



THE CITY OF WINNIPEG

EXPRESSION OF INTEREST

EOI NO. 291-2025

SALE OF CITY-OWNED PROPERTY LOCATED AT 1350 PEMBINA HIGHWAY

Attention Respondents:

The Information Submissions should be submitted directly to the following City email address: HAF@winnipeg.ca

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FORM A: EXPRESSION OF INTEREST APPLICATION

1.	Document Title	_____
2.	Respondent	_____
		Name of Respondent

		Usual Business Name of Respondent (if different from above)

		Street

		City Province Postal Code

		Email Address of Respondent

		Facsimile Number

	(Mailing address if different)	Street or P.O. Box

		City Province Postal Code

		GST Registration Number (if applicable)

	(Choose one)	The Respondent is:
		☐ a sole proprietor
		☐ a partnership
		☐ a corporation
		carrying on business under the above name.
3.	Contact Person	The Respondent hereby authorizes the following contact person to represent the Respondent for purposes of the Information Submission.

		Contact Person Title

		Telephone Number Email Address

4. Addenda

The Respondent certifies that the following addenda have been received and agrees that they shall be deemed to form a part of the Information Submission:

No.	Dated
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

5. Indigenous Self-Declaration

The City is requesting that Proponents identify if their business is at least 51% owned by one or more Indigenous persons of Canada.

☐ YES, 51% or more Indigenous ownership

☐ NO, it is not

This information is being gathered for statistical purposes only and will not be used for purposes of evaluation.

6. Signatures

The Respondent or the Respondent's authorized official or officials have signed this

_____ day of _____, 20_____.

Signature of Respondent or
Respondent's Authorized Official or Officials

(Print here name and official capacity of individual whose signature appears above)

(Print here name and official capacity of individual whose signature appears above)

PART B - REQUEST FOR EXPRESSION OF INTEREST

B1. DEFINITIONS

B1.1 When used in this Expression of Interest:

- (a) **"Affordable Housing"** means one of the following:
 - (i) Less than 80% of the Median Market Rent for the area, in line with CMHC's Affordable Housing Fund Criteria, maintained, at minimum, for twenty years; or
 - (ii) At [Province of Manitoba Affordable Housing rental rates](#), maintained, at minimum, for twenty years.
- (b) **"Business Day"** means any Calendar Day, other than a Saturday, Sunday, or a Statutory or Civic Holiday;
- (c) **"Calendar Day"** means the period from one midnight to the following midnight;
- (d) **"City"** means the City of Winnipeg as continued under The City of Winnipeg Charter, Statutes of Manitoba 2002, c. 39, and any subsequent amendments thereto;
- (e) **"City Contact"** means the City's representative throughout the duration of the Expression of Interest who has the authority to act on behalf of the City to the extent expressly provided for in this Expression of Interest.
- (f) **"City Council"** means the Council of the City of Winnipeg;
- (g) **"may"** indicates an allowable action or feature which will not be evaluated;
- (h) **"must"** or **"shall"** indicates a mandatory requirement which will be evaluated on a pass/fail basis;
- (i) **"Person"** means an individual, firm, partnership, association or corporation, or any combination thereof, and includes heirs, administrators, executors or legal representatives of a person;
- (j) **"Respondent"** means any Person or consortium submitting an EOI Submission in response to this Expression of Interest;
- (k) **"should"** indicates a desirable action or feature which will be evaluated on a relative scale;
- (l) **"Site"** means the lands and other places on, under, in or through which the work is to be performed;
- (m) **"Submission or Information Submission"** means that portion of the Expression of Interest which must be completed or provided and submitted by the Submission Deadline;
- (n) **"Submission Deadline"** means the time and date for final receipt of Submissions.

B2. BACKGROUND

- B2.1 On December 5, 2023, the Government of Canada, through the Canada Mortgage and Housing Corporation (CMHC), entered into an agreement with the City of Winnipeg for \$122.4 million in funding from the Housing Accelerator Fund (HAF).
- B2.2 The HAF funding is contingent upon the City achieving a total of 14,101 building-permitted housing units over a three-year period. This includes 3,166 net new units specifically enabled by HAF initiatives, with the remaining 10,935 units expected to be permitted without HAF support.
- B2.3 One of the key initiatives within the City's agreement with CMHC is the creation of a Land Enhancement Office (LEO). This office is intended to meet the objectives of the CMHC agreement by facilitating the development of affordable, supportive and mixed-income housing on strategic City-owned land. This would include preparing City-owned land for sale/lease to non-profits, Indigenous organizations, and housing developers to build affordable housing.

- B2.4 The unit targets for the LEO over the 3-year agreement is to get to 611 building permits on City-owned land by December 2026. This will include 545 units within close proximity to the Frequent Transit Network and 313 affordable units.
- B2.5 On September 26, 2024, Council [amended the Real Estate Policy Framework](#) in support of affordable housing. This amendment provided delegated authority to the CAO to approve any sale or lease, for any amount, regardless of appraised value intended for affordable housing, subject to a sale/lease condition that the land must remain affordable housing through the life of the agreement on the following properties:
- (a) 825 Taché Avenue
 - (b) 795 William Avenue
 - (c) 395 Pacific Avenue
 - (d) 425 Osborne Street
 - (e) 1350 Pembina Highway
 - (f) 545-569 Watt Street
 - (g) 22 Granite Way
- B2.6 The [September 26, 2024 Council amendment](#) also stipulated evaluation criteria for the properties to be publicly marketed for sale or lease identified in B2.5, subject to any minor modifications necessary to implement this intent. Evaluation criteria approved by Council is outlined in clause B18.5, which will be used to evaluate responses to this EOI. This amendment also required that all lease or sale agreements intended for affordable housing and coordinated through the HAF program include a condition for plan approval by the relevant Community Committee.
- B2.7 The Subject Property contains a former police station in poor condition and parking spaces to the north side and rear of the property. The parking lot is currently used as a lane by vehicles frequenting the high school and public library, including school buses.

B3. PURPOSE OF THE EXPRESSION OF INTEREST DOCUMENT

- B3.1 The purpose of this Expression of Interest (EOI) is to identify an experienced and capable Respondent to work with the City in developing 1350 Pembina Highway into a multi-family residential development with affordable housing.
- B3.2 The City of Winnipeg is seeking innovative and feasible concepts for the development of 1350 Pembina Highway, ensuring that:
- (a) The private or non-profit developer is responsible for financing and constructing the development.
 - (b) The respondent is responsible for operating the residential and/or amenity space portion of the development, including the affordable housing component. The affordable housing component must remain affordable for the lifetime of the agreement with the City.
- B3.3 Council approval of this Site as part of the HAF Land Enhancement Office indicates the intention to see increased housing supply, including affordable units. Respondents will be expected to maximize housing units and affordable housing.
- B3.4 Prior to permitting development of this parcel, the City will enter into a subdivision and rezoning (DASZ) application. A map of the proposed development area is available in 'Schedule A – Map of Subject Property'.
- (a) The application intends to subdivide 1350 Pembina Highway and several surrounding properties in order to create and construct a public lane to service the Subject and surrounding Properties.

- (b) The intended subdivision will reduce the size of the parcel at 1350 Pembina Highway from approximately 4,842 square metres (52,120 sq. ft.) to approximately 3,678 square metres (39,584 sq. ft.).
 - (c) The application intends to re-zone the Subject Property from 'PR3 – Parks & Recreation – Regional' to 'RMF-L – Residential Multi-Family – Large (PDO-1 Malls and Corridors)'.
 - (d) Any agreements or conditions required by the proposed rezoning and subdivision shall be entered into with the City of Winnipeg or assigned to the successful Respondent and registered in series with the plan of subdivision at the Winnipeg Land Titles Office.
- B3.5 The development may include social amenity space, such as a daycare or other amenity that provides positive social impacts to building tenants/residents or the broader community.
- B3.6 The City encourages creative yet practical approaches that maximize development potential while ensuring the City's long-term operational interests are maintained.
- B3.7 The City invites qualified Persons to submit an Information Submission in response to this EOI.
- B3.8 After receiving the Submissions to this EOI, the City will review all Submissions received and use the information to make an informed decision which may proceed to direct negotiations with one or more Respondents or the issuance of a Request for Proposal (RFP). Notwithstanding the above intentions, the City will have no obligation to enter into negotiations or a Contract with a Respondent or issue a subsequent RFP.

B4. PROPERTY INFORMATION

B4.1 Location

- (a) 1350 Pembina Highway (See Schedule "A")

B4.2 Size, Assessment and Title

- (a) Site Size: Subject City Property to be leased – 3,678± m² (39,584± ft²)
- (b) Building Size: Approximately 941± m² (10,124± ft²)
- (c) Assessment: Roll: 3091298400
- (d) Certificate of Title: 2131110
- (e) Legal Description: Part of Lot 1 Plan 4966 WLTO

B4.3 Servicing

- (a) A Municipal Servicing Report completed by Barnes and Duncan dated October 21, 2024 is included as Schedule "B".
- (b) Wastewater
 - (i) The 500 mm wastewater sewer on Crane Avenue does not have capacity to support an increase in wastewater discharge from the subject City property.
 - (ii) The Respondent would be responsible to:
 - (i) provide an updated technical memorandum, prepared by a qualified municipal engineer, which shall outline the wastewater upgrades required to adequately service the proposed development; and
 - (ii) construct and install wastewater sewer upgrades, at no expense to the City, in accordance with the accepted servicing report.
- (c) Water
 - (i) The available water servicing is adequate to support multi-family or commercial development.
- (d) Land Drainage

- (i) The allowable land drainage discharge rate from the Site is 86.32 L/s, based on a “c”-value of 0.5. Any existing connections and overland flows need to be accounted in the allowable discharge rate and on-site storage must be provided for the 25-year rainfall event.
- (e) Public Works
 - (i) Subject to Council approval, the Respondent will be expected to, at no expense to the City, construct a Portland cement concrete public lane behind 1350 and 1360 Pembina Highway, connecting to the existing lane north of Dowker Avenue and to Pembina Highway north of 1350 Pembina Highway, following the public lane configuration available in Schedule “A”. This construction shall include all related works including but not limited to land drainage, if necessary, and tying into the existing public lane north of Dowker Avenue, all as determined by and to the satisfaction of the Director of Public Works. Should the pavement within the existing public lane not be in a condition suitable to tie into, the Respondent shall, at no expense to the City, reconstruct in Portland cement concrete pavement a new public lane, all as determined by and to the satisfaction of the Director of Public Works.
 - (ii) Alternatively, the City may choose the Respondent pay to the City, in cash, on demand, their share of the costs of the above works, all as determined by and to the satisfaction of the Director of Public Works.

B4.4 Environmental Assessments

- (a) The Subject Property was a former police station operated by the City of Winnipeg. The City commissioned a Phase I Environmental Site Assessment, conducted by HLC Consulting Ltd, dated April 5, 2018. The assessment report recommends that a Phase II ESA be conducted to assess the potential of petroleum hydrocarbon contamination (PHC) in the soil.
- (b) The Phase I ESA identified the following issues in the building:
 - (i) Potential asbestos-containing materials in building products not sampled in previous asbestos survey report;
 - (ii) Potential lead-containing paints in areas of the building;
 - (iii) Potential mercury in switches, lead-containing paints and fluorescent lamps; and
 - (iv) Potential of mould-impacted materials.

B4.5 Geotechnical Studies

- (a) The City has not commissioned a geotechnical study for this Site.

B4.6 Site Survey

- (a) A Site Survey was completed by Barnes and Duncan dated November 6th, 2024. A copy of the survey is included as Schedule “C”.

B4.7 Caveat Emptor

- (a) The City makes no representations or warranties whatsoever with respect to the property at 1350 Pembina Highway, including no representations or warranties regarding the quality, condition or sufficiency of the property.

B5. ENQUIRIES

B5.1 All enquiries shall be directed to the City Contact identified in B6.

B5.2 Any Respondent who has questions as to the meaning or intent of any part of this document or who believes this document contains any error, inconsistency or omission should make an enquiry prior to the Submission Deadline requesting clarification, interpretation or explanation in writing to the City Contact.

- B5.3 If the Respondent finds errors, discrepancies or omissions in the document, or is unsure of the meaning or intent of any provision therein, the Respondent shall promptly notify the City Contact of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.
- B5.4 If the Respondent is unsure of the meaning or intent of any provision therein, the Respondent should request clarification as to the meaning or intent prior to the Submission Deadline.
- B5.5 Responses to enquiries which, in the sole judgment of the City Contact, require a correction to or a clarification of the EOI will be provided by the City Contact to all Respondents by issuing an addendum.
- B5.6 Responses to enquiries which, in the sole judgment of the City Contact, do not require a correction to or a clarification of the EOI will be provided by the City Contact only to the Respondent who made the enquiry.
- B5.7 The Respondent shall not be entitled to rely on any response or interpretation received pursuant to B5 unless that response or interpretation is provided by the City Contact in writing.

B6. CITY CONTACT

- B6.1 The City Contact is:
Mike Lennon
HAF Program Support Specialist
Telephone No. 204-986-8356
Email: mlennon@winnipeg.ca

B7. ADDENDA

- B7.1 The City Contact may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the EOI, or clarifying the meaning or intent of any provision therein.
- B7.2 The City Contact will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B7.3 Addenda will be available on the City's website www.winnipeg.ca/landenhancementoffice and MERX website at www.merx.com.
- B7.3.1 The Respondent is responsible for ensuring that they have received all addenda and is advised to check the City's website or the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B7.4 The Respondent should acknowledge receipt of each addendum on Form A: Expression of Interest Application.

B8. CONFLICT OF INTEREST AND GOOD FAITH

- B8.1 Respondents must not include among their team, any business entity or individual who is, or is associated with, in any way, any consultant retained by the City in relation to the Project, including but not limited to consultants providing engineering, architectural, legal, process, finance or financial capacity advice or any Person likely to create a conflict of interest or a perception of conflict of interest.
- B8.2 If a Respondent considers that a particular relationship or association does not create a conflict of interest and will not create a perception of conflict of interest, but is concerned that the City could arrive at a different conclusion, the Respondent should fully disclose the circumstances to the City at the earliest possible date, and request that the City provide an advance interpretation

as to whether the relationship or association will be likely to create a conflict of interest or a perception of conflict of interest.

B8.3 The Respondent declares that in submitting their response to this EOI, it does so in good faith and will disclose to the best of their knowledge, whether there are any circumstances whereby any member of Council or any officer or employee of the City would gain any pecuniary interest, direct or indirect, as a result of the Respondents participation in this Project.

B8.4 Failure to comply with this provision may result in disqualification of your Submission from the EOI process or, if the City becomes aware of your breach of this provision after the EOI has been issued, disqualification from the subsequent procurement process.

B9. CONFIDENTIALITY

B9.1 Information provided to a Respondent by the City or acquired by a Respondent by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Respondent before receipt hereof; or
- (b) becomes publicly known other than through the Respondent; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B9.2 The Respondent shall not make any statement of fact or opinion regarding any aspect of the EOI to the media or any member of the public without the prior written authorization of the City Contact.

B10. NON-DISCLOSURE

B10.1 Respondents must not disclose any details pertaining to their EOI in whole or in part to anyone not specifically involved in their Submission, without the prior written approval of the City. Respondents shall not issue a news release or other public announcement pertaining to details of their Information Submission without the prior written approval of the City.

B10.2 Respondents are advised that an attempt on the part of any Respondent or any of their employees, agents, contractors or representatives to contact any members of City Council or their staff or any member of City Administration other than the City Contact with respect to this EOI solicitation, may lead to disqualification in any subsequent procurement process.

B11. RESPONDENT'S COSTS AND EXPENSES

B11.1 Respondents are solely responsible for their own costs and expenses in preparing and submitting an Information Submission and participating in the EOI, including the provision of any additional information or attendance at meetings or demonstrations of the product(s).

B12. NO CONTRACT

B12.1 By submitting an Information Submission and participating in the process as outlined in this document, Respondents expressly agree that no contract of any kind is formed under, or arises from this EOI, and that no legal obligations will arise. The City will have no obligation to enter into negotiations or a Contract with a Respondent.

B12.2 Without limiting the generality of the foregoing, the City reserves the right and the full power to amend or cancel this EOI at any time.

SUBMISSION INSTRUCTIONS

B13. SUBMISSION DEADLINE

- B13.1 The Submission Deadline should be April 28, 2025 at 12:00 noon. Winnipeg time.
- B13.2 The City Contact or the Manager of Purchasing may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B13.1.
- B13.3 The Information Submission should be submitted directly to the following City email address: HAF@winnipeg.ca.
- B13.4 EOI Submissions submitted by facsimile transmission (fax) or by paper copy will not be accepted.

B14. OPENING OF SUBMISSION AND RELEASE OF INFORMATION

- B14.1 Information Submissions will not be opened publicly.

B15. INFORMATION SUBMISSION

- B15.1 The Information Submission should consist of the following components:
- (a) Form A: Expression of Interest Application (Section A);
 - (b) Information to be supplied by Respondent as part of EOI Submission in B17 (Section B).
- B15.2 All requirements of the EOI should be fully completed or provided, and submitted by the Respondent no later than the Submission Deadline, with all required entries made clearly and completely.
- B15.3 All Submissions received in response to this EOI will be kept in confidence with the sole purposes of evaluating and developing the best possible strategic option for the City.
- B15.4 Submissions and the information they contain will be the property of the City upon receipt. No Submissions will be returned.
- B15.5 The Respondent is advised any information contained in any Submission may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).
- B15.5.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Proposal Submission identified by the Respondent as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.
- B15.6 Should a Respondent require access to the City lands to perform due diligence concerning the 1350 Pembina Highway property (e.g. geotechnical study or environmental assessment), the Respondent will be required to enter into an agreement with the City.

B16. FORM A: EXPRESSION OF INTEREST APPLICATION (SECTION A)

- B16.1 Further to B15.1(a), the Respondent should complete Form A: Expression of Interest Application, making all required entries.
- B16.2 Paragraph 2 of Form A: Expression of Interest Application shall be completed in accordance with the following requirements:
- (a) if the Respondent is a sole proprietor carrying on business in their own name, their name shall be inserted;

- (b) if the Respondent is a partnership, the full name of the partnership shall be inserted;
- (c) if the Respondent is a corporation, the full name and type of corporation shall be inserted;
- (d) if the Respondent is carrying on business under a name other than their own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B16.2.1 If the Submission is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B16.2.

B16.3 In Paragraph 3 of Form A: Expression of Interest Application, the Respondent shall identify a contact person who is authorized to represent the Respondent for purposes of this EOI.

B16.4 Paragraph 6 of Form A: Expression of Interest Application should be signed in accordance with the following requirements:

- (a) if the Respondent is sole proprietor carrying of business in their own name, it shall be signed by the Respondent;
- (b) if the Respondent is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Respondent is a corporation, it shall be signed by their duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
- (d) if the Respondent is carrying on business under a name other than their own, it shall be signed by the registered owner of the business name or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B16.5 The name and official capacity of all individuals signing Form A: Expression of Interest Application should be entered below such signatures.

B16.6 If a Submission is submitted jointly by two or more persons, the word "Respondent" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Respondents in the Submission, shall be both jointly and several.

B17. INFORMATION TO BE SUPPLIED BY RESPONDENT AS PART OF EOI SUBMISSION (SECTION B)

B17.1 Executive Summary

- (a) Provide a high-level summary of the proposed project and approach.
- (b) Confirmation of the City's requirements (land ownership, affordable units, etc.).

B17.2 Respondent Information

- (a) Organizational profile (company history, structure, ownership details).
- (b) Contact information including name, address and telephone number of all Principals associated with the EOI Submission.
- (c) Organization type (ie. non-profit, for-profit), including if the organization is an Indigenous-led organization.
- (d) A brief description of the organizational structure comprising the Respondent, including an organization chart.

B17.3 Respondent Experience

- (a) Description of key staff/team member roles or partners to be involved in the Respondent's project, their associated professional qualifications, and prior related experience.
- (b) A list and description of projects carried out by the Respondent(s) prior, if any.
- (c) Provide reference contact(s) concerning previous projects.

B17.4 If the Respondent is part of a partnership arrangement, all partners should provide information as per B17.2 and B17.3.

