CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director

Mayor Timothy M. Keller

January 15, 2020

Richard Dourte, P.E.
RHD Engineering, LLC.
4305 Purple Sage Ave. NW
Albuquerque, NM 87120

RE: **House of Life Ministries**
Quaker Heights Rd NW
Conceptual Grading Plan Stamp Date 1/2/20
Drainage Report Stamp Date: 1/2/20
Hydrology File: F11D020

Dear Mr. Dourte:

Based on the submittal received on 1/7/20, this project cannot be approved until the following corrections are made:

Prior to Site Plan:

1. Will the sidewalk culvert be built by SO-19 or Work Order? Please label/provide notes as appropriate.
2. Provide proposed grading, finished floors, and spot elevations throughout the site.
3. The site must discharge in accordance with the approved master plan. Accounting for pond routing and stormwater quality volume will probably get within the allowable discharge and volume, but this analysis needs to be presented.
4. Please provide the SWQV calculations for each basin draining to each pond. The stormwater quality ponds need to be sized for the areas draining to them.
5. Please number the ponds and include a label on each with the SWQV and elevation, the 100-year volume and elevation, and the peak 100 year inflow and outflow.

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: House of Life Ministries Building Permit #: _____ Hydrology File #: _____

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

Legal Description: Tract 2, Coors Village Sub'd

City Address: Quaker Heights Road NW

Applicant: RHD Engineering, LLC Contact: Richard Dourte

Address: 4305 Purple Sage Ave. NW, Alb. NM, 87120

Phone#: 505.288.1621 Fax#: _____ E-mail: rhdengineering@outlook.com

Other Contact: Simons Architecture PC Contact: Joe Simons

Address: _____

Phone#: _____ Fax#: _____ E-mail: joe@simonsarchitecture.com

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

IS THIS A RESUBMITTAL? _____ Yes X No

DEPARTMENT _____ TRANSPORTATION X HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

___ ENGINEER/ARCHITECT CERTIFICATION
___ PAD CERTIFICATION
X CONCEPTUAL G & D PLAN
___ GRADING PLAN
___ DRAINAGE REPORT
___ DRAINAGE MASTER PLAN
___ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
___ ELEVATION CERTIFICATE
___ CLOMR/LOMR
___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ TRAFFIC IMPACT STUDY (TIS)
___ STREET LIGHT LAYOUT
___ OTHER (SPECIFY) _____
no PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY

___ PRELIMINARY PLAT APPROVAL
X 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: January 2, 2020 By: Richard Dourte

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

Conceptual Drainage Report

For

Tract 2, Coors Village
House of Life Ministries
Albuquerque, New Mexico

Prepared by

RHD Engineering, LLC
Albuquerque, New Mexico

January 2020

1-02-20

Table of Contents

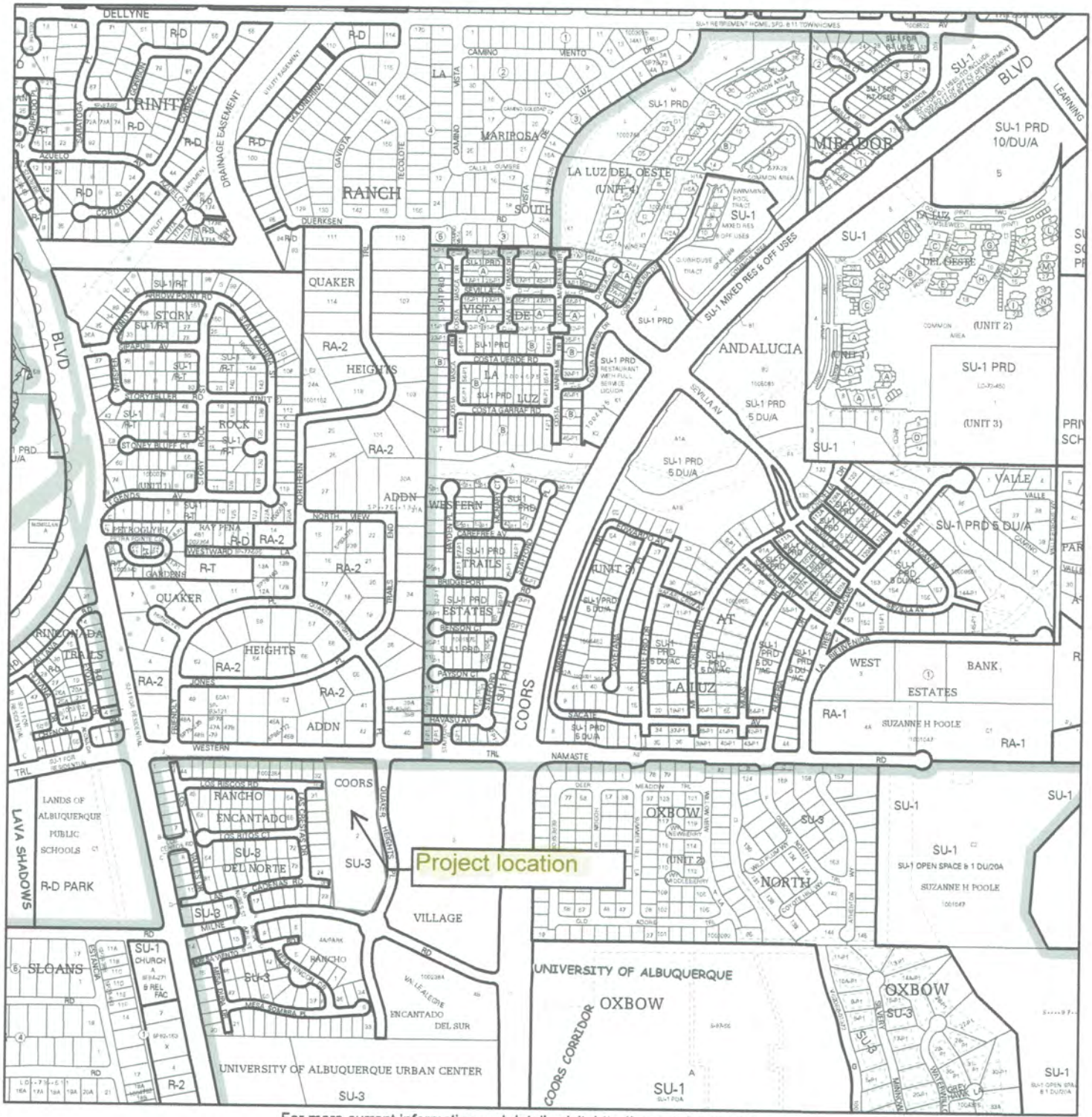
Purpose: To provide a drainage concept for Tract 2, Coors Village for the House of Life Ministries. This plan is prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque's Development Process Manual drainage guidelines. This report will demonstrate that this development will not adverse effect the adjacent site.

Introduction: The House of Life Ministries is proposing to develop Tract 2, Coors Village subdivision. On this property there are 3 planned phases at this time. The first phase consists of 2 buildings, the second consists of 1 building and the third consists of 1 building.

This site is approximately 5.07 acres, located south of Western Trail Blvd NW. The property is within a flood hazard zone "X" as indicated on FIRM Map 35001C0114H (shown on the grading sheet).

This site is part of the Drainage Master Plan, for the Coors Village Subdivision, Basin 160, by Thompson Engineering, Feb. 2000. This master plan identified this site as having a developed condition with 0%A, 20%B, 5%C and 75%D (excerpt from master drainage plan included).

