CITY OF ALBUQUERQUE

Richard J. Berry, Mayor

November 21, 2016

Fred C. Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM, 87108

RE: Albuquerque Zoo – Penguin Exhibit
Grading and Drainage Plan
Engineer's Stamp Date 9-15-16 (File:K13D034G)

Dear Mr. Arfman:

Based upon the information provided in your submittal received 11-16-2016, the above referenced submittal is re-approved for Building Permit. The conditions of the previous approval have been resolved and no longer apply.

Please attach a copy of this approved plan in the construction sets when submitting for a building permit. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Abiel Carrillo, P.E.
Principal Engineer, Planning Dept.
Development Review Services

Orig: Drainage file

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Albuquerque Biopark Zoo Penguin Exhibit Building Permit #: ____ City Drainage #: K13/D034G

DRB#: ____ EPC#: ____ Work Order#: ____

Legal Description: Tropical America and Adjacent Areas - Rio Grande Zoo

City Address: ____

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: ____ E-mail: freda@iacivil.com

Owner: City of Albuquerque Contact: ____

Address: ____

Phone#: ____ Fax#: ____ E-mail: ____

Architect: Van H. Gilbert Architect, PC Contact: ____

Address: ____

Phone#: ____ Fax#: ____ E-mail: ____

Other Contact: ____ Contact: ____

Address: ____

Phone#: ____ Fax#: ____ E-mail: ____

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE
____ TRAFFIC/ TRANSPORTATION
____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

____ ENGINEER/ ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN
X GRADING PLAN
____ DRAINAGE MASTER PLAN
____ DRAINAGE REPORT
____ CLOMR/LOMR

RECEIVED
NOV 16 2016
LAND DEVELOPMENT SECTION

____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) ____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X 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

____ PRE-DESIGN MEETING
____ OTHER (SPECIFY) ____

IS THIS A RESUBMITTAL?: X Yes ____ No

DATE SUBMITTED: November 16, 2016 By: Fred C. Arfman

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ____

Harmon Rita T.

From: Harmon Rita T.
Sent: Friday, October 07, 2016 11:33 AM
To: 'Bryan Bobrick'
Subject: RE: FW: Following up from Friday regarding Penguin Chill plans

If it is a no-go, then just add the pump scheme to the As-built plan/ Eng. Cert. Plan. I will print this email and keep in the file for C.O.

Rita

From: Bryan Bobrick [mailto:bryanb@iacivil.com]
Sent: Friday, October 07, 2016 11:30 AM
To: Harmon Rita T.
Cc: Fred c. Arfman (freda@iacivil.com)
Subject: Re: FW: Following up from Friday regarding Penguin Chill plans

Great - thank you Rita - we are in the process of coordinating with Jane. If it's a no-go, we would need to come up with a sump pump solution that would pump to grade so it shouldn't impact the approval - one way or another, we'll get the water out.

I'll let you know. For now, the letter gives us some breathing room.

Bryan

Bryan Bobrick
Isaacson & Arfman, P.A.
128 Monroe N.E.
Albuquerque, NM 87108
(505) 268-8828

On Fri, Oct 7, 2016 at 11:27 AM, Harmon Rita T. <rharmon@cabq.gov> wrote:

Fred,

Please see the attached approval letter from Hydrology, pending a condition that WUA will accept the drainage from the trench drains.

Rita Harmon, P.E.

Senior Engineer, Hydrology

COA, Planning Department

CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

October 7, 2016

Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe Street N.E.
Albuquerque, NM 87108

RE: **Albuquerque Biopark Zoo Penguin Exhibit (File: K13D034G)**
Grading & Drainage Plan, Engineer's Stamp Date 9-15-2016
Supplemental Information, Engineer's Stamp Date 10-5-2016

Dear Mr. Arfman:

Based upon the information provided in your submittal received 10-6-2016, the above referenced plan is approved for Building Permit with the following condition:

1. The WUA must accept drainage from the trench drains into the sanitary sewer. Verify with Jane Rael (505-289-3439).

Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3695.

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

Sincerely,

Rita T. H

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file

See email 10/7/16 regarding condition! RTH

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Albuquerque Biopark Zoo Penguin Exhibit Building Permit #: ______ City Drainage #: K13/D034G

DRB#: ______ EPC#: ______ Work Order#: ______

Legal Description: Tropical America and Adjacent Areas - Rio Grande Zoo

City Address: ______

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: ______ E-mail: freda@iacivil.com

Owner: City of Albuquerque Contact: ______

Address: ______

Phone#: ______ Fax#: ______ E-mail: ______

Architect: Van H. Gilbert Architect, PC Contact: ______

Address: ______

Phone#: ______ Fax#: ______ E-mail: ______

Other Contact: ______ Contact: ______

Address: ______

Phone#: ______ Fax#: ______ E-mail: ______

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE
___ TRAFFIC/ TRANSPORTATION
___ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

___ $\boxed{\text{ENGINEER}}$/ ARCHITECT CERTIFICATION

___ CONCEPTUAL G & D PLAN
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___ CLOMR/LOMR

___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ TRAFFIC IMPACT STUDY (TIS)
___ EROSION & SEDIMENT CONTROL PLAN (ESC)

___ OTHER (SPECIFY) ______

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY

___ PRELIMINARY PLAT APPROVAL
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___ 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

___ PRE-DESIGN MEETING
___ OTHER (SPECIFY) ______

RECEIVED
OCT 1 3 2016
LAND DEVELOPMENT SECTION

AP

IS THIS A RESUBMITTAL?: X Yes ___ No

DATE SUBMITTED: October 6, 2016 By: Fred C. Arfman

RECEIVED
OCT 0 6 2016
LAND DEVELOPMENT SECTION

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

%D = 0.57 Ac.
A = 1.2 Ac

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Bryan Bobrick <bryanb@iacivil.com>

Penguin - COA Zoo - Hydrology resubmittal

Bryan Bobrick <bryanb@iacivil.com> Thu, Oct 6, 2016 at 3:10 PM
To: COA Planning Development Review Services <PLNDRS@cabq.gov>

Bryan Bobrick
Isaacson & Arfman, P.A.
128 Monroe N.E.
Albuquerque, NM 87108
(505) 268-8828

4 attachments

2016 10-05 SUPPLEMENTAL INFORMATION signed 10-05-16.pdf
3983K

CG-100 GRADING AND DRAINAGE PLAN OVERALL.pdf
1678K

CG-101 GRADING AND DRAINAGE PLAN MAIN LEVEL.pdf
840K

CG-102 GRADING AND DRAINAGE PLAN LOWER LEVEL.pdf
825K

ISAACSON & ARFMAN, P.A. *Consulting Engineering Associates*
Thomas O. Isaacson, PE(RET.) & LS(RET.) . Fred C. Arfman, PE . Åsa Nilsson-Weber, PE

October 5, 2016

Rita Harmon, P.E.
Senior Engineer, Hydrology
COA, Planning Department

RE: **ALBUQUERQUE BIOPARK ZOO PENGUIN EXHIBIT**
RESPONSE TO REVIEW COMMENTS DATED September 30, 2016

Dear Ms. Harmon,

Included with this letter is a revised Grading and Drainage resubmittal with associated supplemental information which addresses your review comments dated September 30, 2016. Our comments below correspond directly to the numbered comments you provided.

1. Aerial image showing the location of the proposed development within the zoo is provided. We have also included portions of our in-house elevation analysis which was used to set the proposed building grades (using the Bernalillo County contour files). The existing low elevations to the north and south (shown black) are 4947.0 to 4947.5. Any excess stormwater will continue to pass north and south. The grading concept for both existing and proposed conditions utilizes landscaping for water harvesting with overflow to adjacent landscaping and ultimately to the lowest portions of the zoo property. There is no significant difference between pre and post development impervious area which would adversely impact the existing conditions.

2. Regarding a maximum water surface elevation, the localized water harvesting basins will equalize via overflow elevations of 4947.5. Stormwater will continue to be retained to infiltrate into the ground until the site overflows at the historic low points (4948.4). Without a Master Drainage Study of the overall zoo drainage basins, land treatments, storm drain infrastructure and retention pond areas, a maximum water surface elevation for the main park area cannot be determined. Per conversations with Ray Johnson, Zoo Maintenance Director, they have never experienced any extensive ponding from storms.

3. Elevations and keyed notes are provided on the plans to clarify the high side and low side grades of all site retaining walls. Per the architect, *"the exposed site retaining walls*

*128 Monroe St. N.E. * Albuquerque, NM 87108 * (505) 268-8828 * www.iacivil.com*

will be engineered interlocking stacked masonry systems. Engineering and final detailing will be performed by the manufacturer and installer. This is specified in Section 04 22 33."

4. Regarding the drainage from the upper plaza over the retaining wall, the architect responds *"The zoo is aware that the water from the Plaza will drain over the edge and down the retaining wall masonry. The masonry units specified are designed for retention... The units have integral protection to resist staining and are made of 3000 PSI concrete."*

5. A basin exhibit for the project is included.

6. The plumbing plan will be provided as soon as I receive it. This plan calls out the ramp trench drain connection to the SAS system and is currently under review as part of the electronic submittal. In addition, the small floor drain in the concrete landing on the north side (at the bottom of the stairs) will also tie to the SAS system. The reason for this is that the door / landing in this area is below grade and must be sealed to prevent groundwater from rising up into the space. Therefore, the only drain options are sump pump (200 sf with 100-year Q=0.02 cfs) or tie to SAS.

7. The architectural sections showing how the building relates to the site are included. The sections include the open mechanical area on the east side.

8. A copy of the architectural site plan is provided. This plan clarifies the hard surface areas and the gravel area in the mechanical yard on the east side. Final landscaping is not included in this project. All unpaved areas will be seeded with natural grasses until landscaping is designed / installed under separate contract.

9. Per the architect, the triple lines on the south side indicated standard curb and gutter. The architect has eliminated this C&G from the site base.

10. As noted above, the flat grading design in both the existing and proposed condition consists of localized landscaped areas (water harvesting) which overflowed to adjacent landscaped areas and ultimately overflowed to the historic lower areas to the north and south. The depressions shown on our plan noted as temporary stormwater retention ponds have been relabeled water harvesting / sediment control basins (varying depths from 0.5' to 2.5') with a general note on CG-100 "The proposed development will utilize water harvesting landscaped areas for infiltration. Excess stormwater will continue to the historic low points within the property. The final landscaping will be designed as part of a separate project."

FRED C. ARFMAN
NEW MEXICO
7322
LICENSED PROFESSIONAL ENGINEER

10-05-16

Per the colored elevation banding study shown with the existing exhibit building which will be demolished to make room for this project, the orange/pink reflects higher grades to the east and west (4949 to 4951) with the center gray/lavender at 4947.75 to 4948.50 sloping to lower grades to the north (the zoo park area) and south.

Using this information, we established a design grade of 4948.7 as the control elevation for the building.

The lower level grade of 4946.2 is depressed below this control grade but all openings to the building lower than 4948.7 are enclosed.

