CITY OF ALBUQUERQUE

August 3, 2012

Ronald R. Bohannan, P.E.
Tierra West, LLC.
5571 Midway Park Place NE
Albuquerque, NM 87109

Re: Bruckner Truck Sales, Inc., Drainage Report and Grading Plan
Engineer's Stamp dated: 7/19/12 (J09/D021)

Dear Mr. Bohannan;

Based upon the information in your submittal received 7-19-12, the above referenced plan is approved for Site Plan for Building Permit. The following comments have to be addressed prior to Building Permit approval:

- Include inlet capacity calculations.
- Provide street flow capacity analysis and inlet capacity analysis for Daytona Rd.
- Please provide erosion and scour analysis passed the enclosed riprap for the channel. Would scour wall be required at the end of the riprap?
- What is the status of plugging the 48" storm drain pipe on the north side of the I-40?

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

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Hydrology
Planning Department

Copy: e-mail

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

2011073
DRAINAGE

DRAINAGE AND TRANSPORTATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: Bruckner's Truck Sales
DRB #: 1008585 EPC #:
ZONE MAP/DRG. FILE # J-09-Z
WORK ORDER #:

LEGAL DESCRIPTION: Tract 20 and Tract 21 of Town of Atrisco Grant, Unit 5
CITY ADDRESS:

ENGINEERING FIRM:	Tierra West, LLC	CONTACT:	Ron Bohannan
ADDRESS:	5571 Midway Park Place NE	PHONE:	(505) 858-3100
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87109
OWNER:	Bruckner's Truck Sales, Inc.	CONTACT:	Chris Bruckner
ADDRESS:	8531 Amarillo Blvd. East	PHONE:	806-376-6273
CITY, STATE:	Amarillo, Texas	ZIP CODE:	79127
ARCHITECT:	Fitzgerald Associates	CONTACT:	Phil Fitzgerald
ADDRESS:	3900 N. Santa Fe Ave.	PHONE:	405-521-8999
CITY, STATE:	Oklahoma City, Oklahoma	ZIP CODE:	73118
SURVEYOR:	Precision Surveys, Inc.	CONTACT:	Larry Medrano
ADDRESS:	5571 Midway Park Place, NE	PHONE:	505-856-5700
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87109
CONTRACTOR:	TBD	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	

CHECK TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- X DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT (TCL)
- ___ ENGINEERS CERTIFICATION (TCL)
- ___ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ___ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SIA / FINANACIAL GUARANTEE RELEASE
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D. APPROVAL
- X S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM.)
- ___ CERTIFICATE OF OCCUPANCY (TEMP.)
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ WORK ORDER APPROVAL
- ___ SO-19

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- X YES
- ___ NO
- ___ COPY PROVIDED

RECEIVED
JUL 19 2012
HYDROLOGY SECTION

DATE SUBMITTED: 7/19/2012 BY: Ronald R. Bohanann, PE

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of sumbittal may be required based on the following:

1. **Conceptual Grading and Drainage Plans**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

TIERRA WEST, LLC

5571 Midway Park Place NE Albuquerque, NM 87109
(505) 858-3100 Fax (505) 858-1118 1-800-245-3102
tierrawestllc.com

July 19, 2012

Mr. Curtis Cherne
Principal Engineer, Planning Department
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

RE: BRUCKNER'S TRUCK SALES,
DRAINAGE REPORT AND GRADING PLAN
ENGINEER'S STAMP DATED: 7/6/12 (J09/DO21)
COMMENT RESPONSE

Dear Mr. Cherne:

Per your correspondence dated July 12, 2012, regarding the above referenced property, please find the following responses addressing the comments listed below.

1. Basin maps are required to include contours and the built environment.
   All basin maps were updated to include contours, as requested.

2. Land Treatment A is shown in the basin tables for developed areas. Land Treatment A is reserved for soil untouched by human activity that has a slope less than 10%. Update the basin tables and recalculate runoff and volume based on revised land treatment types.
   The hydrologic tables were updated to indicate corrected land treatment types and peak volumetric runoff and discharge, as requested.

3. The offsite basin that corresponds to Basin A-1D in the WSTF should be 69% D and 31% B in the developed condition.
   The hydrologic table for the developed condition was updated to reflect the above mentioned land treatment types for Basin A-1D, as requested.

4. Hydraulics will need to be updated after the proposed basin table is updated.
   The hydraulic model was updated and re-run to accurately model the changes based on the updated hydrologic tables for the interim and developed condition.

5. The I40 diversion channel has been graded and a 48" culvert was built that bleeds off flows from the diversion channel under I40. The design engineer suggested the flow was 100 cfs to 150 cfs. It is not clear when the second phase of the I40 channel will be built that will cut off these flows. Hydrology recommends this pipe be plugged so that interim/temporary infrastructure is not required. AMAFCA approval would be required.
   A field visit was conducted to verify this condition. Based on field measurements and calculations, the 48" RCP has a maximum potential discharge of 120 cfs. The updated Grading and Drainage Plan and drainage management solution will allow this 120 cfs to flow through the natural arroyo and pass the proposed turn-around at the Daytona Road terminus under this interim condition without installing a plug.

   Riprap will be placed along the portion of the channel that would otherwise experience erosion based on velocities as shown in the updated G&D Plan. We will continue to work with AMAFCA on the upstream 48" culvert plug if necessary, but the updated

drainage solution allows for this flow to follow its historic path, as well as allow for maintenance access to the natural arroyo channel and riprap.

6. Relocating the turn-a-around to an onsite/different location would provide for an easier drainage solution.
   As indicated, the turn-around was shifted to allow for a cleaner, more economical drainage solution. The turn-around was shifted to allow the arroyo to pass existing flows, as well as allow maintenance access.

7. This plan shows proposed grades in the NMDOT ROW. Grading in the NMDOT ROW should not be required. If it is, NMDOT approval is required.
   A previous Grading and Drainage Plan did indicated grading outside of the property, in NMDOT ROW; however this was a surface file grading error. No grading will occur in NMDOT ROW and the Grading and Drainage Plan was updated to reflect this.

8. A public storm drain easement will not be required for the onsite storm drain that accepts flows from the NMDOT ROW. These flows should be handled as private to protect the site.
   The public drainage easement designation was removed from the storm drain lines that accept flows from NMDOT ROW, as requested.

9. Thank you for meeting with Hydrology yesterday to come to a drainage solution for this development. Hydrology can only approve a drainage solution wherein maintenance access is provided for a public drainage facility. It may be necessary to engage the property owner to the south.
   As previously mentioned, the grading and drainage solution was updated in order to allow maintenance access to the arroyo while achieving design requirements of not overburdening infrastructure for the interim condition. The turn-around was shifted to allow the arroyo to pass existing flows, with riprap protection along effected portions of the arroyo.

