CITY OF ALBUQUERQUE

Planning Department
Alan Varela, Interim Director

Mayor Timothy M. Keller

January 20, 2022

Jessica Lawlis
Dekker/Perich/Sabitini
7601 Jefferson St. NE
Albuquerque, NM 87109

RE: **Sunport Master Plan AA – Inline Baggage System**
2200 Sunport Blvd. SE
Grading and Drainage Plan
Engineers Stamp Date 7/14/2022 (M16D024A)

Ms. Lawlis,

Based upon the information provided in your submittal received 1/19/22, this plan is approved for Building Permit and Administrative Amendment PR-2018-001575.

If you have any questions, please contact me at 924-3986 or earmijo@cabq.gov.

Sincerely,

Ernest Armijo, P.E.
Principal 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)

Other AA: AA PR-2018-001575

Project Title: Sunport Master Plan AA Building Permit #: _____ Hydrology File #: _____

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

Legal Description: _____

City Address: 2200 Sunport

Applicant: Jessica Lawlis, DPS Contact: _____

Address: 7601 Jefferson St NE

Phone#: (505) 761-9700 Fax#: _____ E-mail: jessical@dpsdesign.org

Other Contact: _____ Contact: _____

Address: _____

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

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) _____
____ 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
X OTHER (SPECIFY) AA for amendment to the Sunport Master Plan

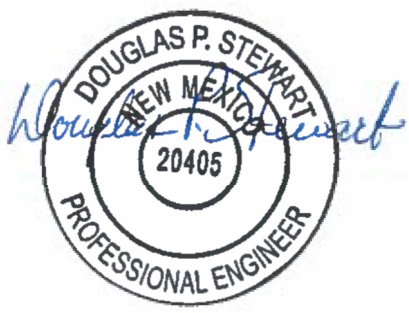
DATE SUBMITTED: 11/4/2021 By: Jessica Lawlis

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

Jacobs



Memorandum

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Subject	**Hydrology Calculations**	**Project Name**	ABQ - Inline Baggage System
Attention	Ernest Armijo, P.E.		
From	Lawrence O'Connor		
Date	January 19, 2022		

1. Background

The purpose of this project is to design a centralized baggage system in the northwest portion of the Albuquerque International Sunport Terminal Building. The site currently consists of impervious concrete pavement. A new building will be constructed to house most of the baggage equipment, with a roof area of 19,036 square feet (0.437 acres). The project will replace impervious area with impervious area. No pervious areas will be added or removed. The project area is shown on the attached drawing CG101.

The pre- and post-construction storm water catchment areas are shown on the attached exhibits EX-01 and EX-02. The storm water in the northwest portion of the Terminal Apron currently flows toward the catch basin CB-2, approximately 700 feet southwest of the new building. CB-2 also collects storm water from catch basins further upstream, including CB-1 located 130 feet southwest of the new building, and a trench drain south of the cooling towers (according to record drawings from previous projects). CB-1 will collect most storm water from the project area. Any remaining storm water will flow toward CB-2.

The roof of the building will carry storm water into a new roof drain system, which will connect to a new catch basin at the southwest corner of the building. The pavement along the western edge of the building will not be covered by roof, and storm water will flow into the new catch basin, which will then flow to CB-1. The southern and eastern edges of the building will also not be covered by roof, and storm water will sheet flow over the apron toward the southwest, either into CB-1 or -2. All storm water eventually will lead to CB-2, as CB-1 is upstream of CB-2. The impact to storm water flow from the construction of this building is summarized in the calculations below.

2. Calculations

The total area in which drainage patterns will be impacted by construction is 32,918 square feet, as shown on EX-01 and EX-02. The area was divided based on whether storm water will drain toward CB-1 or bypass CB-1 during pre- and post-construction conditions. The “Procedure for 40-Acre and Smaller Basins” provided in the City of Albuquerque Development Process Manual Part 6-2(A) was followed to calculate pre- and post-construction peak discharge rate. This procedure mainly follows the Rational Method of $Q = C*I*A$, in which:

Q = flow rate in cubic feet per second (cfs)
C = runoff coefficient
I = precipitation intensity in inches per hour (in./hr)
A = catchment area in acres

The Sunport is located in Albuquerque Precipitation Zone 2. Since the area is impervious, the Land Treatment is type D (runoff coefficient of approximately 0.90). According to Table 6.2.14 of the manual, the 100-year peak discharge is 4.34 cfs/acre, assuming a minimum time of concentration of 12 minutes and precipitation intensity of approximately 4.81 in./hr.