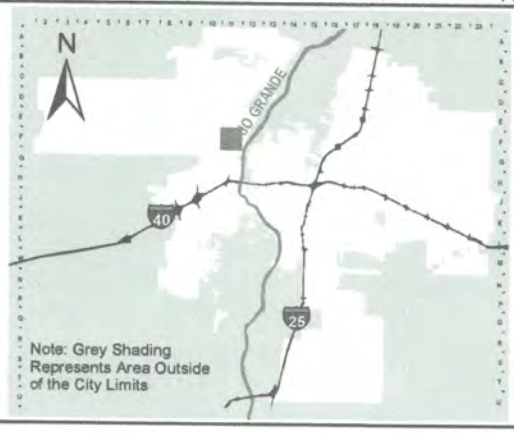
Existing Conditions: Presently this site is undeveloped, the site to the west of this property is developed as a residential subdivision. The adjacent roads have been built, the sidewalks along Quaker Heights and Milne Road have been built, the sidewalk has not been constructed along Western Trail. The water lines, sanitary sewer lines and a storm drain system have also been constructed. A 30" storm sewer lateral has been constructed to this site (refer to project # 704281, page 13 of 23 asbuilts, copy included).



For more current information and details visit: http://www.cabq.gov/gis

AGIS
Albuquerque Geographic Information System

Map amended through: 4/2/2012



Zone Atlas Page:

F-11-Z

Selected Symbols

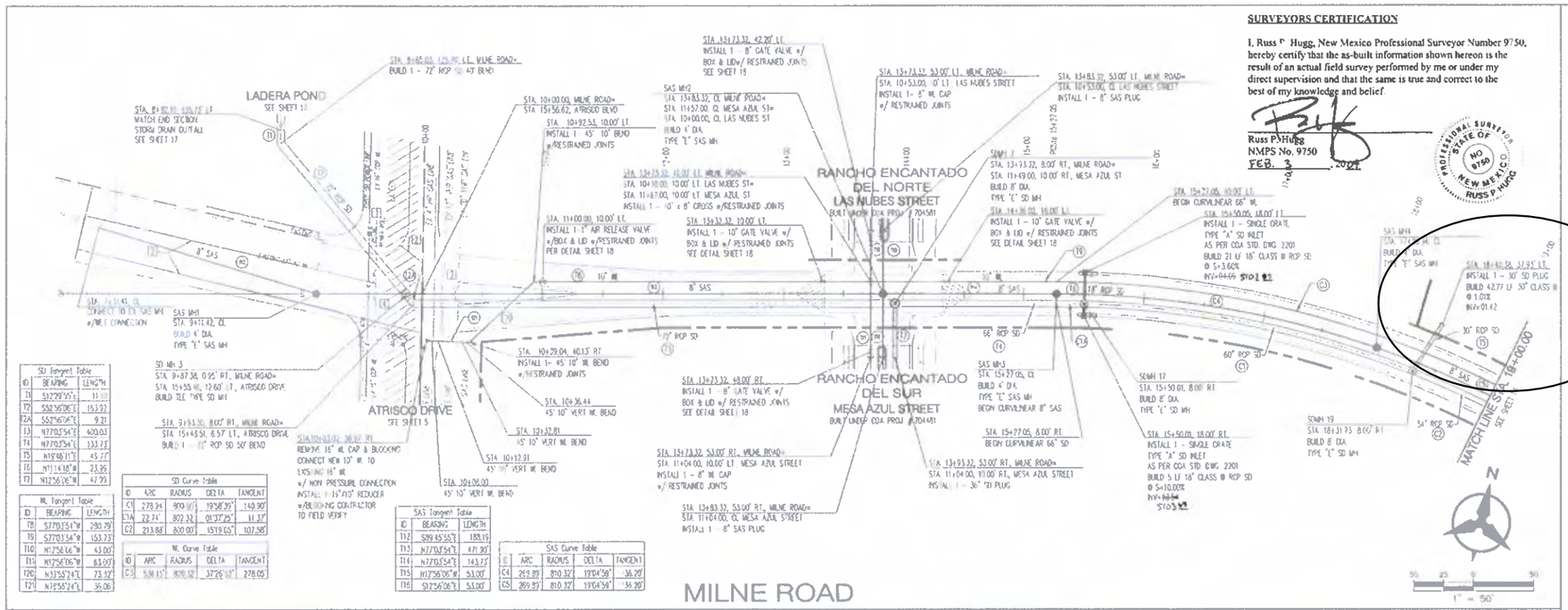
- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

0 750 1,500 Feet

PAGE 4

Proposed Conditions: This site plans on utilizing the existing 30" rcp lateral that connects to the storm drain system that is in Milne Road. The hgl at the manhole for this lateral is 5109.65, per the summary of hydraulic cals table (copy attached). There are three drainage basins for this site. The private storm drain will directly pick up the storm water from 3 ponds via a private storm drain. The private storm drain line computations are included in appendix A. There is a grate capacity of 7.6cfs for 0.5ft of head for each of the private catch basins (refer to the capacity chart in appendix A). There are 4 catch basins, thus 7.6cfs x 4 = 30.4cfs, thus greater than the 20.7cfs needed.

Summary and Recommendations: The proposed flows are slightly higher than the design flows by 1.6cfs. However, the overall proposed volume from the site (100yr 24hr event, the master plan design volume) is 0.91ac-ft - 0.11ac-ft(water quality pond requirement) = .80ac-ft, this is slightly less than the master plan design volume of .807ac-ft (see developed drainage conditions table 2 of master plan, attached).



City Project no. 704281

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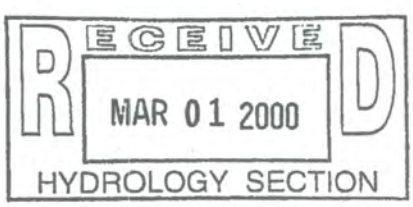
DRAINAGE MASTER PLAN
FOR
COORS VILLAGE
SUBDIVISION

Prepared by:
Thompson Engineering Consultants, Inc.
2060 Main Street N.E., Suite E
Los Lunas, NM 87031

February 2000



INTRODUCTION AND SITE LOCATION

The proposed Coors Village Subdivision is located on the west side of Albuquerque at the intersection of Coors Boulevard and Western Trail. The 58 acre tract is currently platted as Tract A-1-A, a portion of the University of Albuquerque Urban Center. The property will be subdivided into 4 large tracts. Tract 1 will be approximately 16.4 acres in size and will be further subdivided into single family residential lots. Tract 2, which has an area of 5 acres, will be developed as an office complex. Tract 3, which is 13.7 acres in size, will be a commercial development. Tract 4 will be for apartments. It has an area of 17 acres. This report will serve as the Drainage Master Plan for the development of these tracts. A drainage and grading plan for each tract will be required prior to development. This site was previously planned to have similar land uses.

On September 18, 1998, FEMA approved a LOMR request from the City of Albuquerque for the Unser Boulevard South, Rinconada Arroyo, and Ponds 16A and 16B, prepared by URS Greiner. This LOMR Request indicates that there is adequate volume in the Ladera Pond 16B to accept flows from the Coors Village Site.

METHODOLOGY

The hydrologic and hydraulic criteria in Section 22 of the City of Albuquerque Development Process Manual (DPM), entitled "Drainage, Flood Control, and Erosion Control," was followed to perform the analyses given in this report. The design storm used for both the existing undeveloped and developed conditions of the Coors Village Subdivision is the 100-year, 24-hour storm event for peak flow and runoff volume computations.

A hydrologic computer model using AHYMO 97 was developed for both existing and developed conditions to determine the peak flows expected for the development. Finally, a hydraulic analysis of the storm sewer collection system was performed to assist in the sizing of the infrastructure.

EXISTING DRAINAGE CONDITIONS

INTRODUCTION

The site is located between Coors Boulevard and Atrisco Drive and is south of Western Trail. The average slope across the site is 1 to 2%. The site is sparsely vegetated.

The FEMA Flood Insurance Rate Map Number 35001C0114D, effective date September 20, 1996, and revised September 18, 1998 to reflect the LOMR previously mentioned shown in Figure 1, indicates that there is no flood hazard zone on the site.

There are two drainage systems adjacent to the site which eventually drain to the San Antonio Arroyo. The first is the Unser Boulevard/Rinconada Arroyo/Ladera Ponds 16A and 16B, mentioned previously and the Ladera Pond 15 outfall system located in Coors Boulevard. The Unser Boulevard system is maintained by the City of Albuquerque, while the Lader Pond 15 outfall system is maintained by AMAFCA.