   - The detail sheet will and onsite items will be reviewed for Building Permit approval. Provide calculations to support proposed private drainage infrastructure when submitting for Building Permit. **The updated drainage report contains calculations for the onsite infrastructure.**
   - Hydrology may have additional comments after reviewing the revised basin maps and tables.
   - The drainage solution to protect Daytona Rd should be on the infrastructure list. **The infrastructure list will be updated to reflect the drainage solution which protects Daytona Road.**

If you have any questions or need additional information regarding this matter, please do not hesitate to contact me.

Sincerely,

Ronald R. Bohannan, P.E.

Enclosure/s

JN: 2011073
RRB/PE/cla

DRAINAGE REPORT

for

Bruckner's Truck Sales, Inc.

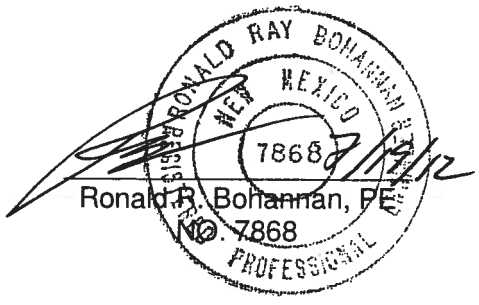
Daytona Road & 90th Street S.W.
Albuquerque, New Mexico

Prepared by:

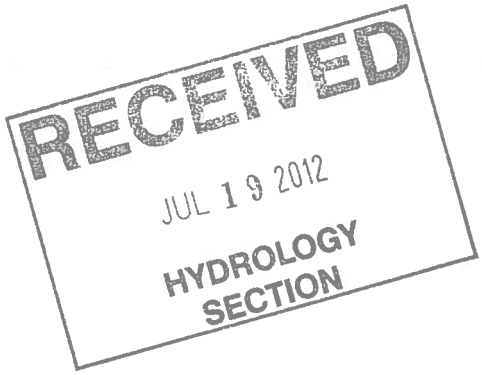
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109

July 2012 (Updated 7/19/2012)

I certify that this report was prepared under my supervision, and I am a registered Professional Engineer in the State of New Mexico in good standing.



Ronald R. Bohannan, PE
NO. 7868



Job No. 2011026

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Map Pockets

Appendices

PURPOSE

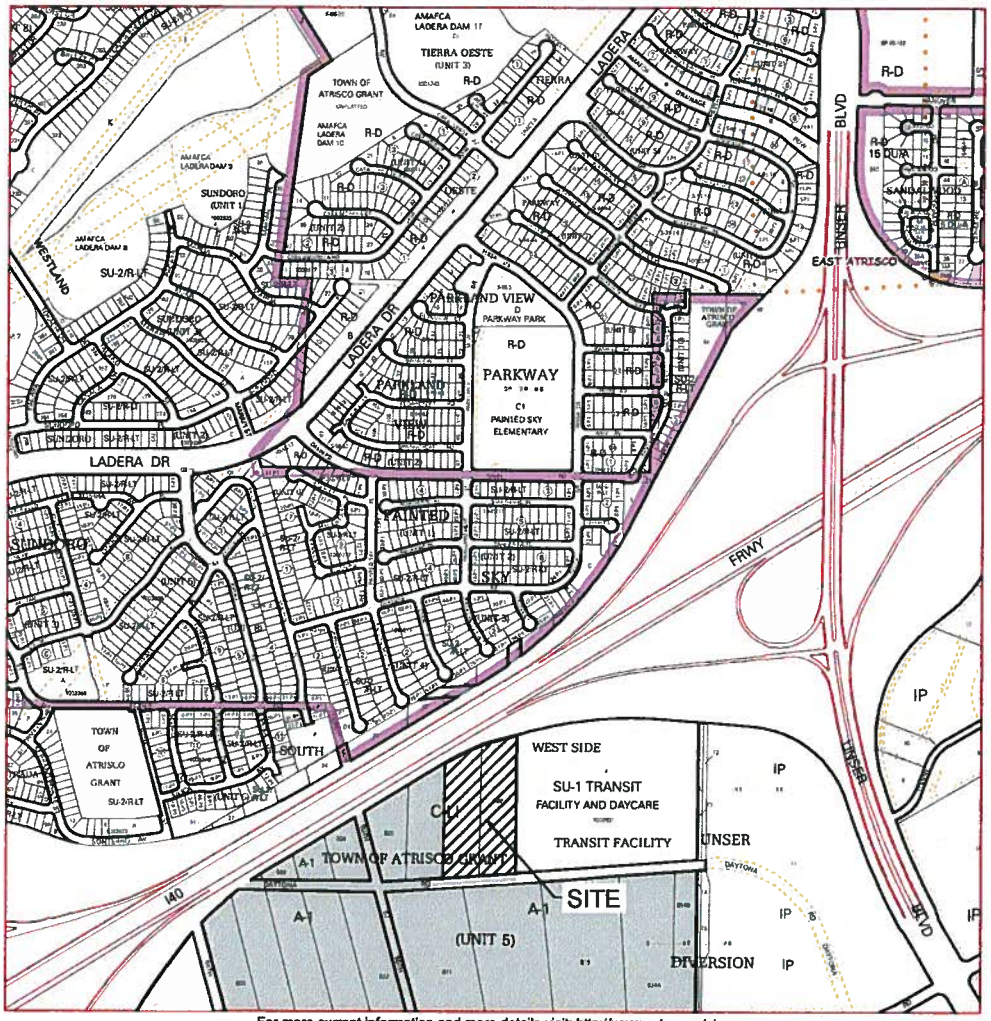
The purpose of this report is to provide the drainage management plan for a proposed development on Albuquerque's west side – Bruckner's Truck Sales, Inc. – in accordance with the City of Albuquerque's' Development Process Manual, Chapter 22. This document briefly describes the overall drainage area, details the hydrologic and hydraulic analyses of the existing, proposed interim and fully developed conditions, and aims to act as an accurate record for future reference regarding the drainage management plan for the site.