B17.5 Details of the Development

- (a) A description of the Respondent's development intentions for the property. This should include:
 - (i) Vision for the Site, including high-level concept for the multi-family development.
 - (ii) Site design approach, including how the development integrates with the surrounding area (building heights, etc.).
 - (iii) Sustainability and urban design considerations (e.g. green building and accessibility features).
 - (iv) Describing how many market and non-market residential units, including the level and duration of affordability, and any intentions on unit sizes and/or number of intended accessible units, and of what definition.
 - (v) Describing any additional details on the intended model for the residential units, such as any supports to be offered to tenants or populations targeted for tenancy. This may include consideration of recreational amenities in close proximity to the property, such as the community centre, pool, and library spaces.
- (b) A detailed description of the development structure and ownership model, including:
 - (i) Describing how governance, cost-sharing, and long-term management of shared elements (e.g., utilities, maintenance, common areas) would be handled.
 - (ii) Providing any legal, statutory, or financial considerations the City should be aware of.
- (c) Project timelines.
 - (i) Provide a high-level development timeline that would be needed to enable the proposed development proposal. This would include assumptions for City decision making timelines that would be needed to support the development.

B17.6 Funding Approach

- (a) Provide a high-level cost estimate for the proposed development.
- (b) Identify potential financing sources (private financing, grants, partnerships, etc.).
- (c) Revenue model (if applicable) and approach to long-term financial sustainability.

B17.7 Optional but Recommended

- (a) Conceptual renderings, site plan, floor plans, or massing studies (if available, to illustrate vision)
- (b) Letters of support or partnership commitments (if applicable).

B17.8 The EOI Submission should include relevant financial terms and conditions related to any agreement, plus any other relevant terms, conditions or assumptions.

B17.9 The EOI Submission should include any other information which the Respondent considers pertinent to the EOI.

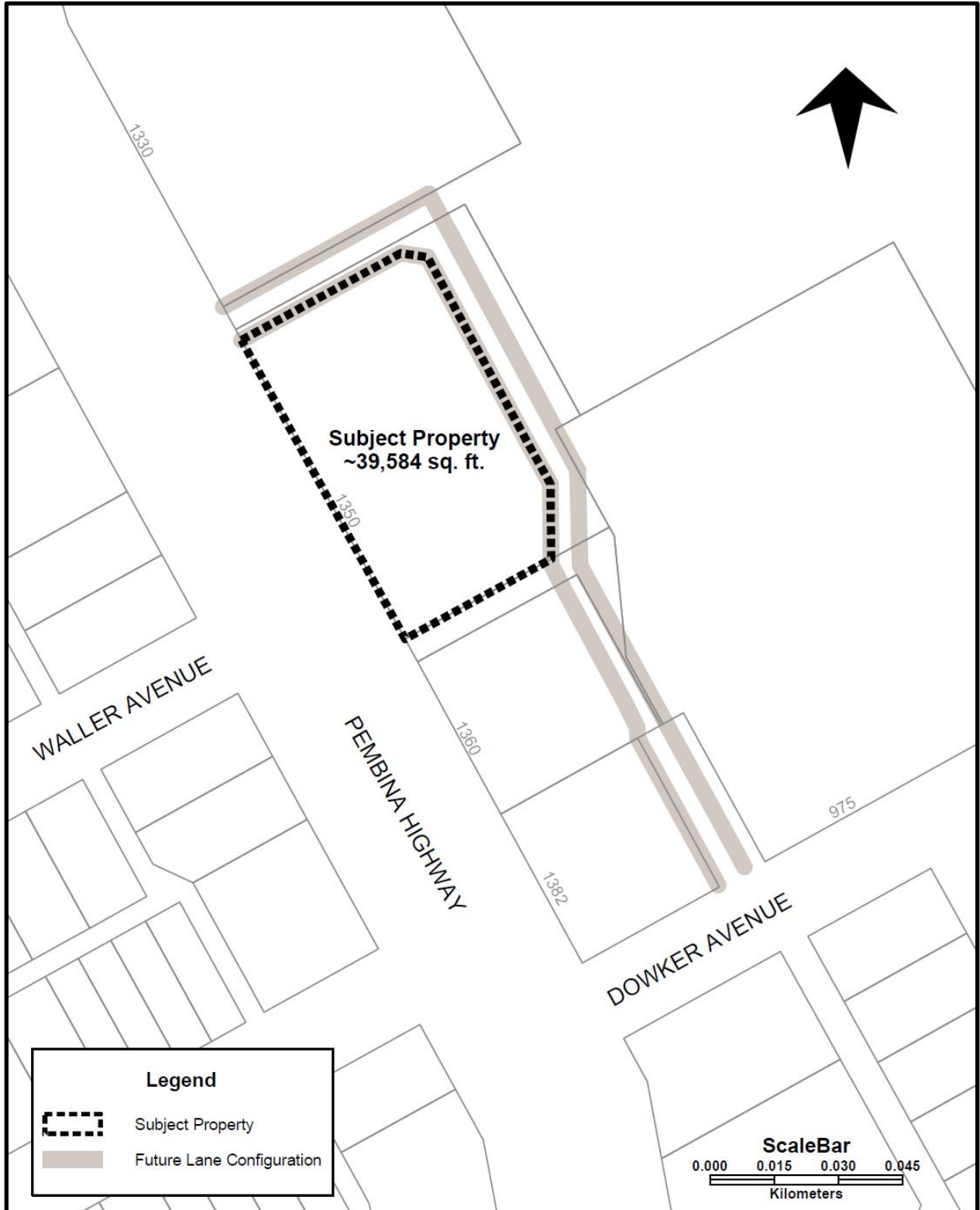
B18. EOI EVALUATION AND REVIEW

B18.1 City will only consider EOI Submissions which, in the City's sole discretion and opinion, are the most advantageous and thorough.

- B18.2 If, after this initial review, the City deems an EOI Submission to be unacceptable, the Respondent will be notified of same and no further discussions will be held.
- B18.3 The City will notify all Respondent of the status of their submission, and may invite one or more Respondents to submit additional or clarifying details, regarding their EOI Submission.
- B18.4 Additional or clarifying details may include, if applicable, a business plan, consideration of phasing and servicing, assumptions regarding realty taxes (municipal taxes and school taxes), or other matters of interest to the City.
- B18.5 Evaluation Criteria
- (i) Total offering price and potential tax revenue generated by the proposed development. (5%)
 - (ii) Total number of units and project description. (15%)
 - (iii) Evidence of available funding and project readiness to complete the proposal. (25%)
 - (iv) Experience and/or history of successful projects and endeavors carried out by the Respondent. (25%)
 - (v) Innovation and social impacts of the proposed development, including affordability criteria that include at least 30% of the units at: (30%)
 - (i) Less than 80% of the Median Market Rent for the area, in line with CMHC's Affordable Housing Fund Criteria, maintained for twenty years; or
 - (ii) At Province of Manitoba Affordable Housing rental rates, maintained for twenty years.
- B18.6 Negotiations
- (a) The HAF Team may enter into detailed negotiations with one or more Respondents which, in the HAF Team's sole discretion and opinion, is believed to have the most merit in consideration of the evaluation criteria. The EOI Submission of such a Respondent(s) may be further developed and finalized as a proposal for submission to and consideration by the CAO, which has the authority to approve or reject such proposal.
- B18.7 RFP
- (a) The HAF Team may in their sole discretion and opinion reserve the right to issue an RFP instead of entering into negotiations with one or more Respondents.

PART C - SCHEDULES

C1. SCHEDULE "A" – MAP OF SUBJECT PROPERTY



C2. SCHEDULE “B” – MUNICIPAL SERVICE REPORT

C3. SCHEDULE “C” – SITE SURVEY



SERVICING REPORT

1350 PEMBINA HIGHWAY, WINNIPEG, MB



Prepared for:
City of Winnipeg

Prepared by:
Barnes & Duncan



OCTOBER 21, 2024
BARNES & DUNCAN
6 Donald St, Winnipeg, MB, Canada R3L 0K6

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Figure 3: South WWS Catchment Concept Map

Figure 4: North WWS Catchment Concept Map

Figure 5: WWS Upgrade Concept Map

Figure 6: City Provided Available Fire Flows

Appendix A: WWS Capacity Analysis (Pre-development and Post Development)

Appendix B: Isochrone Stormwater Storage Calculations

Appendix C: City of Winnipeg Record Drawings

Attention:

Richard Mahé, Consulting Contract Administrator 204-986-8631 rmahe@winnipeg.ca
Acting Manager & Land Enhancement Administrator

and

Matt Nikkel, Water and Waste Contact mnikkel@winnipeg.ca
Water Distribution Planning & Development Engineer

In response to the Request for Proposal (RFP) No. 547-2024 Barnes & Duncan is submitting this
Servicing Report for 1350 Pembina Highway, Winnipeg, MB.

Introduction

The site is located at 1350 Pembina Highway, Winnipeg, MB. The site consists of an approximate total area of 5,675.78 m² (1.40 ac). The site is fronted by Pembina Highway to the west, 1330 Pembina Highway to the north (Holiday Inn), Lions Pool to the east, and 1360 Pembina Highway (Fort Garry Public Library) to the south. The site has a single-storey building with at grade parking lots. The previous use of the site was the Fort Garry Municipal Hall and Fire Hall / Fort Garry War Memorial. The following report will review Wastewater Servicing, Land Drainage Servicing, and Water Servicing. The lot is planned for a 130 multi-family unit (MFU) development. Detailed plans for the proposed redevelopment of the site are not available at this time, so assumptions have been made.

To support the Servicing Report a series of Figures, and Appendices will be referenced.



Image 1: Subject Site, image from City RFP 547-2024.

Wastewater Servicing

Onsite Wastewater Servicing

The site is fronted by a 250mm conc. wastewater sewer (WWS) on Pembina Highway, all of the wastewater sewer from the existing and proposed site will connect to the 250mm WWS.

The non-residential wastewater flow contributions were estimated using the guidelines from the City, and Harmon’s Peaking Factors were applied for population based flows.

Average Dry Weather Flow (ADWF)

Peak Dry Weather Flow (PDWF) = ADWF x Harmon’s Peaking Factor

Peak Wet Weather Flow (PWWF) = PDWF + Extraneous Flows

$$\text{Harmon's Peaking Factor} = 1 + \frac{14}{\left(4 + \left(\frac{P}{1000}\right)^{0.5}\right)}$$

<https://legacy.winnipeg.ca/waterandwaste/dept/wastewaterFlow.stm>

<https://legacy.winnipeg.ca/waterandwaste/pdfs/water/WW%20Flow%20Tables.pdf>

Pre-development wastewater flows are estimated in Table 1.

Table 1: Pre-Development Wastewater Flows (Estimated)

Description	Units	Population per unit	Rate (L/day)	ADWF (L/day)	ADWF (L/sec)	PDWF* (L/sec)	PWWF** (L/sec)
Police & Fire Hall	1	30	38	1,140	0.013	0.057	0.072

*Peaking Factor is 4.35 for population based flows, no commercial properties were factored in.

**Extraneous Flows are 4.55 L/min/weeping tile (NA), 12 L/min/MH (NA), and 2,200 L/ha/day for groundwater

Post-development wastewater flows were estimated in Table 2. The post development site was based on 130 MFU.

Table 2: Post-Development Wastewater Flows

Description	Units	Population per unit	Rate (L/day)	ADWF (L/day)	ADWF (L/sec)	PDWF* (L/sec)	PWWF** (L/sec)
MFU	130	2.3	270	80,730	0.934	3.811	3.826

*Peaking Factor is 4.08 for populations based flows, no commercial properties were factored in.

**Extraneous Flows are 4.55 L/min/weeping tile (NA), 12 L/min/MH (NA), and 2,200 L/ha/day for groundwater

Offsite Wastewater Servicing

This section of the servicing report has been prepared to determine the capacity of downstream sewer infrastructure for the proposed 130-Unit Development at 1350 Pembina Hwy.

City of Winnipeg wastewater flow guidelines were adopted as per the links below.

<https://winnipeg.ca/waterandwaste/dept/wastewaterFlow.stm>

Existing record drawings along Crane Ave were unavailable.

Field survey was completed to determine inverts and rim elevations prior to completion of this report for MH.101-MH.115 and MH.118. See Figures 3, 4 and 5.

The wastewater flow analysis was conducted, and it was determined the following:

1. The 500mm wastewater sewer (WWS) main along Crane Ave is over capacity in existing condition for MH.101-MH.116.
2. Post development the 500mm WWS along Crane Ave is over capacity between MH.101-MH.116.
3. As a result, approximately 773m of the existing 500mm WWS main along Crane Ave will need to be upgraded to a minimum 750mm WWS main between MH.101 and MH.116 with the addition of 10 new manholes and the removal of 14 existing manholes.
4. Detailed design will determine alignment and accommodate input from the City of Winnipeg.

See Figure 2 wastewater sewer catchment map.

Appendix A WWS Capacity Analysis (Pre-development and Post Development)

Appendix C City of Winnipeg Records Drawings.

Land Drainage Servicing

The existing site does not have any land drainage infrastructure. The north sheet flows to the northwest through the existing approach to Pembina Highway. The south sheet flows to the two catch basins located just offset to the east for the Lions Pool parking lot, and to the south the “lane” fronting Vincent Massey Collegiate. The post development site is expected to connect to the 300mm conc. LDS on Pembina Highway, the main is approximately 2m deep which could be challenging for the future detailed civil design.

The allowable peak land drainage discharge flow was calculated using the Rational Method in accordance with the MacLaren Manual (1974).

<https://legacy.winnipeg.ca/waterandwaste/pdfs/drainageFlooding/MaclarenDrainageCriteriaManual.pdf>

$$Q = C * i * A / 3600$$

Q = 5yr Allowable Peak Land Drainage Flow (L/s)

C = Drainage Coefficient provided by the City = (0.50)

i = rainfall intensity = 109.5 mm/hr for 5-year storm event with time of concentration of 10 minutes

A = Site Area = (5,675. m2).

$$Q_{\text{allowable}} = 86.32 \text{ L/s}$$

For the post development analysis, it was assumed 10% of the site would be landscape, and 90% of the site would be building roof, parking lots, and hardscape. For the landscape, 50% of the area would be overland flow to the adjacent street systems. For the hard surfacing, 10% of the area would be overland flow to the adjacent street systems. The remaining 50% of the landscape and 90% of the hard surfacing would account for the controlled flow catchment area.

	C01 Overland Flow	C02 Controlled	Total Site
Landscape Area, m ²	283.79	283.79	567.58
Hard Surface Area, m ²	510.82	4597.38	5108.20
Total Area, m ²	794.61	4881.17	5675.78
Weighted C	0.63	0.86	0.825
intensity i, mm/hr (10 min ToC)	154.33	154.33	154.33
Q 25yr, L/s	21.53	179.21	200.74
Max Controlled Flow	-	64.79	-

$$\text{Max Controlled Flow} = Q_{\text{allowable}} - \text{overland flow} = 86.32 - 21.53$$

A 150mm orifice at 1.8m of head will control the site flow to 63.00 L/s. The detailed civil design should be able to accommodate a similar flow to this.

Based on the catchment area and the flow restriction, a storage volume of 98.7m³ should be provided. The stormwater storage would likely be in the surface parking lot(s). If the parking lots were 1,500m², the depth would be approximately 0.20m to accommodate this volume, the allowed depth for storage is 0.30m. If the site has controlled flow roof drains, the stormwater storage for the parking lot would be reduced.

See Appendix B.

Water Servicing

Based on the City provided Available Fire Flows (see Figure 6), the available flow for fire fighting is 290 L/s.

As the footprint of the proposed building is unknown at this time, a detailed analysis of the required fire flows using the Fire Underwriting Survey (FUS) is not able to be completed. Available flow exceeds the City's target for multi-family development.

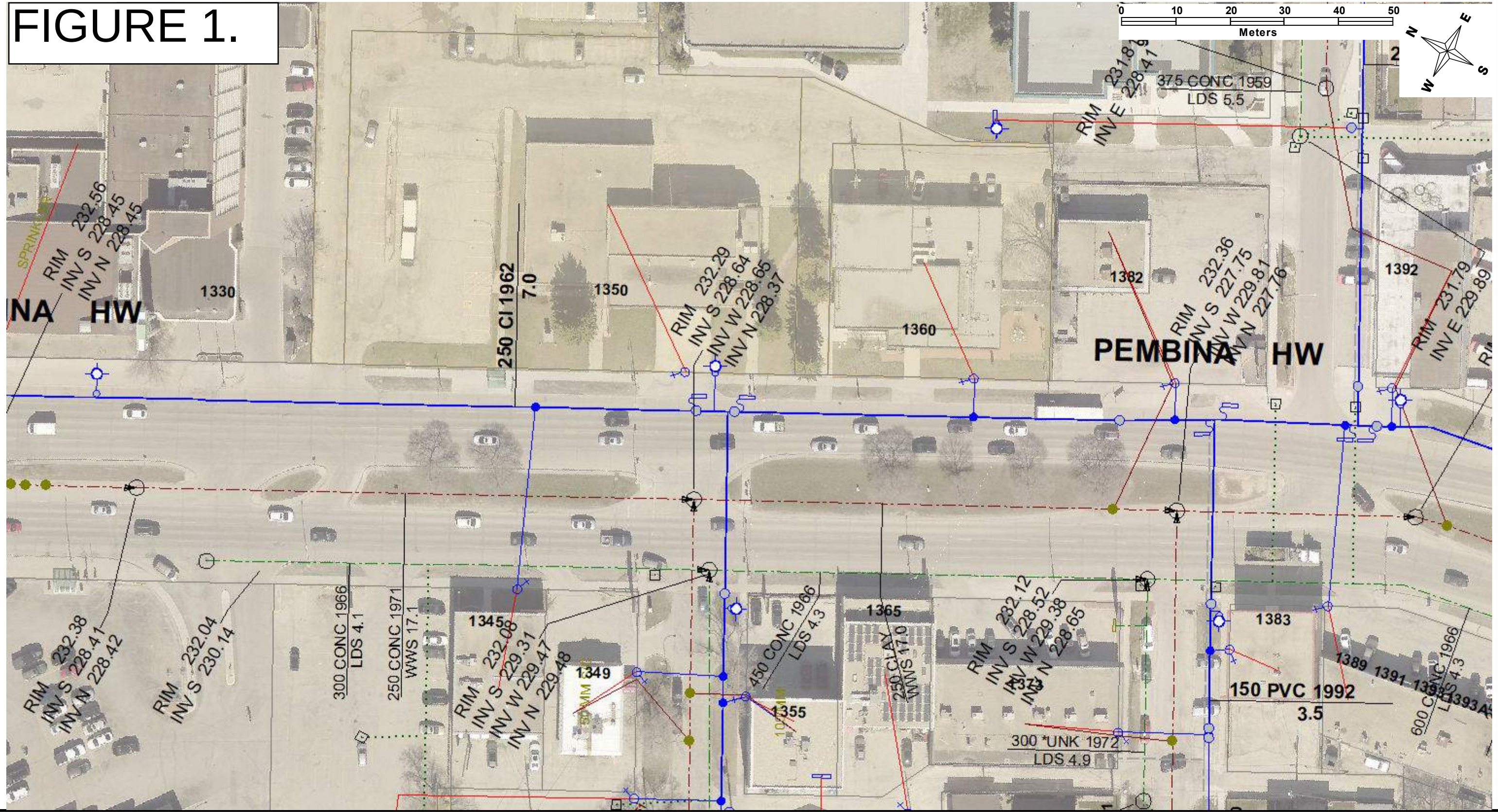
No watermain upgrades should be required to service this development.

<https://legacy.winnipeg.ca/waterandwaste/dept/waterdemand.stm>

<https://www.fireunderwriters.ca/assets/img/Water%20Supply%20for%20Public%20Fire%20Protection%20in%20Canada%202020.pdf>

FIGURES

FIGURE 1.



