

CITY OF ALBUQUERQUE

Planning Department
Alan Varela, Director



Mayor Timothy M. Keller

May 1, 2023

Lauren A. Nuffer, P.E.
Kimley-Horn and Associates, Inc.
1100 W Town and Country Rd., Suite 700
Orange, CA 92868

RE: Starbucks - Wyoming Blvd. NE
Grading Plan and Drainage Report
Engineer's Stamp Date: 03/31/23
Hydrology File: H20D003E

Dear Ms. Nuffer:

Based upon the information provided in your submittal received 03/31/2023, the Grading Plan and Drainage Report are approved for Building Permit and Grading Permit. Please attach a copy of this approved plan in the construction sets for Building Permit processing along with a copy of this letter.

PO Box 1293

PRIOR TO CERTIFICATE OF OCCUPANCY:

Albuquerque

1. Engineer's Certification, per the DPM Part 6-14 (F): *Engineer's Certification Checklist For Non-Subdivision* is required.
2. Please provide the executed paper Drainage Covenant (latest revision) printed on one-side only with Exhibit A and a check for **\$25.00** made out to "**Bernalillo County**" for the detention pond per Article 6-15(C) of the DPM to Hydrology for review at Plaza de Sol.

NM 87103

www.cabq.gov

As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Dough Hughes, PE, jhughes@cabq.gov, 924-3420) 14 days prior to any earth disturbance.

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov.

Sincerely,

Renée C. Brissette, P.E. CFM
Senior Engineer, Hydrology
Planning Department



City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 10/2018)

Project Title: _____ **Building Permit #:** _____ **Hydrology File #:** _____

DRB#: _____ **EPC#:** _____ **Work Order#:** _____

Legal Description: _____

City Address: _____

Applicant: _____ **Contact:** _____

Address: _____

Phone#: _____ **Fax#:** _____ **E-mail:** _____

Other Contact: _____ **Contact:** _____

Address: _____

Phone#: _____ **Fax#:** _____ **E-mail:** _____

TYPE OF DEVELOPMENT: _____ PLAT (# of lots) _____ RESIDENCE _____ DRB SITE _____ ADMIN SITE

IS THIS A RESUBMITTAL? _____ Yes _____ No

DEPARTMENT: _____ TRAFFIC/TRANSPORTATION _____ HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

- _____ ENGINEER/ARCHITECT CERTIFICATION
- _____ PAD CERTIFICATION
- _____ CONCEPTUAL G & D PLAN
- _____ GRADING PLAN
- _____ DRAINAGE MASTER PLAN
- _____ DRAINAGE REPORT
- _____ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
- _____ ELEVATION CERTIFICATE
- _____ CLOMR/LOMR
- _____ TRAFFIC CIRCULATION LAYOUT (TCL)
- _____ TRAFFIC IMPACT STUDY (TIS)
- _____ OTHER (SPECIFY) _____
- _____ PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- _____ BUILDING PERMIT APPROVAL
- _____ CERTIFICATE OF OCCUPANCY
- _____ PRELIMINARY PLAT APPROVAL
- _____ SITE PLAN FOR SUB'D APPROVAL
- _____ SITE PLAN FOR BLDG. PERMIT APPROVAL
- _____ FINAL PLAT APPROVAL
- _____ SIA/ RELEASE OF FINANCIAL GUARANTEE
- _____ FOUNDATION PERMIT APPROVAL
- _____ GRADING PERMIT APPROVAL
- _____ SO-19 APPROVAL
- _____ PAVING PERMIT APPROVAL
- _____ GRADING/ PAD CERTIFICATION
- _____ WORK ORDER APPROVAL
- _____ CLOMR/LOMR
- _____ FLOODPLAIN DEVELOPMENT PERMIT
- _____ OTHER (SPECIFY) _____

DATE SUBMITTED: _____ **By:** _____

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

LEGAL DESCRIPTION

A lease site lying and situate within parcel five-A (5-A) of the plat of parcels 1-A, 1-B, and 4-A & 5-A of Wyoming Mall, Albuquerque, Bernalillo County, New Mexico, being a replat of parcels one (1), four (4) and five (5) of the Wyoming Mall comprising a portion of block "A", Snow Heights addition to the city of Albuquerque, Bernalillo County, New Mexico, as same is shown and designated on the replat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico, on April 2, 2007, in Plat Book 2007C, Page 80, as Document No. 2007049612.

FINAL DRAINAGE REPORT
FOR
Starbucks Wyoming Blvd

Lease Site of Parcel 5-A

Wyoming Mall

Albuquerque, NM 87112

April 26, 2023

PREPARED FOR:

WESTWOOD FINANCIAL

10877 WILSHIRE BLVD, SUITE 1105

LOS ANGELES, CA 90024

PREPARED BY:

KIMLEY-HORN

1201 THIRD AVENUE, SUITE 2800

SEATTLE, WA 98101

OFFICE: (206) 667-8610

KHA PROJECT #: 090100000

City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED

DATE: 05/01/23

BY: *Renée C. Brissette*

HydroTrans # H20D003E

THE APPROVAL OF THESE PLANS/REPORT SHALL NOT BE
CONSTRUED TO PERMIT VIOLATIONS OF ANY CITY
ORDINANCE OR STATE LAW, AND SHALL NOT PREVENT
THE CITY OF ALBUQUERQUE FROM REQUIRING
CORRECTION, OR ERROR OR DIMENSIONS IN PLANS,
SPECIFICATIONS, OR CONSTRUCTIONS. SUCH APPROVED PLANS
SHALL NOT BE CHANGED, MODIFIED OR ALTERED WITHOUT
AUTHORIZATION.



03/31/2023

Kimley»Horn
Expect More. Experience Better.

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Disclosure Statement:

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EXECUTIVE SUMMARY

The project is located in the City of Albuquerque at the northeast corner of the intersection of Wyoming Blvd NE and Northeastern Blvd NE. Current zoning is Mixed Use, Medium Density (MX-M), which aligns with what is proposed for the project. Historically, the Site was developed as a Furr's Buffet and Fresh Restaurant with parking that was recently demolished. In the interim condition, the Site is a mass graded lot with two catch basins along the southern property line. Current zoning is Mixed Use, Medium Density (MX-M), which aligns with what is proposed for the project. Proposed improvements consist of the construction of a new 2,500 SF building with drive-thru, parking lot, and associated improvements. The project will not cause an increase in impervious cover when compared to the historical developed conditions and will thus generate no additional stormwater runoff. After project completion, drainage patterns, point of discharge, and stormwater storage volume will match historical conditions.

INTRODUCTION

PURPOSE AND SCOPE OF STUDY

The purpose of this Final Drainage Report (FDR) is to provide the hydrologic and hydraulic calculations and to document and finalize the drainage design methodology in support of the proposed Starbucks Restaurant ("the Site"). The Site is located within the jurisdictional limits of City of Albuquerque ("the City").

PROJECT REQUIREMENTS

The Site was designed in accordance with the City of Albuquerque's Development Process Manual ("DPM") Chapter 6 (*Drainage, Flood Control, and Erosion Control*), Part 6-2(A) (*Procedure for 40 Acre and Smaller Basins*), and Part 6-12 (*Stormwater Quality and Low-Impact Development*). These sections state that the principal design storm is the 100-year event, and that stormwater quality must be provided for redevelopment of existing sites.

All proposed stormwater improvements onsite are private and are proposed to tie to an existing public storm system in the Northeastern Blvd NE Right-of-Way and the private drive to the east. The Site was historically developed with a restaurant use and recently demolished. The Site is currently in an interim condition and is a part of a retail development which defines drainage patterns and stormwater detention for the whole development.

PROJECT DESCRIPTION

LOCATION

The Site is located northeast of the intersection of Wyoming Blvd NE and Northeastern Blvd NE. Historically, the Site was developed as a Furr's Buffet Fresh Restaurant and located in existing retail development Wyoming Mall. With recent demolition of the Site, it is in an interim condition of a mass graded lot. Refer to **Appendix A** for the Vicinity Map.

BACKGROUND DOCUMENTS

PLANNING HISTORY

The Site, in its historical condition, was developed and contained a Furr's Buffet Fresh Restaurant. It is zoned Mixed Use, Medium Density (MX-M). Current zoning and use align with what is proposed for the Site. The City of Albuquerque has provided copies of records for every approved site plan. Based on this information, the Site has historically always been a restaurant use.

DRAINAGE HISTORY AND RELATED DOCUMENTS

The Site and associated retail development historically use a combination of surface and private storm drain conveyance to the southwest corner of the site. No documentation was found by the owner and tenant of the retail development or the City detailing a former drainage analysis or a master drainage plan, so assumptions were used to determine existing conditions and mitigation required to provide equivalent storage capacity. Refer to **Existing Conditions** for more details on the assumptions that were made during analysis.

EXISTING CONDITIONS

SITE INVESTIGATION

In the historical condition, the Site was fully developed, containing a 11,637 SF building with associated parking and landscaping. The majority of the site historically surface flows to the south to two existing inlets on the Site and a minimal amount flows offsite to the northwest. The historical and interim condition runoff is captured in two inlets on the southwest and southeast sides of the Site. The two inlets are connected via underground storm. Runoff from the Site is collected in underground storm that flows south and connects to an existing system in Northeastern Blvd NE. This system then flows west, and connects to the main storm system in Wyoming Blvd NE. The site is located in precipitation zone 3 per the City of Albuquerque's Development Process Manual.

Form of Analysis

Compared to the historical condition, the proposed development reduces the amount of impervious cover to the project area and decreases the peak discharge leaving the site, refer to **Table 1 - Existing vs Post Development Peak Discharge**.

Stormwater quality is accommodated for the amount of impervious cover being proposed. Per the DPM, the required volume is lower for redeveloped sites than entirely new development.

The Rational Method was used to check existing peak stormwater discharge.

Downstream Capacity

Historically, the point of discharge onsite is an existing catch basin and is conveyed through an existing 24" to an existing 78" storm line in Northeast Blvd NE. The point of discharge will not be changed with the proposed development, and no additional impervious cover is proposed with this project. No adverse effects are anticipated downstream as a result of this development.

DEVELOPED CONDITIONS

ONSITE

Proposed improvements consist of a new 2,500 SF building with drive thru, parking lot, and associated improvements. The proposed site will maintain the historic drainage patterns, utilizing surface conveyances from north to south towards Northeastern Blvd NE. Runoff will be captured in replaced catch basins on the southwest and southeast sides of the site and conveyed through the existing 24" storm line into Northeastern Blvd NE. A catch basin on the north side of the site will capture runoff and connect to the existing catch basin and 30" storm line in the private drive to the east that ultimately connects to the storm lines in Northeast Blvd NE. See **Appendix A and C** for existing 24" and 30" pipe outfall locations.

OFFSITE

The proposed development includes offsite work to connect to existing infrastructure.

CALCULATIONS

The peak discharge generated by the site was determined in existing and post development conditions using the rational method. The site is located in precipitation zone 3 and a 100-year, 12-minute storm was used to determine the peak discharge from the site see **Table 1 - Existing vs Post Development Peak Discharge** for calculations. The proposed inlets, pipes and bioretention pond onsite have been sized to contain the 100-year, 60-minute storm event based on the Peak Discharge Rate found in the City of Albuquerque's Development Process Manual Chapter 6 (*Drainage, Flood Control, and Erosion Control*), Part 6-3(A) (*Procedure for 40 Acre and Smaller Basins*).

