CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director

Mayor Timothy M. Keller

April 2, 2020

Donald Duneman
Wilson & Company Inc.
4401 Masthead St NE, Suite 150
Albuquerque, NM, 87109

RE: 4600 Edith Blvd NE – SWMD Admin. Office and Vehicle Maintenance
Conceptual G&D Plan (Engineer's Stamp 3/9/2020)
Hydrology File: G15D202

Based upon the supplemental information provided in your submittal received 3/30/2020, the Conceptual Grading and Drainage Plan is approved for Site Plan. For Building Permit or Work Order an approved final Grading and Drainage Plan will be required. Below are comments to address what needs to be completed for final Grading and Drainage Plan approval.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Prior to approval of the final G&D Plan for Building Permit and Work Order

1. Remove the label "Not for Construction" from the G&D Plan. Include an overall sheet like the Conceptual G&D Plan and provide a detailed design at a larger scale on multiple 24' x 36" sheets including many more spot elevations and details of the ponds.
2. Please provide a cover page and table of contents for the calculations/report, and an engineer's stamp and signature. Please number the pages and organize each copy of the report in the same order. One of the submitted reports got scrambled and was difficult to reassemble. Please bind or staple the report.
3. Please add typical section of Rankin Road to the G&D Plan and include dimensions from the face of curb and sidewalk to the new right of way line. Also provide a typical section of the slope/retaining wall at the west end of the Rankin Rd frontage between the sidewalk and parking lot. The Retailing wall must not encroach into the public right of way.
4. Please provide details for Pond C, including placement details and elevations. Also include details for the water quality inlet and pipe to underground storage including profiles.
5. Please provide construction specifications and details on the G&D Plan for all of the hydraulic structures (build notes). Label the pipes, inlets, and manholes. The numbering system (nodes) in the calculations should be shown legibly on the G&D Plan both the overall plan and the more detailed sheets. The exhibit in the report is not legible.
6. The AHYMO peak flow rates seem about 20% higher than they should be, probably because the "Time to Peak" (t_p) values are set to -0.1 which is less than the minimum value of 0.1333 hr. When using the "Compute LT TP" command the t_p should be 0.0. The precipitation values seem appropriate though quarter hour should be 0.0 for type 2 distribution. Digital input files should be provided with the next submittal.

7. The numbering of Pond A and B on the G&D Plan does not agree with the labels in the AHYMO files, please fix the labels in AHYMO. Pond B, on the G&D Plan, appears to have an extended detention volume of 3' depth which can be counted as the BMP/ SWQV if the pond will drain in 48 hr or more at the average release rate calculated for the average pond depth (1.5'?). Please provide separate SWQV calculations for the area draining to each BMP.
8. How were the AHYMO pond routing input tables developed?
    a. Details of the pond outfall structures are required on the G&D Plans for construction.
    b. A narrative description of the pond outfall hydraulic calculations is also needed with the calculations.
    c. Provide pond volume calculations using the conic method showing the area of the contours used in the volume calculations.
9. The hydraulic HGL calculations for the on-site storm drains could not be checked because the pipe and inlet numbers are not shown on a map anywhere. Please add the pipe, inlet and MH labels to the overall G&D Plan and add the EGL to the output data table.
10. Please specify the Curb type/height on the G&D Plan and be sure that the 100 year flow depths do not overtop the curb particularly on the curbs carrying a lot of flow running north and south along the west edge. Especially consider specifying 8" STD C&G in the vicinity of curb opening inlets.
11. Typical sections should be shown at numerous locations around the perimeter of the site. Each section should show the property line, both the existing and proposed grades, slopes and walls with dimensions, both horizontal and vertical, as necessary to demonstrate compliance with DPM 22.5.B
12. A Phasing Plan should identify which portions of the site work are to be completed with each building.

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Prior to Certificate of Occupancy

13. An engineer's Certification will be required for each building with site improvements complete according to the approved phasing plan.

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

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 11/2018)

Project Title: SWMD Main. & Admin. Buildings Project Building Permit #: _____ Hydrology File #: G15D202

DRB#: 2019-002046 EPC#: 1010582, 1001515 Work Order#: _____

Legal Description: All or a portion of a northerly portion of Tract 107B1A1, Tract 107B1A1 excl portion to right-of-way & excl a northerly portion, Tract 107B1A2 excl portion to right-of-way, Tract in the SW corner-Tract 107B1B, Tract 108A3A1A, Tract 108A3A1B, and Tract 108A3B, Tracts 108A1A2B1B & 108A1A2B2, Tract 108A1A2B1A, Tract 107B2A2 excl portion to the right-of-way, Tract 107B2A1 excl portion to the right-of-way, MRGCD Map #33.

City Address: 4600 Edith Blvd. NE, Albuquerque, NM

Applicant: Wilson & Company, Inc. Contact: Donald Duneman

Address: 4401 Masthead Street NE, Suite 150, Albuquerque, NM 87109

Phone#: 505.948.5125; 505.238.0152 cell Fax#: _____ E-mail: dmduneman@wilsonco.com

Owner: City of Albuquerque, Solid Waste Management Department Contact: Jill Holbert

Address: 4600 Edith Blvd. NE, Albuquerque, NM

Phone#: 505.761.8342 Fax#: _____ E-mail: jholbert@cabq.gov

TYPE OF SUBMITTAL: _____ PLAT (___# OF LOTS) ____ RESIDENCE X DRB SITE ____ ADMIN SITE

IS THIS A RESUBMITTAL?: X Yes _____ No

DEPARTMENT: _____ TRAFFIC/ TRANSPORTATION X HYDROLOGY/ DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

____ ENGINEER/ARCHITECT CERTIFICATION
____ PAD CERTIFICATION
X 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
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) _____