CAUTION:
This is for information only.
There is no guarantee as to the accuracy or completeness of the data.
For record drawing information, please contact
Underground Structures at 204-986-6401 or
by e-mail at: ugsinforequest@winnipeg.ca

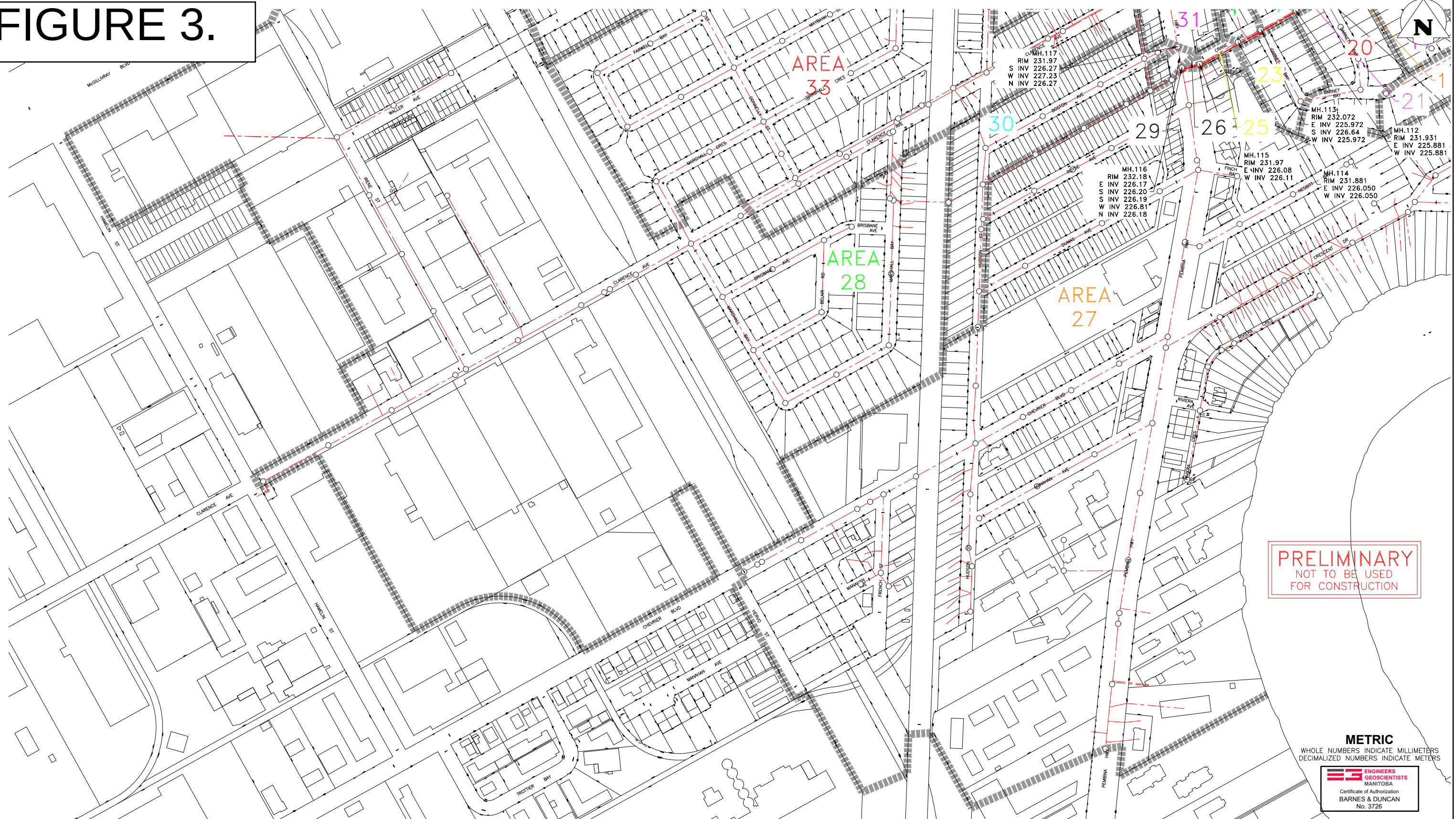
- | WATER | | SEWER | |
|------------|--------------|------------|------------------------|
| Hydrant | Anode | Watermain | Man Hole |
| Valve, LH | Plug | Feedermain | Catch Basin |
| Valve, RH | Service Corp | Aqueduct | Curb Inlet |
| Valve, Air | | | Plug |
| Curb Stop | | | Service Junction |
| | | | Combined Land Drainage |
| | | | Waste Water |
| | | | Storm Relief |
| | | | Interceptor |
| | | | Force Main |
| | | | CB Lead |

Print Date: June 11, 2024
Map Not to Scale

FIGURE 2.

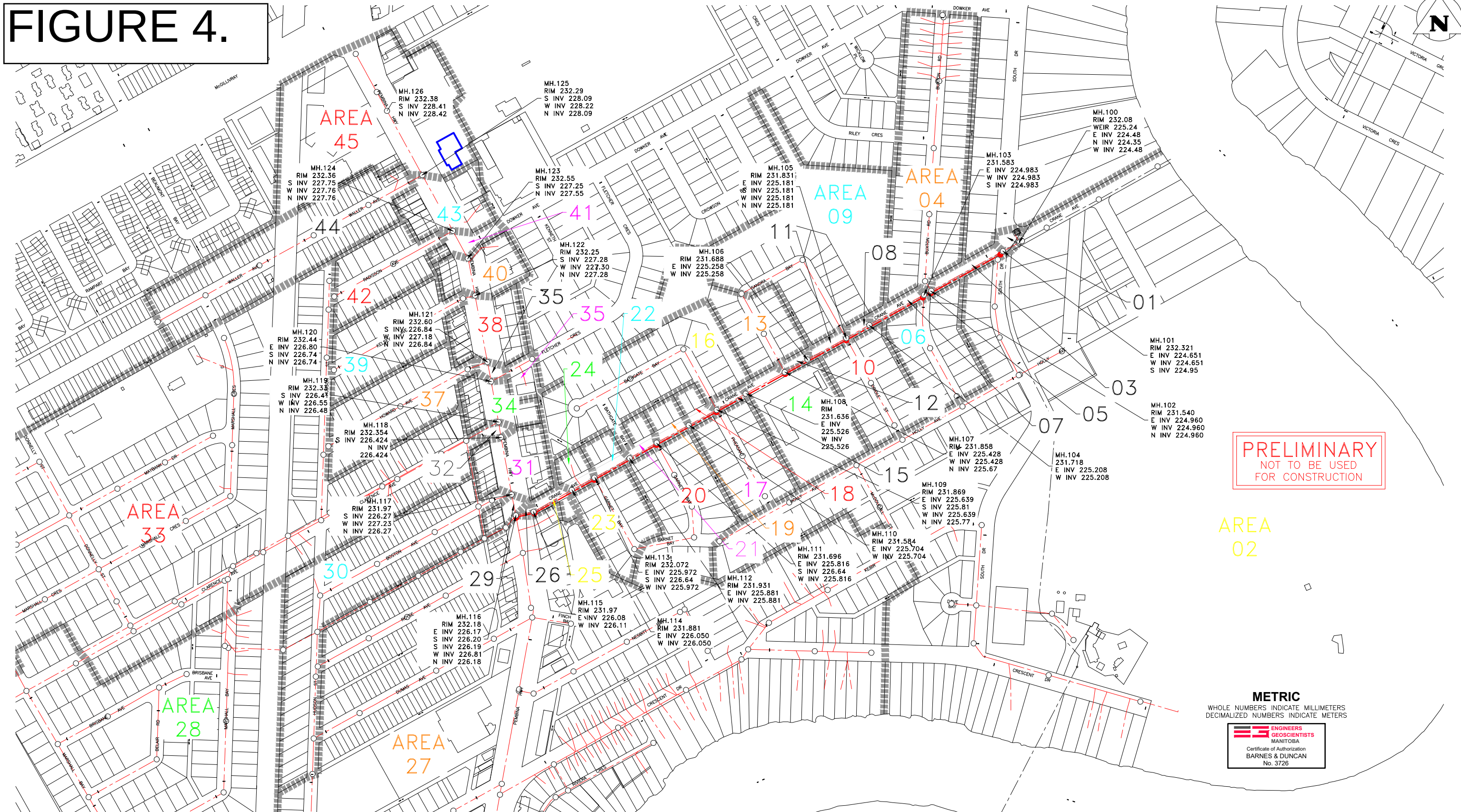


FIGURE 3.



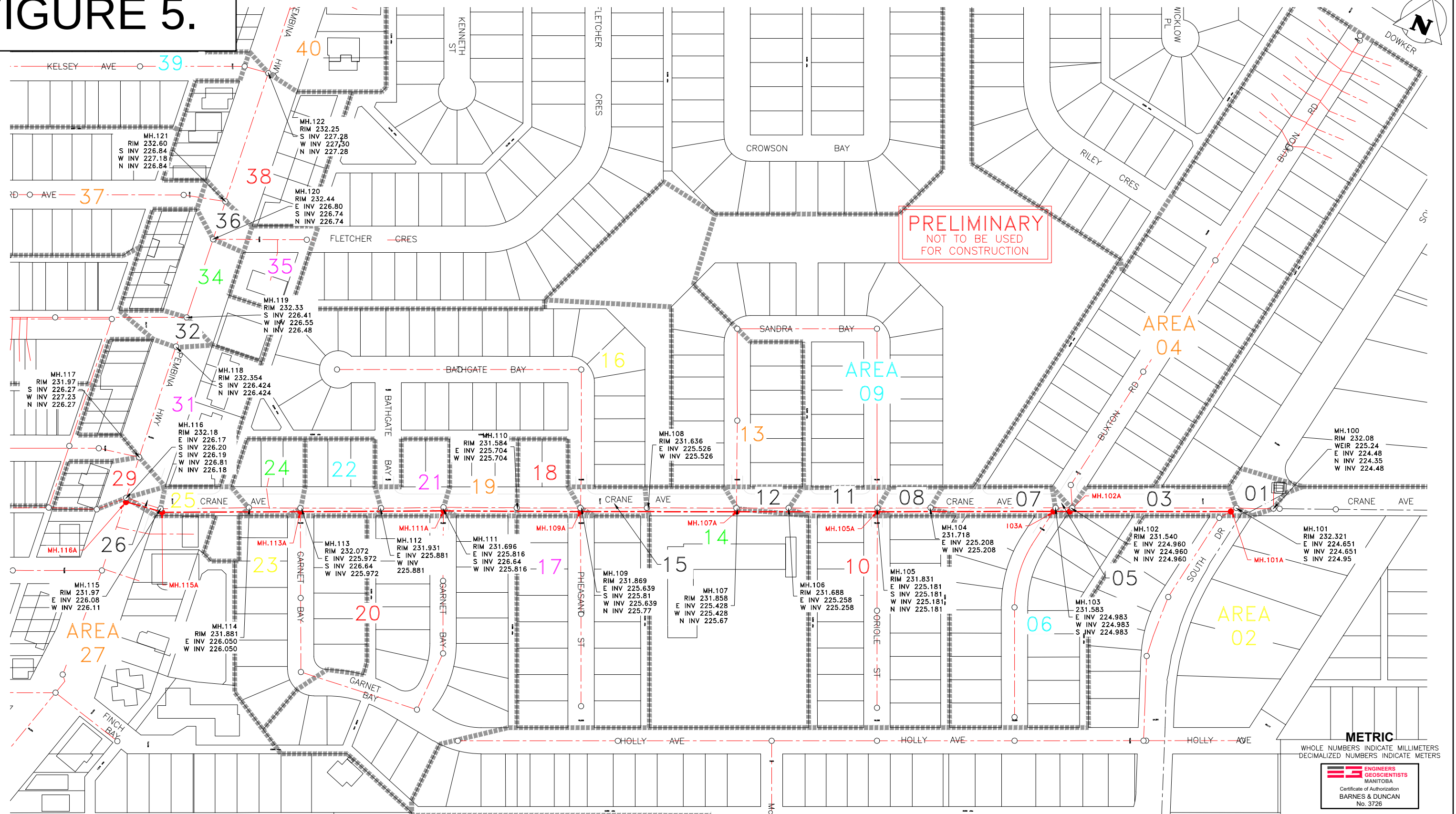
										6 Donald Street Winnipeg, Manitoba R3L 0K6				ENGINEER'S SEAL			
DESIGNED MH										FIRST REVIEW CBS				CITY OF WINNIPEG			
DRAWN MH										SECOND REVIEW BC				WWS MAP			
HOR. SCALE (11x17") 1:5000										PROJECT NUMBER 24-1127				C01			
DATE DRAWN OCT. 11, 2024										DATE OF SURVEY SEP. 24, 2024				SHEET 1 OF 3			
CAD FILE DRAWING NAME 24-1127 1350 PEMBINA HWY WWS CAPACITY REPORT										CITY DRAWING NUMBER				WINNIPEG, MB 1350 PEMBINA HIGHWAY			

FIGURE 4.

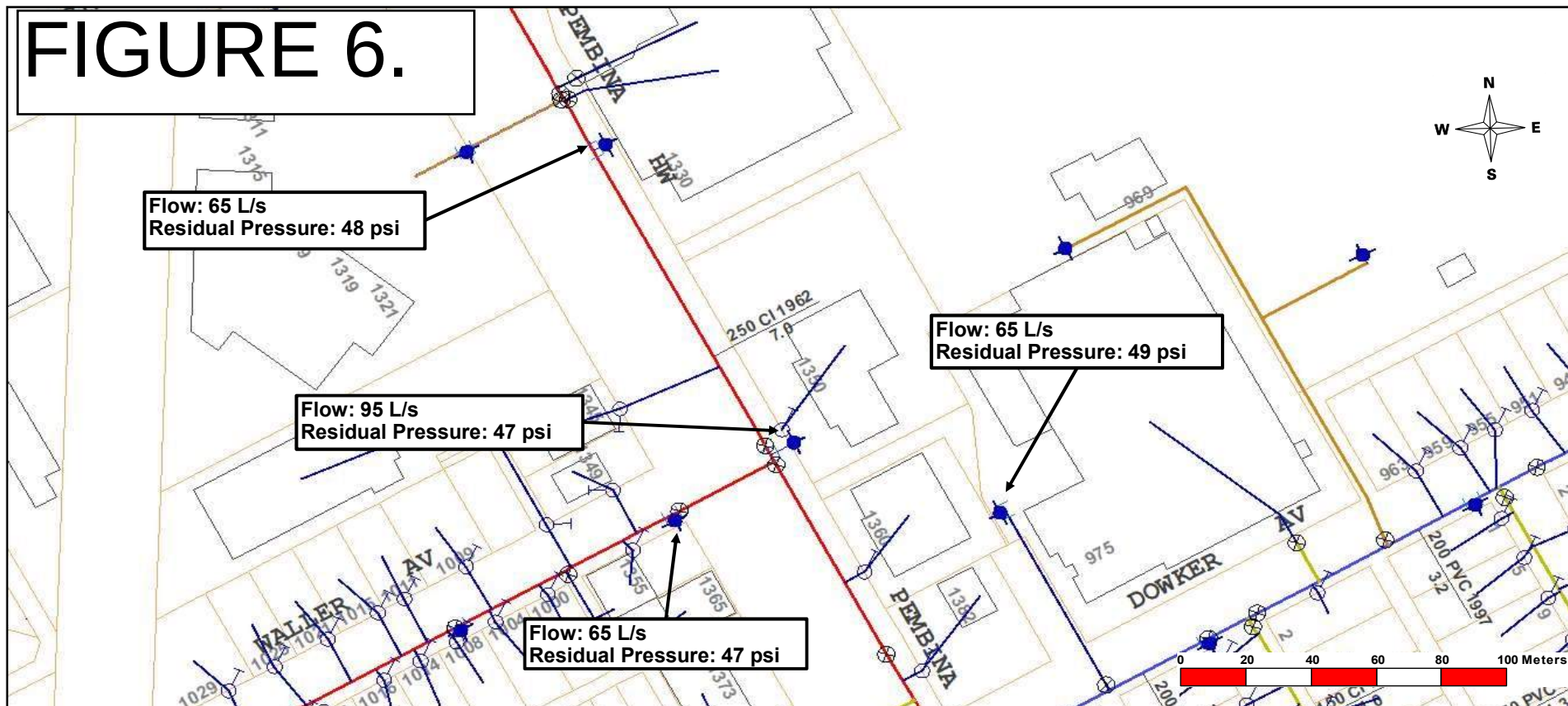


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FIGURE 5.



		PROPERTY BOUNDARY	150 WM	WATERMAIN	150 WM	150 WM	WATERMAIN	150 WM	B.M. ELEV.		F.B.		 6 Donald Street Winnipeg, Manitoba R3L 0K6		ENGINEER'S SEAL		CITY OF WINNIPEG DESCRIPTION OF PROPERTY LIMITS AS SHOWN ON THIS DRAWING DO NOT REPRESENT A LEGAL SURVEY 0.0 50.0 100.0 150.0 200.0			
		SUPPORTING BOUNDARIES		HYDRANT		+	HYDRANT VALVE	+									WWS MAP WINNIPEG, MB 1350 PEMBINA HIGHWAY			
		CENTERLINE ROAD		VALVE		600 LDS	LAND DRAINAGE SEWER	600 LDS									C03			
		DRAINAGE/DITCH		LAND DRAINAGE SEWER		300 WWS	WASTEWATER SEWER	300 WWS									SHEET 3 OF 3			
		GAS		WASTEWATER SEWER			GROUND										CITY DRAWING NUMBER			
		HID/UG		MANHOLE			ROAD GUTTER NORTH/WEST													
		TEL/UG		CATCH BASIN			ROAD GUTTER SOUTH/EAST													
		CULVERT		CURB INLET			PROPERTY LINE NORTH/WEST													
		ELEVATION		CURB STOP			PROPERTY LINE SOUTH/EAST													
		DITCH/SWALE ELEVATION		PLUG			DITCH NORTH/WEST													
		PROPOSED GRADING SLOPE		HYDRO POLE AND ANCHOR			DITCH SOUTH/EAST													
		LEGEND - PLAN		LEGEND - PLAN			LEGEND - PROFILE													
		NO. REVISIONS		NO. REVISIONS			NO. REVISIONS													
		D/M/Y		D/M/Y			D/M/Y													
		BY		BY			BY													
		1st		1st			1st													
		2nd		2nd			2nd													
		DATE DRAWN		DATE OF SURVEY			DATE OF SURVEY													
		OCT. 11, 2024		SEP. 24, 2024			SEP. 24, 2024													
		CAD FILE DRAWING NAME		CAD FILE DRAWING NAME			CAD FILE DRAWING NAME													
		24-1127 1350 PEMBINA HWY WWS CAPACITY REPORT		24-1127 1350 PEMBINA HWY WWS CAPACITY REPORT			24-1127 1350 PEMBINA HWY WWS CAPACITY REPORT													



Total Available Fire Flow: 290 L/s

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APPENDIX A

WWS CAPACITY ANALYSIS (PRE-DEVELOPMENT AND POST DEVELOPMENT)