TABLE 1 – EXISTING VS POST DEVELOPMENT PEAK DISCHARGE

Existing Peak Discharge						
Land Condition	Land Treatment	Area [A]		Intensity [I]	Coefficient [C]	Peak Discharge [Q]
		SF	Acre	in/hr	CSF/Acre	CFS
Pavement/Building (D)	98	37,400	0.86	4.96	0.83	4.00
Landscape (C)	86	6,981	0.16	4.96	0.14	0.38
		44,381	1.02			4.38
Post-Development Peak Discharge						
Land Condition	Land Treatment	Area [A]		Intensity [I]	Coefficient [C]	Peak Discharge [Q]
		SF	Acre	in/hr	CSF/Acre	CFS
Pavement/Building (D)	98	24,646	0.57	4.96	0.60	3.13
Landscape (C)	86	12,803	0.29	4.96	0.31	0.51
Infiltration (A)	77	6,932	0.16	4.96	0.03	0.59
		44,381	1.02			3.64

In addition to matching or lowering peak discharge from the site, stormwater quality is also required. Because this site is a redevelopment and significant impervious cover is present in existing conditions, the calculations for required SWQV are as follows:

$$SWQV (ac - ft) = \frac{A_{impervious} (ac) \times 0.26 (in)}{12 \left(\frac{in}{ft} \right)}$$

With the proposed 0.57 acres of impervious cover being proposed, the total SWQV that must be accommodated is 0.01 ac-ft or 534 cubic feet. The proposed bioretention pond along the northern property line has been designed to infiltrate approximately 1,458 cubic feet of stormwater runoff.

The proposed development will decrease the amount of impervious cover when compared to the existing conditions and will thus decrease the peak discharge generated by the site.

Refer to **Appendix B** for all calculations.

CONCLUSION

The proposed development will maintain the historic drainage patterns, point of discharge, and stormwater storage volume. The proposed development will decrease the amount of impervious cover when compared to the existing conditions and will thus decrease the peak discharge generated by the site. The site will continue to drain south towards Northeastern Blvd NE. Any offsite flows entering the site parking lot via the northwest curb cut will continue to do so. No adverse effects are anticipated downstream as a result of this development.

REFERENCES

1. City of Albuquerque "Development Process Manual" (DPM) dated June 2020.

APPENDIX A: MAPS

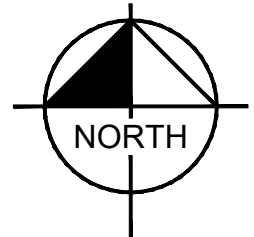
VICINITY MAP



Vicinity Map

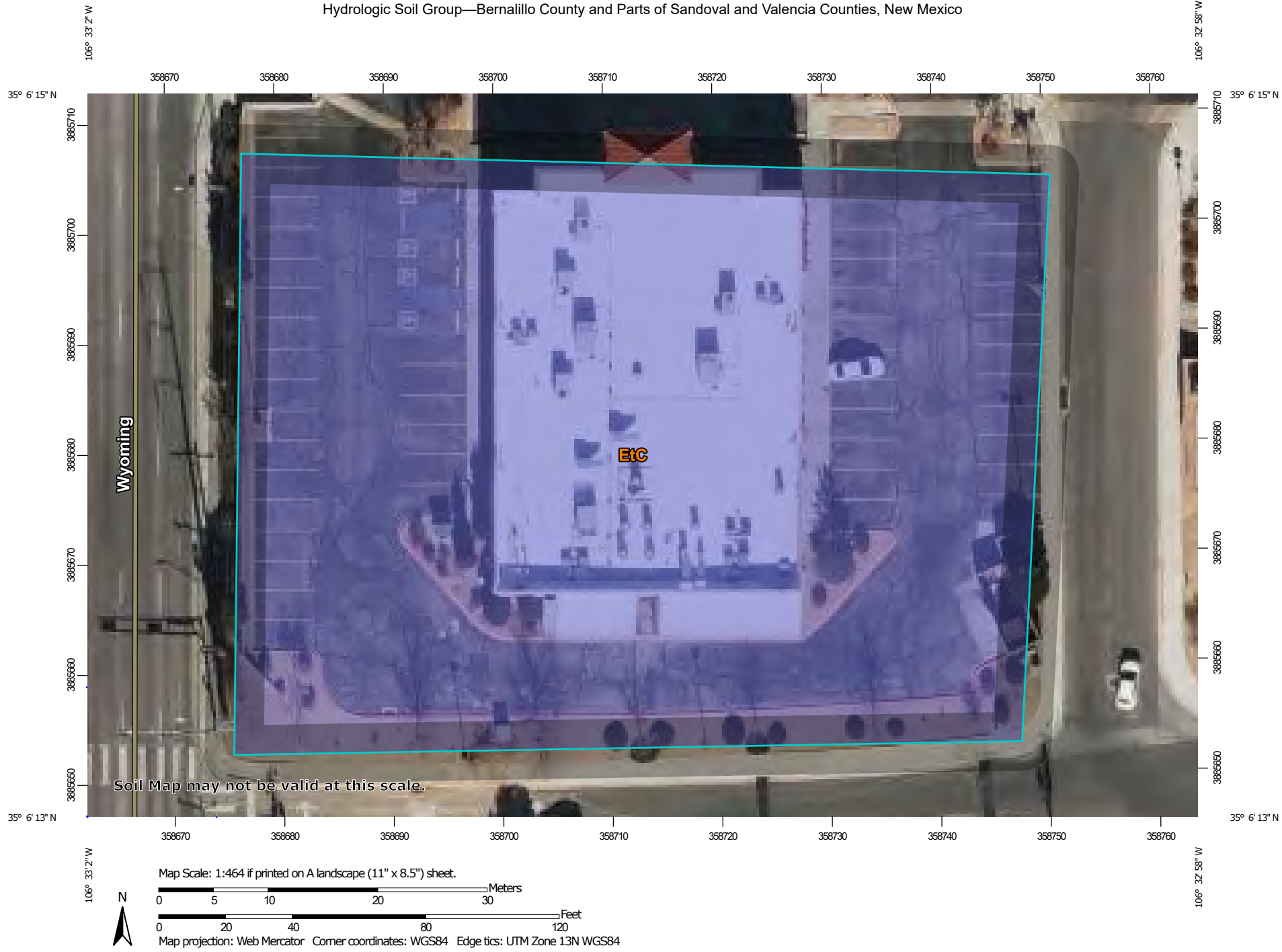
NTS

DATE OF AERIAL: 03/27/2023



HYDROLOGIC SOIL GROUP MAP

Hydrologic Soil Group—Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico



Map Scale: 1:464 if printed on A landscape (11" x 8.5") sheet.

0 5 10 20 30 Meters

0 20 40 80 120 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
 Survey Area Data: Version 17, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes	B	1.0	100.0%
Totals for Area of Interest			1.0	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

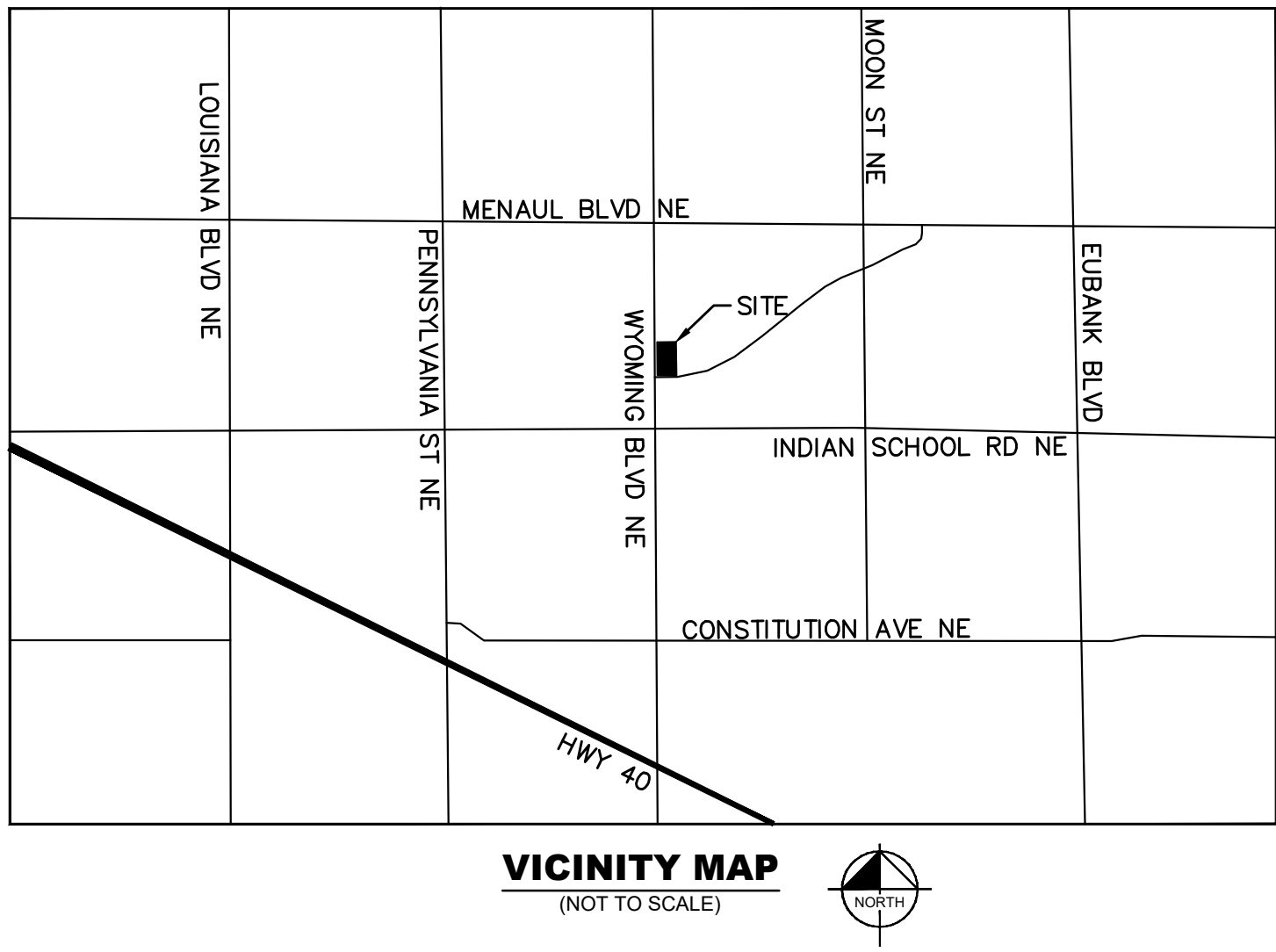
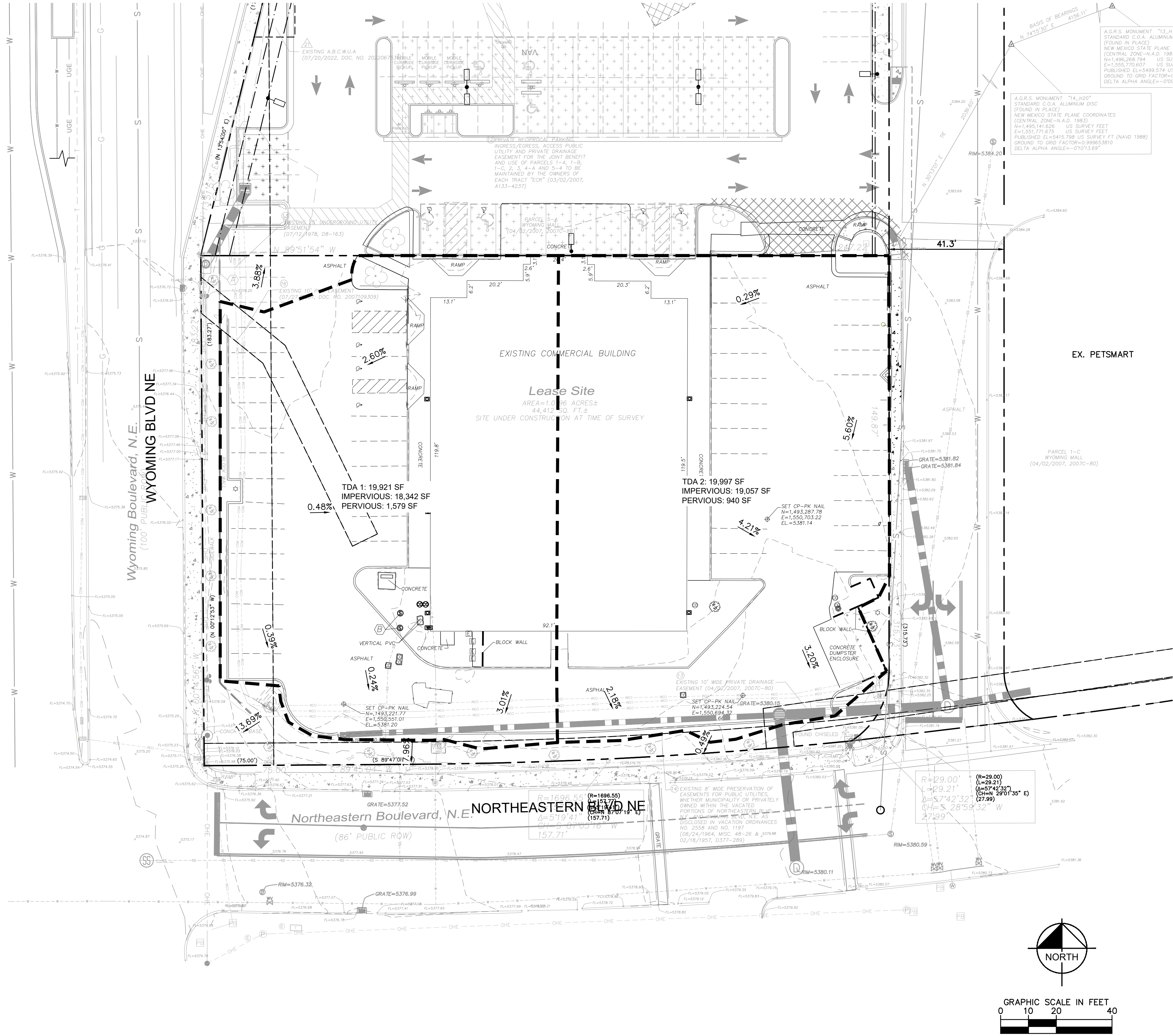
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