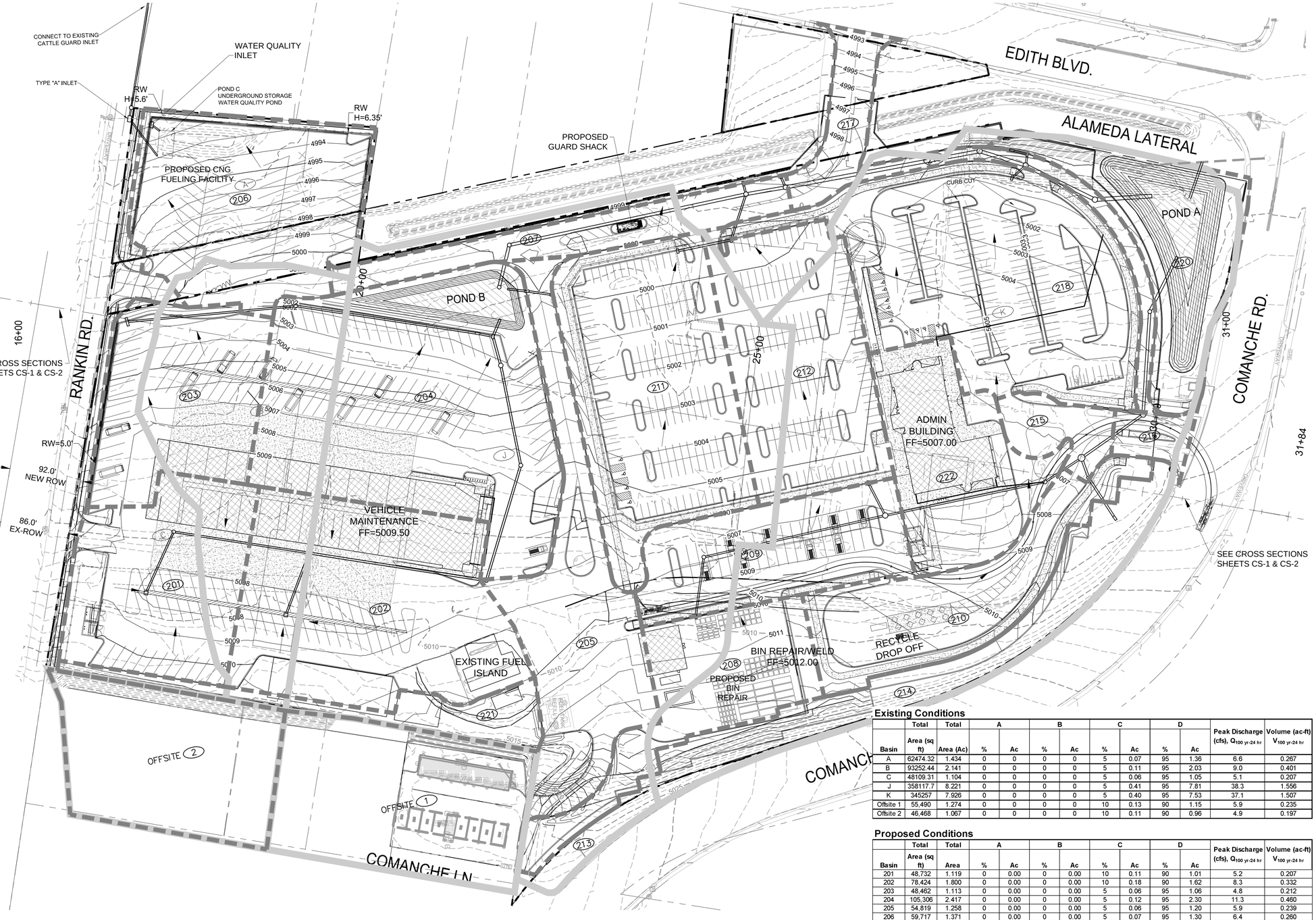
DATE SUBMITTED: 3/9/20 By: Donald Duneman

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

SWMD Maintenance & Administration Buildings Project

City of Albuquerque
Department of Municipal Development
Solid Waste Management Department



LEGEND

- XX — EXISTING CONTOURS
- XX — PROPOSED CONTOURS
- FF — FINISHED FLOOR
- X% — SLOPE ARROW
- PROPOSED RETAINING WALL
- EXISTING BASIN BOUNDARY
- PROPOSED BASIN BOUNDARY

GRADING & DRAINAGE PLAN

0 60' 120'
1"=60'-0"

Pond	Peak Flow (cfs)		Volume (ac-ft)		Elevation (ft)		
	In	Out	Prv'd	Req'd	Top	Bottom	WSEL
A	97	44.3	1.95	1.20	4997	4989	4995.4
B	48	44.2	0.56	0.39	4999	4994	4998.0
C	7	3.0	0.13	0.11	4986	4985	4985.7

DRAINAGE ANALYSIS

INTRODUCTION

THE PROJECT SITE IS LOCATED IN NORTHEAST ALBUQUERQUE AT 4600 EDITH BLVD. THE SITE IS BOUNDED BY THE ALAMEDA DRAIN/EDITH BLVD. TO THE WEST, COMANCHE RD TO THE NORTH, RANKIN RD TO THE SOUTH, AND COMMERCIAL BUSINESSES TO THE EAST OF THE SITE. THE SITE IS NOT LOCATED WITHIN A DESIGNATED FEMA FLOOD PLAIN MAP, SEE FIRM MAPS 35001C0119G AND 35001C0332G. THE DRAINAGE REPORT HAS BEEN PREPARED IN ACCORDANCE WITH THE LATEST REVISION TO VOLUME 2 SECTION 22.2 OF THE CITY OF ALBUQUERQUE PROCESS MANUAL.

EXISTING CONDITIONS

THE SITE IS 23.8 AC AND MAJORITY OF THE SITE IS IMPERVIOUS. THE EXISTING SITE TOPOGRAPHY GENERALLY SLOPES FROM EAST TO WEST. THE EXISTING DRAINAGE INFRASTRUCTURE DIVERTS ALL THE SITES FLOWS THROUGH A SERIES OF WATER/OIL SEPARATORS AND INLETS INTO TWO PONDS LOCATED ON THE NORTH AND SOUTH OF THE SITE. THE LARGER DETENTION POND TO THE NORTH HAS AN OUTLET STRUCTURE THAT DISCHARGES THROUGH A 30 INCH CORRUGATED METAL PIPE (CMP) INTO A DRAINAGE SYSTEM IN COMANCHE RD. THE CONSTRUCTION PLANS FOR STORM WATER CONTROL IMPROVEMENTS FOR SOLID WASTE MANAGEMENT FACILITY COA PROJECT NUMBER 700691 PREPARED BY APPLIED ENGINEERING AND SURVEYING, INC. DATED 07/22/03 SHEET 2 OF 17 SHOWS AN OUTLET FROM THE POND WITH PEAK FLOW OF 44.3 CFS AND AN ALLOWABLE DISCHARGE OF 47.6 CFS FROM THE SITE. THE NORTHERN THREE QUARTERS OF THE SITE DRAINS INTO THIS POND. THE REMAINDER OF THE SITE DRAINS INTO THE SMALLER RETENTION POND TO THE SOUTHWEST CORNER OF THE SITE.