WASTEWATER SEWER CAPACITY STUDY

q = average dry weather flow	270 [L / cap.d]
groundwater infiltration	2200 [L/day/ha]
manhole infiltration	12 [L/min/MH]
weeping tile flow	4.55 [L/min/service connection]
M = peaking factor	
Q (p) = peak population flow (L/s)	
Q (i) = peak extraneous flow (L/s)	
Q (d) = peak design flow (L/s)	
Manning's n	0.013

$$M = 1 + \frac{14}{4 + \sqrt{P}} \quad \text{where } P \text{ is population in 1000's}$$

$$Q(d) = Q(p) + Q(i) \text{ (L/s)}$$

LOCATION				Domestic Wastewater Flows				Extraneous Flows						PWWF	SEWER CAPACITY											
								Groundwater Infiltration		Manhole Infiltration		Weeping Tile Flow														
				Catchment Area				Cathment Area		Cathment Area		Cathment Area														
Area	STREET	FROM	TO	POP(1)	PF(2)	ADWF (3)	PDWF (4)	Area	Infiltration	# Manholes	Infiltration	# Services	Inflow	Q(d)	Length	Pipe size	Pipe	Grade	Capacity	Velocity	Flow Area	Wetted Perim.	Pheta	Ratio to Full Depth	Depth Flow	
						(L/s)	(L/s)	(Ha)	Q(i) (L/s)		Q(i) (L/s)		Q(i) (L/s)	(L/s)												(m)
	PRE-DEVELOPMENT														EXISTING SEWER											
45-45	1300-1350 PEMBINA HY	MH.126	MH.125	1,225	3.741	1.044	4.194	4.604	0.117	3	0.600	0	0.000	4.911	101.9	0.25	CONC	0.31%	33.110	0.484	0.010	0.268	1.071	0.260	4.91	
43-45	1360-1373 PEMBINA HY	MH.125	MH.124	1,511	3.677	1.539	6.302	8.717	0.222	9	1.800	39	2.958	11.281	88.3	0.25	CLAY	0.37%	36.173	0.651	0.017	0.334	1.336	0.384	11.28	
41-45	1383 PEMBINA HY	MH.124	MH.123	1,592	3.661	1.739	7.165	10.277	0.262	12	2.400	56	4.247	14.074	43.6	0.25	CONC	0.46%	40.333	0.748	0.019	0.346	1.385	0.408	14.07	
40-45	1389-1400 PEMBINA HY	MH.123	MH.122	1,912	3.601	1.809	7.383	11.025	0.281	13	2.600	56	4.247	14.510	52.6	0.25	CONC	0.51%	42.468	0.783	0.019	0.344	1.376	0.403	14.51	
38-45	1411-1430 PEMBINA HY	MH.122	MH.121	2,217	3.551	2.539	10.492	13.613	0.347	17	3.400	80	6.067	20.305	93.9	0.25	CLAY	0.47%	40.769	0.830	0.024	0.392	1.568	0.499	20.30	
36-45	PEMBINA HY	MH.121	MH.120	2,299	3.538	2.796	11.585	15.559	0.396	21	4.200	107	8.114	24.295	27.6	0.25	CLAY	0.36%	35.681	0.782	0.031	0.446	1.783	0.605	24.29	
34-45	1441-1450 PEMBINA HY	MH.120	MH.119	2,349	3.530	2.807	11.635	16.410	0.418	23	4.600	107	8.114	24.767	57.2	0.25	CLAY	0.45%	39.892	0.856	0.029	0.428	1.712	0.570	24.77	
32-45	PEMBINA HY	MH.119	MH.118	4,030	3.330	5.946	24.547	39.014	0.993	55	11.000	302	22.902	59.442	21.5	0.5	CLAY	0.26%	192.537	0.864	0.069	0.666	1.331	0.381	59.44	
31-45	1462-1480 PEMBINA HY	MH.118	MH.117	4,030	3.330	5.946	24.547	39.910	1.016	56	11.200	302	22.902	59.665	81.0	0.5	CLAY	0.19%	164.590	0.771	0.077	0.701	1.403	0.416	59.66	
29-45	PEMBINA HY	MH.117	MH.116	4,244	3.310	6.535	27.087	43.914	1.118	65	13.000	350	26.542	67.747	29.6	0.5	CLAY	0.30%	206.817	0.943	0.072	0.678	1.357	0.394	67.75	
26-45	PEMBINA HY	MH.116	MH.115	12,332	2.864	73.488	166.461	162.376	4.135	187	37.400	706	53.538	261.534	25.0	0.5	CLAY	0.24%	184.983	0.942	0.196	1.571	3.142	1.000	184.98	
25-45	966 CRANE AV	MH.115	MH.114	12,335	2.864	73.497	166.503	162.487	4.137	188	37.600	707	53.614	261.854	61.2	0.5	UNK	0.10%	119.406	0.608	0.196	1.571	3.142	1.000	119.41	
24-45	957-965 CRANE AV	MH.114	MH.113	12,344	2.863	73.525	166.627	162.722	4.143	189	37.800	710	53.842	262.412	35.7	0.5	UNK	0.22%	177.108	0.902	0.196	1.571	3.142	1.000	177.11	
22-45	945-953 CRANE AV	MH.113	MH.112	12,396	2.862	73.688	167.333	164.100	4.178	192	38.400	727	55.131	265.042	55.9	0.5	UNK	0.16%	151.038	0.769	0.196	1.571	3.142	1.000	151.04	
21-45	939-943 CRANE AV	MH.112	MH.111	12,402	2.861	73.706	167.416	164.308	4.184	193	38.600	729	55.283	265.482	43.3	0.5	UNK	0.15%	146.242	0.745	0.196	1.571	3.142	1.000	146.24	
19-45	927-935 CRANE AV	MH.111	MH.110	12,475	2.859	73.934	168.399	166.651	4.243	197	39.400	753	57.103	269.145	50.8	0.5	UNK	0.22%	177.108	0.902	0.196	1.571	3.142	1.000	177.11	
18-45	919-923 CRANE AV	MH.110	MH.109	12,481	2.859	73.953	168.480	166.850	4.248	198	39.600	755	57.254	269.582	44.1	0.5	UNK	0.15%	146.242	0.745	0.196	1.571	3.142	1.000	146.24	
15-45	CRANE AV	MH.109	MH.108	12,622	2.854	74.394	170.363	171.239	4.360	204	40.800	801	60.743	276.266	46.1	0.5	UNK	0.25%	188.798	0.962	0.196	1.571	3.142	1.000	188.80	
14-45	888 CRANE AV	MH.108	MH.107	12,622	2.854	74.394	170.363	172.991	4.405	205	41.000	801	60.743	276.511	62.1	0.5	CONC	0.16%	151.038	0.769	0.196	1.571	3.142	1.000	151.04	
12-45	CRANE AV	MH.107	MH.106	12,965	2.842	74.771	171.936	174.667	4.448	208	41.600	815	61.804	279.788	36.2	0.5	CONC	0.47%	258.866	1.318	0.196	1.571	3.142	1.000	258.87	
11-45	CRANE AV	MH.106	MH.105	12,965	2.842	74.771	171.936	174.789	4.451	209	41.800	815	61.804	279.991	61.6	0.5	CONC	0.13%	136.144	0.693	0.196	1.571	3.142	1.000	136.14	
8-45	CRANE AV	MH.105	MH.104	13,078	2.838	75.124	173.456	180.603	4.599	213	42.600	852	64.610	285.264	36.8	0.5	CONC	-0.07%	99.910	1.740	0.196	1.571	3.142	1.000	341.65	
7-45	CRANE AV	MH.104	MH.103	13,078	2.838	75.124	173.456	180.767	4.603	214	42.800	852	64.610	285.469	86.7	0.5	CONC	0.26%	192.537	0.981	0.196	1.571	3.142	1.000	192.54	
5-45	CRANE AV	MH.103	MH.102	13,133	2.836	75.296	174.196	182.303	4.642	217	43.400	870	65.975	288.213	11.5	0.5	CONC	0.20%	168.866	0.860	0.196	1.571	3.142	1.000	168.87	
3-45	CRANE AV	MH.102	MH.101	13,276	2.832	75.743	176.072	186.350	4.745	225	45.000	917	69.539	295.356	113.8	0.5	CONC	0.27%	196.204	0.999	0.196	1.571	3.142	1.000	196.20	
1-45	CRANE AV	MH.101	MH.100	14,016	2.808	76.537	179.448	239.028	6.086	252	50.400	982	74.468	310.403	25.7	0.6	CONC	0.67%	502.590	1.870	0.166	1.025	1.708	0.568	310.40	
	POST-DEVELOPMENT														EXISTING SEWER											
45-45	1300-1350 PEMBINA HY	MH.126	MH.125	1,396	3.702	1.970	7.948	4.604	0.117	3	0.600	0	0.000	8.665	101.9	0.25	CONC	0.31%	33.110	0.568	0.015	0.316	1.264	0.349	8.66	
43-45	1360-1373 PEMBINA HY	MH.125	MH.124	1,682	3.643	2.465	10.056	8.717	0.222	9	1.800	39	2.958	15.035	88.3	0.25	CLAY	0.37%	36.173	0.703	0.021	0.367	1.470	0.449	15.04	
41-45	1383 PEMBINA HY	MH.124	MH.123	1,763	3.628	2.664	10.919	10.277	0.262	12	2.400	56	4.247	17.828	43.6	0.25	CONC	0.46%	40.333	0.796	0.022	0.375	1.502	0.465	17.83	
40-45	1389-1400 PEMBINA HY	MH.123	MH.122	2,083	3.572	2.735	11.137	11.025	0.281	13	2.600	56	4.247	18.264	52.6	0.25	CONC	0.51%	42.468	0.833	0.022	0.372	1.487	0.458	18.26	
38-45	1411-1430 PEMBINA HY	MH.122	MH.121	2,388	3.525	3.465	14.246	13.613	0.347	17	3.400	80	6.067	24.059	93.9	0.25	CLAY	0.47%	40.769	0.865	0.028	0.419	1.676	0.553	24.06	
36-45	PEMBINA HY	MH.121	MH.120	2,470	3.513	3.722	15.339	15.559	0.396	21	4.200	107	8.114	28.049	27.6	0.25	CLAY	0.36%	35.681	0.805	0.035	0.478	1.914	0.668	28.05	
34-45	1441-1450 PEMBINA HY	MH.120	MH.119	2,520	3.506	3.733	15.389	16.410	0.418	23	4.600	107	8.114	28.521	57.2	0.25	CLAY	0.45%	39.892	0.883	0.032	0.456	1.824	0.625	28.52	

WASTEWATER SEWER CAPACITY STUDY																													
q = average dry weather flow groundwater infiltration manhole infiltration weeping tile flow M = peaking factor Q (p) = peak population flow (L/s) Q (i) = peak extraneous flow (L/s) Q (d) = peak design flow (L/s) Manning's n				270 [L / cap.d]				2200 [L/day/ha]				12 [L/min/MH]				4.55 [L/min/service connection]				$M = 1 + \frac{14}{4 + \sqrt{P}} \quad \text{where } P \text{ is population in 1000 's}$ $Q (d) = Q (p) + Q (i) \text{ (L/s)}$									
				0.013																									
								Domestic Wastewater Flows				Extraneous Flows						PWWF		SEWER CAPACITY									
												Groundwater Infiltration		Manhole Infiltration		Weeping Tile Flow													
				LOCATION				Catchment Area				Cathment Area		Cathment Area		Cathment Area		Cathment Area											
Area	STREET	FROM	TO	POP(1)	PF(2)	ADWF (3)	PDWF (4)	Area	Infiltration	# Manholes	Infiltration	# Services	Inflow	Q(d)	Length	Pipe size	Pipe	Grade	Capacity	Velocity	Flow Area	Wetted Perim.	Pheta	Ratio to Full Depth	Depth Flow				
						(L/s)	(L/s)	(Ha)	Q(i) (L/s)		Q(i) (L/s)		Q(i) (L/s)	(L/s)	(m)	(m)	Material	(%)	(L/s)	(m/s)	(m2)	(m)	(rad)	(Peak)	(L/s)				
32-45	PEMBINA HY	MH.119	MH.118	3,899	3.343	6.384	26.312	39.014	0.993	55	11.000	272	20.627	58.932	21.5	0.5	CLAY	0.26%	192.537	0.862	0.068	0.664	1.328	0.380	58.93				
31-45	1462-1480 PEMBINA HY	MH.118	MH.117	4,201	3.314	6.872	28.301	39.910	1.016	56	11.200	272	20.627	61.144	81.0	0.5	CLAY	0.19%	164.590	0.776	0.079	0.707	1.414	0.422	61.14				
29-45	PEMBINA HY	MH.117	MH.116	4,415	3.295	7.460	30.841	43.914	1.118	65	13.000	320	24.267	69.226	29.6	0.5	CLAY	0.30%	206.817	0.949	0.073	0.683	1.366	0.399	69.23				
26-45	PEMBINA HY	MH.116	MH.115	12,453	2.860	74.398	170.159	162.376	4.135	187	37.400	657	49.823	261.516	25.0	0.5	CLAY	0.24%	184.983	0.942	0.196	1.571	3.142	1.000	184.98				
25-45	966 CRANE AV	MH.115	MH.114	12,456	2.859	74.408	170.200	162.487	4.137	188	37.600	658	49.898	261.836	61.2	0.5	UNK	0.10%	119.406	0.608	0.196	1.571	3.142	1.000	119.41				
24-45	957-965 CRANE AV	MH.114	MH.113	12,465	2.859	74.436	170.325	162.722	4.143	189	37.800	661	50.126	262.394	35.7	0.5	UNK	0.22%	177.108	0.902	0.196	1.571	3.142	1.000	177.11				
22-45	945-953 CRANE AV	MH.113	MH.112	12,517	2.857	74.598	171.031	164.100	4.178	192	38.400	678	51.415	265.024	55.9	0.5	UNK	0.16%	151.038	0.769	0.196	1.571	3.142	1.000	151.04				
21-45	939-943 CRANE AV	MH.112	MH.111	12,523	2.857	74.617	171.114	164.308	4.184	193	38.600	680	51.567	265.464	43.3	0.5	UNK	0.15%	146.242	0.745	0.196	1.571	3.142	1.000	146.24				
19-45	927-935 CRANE AV	MH.111	MH.110	12,596	2.855	74.845	172.096	166.651	4.243	197	39.400	704	53.387	269.126	50.8	0.5	UNK	0.22%	177.108	0.902	0.196	1.571	3.142	1.000	177.11				
18-45	919-923 CRANE AV	MH.110	MH.109	12,602	2.854	74.864	172.177	166.850	4.248	198	39.600	706	53.538	269.564	44.1	0.5	UNK	0.15%	146.242	0.745	0.196	1.571	3.142	1.000	146.24				
15-45	CRANE AV	MH.109	MH.108	12,743	2.849	75.305	174.061	171.239	4.360	204	40.800	752	57.027	276.248	46.1	0.5	UNK	0.25%	188.798	0.962	0.196	1.571	3.142	1.000	188.80				
14-45	888 CRANE AV	MH.108	MH.107	13,043	2.839	75.548	175.052	172.991	4.405	205	41.000	752	57.027	277.484	62.1	0.5	CONC	0.16%	151.038	0.769	0.196	1.571	3.142	1.000	151.04				
12-45	CRANE AV	MH.107	MH.106	13,086	2.838	75.682	175.634	174.667	4.448	208	41.600	765	58.013	279.694	36.2	0.5	CONC	0.47%	258.866	1.318	0.196	1.571	3.142	1.000	258.87				
11-45	CRANE AV	MH.106	MH.105	13,086	2.838	75.682	175.634	174.789	4.451	209	41.800	765	58.013	279.897	61.6	0.5	CONC	0.13%	136.144	0.693	0.196	1.571	3.142	1.000	136.14				
8-45	CRANE AV	MH.105	MH.104	13,199	2.834	76.035	177.153	180.603	4.599	213	42.600	803	60.894	285.246	36.8	0.5	CONC	-0.07%	99.910	1.740	0.196	1.571	3.142	1.000	341.65				
7-45	CRANE AV	MH.104	MH.103	13,199	2.834	76.035	177.153	180.767	4.603	214	42.800	803	60.894	285.451	86.7	0.5	CONC	0.26%	192.537	0.981	0.196	1.571	3.142	1.000	192.54				
5-45	CRANE AV	MH.103	MH.102	13,254	2.832	76.207	177.894	182.303	4.642	217	43.400	850	64.458	290.394	11.5	0.5	CONC	0.20%	168.866	0.860	0.196	1.571	3.142	1.000	168.87				
3-45	CRANE AV	MH.102	MH.101	13,397	2.828	76.654	179.769	186.350	4.745	225	45.000	868	65.823	295.338	113.8	0.5	CONC	0.27%	196.204	0.999	0.196	1.571	3.142	1.000	196.20				
1-45	CRANE AV	MH.101	MH.100	14,137	2.804	77.448	183.146	239.028	6.086	252	50.400	933	70.753	310.384	25.7	0.6	CONC	0.67%	502.590	1.870	0.166	1.025	1.708	0.568	310.38				
															PROPOSED SEWER														
26-45	CRANE AV	MH.116	MH.116A	12,465	2.859	74.436	170.325	166.635	4.246	187	37.400	661	50.126	262.096	26.0	0.75	PVC	0.19%	485.266	1.120	0.234	1.213	1.618	0.523	262.10				
25A-45	CRANE AV	MH.116A	MH.115A	12,465	2.859	74.436	170.325	166.746	4.246	188	37.600	661	50.126	262.296	3.0	0.75	PVC	0.19%	485.266	1.120	0.234	1.214	1.618	0.524	262.30				
25-45	956-966 CRANE AV	MH.115A	MH.113A	12,465	2.859	74.436	170.325	166.746	4.246	188	37.600	661	50.126	262.296	95.2	0.75	PVC	0.19%	485.266	1.120	0.234	1.214	1.618	0.524	262.30				
22-45	939-945 CRANE AV	MH.113A	MH.111A	12,523	2.857	74.617	171.114	168.332	4.286	192	38.400	680	51.567	265.367	99.2	0.75	PVC	0.19%	485.266	1.123	0.236	1.219	1.626	0.527	265.37				
19-45	919-927 CRANE AV	MH.111A	MH.109A	12,602	2.854	74.864	172.177	170.675	4.346	197	39.400	706	53.538	269.462	94.9	0.75	PVC	0.19%	485.266	1.127	0.239	1.227	1.636	0.532	269.46				
15-45	CRANE AV	MH.109A	MH.107A	13,043	2.839	75.548	175.052	176.816	4.502	204	40.800	752	57.027	277.381	109.1	0.75	PVC	0.19%	485.266	1.135	0.244	1.241	1.655	0.542	277.38				
12-45	CRANE AV	MH.107A	MH.105A	13,086	2.838	75.682	175.634	178.614	4.548	208	41.600	766	58.088	279.870	96.9	0.75	PVC	0.19%	485.266	1.137	0.246	1.245	1.661	0.545	279.87				
8-45	CRANE AV	MH.105A	MH.103A	13,199	2.834	76.035	177.153	184.592	4.700	215	43.000	803	60.894	285.748	122.0	0.75	PVC	0.16%	445.311	1.070	0.267	1.302	1.736	0.582	285.75				
5-45	CRANE AV	MH.103A	MH.102A	13,254	2.832	76.207	177.894	186.128	4.739	221	44.200	868	65.823	292.656	13.1	0.75	PVC	0.18%	472.323	1.126	0.260	1.283	1.711	0.570	292.66				
3-45	CRANE AV	MH.102A	MH.101A	13397	2.828	76.654	179.769	186.350	4.745	228	45.600	868	65.823	295.938	110.0	0.75	PVC	0.26%	567.662	1.298	0.228	1.197	1.596	0.513	295.94				
2-45	CRANE AV	MH.101A	MH.101	14137	2.804	77.448	183.146	238.935	6.084	254	50.800	933	70.753	310.782	4.5	0.75	PVC	0.26%	567.662	1.314	0.237	1.220	1.626	0.528	310.78				

(1) Population For Residential Flows Only or Where Population Data Was Available

(2) Net Peaking factor for Population Flows

(3) ADWF = Residential ADWF + Commercial ADWF

WASTEWATER SEWER CAPACITY STUDY																										
q = average dry weather flow groundwater infiltration manhole infiltration weeping tile flow M = peaking factor Q (p) = peak population flow (L/s) Q (i) = peak extraneous flow (L/s) Q (d) = peak design flow (L/s) Manning's n				270 [L / cap.d]				$M = 1 + \frac{14}{4 + \sqrt{P}} \quad \text{where } P \text{ is population in } 1000 \text{ 's}$ $Q (d) = Q (p) + Q (i) \text{ (L/s)}$																		
				2200 [L/day/ha]																						
				12 [L/min/MH]																						
				4.55 [L/min/service connection]																						
LOCATION				Domestic Wastewater Flows				Extraneous Flows						PWWF	SEWER CAPACITY											
								Groundwater Infiltration		Manhole Infiltration		Weeping Tile Flow														
				Catchment Area				Cathment Area		Cathment Area		Cathment Area		Cathment Area												
Area	STREET	FROM	TO	POP(1)	PF(2)	ADWF (3)	PDWF (4)	Area	Infiltration	# Manholes	Infiltration	# Services	Inflow	Q(d)	Length	Pipe size	Pipe	Grade	Capacity	Velocity	Flow Area	Wetted Perim.	Pheta	Ratio to Full Depth	Depth Flow	
						(L/s)	(L/s)	(Ha)	Q(i) (L/s)		Q(i) (L/s)		Q(i) (L/s)	(L/s)	(m)	(m)	Material	(%)	(L/s)	(m/s)	(m2)	(m)	(rad)	(Peak)	(L/s)	