2.1 Pre-Construction Calculations

The pre-construction catchment area for CB-1 is approximately 26,410 square feet (0.6063 acres). This includes the eastern half of the project area and area surrounding the cooling towers (Areas 1 and 2 on EX-01). This results in an existing peak discharge rate of 2.63 cfs toward CB-1:

Q = (*peak discharge*)*(*area*)

= (4.34 cfs/acre)*(0.6063 acres)

= 2.63 cfs

Storm water in the remaining 6,508 square feet of pavement will bypass CB-1 and sheet-flow over the apron toward CB-2 (Areas 3 and 4 on EX-01). Area 3 is 5,142 square feet (0.118 acres) and the discharge rate of water is 0.51 cfs flowing over the apron north of CB-1:

Q = (4.34 cfs/acre)*(0.118 acres)

= 0.51 cfs

Area 4 is 1,366 square feet (0.0314 acres) and the discharge rate of water is 0.14 cfs flowing over the apron south of CB-1:

Q = (4.34 cfs/acre)*(0.0314 acres)

= 0.14 cfs

2.2 Post-Construction Calculations

The post-construction catchment area for CB-1 is approximately 29,968 square feet (0.688 acres), 3,558 square feet greater than the pre-construction catchment area. The catchment area increased due to the roof area of the new baggage building. The roof area will include a drainage system consisting of a roof drain and overflow drain. The roof drain will connect to a new catch basin at the southwest corner of the building. In addition to the roof drain, the new catch basin will accept flows from the pavement area along the western edge of the building (excluding the area below the cooling towers, which is served by the separate trench drain) and water from the overflow drains.

CB-1 will accept flows from the new catch basin, area surrounding the cooling towers, pavement area along the southern edge of the new building, and water from the roof overflow drains. It is assumed all water from Areas 1 to 4 on EX-02 will flow toward CB-1.

Along the eastern edge of the new building (Area 5 on EX-02), the pavement will be sloped away from both the new building and existing Terminal Building to prevent storm water from flowing into either

building. This area, which mostly drains to CB-1 in pre-construction conditions, will now drain toward the south, with flows bypassing CB-1 and ultimately being captured by CB-2. As CB-1 and CB-2 are connected by an underground pipe, there would be a negligible difference in flows to the drainage system. Refer to EX-02 for approximate new flow path.

The catchment areas for the cooling towers, western edge of the new building, new building roof area, and southern edge of the new building (Areas 1 to 4 on EX-02) total to approximately 29,968 square feet (0.688 acres). This results in a total discharge rate of 2.99 cfs toward CB-1:

Q = (4.34 cfs/acre)*(0.688 acres)

= 2.99 cfs

The total discharge rate of water toward CB-1 is 2.99 cfs, 0.36 cfs greater than the pre-construction calculations. Even though the flow toward CB-1 has increased, the flow bypassing CB-1 has also decreased overall. The discharge rate of water over the apron north of CB-1 (formerly Area 3 on EX-01) is now 0 cfs due to water being redirected toward CB-1. The discharge rate of water over the apron south of CB-1 (formerly Area 4 on EX-01) has increased to 0.29 cfs due to the regrading of the eastern edge of the new building (now Area 5 on EX-02, which is 2,950 square feet, or 0.0677 acres):

Q = (4.34 cfs/acre)*(0.0677 acres)

= 0.29 cfs

The flow over the apron north of CB-1 has decreased by 0.51 cfs, while flow over the apron south of CB-1 has increased by 0.15 cfs. When the flows toward CB-1 and bypassing CB-1 are added together, for both the pre- and post-construction conditions, they total the same amount of 3.28 cfs:

Q = (*CB-1 subcatchment area flow*) + (*CB-1 bypass flow*)

Pre-construction		*Post-construction*
= 2.63 + 0.51 + 0.14 cfs	=	2.99 + 0 + 0.29 cfs

= 3.28 cfs

2.3 Roof Drain Design

The International Plumbing Code was used to determine the roof drain pipe size. The roof drain will have capacity for a storm of up to 2 in./hr intensity (100-year, 1-hour storm), while the overflow drains will collect water during storms with higher intensity and drain water onto the pavement outside the building. The roof drain will carry a maximum discharge rate of 0.787 cfs directly into the new catch basin, while the overflow drains will carry the remaining water onto the pavement:

Q = (0.90)*(2 in./hr)*(0.4370 acres) = 0.787 cfs

The discharge rate of 0.787 cfs was converted to gallons per minute (gpm). This resulted in a rate of 353 gpm, which requires a minimum pipe size of 8″ and slope of 1/16″ per foot according to Table 1106.2 from the International Plumbing Code:

Q = (0.787 cfs)*(7.48 gal/cf)*(60 s/min) = 353 gpm

TABLE 1106.2
STORM DRAIN PIPE SIZING

PIPE SIZE (inches)	CAPACITY (gpm)				
	VERTICAL DRAIN	SLOPE OF HORIZONTAL DRAIN			
		1/16 inch per foot	1/8 inch per foot	1/4 inch per foot	1/2 inch per foot
2	34	15	22	31	44
3	87	39	55	79	111
4	180	81	115	163	231
5	311	117	165	234	331
6	538	243	344	487	689
8	1,117	505	714	1,010	1,429
10	2,050	927	1,311	1,855	2,623
12	3,272	1,480	2,093	2,960	4,187
15	5,543	2,508	3,546	5,016	7,093

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

The 8" roof drain will connect to the new catch basin at the southwest corner of the building. In addition to the roof drain, the new catch basin will be designed to accept flows from the pavement area along the western edge of the building (excluding the area below the cooling towers, which is served by the separate trench drain), and all water from the roof during higher-intensity storms.

The roof of the new building is approximately 19,036 square feet (0.4370 acres), while the pavement along the western edge of the building is 1,302 square feet (0.0299 acres), for a total of 0.4669 acres. This results in a total peak discharge rate of 2.03 cfs from the new catch basin for a storm with 4.81 in./hr intensity:

Q = (4.34 cfs/acre)*(0.4669 acres)

= 2.03 cfs

This discharge rate converts to 911 gpm, which requires a minimum pipe size of 10" and slope of 1/16" per foot (according to Table 1106.2 above) from the new catch basin to CB-1.

3. Summary

The difference in peak discharge toward CB-1, between pre- and post-construction, is 0.36 cfs. The flow rate increased due to the roof area of the new baggage building. Even though the storm water flow toward CB-1 has increased, the bypass flow around CB-1 decreased the same amount of 0.36 cfs – the flow over the apron north of CB-1 has decreased by 0.51 cfs, while flow over the apron south of CB-1 has increased by 0.15 cfs. Therefore, the total discharge from the project area will remain the same at 3.28 cfs. It is also assumed CB-1 will have enough capacity to accept the additional flow, although drainage software was not used to evaluate the capacity – as CB-1 and CB-2 are connected by an underground pipe, and all storm water from the project area ultimately is captured by CB-2, there would be a negligible difference in flows to the drainage system.

NOTE:

1. AERIAL IMAGE PROVIDED BY BING MAPS.

LEGEND:

- 5318.0 — EXISTING SURFACE CONTOUR
- SDG — EXISTING STORM DRAIN
- TOTAL AREA IN WHICH DRAINAGE PATTERNS WILL BE IMPACTED BY CONSTRUCTION
- CB-1 SUBCATCHMENT AREA
- AREA BYPASSING CB-1
- 1 — AREA NUMBER

EXISTING COOLING TOWERS (TYP)
EXISTING TRENCH DRAIN
PRE-CONSTRUCTION AREA BYPASSING CB-1 (TYP)
EXISTING CB-1
PRE-CONSTRUCTION CB-1 SUBCATCHMENT AREA (TYP)
TOTAL AREA IN WHICH DRAINAGE PATTERNS WILL BE IMPACTED BY CONSTRUCTION (TYP)
EXISTING STORM DRAIN (TYP)
EXISTING CB-2
5317.0
5316.0
5318.0
5319.0
SDG
B8
B6
B4

N

40 20 0 40

SCALE: 1"=40'

Jacobs

ABQ INTERNATIONAL SUNPORT

PRE-CONSTRUCTION CATCHMENT AREA

EXHIBIT NO.
EX-01

NOTE:

1. AERIAL IMAGE PROVIDED BY BING MAPS.

LEGEND:

- 5318.0 — EXISTING OR PROPOSED SURFACE CONTOUR
- SDG — EXISTING STORM DRAIN
- PROPOSED ROOF DRAIN
- APPROXIMATE FLOW PATH OF STORM WATER EAST OF NEW BAGGAGE BUILDING
- TOTAL AREA IN WHICH DRAINAGE PATTERNS WILL BE IMPACTED BY CONSTRUCTION
- CB-1 SUBCATCHMENT AREA
- NEW BUILDING ROOF AREA
- AREA BYPASSING CB-1
- 1 — AREA NUMBER