PRE-DEVELOPMENT THRESHOLD DISCHARGE AREAS MAP

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KIMLEY-HORN		KIMLEY-HORN AND ASSOCIATES, INC. 1201 3RD AVE SUITE 2500, SEATTLE, WA 98101 PHONE: (206) 970-1900 WWW.KIMLEY-HORN.COM	
PRE-DEVELOPMENT DRAINAGE AREAS		QUICK SERVE RESTAURANT	
ALBUQUERQUE, NM 87112		2004 WYOMING BLVD NE	
SHEET NUMBER		C0	
KHA PROJECT		DATE 04/25/2023	
LICENSED PROFESSIONAL		SCALE AS SHOWN	
		DESIGNED BY NW	
		DRAWN BY NW	
		CHECKED BY LW	
		DATE:	
		REVISIONS	
		BY	
		DATE	

POST-DEVELOPMENT THRESHOLD DISCHARGE AREAS MAP

WYOMING BLVD NE

NORTHEASTERN BLVD NE

QUICK SERVE RESTAURANT
2,260 SF
FFE: 5382.75
TDA 6: 2498 SF

TDA 1: 14,772 SF
IMPERVIOUS: 10,771 SF
PERVIOUS: 4,001 SF

TDA 2: 2,749 SF
IMPERVIOUS: 1,319 SF
PERVIOUS: 1,430 SF

TDA 3: 7,922 SF
IMPERVIOUS: 7,521 SF
PERVIOUS: 401 SF

TDA 4: 4183 SF
IMPERVIOUS: 1399 SF
PERVIOUS: 2784 SF

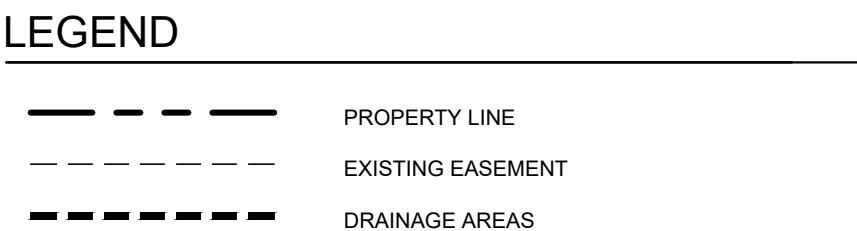
TDA 5: 5,273 SF
IMPERVIOUS: 3,856 SF
PERVIOUS: 1,417 SF

Lease Site
TDA 3: 7,922 SF
IMPERVIOUS: 7,521 SF
PERVIOUS: 401 SF

EX. PETSMART

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH



LEGEND

PROPERTY LINE
EXISTING EASEMENT
DRAINAGE AREAS

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1201 3RD AVE SUITE 2500, SEATTLE, WA 98101
PHONE: (206) 970-1900
WWW.KIMLEY-HORN.COM

POST-DEVELOPMENT DRAINAGE AREAS

QUICK SERVE RESTAURANT

SHEET NUMBER

C1

2004 WYOMING BLVD NE
ALBUQUERQUE, NM 87112



APPENDIX B: CALCULATIONS

EXISTING AND PROPOSED PEAK DISCHARGE

Zone 3			
duration		Depth	100-yr intensity (in/hr)
5	min	0.584	7.01
10	min	0.889	5.33
12	min	-	4.96
15	min	1.1	4.4
30	min	1.48	2.96
60	min	1.84	1.84
2	hr	2.15	1.08
3	hr	2.22	0.74
6	hr	2.43	0.41
24	hr	2.84	0.12

Excess Precipitation & Volumetric Runoff

Proposed Conditions Option 1
Drive Isles are paved
Zone 3

	Land Treatment (Table 6.2.13)			
	A	B	C	D
Site Area	0.67	0.86	1.09	2.58
A _A =	0			
A _B =	0			
A _C =	0.40			
A _D =	0.62			

Total: 1.02 acres

Weighted Excess Precipitation, E

EQUATION 6.1 **Weighted E** =
$$\frac{E_A A_A + E_B A_B + E_C A_C + E_D A_D}{A_A + A_B + A_C + A_D}$$

E= 2.00 inches
100-yr, 6-hr Volume = 0.17 acre-ft
7,386 cu. ft

Land Treatments

Existing Conditions

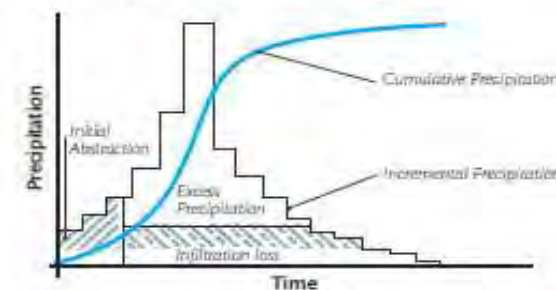
Treatment = D

Proposed Conditions

Treatment = D

Percent Imp - Light Industrial 70

FIGURE 6.2.4 Precipitation and Time



The 6-hour excess precipitation, E, by zone and treatment is summarized in [TABLE 6.2.13](#).

TABLE 6.2.13 6-hour Excess Precipitation, 'E'

Zone	Land Treatment			
	A	B	C	D
100-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.55	0.73	0.95	2.24
2	0.62	0.80	1.03	2.33
3	0.67	0.86	1.09	2.58
4	0.76	0.95	1.20	3.34
2-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.00	0.01	0.13	0.92
2	0.00	0.02	0.16	0.98
3	0.00	0.05	0.19	1.05
4	0.00	0.28	0.87	1.39
10-YEAR EXCESS PARTICIPATION, E (IN)				
1	0.11	0.26	0.43	1.43
2	0.15	0.30	0.48	1.51
3	0.18	0.34	0.52	1.64
4	0.25	0.41	0.59	2.15

To determine the volume of runoff:

1. Determine the area in each treatment, A_A, A_B, A_C, A_D.
2. Compute the weighted excess precipitation, E.

Project Name: Starbucks Wyoming Blvd

Project Number: 90100000

Per : DPM Chapter 6, Section 6-2(A)(5)

Input Cells

The peak discharge rate is given in [TABLE 6.2.14](#) for small watersheds, less than or equal to 40 acres, where the time of concentration is assumed to be 12 minutes.

TABLE 6.2.14 Peak Discharge				
Zone	Land Treatment			
	A	B	C	D
100-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	1.54	2.16	2.87	4.12
2	1.71	2.36	3.05	4.34
3	1.84	2.49	3.17	4.49
4	2.09	2.73	3.41	4.78
2-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	0.00	0.02	0.50	1.56
2	0.00	0.08	0.61	1.66
3	0.00	0.15	0.71	1.73
4	0.00	0.28	0.87	1.88
10-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	0.30	0.81	1.46	2.57
2	0.41	0.95	1.59	2.71
3	0.51	1.07	1.69	2.81
4	0.70	1.28	1.89	3.04

To determine the peak rate of discharge,

1. Determine the area in each treatment, A_A , A_B , A_C , A_D
2. Multiply the peak rate for each treatment by the respective areas and sum to compute the total Q_p .