(4) PDWF = (PF x Residential ADWF) + Commercial PWWF
See Wastewater Sewer Catchment Analysis page for details

WASTEWATER SEWER CATCHMENT ANALYSIS															
Residential SF Pop Density		3.05	[persons/lot]								ADWF	PDWF			
Residential MF Pop Density		2.3	[persons/lot]								Residential (LPCD)	270	x PF		
Average Dry Weather Flow (ADWF)		LPCD										Commercial (L/ha/day)	16,800	28,100	
Peak Dry Weather Flow (PDWF)		ADWF x peaking factor										Light Industrial (L/ha/day)	22,500	37,600	
Peak Wer Weather Flow (PWWF)		PDWF + extraneous flows										Wet Industrial (L/ha/day)	33,600	44,900	
						PRE-DEVELOPMENT					POST-DEVELOPMENT				
Area	RUC	RUC DESCRIPTION	ADDRESS	LAND AREA (ha)	LAND AREA BY DESCRIPTION (ha)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)
1	-	-	-	0.093	-	-	-	-	-	-	-	-	-	-	-
2	RESSD	DETACHED SINGLE DWELLING	854-935 SOUTH DR	52.585		13	40	4.33	0.125	0.542	13	40	4.33	0.125	0.542
	RESSD	DETACHED SINGLE DWELLING	854-908 HOLLY AV			27	82	4.27	0.256	1.093	27	82	4.27	0.256	1.093
	RESSD	DETACHED SINGLE DWELLING	1-5 McDOUGAL ST			2	6	4.43	0.019	0.083	2	6	4.43	0.019	0.083
	RESSD	DETACHED SINGLE DWELLING	806-830 KEBIR PL			13	40	4.33	0.125	0.542	13	40	4.33	0.125	0.542
	RESSD	DETACHED SINGLE DWELLING	758-826 CRESENT DR			2	6	4.43	0.019	0.083	2	6	4.43	0.019	0.083
	RESSD	DETACHED SINGLE DWELLING	1-18 DOVE BY			8	24	4.37	0.075	0.328	8	24	4.37	0.075	0.328
	RESSU	RESIDENTIAL SECONDARY UNIT	934 HOLLY AV			1	2	4.46	0.006	0.028	1	2	4.46	0.006	0.028
	PIRGC	PUBLIC GOLF COURSE	781 CRESENT DR			POOL	500	3.97	0.151	0.601	POOL	500	3.97	0.151	0.601
						PRO SHOP	40	4.33	0.018	0.076	PRO SHOP	40	4.33	0.018	0.076
3	-	-	-	0.222	-	-									
4	RESSD	DETACHED SINGLE DWELLING	100-149 BUXTON RD	3.825		47	143	4.20	0.447	1.876	47	143	4.20	0.447	1.876
5	-	-	-	0.011											
6	RESSD	DETACHED SINGLE DWELLING	206-240 BUXTON RD	1.525		18	55	4.31	0.172	0.740	18	55	4.31	0.172	0.740
7	-	-	-	0.164											
8	-	-	-	0.076											
9	RESSD	DETACHED SINGLE DWELLING	1-58 SANDRA BY	4.299		20	61	4.30	0.191	0.819	20	61	4.30	0.191	0.819
10	RESSD	DETACHED SINGLE DWELLING	1-34 ORIOILE ST	1.439		17	52	4.31	0.163	0.701	17	52	4.31	0.163	0.701
11	-	-	-	0.122											
12	-	-	-	0.077											
13	RESSD	DETACHED SINGLE DWELLING	62-90 SANDRA BY	1.599		14	43	4.33	0.134	0.582	14	43	4.33	0.134	0.582
14	PIISC	SCHOOL	888 CRANE AV	1.752		1	300	4.08	0.243	0.991	1	300	4.08	0.243	0.991
15	-	-	-	0.096											
16	RESSD	DETACHED SINGLE DWELLING	2-75 BATHGATE BY	2.944		30	92	4.25	0.288	1.223	30	92	4.25	0.288	1.223
17	RESSD	DETACHED SINGLE DWELLING	1-30 PHEASANT ST	1.349		16	49	4.32	0.153	0.661	16	49	4.32	0.153	0.661
18	RESSD	DETACHED SINGLE DWELLING	919-923 CRANE AV	0.199		2	6	4.32	0.019	0.081	2	6	4.32	0.019	0.081
19	RESSD	DETACHED SINGLE DWELLING	927-935 CRANE AV	0.256		3	9	4.42	0.028	0.124	3	9	4.42	0.028	0.124
20	RESSD	DETACHED SINGLE DWELLING	1-52 GARNET BAY	2.087		21	64	4.29	0.200	0.858	21	64	4.29	0.200	0.858
21	RESSD	DETACHED SINGLE DWELLING	939-943 CRANE AV	0.208		2	6	4.43	0.019	0.083	2	6	4.43	0.019	0.083
22	RESSD	DETACHED SINGLE DWELLING	945-953 CRANE AV	0.269		3	9	4.42	0.028	0.124	3	9	4.42	0.028	0.124
23	RESSD	DETACHED SINGLE DWELLING	56-84 GARNET BY	1.109		14	43	4.33	0.134	0.582	14	43	4.33	0.134	0.582
24	RESSD	DETACHED SINGLE DWELLING	957-965 CRANE AV	0.235		3	9	4.42	0.028	0.124	3	9	4.42	0.028	0.124
25	RESSD	DETACHED SINGLE DWELLING	966 CRANE AV	0.111		1	3	4.45	0.009	0.042	1	3	4.45	0.009	0.042
26	-	-	-	0.027											
	RESSD	DETACHED SINGLE DWELLING	ROYSE AV			32	98	4.25	0.306	1.300	32	98	4.25	0.306	1.300
	RESSU	RESIDENTIAL SECONDARY UNIT	1051, 1053, 1042, 1044, 1035, ROYSE AV			18	41	4.33	0.128	0.555	18	41	4.33	0.128	0.555
	RESMA	MULTIPLE ATTACHED UNITS	999 ROYSE AV			2	5	4.44	0.016	0.069	2	5	4.44	0.016	0.069
	RESSD	DETACHED SINGLE DWELLING	1003-1070 DUMAS AV			37	113	4.23	0.353	1.493	37	113	4.23	0.353	1.493

WASTEWATER SEWER CATCHMENT ANALYSIS														
Residential SF Pop Density		3.05	[persons/lot]								ADWF	PDWF		
Residential MF Pop Density		2.3	[persons/lot]								Residential (LPCD)		270	x PF
Average Dry Weather Flow (ADWF)		LPCD									Commercial (L/ha/day)		16,800	28,100
Peak Dry Weather Flow (PDWF)		ADWF x peaking factor									Light Industrial (L/ha/day)		22,500	37,600
Peak Wer Weather Flow (PWWF)		PDWF + extraneous flows									Wet Industrial (L/ha/day)		33,600	44,900

						PRE-DEVELOPMENT					POST-DEVELOPMENT				
Area	RUC	RUC DESCRIPTION	ADDRESS	LAND AREA (ha)	LAND AREA BY DESCRIPTION (ha)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)
27	RESSD	DETACHED SINGLE DWELLING	1001-1047 CHEVRIER BV	59.211		26	79	4.27	0.247	1.054	26	79	4.27	0.247	1.054
	CMMRH	COMMERCIAL ROW HOUSE	1060 CHEVRIER BV			12	28	4.36	0.088	0.381	12	28	4.36	0.088	0.381
	CMRST	STORE	1601 PEMBINA HWY		0.107	1		1.67	0.021	0.035	1		1.67	0.021	0.035
	INWWH	WAREHOUSE	1104, 1114 CHEVRIER BV		0.196	2		1.67	0.051	0.085	2		1.67	0.051	0.085
	CMVSR	VEHICLE SERVICE RELATED	1106, 1110, 1118 CHEVRIER BV		0.240	3		1.67	0.063	0.104	3		1.67	0.063	0.104
	PIICH	CHURCH	1111 CHEVRIER BV			1	1100	3.77	0.115	0.432	1	1100	3.77	0.115	0.432
	RESSD	DETACHED SINGLE DWELLING	907-984 NESBITT BY			27	82	4.27	0.256	1.093	27	82	4.27	0.256	1.093
	PIICH	CHURCH	935 NESBITT BY			1	200	4.15	0.021	0.086	1	200	4.15	0.021	0.086
	RESSD	DETACHED SINGLE DWELLING	852-986 CRESENT DR			50	153	4.19	0.478	2.002	50	153	4.19	0.478	2.002
	RESMC	MULTIFAMILY CONVERSION	980 CRESENT DR			2	5	4.44	0.016	0.069	2	5	4.44	0.016	0.069
	RESSU	RESIDENTIAL SECONDARY UNIT	936 CRESENT DR			2	5	4.44	0.016	0.069	2	5	4.44	0.016	0.069
	RESSD	DETACHED SINGLE DWELLING	834-899 KIBIR PL			22	67	4.29	0.209	0.898	22	67	4.29	0.209	0.898
	RESSD	DETACHED SINGLE DWELLING	940-990 REVIERA CR			18	55	4.31	0.172	0.740	18	55	4.31	0.172	0.740
	CNCMP	CONDO COMPLEX	994 RIVIERA CR			4	9	4.42	0.028	0.124	4	9	4.42	0.028	0.124
	RESSD	DETACHED SINGLE DWELLING	1005-1052 MANAHAN AV			17	52	4.31	0.163	0.701	17	52	4.31	0.163	0.701
	INMMU	INDUSTRIAL MULTIUSE	1149 MANAHAN AV		0.070	1		1.67	0.018	0.030	1		1.67	0.018	0.030
	INWSC	STORAGE COMPOUND	1150 MANAHAN AV		0.066	1		1.67	0.017	0.029	1		1.67	0.017	0.029
	INWWH	WAREHOUSE	1060, 1070 FRENCH ST		0.217	2		1.67	0.057	0.094	2		1.67	0.057	0.094
	RESSD	DETACHED SINGLE DWELLING	HUDSON ST			22	67	4.29	0.209	0.898	22	67	4.29	0.209	0.898
	RESGC	RESIDENTIAL GROUP CARE	465 HUDSON ST			1	2	4.46	0.006	0.028	1	2	4.46	0.006	0.028
	RESAP	RESIDENTAIL APARTMENTS	528 HUDSON ST			108	248	4.11	0.775	3.187	108	248	4.11	0.775	3.187
	RESAP	APARTMENTS	1 FINCH BY			42	97	4.25	0.303	1.287	42	97	4.25	0.303	1.287
	CMOFF	OFFICE	1495, 1531, 1536, 1581, 1600, 1619 PEMBINA HWY				306	4.07	0.135	0.548		306	4.07	0.135	0.548
	CMRCV	CONVINIENCE STORE	1490 PEMBINA HWY				3	4.45	0.001	0.005		3	4.45	0.001	0.005
	RESAP	APARTMENTS	1515 PEMBINA HWY			36	83	4.26	0.259	1.106	36	83	4.26	0.259	1.106
	CMRRE	RESTAURANT	1500 PEMBINA HWY			1	291	4.08	0.088	0.358	1	291	4.08	0.088	0.358
	CMRRE	RESTAURANT	1521 PEMBINA HWY			1	35	4.34	0.011	0.046	1	35	4.34	0.011	0.046
	RESAP	APARTMENTS	1520 PEMBINA HWY			32	74	4.28	0.231	0.989	32	74	4.28	0.231	0.989
	PIISC	SCHOOL	1551 PEMBINA HWY			1	1000	3.80	0.486	1.847	1	1000	3.80	0.486	1.847
	CMRST	STORE	1540, 1544, 1640 PEMBINA HWY		0.243			1.67	0.047	0.079			1.67	0.047	0.079
	CMSTP	STRIP MALL	1566 PEMBINA HWY		0.272			1.67	0.053	0.088			1.67	0.053	0.088
	PIICH	CHURCH FUNERAL HOME	1563 PEMBINA HWY			1	125	4.22	0.013	0.055	1	125	4.22	0.013	0.055
	PIMFH		1577 PEMBINA HWY												
	PIISC	SCHOOL	1639 PEMBINA HWY			1	700	3.89	0.340	1.325	1	700	3.89	0.340	1.325
	RESAP	APARTMENTS	1616 PEMBINA HWY			24	55	4.31	0.172	0.740	24	55	4.31	0.172	0.740
	RESAP	APARTMENTS	1626 PEMBINA HWY			12	28	4.36	0.088	0.381	12	28	4.36	0.088	0.381
	RESAP	APARTMENTS	1650 PEMBINA HWY			50	115	4.23	0.359	1.519	50	115	4.23	0.359	1.519

WASTEWATER SEWER CATCHMENT ANALYSIS															
Residential SF Pop Density		3.05	[persons/lot]								ADWF	PDWF			
Residential MF Pop Density		2.3	[persons/lot]								Residential (LPCD)		270	x PF	
Average Dry Weather Flow (ADWF)		LPCD									Commercial (L/ha/day)		16,800	28,100	
Peak Dry Weather Flow (PDWF)		ADWF x peaking factor									Light Industrial (L/ha/day)		22,500	37,600	
Peak Wer Weather Flow (PWWF)		PDWF + extraneous flows									Wet Industrial (L/ha/day)		33,600	44,900	
						PRE-DEVELOPMENT					POST-DEVELOPMENT				
Area	RUC	RUC DESCRIPTION	ADDRESS	LAND AREA (ha)	LAND AREA BY DESCRIPTION (ha)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)
	PIINH	NURSING HOME	1679 PEMBINA HWY			50	115	4.23	0.359	1.519	50	115	4.23	0.359	1.519
	RESAP	APARTMENTS	1681 PEMBINA HWY			171	393	4.03	1.228	4.944	171	393	4.03	1.228	4.944
	CNCMP	CONDO COMPLEX	1660 PEMBINA HWY			48	110	4.23	0.344	1.455	48	110	4.23	0.344	1.455
	CMRWC	RETAIL WAREHOUSE	1680 PEMBINA HWY		0.265			1.67	0.052	0.086			1.67	0.052	0.086
	CMRRE	RESTAURANT	1740 PEMBINA HWY			1	50	4.31	0.015	0.065	1	50	4.31	0.015	0.065
	CMONC	MEDICAL OFFICE CLINIC	1686 PEMBINA HWY				20	4.38	0.009	0.039		20	4.38	0.009	0.039
	CMRRE	RESTAURANT	1700 PEMBINA HWY			1	550	3.95	0.166	0.654	550	500	3.97	0.150	0.598
	CMRRE		1710 PEMBINA HWY												
	CMHHO	HOTEL	1714 PEMBINA HWY			GUESTS	200	4.15	0.463	1.920	GUESTS	200	4.15	0.463	1.920
					STAFF	10	4.41	0.003	0.015	STAFF	10	4.41	0.003	0.015	
	CNCMP	CONDO COMPLEX	1720 PEMBINA HWY			108	248	4.11	0.775	3.187	108	248	4.11	0.775	3.187
28	RESSD	DETACHED SINGLE DWELLING	1182-1204 CLARENCE AV	59.224		13	40	4.33	0.125	0.542	13	40	4.33	0.125	0.542
	RESSD	DETACHED SINGLE DWELLING	MARSHALL BY			62	189	4.16	0.591	2.455	62	189	4.16	0.591	2.455
	RESSD	DETACHED SINGLE DWELLING	BRISBANE AV			15	46	4.32	0.144	0.621	15	46	4.32	0.144	0.621
	RESSD	DETACHED SINGLE DWELLING	BELAIR RD			15	46	4.32	0.144	0.621	15	46	4.32	0.144	0.621
	INMLM	INDUSTRIAL LIGHT MANUFACTURING	1260 CLARENCE AV		6.067	1		1.67	1.580	2.639	1		1.67	1.580	2.639
	INWWH	WAREHOUSE	1247, 1249, 1255, 1301 CLARENCE AV			4	250	4.11	0.217	0.892	4	250	4.11	0.217	0.892
	INWWH	WAREHOUSE	121, 101, 100, 77, 68, 10 IRENE ST			6	350	4.05	0.304	1.230	6	350	4.05	0.304	1.230
	INWWH	WAREHOUSE	1370 SONY PL			1	100	4.24	0.087	0.368	1	100	4.24	0.087	0.368
	INWWH	WAREHOUSE	70 IRENE ST			1			17.964	30.000	1			17.964	30.000
	-	LIFT STATION	155 HAMELIN			1			35.928	60.000				35.928	60.000
	INWWH	WAREHOUSE	1389, 1395, 1477, 1495 WALLER AV			4	50	4.31	0.043	0.187	4	50	4.31	0.043	0.187
29	CMOFF	OFFICE	1483 PEMBINA HWY	0.190		1	30	4.35	0.013	0.057	1	30	4.35	0.013	0.057
30	RESSD	DETACHED SINGLE DWELLING	HUDSON ST	3.814		16	49	4.32	0.153	0.661	16	49	4.32	0.153	0.661
	RESSD	DETACHED SINGLE DWELLING	BOSTON AV			32	98	4.32	0.306	1.322	32	98	4.32	0.306	1.322
	RESSU	RESIDENTIAL SECONDARY UNIT	BOSTON AV			16	37	4.32	0.116	0.499	16	37	4.32	0.116	0.499
31	CMRST	STORE	1463, 1467 PEMBINA HWY	0.896	0.202			1.67	0.039	0.066			1.67	0.039	0.066
	CMRRE	RESTAURANT	1480 PEMBINA HWY			1	164	4.18	0.018	0.076	1	164	4.18	0.018	0.076
	RESAP	APARTMENTS	1472 PEMBINA HWY			30	69	4.28	0.216	0.924	30	69	4.28	0.216	0.924
	CNCMP	CONDO COMPLEX	1462 PEMBINA HWY			30	69	4.28	0.216	0.924	30	69	4.28	0.216	0.924
32	-	-	-	0.093											
	CMRST	STORE	1463 PEMBINA HWY		0.125	1		1.67	0.024	0.041	1		1.67	0.024	0.041
	RESSU	RESIDENTIAL SECONDARY UNIT	1126 CLARENCE AV			4	9	4.42	0.028	0.124	4	9	4.42	0.028	0.124
	RESSD	DETACHED SINGLE DWELLING	CLARENCE AV			56	171	4.17	0.534	2.229	56	171	4.17	0.534	2.229

