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MEMORANDUM

Date: 06/17/2025

To: City of Urbandale

From: Ryan Benjegerdes, PE, CFM

Subject: Preliminary Stormwater Management Assumptions
Downtown Master Plan
Project No.: OT6.133774

The following memo lists the assumptions made in creating a high-level estimate of the detention required for the Downtown Urbandale Master Plan, as well as the methodology behind the modeling. It was agreed upon with the client that the proposed concept for the Urbandale Downtown Master Plan would need to meet current local stormwater requirements for a new development. The City of Urbandale requested that the 100-year proposed release rate would have to meet the pre-settlement 100-year release rate instead of the existing 5-year release rate. The following model and descriptions in this report were based on a representative concept-level alternative. It is noted that the proposals in this project and report may not exactly match what is built or required in the future. Therefore, general assumptions were made regarding the proposed requirements and conditions.

To fulfill the city requirements, a model was made for each of the following conditions: pre-settlement and proposed. Each watershed was delineated based on their individual block faces and publicly available LiDAR. The hydrology for the watersheds was determined by using the TR-55 method; a minimum of 10 minutes was used for the smaller and mostly impervious watersheds. The times of concentration across all modeled conditions were calculated to be between 10 and 23 minutes. For all modeled conditions, the SCS Curve Number (CN) method was used to compute rainfall losses. For the pre-settlement conditions, a CN of 58 was assigned to represent meadow in good condition for NRCS Type B Hydrologic Soil. For the proposed conditions, the CN was determined using the concept-level alternative to estimate impervious percentage of each block face and the USDA Soil Survey Data. Once all the necessary models were created, the storage volumes to meet the allowable release rates were determined for each block face. The required volume was used to determine the area, depth and relative location of each storage area.

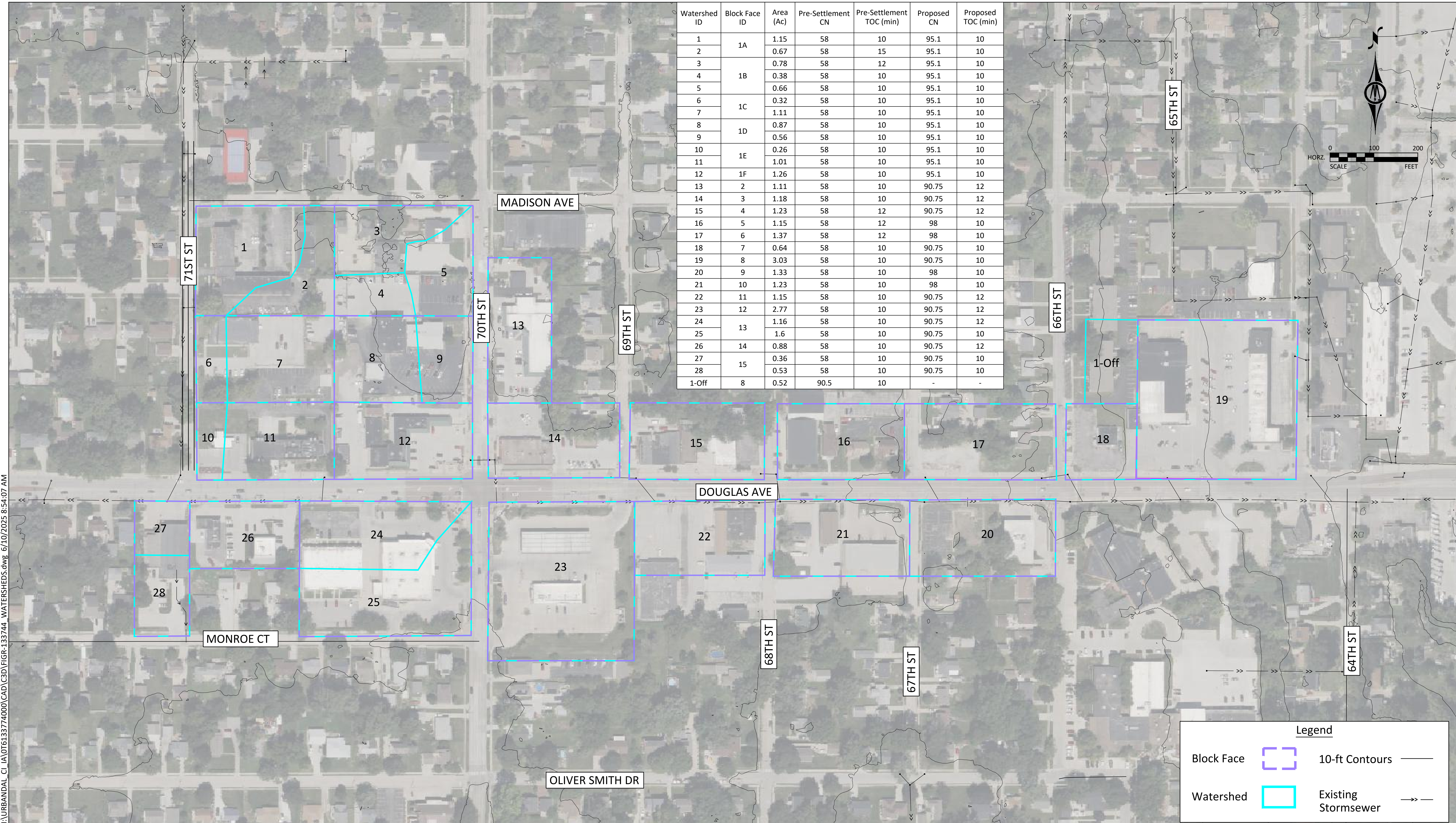
The results and assumptions are summarized in the following table.