EQUATION 6.6
$$\text{Total } Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$$

Existing Project Site Q_p

Basin EX

Assumptions:

t_c is 12 minutes

100-yr Peak Discharge (CFS/ACRE)

Site is in Zone 3 Per Table 6.2.14

Zone	Land Treatment			
	A	B	C	D
3	1.84	2.49	3.17	4.49

Eq 6.6:

Existing Storm_South (DA 1)

$Q_{PA} =$	1.84	cfs/ac
$A_A =$	0.00	acres
$Q_{PB} =$	2.49	cfs/ac
$A_B =$	0.00	acres
$Q_{PC} =$	3.17	cfs/ac
$A_C =$	0.03	acres
$Q_{PD} =$	4.49	cfs/ac
$A_D =$	0.87	acres

Total $Q_p =$ 4.00 cfs

Total $Q_p =$ 4.38 cfs

Bypass (DA 2)

$Q_{PA} =$	1.84	cfs/ac
$A_A =$	0	acres
$Q_{PB} =$	2.49	cfs/ac
$A_B =$	0	acres
$Q_{PC} =$	3.17	cfs/ac
$A_C =$	0.12	acres
$Q_{PD} =$	4.49	cfs/ac
$A_D =$	0.00	acres

Total $Q_p =$ 0.38 cfs

Project Name: Starbucks Wyoming Blvd
 Project Number: 90100000

Per : DPM Chapter 6, Section 6-2(A)(5)

Input Cells

The peak discharge rate is given in [TABLE 6.2.14](#) for small watersheds, less than or equal to 40 acres, where the time of concentration is assumed to be 12 minutes.

TABLE 6.2.14 Peak Discharge				
Zone	Land Treatment			
	A	B	C	D
100-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	1.54	2.16	2.87	4.12
2	1.71	2.36	3.05	4.34
3	1.84	2.49	3.17	4.49
4	2.09	2.73	3.41	4.78
2-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	0.00	0.02	0.50	1.56
2	0.00	0.08	0.61	1.66
3	0.00	0.15	0.71	1.73
4	0.00	0.28	0.87	1.88
10-YEAR PEAK DISCHARGE (CSF/ACRE)				
1	0.30	0.81	1.46	2.57
2	0.41	0.95	1.59	2.71
3	0.51	1.07	1.69	2.81
4	0.70	1.28	1.89	3.04

To determine the peak rate of discharge:

1. Determine the area in each treatment: A_A , A_B , A_C , A_D .
2. Multiply the peak rate for each treatment by the respective areas and sum to compute the total Q_p .

EQUATION 6.6 $\text{Total } Q_p = Q_{pA}A_A + Q_{pB}A_B + Q_{pC}A_C + Q_{pD}A_D$

Proposed Project Site Q_p

Assumptions:

t_c is 12 minutes

100-yr Peak Discharge (CFS/ACRE)

Site is in Zone 3

Per Table 6.2.14

Zone	Land Treatment			
	A	B	C	D
3	1.84	2.49	3.17	4.49

Eq 6.6: Proposed Storm_South (DA 1)

$Q_{pA} = 1.84$ cfs/ac
 $A_A = 0$ acres
 $Q_{pB} = 2.49$ cfs/ac
 $A_B = 0$ acres
 $Q_{pC} = 3.17$ cfs/ac
 $A_C = 0.13$ acres
 $Q_{pD} = 4.49$ cfs/ac
 $A_D = 0.57$ acres

Total $Q_p = 2.97$ cfs

TOTAL 3.13 cfs

Bypass (DA 2)

$Q_{pA} = 1.84$ cfs/ac
 $A_A = 0$ acres
 $Q_{pB} = 2.49$ cfs/ac
 $A_B = 0$ acres
 $Q_{pC} = 3.17$ cfs/ac
 $A_C = 0.16$ acres
 $Q_{pD} = 4.49$ cfs/ac
 $A_D = 0.00$ acres

Total $Q_p = 0.51$ cfs

Infiltration (DA 3)

$Q_{pA} = 1.84$ cfs/ac
 $A_A = 0$ acres
 $Q_{pB} = 2.49$ cfs/ac
 $A_B = 0$ acres
 $Q_{pC} = 3.17$ cfs/ac
 $A_C = 0.06$ acres
 $Q_{pD} = 4.49$ cfs/ac
 $A_D = 0.03$ acres

Total $Q_p = 0.35$ cfs

Infiltration (DA 3)

$Q_{pA} = 1.84$ cfs/ac
 $A_A = 0$ acres
 $Q_{pB} = 2.49$ cfs/ac
 $A_B = 0$ acres
 $Q_{pC} = 3.17$ cfs/ac
 $A_C = 0.03$ acres
 $Q_{pD} = 4.49$ cfs/ac
 $A_D = 0.03$ acres

Total $Q_p = 0.24$ cfs

Hydrograph for Small Watersheds

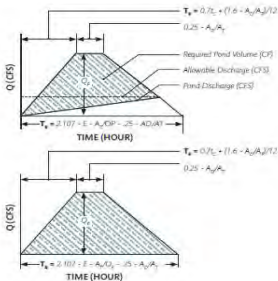
Base time, t_b , for a small watershed hydrograph is:

EQUATION 6.8 $t_b = (2.107 \cdot E \cdot A_T / Q_p) + (0.25 \cdot A_D / A_T)$

Where t_b is in hours, E is the excess precipitation in inches (from [Table 6.2.1.3](#)), Q_p is the peak flow in cfs, A_D is the area in treatment D, and A_T is the total area in acres. Using the time of concentration, t_c (hours), the time to peak in hours is:

EQUATION 6.9 $t_p = (0.7 \cdot t_c) + ((1.6 \cdot (A_D / A_T)) / 12)$

FIGURE 6.2.5 Time to Peak in 100-years



Eq 6.8:

Eq 6.9:

$E = 2.00$ inches
 $A_T = 1.02$ acres
 $A_D = 0.62$ acres
 $Q_p = 4.38$ cfs
 $Q_{infiltration1} = 0.35$ cfs
 $Q_{infiltration2} = 0.24$ cfs
 $Q_{bypass} = 0.51$ cfs
 $t_b = 1.22$ hrs
 $t_c = 12$ minutes
 $t_p = 0.22$ hrs
 $0.25 \times A_D / A_T = 0.15$ hrs
 $(t_p + (0.25 \times A_D / A_T)) = 0.37$ hrs
 $t_b - (t_p + (0.25 \times A_D / A_T)) = 0.84$ hrs

Determine Required Pond Volume:

Allowable Site Discharge (Q_d) =	4.38	cfs
Proposed Site Discharge ($Q_p + Q_{bypass}$) =	3.63	cfs
Detention Required:	0	ac-ft
Required Water Quality Pond Volume:	0.03	ac-ft

Solve for: Infiltrating Pond Volume

$Q_{infiltration1} = 0.35$ cfs
 $0.5 \cdot t_p \cdot Q_{infiltration1} = 139$ cu. ft.

Area 1:
 $(0.25 \cdot A_D / A_T) \cdot Q_{infiltration1} = 190$ cu. ft.

Area 2:
 $0.5 \cdot (t_b - (t_p + (0.25 \times A_D / A_T))) \cdot Q_{infiltration1} = 527$ cu. ft.

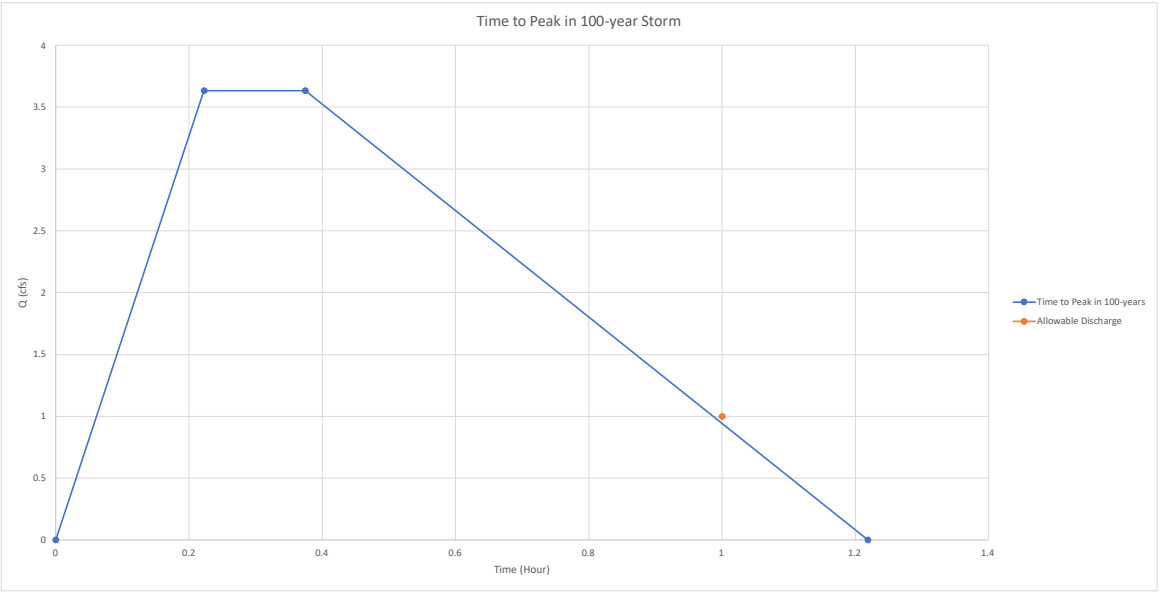
Area 3:
Total Required Water Quality Pond Volume = 0.02 ac-ft

$Q_{infiltration2} = 0.24$ cfs
 $0.5 \cdot t_p \cdot Q_{infiltration2} = 96$ cu. ft.

$(0.25 \cdot A_D / A_T) \cdot Q_{infiltration2} = 131$ cu. ft.

$0.5 \cdot (t_b - (t_p + (0.25 \times A_D / A_T))) \cdot Q_{infiltration2} = 363$ cu. ft.

Total Required Water Quality Pond Volume = 0.01 ac-ft



THRESHOLD DISCHARGE AREA CALCULATIONS



STANDARD FORM SF-1
RUNOFF COEFFICIENTS - IMPERVIOUS CALCULATION

PROJECT NAME: Starbucks Wyoming Blvd
PROJECT NUMBER: 90100000
CALCULATED BY: NW
CHECKED BY: LW/LN

DATE: 4/25/2023

SOIL:

LAND USE:	TYPE A AREA	TYPE B AREA	TYPE C AREA	TYPE D AREA
2-YEAR COEFF.	0.00	0.15	0.71	1.73
5-YEAR COEFF.	0.00	0.00	0.00	0.00
10-YEAR COEFF.	0.51	1.07	1.69	2.81
100-YEAR COEFF.	1.84	2.49	3.17	4.49
IMPERVIOUS %	7%	7%	45%	90%

DESIGN BASIN	DESIGN POINT	TYPE A AREA (AC)	TYPE B AREA (AC)	TYPE C AREA (AC)	TYPE D AREA (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %
On-Site Basins											
DA1	1	0.00	0.00	0.09	0.25	0.34	1.45	0.00	2.51	4.13	78%
DA2	2	0.00	0.00	0.03	0.03	0.06	1.20	0.00	2.23	3.80	67%
DA3	3	0.00	0.00	0.01	0.17	0.18	1.68	0.00	2.75	4.42	88%
DA4	4	0.00	0.00	0.06	0.03	0.10	1.05	0.00	2.06	3.61	60%
DA5	5	0.00	0.00	0.03	0.09	0.12	1.46	0.00	2.51	4.14	78%
DA6	6	0.00	0.00	0.00	0.06	0.06	1.73	0.00	2.81	4.49	90%
BASIN SUBTOTAL		0.00	0.00	0.23	0.63	0.86	1.46	0.00	2.51	4.14	78%