WASTEWATER SEWER CATCHMENT ANALYSIS																	
Residential SF Pop Density		3.05	[persons/lot]								ADWF		PDWF				
Residential MF Pop Density		2.3	[persons/lot]								Residential (LPCD)		270		x PF		
Average Dry Weather Flow (ADWF)		LPCD										Commercial (L/ha/day)		16,800		28,100	
Peak Dry Weather Flow (PDWF)		ADWF x peaking factor										Light Industrial (L/ha/day)		22,500		37,600	
Peak Wer Weather Flow (PWWF)		PDWF + extraneous flows										Wet Industrial (L/ha/day)		33,600		44,900	
						PRE-DEVELOPMENT					POST-DEVELOPMENT						
Area	RUC	RUC DESCRIPTION	ADDRESS	LAND AREA (ha)	LAND AREA BY DESCRIPTION (ha)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)		
33	RESMA	MULTIPLE ATTACHED UNITS	1065 CLARENCE AV	22.511		1	2	4.46	0.006	0.028	1	2	4.46	0.006	0.028		
	RESGC	RESIDENTIAL GROUP CARE	339 HUDSON ST			1	2	4.46	0.006	0.028	1	2	4.46	0.006	0.028		
	RESDU	DUPLEX	HUDSON ST			14	32	4.35	0.100	0.435	14	32	4.35	0.100	0.435		
	RESMA	MULTIPLE ATTACHED UNITS	HUDSON ST			7	16	4.39	0.050	0.220	7	16	4.39	0.050	0.220		
	PIISC	SCHOOL	20 DONNELLY ST			1	690	3.90	0.559	2.179	1	690	3.90	0.559	2.179		
	RESSD	DETACHED SINGLE DWELLING	DONELLY ST			4	12	4.41	0.038	0.165	4	12	4.41	0.038	0.165		
	RESSU	RESIDENTIAL SECONDARY UNIT	67 MARSHALL CR			1	2	4.46	0.006	0.028	1	2	4.46	0.006	0.028		
	RESSD	DETACHED SINGLE DWELLING	MARSHALL CR			64	195	4.15	0.609	2.530	64	195	4.15	0.609	2.530		
	PIRCC	COMMUNITY CENTRE	3 MARSHALL CR			1	32	4.35	0.014	0.061	1	32	4.35	0.014	0.061		
	RESSD	DETACHED SINGLE DWELLING	MAYBANK DR			27	82	4.27	0.256	1.093	27	82	4.27	0.256	1.093		
	RESSD	DETACHED SINGLE DWELLING	FARWELL BY			44	134	4.21	0.419	1.761	44	134	4.21	0.419	1.761		
34	CMOFF	OFFICE	1441 PEMBINA HWY	0.602			30	4.35	0.005	0.023		30	4.35	0.005	0.023		
	CMRST	STORE	1456 PEMBINA HWY				10	4.41	0.002	0.008		10	4.41	0.002	0.008		
35	CMOFF	OFFICE	1444 PEMBINA HWY	0.249			10	4.41	0.004	0.019		10	4.41	0.004	0.019		
36	-	-	-	0.098													
37	RESSD	DETACHED SINGLE DWELLING	HOWARD AV	1.848		27	82	4.27	0.256	1.093	27	82	4.27	0.256	1.093		
38	RESAP	APARTMENTS	1430 PEMBINA HWY	0.947		54	124	4.22	0.388	1.634	54	124	4.22	0.388	1.634		
	CMRRE	RESTAURANT	1425 PEMBINA HWY			1	50	4.31	0.014	0.060	1	50	4.31	0.014	0.060		
	CMRST	STORE	1415, 1419 PEMBINA HWY		0.092		30	4.35	0.013	0.057		30	4.35	0.013	0.057		
	RESAP	APARTMENTS	1411 PEMBINA HWY			12	28	4.36	0.088	0.381	12	28	4.36	0.088	0.381		
39	RESSD	DETACHED SINGLE DWELLING	KELSEY AV	1.641		24	73	4.28	0.228	0.976	24	73	4.28	0.228	0.976		
40	PIICH	CHURCH	1400 PEMBINA HWY	0.748		1	300	4.08	0.031	0.127	1	300	4.08	0.031	0.127		
	CMRST	STORE	1392 PEMBINA HWY				20	4.38	0.009	0.039		20	4.38	0.009	0.039		
	CMSTP	STRIP MALL	1389 PEMBINA HWY		0.158			1.67	0.031	0.051			1.67	0.031	0.051		
41	CMOFF	OFFICE	1383 PEMBINA HWY	0.273			20	4.38	0.009	0.039		20	4.38	0.009	0.039		
42	RESSS	SIDE BY SIDE	1000-1003 RADISSON AV	1.287		4	9	4.42	0.028	0.124	4	9	4.42	0.028	0.124		
	RESSD	DETACHED SINGLE DWELLING	RADISSON AV			17	52	4.31	0.163	0.701	17	52	4.31	0.163	0.701		
43	CMRRE	RESTAURANT	1382 PEMBINA HWY	0.961		1	52	4.31	0.014	0.062	1	52	4.31	0.014	0.062		
	PIMLI	LIBRARY	1360 PEMBINA HWY			1	20	4.38	0.002	0.009	1	20	4.38	0.002	0.009		
	CMSTP	STRIP MALL	1373 PEMBINA HWY				15	4.40	0.018	0.077		15	4.40	0.018	0.077		
	CMRST	STORE	1365 PEMBINA HWY				40	4.33	0.018	0.076		40	4.33	0.018	0.076		
	RESAM	APARTMENTS MULTILISE	1355 PEMBINA HWY			8	18	4.39	0.056	0.247	8	18	4.39	0.056	0.247		

WASTEWATER SEWER CATCHMENT ANALYSIS																
Residential SF Pop Density		3.05	[persons/lot]								ADWF	PDWF				
Residential MF Pop Density		2.3	[persons/lot]								Residential (LPCD)	270	x PF			
Average Dry Weather Flow (ADWF)		LPCD								Commercial (L/ha/day)	16,800	28,100				
Peak Dry Weather Flow (PDWF)		ADWF x peaking factor								Light Industrial (L/ha/day)	22,500	37,600				
Peak Wer Weather Flow (PWWF)		PDWF + extraneous flows								Wet Industrial (L/ha/day)	33,600	44,900				
						PRE-DEVELOPMENT					POST-DEVELOPMENT					
Area	RUC	RUC DESCRIPTION	ADDRESS	LAND AREA (ha)	LAND AREA BY DESCRIPTION (ha)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)	UNITS	POP	PF	ADWF (L/s)	PDWF (L/s)	
	RESAM	APARTMENTS MULTIPLE	1333 PEMBINA HWY				20	4.38	0.009	0.039		20	4.38	0.009	0.039	
44	RESGC	RESIDENTIAL GROUP CARE	1018 WALLER AV	3.152		1	2	4.46	0.006	0.028	1	2	4.46	0.006	0.028	
	RESSD	DETACHED SINGLE DWELLING	WALLER AV			39	119	4.22	0.372	1.570	39	119	4.22	0.372	1.570	
45	PIIPF	POLICE/FIRE	1350 PEMBINA HWY	4.604			30	4.35	0.013	0.057	130	299	4.08	0.934	3.811	
	CMRRE	RESTAURANT	1349 PEMBINA HWY			1	15	4.40	0.004	0.018	1	15	4.40	0.004	0.018	
	CMOFF	OFFICE	1345 PEMBINA HWY				40	4.33	0.018	0.076		40	4.33	0.018	0.076	
	PIPCR	CURLING RINK	1341 PEMBINA HWY			1	600	3.93	0.063	0.246	1	600	3.93	0.063	0.246	
	CMHHO	HOTEL	1330 PEMBINA HWY			GUESTS	400	4.02	0.926	3.724	GUESTS	400	4.02	0.926	3.724	
						STAFF	40	4.33	0.014	0.060	STAFF	40	4.33	0.014	0.060	
	CMRSM	SUPERMARKET	1305 PEMBINA HWY					100	1.67	0.007	0.012	100	1.67	0.007	0.012	0.012
SUM TOTAL				239.028			14,016		76.537	179.448		14,137		77.448	183.146	
Total PDWF based on revised PF							14,016	2.81	21.564	153.923		14,137	2.80	22.483	156.363	

APPENDIX B

ISOCHRONE STORMWATER STORAGE CALCULATIONS

Methodology for calculating impervious and pervious runoff from a site.

i) Impervious area, surface storage capacity

imperial		metric used in SWMM	
fo (in/hr)	3.00	fo (mm/hr)	75
fc (in/hr)	0.118	fc (mm/hr)	3
k (1/min)	-0.069	k (1/sec)	-0.00115

Total Impervious Area
Total Pervious Area

1.14	acres
0.07	acres
1.206	acres
2.2239	cfs
3486	ft ³
98.7	m ³

Q = c i A	2.224	cfs
Enter "C" Value =	NA	
Enter from 5 year storm "i" =	4.300	
A =	1.206	In Acres

Please use a Time of Concentration of **10 min**
for Commercial developments

Editable fields

63.00	L/s =
2.22	Cfs

City of Wpg 25 yr storm				Impervious runoff	Pervious Flow Calculation			total per. + imp. flow	allowable discharge offsite	net runoff requiring storge	mass sum of storage
Time	25 yr discretized storm ²	rainfall depth	sum of rainfall depths		infiltration ¹	net intensity after infiltration	pervious runoff				
(min)	(in/hr)	(in)	(in)		(cfs)	(in/hr)	(in/hr)				
0	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0
5	0.12	0.01	0.01	0.00	2.16	0.00	0.00	0.00	0.00	0.00	0
10	0.13	0.01	0.02	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0
15	0.15	0.01	0.03	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0
20	0.17	0.01	0.05	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0
25	0.19	0.02	0.06	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0
30	0.21	0.02	0.08	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0
35	0.23	0.02	0.10	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0
40	0.26	0.02	0.12	0.30	0.30	0.00	0.00	0.30	0.30	0.00	0
45	0.29	0.02	0.15	0.33	0.25	0.04	0.00	0.33	0.33	0.00	0
50	0.33	0.03	0.17	0.37	0.21	0.12	0.01	0.38	0.38	0.00	0
55	0.42	0.04	0.21	0.48	0.18	0.24	0.02	0.49	0.49	0.00	0
60	0.53	0.04	0.25	0.60	0.16	0.37	0.03	0.63	0.63	0.00	0
65	0.76	0.06	0.32	0.86	0.15	0.61	0.04	0.91	0.91	0.00	0
70	1.24	0.10	0.42	1.41	0.14	1.10	0.08	1.49	1.49	0.00	0
75	2.96	0.25	0.67	3.36	0.13	2.83	0.20	3.56	2.22	1.34	401
80	7.86	0.66	1.32	8.93	0.13	7.73	0.54	9.47	2.22	7.25	2575
85	3.93	0.33	1.65	4.46	0.13	3.80	0.27	4.73	2.22	2.51	3327
90	2.29	0.19	1.84	2.60	0.12	2.17	0.15	2.75	2.22	0.53	3486
95	1.54	0.13	1.97	1.75	0.12	1.42	0.10	1.85	1.85	0.00	3486
100	1.17	0.10	2.07	1.33	0.12	1.05	0.07	1.40	1.40	0.00	3486
105	0.92	0.08	2.14	1.05	0.12	0.80	0.06	1.10	1.10	0.00	3486
110	0.75	0.06	2.20	0.85	0.12	0.63	0.04	0.90	0.90	0.00	3486
115	0.65	0.05	2.26	0.74	0.12	0.53	0.04	0.78	0.78	0.00	3486
120	0.58	0.05	2.31	0.66	0.12	0.46	0.03	0.69	0.69	0.00	3486
125	0.51	0.04	2.35	0.58	0.12	0.39	0.03	0.61	0.61	0.00	3486
130	0.45	0.04	2.39	0.51	0.12	0.33	0.02	0.53	0.53	0.00	3486
135	0.40	0.03	2.42	0.45	0.12	0.28	0.02	0.47	0.47	0.00	3486
140	0.35	0.03	2.45	0.40	0.12	0.23	0.02	0.41	0.41	0.00	3486
145	0.30	0.03	2.47	0.34	0.12	0.18	0.01	0.35	0.35	0.00	3486
150	0.26	0.02	2.50	0.30	0.12	0.14	0.01	0.31	0.31	0.00	3486
155	0.22	0.02	2.51	0.25	0.12	0.10	0.01	0.26	0.26	0.00	3486
160	0.19	0.02	2.53	0.22	0.12	0.07	0.01	0.22	0.22	0.00	3486
165	0.17	0.01	2.54	0.19	0.12	0.05	0.00	0.20	0.20	0.00	3486
170	0.16	0.01	2.56	0.18	0.12	0.04	0.00	0.18	0.18	0.00	3486
175	0.15	0.01	2.57	0.17	0.12	0.03	0.00	0.17	0.17	0.00	3486
180	0.14	0.01	2.58	0.16	0.12	0.02	0.00	0.16	0.16	0.00	3486
185	0.13	0.01	2.59	0.15	0.12	0.01	0.00	0.15	0.15	0.00	3486
190	0.12	0.01	2.60	0.14	0.12	0.00	0.00	0.14	0.14	0.00	3486
195	0.12	0.01	2.61	0.14	0.12	0.00	0.00	0.14	0.14	0.00	3486
2.61											

print date: 10/17/2024

APPENDIX C

CITY OF WINNIPEG RECORD DRAWINGS

232.00
230.00
228.00
226.00
224.00

232.00
230.00
228.00
226.00
224.00

GROUND PROFILE ALONG
C. OF PIPE

610mm CROSS-CONNECTION
PLUGGED AT BOTH ENDS

NOTE: HORIZ. SCALE = 1:125

GROUND PROFILE ALONG
PIPING

ELEV. 231.000

TOP ELEV. 231.815
TOP ELEV. 231.850

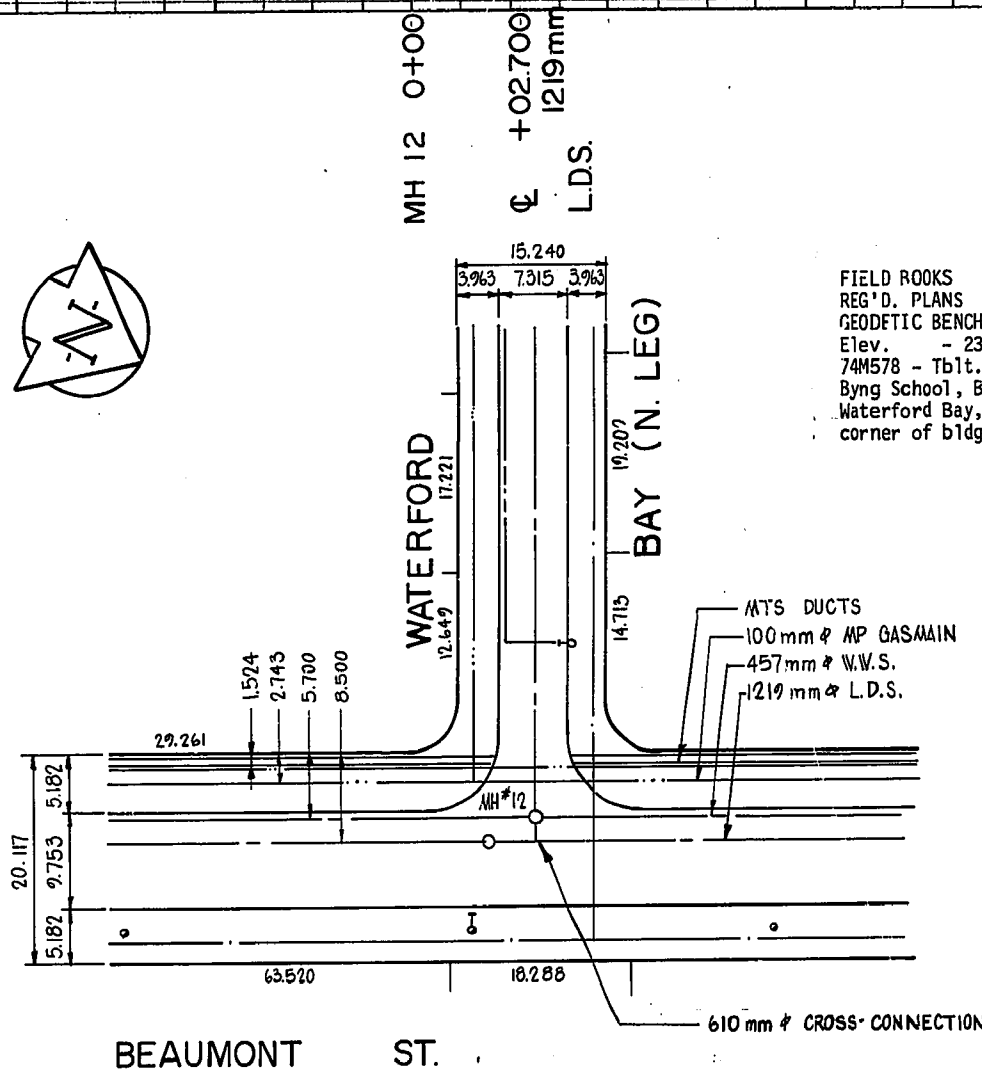
2.0 m OF 525 mm CONC.
PIPE (C76-CL IV) @ 1.50 %

2.0 m OF 525 mm CONC. PIPE
(C76-CL IV) @ 1.25 %

1829 mm L.D.S. HWY. 224.00

E. HWY 224.00
V. HWY 224.00
E. HWY 224.00
V. HWY 224.00

NOTE: HORIZ. SCALE = 1:500

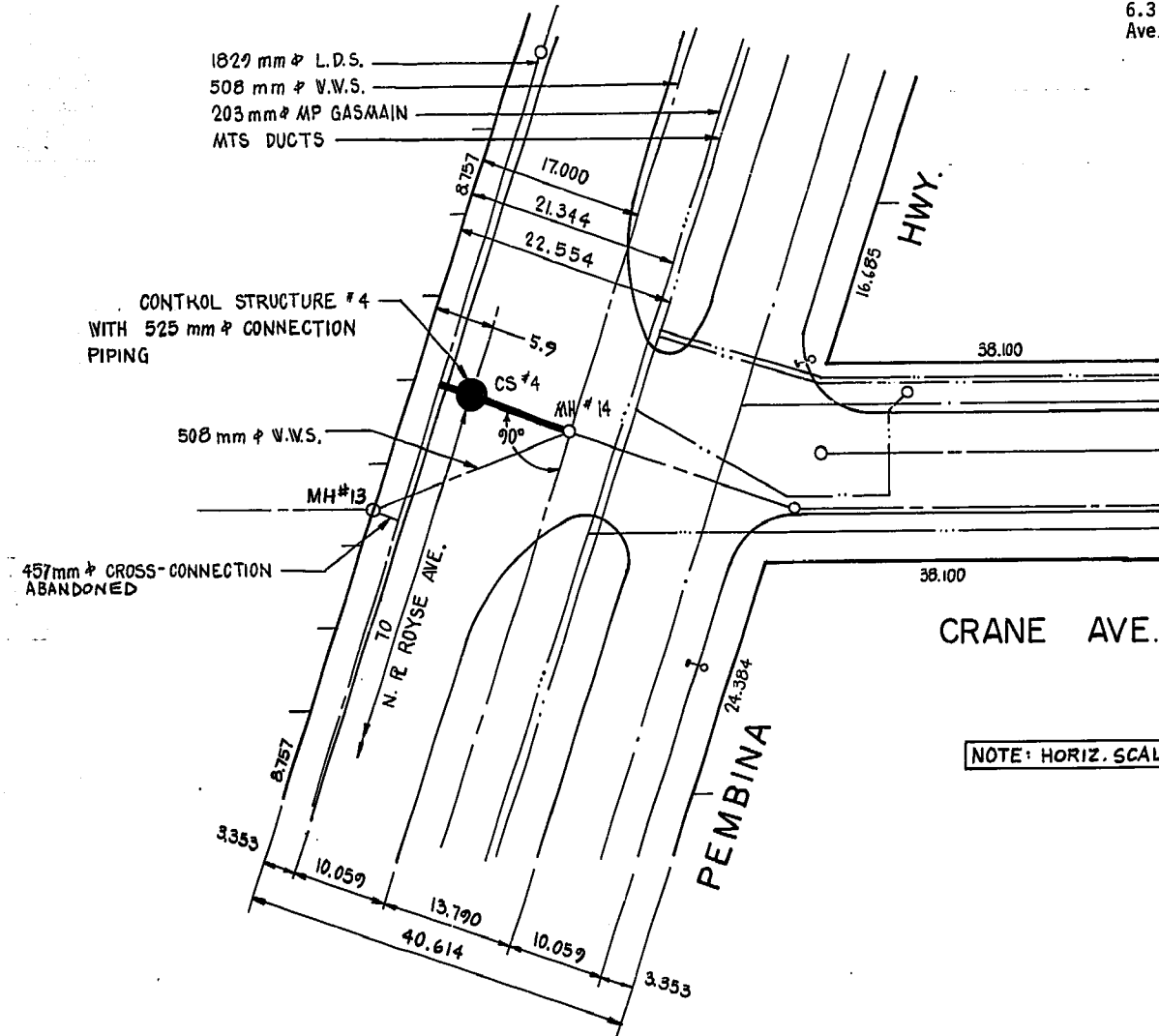
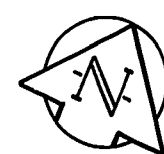


FIELD BOOKS - 1191, 1194
REG'D. PLANS - 2875, 3324, 8776, 7077
GEODETIC BENCH MARK - 65-003
Elev. - 232.439 m
74M578 - Tblt. in W. Wall of General
Byng School, Beaumont St. at
Waterford Bay, 0.6 m N. of S.W.
corner of bldg.