Table 1: Summary of Assumptions and Results

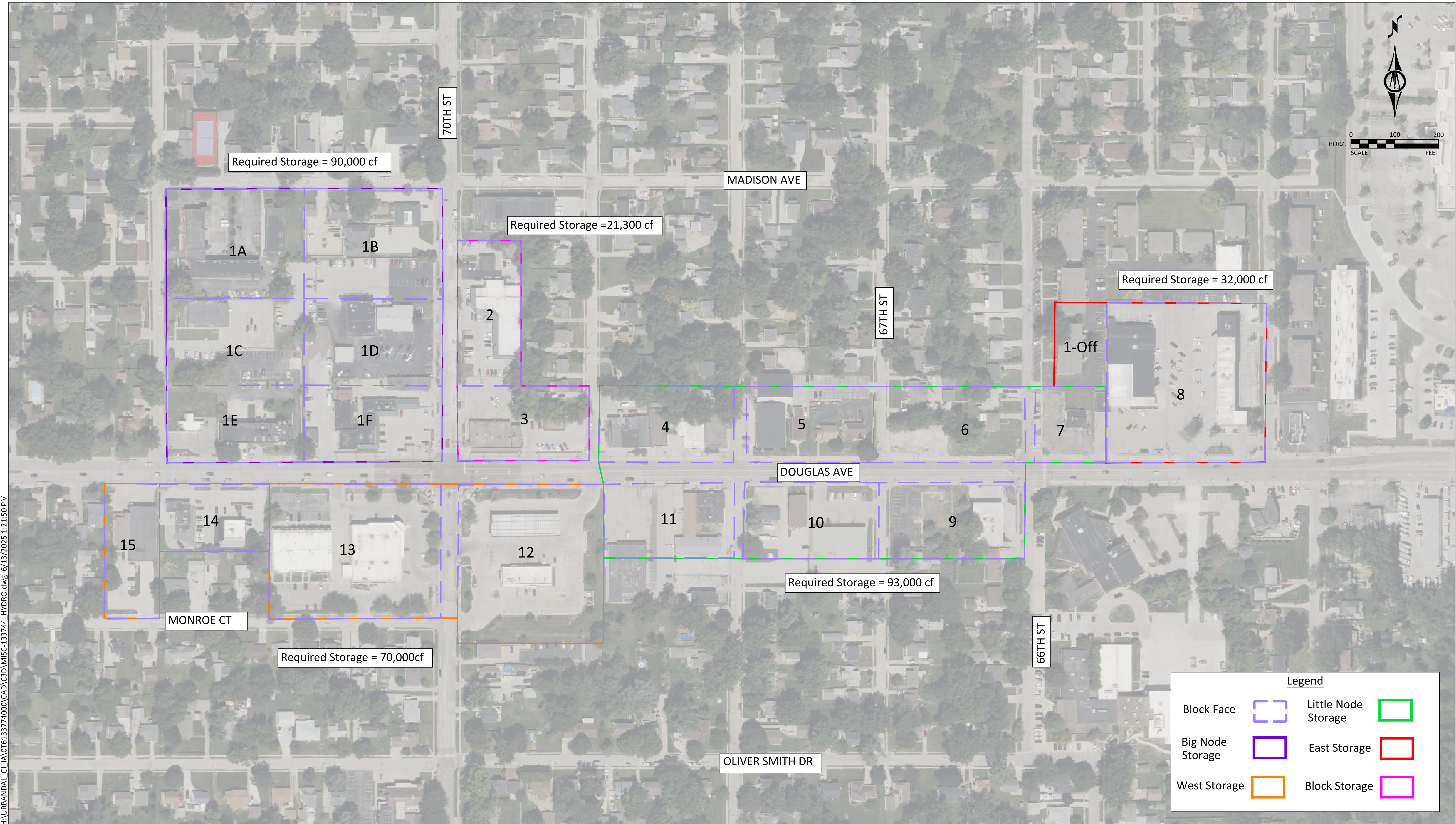
Block Face ID	Watershed Area (Acres)	Allowable Release Rate (cfs)	100-year Uncontrolled Release Rates (cfs)	Estimated Volume Required (ft ³)
1A – 1F	9.03	34.39	82.89	90,000
2	1.11	4.33	9.14	9,460
3	1.18	4.61	9.72	11,710
4	1.23	4.43	10.14	14,760
5	1.15	4.15	10.73	13,460
6	1.37	4.94	12.75	17,545
7	0.64	2.50	5.67	6,060
8	3.03	16.53 ⁽¹⁾	29.57 ⁽¹⁾	31,470
9	1.33	5.21	12.39	15,110
10	1.23	4.81	11.44	13,950
11	1.15	4.51	9.51	11,460
12	2.77	10.85	23.70	25,590
13	2.76	10.78	23.57	26,670
14	0.88	3.46	7.29	8,780
15	0.89	3.48	7.87	8,420

(1) This flow also contains the flow from the off-site watershed shown in the figures attached.

It is important to note that the required detention volume and release rates presented in this project are subject to change during the final design. The purpose of this plan is to create a preliminary stormwater management plan and concept for what will be implemented in the future. In the final design phase, this memo and preliminary concept may serve as an initial baseline, but the exact numbers that are derived from the final design should be used.