UNSER BOULEVARD/RINCONADA ARROYO/PONDS 16A AND 16B LOMR REQUEST TO FEMA

On September 18, 1998, FEMA approved a LOMR request from the City of Albuquerque for the Unser Boulevard South, Rinconada Arroyo, and Ponds 16A and 16B, prepared by URS Greiner (see Appendix C). A review of this LOMR Request indicates that there is adequate volume in the Ladera Pond 16B to accept flows from the Coors Village Site. This LOMR reduced the Base Flood Elevation for Ladera Pond 16B from 5108 to 5102 and removed the 100-year flood hazard zone from the Coors Village Site.

The majority of the watershed for the LOMR is within the Petroglyph National Monument and therefore is assumed to be undeveloped. The remainder of the watershed was analyzed as future developed conditions. A HEC-1 model was developed in 1989 for the watershed. Ladera Pond 16B was regraded in the early 1990's increasing the capacity. A survey was performed to determine the increased capacity of the facility (see Plate 3). According to calculations performed by URS Greiner, the 100-year water surface elevation using the volume detained (18 acre-feet) in the HEC-1 analysis and the survey information is 5101.50, which is lower than the water surface of 5102.63 given in the HEC-1 analysis.

MESA PRIETA SUBDIVISION DRAINAGE REPORT

The Mesa Prieta Subdivision Drainage Report, prepared by Resource Technology, Inc. in September 1995, analyzed the hydraulic grade line of the Ladera Pond 15 outfall storm sewer located in Coors Village. An additional analysis of the Ladera Pond 15 outfall system was performed by Mr. Mark Burak, P.E. in May of 1995. Both of these analyses conclude that the Ladera Pond 15 Outfall storm sewer in Coors Boulevard is at capacity. The storm sewer at the intersection of Coors and Western Trail is flowing under pressure with a peak flow of 297 cfs. Since the storm sewer is flowing at capacity under pressure conditions, it cannot accept any additional flows from Coors Village.

CHAPPARAL WEST SUBDIVISION DRAINAGE REPORT

The Chapparal West Subdivision Drainage Report, prepared by Jeff Mortensen & Associates, Inc. in November 1999, indicates that the runoff from the subdivision will drain into Ladera Pond 16B via a storm drain that cross Chapparal Elementary School. The 17.1 acre Chapparal West Subdivision is located within the Basin P of the Unser

Boulevard South HEC-1 hydrologic model. The HEC-1 analysis computed excess runoff in Basin P to be 1.28 inches, whereas Mortensen calculated the excess runoff to be 1.51 inches. Therefore, the additional runoff reaching Pond 16B from Chapparal West Subdivision is 0.33 acre-feet. This additional runoff raises the 100-year water surface elevation of the pond by 0.05 feet.

According to the Chapparal West Subdivision Drainage Report, Ladera Pond 16B is owned by Albuquerque Public Schools. The property has an AMAFCA blanket drainage easement with a license agreement to the City of Albuquerque. Therefore, the City and AMAFCA are responsible for maintaining the pond.

OFF-SITE FLOWS

The site is bounded on three sides by existing streets, which are Coors Boulevard, Western Trail, and Atrisco Drive. There are no offsite flows from surrounding streets or from the property to the south of the site (Tracts X-1-A-1 and X-1-A-2). According to the Altura West Drainage Report, Tracts X-1-A-1 and X-1-A-2 drain to the Altura West storm drain system that is located in St. Joseph's Drive, which eventually drains to the Rio Grande. Therefore, there are no offsite flows that reach the site.

ON-SITE FLOWS

For the existing conditions hydrologic analysis, land treatment type A was used to determine peak flows and runoff volumes. The developed basin boundaries were used for existing basins. The site currently drains in three directions (See Plate 1). The majority of the north portion of the site (Basins 140, 160, 200 and a portion of 100) drains to Ladera Pond 16B located west of the site. The total volume reaching Ladera Pond 16B is about 0.94 acre-feet. Portions of Basins 100 drain to Coors Boulevard. The majority of the southern portion of the site (Basins 110, 120, 130, 170, and 180) drains to a depression located at the southeast corner of the site. The total volume reaching the depression is 0.74 acre-feet. Table 1 shows the results of the existing conditions modeling.

Table 1 Existing Drainage Conditions

BASINS	Area (acres)	100yr-24hr Peak Flow (cfs)	100yr- 24hr Runoff Volume (acre-ft)	Land Treatment
100	13.87	18.42	0.519	100%A
110	6.04	8.03	0.226	100%A
120	0.83	1.11	0.031	100%A
130	0.72	0.97	0.027	100%A
140	1.03	1.37	0.039	100%A
150	1.83	2.44	0.069	100%A
160	5.00	6.64	0.187	100%A
170	1.57	2.09	0.059	100%A
180	10.60	14.08	0.397	100%A
200	16.37	21.74	0.613	100%A

DEVELOPED DRAINAGE CONDITIONS

DRAINAGE BASIN DELINEATION

Plate 1 shows that the site is divided into ten drainage basins, basins 100-180 and 200. It is proposed that all of the peak flows from the site will be routed in a storm sewer to Ladera Pond 16B. The eventual outfall for the Ladera Pond 16B is the San Antonio Arroyo. The LOMR request from the City of Albuquerque for the Unser Boulevard South, Rinconada Arroyo, and Ponds 16A and 16B, prepared by URS Greiner (see Appendix C) indicates that the Ladera Pond 16B has the capacity to accept the runoff from Coors Village with minimal impact.

HYDROLOGIC ANALYSIS

To determine the peak flows of each basin a hydrologic analysis was performed in accordance to section 22.2 of the Development Process Manual (DPM) using AHYMO 97. The analysis included the 100-year 24-hour storm. The 100-year 24-hour storm was the basis for determining peak flows to size the storm sewer collection system and was used to determine the required capacity of the detention ponds. The design storm values are based on Tables C-1, C-2, and C-3 of the DPM's section 22.2. The Coors Village Subdivision is contained within section F-11-Z of the City of Albuquerque Zone Atlas Map. The location of the site results in the following design storms:

100-year 1-hour event -- 1.90 inches,
100-year 6-hour event -- 2.20 inches,
100-year 24-hour event -- 2.65 inches.

Basins were assigned land treatment values in accordance with Tables A-4 and A-5 of the DPM's section 22.2. Table 1 shows the land treatments and areas for each drainage basin.

The time of concentration for all basins was calculated using the SCS Upland Method Calculated outlined in subsection B.2 of DPM section 22.2 within the AHYMO 97 model.

Because the Unser HEC-1 model was not available, an AHYMO model of the inflows to the Ladera Pond 16B and the stage-storage relationship for the pond was developed following the hydrograph parameters given in the output of the HEC-1 model for the LOMR submittal. Some trial and error was required to match the peak flow of the incoming flows and the stage-storage characteristics of Ladera Pond 16B as shown in the HEC-1 output. The AHYMO model resulted in a 100-year water surface elevation of 5102.63 with a volume of 18.42 acre-feet and a peak flow out of 32.5 cfs. This compares favorably to the values given in the HEC-1 model, which are 5102.63 water surface elevation, a volume of 18.5 acre-feet, and a peak flow of 33 cfs. Then, the revised volumes of the pond for each stage as calculated by URS Greiner was input to the AHYMO model and run to determine the 100-year water surface elevation. With the revised volumes, the 100-year water surface elevation is 5101.76 and the detained volume and peak flow out are 19.85 acre-feet and 28.8 cfs, respectively.