NEW BAGGAGE BUILDING ROOF AREA (TYP)
EXISTING COOLING TOWERS (TYP)
EXISTING TRENCH DRAIN
NEW CB
PROPOSED ROOF DRAIN (TYP)
EXISTING CB-1
POST-CONSTRUCTION CB-1 SUBCATCHMENT AREA (TYP)
POST-CONSTRUCTION AREA BYPASSING CB-1 (TYP)
TOTAL AREA IN WHICH DRAINAGE PATTERNS WILL BE IMPACTED BY CONSTRUCTION (TYP)
APPROXIMATE FLOW PATH OF STORM WATER EAST OF NEW BAGGAGE BUILDING (TYP)
EXISTING STORM DRAIN (TYP)
EXISTING CB-2
5317.0
5318.0
5319.0
5316.0
SDG
B4
B6
B8

N

40 20 0 40

SCALE: 1"=40'

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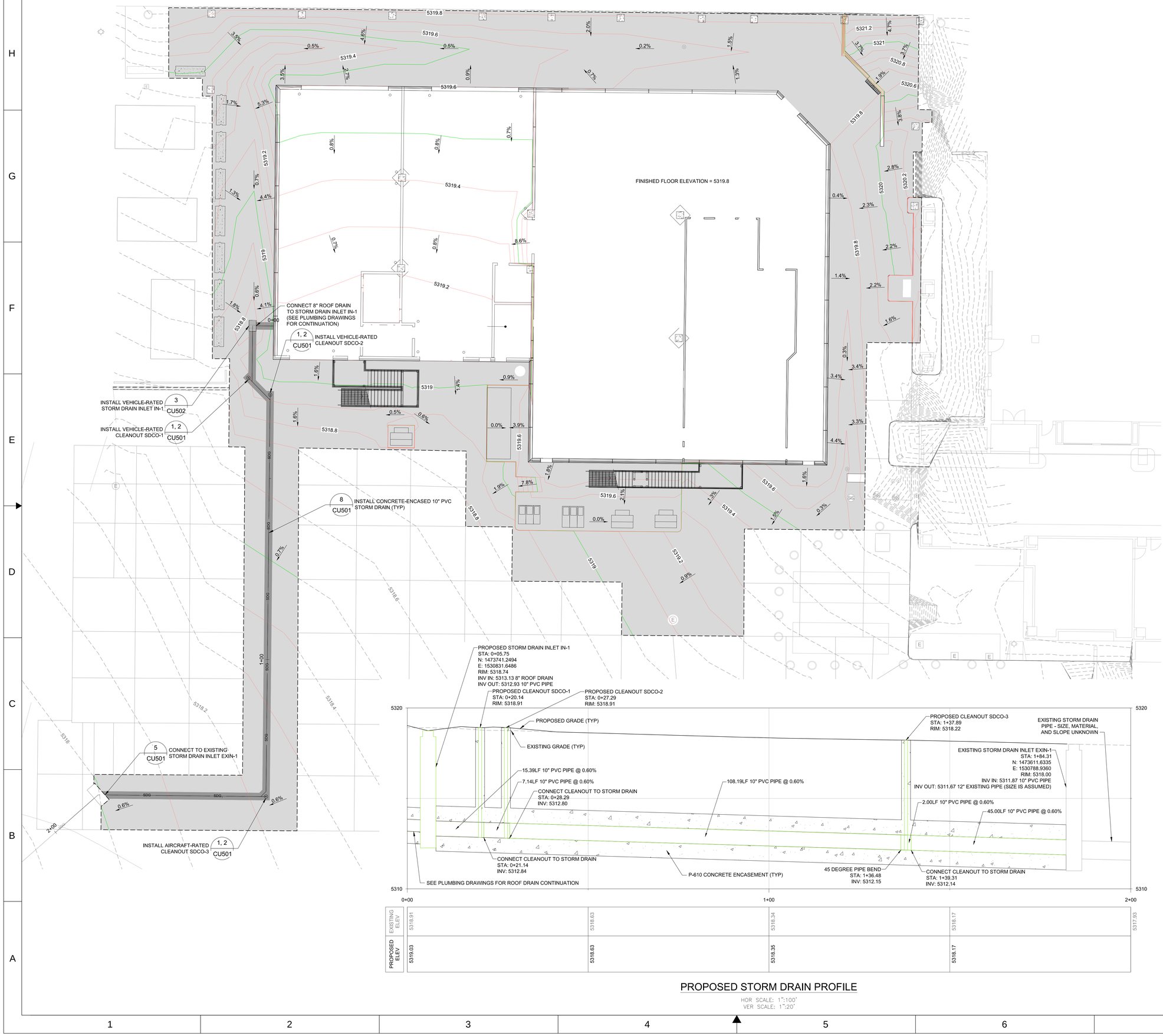
ABQ INTERNATIONAL SUNPORT