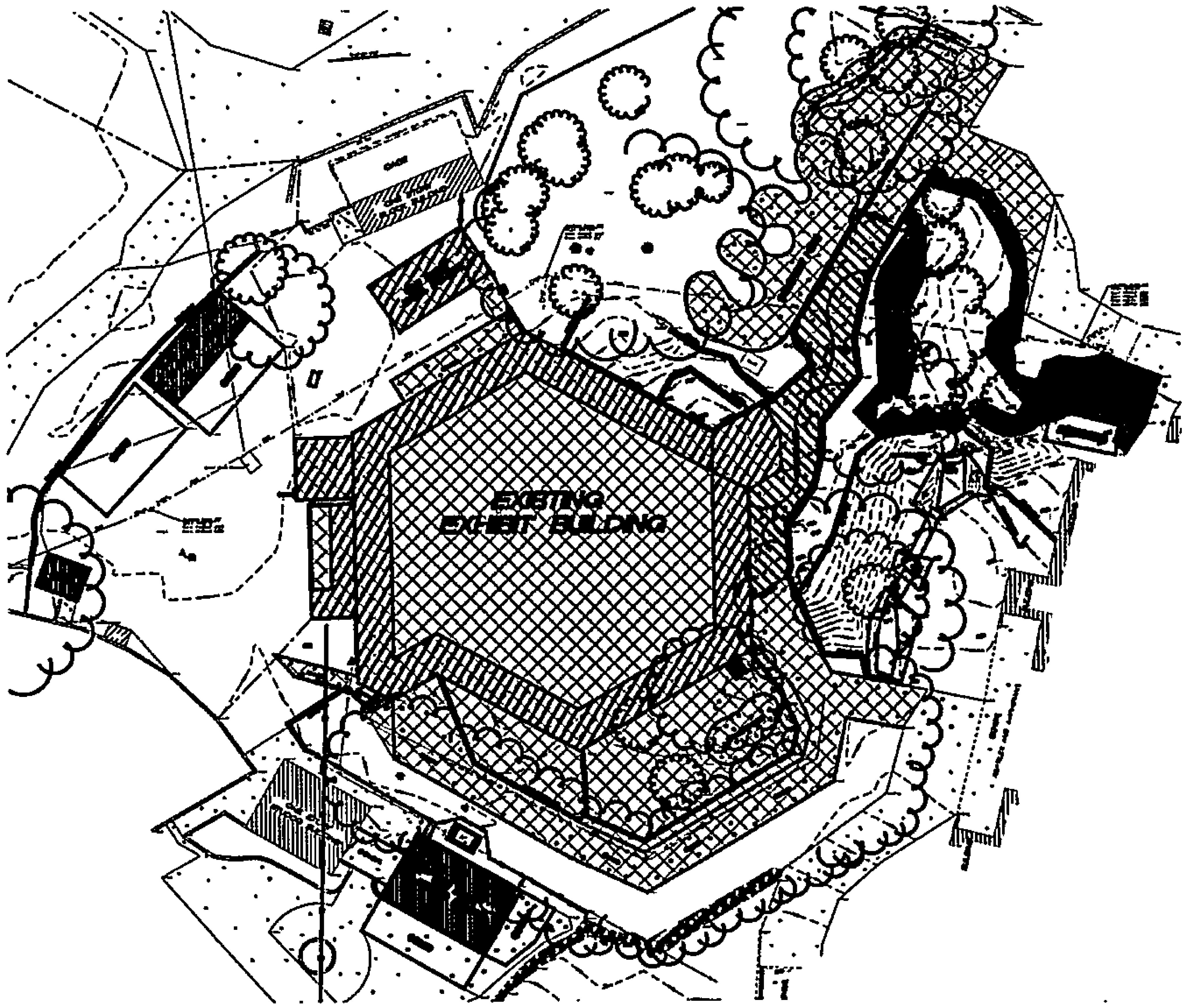
In the existing condition, stormwater discharge is accepted into the flat site grading concept

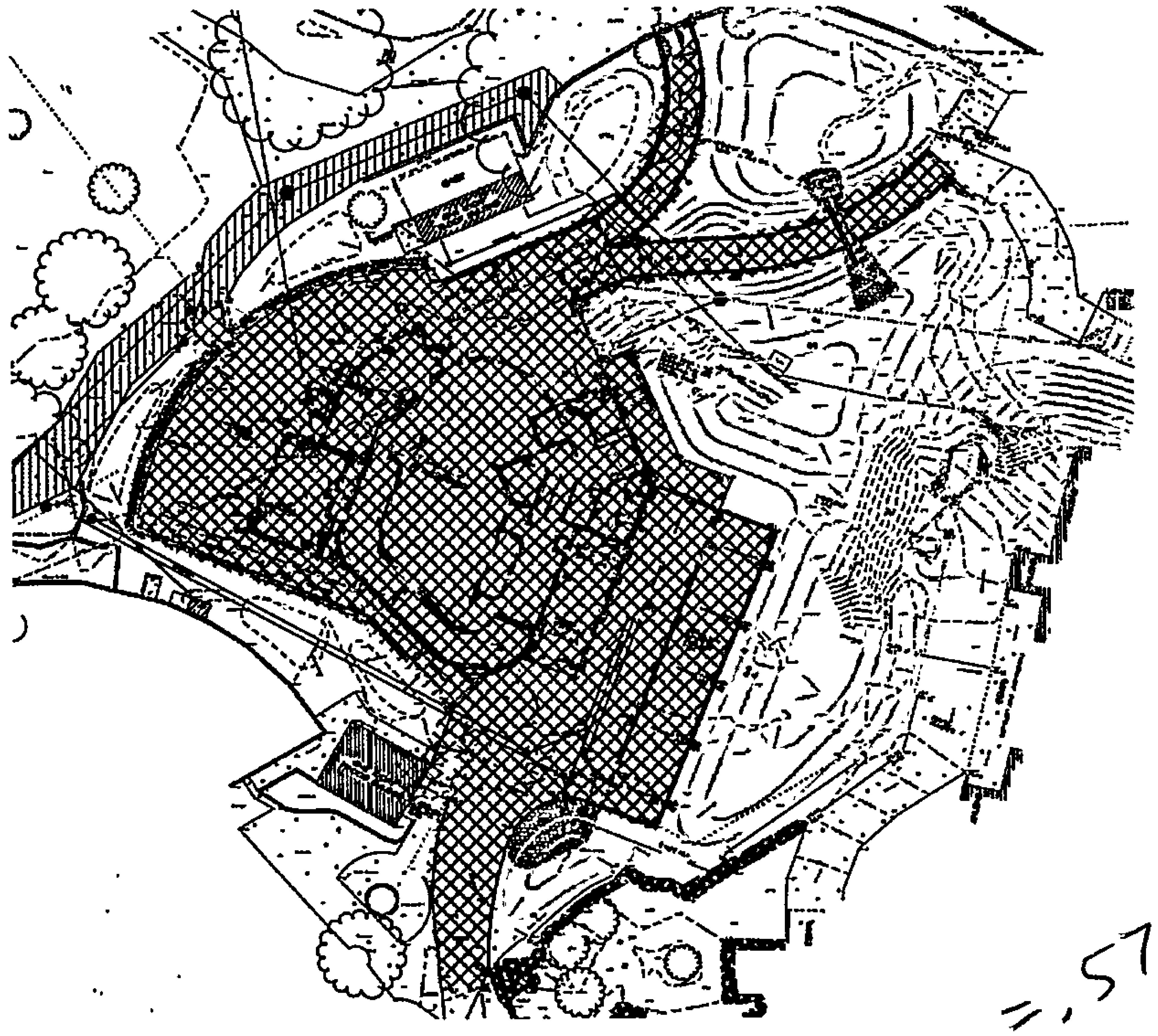
The center of the park area and the south low area (shown black) represent the low elevation in the area 4947.0 to which accepts any overflow from the project boundary.

Elevations Table

Minimum Elevation	Maximum Elevation	Color
4947.75	4948.00	
4948.00	4948.25	
4948.25	4948.50	
4948.50	4948.75	
4948.75	4949.00	
4949.00	4949.50	
4949.50	4950.00	
4950.00	4951.00	

EXISTING –VS- PROPOSED IMPERVIOUS AREA





=,57 Ac

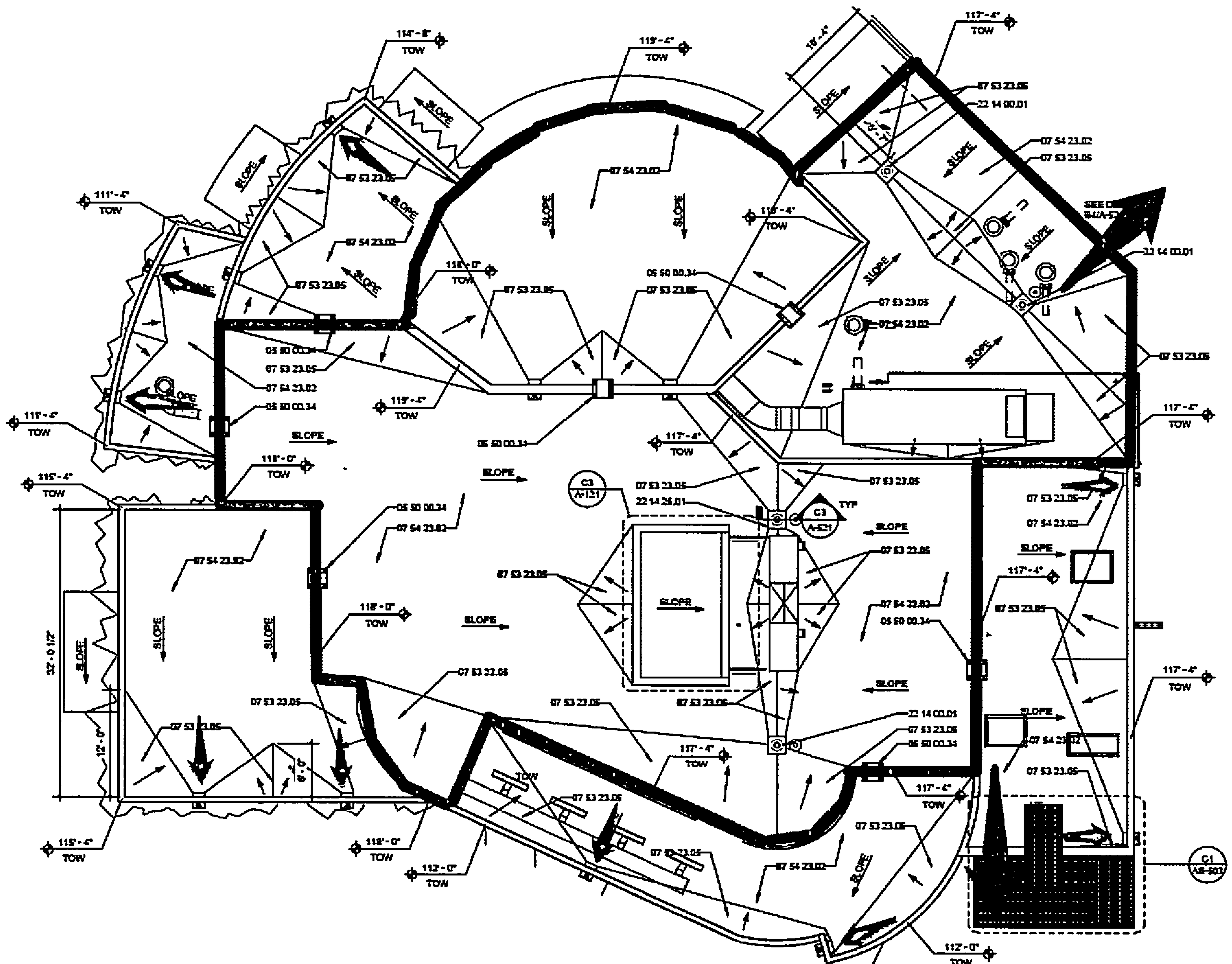
Proposed Condition: Treatment 'D' (impervious) = 23600± sf

Proposed Condition: Treatment 'D' (impervious) = 24800± sf

The proposed development will include a small (1200± sf) increase in impervious area.

Roof Discharge

The green outline drains to interior roof drains and discharges at the locations shown (green arrows). The remainder of the small, isolated roof areas drain from canales on all sides of the building (blue arrows).