Table 2 Developed Drainage Conditions

BASINS	Area (acres)	100yr-24hr Peak Flow (cfs)	100yr-24hr Runoff Volume (acre-ft)	Land Treatment
100	13.87	57.13	2.431	10%B,5%C,85%D
110	6.04	23.45	0.976	20%B,5%C,85%D
120	0.83	3.44	0.146	10%B,5%C,85%D
130	0.72	2.99	0.127	10%B,5%C,85%D
140	1.03	4.26	0.181	10%B,5%C,85%D
150	1.83	4.93	0.163	60%B,20%C,20%D
160	5.00	19.40	0.807	20%B,5%C,75%D
170	1.57	6.47	0.275	10%B,5%C,85%D
180	10.60	41.12	1.711	20%B,5%C,75%D
200	16.37	60.99	2.459	25%B,10%C,65%D

SUMMARY OF HYDRAULIC CALCULATIONS
CLOSED CONDUIT 2/28/2000
ONE DISCHARGE INTO LADERA POND 16B - NO PARK POND

n = 0.013

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
										JUNCTION		LOSSES											
STATION	STRUCT	D	Q	A	V	K	Sf	L	DELTA	D	ANGLE	hf	hb	hj	hmh	ht	hmisc	SUM	E.G.	hv	H.G.	GROUND ELEV.	C
Street A line																					5102.81		
																		0.00	5103.49	0.68	5102.81	5106.00	
Atrisco	Pond 16B											0.18						0.18	5103.67	0.68	5102.99		
		78.00	220	33.18	6.63	5246.4	0.0018	100					0.06	1.41	0.00	0.00		1.47	5105.14	0.45	5104.69	5108.00	
									45	42	45	0.69						0.69	5105.84	0.68	5105.15		
Milne	MH/J	72.00	158	28.27	5.59	4237.9	0.0014	500					0.09	0.14	0.00	0.00		0.23	5106.07	0.45	5105.62	5113.00	
									90	24	90	0.12						0.12	5106.19	0.68	5105.51		
Basin 180	MH/B	72.00	154	28.27	5.45	4237.9	0.0013	90					0.00	0.05	0.00	0.00		0.05	5106.24	0.45	5105.79	5110.70	
									0	36	90	0.30						0.30	5106.53	0.45	5106.08		
Basin 180	MH/B	72.00	152	28.27	5.38	4237.9	0.0013	230					0.00	0.21	0.00	0.00		0.21	5106.74	0.51	5106.24	5110.70	
									0	36	90	0.79						0.79	5107.54	0.51	5107.03		
Basin 150	MH/J	60.00	112	19.64	5.70	2606	0.0018	430					0.00	0.04	0.00	0.00		0.04	5107.57	0.50	5107.08	5108.40	
										24	45	0.28						0.28	5107.85	0.51	5107.34		
Street A/B	MH/J	60.00	112	19.64	5.70	2606	0.0018	150					0.00	0.00	0.02	0.00		0.02	5107.87	0.50	5107.38	5109.50	
										0	0	0.42						0.42	5108.29	0.50	5107.79		
Street A/B	MH/J	54.00	90	15.90	5.66	1967.6	0.0021	200					0.00	0.00	0.02	0.00		0.02	5108.31	0.42	5107.89	5110.25	
										0	0	0.12						0.12	5108.44	0.42	5108.01		
Basin 100	MH/J	54.00	83	15.90	5.22	1967.6	0.0018	70					0.04	0.46	0.00	0.00		0.50	5108.94	0.19	5108.74	5109.85	
									90	36	90	0.81						0.81	5109.75	0.19	5109.55		
		54.00	56	15.90	3.52	1967.6	0.0008	1000					0.00	0.00	0.00	-0.10		-0.10	5109.65	0.00	5109.65	5110.00	
Basin 160	MH																						
		24.00	0	3.14	0.00	226.29	0.0000	0				0.00						0.00	5109.65	0.00	5109.65		
																					5104.69		
Basin 200																							
Atrisco	MH												0.00	0.00	0.03	0.12		0.15	5105.45	0.61	5104.84	5106.00	
Inter		42.00	60.1	9.62	6.25	1006.6	0.0036	150				0.53						0.53	5105.98	0.61	5105.38		
Basins 100	MH												0.00	0.00	0.00	0.00		0.00	5105.98	0.00	5105.98	5108.00	
110 & 120		42.00	0	9.62	0.00	1006.6	0.0000	0				0.00						0.00	5105.98	0.00	5105.98		
Basins 100	MH												0.00	0.00	0.00	-0.14		-0.14	5105.85	0.00	5105.85	5108.00	
110 & 120		42.00	0	9.62	0.00	1006.6	0.0000	0				0.00						0.00	5105.85	0.00	5105.85		

APPENDIX A

Site Hydrology/hydraulic Calculations:

The total site is 220,801sf or 5.07ac.

Basin A= 76,700sf or 34.7% of the site.
Basin B= 110,360sf or 50% of the site.
Basin C= 33,741sf or 15.3% of the site.

The total Flow is 20.65cfs
Basin A develops .347 x 20.65cfs = 7.17cfs
Basin B develops .50 x 20.65cfs = 10.33cfs
Basin C develops .153 x 20.65cfs = 3.16cfs

The total Volume is 39492cf or 0.91ac-ft
Basin A develops .347 x 39492cf = 13,703cf
Basin B develops .50 x 39492cf = 19,746cf
Basin C develops .153 x 39492cf = 6,043cf

The storm water quality requirements are 5023cf.

Basin A
Pond 1 – 227cf
Pond 2 – 1471cf

Basin B
Pond 3 – 2,564cf

Basin C
Pond 4 – 997cf

Total ponding 5259cf, thus greater than 5023cf required.

Project: House of Life Ministries

Drainage Calculations - Zone 1

Depth (inches) at 100yr Storm					
Zone	P_{60}	P_{360}	P_{1440}	P_{4days}	P_{10days}
1	1.87	2.20	2.66	3.12	3.67
2	2.01	2.35	2.75	3.30	3.95
3	2.14	2.60	3.10	3.95	4.90
4	2.23	2.90	3.65	4.70	5.95

Excess Precipiation, E(inches) - 6 HR				
	Treatment			
Zone	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.80	1.08	1.46	2.64

Weighted E= $((E_A*A_A)+(E_B*A_B)+(E_C*A_C)+(E_D*A_D))/(A_A+A_B+A_C+A_D)$
V_{360}=(Weighted E *A_T)/12 in/ft
V_{1440}= $V_{360}+A_D*(P_{1440}-P_{360})/12$in/ft
V_{4days}=$V_{360}+A_D*(P_{4day}-P_{360})/12$in/ft
V_{10days}=$V_{360}+A_D*(P_{10days}-P_{360})/12$in/ft

Peak Discharge (CFS/ACRE) 100 YR				
	Treatment			
Zone	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.70
3	1.87	2.60	3.45	5.02
4	2.20	2.92	3.73	5.25

******Developed Conditions per the Coors Village Master Drainage Plan**********

Area	SQ. FT	Acres	% Total
A=	0	0.000	0%
B=	44160	1.014	20%
C=	11040	0.253	5%
D=	162600	3.733	75%
Total	217800	5.000	100%
Weighted E=	1.657		

Design Flows (CFS)			
Area	SQ. FT	Acres	Peak Discharge (100 YR)
A=	0	0.000	0.00
B=	44160	1.014	2.06
C=	11040	0.253	0.73
D=	162600	3.733	16.31
Total (CFS)			19.10

	V_{360}	V_{1440}	V_{4days}	V_{10days}
Cubic feet	30070	36303	42536	49988
Acre-ft	0.69	0.83	0.98	1.15

**********PROPOSED CONDITIONS**********

Area	SQ. FT	Acres	% Total
A=	0	0.000	0%
B=	0	0.000	0%
C=	43504	0.999	20%
D=	177297	4.070	80%
Total	220801	5.069	100%
Weighted E=	1.777		