POST-CONSTRUCTION CATCHMENT AREAS

EXHIBIT NO.
EX-02



PROPOSED STORM DRAIN PROFILE

HOR SCALE: 1":100'
VER SCALE: 1":20'

GRADING AND DRAINAGE NOTES:

1. PROPOSED CONTOURS ARE SHOWN AT 0.1-FOOT INTERVALS.
2. EXISTING CONTOURS ARE SHOWN AT 0.1-FOOT INTERVALS.
3. SEE SHEET C-301 FOR TYPICAL SECTIONS.
4. SEE SHEET CP101 FOR PROPOSED PAVEMENT SPOT ELEVATIONS.
5. CONTRACTOR SHALL PROTECT ALL UTILITIES TO REMAIN THAT COULD BE DISTURBED BY GRADING ACTIVITIES.
6. CONTRACTOR SHALL HAUL AND DISPOSE OF ALL EXCESS EXCAVATED MATERIAL OFF SITE.
7. CONTRACTOR SHALL VERIFY EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION AND NOTIFY THE AIRPORT IMMEDIATELY UPON ENCOUNTERING POTENTIAL CONFLICTS WITH CROSSING PROPOSED UTILITIES.
8. CONTRACTOR SHALL FOLLOW FUGITIVE DUST REQUIREMENTS PER THE AIRPORT, STATE, AND LOCAL REQUIREMENTS.
9. CONTRACTOR SHALL FIELD VERIFY THE EXISTING PAVEMENT GRADES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL MATCH INTO EXISTING ELEVATIONS OF ADJACENT PAVEMENT.
10. SEE SHEET GC701 FOR SURVEY CONTROL DATA.

GRADING AND DRAINAGE LEGEND:

- 5320 — PROPOSED CONTOUR (MAJOR) (0.5' INTERVAL)
- PROPOSED CONTOUR (MINOR) (0.1' INTERVAL)
- 5320 — EXISTING CONTOUR (0.1' INTERVAL)
- 1.0% — PROPOSED SLOPE
- PROJECT GRADING LIMITS, MATCH EXISTING ELEVATIONS
- SDG — PROPOSED DIRECT-BURIED STORM LINE (9 CU501)
- SDG — PROPOSED CONCRETE-ENCASED STORM LINE (8 CU501)
- PROPOSED CLEANOUT (1, 2, 3 CU501)
- PROPOSED STORM DRAIN INLET (3 CU502)
- SDG — EXISTING STORM LINE
- CONCRETE REPLACEMENT PANELS

PLAN NORTH

10 5 0 10

SCALE: 1"=10'

ALBUQUERQUE INTERNATIONAL SUNPORT

CONSULTANTS

Jacobs

Jacobs Engineering Group Inc.
717 17th Street, Suite 2750
Denver CO 80202

KEY PLAN 1

DOUGLAS P. STEWART NEW MEXICO 20405 PROFESSIONAL ENGINEER

DOUGLAS STEWART
20405 — Registration #
01/14/2022 — Date #
SEAL

NO.	DATE	DESCRIPTION	BY
0	01/14/22	ISSUED FOR PERMIT	DS
		AS-BUILT INFORMATION	
		CONTRACTOR:	
		WORK STAKED BY: DATE:	
		INSPECTOR'S ACCEPTANCE BY: DATE:	
		FIELD VERIFICATION BY: DATE:	
		DRAWINGS CORRECTED BY: DATE:	

DESIGNED BY :	L. O'CONNOR
DRAWN BY :	S. WAZIRI
CHECKED BY :	D. STEWART
DATE :	01/14/2022
PROJECT NUM. :	WXXY7500

CITY OF ALBUQUERQUE NEW MEXICO 1706

CITY OF ALBUQUERQUE
AVIATION DEPARTMENT

SHEET TITLE
ABQ - INLINE BAGGAGE SYSTEM
ALBUQUERQUE INTERNATIONAL SUNPORT
2200 Sunport Blvd, Albuquerque, NM 87106

GRADING AND DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	ZONE MAP NO.	
		M-16	
		CITY PROJECT NO.	
		T.B.D	
		SHEET NO. 14 CG101	REV 0