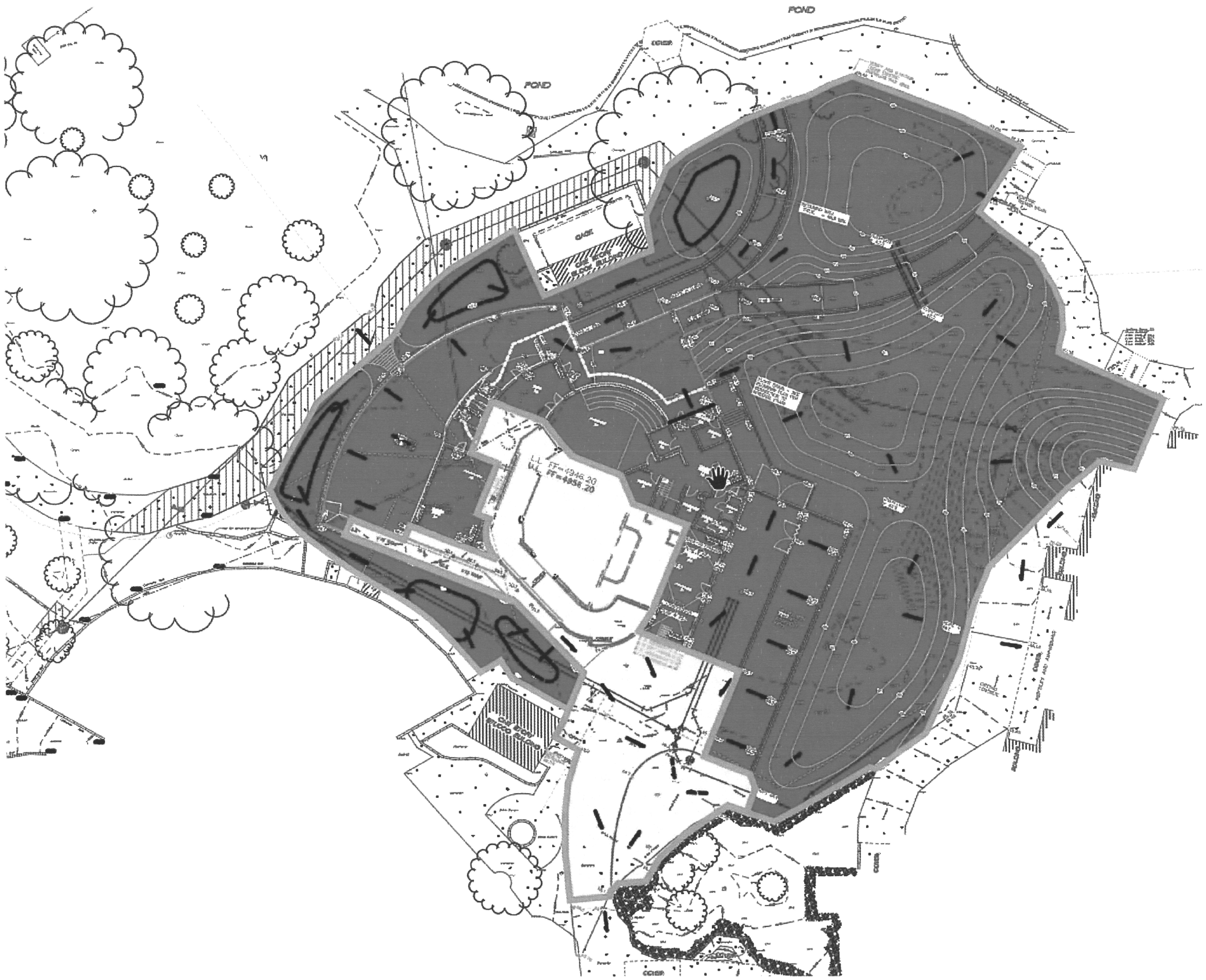
A1 ROOF PLAN
Scale: 1/8" = 1'-0"

0' 4' 8' 16'

TRUE NORTH PROJECT NORTH

Proposed Drainage Basins

The redeveloped property can be divided into two main drainage basins. Basin 1 (red) which overflows to the north park and Basin 2 (yellow) which overflows to the south.



CALCULATIONS: COA Rio Grande Zoo - Penguin Enxhibit : Sept. 19, 2016

Based on Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

ON-SITE

AREA OF SITE: 53014 SF = 1.2

100-year, 6-hour

HISTORIC FLOWS: **DEVELOPED FLOWS:** **EXCESS PRECIP:**

		Treatment SF	%			Treatment SF	%	Precip. Zone 2
Area A	=	0	0%	Area A	=	0	0%	E_A = 0.53
Area B	=	15904.2	30%	Area B	=	18555	35%	E_B = 0.78
Area C	=	13253.5	25%	Area C	=	9543	18%	E_C = 1.13
Area D	=	23856.3	45%	Area D	=	24917	47%	E_D = 2.12
Total Area	=	53014	100%	Total Area	=	53014	100%	

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)

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

Historic E	=	1.47 in.	Developed E	=	1.47 in.

On-Site Volume of Runoff: V360 = E*A / 12

Historic V_{360}	=	6496 CF	Developed V_{360}	=	6507 CF

On-Site Peak Discharge Rate: $Qp = Q_{pA}A_A+Q_{pB}A_B+Q_{pC}A_C+Q_{pD}A_D / 43{,}560$

For Precipitation Zone 2

Q_{pA} = 1.56 Q_{pC} = 3.14

Q_{pB} = 2.28 Q_{pD} = 4.70

Historic Q_p	=	4.4 CFS	Developed Q_p	=	4.3 CFS

BASIN NO. 1 **DESCRIPTION** Overflowing to the north park

Area of basin flows = 43423 SF = 1.0 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.40 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 5077 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 3.4 cfs

LAND TREATMENT	
A =	0%
B =	38%
C =	21%
D =	41%
FIRST FLUSH VOL.	504 CF

BASIN NO. 2 **DESCRIPTION** Overflowing to the south

Area of basin flows = 9591 SF = 0.2 Ac.

The following calculations are based on Treatment areas as shown in table to the right

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.81 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1449 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 0.9 cfs

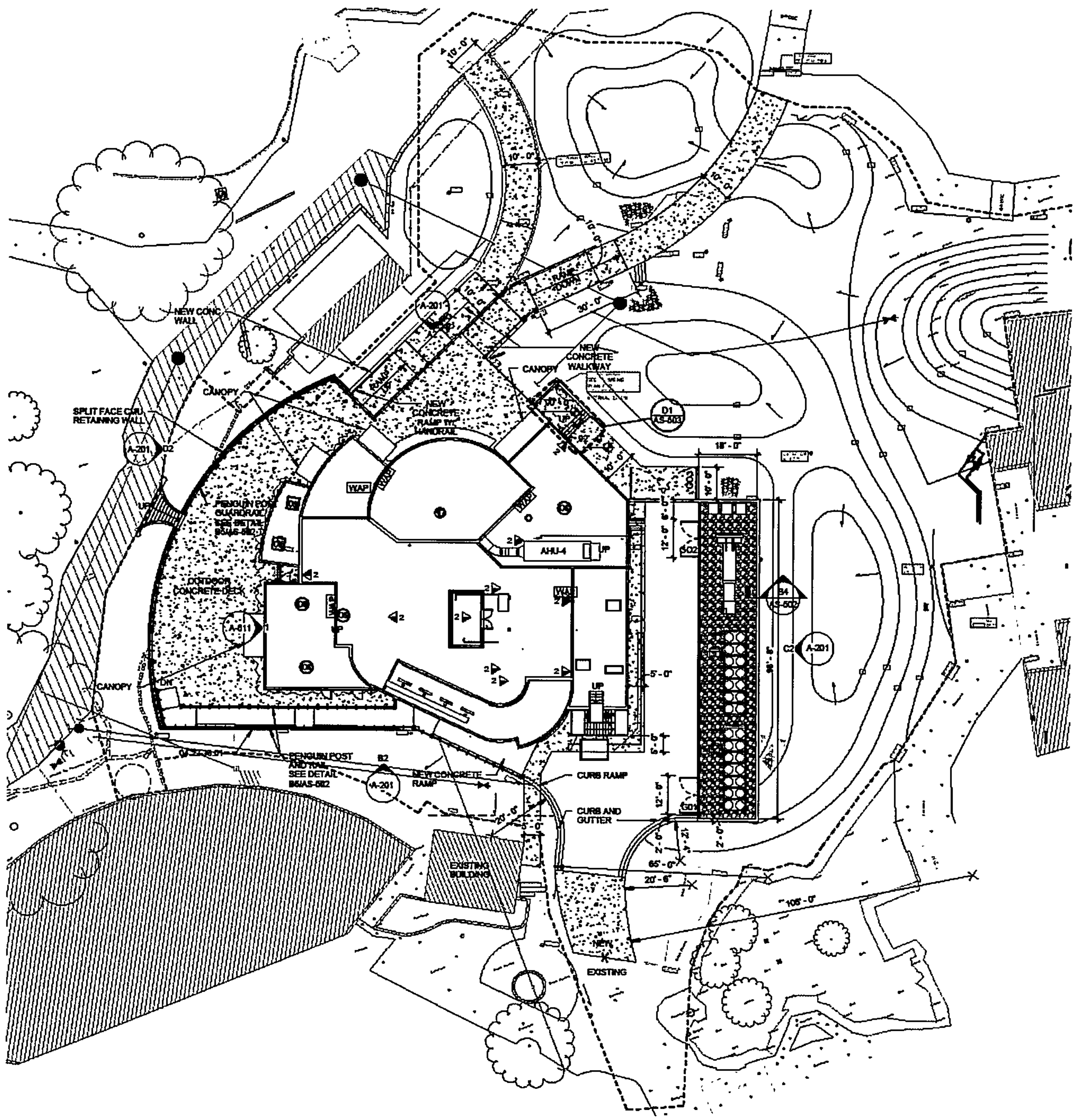
LAND TREATMENT	
A =	0%
B =	17%
C =	8%
D =	75%
FIRST FLUSH VOL.	204 CF

GENERAL SHEET NOTES

1. PRIOR TO COMPLETION OF PROJECT, REPAIR, REGRADE, AND COMPACT EXISTING GRAVEL ACCESS ROAD AS REQUIRED FOR PERMANENT USE BY THE BIOPARK.
2. BASE ELEVATION: ELEVATION 4958.3 = ELEVATION 100'-0"

SPECIFICATION KEYNOTES

04 22 33.01	INTERLOCKING CONCRETE UNIT MASONRY



A1 SITE PLAN
Scale: 1" = 20'-0"

0' 10' 20' 40'
TRUE NORTH
PROJECT NORTH

Van H. Gilbert Architect PC
ARCHITECTURE • INTERIORS • PLANNING
VHGA
2428 Baylor Dr SE Albuquerque, NM 87106
Tel 505-247-9955 Fax 505-247-1826
E-mail info@vhgarchitect.com
Web Site www.vhgarchitect.com

CONSULTANTS

CIVIL ENGINEER	Isaacson & Arfman, P.A
STRUCTURAL ENGINEERS:	Chavez - Grieves Consulting Engineers, Inc
MECHANICAL, ELECTRICAL ENGINEERS:	Bridgers and Paxton Consulting Engineers, Inc
LIFE SUPPORT ENGINEERS:	Alvine and Associates, Inc.