INTRODUCTION

The subject of this report, shown in *Exhibit A – Vicinity Map*, is two parcels totaling ±7.04 acres of vacant, undeveloped land, identified as Tract B-20 and B-21 of the Town of Atrisco Grant, Unit No.5, and can be found on COA Zone Atlas Page J-09-Z. (This land was annexed into the City in late 2011.) Bruckner's Truck Sales, Inc. proposes to develop Tracts B-20 and B-21 for a semi-truck sale and service facility. A platting action to consolidate the above mentioned lots is currently underway, which will create a single parcel for the truck facility; Tract B-21-A (7.04 acres), referred to as the Development for the remainder of this report. The site is located southwest of the Unser Boulevard and Interstate 40 interchange; more specifically, bound by Interstate 40 to the north, the City of Albuquerque's West Side Transit Facility (WSTF) to the east, and undeveloped land to the south and west. Access to the site is by way of Daytona Road SW. Daytona Road currently dead-ends at the southwest corner of the WSTF property and would be extended across the southern property line, including a turn-around, for the Development. As shown in *Exhibit B – FEMA FIRMap*, the Development lies outside the mapped flood hazard zone. Further, the site is located in Precipitation Zone 1 according to Table A-1 of the City of Albuquerque Development Process Manual (COA DPM).

100-year, 6-hour peak discharge rates were used to analyze existing and proposed hydraulic structures involved with the Development, while 100-year, 24-hour runoff volumes were used where applicable.

Exhibit A- Vicinity Map



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

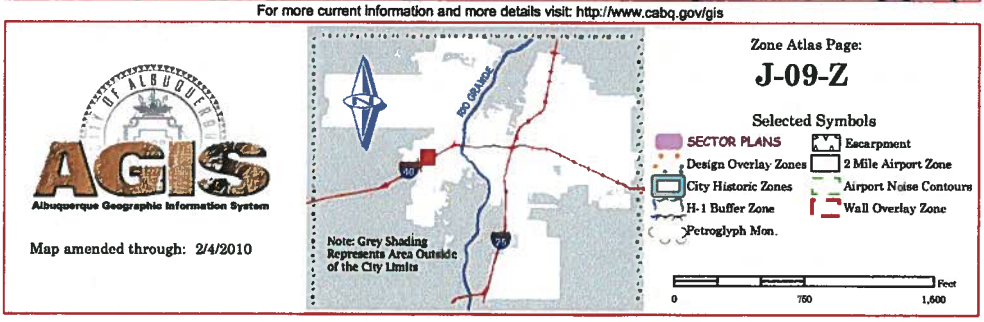
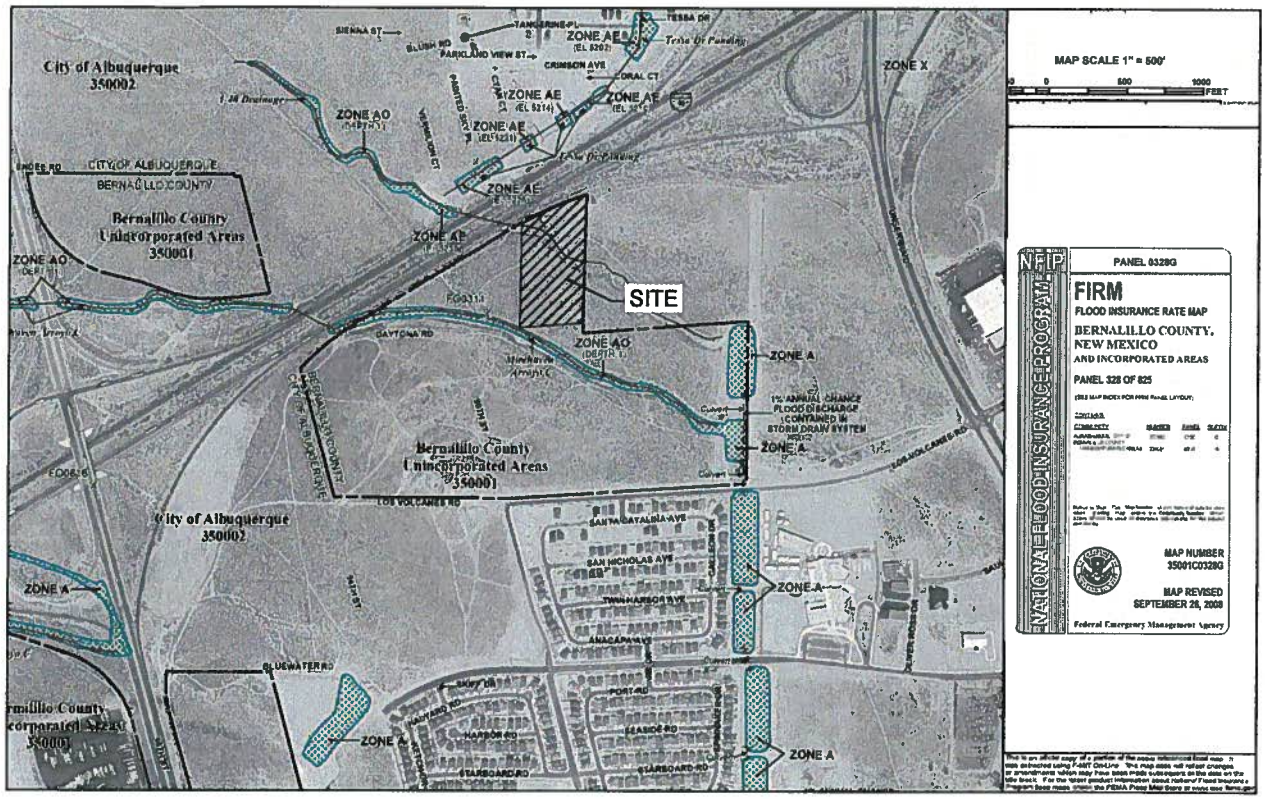


Exhibit B – FEMA FIRMap



HISTORIC CONDITIONS

Map Pocket 1 contains the Historic Drainage Basin Map and should be referred to during this section

As mentioned above, the site is ±7.04 acres of undeveloped land with topography generally sloping from northwest to southeast. Existing slopes on the site ranging between 2.5 and 6 percent. The existing site contains relatively sparse shrubs and vegetation, covering less than 40 percent of the total area. Natural arroyos cross the site, which have historically conveyed upland flows to the Unser Diversion ponds, including undeveloped land to the north of I-40, as well as the I-40 basins to the north of the subject site.

The historic condition for this area included a large upland drainage basin (approximately 237 acres) north of Interstate 40, which discharged runoff through several culverts under the in-

terstate, crossed the subject site and surrounding area in natural arroyos, and were conveyed to the Unser Diversion pond series to the southeast. The Unser Diversion pond structures are located west of Unser Boulevard, between Daytona Road and Avalon Road. The ponds are connected in series via culverts and ultimately discharge through the Unser Outlet Pipe and tie into the Unser Boulevard storm drain system. Much of these historic upland flows have already been cut off by the initial construction of an earthen channel bordering I-40 to the north.