STANDARD FORM SF-2
Time of Concentration

PROJECT NAME: Starbucks Wyoming Blvd
PROJECT NUMBER: 90100000
CALCULATED BY: NW
CHECKED BY: LW/LN

DATE: 4/25/2023

SUB-BASIN DATA			INITIAL TIME (T _i)			TRAVEL TIME (T _t)					T _c CHECK (URBANIZED BASINS)					FINAL T _c
DESIGN BASIN (1)	AREA Ac (2)	C5 (3)	LENGTH Ft (4)	SLOPE % (5)	T _i Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	C _v (9)	VEL fps (11)	T _t Min. (12)	COMP. t _c (13)	TOTAL LENGTH (14)	TOTAL SLOPE (15)	TOTAL IMP. (16)	T _c Min. (17)	Min.
On-Site Basins																
DA1	0.339		179	1.5%	23.6	10	0.5%	17.3	1.2	0.1	23.7	189	1.4%	78%	14.1	14.1
DA2	0.063		52	1.0%	14.5	52	0.5%	14.8	1.0	0.8	15.4	104	0.8%	67%	15.8	15.4
DA3	0.182		115	2.0%	17.2	127	0.5%	19.5	1.4	1.5	18.7	242	1.2%	88%	12.8	12.8
DA4	0.096		83	1.5%	16.1	83	0.5%	13.3	0.9	1.5	17.5	166	1.0%	60%	17.4	17.4
DA5	0.121		82	1.5%	16.0	5	0.5%	17.3	1.2	0.1	16.0	87	1.4%	78%	13.4	13.4
DA6	0.057		45	1.0%	13.5	37	0.5%	20.0	1.4	0.4	14.0	82	0.8%	90%	11.4	11.4
$t_i = \frac{0.395(1.1 - C_s)\sqrt{L_i}}{S_o^{0.33}}$ $t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t}$ $t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_i}}$																



STANDARD FORM SF-3
STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Starbucks Wyoming Blvd
PROJECT NUMBER: 90100000
CALCULATED BY: NW
CHECKED BY: LW/LN

DATE: 4/25/2023

P₁ (1-Hour Rainfall) = 1.84

[illegible]



PROJECT NAME: Starbucks Wyoming Blvd

PROJECT NUMBER: 90100000

CALCULATED BY: NW

CHECKED BY: LW/LN

RATIONAL CALCULATIONS SUMMARY

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	PEAK FLOWS (CFS)
			Q100
On-Site Basins			
1	DA1	0.34	6.03
2	DA2	0.06	0.99
3	DA3	0.18	3.61
4	DA4	0.10	1.35
5	DA5	0.12	2.21
6	DA6	0.06	1.21
TOTAL		0.86	15.40

STORMWATER QUALITY VOLUME CALCULATIONS



Storm Water Quality Volume (SWQC)

Project Name: Starbucks Wyoming Blvd

Project Number: 90100000

Per Drainage, Flood Control, and Erosion Control Manual, Chapter 6, Section 6-11

SWQV:

Redevelopment

SWQV: (Impervious area x 0.26)/12

Impervious Area = 0.5657943 acres

SWQV =	0.01	ac-ft
	534	cf



Retention Pond Drain Time

Project Name: Starbucks Wyoming Blvd

Project Number: 90100000

North Retention Pond Drain Time					Drain Time Check
Pond	Volume	Percolation Rate*	Pond Bottom	Drain Time	
	cf	inches/hr	Sq. Ft.	hr	
A	855	1.25	378	22	Meets Required Drain Time

Pond Volume 0.020 ac-ft

input cells

*Percolation rate per Table 6.2.12 of the 2020 DPM

South Retention Pond Drain Time					Drain Time Check
Pond	Volume	Percolation Rate*	Pond Bottom	Drain Time	
	cf	inches/hr	Sq. Ft.	hr	
A	603	1.25	103	57	Meets Required Drain Time

Pond Volume 0.014 ac-ft

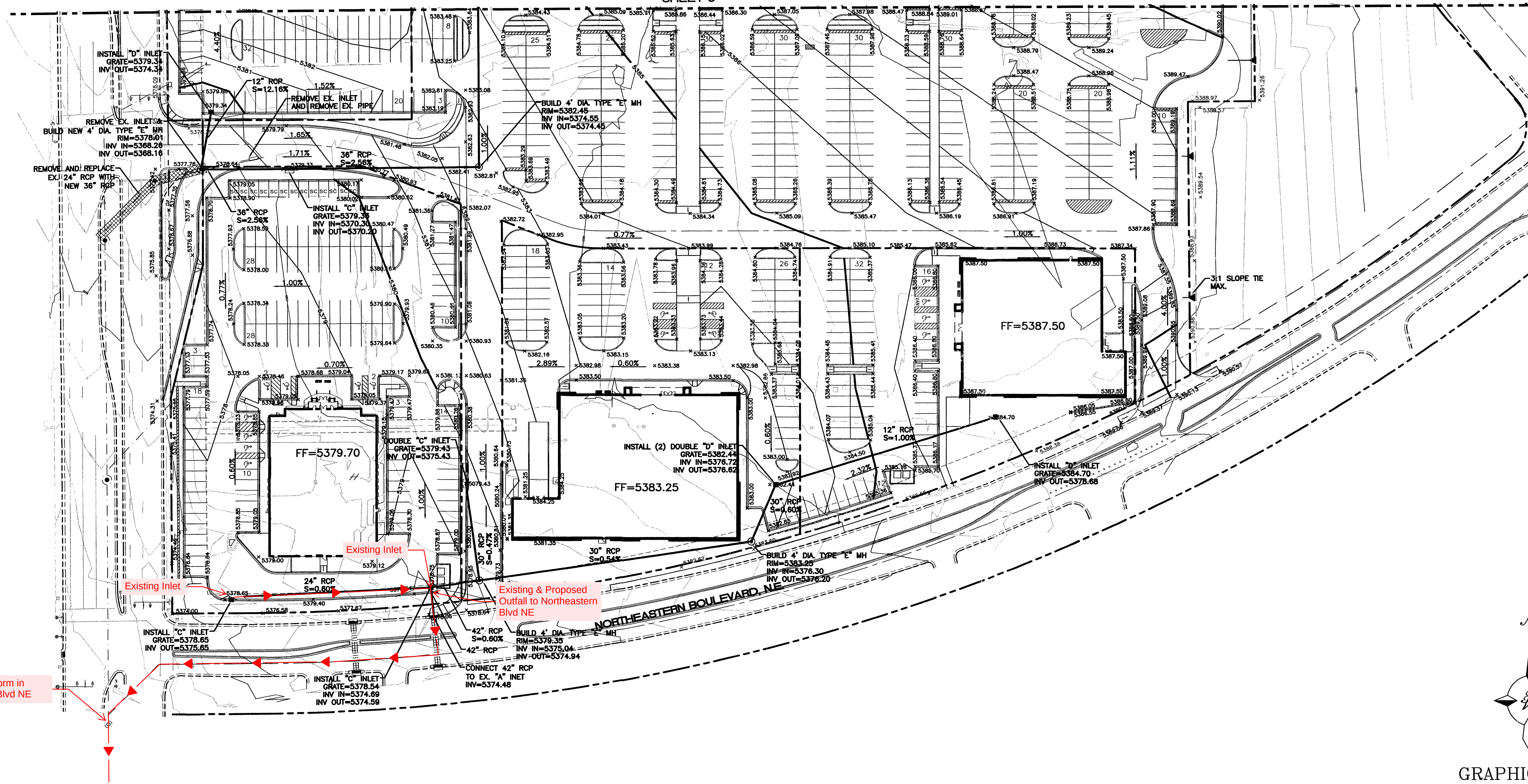
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*Percolation rate per Table 6.2.12 of the 2020 DPM

APPENDIX C: RELEVANT DOCUMENTS

AS-BUILT STORMWATER PLAN

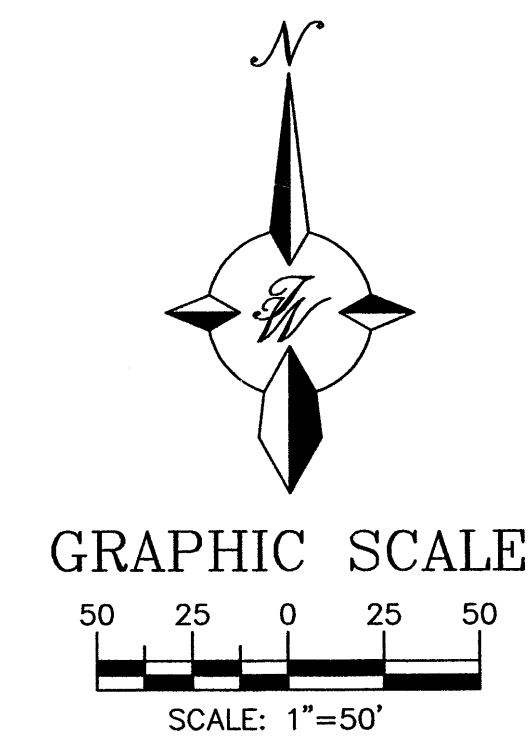
MATCH LINE SEE
SHEET 5



CAUTION:
EXISTING UTILITIES ARE NOT SHOWN.
IT SHALL BE THE SOLE RESPONSIBILITY
OF THE CONTRACTOR TO CONDUCT ALL
NECESSARY FIELD INVESTIGATIONS PRIOR
TO ANY EXCAVATION TO DETERMINE THE
ACTUAL LOCATION OF UTILITIES & OTHER
IMPROVEMENTS.