ABQ BIOPARK
ZOO BOTANIC GARDEN TINGLEY BEACH AQUARIUM

NO.	DATE	REVISION/REMARKS	BY

DESIGNED BY:	VHG	DATE: 9/15/2016
DRAWN BY:	RS	DATE: 9/15/2016
CHECKED BY:	RS	DATE: 9/15/2016
SUBMITTAL / DATE: CONTRACT DOCUMENTS		09/15/2016
PROJECT NUMBER		16600
PROJECT FILENAME		16600 Penguin Exhibit.rvt

STATE OF NEW MEXICO
VAN H. GILBERT
REGISTERED ARCHITECT

ALBUQUERQUE BIOPARK ZOO
PENGUIN EXHIBIT
Albuquerque, New Mexico

SHEET TITLE

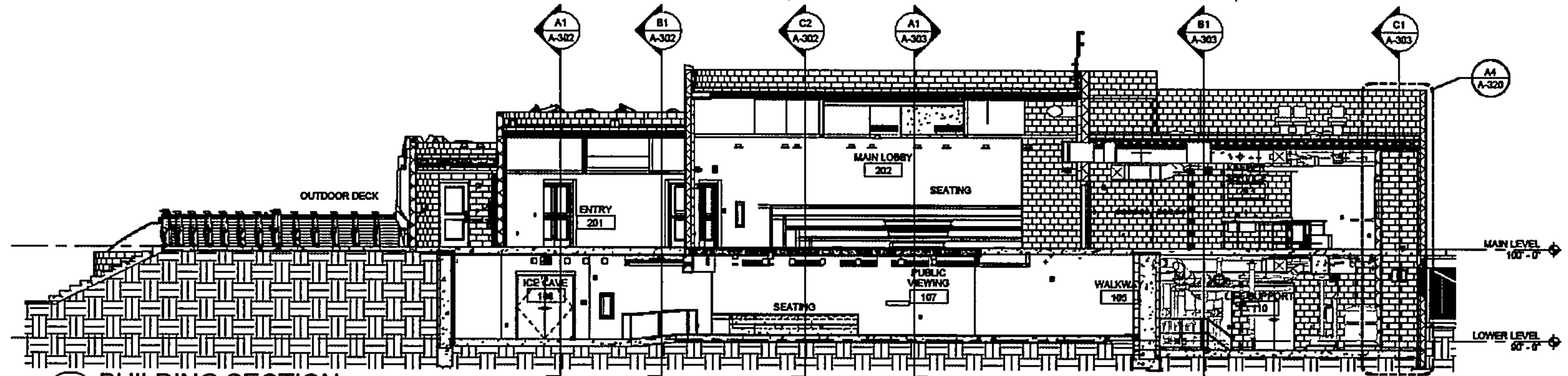
SITE PLAN

SHEET AS-101 OF

9/15/2016 4:58:21 PM C:\Users\rbrumfield\Documents\16600 Penguin Exhibit_rbrumfield.rvt

SPECIFICATION KEYNOTES

04 20 00.14	8" CMU
04 20 00.21	8" SPLIT-FACE CMU
05 52 13.04	1 1/2" (OD) METAL GUARDRAIL



D1 BUILDING SECTION
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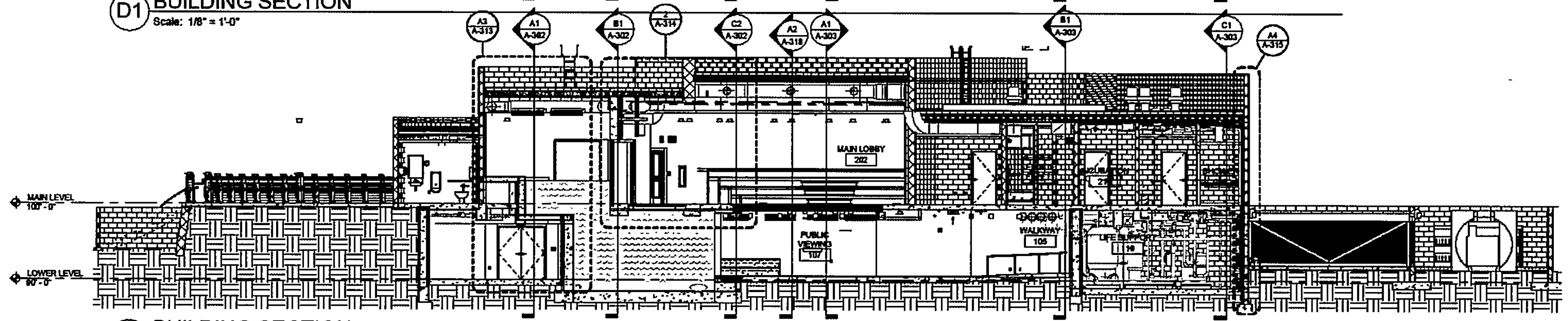

C1 BUILDING SECTION
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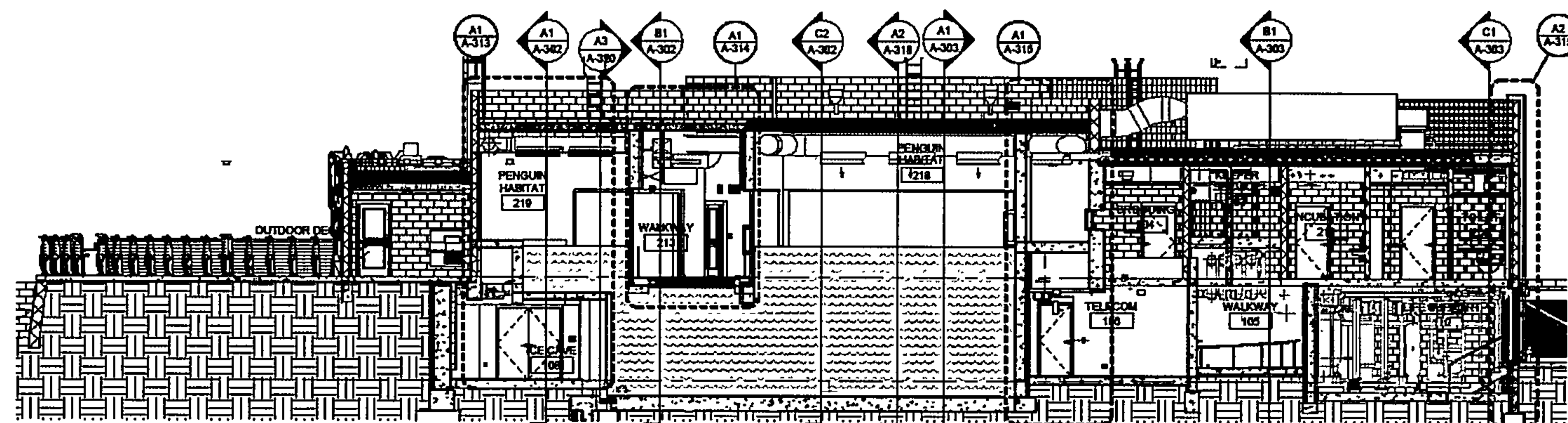

B1 BUILDING SECTION
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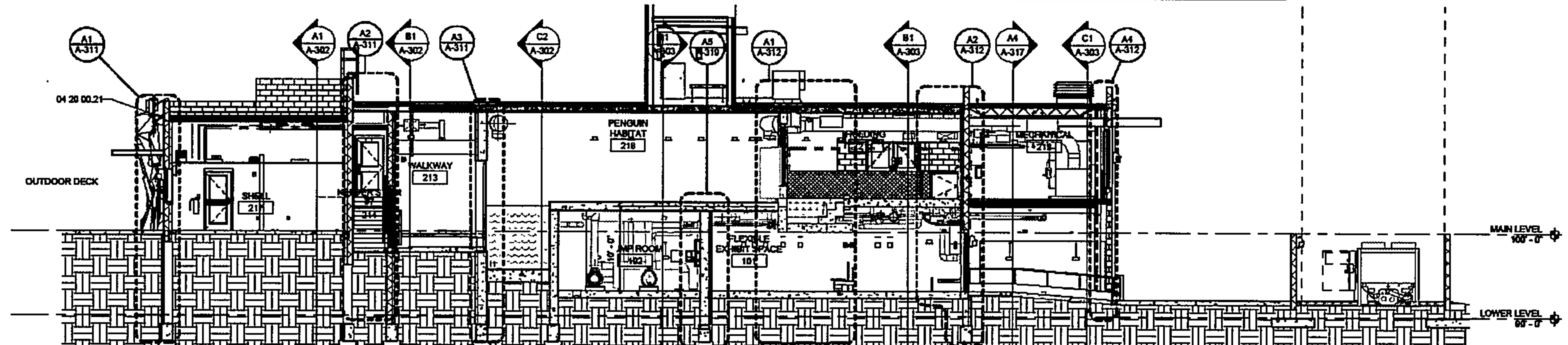


A1 BUILDING SECTION
Scale: 1/8" = 1'-0"

Van H. Gilbert Architect PC
ARCHITECTURE • INTERIORS • PLANNING
VHGA
2428 Baylor Dr SE Albuquerque, NM 87106
Tel 505-247-9955 Fax 505-247-1826
E-mail info@vhgarchitect.com
Web Site www.vhgarchitect.com

CONSULTANTS

CIVIL ENGINEER	Isaacson & Arfman, P.A
STRUCTURAL ENGINEERS:	Chavez - Grieves Consulting Engineers, Inc
MECHANICAL, ELECTRICAL ENGINEERS:	Bridgers and Paxton Consulting Engineers, Inc
LIFE SUPPORT ENGINEERS:	Alvine and Associates, Inc.

ABQ BIOPARK
ZOO BOTANIC GARDEN TINGLEY BEACH AQUARIUM

NO.	DATE	REVISION/REMARKS	BY

DESIGNED BY: VHG	DATE: 9/15/2016
DRAWN BY: RS	DATE: 9/15/2016
CHECKED BY: RS	DATE: 9/15/2016
SUBMITTAL / DATE:CONTRACT DOCUMENTS	09/15/2016
PROJECT NUMBER	16500
PROJECT FILENAME	16500 Penguin Exhibit.rvt