A Master Drainage Plan for the West Side Transit Facility (February 2001) was developed by Smith Engineering Company for the purpose of analyzing the existing, interim, and ultimate conditions of the basins impacting the Unser Diversion pond series, in relation to the developing area and the I-40 Interceptor project. The subject lots pertaining to this report fall within this master drainage plan and therefore the master drainage plan was reviewed to understand how the Development will function within the larger basin.

According to the Master Drainage Plan, the Unser Diversion pond series have adequate capacity to handle a total volumetric runoff of 22.3 acre-feet based on the 100-year, 24-hour storm event.

PROPOSED INTERIM CONDITIONS

Map Pocket 2 contains the Proposed Interim Drainage Basin Map and should be referred to during this section

Discussions with AMAFCA and City Hydrology concerning the interim condition have taken place throughout the design and development of this report. The I-40 Interceptor Channel is planned to cut off all upland flows (north of I-40) by diverting runoff in a concrete lined channel and the Unser Dam. Unser Dam is currently being constructed and the channel has been graded, but remains and earthen channel. Further, a 48" RCP culvert approximately 1,530 LF to the west of the Development has been installed, which bleeds off a portion of the channel's flow.

This bleed-off flow is conveyed by the box culvert under I-40 to the natural arroyo, which passes near the southwest corner of the Development. According to AMAFCA and City Hydrology the flow through this 48" culvert was estimated to be between 100 and 150 cfs. A field visit was conducted to verify this condition and measurements were taken to calculate approximate maximum flow from this culvert at approximately 120 cfs.

The proposed ±7.04 acre Development consists of a new 43,338 square foot facility with office, sales, service garage space, and associated site utilities, along with concrete and asphalt pavement, curb and gutter, and landscaping. The Development will include a single building with a Finished Floor Elevation of 5,216.74 and site grading to maintain positive drainage away from the building. Passive rain water harvesting will be implemented by routing storm runoff through landscaping and vegetative swales at the perimeter of the site before entering drop inlets, which will convey onsite runoff to the Daytona storm drain line and ultimately the Unser Diversion ponds.

The WSTF MDP included the design of the Daytona Road storm drain system, with pipe sizes ranging from 24 to 60 inches. The existing Daytona storm drain currently captures flows from the natural arroyo with a headwall and inlet at the west property line of the WSTF, continues south to Daytona Road, then turns east until it outlets at the top end of the Unser Diversion pond series. The Daytona storm drain also picks up developed flows from the WSTF. This storm drain line will be extended along the frontage of Bruckner's site to pick up the developed onsite flows, portions of the I-40 basins, as well as future developed flows from surrounding sites, which will be conveyed to the Unser Diversion ponds via the storm drain system. A schematic of the proposed storm drain system is shown in Appendix A and indicates the extensions from the existing storm drain infrastructure.

The extension of Daytona Road along the south frontage of the developed site will include a vehicular turn around area shown on the Grading and Drainage Plan. As shown, this

turn-around will include grading that will allow the arroyo to continue to pass the existing flows. Rip rap, as indicated on the plan, will protect the portion of the channel that is affected by the turn-around, and allow for maintenance access.

Bentleys' StormCAD V8i software was used to model the existing Daytona storm drain system (based on Weighted E calculation for the 100 year – 6 hour event), along with the extension west on Daytona, as well as the onsite storm drain system for the Development in the interim condition. However, all storm drain sizing was based on the fully developed condition (100-year, 6-hour storm).

ULTIMATE DEVELOPED CONDITION

Map Pocket 3 contains the Ultimate Developed Drainage Basin Map and should be referred to during this section

Under the fully developed condition, the I-40 Interceptor Channel will cut off all upland flows and the Daytona storm drain system will convey developed flows from the subject site, I-40 drainage basins, as well as additional developed land as show in the basin map to the Unser Diversion ponds.

As mentioned above, Bentley's StormCAD was used to model the storm drain infrastructure for the onsite system as well as the ultimate peak discharge condition. The WSTF MDP called for a 30-inch storm drain line in Daytona along the frontage of the proposed Bruckner's site, however, after further hydraulic analysis, the resulting pipe profiles indicate that a section of this line needs to be upsized to 42 and 36 inches along the frontage of the Development (see Grading and Drainage Plan). Appendix A contains the storm drain schematic, system profiles, and inlet calculations, and illustrates adequate capacity in the Daytona storm drain to convey the ultimate developed conditions peak discharge based on the 100-year, 6-hour storm.

According to the WSTF MDP, the large upland basin being cut off by the I-40 Interceptor will result in an additional 10 ac-ft of storage volume by the Unser Diversion ponds (based on the 100-year, 24-hour storm). This large increase in storage capacity will allow for the additional developed flows from Bruckner's Truck Sales to have a minimal effect on the downstream system.

Drainage Summary - Historic to Fully Developed Condition

updated 19-July-2012

Condition	Area (acre)	Peak Discharge, 100yr,6hr (cfs)	Downstream Impact, Volume (ac-ft)
Existing Site	7.04	10	0.28
Developed Site	7.04	31	1.15
Existing Overall Basin	276	323	12.00
Resulting Overall Basin	43	155	5.50
Total Overall Basin Change and downstream affect	**-233**	**-168**	**-6.50**

SUMMARY

Historic upland flows that once crossed the subject site and entered the Unser Diversion pond series will be cut off due to the completion of the I-40 Interceptor channel. These flows account for a total volumetric runoff of 10 acre-feet according the West Side Transit Facility Master Drainage Plan (Smith Engineering Company, 2001). Under the proposed Development, historic drainage paths will not be diverted. The existing Daytona storm drain system was sized to adequately convey the 100-year, 6-hour storm event under these assumed conditions. The Daytona storm drain extension, as well as the onsite storm drain and inlets were sized to adequately convey the same storm event. Due to the upland flows being cut off by the I-40 Interceptor and resulting increase in capacity on the order of 10 acre-feet, the relatively small volumetric increase in runoff due to development ($\Delta V_{100,24DEV}$ = 1.13 ac-ft) will not adversely affect the downstream ponds, and according to the master drainage plan, all ponds will have adequate freeboard.

Under the proposed conditions and accompanying Grading and Drainage Plan, no surrounding property will be negatively impacted by the Development, onsite drainage design will properly convey the 100-year, 6-hour storm event, historic drainage paths will not be diverted, and the downstream system has adequate capacity to accept the developed flows under these proposed conditions. The proposed drainage management plan thus illustrates capacity to effectively convey the design storm according to the Development Process Manual and it is requested that this report, and the included Grading and Drainage Plan be approved by the Design Review Board for Site Plan for Building Permit.