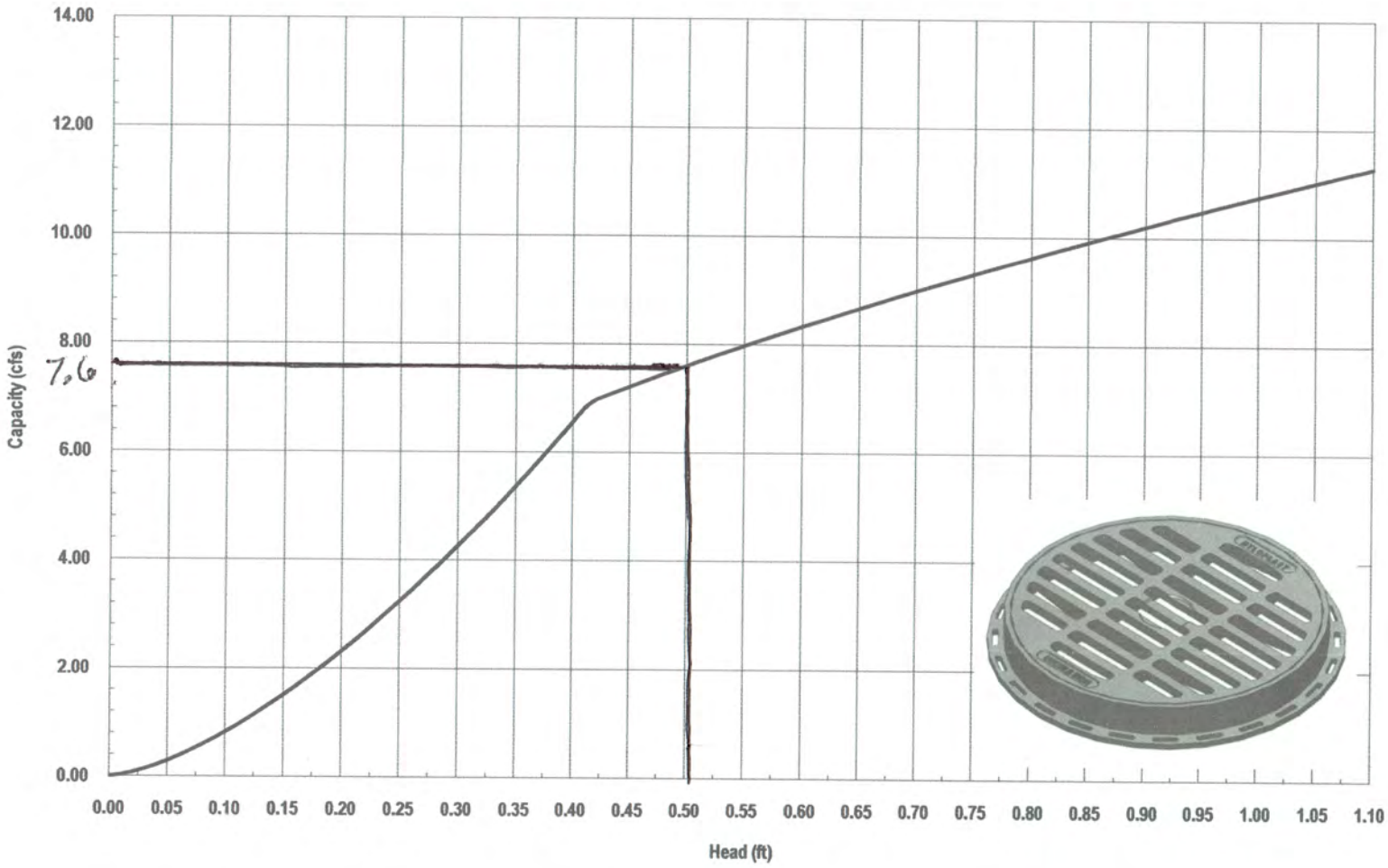
Design Flows (CFS)			
Area	SQ. FT	Acres	Peak Discharge (100 YR)
A=	0	0.000	0.00
B=	0	0.000	0.00
C=	43504	0.999	2.87
D=	177297	4.070	17.79
Total (CFS)			20.65

	V_{360}	V_{1440}	V_{4days}	V_{10days}
Cubic feet	32695	39492	46288	54414
Acre-ft	0.75	0.91	1.06	1.25

The 100 year peak flows for this developed site is 20.7 CFS and the masterplan design flows are 19.1 CFS for an increase of 1.6 CFS. The 100 year 6 hr volume increase is 32695-30070 = 2625CF.

Storm Water Quality Ponding Requirement = A_D *0.34 in/12in/ft = 5023 CF

Nyloplast 30" Standard Grate Inlet Capacity Chart



Nyloplast
3130 Verona Avenue • Buford, GA 30518
(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

Plan View

Stormwater Studio 2019 v 3.0.0.15

Project Name: House of life ministries

12-28-2019

Project File: private storm drain profile.sws

Storm Sewer Tabulation

Project Name: House of life ministries

Stormwater Studio 2019 v 3.0.0.15

12-28-2019

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	45.17	0.000	0.000	0.00	0.00	0.00	0.0	4.29	6.37	20.70	40.93	4.22	30	1.00	4.22	3.77	9.77	9.65	13.50	13.60	1
Line 2	148.54	0.000	0.000	0.00	0.00	0.00	0.0	3.45	6.37	20.70	38.77	2.93	36	0.20	4.50	4.20	10.26	10.18	11.90	13.50	2
Line 3	272.50	0.000	0.000	0.00	0.00	0.00	0.0	2.17	6.37	17.50	23.78	3.57	30	0.20	5.04	4.50	10.66	10.36	10.70	11.90	3
Line 4	298.60	0.000	0.000	0.00	0.00	0.00	0.0	0.00	6.37	7.20	13.17	2.29	24	0.20	5.64	5.04	11.05	10.87	13.60	10.70	4

Notes: IDF File = SampleIDF.idf, Return Period = 2-yrs.

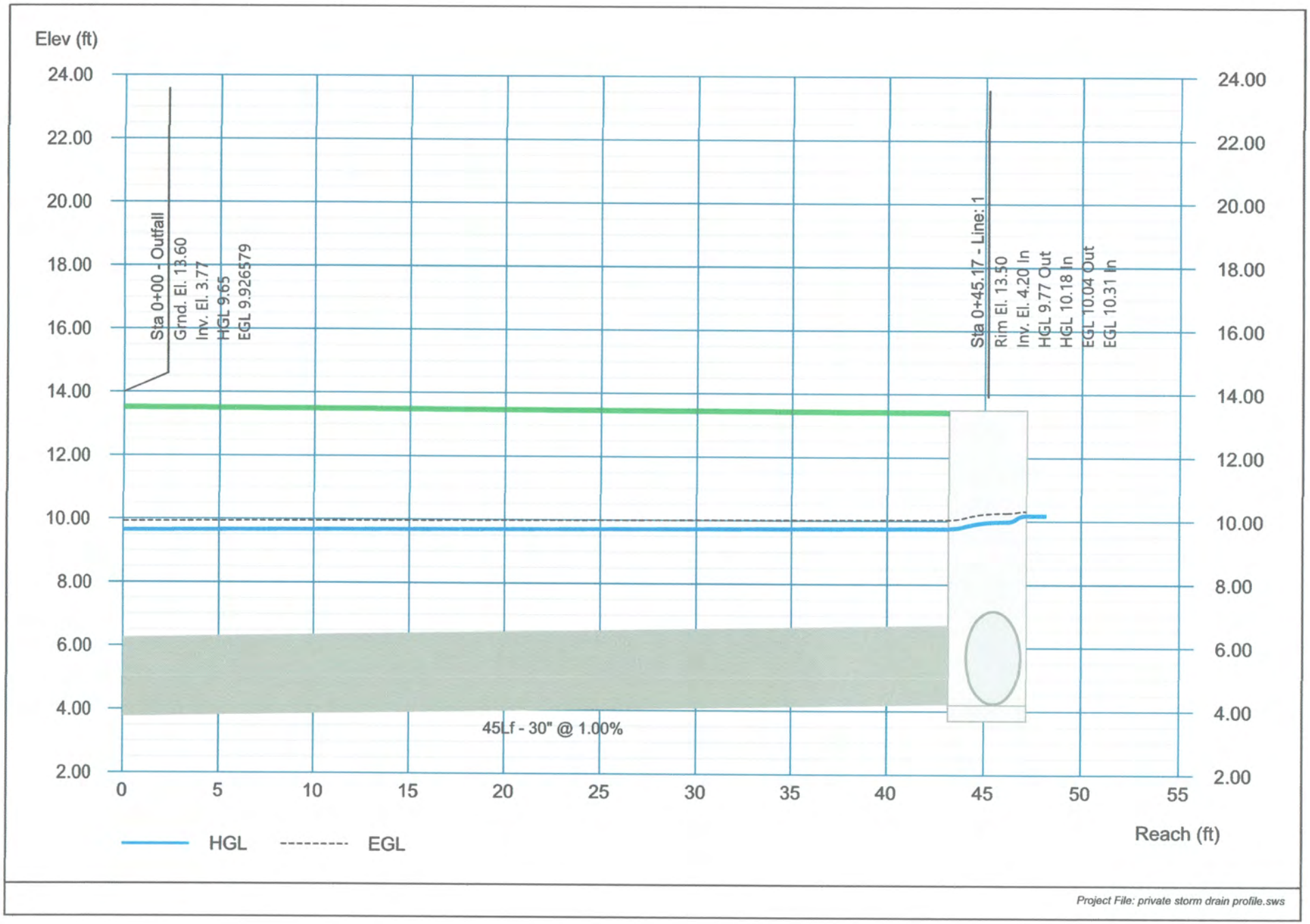
Project File: private storm drain profile.sws