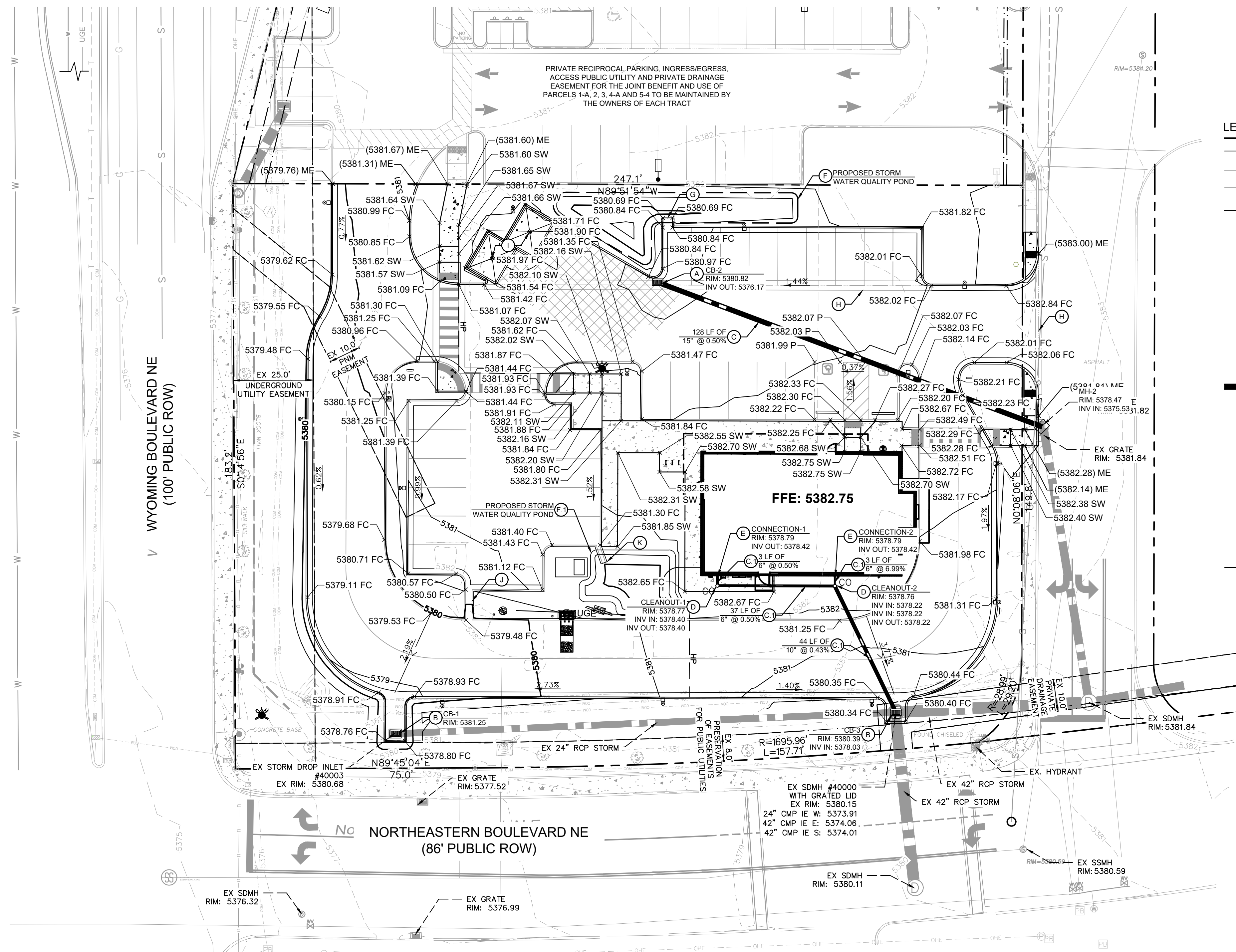
LEGEND

- EXISTING CURB
- FUTURE IMPROVEMENTS
- EXISTING BUILDING
- PROPOSED EXPANSION
- PROPOSED CURB
- BOUNDARY LINE
- ~~~~~ GRADE CHANGE
- × 5257.73 PROPOSED GRADE ELEVATION
- × 5257.18 EXISTING GRADE ELEVATION



ENGINEER'S SEAL RONALD R. BOHANNAN P.E. #7868	ALBUQUERQUE WAL-MART NM: 5491-00	DRAWN BY BDG
	GRADING AND DRAINAGE PLAN - B	DATE 9/08/05
	TERRA WEST, LLC 8509 JEFFERSON NE ALBUQUERQUE, NEW MEXICO 87113 (505)858-3100	22920RE-2-15-05X
		SHEET # 6 JOB # 220092

GRADING PLAN



GRADING NOTES

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THESE PLANS AND THE CITY/IAHJ STANDARDS AND SPECIFICATIONS.
2. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL MAKE CERTAIN THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS APPROVED BY ALL OF THE PERMITTING AUTHORITIES.
3. THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE COMMENCEMENT OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES. MINOR ADJUSTMENTS TO FINISH GRADE TO ACCOMPLISH SPOT DRAINAGE ARE ACCEPTABLE, IF NECESSARY, UPON PRIOR APPROVAL OF ENGINEER. PAVING INSTALLED SHALL "FLUSH OUT" AT ANY JUNCTURE WITH EXISTING PAVING.
4. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
5. ALL CUT OR FILL SLOPES SHALL BE 4:1 OR FLATTER UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
7. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
8. TOPOGRAPHIC INFORMATION IS TAKEN FROM A TOPOGRAPHIC SURVEY BY LAND SURVEYORS. IF THE CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THEN THE CONTRACTOR

SHALL SUPPLY, AT THEIR EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR TO THE OWNER FOR REVIEW.

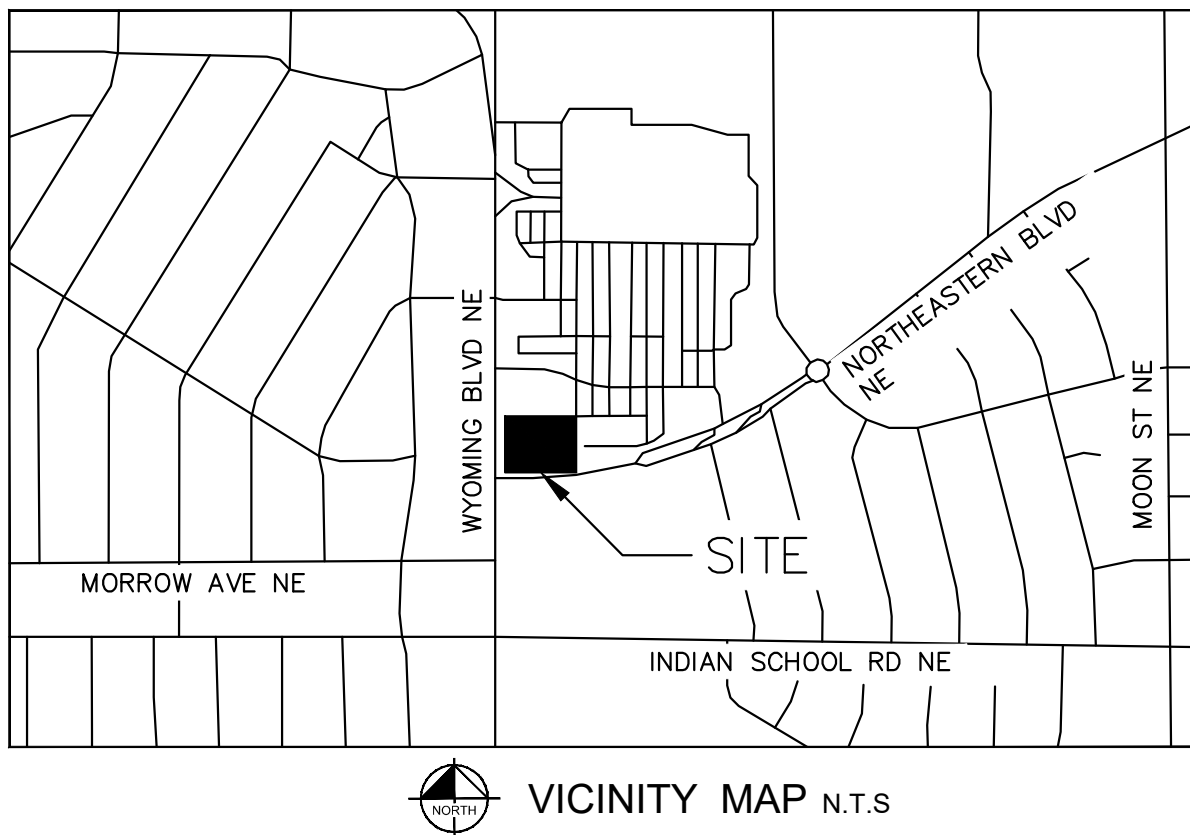
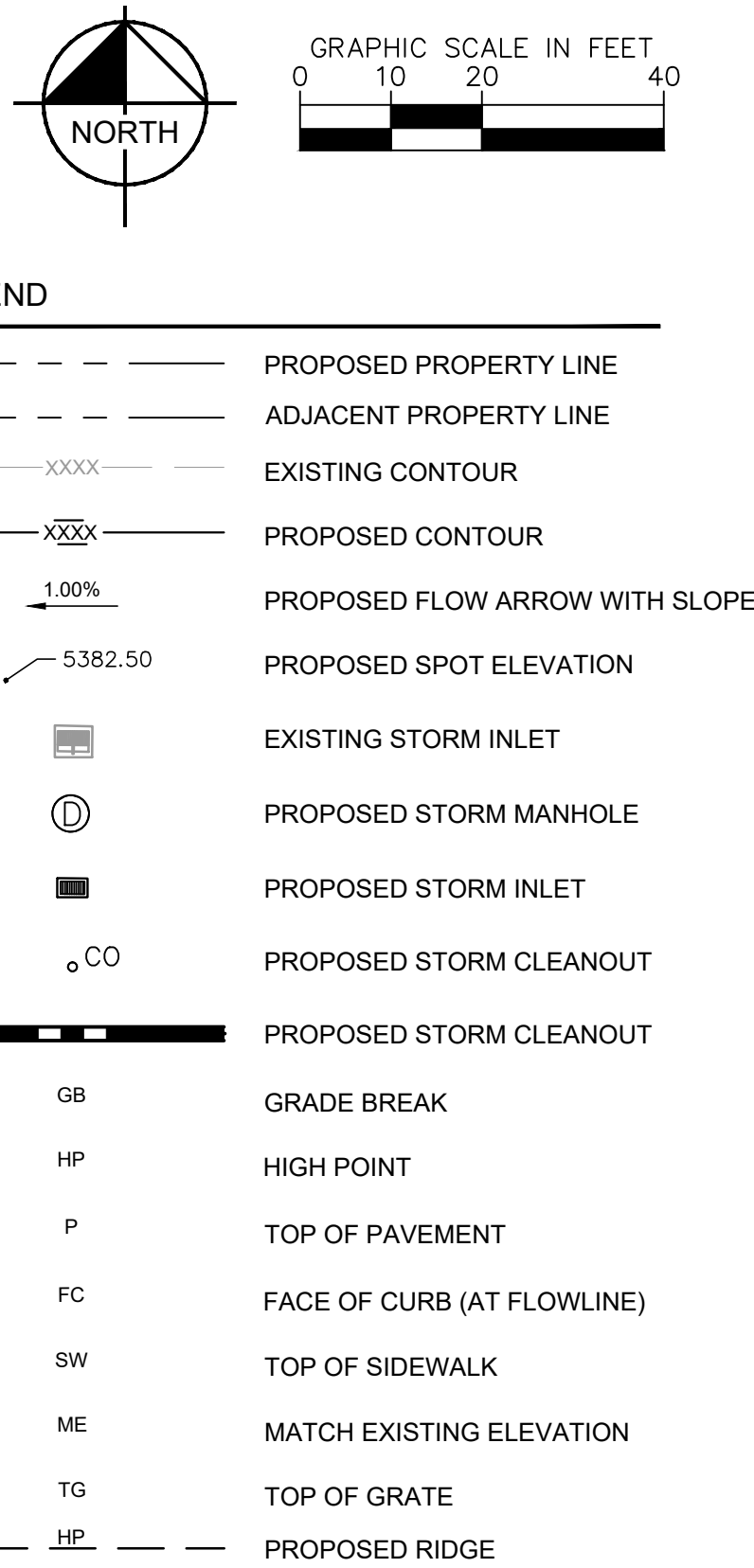
9. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING FOOTPRINT DIMENSIONS.
10. CONTRACTOR SHALL REFER TO FINAL GEOTECH REPORT FOR BUILDING SUBGRADE AND SITE PREPARATION REQUIREMENTS.
11. CONTRACTOR SHALL ADJUST EXISTING VALVES, MANHOLE RIMS, ETC. AS NECESSARY TO MATCH FINISHED GRADE.
12. ALL ELEVATIONS ARE TOP OF PAVEMENT UNLESS NOTED OTHERWISE. TO GET TOP OF CURB ELEVATIONS ADD 6" TO THE ELEVATION SHOWN.
13. GRADING FOR ALL SIDEWALKS AND ACCESSIBLE ROUTES INCLUDING CROSSING DRIVEWAYS SHALL CONFORM TO ADA STANDARDS. SLOPES SHALL NOT EXCEED 5% LONGITUDINAL SLOPE OR 2% CROSS SLOPE. SIDEWALK ACCESS TO EXTERNAL BUILDING DOORS SHALL BE ADA COMPLIANT. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF ADA CRITERIA CANNOT BE MET AT ANY LOCATION.
14. ANY PROPOSED CONTOURS SHOWN ARE APPROXIMATE. PROPOSED SPOT ELEVATIONS AND DESIGNATED GRADIENT ARE TO BE USED IN THE EVENT OF ANY DISCREPANCIES.
15. REFER TO EROSION CONTROL PLAN FOR EROSION CONTROL DEVICES TO BE INSTALLED PRIOR TO COMMENCING GRADING OPERATIONS.
16. ALL FILL TO BE PLACED SHALL BE IN ACCORDANCE WITH THE CURRENT APPLICABLE GEOTECHNICAL REPORT RECOMMENDATIONS.
17. SIDE SLOPES NEED TO BE STABILIZED WITH NATIVE GRASS SEED (PER CITY OF ALBUQUERQUE SPECIFICATION 1012) WITH AGGREGATE MULCH OR EQUAL (MUST SATISFY THE "FINAL STABILIZATION CRITERIA" CONSTRUCTION GENERAL PERMIT 2.2.14.B).

WEIGHTED E CALCULATIONS (EXISTING CONDITION)																
										100- Year			10- Year			
Basin	Area (SF)	Area (AC)	Treatment A		Treatment B		Treatment C		Treatment D	Weighted E	Volume	Flow	Weighted E	Volume	Flow	