APPENDIX A

HYDROLOGIC AND HYDRAULIC ANALYSIS

DPM Weighted E Method

Precipitation Zone 1

Bruckner's Truck Sales - Daytona Road

updated 19-July-2012

Historic Condition

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr			2-Year, 6-Hr		
Basin Name	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
*North Offsite Basin	10,336,207.43	237.287	0.37076	85%	201.694	0%	0.000	0%	0	15%	35.593	---	10	256	---	2.7	62	---	---	---
**Offsite Basin I40-1	202,965.68	4.659	0.00728	0%	0.000	65%	3.029	0%	0	35%	1.631	1.125	0.437	13.27	0.577	0.224	7.01	0.259	0.100	2.85
**Offsite Basin I40-2	79,307.72	1.821	0.00284	0%	0.000	65%	1.183	0%	0	35%	0.637	1.125	0.171	5.19	0.577	0.088	2.74	0.259	0.039	1.11
**Offsite Basin I40-3	55,498.47	1.274	0.00199	0%	0.000	65%	0.828	0%	0	35%	0.446	1.125	0.119	3.63	0.577	0.061	1.92	0.259	0.027	0.78
**Offsite Basin I40-4	33,350.34	0.766	0.00120	0%	0.000	65%	0.498	0%	0	35%	0.268	1.125	0.072	2.18	0.577	0.037	1.15	0.259	0.016	0.47
**West Offsite Basin 1	238,313.99	5.471	0.00855	86%	4.705	12%	0.657	2%	0.109419	0%	0.000	0.479	0.218	7.72	0.104	0.047	1.79	0.004	0.002	0.07
**West Offsite Basin 2	609,646.86	13.996	0.02187	86%	12.036	12%	1.679	2%	0.279911	0%	0.000	0.479	0.558	19.74	0.104	0.121	4.58	0.004	0.004	0.18
Basin 1	157,515.77	3.616	0.00565	86%	3.110	12%	0.434	2%	0.072321	0%	0.000	0.479	0.144	5.10	0.104	0.031	1.18	0.004	0.001	0.05
Basin 2	303,769.48	6.974	0.01090	86%	5.997	12%	0.837	2%	0.139472	0%	0.000	0.479	0.278	9.84	0.104	0.060	2.28	0.004	0.002	0.09
Total	**12,016,575.74**	**275.863**	**0.43104**										**11.997**	**322.66**		**3.370**	**84.67**		**0.193**	**5.60**

NOTES:

*The North/Offsite Basin represents the historic drainage area north of Interstate 40 that previously contributed runoff to the Unser Diversion pond series based on the analysis and Master Drainage Plan for the West Side Transit Facility (February 2001) developed by Smith Engineering Inc. The basin area, along with 100 year and 10 year peak discharge rates and volumes were obtained from this master drainage plan and have NOT been calculated using the Weighted E method, since the basin area is greater than 40 acres. Further, according to the master drainage plan, these calculations represent the 24 hour storm. The master drainage plan did not have tabulations that included the 2 year storm event.

**Basin areas and land treatment details based on available topography and existing land type, however peak discharge rates and volumetric runoff represent the 100 year - 6 hour storm.

Proposed Interim Condition

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr			2-Year, 6-Hr		
Basin Name	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
**Offsite Basin I40-1	202,965.68	4.659	0.00728	0%	0.000	65%	3.029	0%	0	35%	1.631	1.125	0.437	13.27	0.577	0.224	7.01	0.259	0.100	2.85
**Offsite Basin I40-2	79,307.72	1.821	0.00284	0%	0.000	65%	1.183	0%	0	35%	0.637	1.125	0.171	5.19	0.577	0.088	2.74	0.259	0.039	1.11
**Offsite Basin I40-3	79,664.58	1.829	0.00286	0%	0.000	65%	1.189	0%	0	35%	0.640	1.125	0.171	5.21	0.577	0.088	2.75	0.259	0.039	1.12
**Offsite Basin I40-4	56,832.90	1.305	0.00204	0%	0.000	65%	0.848	0%	0	35%	0.457	1.125	0.122	3.72	0.577	0.063	1.96	0.259	0.028	0.80
**Offsite Basin I	848,331.98	19.475	0.03043	0%	0.000	98%	19.086	2%	0.3895	0%	0.000	0.676	1.098	39.86	0.224	0.364	15.09	0.012	0.020	0.76
Basin A	65,268.01	1.498	0.00234	0%	0.000	15%	0.225	0%	0	85%	1.274	1.775	0.222	6.02	1.087	0.136	3.85	0.614	0.077	2.16
Basin B	65,439.25	1.502	0.00235	0%	0.000	15%	0.225	0%	0	85%	1.277	1.775	0.222	6.04	1.087	0.136	3.86	0.614	0.077	2.16
Basin C	68,526.25	1.573	0.00246	0%	0.000	15%	0.236	0%	0	85%	1.337	1.775	0.233	6.32	1.087	0.143	4.04	0.614	0.080	2.27
Basin D	21,005.16	0.482	0.00075	0%	0.000	0%	0.000	0%	0	100%	0.482	1.970	0.079	2.11	1.240	0.050	1.39	0.720	0.029	0.81
Basin E	39,721.60	0.912	0.00142	0%	0.000	15%	0.137	0%	0	85%	0.775	1.775	0.135	3.66	1.087	0.083	2.34	0.614	0.047	1.31
Basin F	35,539.15	0.816	0.00127	0%	0.000	15%	0.122	0%	0	85%	0.693	1.775	0.121	3.28	1.087	0.074	2.10	0.614	0.042	1.18
Basin G	25,201.82	0.579	0.00090	0%	0.000	15%	0.087	0%	0	85%	0.492	1.775	0.086	2.33	1.087	0.052	1.49	0.614	0.030	0.83
Basin H	13,461.84	0.309	0.00048	0%	0.000	15%	0.046	0%	0	85%	0.263	1.775	0.046	1.24	1.087	0.028	0.79	0.614	0.016	0.45
Daytona 1	13,896.07	0.319	0.00050	0%	0.000	0%	0.000	0%	0	100%	0.319	1.970	0.052	1.39	1.240	0.033	0.92	0.720	0.019	0.54
Daytona 2	10,032.50	0.230	0.00036	0%	0.000	0%	0.000	0%	0	100%	0.230	1.970	0.038	1.01	1.240	0.024	0.67	0.720	0.014	0.39
Total	**1,625,194.50**	**37.079**	**0.05830**										**3.232**	**100.65**		**1.584**	**51.02**		**0.656**	**18.73**

NOTES:

**Basin areas and land treatment details based on available topography and existing land type, however peak discharge rates and volumetric runoff represent the 100 year - 6 hour storm.