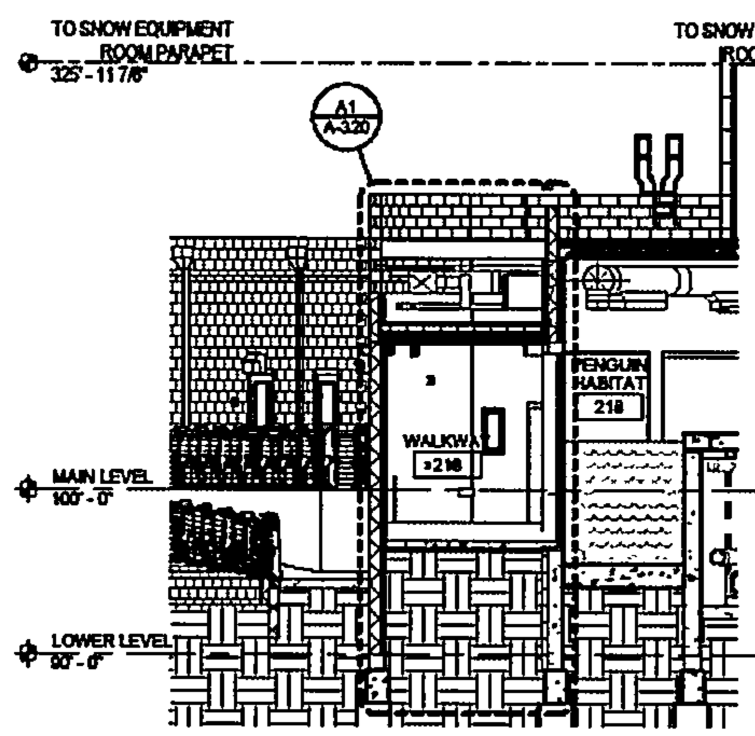
STATE OF NEW MEXICO VAN H. GILBERT REGISTERED ARCHITECT 9.15.2016

ALBUQUERQUE BIOPARK ZOO PENGUIN EXHIBIT
Albuquerque, New Mexico

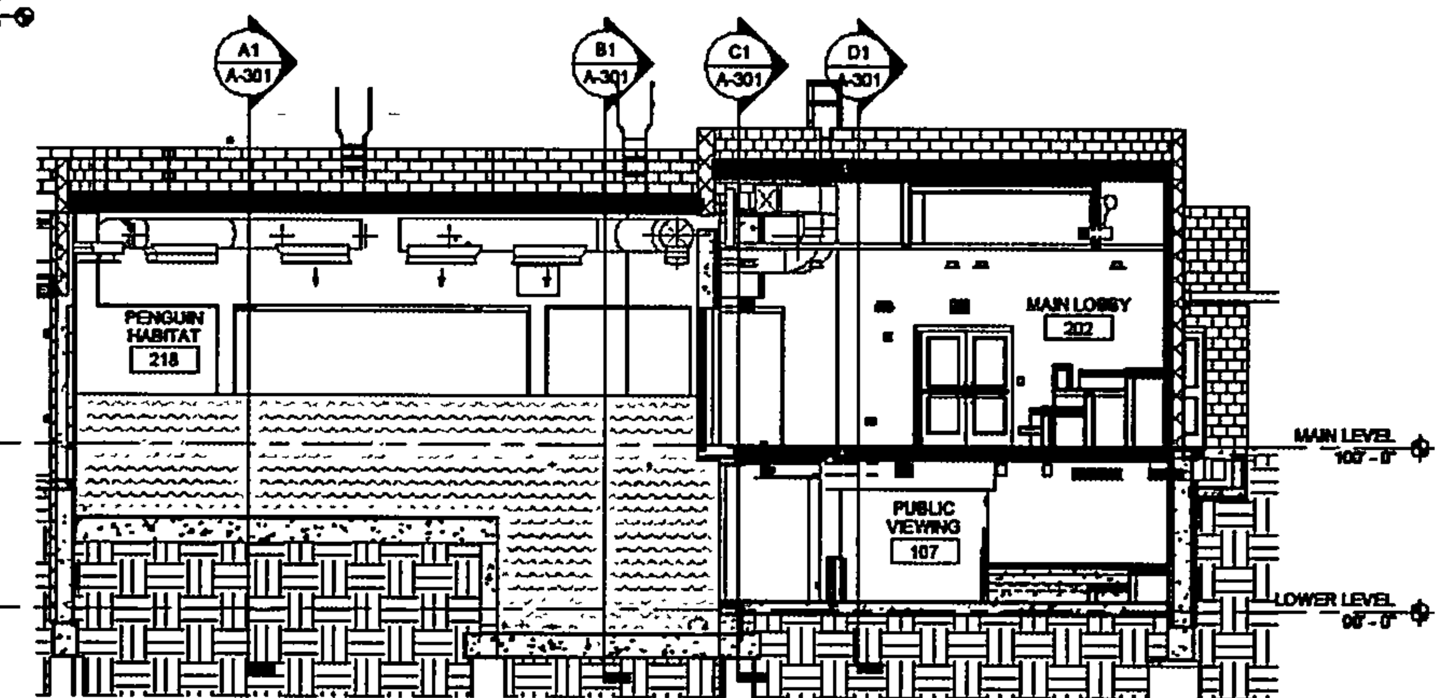
SHEET TITLE
BUILDING SECTIONS

SHEET A-301 OF

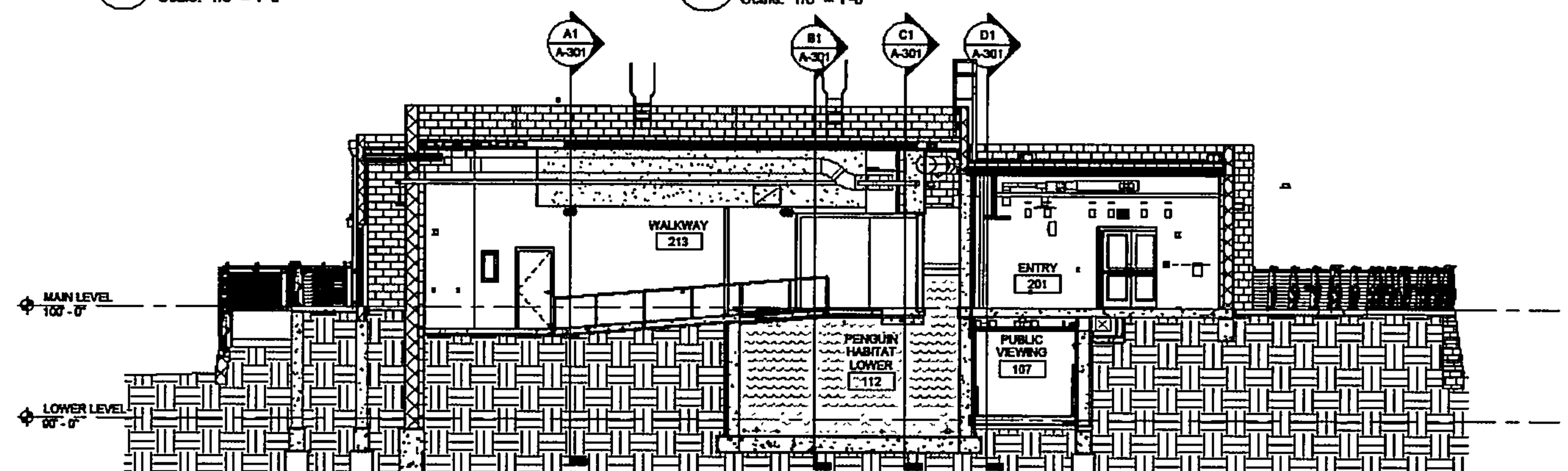
10/5/2016 5:00:13 PM C:\Users\rsalvador\Documents\16500 Penguin Exhibit_rsalvador7023.rvt



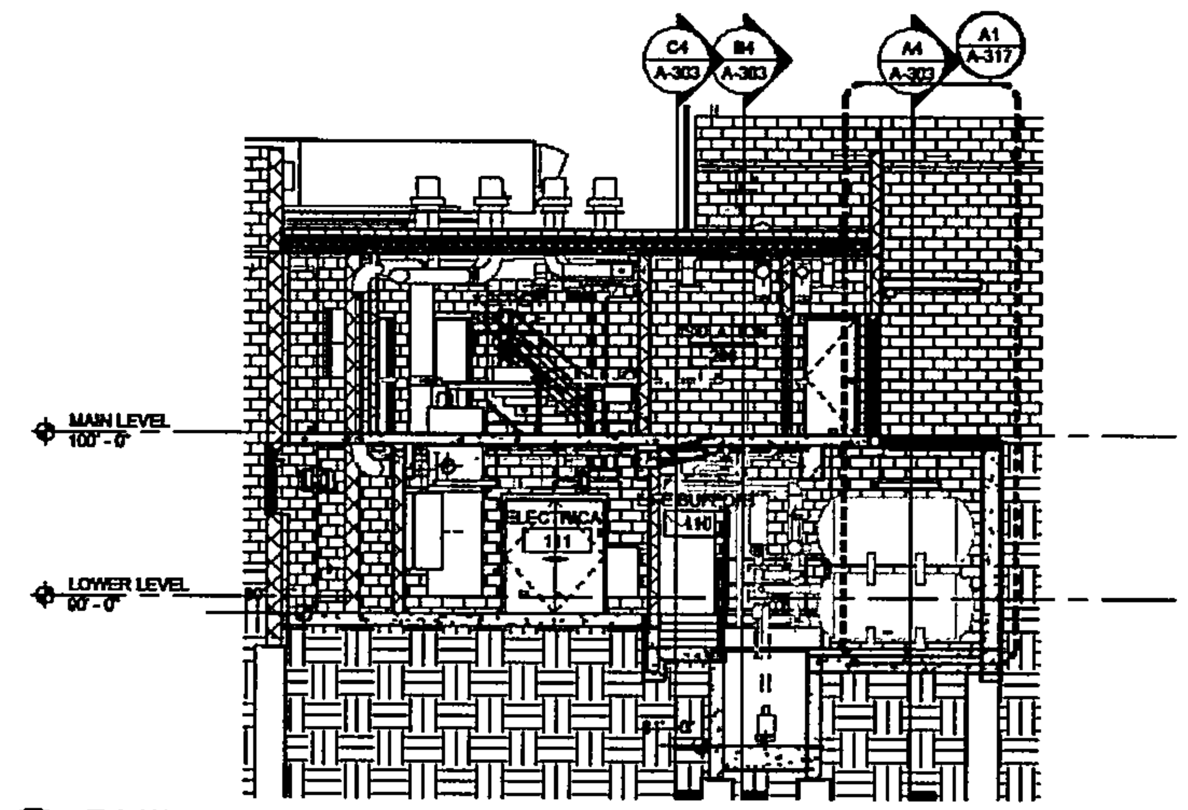
C1 BUILDING SECTION
Scale: 1/8" = 1'-0"



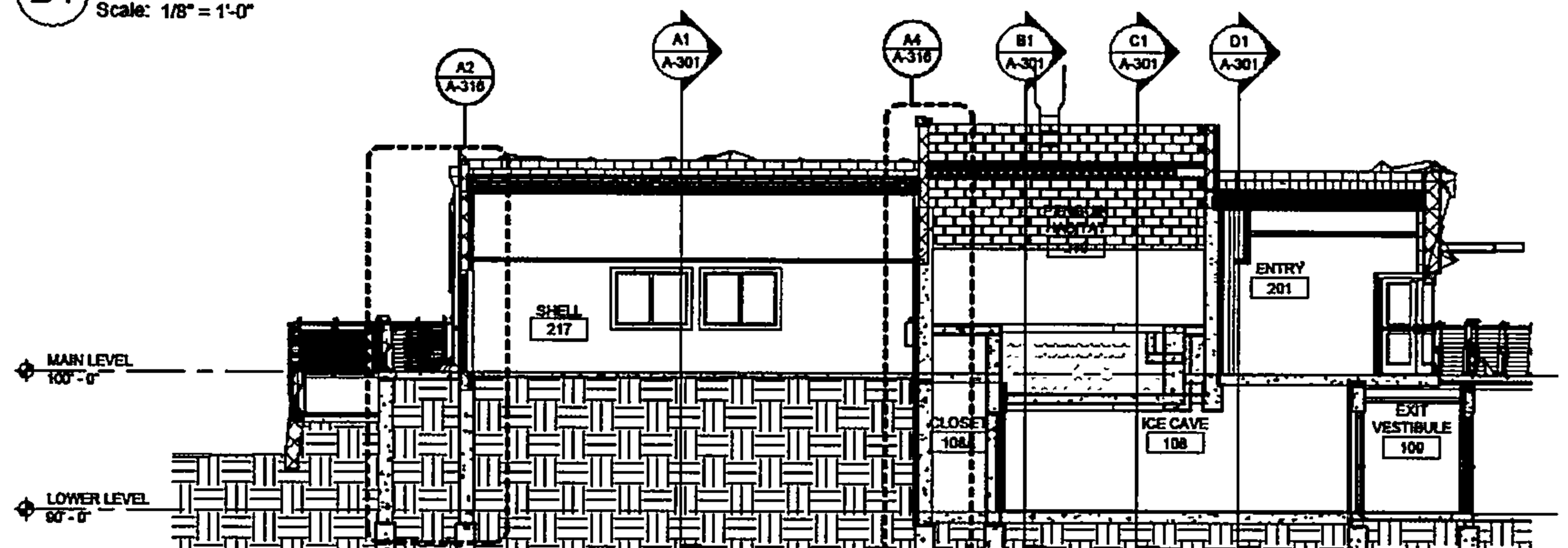
C2 BUILDING SECTION
Scale: 1/8" = 1'-0"