THE COMMERCIAL BUSINESSES TO THE EAST OF THE SITE ALSO DRAIN FROM THE EAST TO WEST. THE BUILDINGS ON THESE COMMERCIAL SITES ARE APPROXIMATELY 10-15 FT HIGHER THAN THE SITES EXISTING GRADE. THE OFFSITE FLOWS WILL FLOW DIRECTLY TO THE EAST AND THE NORTHERN HALF WILL EVENTUALLY DRAIN INTO THE NORTH POND AND THE SOUTH HALF FLOWS INTO THE SOUTH RETENTION POND. THE POND IS A SHALLOW POND WITH ROCK RIPRAP SPILLWAY DRAINING INTO RANKIN RD. THE AREA TO THE NORTH OF THE SITE IS COMANCHE RD WHICH HAS DRAINAGE INFRASTRUCTURE IN PLACE TO PREVENT FLOWS FROM BEING DISCHARGED TO THE PROJECT SITE. RANKIN RD TO THE SOUTH DRAINS EAST TO WEST AND THE FLOWS DO NOT ENTER THE PROPERTY. THE AREA TO THE WEST DRAINS EAST TO WEST AND THOSE FLOWS WILL ENTER THE ALAMEDA DRAIN.

PROPOSED CONDITIONS

THE PROPOSED SITE WILL MAINTAIN THE GENERAL FLOW DIRECTION OF EAST TO WEST AND SOUTH TO NORTH. ALL THE BASINS EXCEPT BASIN 206 WILL ULTIMATELY DRAIN INTO THE NEW POND LOCATED IN BASIN 220. BASINS 201-204 AND OFFSITE BASINS 1 AND 2 WILL CAPTURE THE DRAINAGE FROM THE MAINTENANCE AREA AND COMMERCIAL VEHICLE PARKING LOT AND BE ROUTED THROUGH A NEW POND IN BASIN 204. THIS POND WILL BE LINED AND WILL HAVE A WATER QUALITY OUTLET TO REMOVE THE TRASH AND OIL CAPTURED FROM THE SITE RUNOFF. THE NEW POND IN BASIN 220 WILL BE CONNECTED TO THE EXISTING POND DRAINAGE INFRASTRUCTURE THAT DISCHARGES TO THE STORM DRAIN SYSTEM IN COMANCHE RD. THIS POND WILL HAVE A WATER QUALITY RISER TO HELP REMOVE TRASH AND SEDIMENT FROM THE RUNOFF. THE POND DISCHARGE WILL BE 44.3 CFS WHICH WILL LESS THAN THE ALLOWABLE SITE DISCHARGE OF 47.6 CFS. THE EXISTING 60 INCH DRAINAGE SYSTEM IN COMANCHE RD IS ABOUT 19 FT DEEP. NO DATA RELATED TO HYDRAULIC GRADE LINE OF THIS SYSTEM WAS FOUND. THE POND OUTFALL WILL TIE TO THE EXISTING 30 INCH PIPE UPSTREAM OF THE EXISTING SYSTEM IN COMANCHE RD. THE EXISTING RETENTION POND IN BASIN 206 LOCATED ON THE SOUTHWEST CORNER WILL BE REMOVED. RUNOFF FROM THIS BASIN SHEET FLOWS TO AN INLET WHICH WILL ULTIMATELY DRAIN INTO THE EXISTING CATTLE GUARD INLET AT THE INTERSECTION OF EDITH BLVD AND RANKIN RD. THE COA STORMWATER QUALITY VOLUME FOR THE 80th PERCENTILE EVENT WAS CALCULATED USING 0.26 INCH OF RAINFALL DEPTH. THIS VOLUME WAS CALCULATED TO BE 0.47 AC-FT FOR THE 21.48 AC OF THE SITE IMPERVIOUS AREAS. THIS RETENTION VOLUME WILL BE ACCOMMODATED IN POND A.

CALCULATIONS

THE 100-YR, 24-HR STORM EVENT USING AHYMO S-4 WERE USED TO CALCULATE PEAK FLOWS AND RUNOFF VOLUME FOR THE PROPOSED DEVELOPMENT WHICH ARE SUMMARIZED HERE. BENTLEY FLOWMASTER V8I WERE UTILIZED TO DETERMINE PROPOSED INLET CAPACITIES. BENTLEY CULVERTMASTER V3.3 WAS USED TO DESIGN PONDS OUTFALL PIPES. PEAK FLOWS FROM THE MODEL WERE ENTERED INTO THE STORMCAD V10.1 SOFTWARE TO ANALYZE AND DESIGN THE STORM SYSTEMS. BOTH PONDS INCLUDE ONE FOOT OF FREEBOARD AND SIDE SLOPES OF 3H: 1V.

Existing Conditions

Basin	Total Area (sq ft)	Total Area (Ac)	A %	A Ac	B %	B Ac	C %	C Ac	D %	D Ac	Peak Discharge (cfs), $Q_{100\ yr\text{-}24\ hr}$	Volume (ac-ft) $V_{100\ yr\text{-}24\ hr}$
A	62474.32	1.434	0	0	0	0	5	0.07	95	1.36	6.6	0.267
B	93252.44	2.141	0	0	0	0	5	0.11	95	2.03	9.0	0.401
C	48109.31	1.104	0	0	0	0	5	0.06	95	1.05	5.1	0.207
J	358117.7	8.221	0	0	0	0	5	0.41	95	7.81	38.3	1.556
K	345257	7.926	0	0	0	0	5	0.40	95	7.53	37.1	1.507
Offsite 1	55,490	1.274	0	0	0	0	10	0.13	90	1.15	5.9	0.235
Offsite 2	46,468	1.067	0	0	0	0	10	0.11	90	0.96	4.9	0.197