The AMAFCA earthen channel on the north side of Interstate 40 currently has a 48" RCP culvert which will continue to direvt flows during large rain events. This flow has been conservatively estimated to be 120 cfs based on field measurements of available head at the culvert inlet. If this culvert remains unplugged in this Interim condition the flow in the 48" culvert will be conveyed to the natural arroyo and continue along the historic drainage path.

Ultimate Developed Condition

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr			2-Year, 6-Hr		
Basin Name	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
**I40-1	202,965.68	4.659	0.00728	0%	0.000	65%	3.029	0%	0	35%	1.631	1.125	0.437	13.27	0.577	0.224	7.01	0.259	0.100	2.85
**I40-2	79,307.72	1.821	0.00284	0%	0.000	65%	1.183	0%	0	35%	0.637	1.125	0.171	5.19	0.577	0.088	2.74	0.259	0.039	1.11
**I40-3	55,498.47	1.274	0.00199	0%	0.000	65%	0.828	0%	0	35%	0.446	1.125	0.119	3.63	0.577	0.061	1.92	0.259	0.027	0.78
**I40-4	33,350.34	0.766	0.00120	0%	0.000	65%	0.498	0%	0	35%	0.268	1.125	0.072	2.18	0.577	0.037	1.15	0.259	0.016	0.47
**A-1D	696,671.20	15.993	0.02499	0%	0.000	31%	4.958	0%	0	69%	11.035	1.567	2.088	58.29	0.924	1.231	35.66	0.500	0.666	18.80
**A-2D	782,817.92	17.971	0.02808	0%	0.000	15%	2.696	0%	0	85%	15.275	1.775	2.658	72.23	1.087	1.628	46.19	0.614	0.919	25.90
Total	**1,850,611.32**	**42.484**	**0.06638**										**5.545**	**154.79**		**3.269**	**94.68**		**1.769**	**49.90**

NOTES:

**Basin areas and land treatment details based on available topography and existing land type in the ultimate developed condition, with peak discharge rates representing the 100 year - 6 hour storm.

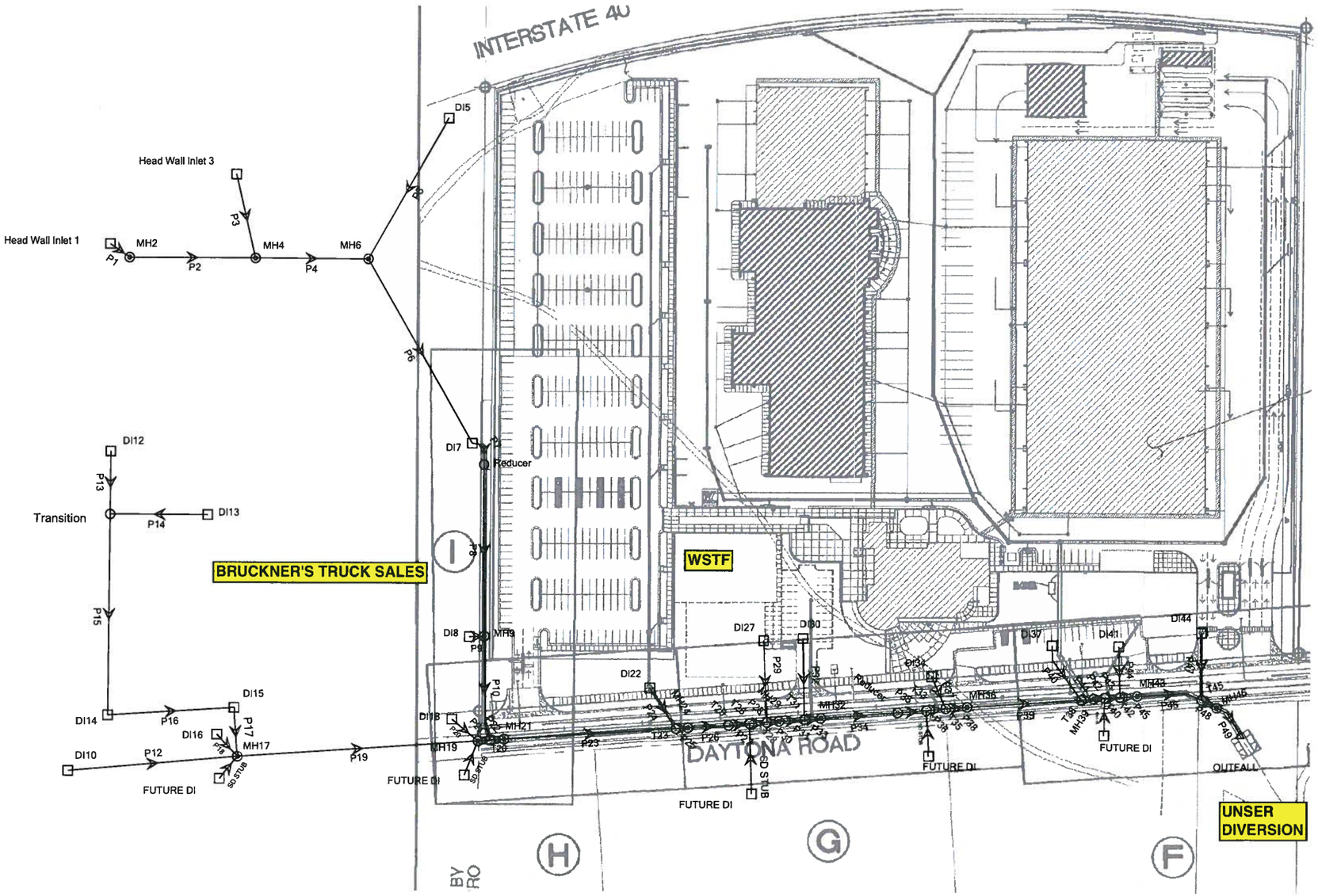
Under the ultimate developed condition the I-40 Interceptor Channel is in place with all upland flows cut off.