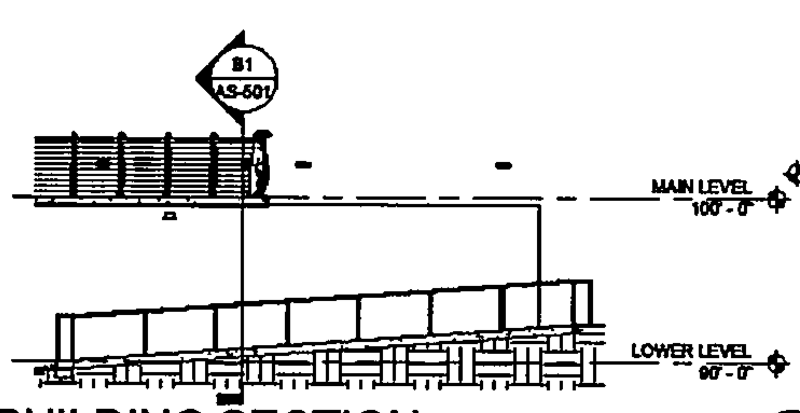
B1 BUILDING SECTION
Scale: 1/8" = 1'-0"



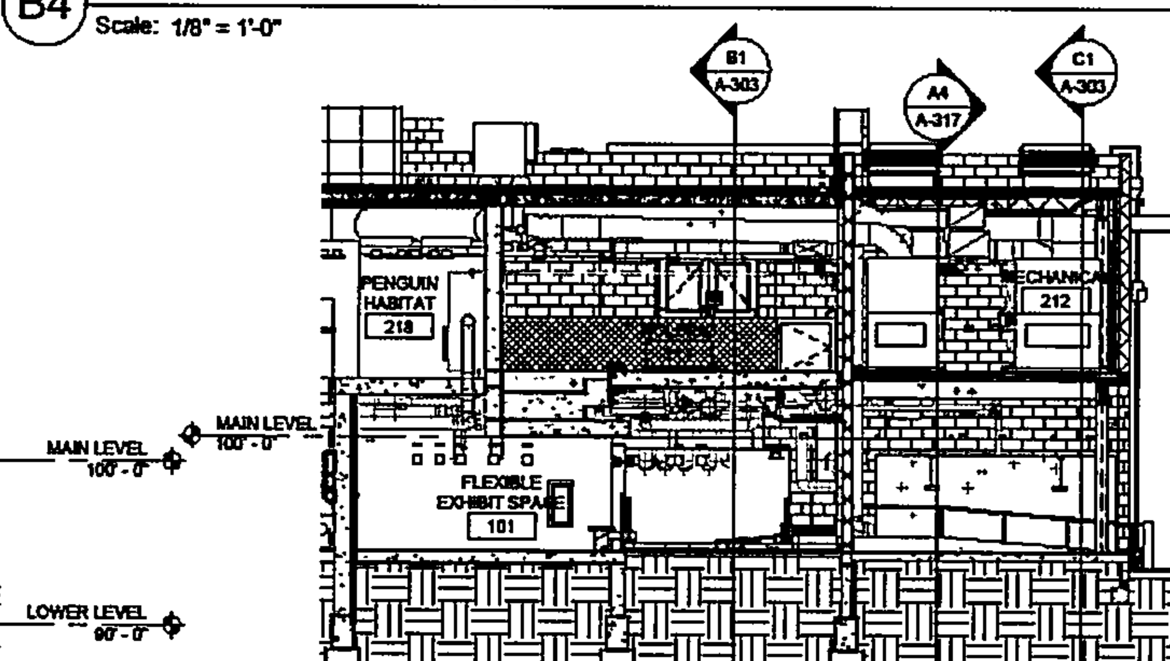
B4 BUILDING SECTION
Scale: 1/8" = 1'-0"



A1 BUILDING SECTION
Scale: 1/8" = 1'-0"



A3 BUILDING SECTION
Scale: 1/8" = 1'-0"



A4 BUILDING SECTION
Scale: 1/8" = 1'-0"

Van H. Gilbert Architect PC
ARCHITECTURE • INTERIORS • PLANNING
VHGA
2428 Baylor Dr SE Albuquerque, NM 87106
Tel 505-247-9955 Fax 505-247-1826
E-mail info@vhgarchitect.com
Web Site www.vhgarchitect.com

CONSULTANTS

CIVIL ENGINEER	Isaacson & Arfman, P.A
STRUCTURAL ENGINEERS:	Chavez - Grieves Consulting Engineers, Inc
MECHANICAL, ELECTRICAL ENGINEERS:	Bridgers and Paxton Consulting Engineers, Inc
LIFE SUPPORT ENGINEERS:	Alvine and Associates, Inc.

ABQ BIOPARK
ZOO BOTANIC GARDEN TINGLEY BEACH AQUARIUM

NO.	DATE	REVISION/REMARKS	BY

DESIGNED BY: VHG	DATE: 9/15/2016
DRAWN BY: RS	DATE: 9/15/2016
CHECKED BY: RS	DATE: 9/15/2016
SUBMITTAL / DATE:CONTRACT DOCUMENTS	09/15/2016
PROJECT NUMBER	16000
PROJECT FILENAME	16000 Penguin Exhibit.rvt

ALBUQUERQUE BIOPARK ZOO
PENGUIN EXHIBIT
Albuquerque, New Mexico

SHEET TITLE
BUILDING SECTIONS

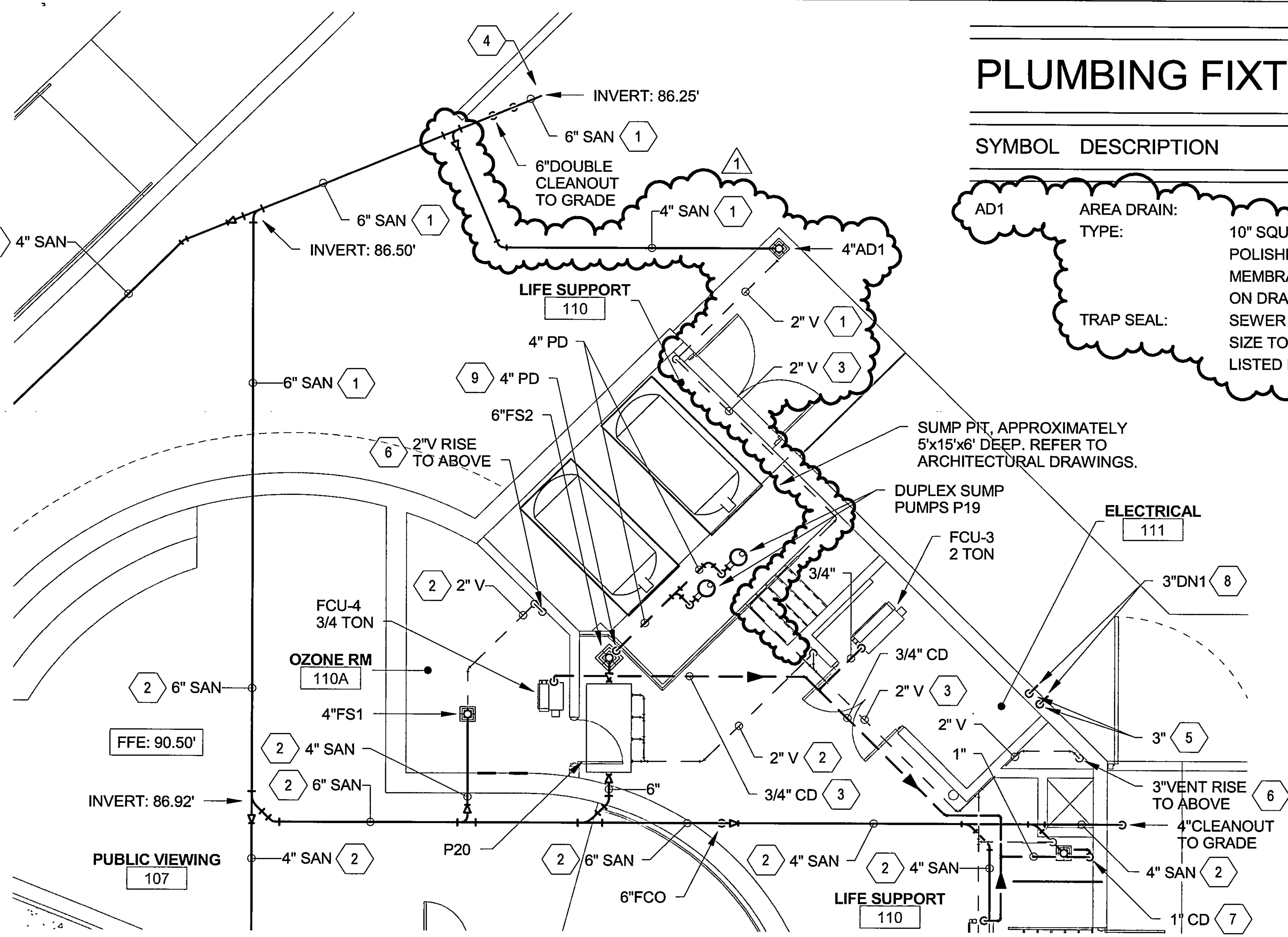
SHEET A-302 OF

C:\Users\rsalvador\Documents\16000 Penguin Exhibit_rsalvador7023.rvt
10/5/2016 6:00:52 PM

PLUMBING FIXTURE SPECIFICATIONS

SYMBOL	DESCRIPTION		(OR APPROVED EQUAL)
AD1	AREA DRAIN:		
	TYPE:	10" SQUARE TOP PROM-DECK DRAIN WITH HEEL-PROOF GRATE AND ROTATABLE FRAME POLISHED BRONZE, CAST IRON BODY WITH BOTTOM OUTLET, COMBINATION INVERTIBLE MEMBRANE CLAMP, VANDAL PROOF SECURED TOP, DIAMETER OF OUTLET AS SHOWN ON DRAWINGS. MFG: ZURN No. ZB158-VP.	
	TRAP SEAL:	SEWER GAS EMISSION PROTECTION DEVICE, FOR INSERTION INTO ALL FLOOR DRAINS. SIZE TO FIT INSIDE PIPE AT DRAIN OPENING ACCORDING TO PIPE MATERIAL USED AS LISTED BY PROSET SYSTEMS. MFG: PROSET SYSTEMS No. TG33-Z OR TG34-Z.	