Proposed Conditions

Basin	Total Area (sq ft)	Total Area	A %	A Ac	B %	B Ac	C %	C Ac	D %	D Ac	Peak Discharge (cfs), $Q_{100\ yr\text{-}24\ hr}$	Volume (ac-ft) $V_{100\ yr\text{-}24\ hr}$
201	48,732	1.119	0	0.00	0	0.00	10	0.11	90	1.01	5.2	0.207
202	78,424	1.800	0	0.00	0	0.00	10	0.18	90	1.62	8.3	0.332
203	48,462	1.113	0	0.00	0	0.00	5	0.06	95	1.06	4.8	0.212
204	105,306	2.417	0	0.00	0	0.00	5	0.12	95	2.30	11.3	0.460
205	54,819	1.258	0	0.00	0	0.00	5	0.06	95	1.20	5.9	0.239
206	59,717	1.371	0	0.00	0	0.00	5	0.07	95	1.30	6.4	0.260
207	23,213	0.533	0	0.00	0	0.00	5	0.03	95	0.51	2.5	0.101
208	38,436	0.882	0	0.00	0	0.00	5	0.04	95	0.84	4.2	0.168
209	39,485	0.906	0	0.00	0	0.00	2	0.02	98	0.89	4.3	0.176
210	40,798	0.937	0	0.00	0	0.00	2	0.02	98	0.92	4.4	0.181
211	71,721	1.646	0	0.00	0	0.00	5	0.08	95	1.56	7.7	0.312
212	56,736	1.302	0	0.00	0	0.00	5	0.07	95	1.24	6.1	0.248
213	6,289	0.144	0	0.00	0	0.00	75	0.11	25	0.04	0.7	0.025
214	38,158	0.876	0	0.00	0	0.00	75	0.66	25	0.22	3.9	0.147
215	10,070	0.231	1	0.00	1	0.00	10	0.02	90	0.21	1.1	0.042
216	5,758	0.132	0	0.00	0	0.00	5	0.01	95	0.13	0.6	0.026
217	12,735	0.292	0	0.00	0	0.00	20	0.06	80	0.23	1.3	0.051
218	90,301	2.073	0	0.00	0	0.00	10	0.21	90	1.87	9.6	0.382
219	10,416	0.239	0	0.00	0	0.00	5	0.01	95	0.23	1.1	0.045
220	38,671	0.888	0	0.00	0	0.00	15	0.13	85	0.75	4.1	0.159
221	16,629	0.382	0	0.00	0	0.00	10	0.04	90	0.34	1.8	0.071
222	41,098	0.943	0	0.00	0	0.00	2	0.02	98	0.92	4.5	0.182
Offsite 1	55,490	1.274	0	0.00	0	0.00	10	0.13	90	1.15	5.9	0.235
Offsite 2	46,468	1.067	0	0.00	0	0.00	10	0.11	90	0.96	4.9	0.197

CONCEPTUAL GRADING & DRAINAGE PLAN

MARYAM D. GHAHI — NEW MEXICO — 17623 — 12/12/19 — PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

JRMA ARCHITECTS ENGINEERS
JR MILLER & ASSOCIATES
2700 SATURN STREET
BREA, CA 92821
714-524-1870

WILSON & COMPANY
WILSON & COMPANY, INC.
4401 MASTHEAD ST NE
ALBUQUERQUE, NM 87109
505-348-4000

DECEMBER 10, 2019

SHEET No. GR-1

COA PROJECT No. 7006.92 JRMA No. 4907

M:\TRN\144-100-132-0/12_DISCIPLINES_SHEETS\2_SHEETS - CIVIL\GR-01-1.DWG3/6/2020 3:49 PM

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AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4)                    - Ver. S4.01a, Rel: 01a      RUN DATE (MON/DAY/YR) =03/09/2020
INPUT FILE = 14-100-132-01\2_Disciplines\Drainage_or_Sitework\Calculations\AHYMO\SWMD.txt USER NO.= WilsonCoANMSiteA96476897

                          FROM  TO                  PEAK         RUNOFF              TIME TO    CFS      PAGE =   1
                  HYDROGRAPH   ID   ID       AREA    DISCHARGE    VOLUME     RUNOFF    PEAK     PER
COMMAND       IDENTIFICATION   NO.  NO.    (SQ MI)    (CFS)      (AC-FT)   (INCHES)  (HOURS)   ACRE     NOTATION