			Acres	%	Acres	%	Acres	%	Acres	(in)	(ac-ft)	(cfs)	(in)	(ac-ft)	(cfs)	
DA 1	38,768	0.89	0.00	0%	0.00	0%	0.03	3%	0.86	97%	2.53	0.19	3.96	1.60	0.12	2.47
DA 2	5,663	0.13	0.00	0%	0.00	0%	0.13	100%	0	0%	1.09	0.01	0.41	1.64	0.02	0.37
WEIGHTED E CALCULATIONS (DEVELOPED CONDITION)																
										100- Year			10- Year			
Basin	Area (SF)	Area (AC)	Treatment A		Treatment B		Treatment C		Treatment D	Weighted E	Volume	Flow	Weighted E	Volume	Flow	
			Acres	%	Acres	%	Acres	%	Acres	(in)	(ac-ft)	(cfs)	(in)	(ac-ft)	(cfs)	
DA 1	0	0.75	0.00	0%	0.00	0%	0.16	21%	0.59	79%	2.26	0.14	3.16	1.40	0.09	1.93
DA 2	0	0.18	0.00	0%	0.00	0%	0.18	100%	0.00	0%	1.09	0.02	0.57	0.52	0.01	0.30
DA 3	0	0.11	0.02	18%	0.00	0%	0.06	55%	0.03	27%	1.42	0.01	0.36	0.77	0.01	0.20

Excess Precipitation E (in)			Peak Discharge (cfs/acre)			SWQ VOL	
Zone 3	100-Year	10-Year	Zone 3	100-Year	10-Year	Impervious Area (sf)	
Ea	0.67	0.18	Qa	1.84	0.51	SWQ VOL Required (CF)*	945
Eb	0.86	0.34	Qb	2.49	1.07	SWQ VOL Provided (CF)	1,100
Ec	1.09	0.52	Qc	3.17	1.69	*0.26 in per impervious SF	
Ed	2.58	1.64	Qd	4.49	2.81		

FLOODPLAIN NOTE

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN
ZONE "X" OF THE FLOOD INSURANCE RATE MAP
(FIRM), COMMUNITY PANEL NO. 35001C0356H, WHICH
BEARS AN EFFECTIVE DATE OF AUGUST 16, 2012 AND
IS NOT IN A SPECIAL FLOOD HAZARD AREA.



DRAINAGE KEYNOTES	
(A)	NYLOPLAST 18" DRAIN BASIN WITH 2X3 CURB INLET GRATE, SEE DETAIL SHEET C6.1
(B)	REPLACE WITH EXISTING CATCH BASIN WITH NYLOPLAST 30" DRAIN BASIN WITH 2X3 CURB INLET GRATE, SEE DETAIL SHEET C6.1
(C)	HDPE STORM PIPE
(C-1)	PVC STORM PIPE
(D)	ROOF DRAIN CLEANOUT
(E)	ROOF DRAIN CONNECTION
(F)	INFILTRATING DETENTION POND 1 TOTAL VOLUME = 855 CF
(F-1)	INFILTRATING DETENTION POND 2 TOTAL VOLUME = 603 CF
(G)	PROPOSED 3' WIDE DRAINAGE CURB CUT
(H)	PROPOSED VALLEY GUTTER
(I)	INLET TO BE CONNECTED TO THE SANITARY SEWER. SEE UTILITY PLAN.
(J)	PROPOSED 2' WIDE DRAINAGE CURB CUT
(K)	PROPOSED 1' WIDE CONCRETE FLUME

INTRODUCTION AND PROJECT DESCRIPTION:

THE PROJECT SITE IS LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF WYOMING BOULEVARD NE AND NORTHEASTERN BOULEVARD NE IN THE CITY OF ALBUQUERQUE, NM. THE SITE IS ZONED AND PLANNED FOR COMMERCIAL DEVELOPMENT, AND THE USE PROPOSED IS A RESTAURANT WITH DRIVE-THROUGH, AS SHOWN BY MAP #35001C0356H OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS PUBLISHED BY FEMA FOR BERNALILLO COUNTY, NEW MEXICO DATED AUGUST 16, 2012. THE SITE IS LOCATED IN ZONE X AND IS NOT WITHIN A FLOOD HAZARD AREA.

METHODOLOGY:

CHAPTER 6 OF THE COA DPM WAS UTILIZED TO CALCULATE THE PEAK FLOW AND RUNOFF VOLUME FOR 10-YEAR AND 100-YEAR, 24-HOUR STORM EVENTS. THE SITE IS LOCATED IN PRECIPITATION ZONE 3. EXISTING BASIN INFORMATION WAS OBTAINED BY SITE AERIALS AND TOPOGRAPHIC SURVEY.

EXISTING CONDITIONS:

THE SITE HISTORICALLY WAS FULLY DEVELOPED, CONTAINED A 11,637 SF BUILDING WITH ASSOCIATED PARKING AND LANDSCAPING. THE SITE IN THE INTERIM CONDITION IS A MASS GRADED SITE WITH NO DEVELOPMENT. THE SITE HISTORICALLY AND IN THE INTERIM CONDITION SURFACE FLOWS TO THE SOUTH TO TWO EXISTING INLETS ON THE SITE, ONE ON THE WEST SIDE AND ONE ON THE EAST SIDE. THE EXISTING STORM DRAIN INLETS DISCHARGE INTO THE PUBLIC STORM DRAIN SYSTEM IN NORTHEASTERN BOULEVARD NE AND WYOMING BOULEVARD NE.