1



1 PARTIAL LOWER LEVEL WASTE & VENT FLOOR PLAN

SCALE: 1/8" = 1'-0"

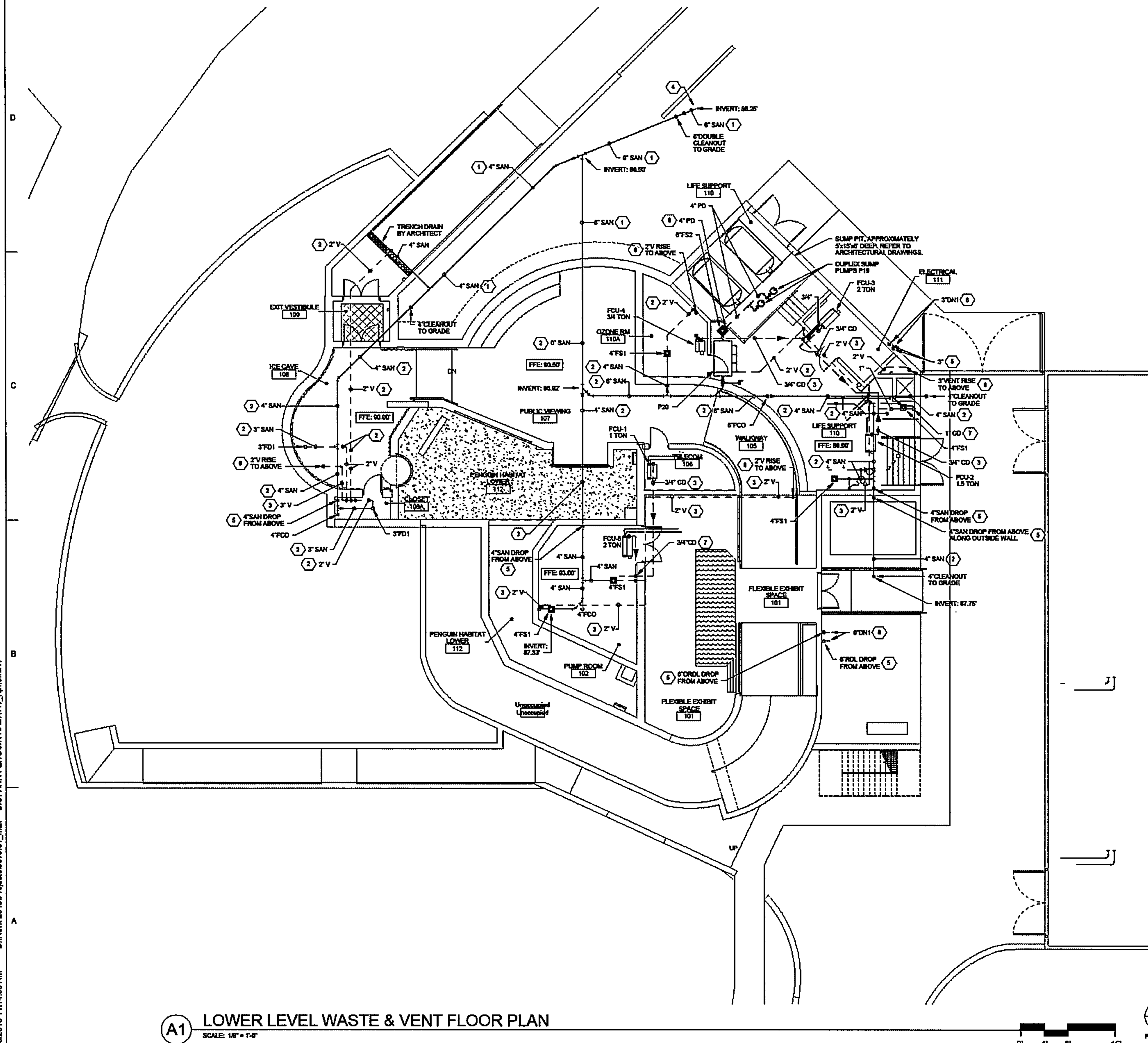
Van H. Gilbert Architect PC	RIO GRANDE ZOOLOGICAL PARK		
www.vhgarchitect.com	THE PENGUIN CHILL HABITAT		

No.	Description	Date
1	PERMIT REVIEW	10/10/2016

LOWER LEVEL W&V PLAN

Project number	16600	SKP-001
Date	10/10/2016	
Drawn by	ATD	
Checked by	JSS	Scale As indicated

RECEIVED
OCT 06 2016
LAND DEVELOPMENT SECTION



A1 LOWER LEVEL WASTE & VENT FLOOR PLAN
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

A. ALL HOT AND COLD WATER DROPS/RISES TO FIXTURES SHALL BE VERTICAL BETWEEN THE FRAMING STUDS.

B. ALL WASTE, VENT, AND WATER PIPING IN PIPE CHASE SHALL BE RACKED TIGHT TO INTERIOR FRAME WALL, LEAVING CENTER OF CHASE CLEAR FOR MAINTENANCE. ANY CROSSOVER SHALL BE 7'-0" A.F.F. TO BOTTOM OF PIPE MINIMUM.

C. PROVIDE BALL VALVES FOR ALL WATER ISOLATION AND SUPPLY TAKE-OFFS.

D. ISOLATION VALVES FOR BRANCH PIPING TO BE LOCATED ABOVE LAY-IN CEILING FOR EASY ACCESS BY MAINTENANCE. ISOLATION VALVES THAT CAN NOT BE LOCATED ABOVE LAY-IN CEILING MUST BE PROVIDED MAINTENANCE ACCESS IN THE FORM OF AN ACCESSIBLE PLUMBING CHASE OR AN ACCESS PANEL.

E. ALL EQUIPMENT DRAINS AND SHOCK ABSORBERS SHALL HAVE MAINTENANCE ACCESS IN THE FORM OF AN ACCESSIBLE PLUMBING CHASE OR AN ACCESS PANEL.

F. FLOOR DRAINS SHALL BE INSTALLED WITH NICKEL BRONZE AND HEEL PROOF GRATES.

G. COORDINATE ALL VTR'S WITH MECHANICAL FRESH AIR INTAKES ON ROOF. VENTS SHALL MAINTAIN A MINIMUM OF 15'-0" CLEARANCE.

H. SEE SPECIFICATION SECTION 23 0548, SEISMIC RESTRAINT AND VIBRATION ISLATION, FOR PROJECT SEISMIC RESTRAINT REQUIREMENTS.

I. WATER HEATERS SHALL BE ANCHORED OR STAPPED TO RESIST HORIZONTAL DISPLACEMENT DUE TO EARTHQUAKE MOTION. STRAPPING SHALL BE AT POINTS WITHIN THE UPPER ONE-THIRD AND LOWER ONE-THIRD OF ITS VERTICAL DIMENSIONS. AT THE LOWER POINT, A DISTANCE OF NOT LESS THAN FOUR INCHES SHALL BE MAINTAINED ABOVE THE CONTROLS WITH STRAPPING.

J. ALL COUNTERTOP AND WALL MOUNTED PLUMBING FIXTURES (URINALS, LAVATORIES, COUNTERTOP MOUNTED SINKS, DRINKING FOUNTAINS, ETC.) SHALL BE PROVIDED WITH A T-PATTERN WALL CLEANOUT BELOW PLUMBING FIXTURE. CLEANOUT SHALL BE CAST IRON DRAINAGE T-PATTERN, 90 DEGREE BRANCH FITTINGS WITH SQUARE HEAD BRASS SCREW PLUGS OF THE SAME SIZE AS THE PIPE UP TO AND INCLUDING 4 INCHES, PER SPECIFICATION 22 1300. WALL CLEANOUTS IN FINISHED AREAS SHALL BE ZURN No. Z-1460-8 WITH POLISHED STAINLESS STEEL OR CHROME PLATED METAL COVER.

SHEET KEYED NOTES

1 PIPING TO BE ROUTED BELOW GRADE.

2. PIPING TO BE ROUTED BELOW FLOOR.

3. PIPING TO BE ROUTED IN CEILING SPACE. KEEP PIPING AS TIGHT TO STRUCTURE AS POSSIBLE.

4. FOR ORIGINATION OF PIPING, REFER TO CIVIL UTILITY DRAWINGS WITHIN THIS SET.

5. PIPE DROP FROM ABOVE. FOR ORIGINATION OF PIPING, REFER TO A1 - MAIN LEVEL WASTE & VENT FLOOR PLAN ON PLUMBING SHEET PL-102.

6. PIPE RISE TO ABOVE. FOR CONTINUATION OF PIPING, REFER TO A1 - MAIN LEVEL WASTE & VENT FLOOR PLAN ON PLUMBING SHEET PL-102.

7. CONDENSATE DRAIN PIPE DROP ALONG WALL TO FLOOR DRAIN AS SHOWN. TERMINATE CONDENSATE DRAIN INTO FLOOR SINK AT 6" ABOVE RIM TO MAINTAIN AIR GAP.

8. DOWNSPOUT NOZZLE TO DISCHARGE ONTO SPLASH BLOCK AT 18" ABOVE FINISHED GRADE.

9. PUMPED BACKWASH DRAIN PIPE DROP DOWN TO FLOOR SINK AS SHOWN. TERMINATE PUMPED BACKWASH DRAIN INTO FLOOR SINK AT 6" ABOVE RIM TO MAINTAIN AIR GAP.

10. INSTALL CLEANOUT TO GRADE IN ACCORDANCE WITH DETAIL C3 ON PLUMBING SHEET P501.

11. INSTALL DOUBLE CLEANOUT TO GRADE IN ACCORDANCE WITH DETAIL ON PLUMBING SHEET P501.

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LIFE SUPPORT ENGINEERS:	Alvine and Associates, Inc.

ABQ BIOPARK
ZOO BOTANIC GARDEN TINGLEY BEACH AQUARIUM

NO.	DATE	REVISION/REMARKS	BY

DESIGNED BY: ATD	DATE: 02/28/15
DRAWN BY: ATD	DATE: 02/28/15
CHECKED BY: JSS	DATE: 02/28/15
SUBMITTAL / DATE. CONTRACT DOCUMENTS	09/15/2016
PROJECT NUMBER	16600
PROJECT FILENAME	16600 Penguin Exhibit.rvt

JOHN S. STEVENS NEW MEXICO 21071 PROFESSIONAL ENGINEER

THE PENGUIN CHILL HABITAT

Albuquerque, New Mexico

SHEET TITLE

LOWER LEVEL WASTE & VENT FLOOR PLAN

SHEET PL-101 OF

9/15/2016 11:14:05 AM D:\Revit 2016\Projects\5375.01_MEP - BIOPARK PENGUIN HABITAT_Kphom.rvt

RECEIVED
OCT 0 6 2015
LAND DEVELOPMENT SECTION

CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

September 30, 2016

Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe Street N.E.
Albuquerque, NM 87108

(phone w/ Fred)
All retaining walls should be & part of the Civil sheets so that only 1 retaining wall permit reqd.

RE: **Albuquerque Biopark Zoo Penguin Exhibit**
Grading & Drainage Plan
Engineer's Stamp Date 9-15-2016 (File: K13D034G)

Dear Mr. Arfman:

Based upon the information provided in your submittal received 9-19-2016, the above referenced cannot be approved for Building Permit until the following comments are addressed:

1. Provide an overall plan of the Zoo showing the location of the proposed development, including the pond and park that would accept any overflow of the retention ponds.
2. Provide calculations that show the Max WSE of the retention ponds (use the 10 day storm for permanent retention ponds per DPM). Show the MWSE on the plan.
3. Clarify the location of all retaining walls and note which walls are part of the architectural plan set and which walls are part of the Civil plans. All retaining walls need to show the Top of Wall and Bottom of Wall elevation.
4. Verify that the Zoo is willing to accept drainage discharging over the retaining wall. This seems very unusual since such discharge will stain and erode the wall over time. If this is in fact acceptable, show depressed areas that would collect the flows.
5. Provide a basin map.
6. Contact Jane Rael (505-289-3439) at the WUA to verify that they will in fact accept drainage from the trench drain into the sanitary sewer. If so, ensure that the plumbing sheets show a pipe tied to the trench drain. Provide the Plumbing sheet. (11x17 only)
7. Provide Sections showing how the building relates to the site. Include the open mechanical area in the section.
8. Define the surface materials particularly the area on the east side of the building.
9. Walkway on the south side shows curb using triple lines. What is the meaning? Provide section cut.
10. The narrative states that the previous drainage scheme is being used, but the existing contours do not reflect previous ponding. Please clarify.

