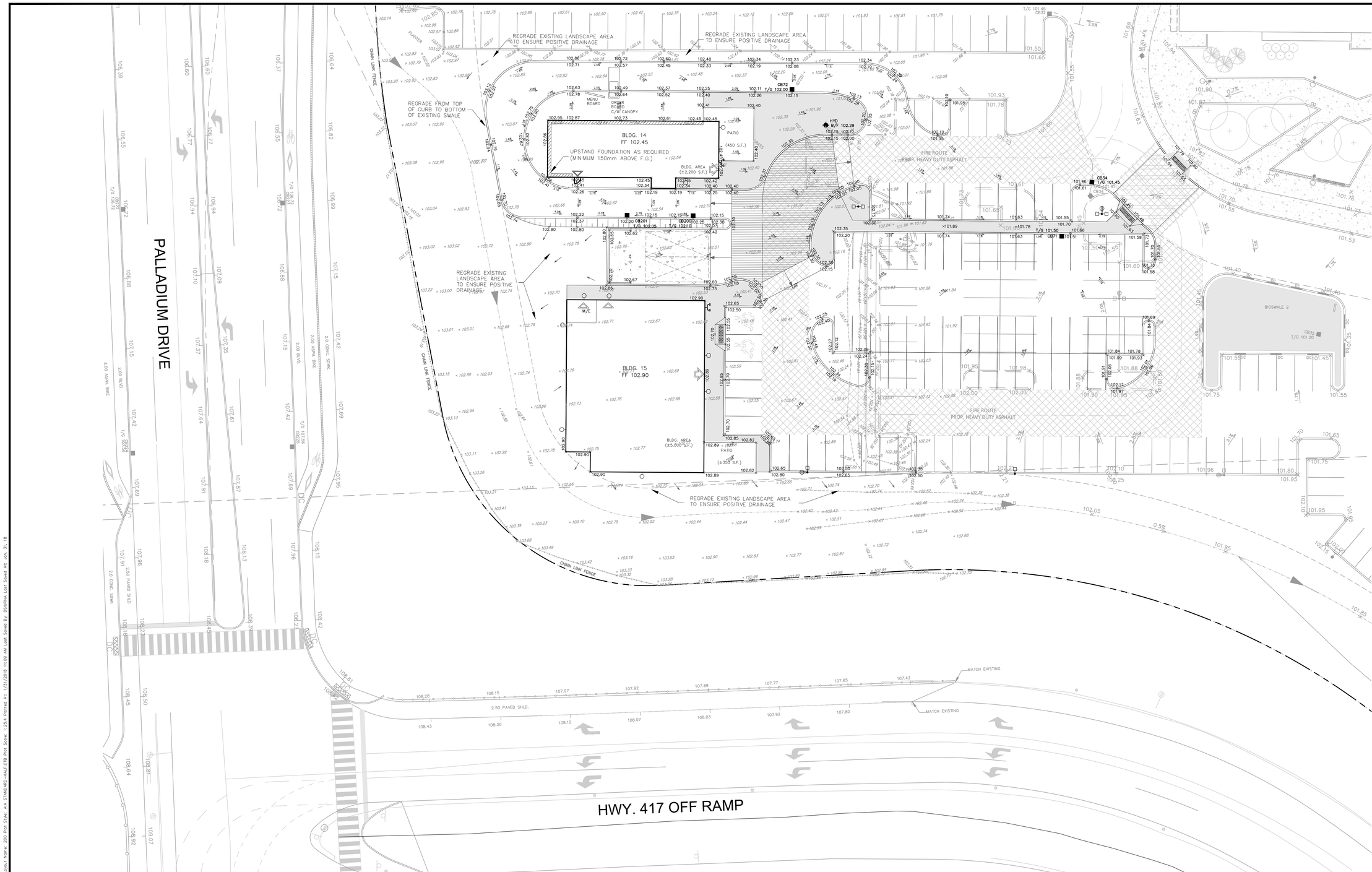
APPENDIX D

C-900 – SEDIMENT AND EROSION CONTROL PLAN


PALLADIUM DRIVE
HWY. 417 OFF RAMP
BUILDING 04
BUILDING 03
BLDG. 14
BLDG. 15
PATIO (180 S.F.)
PATIO (4,950 S.F.)
BLDG. 4REX (10,000 S.F.)
BLDG. 4REX (10,000 S.F.)
PRV
SILT SACK AROUND BIOSWALE C/W OVERFLOW (TYP)
BIOSWALE 3
BIOSWALE 2
BIOSWALE 1
EX. 1050mm SWS
EX. 1050mm SWS
EX. 1050mm SWS

APPENDIX E

C-200 – SITE GRADING PLAN



PAVEMENT STRUCTURE

LIGHT DUTY

50mm 12.5 SUPERPAVE
150mm GRANULAR 'A'
400mm GRANULAR 'B'

HEAVY DUTY

40mm 12.5 SUPERPAVE
50mm 19.0 SUPERPAVE
150mm GRANULAR 'A'
450mm GRANULAR 'B'

APPROVED ☐ REFUSED ☐

THIS____DAY OF _____, 20_____

DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

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1	ISSUED FOR SITE PLAN APPROVAL	JIM	18:01:31

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(416) 646 8330

DEVELOPER
TangerOutlets
Tanger Outlets
3200 Northline Avenue, Suite 360
Greensboro, North Carolina
27408

Project :
TANGER OUTLETS KANATA
BUILDINGS 14 & 15
KANATA, ONTARIO

Drawing Name :
SITE GRADING PLAN

LICENSED PROFESSIONAL ENGINEER
J. I. MOFFATT
2018/01/31
PROVINCE OF ONTARIO

Proj no. :	114326	Date :	JAN. 2018
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Checked by :	J.I.M.	Design :	M.B.

Issue Month / Construction Year

Drawing No : C-200

D07-xx-xx-xxxx

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