NOTES:

1. All chainages are along $\pm$ of existing
610 mm cross-connection. Sta 0+00 is $\pm$
of MH #12.

NOTE: HORIZ. SCALE = 1:500



FIELD BOOKS - 1191, 1194
REG'D. PLAN - 5652, 6256
GEODETIC BENCH MARK - 64-004
Elev. - 232.153 m
269 - Tblt. in 7.6 m Concrete Pile
in median of Pembina Hwy.,
6.3 m N. of line of N.L. of Dumas
Ave. & 0.5 m E. of W. edge of median.

NOTES:

1. All chainages are along $\pm$ of new piping.
Sta 0+00 is $\pm$ of existing 1829 mm diameter
LDS.
2. Control structure #4 Type A (see detail
drawing LD-294) with 525 mm diameter control
gates and connection piping.

NOTE: HORIZ. SCALE = 1:500

NOTE: ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED.

EXISTING FEATURES

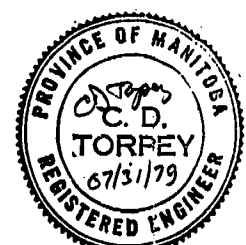
- SEWER, STORM RELIEF SEWER
- WATERMAIN
- GAS
- WINNIPEG HYDRO
- MANITOBA HYDRO
- STREET LIGHTING
- MANITOBA TELEPHONE SYSTEM
- TRAFFIC SIGNALS
- C.N.R. TELEGRAPHS
- C.P.R. TELEGRAPHS
- WINNIPEG HYDRO STEAM HEAT
- WINNIPEG CENTRAL HTG. CO.
- POLE
- FENCE
- TREE
- SION
- VALVE

NEW FEATURES

- SEWER, STORM RELIEF SEWER
- WATERMAIN
- MANHOLE
- CATCH BASIN & LEAD
- DIRECTION OF FLOW
- CURB INLET
- COMBINATION INLET
- CURB INLET & LEAD
- MAIN LINE VALVE, TEE & BEND
- VALVE CHAMBER
- HYDRANT & CONNECTING VALVE
- CULVERT (CWP.)
- ROAD EDGE & CURB
- SIDEWALK

UNDERGROUND STRUCTURES

LOCATIONS OF UNDERGROUND STRUCTURES
AS SHOWN ARE BASED ON THE BEST
INFORMATION AVAILABLE, BUT NO GUARANTEE
IS GIVEN THAT ALL EXISTING UTILITIES ARE
EXACT. CONFIRMATION OF EXISTENCE AND
EXACT LOCATION OF ALL SERVICES MUST BE
OBTAINED FROM THE INDIVIDUAL UTILITIES
BEFORE PROCEEDING WITH CONSTRUCTION.



W.L. WARDROP & ASSOCIATES LTD. ENGINEERING CONSULTANTS	
DESIGNED BY CDT	DRAWN BY GAM
CHECKED BY WRD	DATE JULY, 1979
APPROVED BY	DATE 8 AUG. 1979

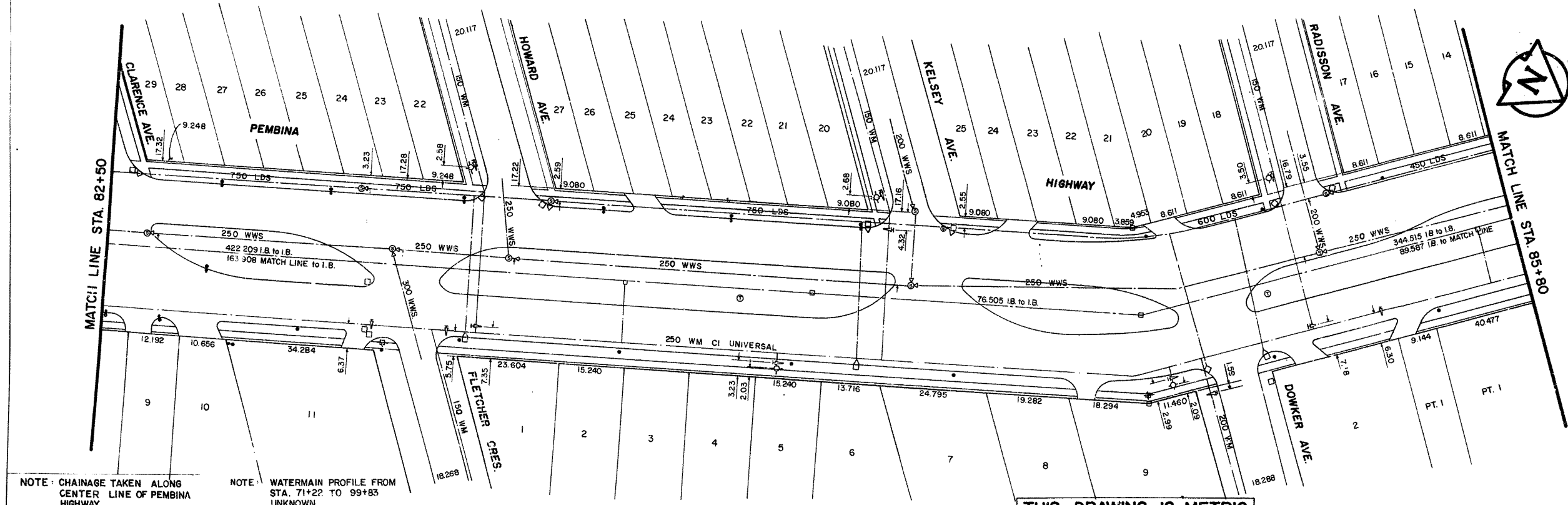
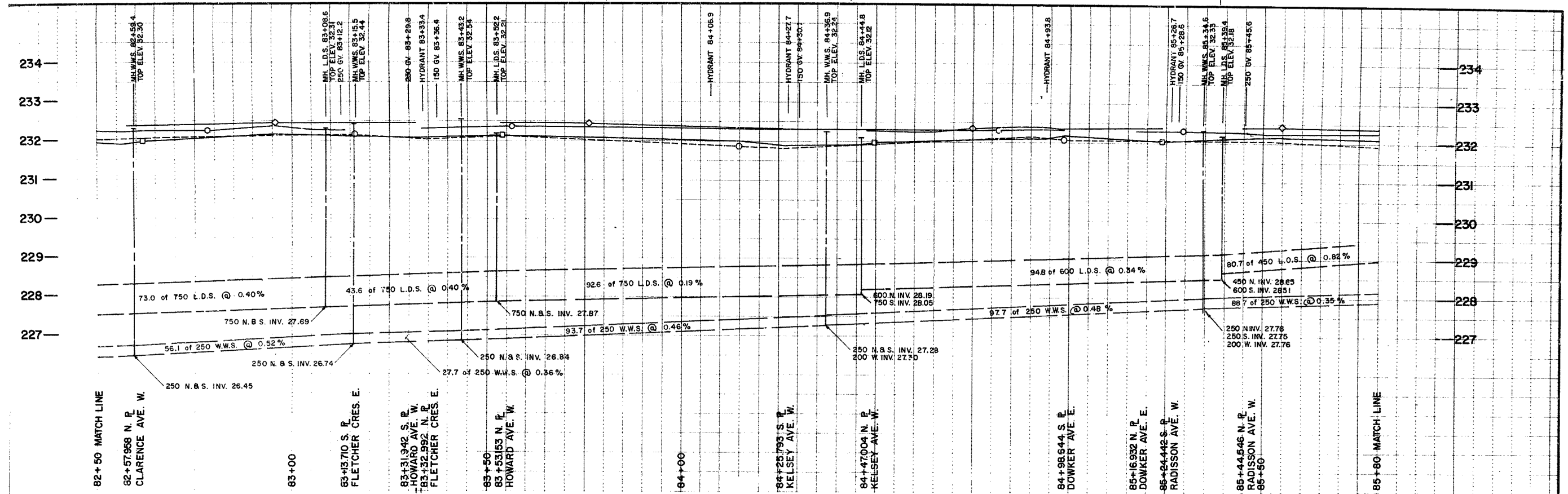
THE CITY OF WINNIPEG	
WORKS & OPERATIONS DEPARTMENT	
WATERWORKS, WASTE & DISPOSAL DIVISION	

ABANDONMENT OF EXISTING OVERFLOW PIPING-BEAUMONT ST. AT WATERFORD BAY (N. LEG)		
CONTROL STRUCTURE #4 CRANE AVE. AT PEMBINA HWY.		
AUTHORIZED BY R.M. Gilling	DATE 9 AUG. 1979	DRAWING NO. LD-287
SCALE HORIZ. AS SHOWN VERT. 1:50		

AS - BUILT		
DATE Nov. 1980	FB. NO. 1179	PAGE 29-40

REF. or Drawing No.

DETAILS



NOTE: CHAINAGE TAKEN ALONG CENTER LINE OF PEMBINA HIGHWAY.

NOTE: WATERMAIN PROFILE FROM STA. 71+22 TO 99+83 UNKNOWN.

THIS DRAWING IS METRIC

the **uma** group Underwood McLellan Ltd. Consulting Engineers and Planners

DESIGNED BY: **NK.B., PAG.** CHECKED BY: **K.T.J. RABAN**

DRAWN BY: **NK.B., PAG.** DATE: **20/01/81**

HOR. SCALE: 1:500 APPROVED BY: **K.T.J. RABAN**

VERTICAL SCALE: 1:50 DATE: **20/01/81**

DETAIL: **20/01/81**

EXISTING		PROPOSED		EXISTING		PROPOSED		EXISTING		PROPOSED	
LEGEND-PLAN		LEGEND-PLAN		LEGEND-PLAN		LEGEND-PLAN		LEGEND-PLAN		LEGEND-PLAN	
150 mm W.M.	WATERMAIN	150 mm W.M.	WATERMAIN	150 mm W.M.	WATERMAIN	150 mm W.M.	WATERMAIN	150 mm W.M.	WATERMAIN	150 mm W.M.	WATERMAIN
300 mm L.D.S.	LAND DRAINAGE SEWER	300 mm L.D.S.	LAND DRAINAGE SEWER	300 mm L.D.S.	LAND DRAINAGE SEWER	300 mm L.D.S.	LAND DRAINAGE SEWER	300 mm L.D.S.	LAND DRAINAGE SEWER	300 mm L.D.S.	LAND DRAINAGE SEWER
250 mm W.W.S.	WASTE WATER SEWER	250 mm W.W.S.	WASTE WATER SEWER	250 mm W.W.S.	WASTE WATER SEWER	250 mm W.W.S.	WASTE WATER SEWER	250 mm W.W.S.	WASTE WATER SEWER	250 mm W.W.S.	WASTE WATER SEWER
MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE	MANHOLE
CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN	CATCH BASIN
CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET	CURB INLET
JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS	JUNCTIONS
CULVERT	CULVERT	CULVERT	CULVERT	CULVERT	CULVERT	CULVERT	CULVERT	CULVERT	CULVERT	CULVERT	CULVERT
GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS	GAS

LOCATION APPROVED

UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES COMMITTEE

DATE: _____

THE CITY OF WINNIPEG

WORKS AND OPERATIONS DEPARTMENT

OPERATIONS DIVISION - DISTRICT 6

PEMBINA HIGHWAY

RECORD DRAWINGS

STA. 82+50 TO STA. 85+80

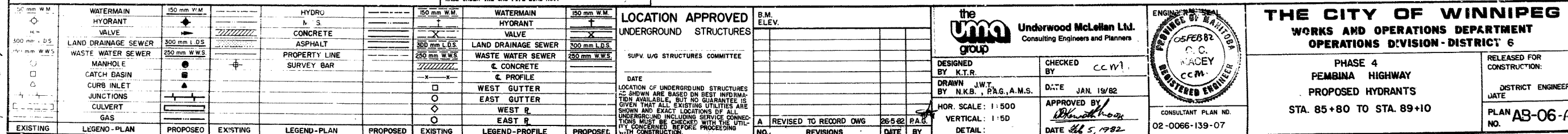
RELEASED FOR CONSTRUCTION: _____

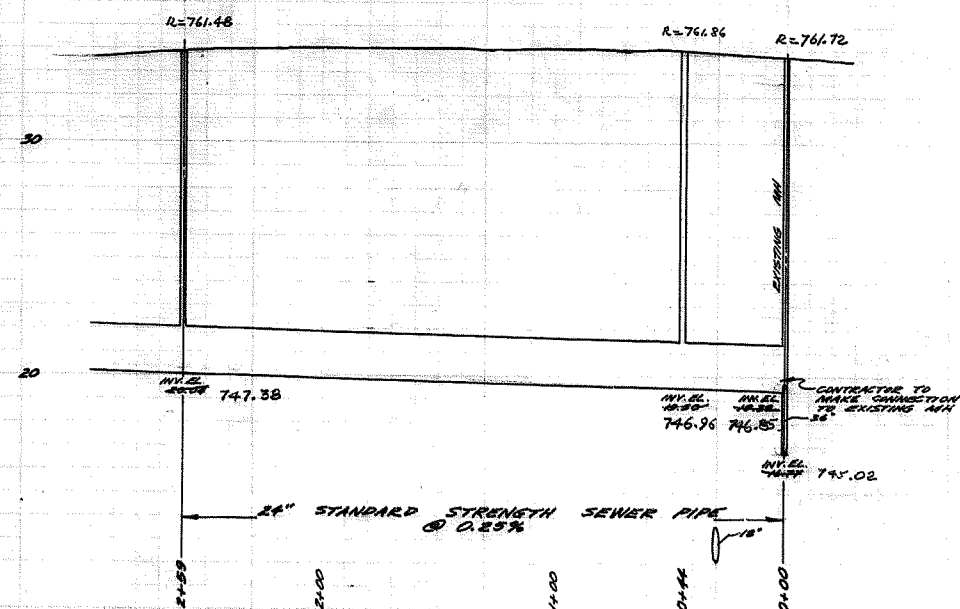
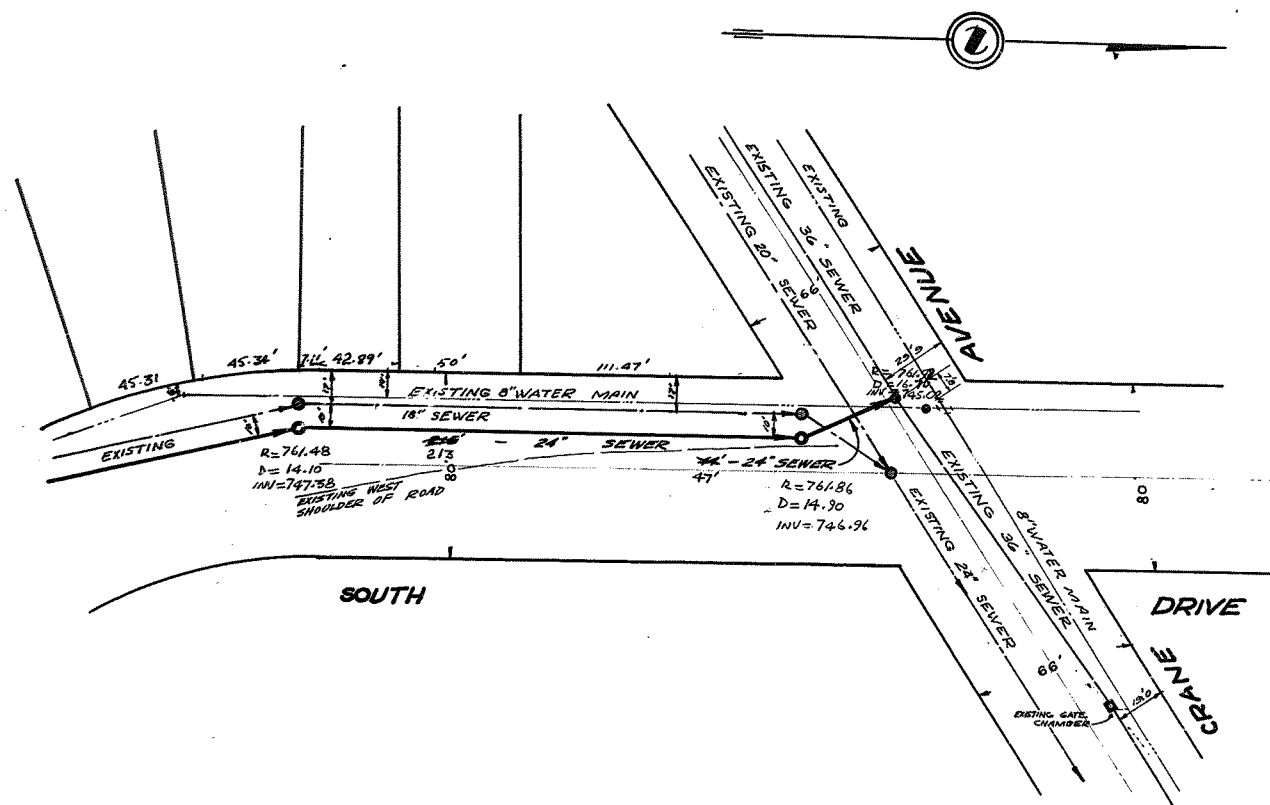
DISTRICT ENGINEER: _____

DATE: _____

PLAN NO. **AB 27**

02-0066-139-07

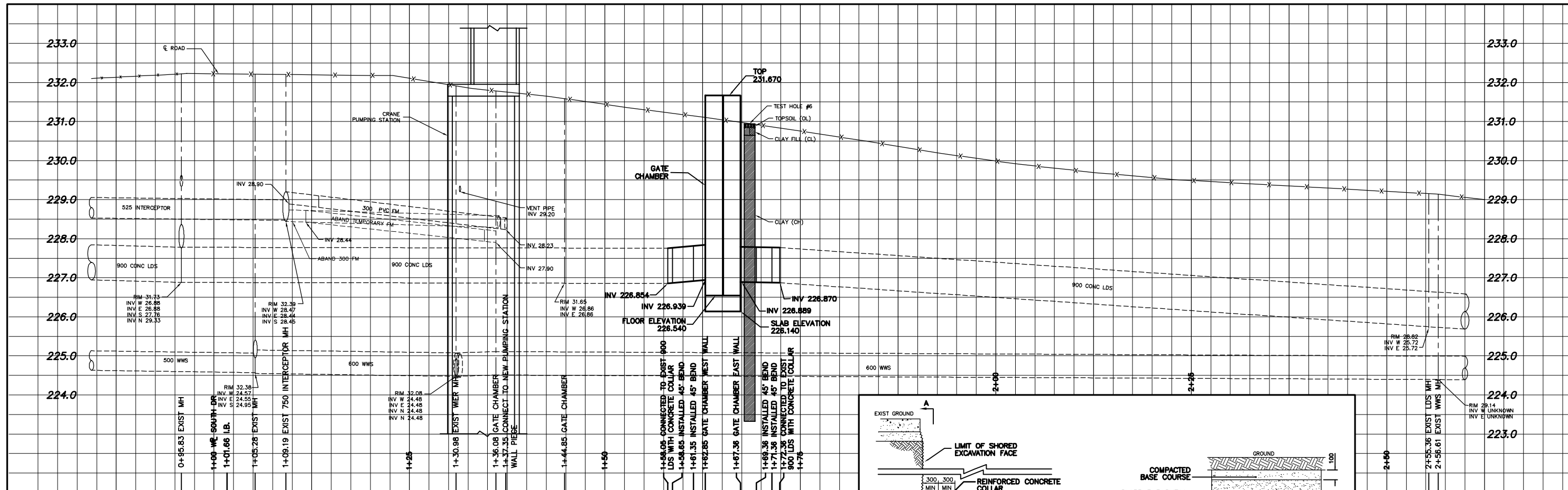




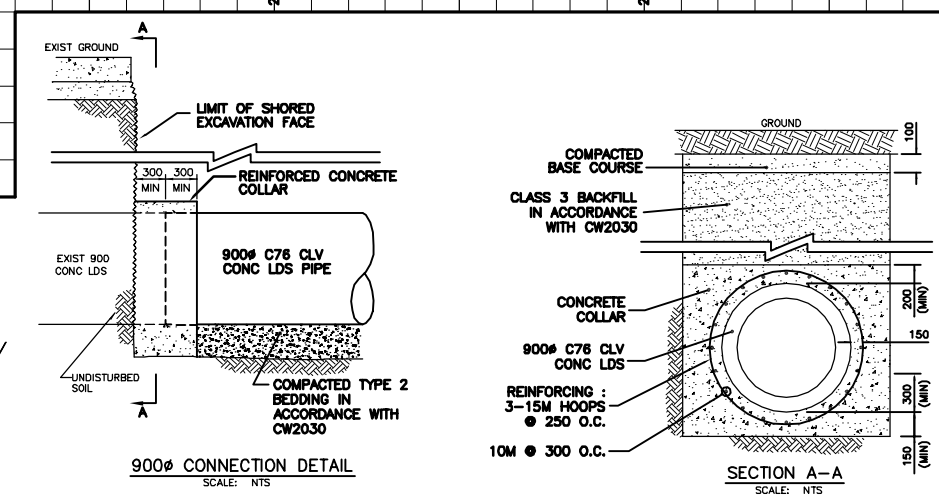
SOUTH DIRT
HOLLY AVENUE TO CRANE AVENUE

DRAWN BY: <i>B.L.B.</i> TRACED BY: <i>B.L.B.</i> CHECKED BY: <i>R.H.</i> DESIGNED BY: <i>R.H.</i> LAYOUT BY:	UNDERWOOD McLELLAN & ASSOCIATES LIMITED CONSULTING PROFESSIONAL ENGINEERS CALGARY - SASKATOON - WINNIPEG	
	AS BUILT APRIL 5 / 78	
	APPROVED BY: _____ DATE _____	
	SHEET OF _____	SCALE: <i>AS SHOWN</i>
DRAWING No. _____		