11. Fred will provide additional info in supplement – see email

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

If you have any questions, you can contact me at 924-3695.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Albuquerque Biopark Zoo Penguin Exhibit Building Permit #: ______ City Drainage #: K13/D0346

DRB#: ______ EPC#: ______ Work Order#: ______

Legal Description: Tropical America and Adjacent Areas - Rio Grande Zoo

City Address: 903 10TH

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: ______ E-mail: freda@iacivil.com

Owner: City of Albuquerque Contact: ______

Address: ______

Phone#: ______ Fax#: ______ E-mail: ______

Architect: ______ Contact: ______

Address: ______

Phone#: ______ Fax#: ______ E-mail: ______

Other Contact: ______ Contact: ______

Address: ______

Phone#: ______ Fax#: ______ E-mail: ______

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

____ TRAFFIC/ TRANSPORTATION

____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

____ ENGINEER/ ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN

X GRADING PLAN

____ DRAINAGE MASTER PLAN

____ DRAINAGE REPORT

____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)

____ TRAFFIC IMPACT STUDY (TIS)

____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) ______

AO

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SEP 19 2016

LAND DEVELOPMENT SECTION

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X 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

____ PRE-DESIGN MEETING

____ OTHER (SPECIFY) ______

IS THIS A RESUBMITTAL?: ____ Yes X No

DATE SUBMITTED: September 19, 2016 By: Fred C. Arfman

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ____

CALCULATIONS: COA Rio Grande Zoo - Penguin Enxhibit : Sept. 19, 2016

Based on Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

ON-SITE

AREA OF SITE: 50249 SF = 1.2

100-year, 6-hour

HISTORIC FLOWS:

		Treatment SF	%
Area A	=	0	0%
Area B	=	15074.7	30%
Area C	=	11557.27	23%
Area D	=	23617.03	47%
Total Area	=	50249	100%

DEVELOPED FLOWS:

		Treatment SF	%
Area A	=	0	0%
Area B	=	17587	35%
Area C	=	6532	13%
Area D	=	26129	52%
Total Area	=	50249	100%

EXCESS PRECIP:

Precip. Zone 2

E_A = 0.53

E_B = 0.78

E_C = 1.13

E_D = 2.12

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)

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

Historic E	= 1.49 in.	Developed E	= 1.52 in.

On-Site Volume of Runoff: V360 = E*A / 12

Historic V_{360}	= 6241 CF	Developed V_{360}	= 6375 CF

On-Site Peak Discharge Rate: $Qp = Q_{pA}A_A + Q_{pB}A_B + Q_{pC}A_C + Q_{pD}A_D / 43{,}560$

For Precipitation Zone 2

Q_{pA} = 1.56 Q_{pC} = 3.14

Q_{pB} = 2.28 Q_{pD} = 4.70

Historic Q_p	= 4.2 CFS	Developed Q_p	= 4.2 CFS

RECEIVED
SEP 19 2016
LAND DEVELOPMENT SECTION

Harmon Rita T.

From: Harmon Rita T.
Sent: Monday, October 03, 2016 10:02 AM
To: Fred c. Arfman (freda@iacivil.com); 'Bryan Bobrick'
Subject: FW: Following up from Friday regarding Penguin Chill plans

Fred,
Just to follow up on our phone conversation and be sure we are on the same page, my understanding is that in your next submittal you will be providing supplemental information which will include:

- Existing topo that shows the ponds for the previous building
- Expansion of the narrative to state how the drainage scheme was determined. Specifically, to acknowledge that there is an existing SD system, but the inlets are not close enough to the site, nor is the capacity known. State that you spoke with Ray Johnson (Facility Manager?) and the outcome of that discussion. This is needed since there is no Master Drainage plan for the zoo and so we are trying to follow the rational.

Additionally, the Building Permit process will be complicated if the retaining walls are shown partially on the architectural plans, and partially on the Civil plans. It would be better to show all retaining walls on the Civil plans.

Thanks,
Rita

From: Harmon Rita T.
Sent: Monday, October 03, 2016 9:49 AM
To: Fred c. Arfman (freda@iacivil.com)
Subject: FW: Following up from Friday regarding Penguin Chill plans

FYI

From: Harmon Rita T.
Sent: Monday, October 03, 2016 9:47 AM
To: Hubbard, Erica C.
Subject: RE: Following up from Friday regarding Penguin Chill plans

Hi Erica,
I did speak to both the Civil Engineer and the PM at the City, Jerry Francis. My questions have been answered, and Fred Arfman is going to provide the additional information I need.
Thank you for all your help.

Rita Harmon, P.E.
Senior Engineer, Hydrology
COA, Planning Department
505-924-3695

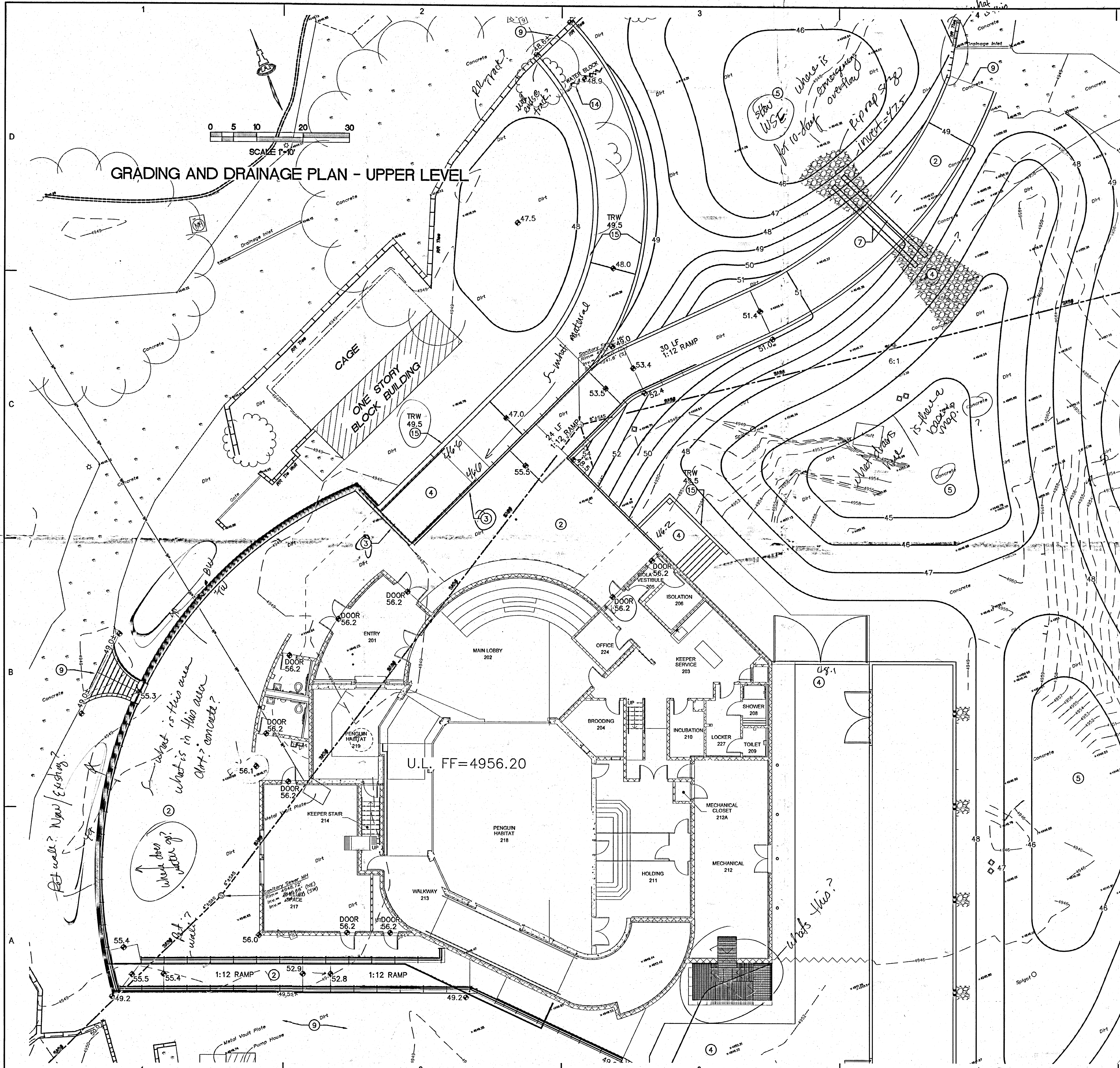
From: Hubbard, Erica C.
Sent: Monday, October 03, 2016 9:35 AM
To: Harmon Rita T.
Subject: Following up from Friday regarding Penguin Chill plans

Rita, good morning! I have spoken to City Hall departments, Fred Arfman engineer, and Van Gilbert Architect, this morning already. I asked the engineer to call you directly to discuss the details needed to satisfy your request. Please let me know the status and if I might be of assistance still.
Thank you for the head's up Friday. It allowed me the small window to make all aware of the document needed.
Erica

ABQ BIOPARK

Erica Hubbard
Project Coordinator, ABQ BIOPARK Master Plan
City of Albuquerque
Cultural Services Dept.
505*764*6278
ehubbard@cabq.gov

CITY OF ALBUQUERQUE NEW MEXICO 1706



KEYED NOTES

1. NOT USED
2. CONSTRUCT STEPS AND ADA COMPLIANT RAMP(S) AND WALKWAYS TO ACHIEVE GRADE DIFFERENCES SHOWN. SEE ARCHITECTURAL FOR DETAILS.
3. SEE ARCHITECTURAL FOR CURB THIS AREA TO ENSURE NO UPPER PLAZA STORMWATER DRAINS ONTO TO LOWER LEVEL RAMP.
4. SEE CG-102 FOR LOWER LEVEL GRADES THIS AREA.
5. FINAL SITE LANDSCAPE PLAN TO BE DESIGNED UNDER SEPARATE CONTRACT. CONSTRUCT TEMPORARY STORMWATER RETENTION PONDS TO ELEVATIONS SHOWN. SEE OVERALL GRADING AND DRAINAGE PLAN (CG-001) FOR FULL EXTENT OF TEMPORARY GRADING.
6. NOT USED
7. INSTALL TWO 12"ø CULVERTS AT INV. = 47.5 (TO EQUALIZE FLOW). PROVIDE EROSION PROTECTION EACH END. material? size + dimensions
8. NOT USED
9. COORDINATE TRANSITION BETWEEN NEW CONSTRUCTION AND EXISTING CONSTRUCTION WITH ARCHITECT.
10. NOT USED
11. NOT USED
12. NOT USED
13. NOT USED
14. PAVEMENT GRADE BREAK / WATER BLOCK.
15. CONSTRUCT RETAINING WALLS THIS AREA TO PROTECT LOWER AREAS FROM STORMWATER. TOP OF WALL ELEVATION SHOWN REFERS TO MINIMUM ELEVATION. SEE ARCHITECTURAL FOR ADDITIONAL INFORMATION.
16. NOT USED
17. NOT USED

LEGEND

- - - -	EXISTING CONTOUR
——56——	PROPOSED CONTOUR
56.2	PROPOSED SPOT ELEVATION
→	FLOW ARROW (PROPOSED)
FF=4946.20	FINISH FLOOR ELEVATION
	EROSION PROTECTION
	Ret. walls.

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108
Ph. 505-268-8828 www.iacivil.com
2140 CG-101.dwg Sep 15,2016

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ABQ BIOPARK
ZOO BOTANIC GARDEN TINGLEY BEACH AQUARIUM

NO.	DATE	REVISION/REMARKS	BY

DESIGNED BY: BJB	DATE:	9/15/16
DRAWN BY: BJB	DATE:	9/15/16
CHECKED BY: FCA	DATE:	9/15/16
SUBMITTAL / DATE CONSTRUCTION DOCUMENTS		15/16
PROJECT NUMBER		16200
PROJECT FILENAME	2140 CG-101.dwg	Sep 15,2016

FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER
09.15.16

ALBUQUERQUE BIOPARK ZOO
PENGUIN EXHIBIT
Albuquerque, New Mexico

SHEET TITLE

GRADING AND DRAINAGE PLAN MAIN LEVEL

SHEET CG-101 OF

8/31/2016 10:58:17 AM