*S "PROPOSED" CONDITION MODEL FOR SWMD Maintenance & Admin Project
START                                                                                                  TIME=      0.00
LOCATION                     ALBUQUERQUE
*S                RAINFALL DATA FROM NOAA ATLAS 14
*S*************************************************************************
*S  100 YEAR 24HR STORM
RAINFALL  TYPE= 2 NOAA 14                                                                              RAIN24=   2.600
COMPUTE NM HYD          OFF2   -     1      0.00167      4.94      0.197     2.21326    1.467    4.623 PER IMP=  90.00
COMPUTE NM HYD        201.00   -    97      0.00175      5.18      0.207     2.21326    1.467    4.623 PER IMP=  90.00
ADD HYD               201SUM  1&97  12      0.00342     10.12      0.404     2.21313    1.467    4.623
COMPUTE NM HYD        203.00   -     2      0.00160      4.80      0.195     2.27932    1.467    4.692 PER IMP=  95.00
ADD HYD               203SUM 12& 2  10      0.00502     14.92      0.598     2.23418    1.467    4.645
COMPUTE NM HYD          OFF1   -     1      0.00199      5.89      0.235     2.21326    1.467    4.621 PER IMP=  90.00
COMPUTE NM HYD        202.00   -    98      0.00281      8.31      0.332     2.21326    1.467    4.618 PER IMP=  90.00
ADD HYD               202SUM  1&98   3      0.00480     14.19      0.567     2.21316    1.467    4.620
COMPUTE NM HYD        204.00   -     2      0.00378     11.33      0.460     2.27932    1.467    4.684 PER IMP=  95.00
ADD HYD               204SUM  3& 2   1      0.00858     25.52      1.026     2.24228    1.467    4.648
COMPUTE NM HYD        221.00   -     2      0.00060      1.78      0.071     2.21326    1.467    4.647 PER IMP=  90.00
COMPUTE NM HYD        205.00   -     5      0.00197      5.91      0.239     2.27931    1.467    4.689 PER IMP=  95.00
ADD HYD               205SUM  2& 5   4      0.00257      7.70      0.310     2.26372    1.467    4.679
ADD HYD               205SUMA 1& 4   6      0.01115     33.22      1.336     2.24722    1.467    4.655
ADD HYD               205SUMB 10& 6  1      0.01617     48.14      1.935     2.24317    1.467    4.652
ROUTE RESERVOIR         PONDA    1   30      0.01617     44.19      1.858     2.15479    1.533    4.270 AC-FT=    0.395
COMPUTE NM HYD        206.00   -     1      0.00223      6.69      0.271     2.27932    1.467    4.687 PER IMP=  95.00
ROUTE RESERVOIR         PONDC    1    2      0.00223      2.63      0.271     2.27922    1.667    1.843 AC-FT=    0.112
COMPUTE NM HYD        208.00   -     8      0.00138      4.15      0.168     2.27932    1.467    4.694 PER IMP=  95.00
COMPUTE NM HYD        209.00   -     9      0.00142      4.30      0.176     2.31895    1.467    4.734 PER IMP=  98.00
ADD HYD               209SUM  9& 8  11      0.00280      8.45      0.343     2.29924    1.467    4.714
COMPUTE NM HYD        222.00   -    12      0.00147      4.45      0.182     2.31895    1.467    4.734 PER IMP=  98.00
ADD HYD               222SUM 11&12  13      0.00427     12.90      0.525     2.30597    1.467    4.721
COMPUTE NM HYD        215.00   -    14      0.00036      1.08      0.042     2.21326    1.467    4.672 PER IMP=  90.00
ADD HYD               215SUM 14&13  15      0.00463     13.98      0.568     2.29873    1.467    4.717
COMPUTE NM HYD        216.00   -    16      0.00021      0.64      0.026     2.27932    1.467    4.746 PER IMP=  95.00
ADD HYD               216SUM 16&15  17      0.00484     14.62      0.593     2.29786    1.467    4.718
COMPUTE NM HYD        213.00   -     2      0.00023      0.66      0.025     2.01509    1.467    4.504 PER IMP=  75.00
COMPUTE NM HYD        214.00   -    99      0.00137      3.88      0.147     2.01509    1.467    4.425 PER IMP=  75.00
ADD HYD               214SUM 99& 2   3      0.00160      4.54      0.172     2.01488    1.467    4.436
COMPUTE NM HYD        210.00   -     1      0.00146      4.42      0.181     2.31895    1.467    4.734 PER IMP=  98.00
ADD HYD               210SUM  1& 3  31      0.00306      8.97      0.352     2.15989    1.467    4.578
ADD HYD               210SUMA 17&31 18      0.00790     23.58      0.946     2.24442    1.467    4.664
COMPUTE NM HYD        207.00   -     1      0.00083      2.50      0.101     2.27932    1.467    4.703 PER IMP=  95.00
COMPUTE NM HYD        211.00   -    11      0.00257      7.71      0.312     2.27932    1.467    4.687 PER IMP=  95.00
ADD HYD               211SUM  1&11  10      0.00340     10.21      0.413     2.27918    1.467    4.691
COMPUTE NM HYD        212.00   -     3      0.00204      6.12      0.248     2.27932    1.467    4.689 PER IMP=  95.00
ADD HYD               212SUM 10& 3  11      0.00544     16.33      0.661     2.27919    1.467    4.690
COMPUTE NM HYD        218.00   -     1      0.00324      9.58      0.382     2.21326    1.467    4.618 PER IMP=  90.00
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	218SUM	18& 1	10	0.01114	33.16	1.328	2.23533	1.467	4.651	
COMPUTE NM HYD	219.00	-	1	0.00037	1.12	0.045	2.27932	1.467	4.725	PER IMP= 95.00
ADD HYD	219SUM	10& 1	19	0.01151	34.28	1.373	2.23673	1.467	4.653	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	219SUMA	19&11	18	0.01695	50.60	2.034	2.25036	1.467	4.665	
COMPUTE NM HYD	220.00	-	20	0.00139	4.06	0.159	2.14720	1.467	4.559	PER IMP= 85.00
ADD HYD	220SUM	18&20	21	0.01834	54.66	2.193	2.24253	1.467	4.657	
ADD HYD	POND.IN	21&30	1	0.03451	97.07	4.052	2.20142	1.500	4.395	
ROUTE RESERVOIR	PONDA	1	96	0.03451	44.29	4.051	2.20123	1.667	2.005	AC-FT= 1.207
COMPUTE NM HYD	217.00	-	6	0.00046	1.33	0.051	2.08115	1.467	4.524	PER IMP= 80.00
FINISH										

```
*  SWMD Maintenance & Admin Project Proposed Basins