Line 1

Project Name: House of life ministries

Stormwater Studio 2019 v 3.0.0.15

12-28-2019



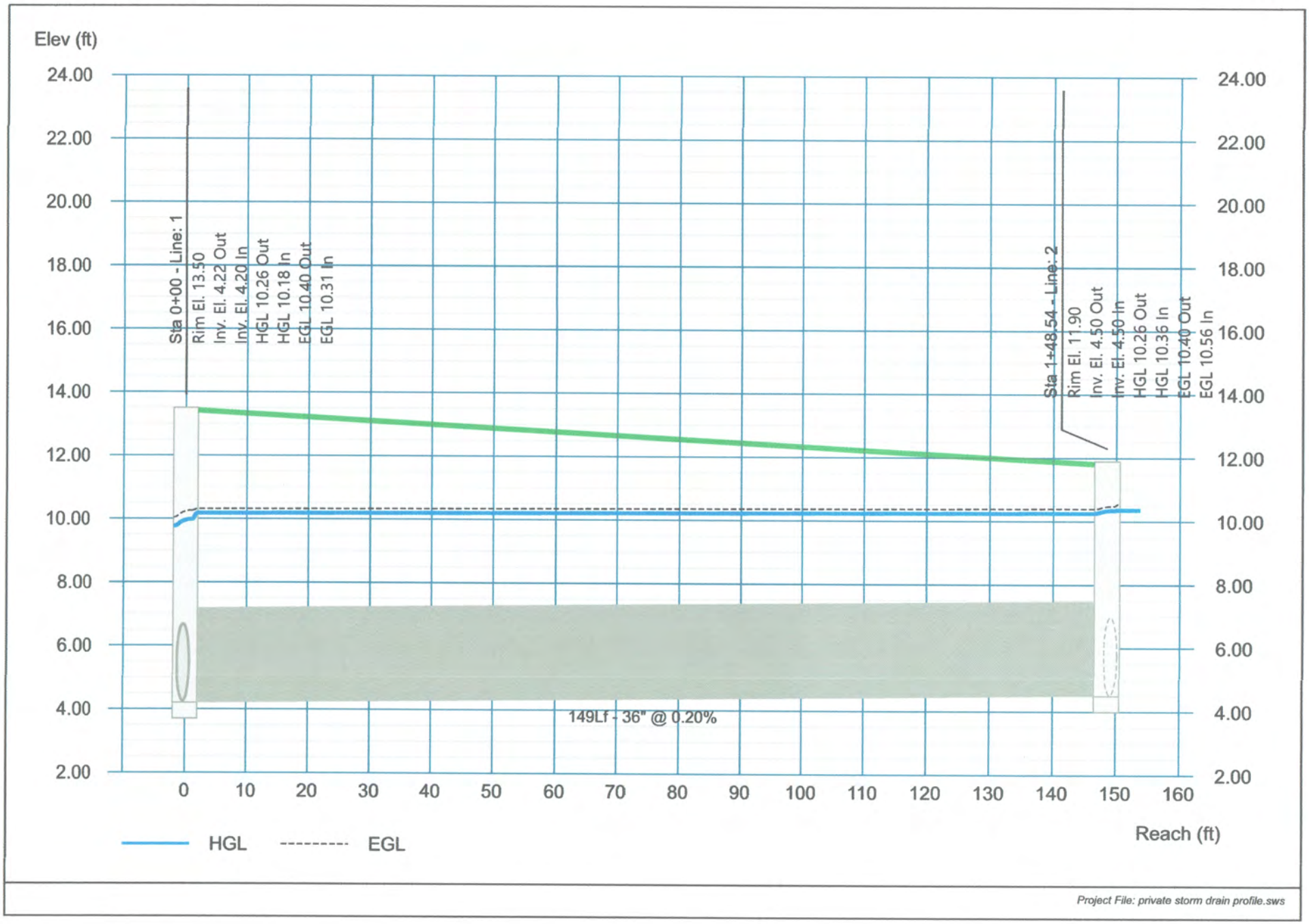
Project File: private storm drain profile.sws

Line 2

Project Name: House of life ministries

Stormwater Studio 2019 v 3.0.0.15

12-28-2019



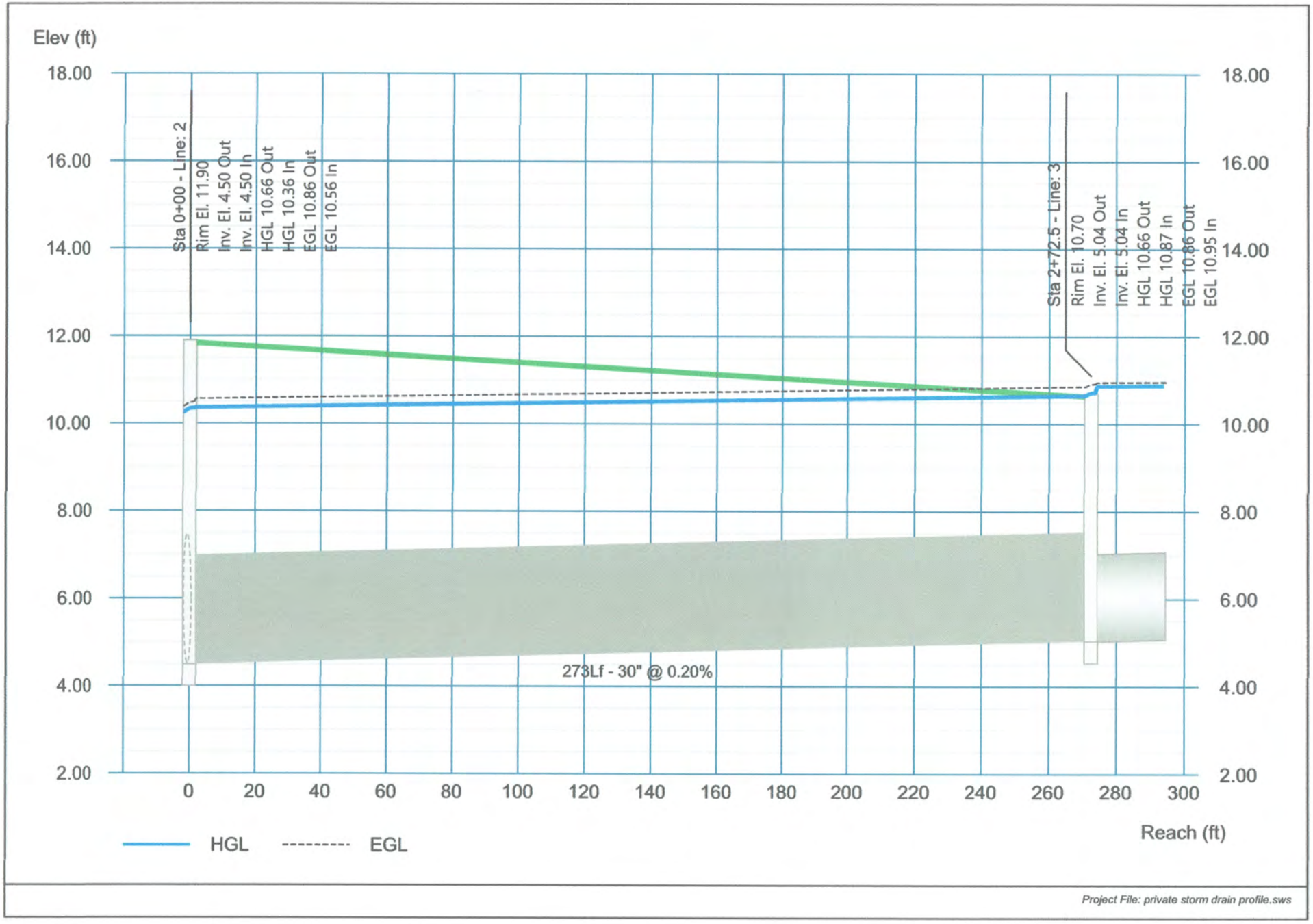
Project File: private storm drain profile.sws