Weighted E = $E_a*A_a + E_b*A_b + E_c*A_c + E_d*A_d$ / (Total Area)

Volume = Weighted D * Total Area

Flow = $Q_a * A_a + Q_b * A_b + Q_c * A_c + Q_d * A_d$

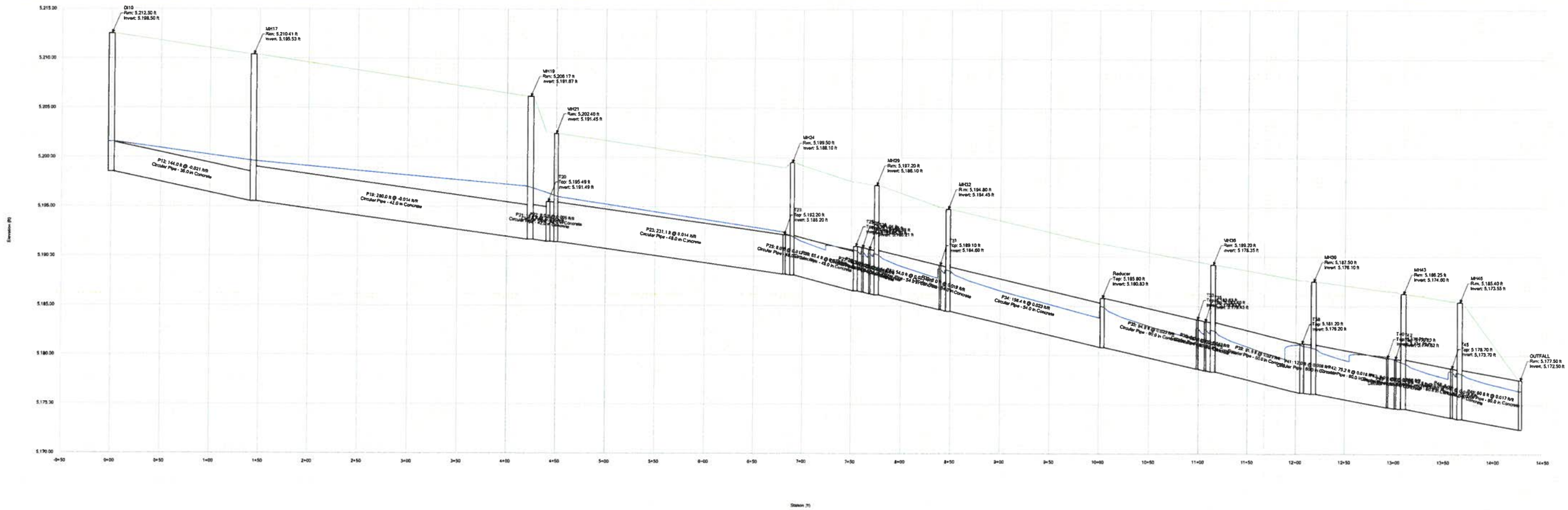
Scenario: Base



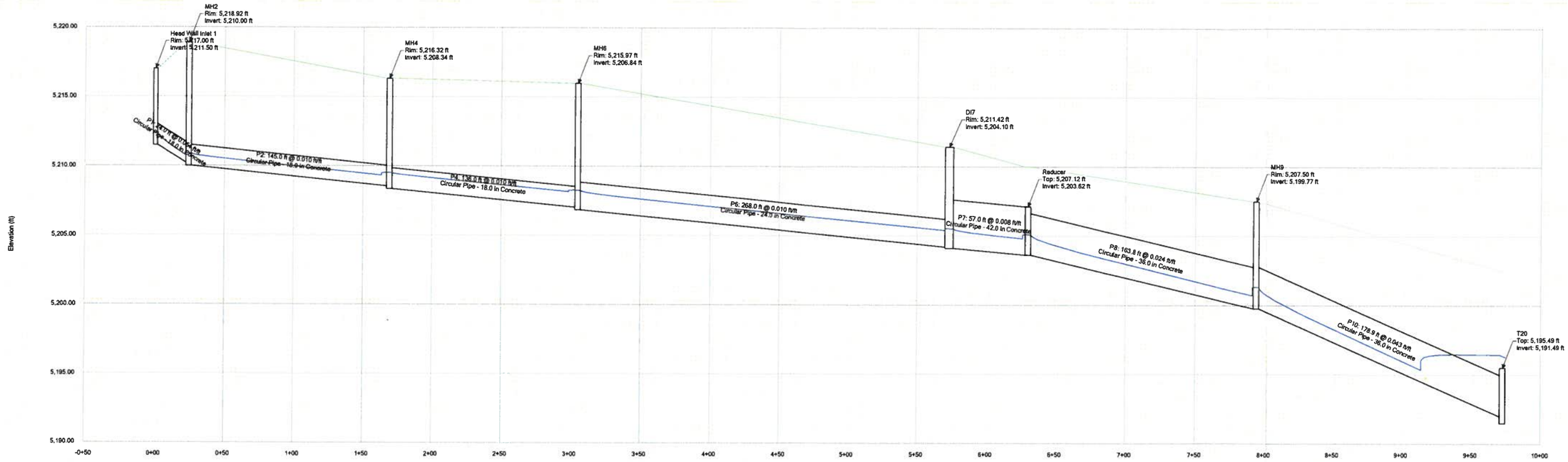
STORM DRAIN SYSTEM - updated 19 July 2012