*  Drainage Basin Analysis
*S "PROPOSED" CONDITION MODEL FOR SWMD Maintenance & Admin Project
*
START               TIME=0.0  PUNCH CODE=0 PRINT CODE=0
LOCATION            ALBUQUERQUE
*
* RAINFALL FROM NOAA COA DEVELOPMENT PROCESS MANUAL
*S      RAINFALL DATA FROM NOAA ATLAS 14
*S*************************************************************************
*S  100 YEAR 24HR STORM
RAINFALL                TYPE=2
                        QUARTER=1.06 IN
                        HOUR=   1.77 IN
                        SIX HR= 2.29 IN
                        DAY=    2.60 IN   DT=0.03333

*** Sub-BASIN OFF2 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.010   K=0.7
                        LENGTH=200 FT   SLOPE=0.050   K=2.0
*
COMPUTE NM HYD          ID=1   HYD NO=OFF2   DA=0.00167 SQ MI
                        PER A=00 PER B=00 PER C=10 PER D=90
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=1   CODE=1
*
*

*** Sub-BASIN 201 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.050   K=0.7
                        LENGTH=185 FT   SLOPE=0.011   K=2.0
*
COMPUTE NM HYD          ID=97   HYD NO=201   DA=0.00175 SQ MI
                        PER A=00 PER B=00 PER C=10 PER D=90
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=97   CODE=1
*
*
* Total Flow from Basin (OFF2 + 201)
ADD HYD                 ID=12  HYD NO=201SUM ID I=1   ID II=97
PRINT HYD               ID=12  CODE=1
*
*
*** Sub-BASIN 203 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.020   K=0.7
                        LENGTH=190 FT   SLOPE=0.020   K=2.0
*
COMPUTE NM HYD          ID=2   HYD NO=203   DA=0.0016 SQ MI
                        PER A=00 PER B=00 PER C=5 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=2   CODE=1
*
*
* Total Flow from Basin (OFF2+201+203)
ADD HYD                 ID=10  HYD NO=203SUM ID I=12   ID II=2
PRINT HYD               ID=10  CODE=1
*
```

```
*
**************************************************************************
*** Sub-BASIN OFF1 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.010   K=0.7
                        LENGTH=200 FT   SLOPE=0.050   K=2.0
*
COMPUTE NM HYD          ID=1   HYD NO=OFF1   DA=0.00199 SQ MI
                        PER A=00 PER B=00 PER C=10 PER D=90
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=1   CODE=1
*
*
*** Sub-BASIN 202 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.048   K=0.7
                        LENGTH=240 FT   SLOPE=0.052   K=2.0
*
COMPUTE NM HYD          ID=98   HYD NO=202   DA=0.00281 SQ MI
                        PER A=00 PER B=00 PER C=10 PER D=90
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=98   CODE=1
*
*
* Total Flow from Basin (OFF1+202)
ADD HYD                 ID=3  HYD NO=202SUM ID I=1   ID II=98
PRINT HYD               ID=3  CODE=1
*
*
*** Sub-BASIN 204 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=90 FT   SLOPE=0.050   K=0.7
*
COMPUTE NM HYD          ID=2   HYD NO=204   DA=0.00378 SQ MI
                        PER A=00 PER B=00 PER C=5 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=2   CODE=1
*
*
* Total Flow from Basin (OFF1 +202 + 204)
ADD HYD                 ID=1  HYD NO=204SUM ID I=3   ID II=2
PRINT HYD               ID=1   CODE=1
*
*
*** Sub-BASIN 221 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.045   K=0.7
                        LENGTH=200 FT   SLOPE=0.032   K=2.0
*
COMPUTE NM HYD          ID=2   HYD NO=221   DA=0.0006 SQ MI
                        PER A=00 PER B=00 PER C=10 PER D=90
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=2   CODE=1
*
*

*** Sub-BASIN 205 ****
```

```
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.025   K=0.7
                        LENGTH=239 FT   SLOPE=0.014   K=2.0
*
COMPUTE NM HYD          ID=5   HYD NO=205   DA=0.00197 SQ MI
                        PER A=00 PER B=00 PER C=05 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=5   CODE=1
*
*
* Total Flow from Basin (205 + 221)
ADD HYD                 ID=4  HYD NO=205SUM ID I=2   ID II=5
PRINT HYD               ID=4  CODE=1
*
*

* Total Flow from Basin (OFF1 TO 205)
ADD HYD                 ID=6  HYD NO=205SUMA ID I=1   ID II=4
PRINT HYD               ID=6   CODE=1
*
*
* Total Flow TO POND B
ADD HYD                 ID=1  HYD NO=205SUMB ID I=10   ID II=6
PRINT HYD               ID=1   CODE=1
*
*
****Route HYD 205sum to Sub-Basin  Through a Pipe

****Route Hyd  through POND B
*
ROUTE RESERVOIR         ID=30  HYD NO=PONDA  INFLOW ID=1  CODE=1
                        OUTFLOW (CFS)     STORAGE (AC FT)       ELEV
                        0                       0.0             4994
                        0.01                    0.0626          4995
                        0.02                    0.1469          4996
                        0.03                    0.2561          4997
                        43.9                    0.3932          4998
                        76.5                    0.5613          4999

*
*PRINT HYD               ID=30   CODE=1
*
**********************************************************************
*** Sub-BASIN 206, Sheet Flow Out ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.020   K=0.7
                        LENGTH=187 FT   SLOPE=0.033   K=2.0
*
COMPUTE NM HYD          ID=1   HYD NO=206   DA=0.00223 SQ MI
                        PER A=00 PER B=00 PER C=05 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=1   CODE=1
*

*
*****Route HYD  to Sub-Basin  Through a Pipe
*COMPUTE RATING CURVE   CID=1   VS NO=1 CODE=-1   SLP=0.023
                        DIA=24 IN   N=0.013
*
*ROUTE MCUNGE           ID=2  HYD NO=206Rt  INFLOW ID=1
*                       DT=0 HR  LENGTH=200 FT
*                       NS=0  SLOPE=0.010
*
```