Line 3

Project Name: House of life ministries

Stormwater Studio 2019 v 3.0.0.15

12-28-2019



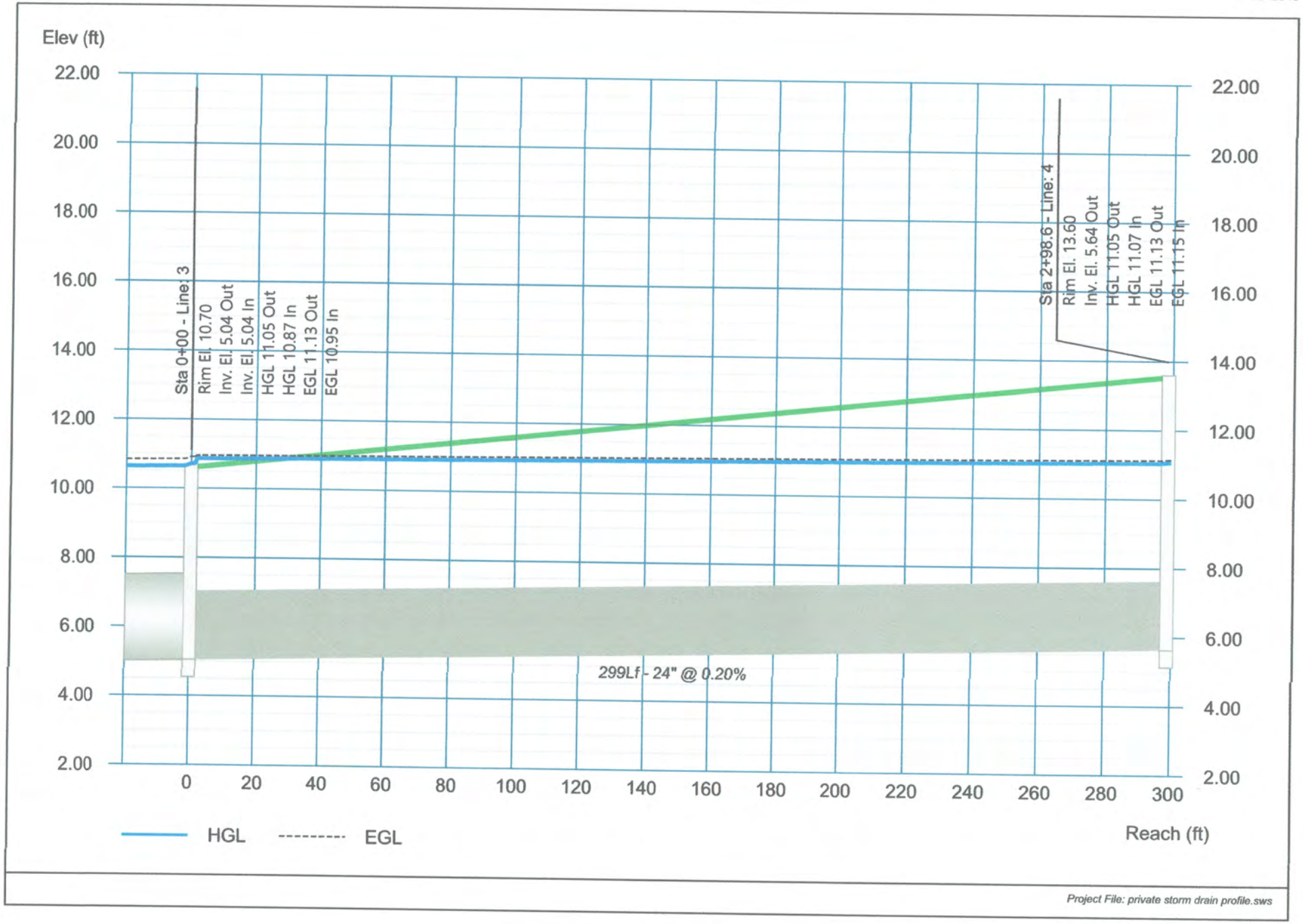
Project File: private storm drain profile.sws

Line 4

Stormwater Studio 2019 v 3.0.0.15

Project Name: House of life ministries

12-28-2019



Project File: private storm drain profile.sws

DRAINAGE NARRATIVE:

Summary–

- The proposed flows are slightly higher than the masterplan design flows 20.7cfs vs 19.1cfs or 1.6cfs.
- The overall proposed volume from the site(100yr 24hr event, the masterplan design volume) is 0.91ac–ft – 0.11ac–ft (water quality pond reqmt) = 0.80ac–ft, this is slighty less than the masterplan design volume for this site of 0.807ac–ft.
- Refer to the drainage report for more information.

Project: House of Life Ministries
Drainage Calculations - Zone 1

Depth (inches) at 100yr Storm

Zone	P60	P360	P1440	P4days	P10days
1	1.87	2.20	2.66	3.12	3.67
2	2.01	2.35	2.75	3.30	3.95
3	2.14	2.60	3.10	3.95	4.90
4	2.23	2.90	3.65	4.70	5.95

Excess Precipiation, E(inches) - 6 HR

Zone	Treatment A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.80	1.08	1.46	2.64

Weighted E= ((EA*AA)+(EB*AB)+(EC*AC)+(ED*AD))/(AA+AB+AC+AD)
V360=(Weighted E *AT)/12 in/ft
V1440= V360+AD*(P1440-P360)/12in/ft
V4days=V360+AD*(P4days-P360)/12in/ft
V10days=V360+AD*(P10days-P360)/12in/ft

Peak Discharge (CFS/ACRE) 100 YR

Zone	Treatment A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.70
3	1.87	2.60	3.45	5.02
4	2.20	2.92	3.73	5.25

********Developed Conditions per the Coors Village Master Drainage Plan**************

Area	SQ. FT	Acres	% Total
A=	0	0.000	0%
B=	44160	1.014	20%
C=	11040	0.253	5%
D=	162600	3.733	75%
Total	217800	5.000	100%
Weighted E=	1.657		

Design Flows (CFS)

Area	SQ. FT	Acres	Peak Discharge (100 YR)
A=	0	0.000	0.00
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C=	11040	0.253	0.73
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Total (CFS)			19.10