PROPOSED CONDITIONS:

THE PROJECT IMPROVEMENTS WILL INCLUDE INSTALLATION OF A RESTAURANT WITH DRIVE- THROUGH, CUSTOMER PARKING, SITE DRIVEWAYS, AND LANDSCAPE AREAS. THE PROJECT SITE GENERATES A PEAK FLOW OF 3.64 CFS IN THE 100-YEAR, 6-HOUR STORM EVENT. THE PROPOSED DEVELOPMENT WILL DECREASE THE AMOUNT OF IMPERVIOUS COVER WHEN COMPARED TO THE EXISTING CONDITIONS AND WILL THUS DECREASE THE PEAK DISCHARGE GENERATED BY THE SITE.

THE REQUIRED SWQ VOLUME IS 0.26 INCHES PER SF OF IMPERVIOUS AREA= $0.26 \times (1 \text{ FT} / 12 \text{ IN}) \times 27,018 \text{ SF} = 585 \text{ CF}$. THE SITE HAS PROVIDED APPROXIMATELY 1,458 CF OF SWQV IN DEPRESSED LANDSCAPE AREAS ON THE SITE.

CONCLUSIONS:

THE PROPOSED DEVELOPMENT WILL NOT INCREASE RUNOFF FROM THE SITE NOR WILL IT CHANGE EXISTING DRAINAGE PATTERNS. THE SITE WILL DISCHARGE TO AN EXISTING STORM SEWER ON NORTHEASTERN BOULEVARD NE.

SITE BENCHMARKS

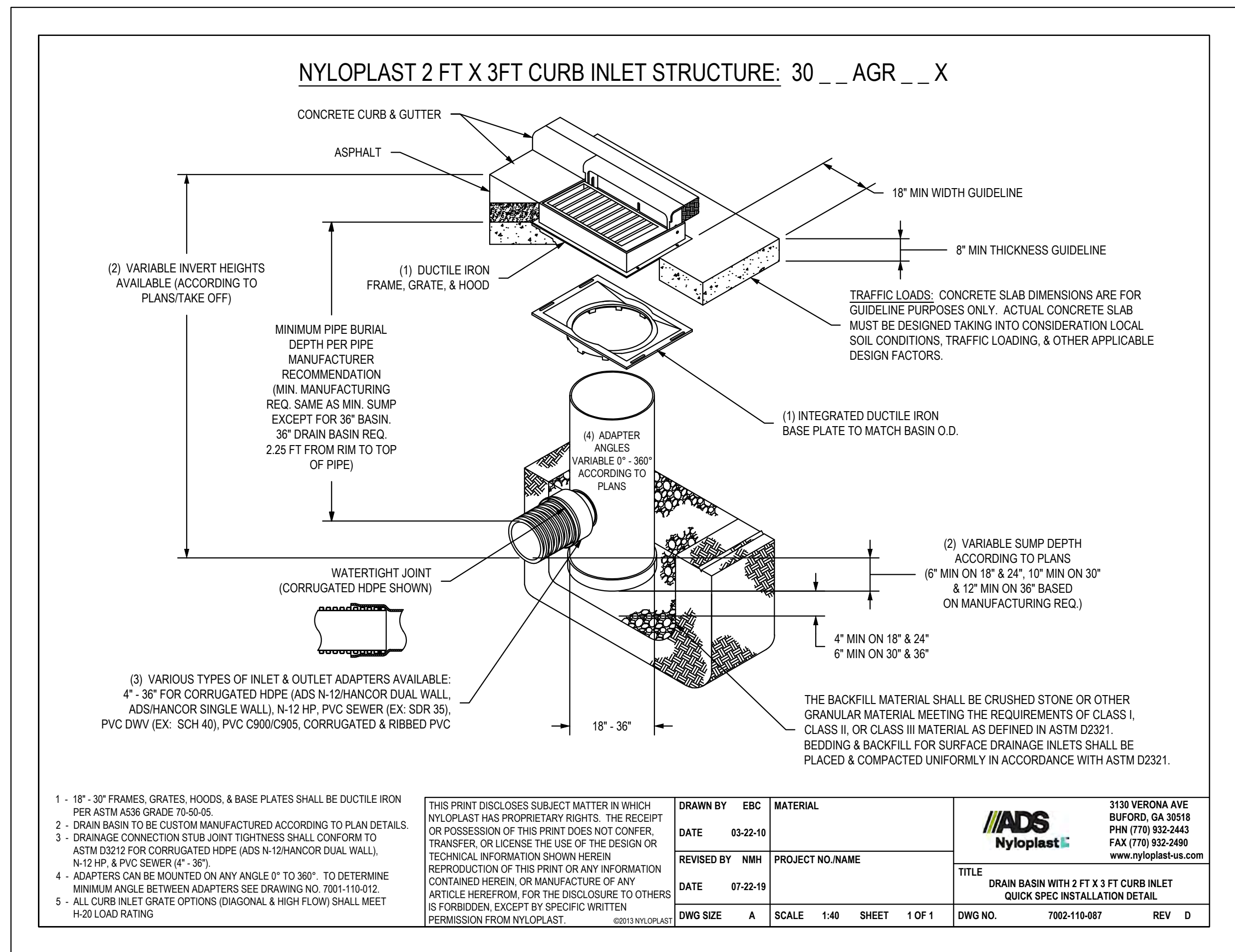
- ⊕ BENCHMARK #1*
A.G.R.S. MONUMENT "13_H21"
NORTHING: 1,496,268.794
EASTING: 1,555,770.607
ELEVATION: 5499.574 (NAVD 1988)
GROUND TO GRID FACTOR: 0.999649002
DELTA ALPHA ANGLE: -0°09'46.08"
- ⊕ BENCHMARK #2*
A.G.R.S. MONUMENT "14_H20"
NORTHING: 1,495,141.626
EASTING: 1,551,771.675
ELEVATION: 5415.798 (NAVD 1988)
GROUND TO GRID FACTOR: 0.999653810
DELTA ALPHA ANGLE: -0°10'13.69"

*SEE DIMENSION CONTROL PLAN, SHEET C5.1,
FOR LOCATIONS



CAUTION!!

CONTRACTOR IS TO VERIFY
PRESENCE AND EXACT
LOCATION OF ALL UTILITIES
PRIOR TO CONSTRUCTION.



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SHEET NUMBER
C6.1

STARBUCKS COFFEE
COMPANY
2401 UTAH AVENUE SOUTH
SEATTLE, WASHINGTON 98134
(206) 246-4575

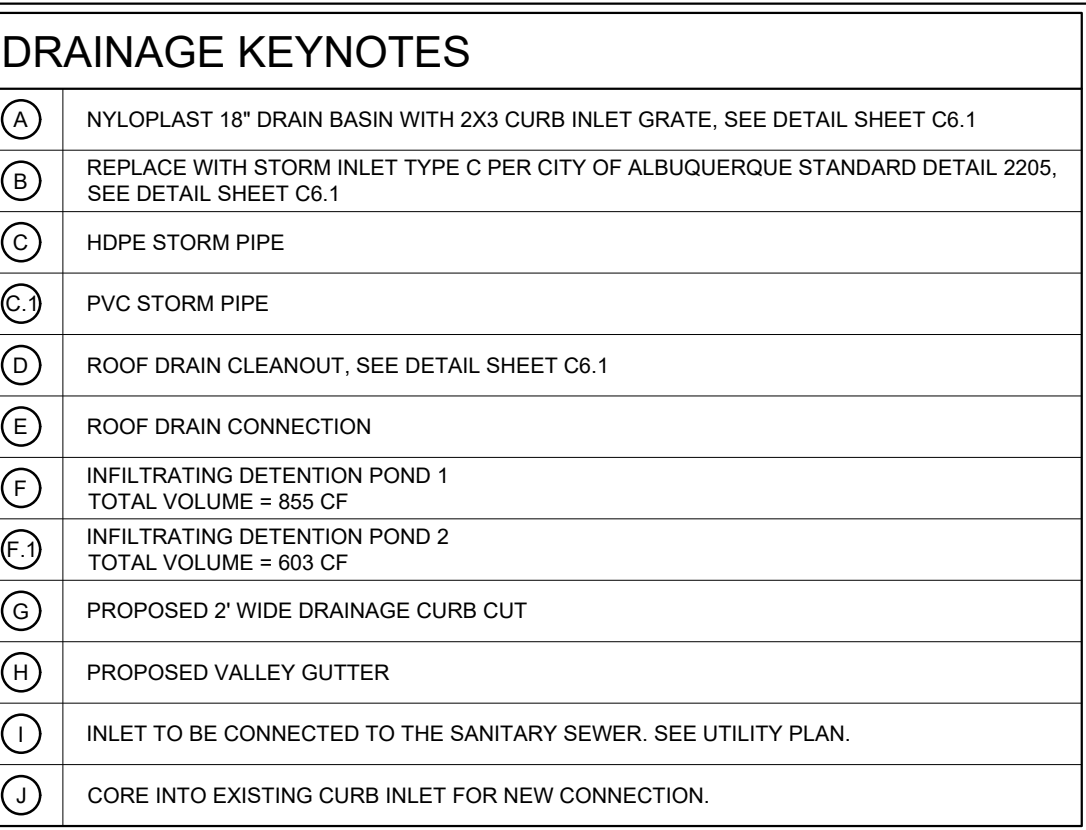
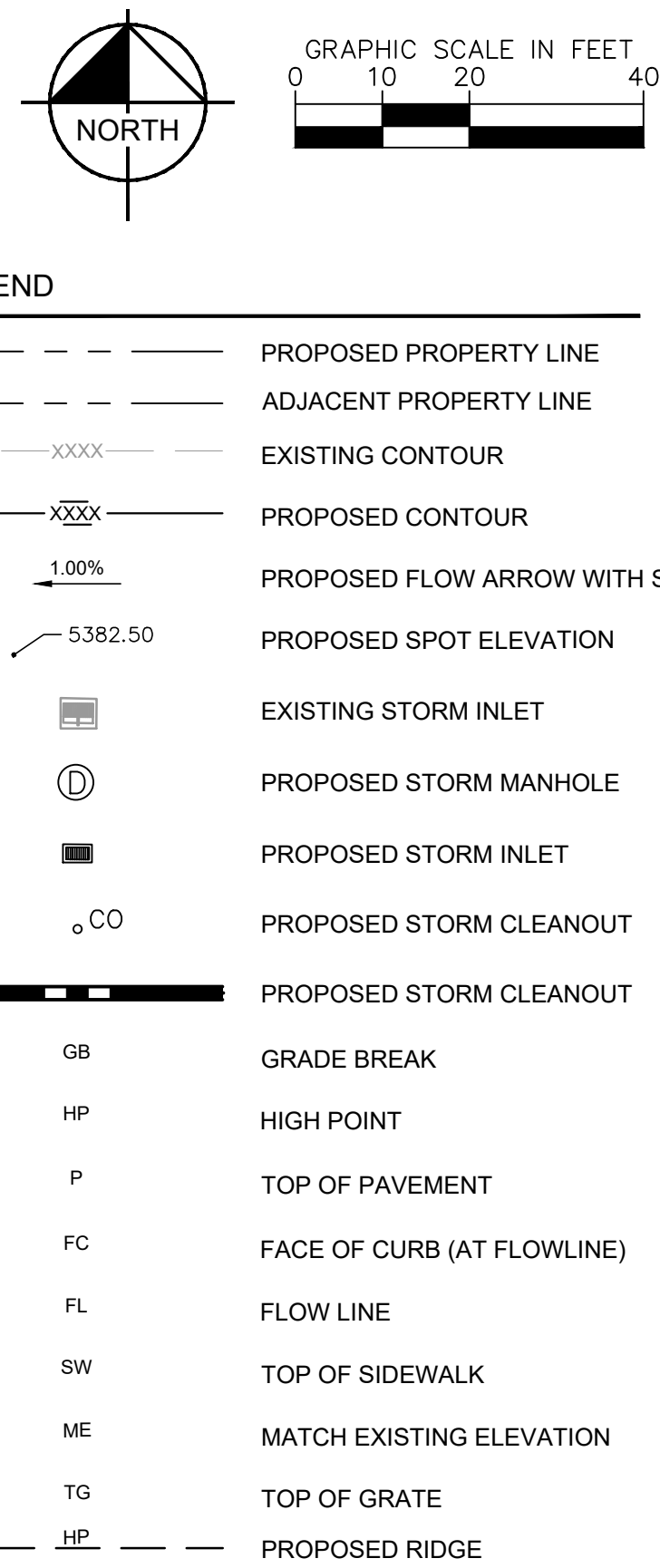
Kimley»Horn
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1201 3RD AVE SUITE 2500, SEATTLE, WA 98101
PHONE: (206) 970-1900
WWW.KIMLEY-HORN.COM



KHA PROJECT
090100000
DATE
03/31/2023
SCALE AS SHOWN
DESIGNED BY NW/SP
DRAWN BY NW/SP
CHECKED BY LW

DRAINAGE DETAILS

[illegible]



THE PROJECT SITE IS LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF WYOMING BOULEVARD NE AND NORTHEASTERN BOULEVARD NE IN THE CITY OF ALBUQUERQUE, NM. THE SITE IS ZONED AND PLANNED FOR COMMERCIAL DEVELOPMENT, AND THE USE PROPOSED IS A RESTAURANT WITH DRIVE-THROUGH. AS SHOWN BY MAP #35001C0356H OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS PUBLISHED BY FEMA FOR BERNALILLO COUNTY, NEW MEXICO DATED AUGUST 16, 2012, THE SITE IS LOCATED IN ZONE X AND IS NOT WITHIN A FLOOD HAZARD AREA.

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GROUND TO GRID FACTOR: 0.999653810
DELTA ALPHA ANGLE: -0°10'13.69"

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FOR LOCATIONS

Excess Precipitation E (in)			Peak Discharge (cfs/acre)		
Zone 3	100-Year	10-Year	Zone 3	100-Year	10-Year
Ea	0.67	0.18		1.84	0.51
Eb	0.86	0.34		2.49	1.07
Ec	1.09	0.52		3.17	1.69
Ed	2.58	1.64		4.49	2.81

SWQ VOL	
Impervious Area (sf)	27,018
SWQ VOL Required (CF)*	945
SWQ VOL Provided (CF)	1,100
*0.26 in per impervious SF	

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN
ZONE "X" OF THE FLOOD INSURANCE RATE MAP
(FIRM), COMMUNITY PANEL NO. 35001C0356H, WHICH
BEARS AN EFFECTIVE DATE OF AUGUST 16, 2012 AND
IS NOT IN A SPECIAL FLOOD HAZARD AREA.



SHEET NUMBER
C6.0