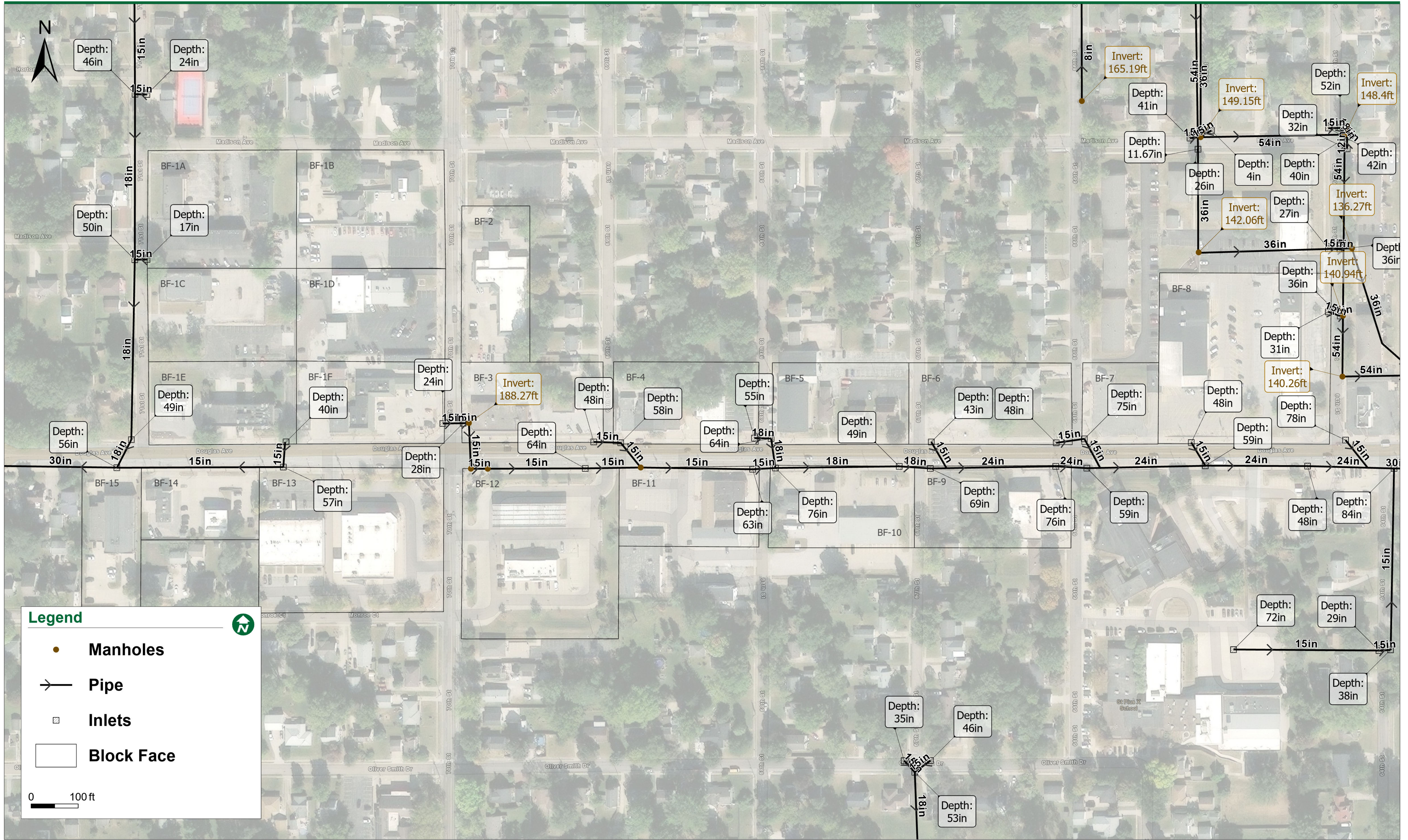


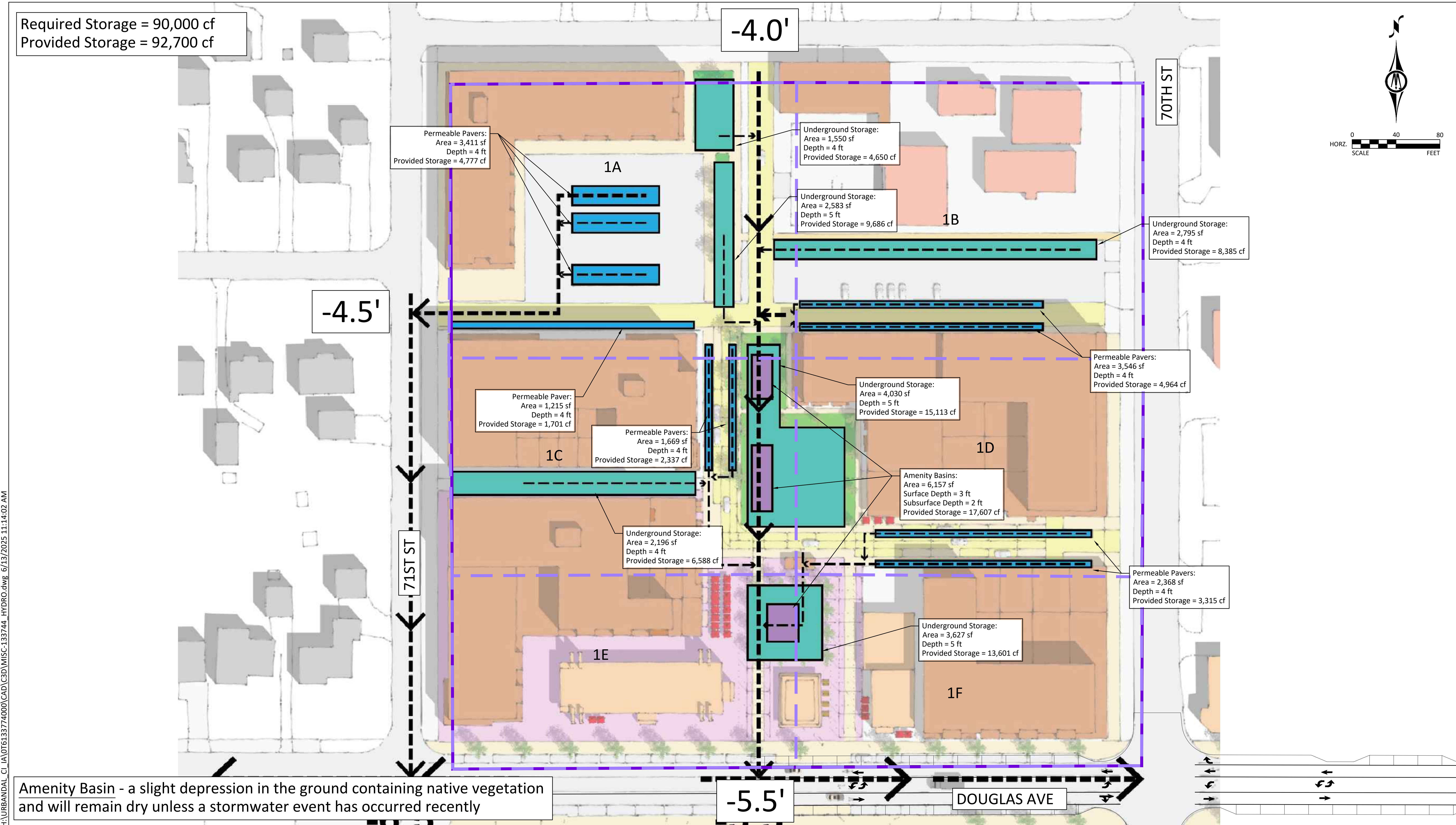
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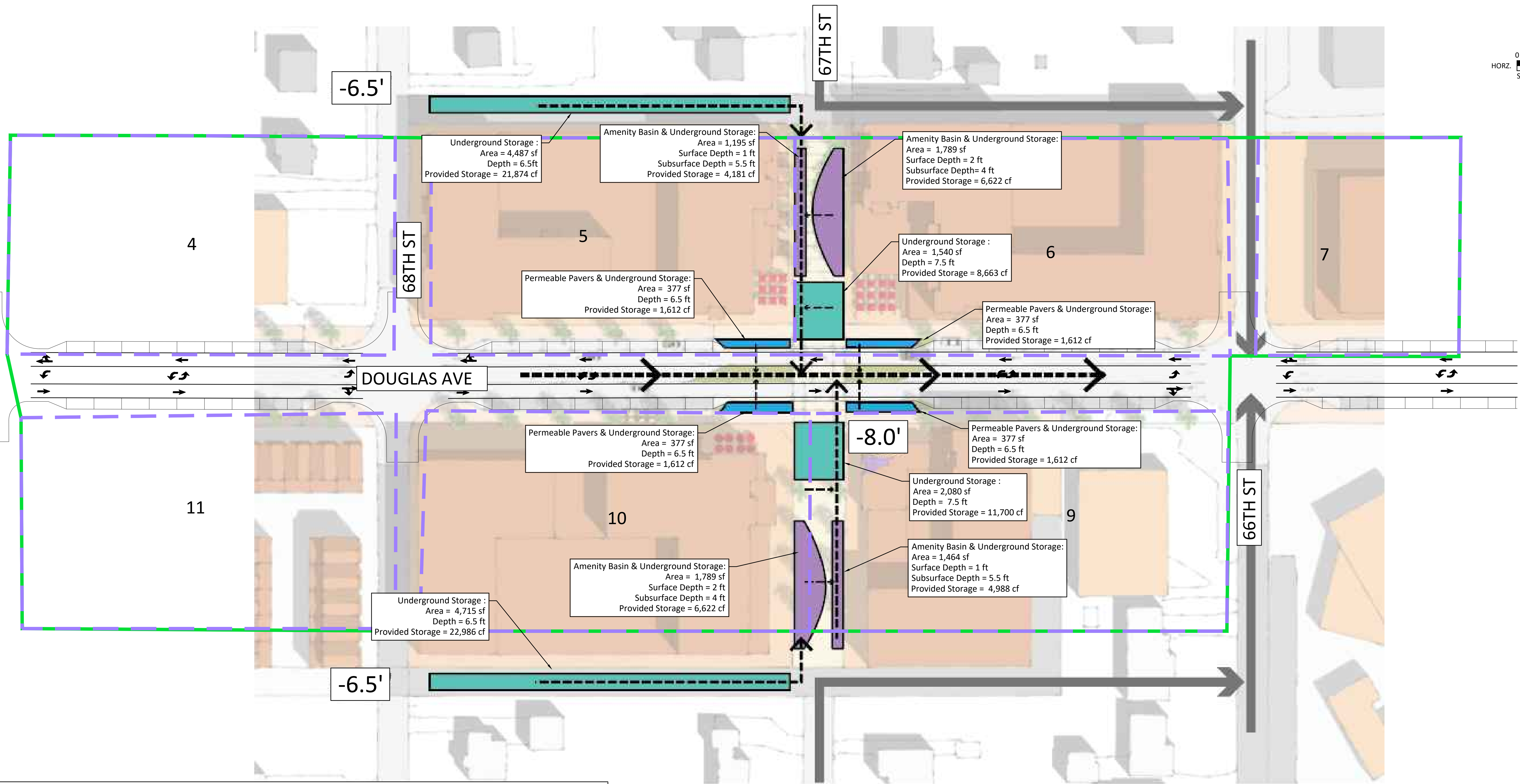
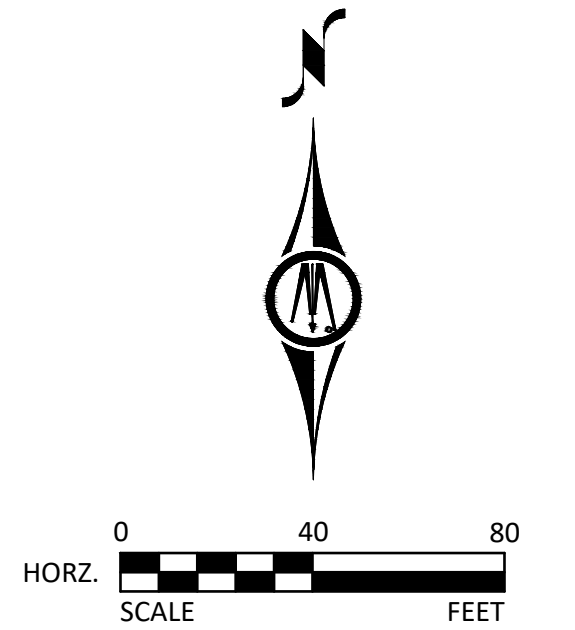
Legend		
Block Face		Little Node Storage
Big Node Storage		East Storage
West Storage		Block Storage





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Required Storage = 93,000 cf
 Provided Storage = 94,083 cf



Amenity Basin - a slight depression in the ground containing native vegetation and will remain dry unless a stormwater event has occurred recently

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