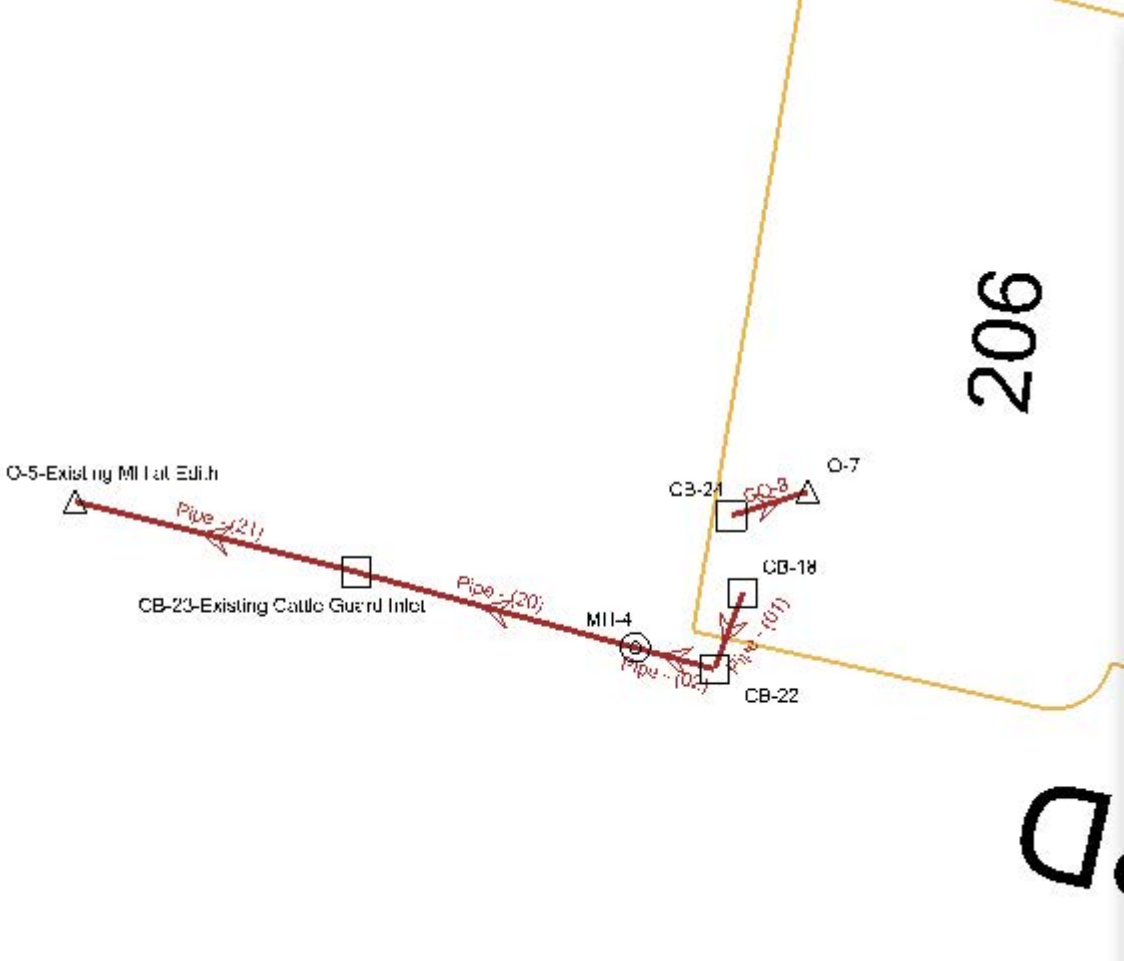
```
*PRINT HYD              ID=2   CODE=1
*
*
**************************************************************************
****Route Hyd  through POND C - Underground
*
ROUTE RESERVOIR         ID=2  HYD NO=PONDC  INFLOW ID=1  CODE=1
                        OUTFLOW (CFS)     STORAGE (AC FT)       ELEV
                        0.0                     0.00            4985.0
                        2.0                     0.10            4985.5
                        3.6                     0.13            4986.0

*
*PRINT HYD              ID=2    CODE=1




**************************************************************************
*
**** Sub-BASIN 208 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.025   K=0.7
                        LENGTH=485 FT   SLOPE=0.018   K=2.0
*
COMPUTE NM HYD          ID=8   HYD NO=208   DA=0.00138 SQ MI
                        PER A=00 PER B=00 PER C=05 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=8   CODE=1
*
*
*** Sub-BASIN 209 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.018   K=0.7
                        LENGTH=410 FT   SLOPE=0.004   K=2.0
*
COMPUTE NM HYD          ID=9   HYD NO=209   DA=0.00142 SQ MI
                        PER A=00 PER B=00 PER C=02 PER D=98
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=9   CODE=1
*
*
* Total Flow from Basin (208 + 209)
ADD HYD                 ID=11  HYD NO=209SUM ID I=9   ID II=8
PRINT HYD               ID=11   CODE=1
*
*** Sub-BASIN 222 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=89 FT   SLOPE=0.032   K=0.7
*
COMPUTE NM HYD          ID=12   HYD NO=222   DA=0.00147 SQ MI
                        PER A=00 PER B=00 PER C=2 PER D=98
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=12   CODE=1
*
*
* Total Flow from Basin (208 + 209 + 222)
ADD HYD                 ID=13  HYD NO=222SUM ID I=11   ID II=12
PRINT HYD               ID=13   CODE=1
```

```
*
*** Sub-BASIN 215 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.029   K=0.7
                        LENGTH=206 FT   SLOPE=0.003   K=2.0
*
COMPUTE NM HYD          ID=14   HYD NO=215   DA=0.00036 SQ MI
                        PER A=00 PER B=00 PER C=10 PER D=90
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=14   CODE=1
*
*
* Total Flow from Basin (208 TO 215)
ADD HYD                 ID=15  HYD NO=215SUM ID I=14   ID II=13
PRINT HYD               ID=15   CODE=1
*

*** Sub-BASIN 216 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.011   K=0.7
                        LENGTH=479 FT   SLOPE=0.023   K=2.0
*
COMPUTE NM HYD          ID=16   HYD NO=216   DA=0.00021 SQ MI
                        PER A=00 PER B=00 PER C=05 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=16   CODE=1
*
*
* Total Flow from Basin (208 TO 216)
ADD HYD                 ID=17  HYD NO=216SUM ID I=16   ID II=15
PRINT HYD               ID=17   CODE=1
*
**********************************************************************
*** Sub-BASIN 213 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.025   K=0.7
                        LENGTH=50 FT   SLOPE=0.060   K=2.0
*
COMPUTE NM HYD          ID=2   HYD NO=213   DA=0.00023 SQ MI
                        PER A=00 PER B=00 PER C=25 PER D=75
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=2   CODE=1
*
*
*** Sub-BASIN 214 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.028   K=0.7
                        LENGTH=90 FT   SLOPE=0.061   K=2.0
*
COMPUTE NM HYD          ID=99   HYD NO=214   DA=0.00137 SQ MI
                        PER A=00 PER B=00 PER C=25 PER D=75
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=99   CODE=1
*
* Total Flow from Basin (214 + 213)
ADD HYD                 ID=3  HYD NO=214SUM ID I=99   ID II=2
PRINT HYD               ID=3   CODE=1
```