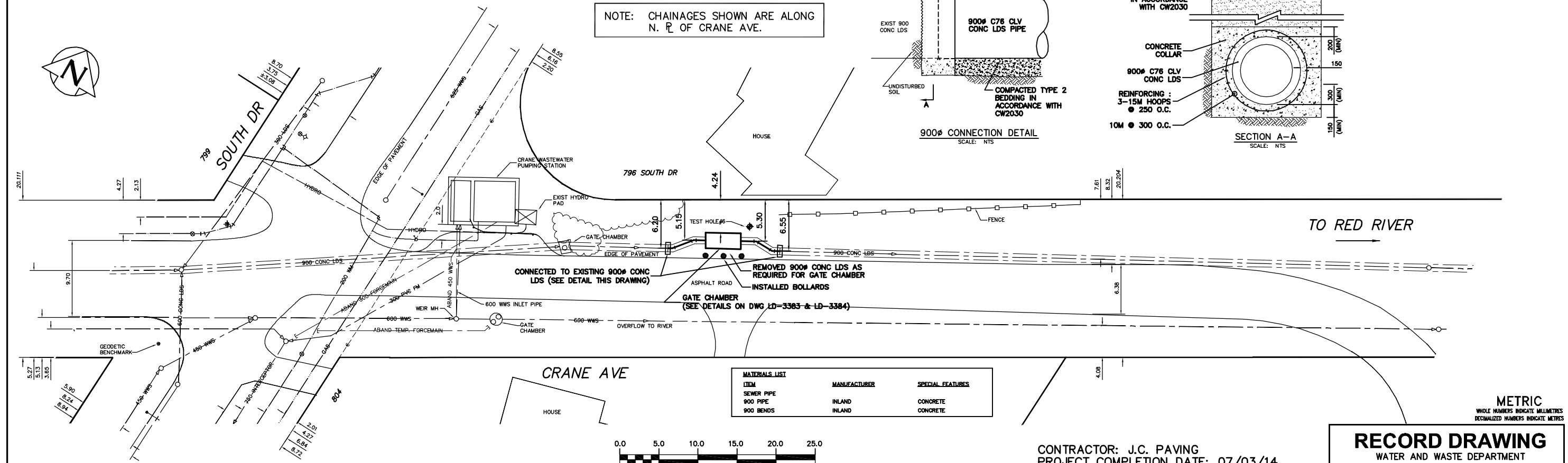
ZONE 6 : E-7
C-8



NOTE: CHAINAGES SHOWN ARE ALONG N. E. OF CRANE AVE.



ITEM	MANUFACTURER	SPECIAL FEATURES
SEWER PIPE	INLAND	CONCRETE
900 PIPE	INLAND	CONCRETE
900 BENDS	INLAND	CONCRETE



200 WM	WATERMAIN	200 WM	SL, HYDRO	150 WM	WATERMAIN	150 WM
525 LDS	LAND DRAINAGE SEWER	525 LDS	MTS	300 LDS	LAND DRAINAGE SEWER	300 LDS
375 WWS	WASTEWATER SEWER	375 WWS	TRAFFIC SIGNALS	250 WWS	WASTEWATER SEWER	250 WWS
MANHOLE		MANHOLE	GAS	50 GAS		
CATCH BASIN		CATCH BASIN	SURVEY BAR			
CURB INLET		CURB INLET	FENCE			
JUNCTIONS		JUNCTIONS	POLE - HYDRO, MTS			
CULVERT		CULVERT	CURB STOP			
ANODE		ANODE	GUY ANCHOR			
EXISTING	LEGEND-PLAN	PROPOSED	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PROFILE

200 WM	WATERMAIN	200 WM	SL, HYDRO	150 WM	WATERMAIN	150 WM
525 LDS	LAND DRAINAGE SEWER	525 LDS	MTS	300 LDS	LAND DRAINAGE SEWER	300 LDS
375 WWS	WASTEWATER SEWER	375 WWS	TRAFFIC SIGNALS	250 WWS	WASTEWATER SEWER	250 WWS
MANHOLE		MANHOLE	GAS	50 GAS		
CATCH BASIN		CATCH BASIN	SURVEY BAR			
CURB INLET		CURB INLET	FENCE			
JUNCTIONS		JUNCTIONS	POLE - HYDRO, MTS			
CULVERT		CULVERT	CURB STOP			
ANODE		ANODE	GUY ANCHOR			
EXISTING	LEGEND-PLAN	PROPOSED	LEGEND-PLAN	PROPOSED	EXISTING	LEGEND-PROFILE

LOCATION APPROVED UNDERGROUND STRUCTURES

DATE: _____

NOTE: LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

CONTRACTOR: J.C. PAVING
PROJECT COMPLETION DATE: 07/03/14

RECORD DRAWING
WATER AND WASTE DEPARTMENT

THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

2006 OUTFALL GATE CHAMBER CONSTRUCTION
CRANE AVENUE
LDS OUTFALL GATE CHAMBER SITE PLAN

SHEET 8 OF 12

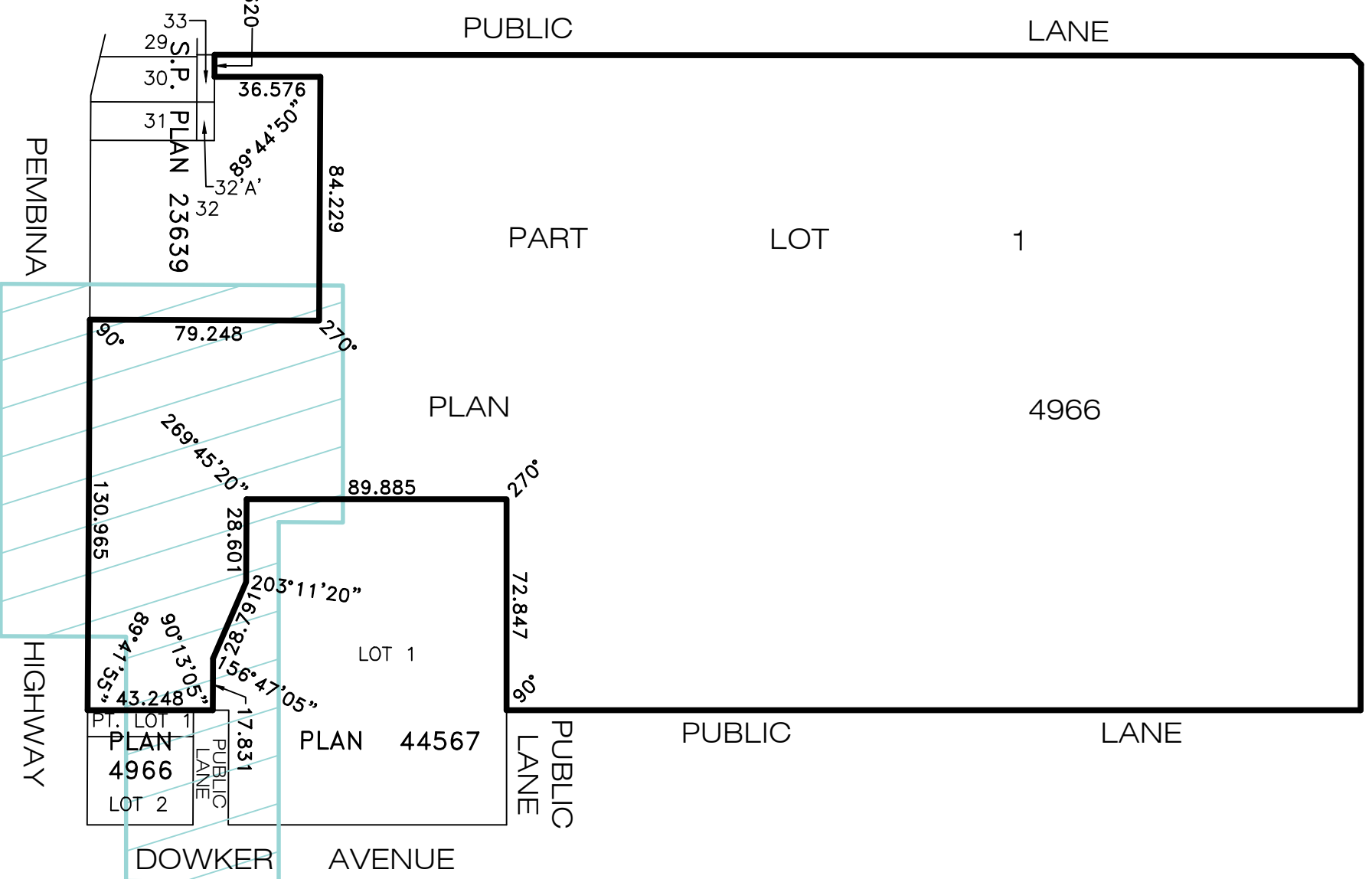
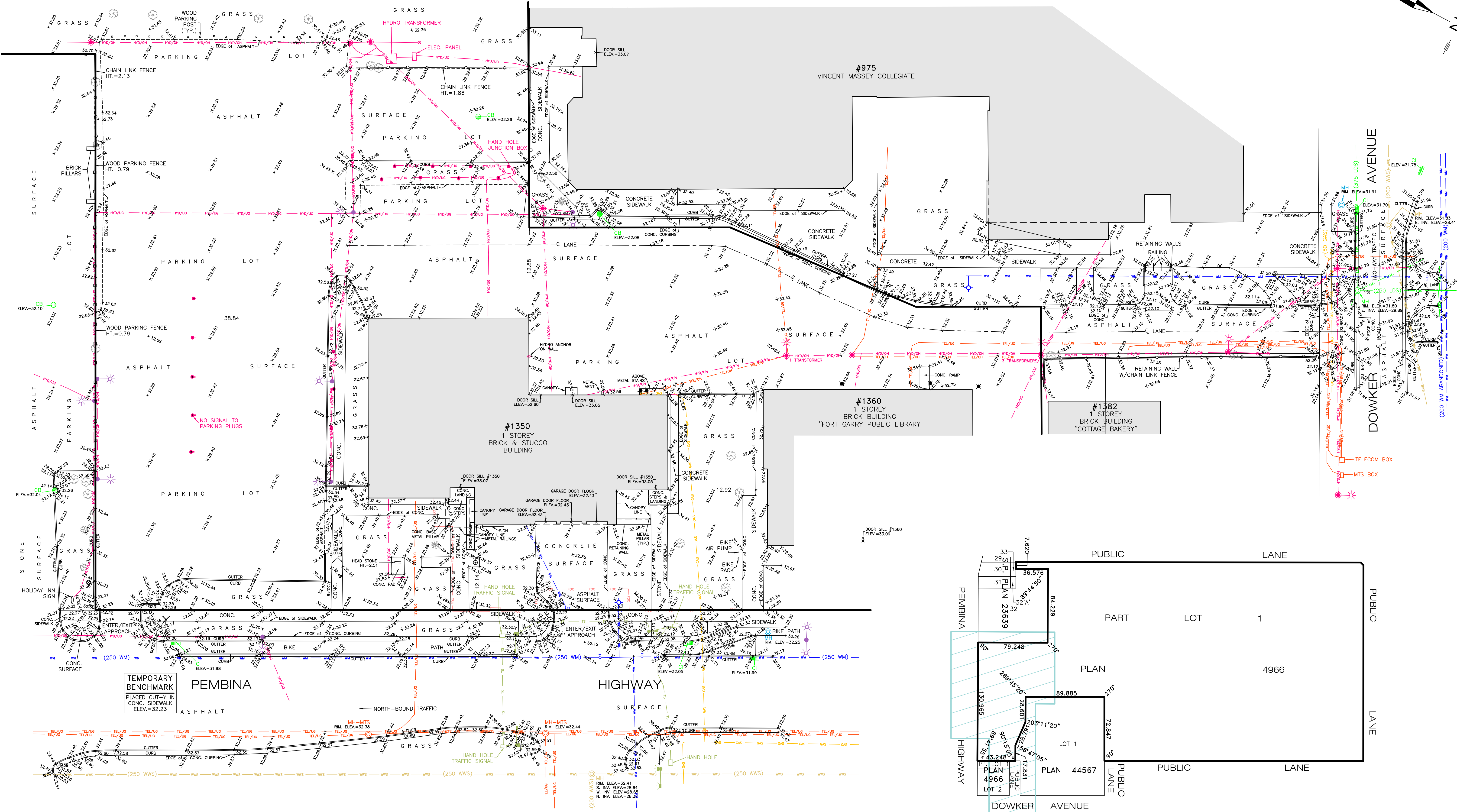
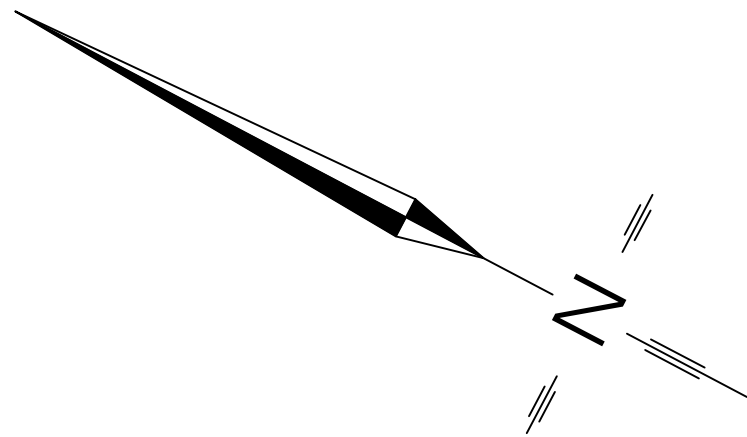
CITY DRAWING NUMBER
LD-3382

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This document is not an official survey unless it bears the signature (in blue ink) and/or seal of the Manitoba Land Surveyor whose authority it was prepared under. It is at the discretion of Barnes & Duncan to issue additional copies of documents on a case by case basis.

METRIC



BARNES & DUNCAN 1906
SURVEYING, ENGINEERING & PLANNING
6 DONALD STREET
WINNIPEG, MANITOBA
R3L 0K6

CLIENT:
CITY OF WINNIPEG

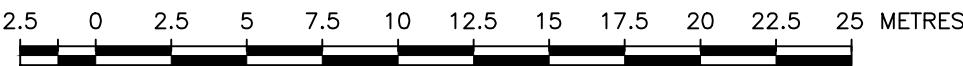
1350 PEMBINA HIGHWAY
WINNIPEG, MANITOBA

PLAN OF TOPOGRAPHIC SURVEY
OF PART OF
RIVER LOTS 2 TO 5,
PARISH OF ST. BONIFACE

BEING
PART OF LOT 1, PLAN 4966 W.L.T.O.

CITY OF WINNIPEG
MANITOBA

SCALE - 1 : 250



TITLE INFORMATION:

CERTIFICATE OF TITLE: 2131110/1 W.L.T.O. (SEARCH DATE: AUGUST 28, 2024)

REGISTERED OWNER: THE CITY OF WINNIPEG

LEGAL DESCRIPTION:

LOT 1, PLAN 4966 W.L.T.O.
EXC. FIRSTLY, PLANS 5135 W.L.T.O., 23639 W.L.T.O. AND 44567 W.L.T.O.
SECONDLY, ALL THAT PORTION BOUNDED AS FOLLOWS: ON THE SOUTH BY THE NORTHERN LIMIT OF LOT 2 ON SAID PLAN 4966, ON THE WEST BY THE WESTERN LIMIT OF SAID LOT 1, ON THE EAST BY THE WESTERN LIMIT OF LANE ADJOINING SAID LOT 2 AND ON THE NORTH BY THE PRODUCTION WLY IN A STRAIGHT LINE OF THE NORTHERN LIMIT OF THE LANE ADJOINING LOTS 3 TO 28 AS SHOWN ON SAID PLAN 4966 W.L.T.O. IN RL 2 TO 5, PARISH OF ST. BONIFACE

ENCUMBRANCES:

INSTRUMENT NUMBERED 5663918/1 IS REGISTERED AGAINST THE ABOVE CERTIFICATE OF TITLE. ENCUMBRANCES NOTED HEREIN ARE PROVIDED FOR INFORMATION ONLY AND HAVE NOT BEEN INVESTIGATED AS TO THEIR INTENT OR EXTENT.

LEGEND

Survey monuments found on the ground are described and shown thus: O

Property Lines and Dimensions: 100,000

Curbs and Gutters: CURB, GUTTER

Fences: OR

Manholes (Colour varies by Utility):

Catch Basins: Guy Wire Anchors

Curb Inlets: Street and Traffic Signs

Fire Hydrants: Deciduous Trees

Water Valves: Coniferous Trees

Street Lights: Shrubs

Traffic Lights: Guard Posts

Power Poles: Flag Poles

Power Poles with Light: Gas Meter

Land Drainage Sewer: LBS

Waste Water Sewer: WWS

Watermain: WM

Natural Gas Line: GAS

Telephone Cables (overhead): TEL/OH

Telephone Cables (underground): TEL/UG

Hydro Cables (overhead): HYO/OH

Hydro Cables (underground): HYO/UG

Fibre Optic Cables: FOC

Traffic Signal Cables: TS

NOTES

All dimensions are in metres and may be converted to feet by multiplying by 3.28084.
Elevations are referred to Geodetic Datum and are indicated thus: - - - - -
For Geodetic Elevations add 200.0 to all elevations shown.
Elevations are referred to Can-Net Benchmark MB_Winnipeg_Wes, Elevation = 241.423 (CGVD28).
Invert elevations are from the City of Winnipeg data.

Locations of underground structures as shown are based on the best information available, as provided by the City of Winnipeg's Underground Structures Department and Accurate Underground Utility Locating Ltd., but no guarantee is given that all existing utilities are shown or that the given locations are exact.

Confirmation of existence and exact location of all services must be obtained from the individual utilities before proceeding with construction.

This survey was made between the 26th and 27th days of September, 2024.

SHOULD INFORMATION ON THE DIGITAL FILE DIFFER FROM THE INFORMATION SHOWN ON THE ORIGINAL HARD COPY, AS PROVIDED BY OUR FIRM, THE LATTER WILL GOVERN.

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THIS DOCUMENT IS NOT VALID UNLESS ORIGINALLY SIGNED AND SEALED BY THE MANITOBA LAND SURVEYOR

JASON A. CROSSLEY, M.L.S.
DATED THIS 6th DAY OF NOVEMBER, 2024

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SITE MAP

FILE: 24-1127
DWG: 24-1127-2-TOPO
FB: B&D 1563-125, 129/131

AN