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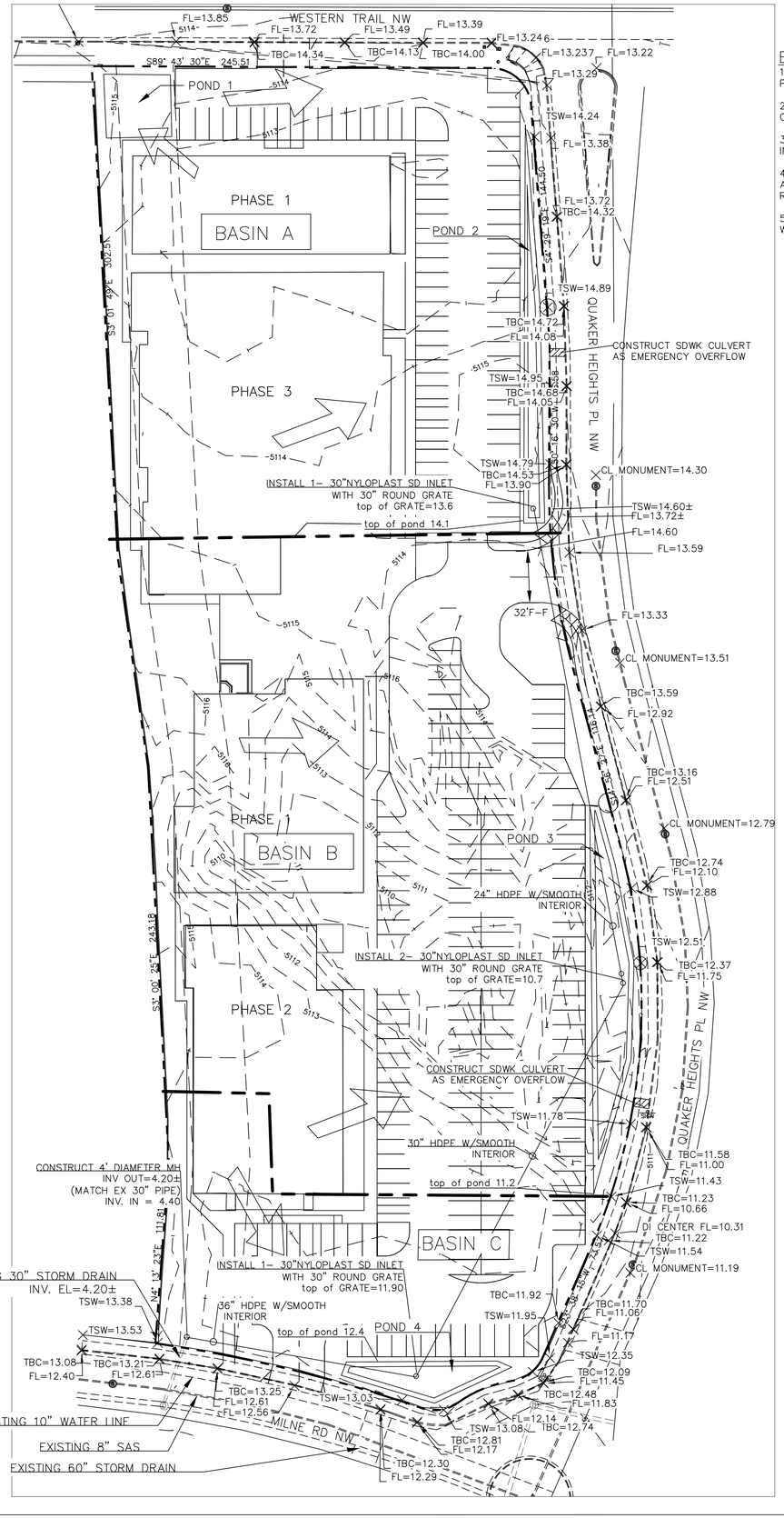

EROSION CONTROL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.

2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN–OFF ON SITE DURING CONSTRUCTION.

3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT–OF–WAY.

4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

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.

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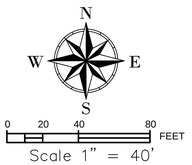


GENERAL NOTES:

1. THIS SITE IS NOT LOCATED IN A FEMA FLOOD HAZARD ZONE (REFER TO THE FIRM MAP 35001C0114H, EXCERPT ATTACHED).

2. RHD ENGINEERING, LLC RECOMMENDS THAT THE OWNER OBTAIN A GEOTECHNICAL REPORT PRIOR TO DESIGN OF BUILDING FOOTING/FOUNDATION.

3. SLOPE STABILAZATION SHALL BE USED ON SLOPES GREATER THAN A 3:1 SLOPE, PER MANUFACTURER RECOMMENDATIONS.

4. MODIFICATIONS OR ADJUSTMENTS TO EXISTING DRAINAGE STRUCTURES/EROSION MITIGIATION IMPROVEMENTS SHALL BE DONE IN THE SAME MANNER AS THE ORIGINAL IMPROVEMENT.

5. ALL SWPPP REQUIREMENTS SHALL BE ADHERED TO.

6. ALL WORK ON THIS PLAN SHALL BE DONE IN ACCORDANCE WITH CITY OF ALBUQUERQUE STANDARDS. ALL APPLICABLE PERMITS SHALL BE OBTAINED PRIOR TO WORK COMMENCING.

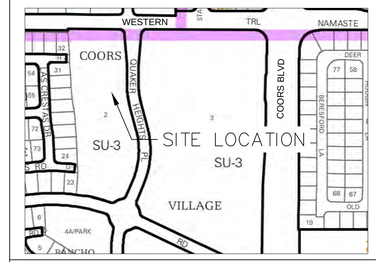
7. ALL WORK IN THE RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH CITY OF ALBUQUERQUE STANDARDS.

8. THIS GRADING PLAN IS TO BE UTILIZED AND A COPY PROVIDED TO THE CITY WHEN APPLYING FOR THE CONSTRUCTION OF ANY GARDEN OR RETAINING WALLS, WITH RESPECT TO THIS SITE.

9. THE SURVEY INFORMATION WAS PROVIDED BYCONSTRUCTION SURVEYS TECHNOLOGIES, INC.

10. FOR SITE DIMENSIONS, BUILDING AND INFRASTRUCTURE LOCATION REFER TO THE SITE PLAN.

11. DO NOT PLACE ADDITIONAL FILL OR LOADING ON ADJACENT WALLS WITHOUT APPROVAL OF A STRUCTURAL ENGINEER. CONTACT A STRUCTURAL ENGINEER FOR ADEQUACY OF THE EXISTING PERIMETER WALLS W/RESPECT TO THIS GRADING PLAN.



VICINITY MAP: F–11–Z

FIRM MAP: 35001C0114H

LEGAL DESCRIPTION:

TRACT 2, COORS VILLAGE
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.

2. RETAIN THE FIRST .34" OF STORM RUNOFF FROM ENTIRE DEVELOPMENT TO CONFORM TO THE WATER QUALITY REQURIEMENTS

LEGEND

- 46.00 — PROPOSED SPOT ELEVATION
- NG=44.00 — EXISTING SPOT ELEVATION
- 5601 — EXISTING CONTOUR EXISTING
- 5600 — INDEX CONTOUR PROPOSED
- 5601 — CONTOUR PROPOSED INDEX
- 5600 — CONTOUR
- LOT LINE
- EXISTING WALL
- EXISTING CURB AND GUTTER
- PROPOSED RETAINING WALL
- PROPOSED WALL
- PROPOSED EDGE OF CONCRETE
- PROPOSED FLOWLINE
- PROPOSED BASIN BOUNDARY
- CONCEPTUAL DIRECTION OF FLOW

I HAVE PERSONALLY INSPECTED THE PROPERTY ON 12–31–19. NO EARTHWORK HAS BEEN PERFORMED AND THE SITE IS CONSISTENT WITH THE TOPO SHOWN.

Richard Dourte P.E. #10854 DATE

ENGINEER'S SEAL

RICHARD H. DOURTE NEW MEXICO 10854 REGISTERED PROFESSIONAL ENGINEER

1–02–20

Richard Dourte
P.E. #10854

Title:
House of Life Ministries
Quaker Heights Pl. NW

CONCEPTUAL GRADING AND DRAINAGE PLAN

DRAWN BY

DATE

RHD Engineering, LLC
4305 Purple Sage Ave. NW
Albuquerque, NM 87120
(505) 288–1621

SHEET # Appendix B

JOB #