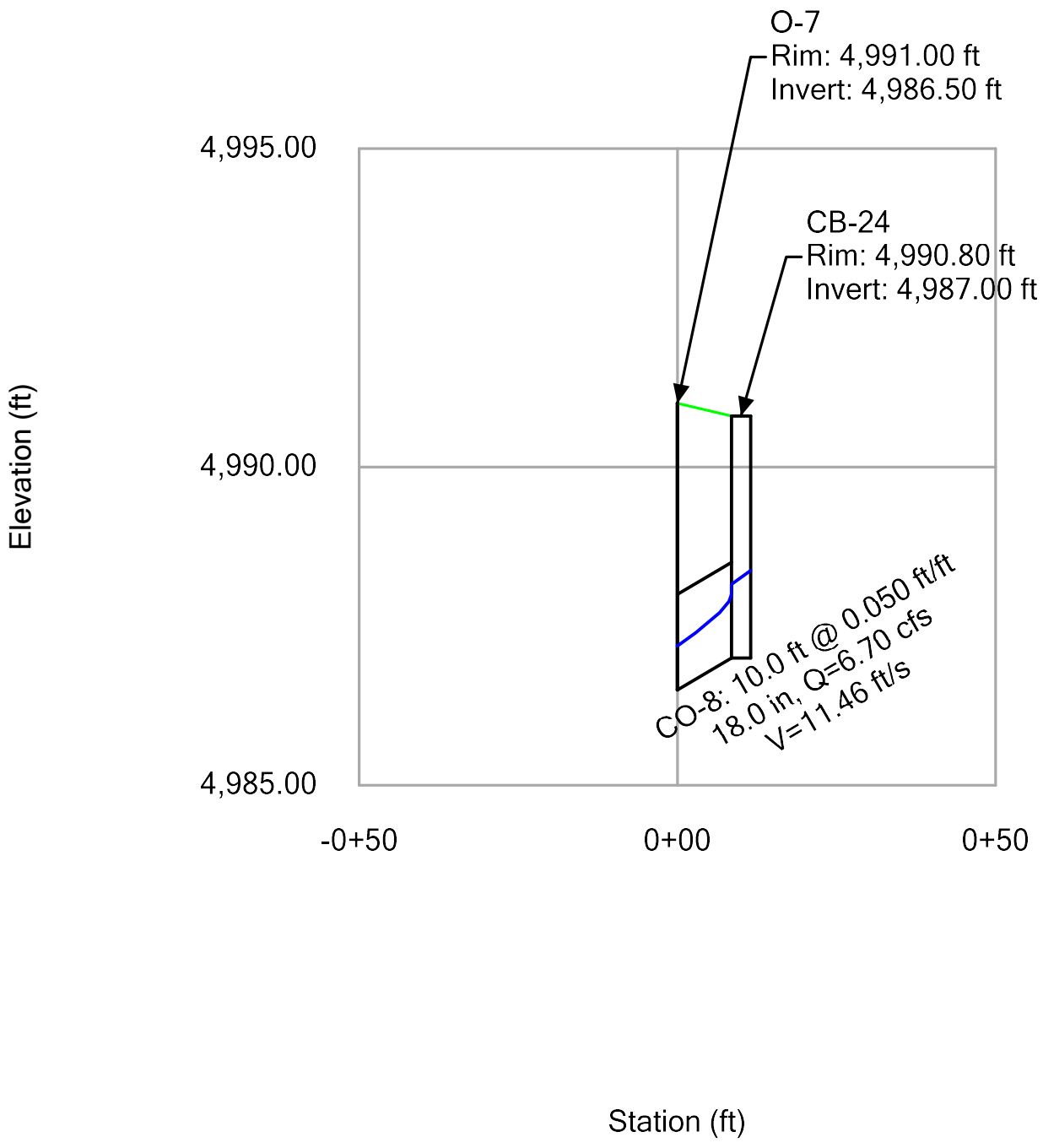
```
*
*
**********************************************************************
*
****************************************************************
*** Sub-BASIN 210 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=300 FT   SLOPE=0.005   K=0.7
*
COMPUTE NM HYD          ID=1   HYD NO=210   DA=0.00146 SQ MI
                        PER A=00 PER B=00 PER C=02 PER D=98
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=1   CODE=1
*
* Total Flow from Basin (213 + 214 + 210)
ADD HYD                 ID=31  HYD NO=210SUM ID I=1   ID II=3
PRINT HYD               ID=31   CODE=1
*
*

* Total Flow from Basin (208 TO 216 TO 210, 213 + 214)
ADD HYD                 ID=18  HYD NO=210SUMA ID I=17   ID II=31
PRINT HYD               ID=18   CODE=1
*
****************************************************************

*** Sub-BASIN 207 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.025   K=0.7
                        LENGTH=545 FT   SLOPE=0.015   K=2.0
*
COMPUTE NM HYD          ID=1   HYD NO=207   DA=0.00083 SQ MI
                        PER A=00 PER B=00 PER C=05 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=1   CODE=1
*
*
*** Sub-BASIN 211 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.055   K=0.7
                        LENGTH=114 FT   SLOPE=0.037   K=2.0
*
COMPUTE NM HYD          ID=11   HYD NO=211   DA=0.00257 SQ MI
                        PER A=00 PER B=00 PER C=5 PER D=95
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=11   CODE=1
*
*
* Total Flow from Basin (211 + 207)
ADD HYD                 ID=10  HYD NO=211SUM ID I=1   ID II=11
PRINT HYD               ID=10   CODE=1
*
*** Sub-BASIN 212 ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.005   K=0.7
                        LENGTH=50 FT   SLOPE=0.260   K=2.0
*
COMPUTE NM HYD          ID=3   HYD NO=212   DA=0.00204 SQ MI
```

```
                      PER A=00 PER B=00 PER C=5 PER D=95
                      TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD             ID=3   CODE=1
*
*
* Total Flow from Basin (207+211+212)
ADD HYD               ID=11  HYD NO=212SUM ID I=10   ID II=3
PRINT HYD             ID=11   CODE=1
*

*** Sub-BASIN 218 ****
*
COMPUTE LT TP         LCODE=1   UPLAND/LAG TIME METHOD
                      NK=2   ISLOPE=1
                      LENGTH=100 FT   SLOPE=0.040   K=0.7
                      LENGTH=50 FT   SLOPE=0.040   K=2.0
*
COMPUTE NM HYD        ID=1   HYD NO=218   DA=0.00324 SQ MI
                      PER A=00 PER B=00 PER C=10 PER D=90
                      TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD             ID=1   CODE=1
*
*
* Total Flow from Basins
ADD HYD               ID=10  HYD NO=218SUM ID I=18   ID II=1
PRINT HYD             ID=10   CODE=1
*

*** Sub-BASIN 219 ****
*
COMPUTE LT TP         LCODE=1   UPLAND/LAG TIME METHOD
                      NK=2   ISLOPE=1
                      LENGTH=100 FT   SLOPE=0.025   K=0.7
                      LENGTH=143 FT   SLOPE=0.019   K=2.0
*
COMPUTE NM HYD        ID=1   HYD NO=219   DA=0.00037 SQ MI
                      PER A=00 PER B=00 PER C=05 PER D=95
                      TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD             ID=1   CODE=1
*
*
* Total Flow from Basins
ADD HYD               ID=19  HYD NO=219SUM ID I=10   ID II=1
PRINT HYD             ID=19   CODE=1
*
*
*
* Add Flows from West Basins
ADD HYD               ID=18  HYD NO=219SUMA ID I=19   ID II=11
PRINT HYD             ID=18   CODE=1
*
*
*** Sub-BASIN 220 ****
*
COMPUTE LT TP         LCODE=1   UPLAND/LAG TIME METHOD
                      NK=2   ISLOPE=1
                      LENGTH=100 FT   SLOPE=0.016   K=0.7
                      LENGTH=127 FT   SLOPE=0.032   K=2.0
*
COMPUTE NM HYD        ID=20   HYD NO=220   DA=0.00139 SQ MI
                      PER A=00 PER B=00 PER C=15 PER D=85
                      TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD             ID=20   CODE=1
*
*
```

```
* Total Flows from All Basins
ADD HYD                 ID=21  HYD NO=220SUM ID I=18   ID II=20
PRINT HYD               ID=21   CODE=1
*
*

* Add Outflow From Pond B
ADD HYD                 ID=1  HYD NO=POND.IN ID I=21   ID II=30
PRINT HYD               ID=1   CODE=1
*

****Route Hyd  through POND A- 27 inch orifice
*
ROUTE RESERVOIR         ID=96  HYD NO=PONDA  INFLOW ID=1  CODE=1
                        OUTFLOW (CFS)     STORAGE (AC FT)       ELEV
                        0.0                     0.00            4989
                        3.7                     0.1097          4990
                        12.8                    0.2491          4991
                        24.2                    0.4241          4992
                        32.1                    0.6403          4993
                        37.8                    0.8999          4994
                        42.7                    1.0112          4995
                        47.1                    1.5550          4996
                        51.2                    1.9531          4997
*
*PRINT HYD              ID=96   CODE=1
*
*
*** Sub-BASIN 217, Sheet flow Out ****
*
COMPUTE LT TP           LCODE=1   UPLAND/LAG TIME METHOD
                        NK=2   ISLOPE=1
                        LENGTH=100 FT   SLOPE=0.005   K=0.7
                        LENGTH=230 FT   SLOPE=0.004   K=2.0
*
COMPUTE NM HYD          ID=6   HYD NO=217   DA=0.00046 SQ MI
                        PER A=00 PER B=00 PER C=20 PER D=80
                        TP=-0.1 hr   MASSRAIN=-1
*
PRINT HYD               ID=6   CODE=1
*
*
*
FINISH
```


206
O-5-Existing MH at Edith
Pipe - (21)
CB-23-Existing Cattle Guard Inlet
Pipe - (20)
MH-4
Pipe - (02)
Pipe - (01)
CB-22
CB-24
CO-8
O-7
CB-18

Profile Report
Engineering Profile - Profile - Basin 206 to Pond C (SWMD SD_Rankin flows added.stsw)



Profile Report
Engineering Profile - Profile - Basin 206 (SWMD SD_Rankin flows added.stsw)