Label	Start Node	Stop Node	Length (Unified) (ft)	Diameter (in)	Flow / Capacity (Full) (%)	Total Flow (ft³/s)	Invert (Downstream) (ft)	Invert (Upstream) (ft)	Velocity (Average) (ft/s)	Slope (ft/ft)
P49	MH46	OUTFALL	60.8	60	80.3	274.8	5,172.50	5,173.55	19.38	0.017
P48	T45	MH46	8	60	77.1	274.8	5,173.55	5,173.70	20.04	0.019
P47	DI44	T45	80	24	6	2	5,175.20	5,176.92	5.82	0.022
P46	MH43	T45	48.8	60	77.1	272.8	5,173.70	5,174.60	19.88	0.018
P45	T42	MH43	8	60	209.5	272.8	5,174.60	5,174.62	13.89	0.002
P44	DI41	T42	24	18	8	1	5,176.43	5,176.77	0.57	0.014
P43	T40	T42	8	60	89	271.8	5,174.62	5,174.73	17.58	0.014
SD STUB	FUTURE DI	T40	24	18	17.3	2	5,176.48	5,176.77	1.13	0.012
P42	MH39	T40	75.2	60	76.7	269.8	5,174.73	5,176.10	19.74	0.018
P41	T38	MH39	12	60	113.5	269.8	5,176.10	5,176.20	13.74	0.008
P40	DI37	T38	64	48	30.1	61	5,176.70	5,177.97	14.1	0.02
P39	MH36	T38	91.6	60	52.3	208.8	5,176.20	5,178.35	20.56	0.023
P38	T35	MH36	8	60	71.7	208.8	5,178.35	5,178.45	16.13	0.012
P37	DI34	T35	30	18	14.1	2	5,180.20	5,180.75	1.13	0.018
P36	T33	T35	8	60	52.9	206.8	5,178.45	5,178.63	20.18	0.023
SD STUB	FUTURE DI	T33	8	18	5.1	2	5,187.89	5,189.00	11.61	0.139
P35	Reducer	T33	94.9	60	52	204.8	5,178.63	5,180.80	20.26	0.023
P34	MH32	Reducer	156.4	54	68.2	204.8	5,180.80	5,184.45	20.32	0.023
P33	T31	MH32	8	54	76.1	204.8	5,184.45	5,184.60	18.63	0.019
P32	DI30	T31	60	18	41.3	6	5,186.10	5,187.25	3.4	0.019
P31	MH29	T31	64	54	66	198.8	5,184.60	5,186.10	20.22	0.023
P30	T28	MH29	7	54	80.6	198.8	5,186.10	5,186.21	17.24	0.016
P29	DI27	T28	25	18	23.8	2	5,187.71	5,187.87	1.13	0.006
P28	T26	T28	7	54	62.4	196.8	5,186.21	5,186.39	20.91	0.026
SD STUB	FUTURE DI	T26	135	18	55.3	2	5,187.89	5,188.05	1.13	0.001
P27	T25	T26	7	54	75.7	194.8	5,186.39	5,186.51	17.8	0.017
P26	MH24	T25	65.4	48	87	194.8	5,186.51	5,188.10	20.08	0.024
P25	T23	MH24	8	48	121.3	194.8	5,188.10	5,188.20	15.5	0.012
P24	DI22	T23	60	30	27.9	17	5,188.75	5,190.07	10.62	0.022
P23	MH21	T23	231.1	48	104.4	177.8	5,188.20	5,191.45	14.15	0.014
P22	T20	MH21	8	48	175.1	177.8	5,191.45	5,191.49	14.15	0.005
P21	T20	MH19	18	42	153.7	154.6	5,191.67	5,191.49	16.07	0.01
P20	MH19	DI18	65	18	7.3	2	5,198.77	5,203.17	1.13	0.068
P19	MH19	MH17	280	42	80.9	95.6	5,195.53	5,191.67	9.94	0.014
SD STUB	FUTURE DI	MH19	70	12	416.5	57	5,191.67	5,202.00	72.57	0.148
P18	DI16	MH17	58	18	4.3	2	5,195.73	5,207.16	13.15	0.197
P17	DI15	MH17	62	24	20.6	15.1	5,195.73	5,202.27	18.4	0.105
SD STUB	FUTURE DI	MH17	54	18	4.4	2	5,195.53	5,205.66	12.91	0.188
P16	DI14	DI15	146	24	44.8	11.8	5,202.47	5,204.45	8.16	0.014
P15	Transition	DI14	253	18	94.4	8.1	5,204.65	5,206.34	5.53	0.007
P14	DI13	Transition	97	12	23.9	2.1	5,206.34	5,212.24	9.19	0.061
P13	DI12	Transition	82	18	31.7	6	5,206.34	5,209.00	9.5	0.032
P12	MH17	DI10	144	36	79.9	76.5	5,198.50	5,195.53	10.82	0.021
P10	MH9	T20	178.9	36	16.7	23.2	5,191.99	5,199.77	14.59	0.043
P9	DI8	MH9	15	18	4.2	2.3	5,199.97	5,204.05	15.31	0.272
P8	Reducer	MH9	163.8	36	20.4	20.9	5,199.77	5,203.62	11.37	0.024
P7	DI7	Reducer	57	42	22.6	20.9	5,203.62	5,204.10	7.76	0.008
P6	MH6	DI7	268	24	66.4	14.9	5,204.20	5,206.84	7.64	0.01
P5	DI5	MH6	194	18	56	6	5,207.03	5,209.05	6.24	0.01
P4	MH4	MH6	136	18	86.3	8.9	5,207.03	5,208.34	6.56	0.01
P3	Head Wall Inlet 3	MH4	100	18	16.7	3.7	5,208.54	5,213.00	9.31	0.045
P2	MH2	MH4	145	18	49.3	5.2	5,208.54	5,210.00	5.95	0.01
P1	Head Wall Inlet 1	MH2	24	18	21.4	5.2	5,210.21	5,211.50	10.96	0.054

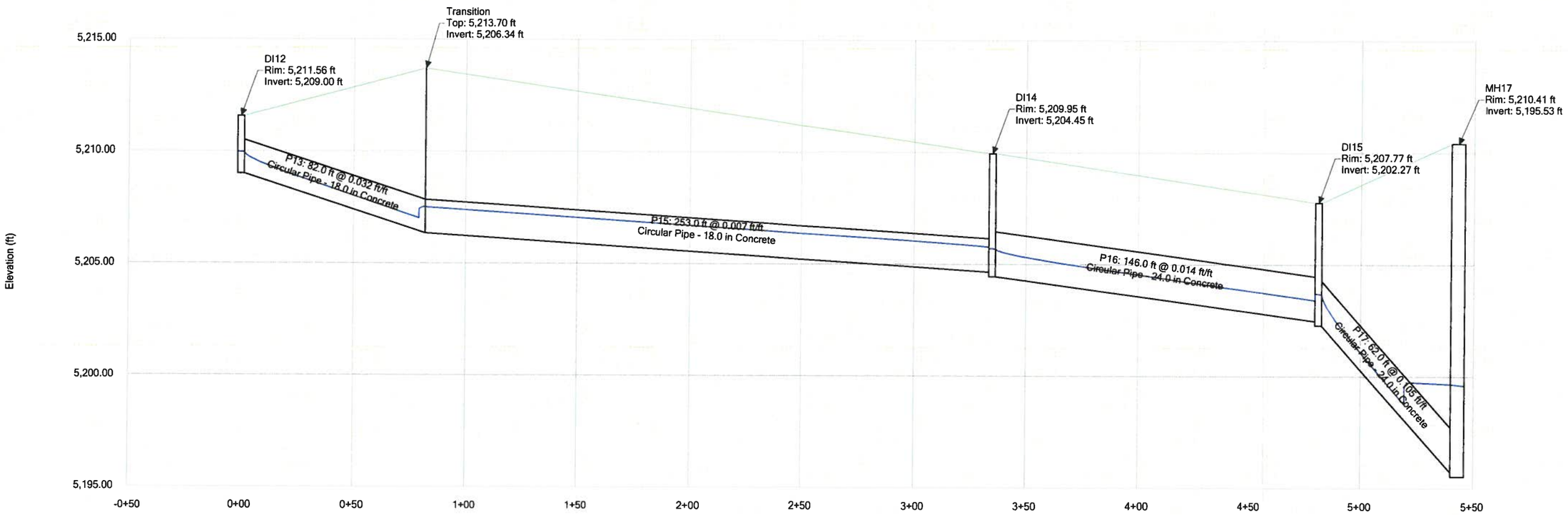
Profile Report
Engineering Profile - DAYTONA ROAD SD (WSTF SD System.stc)



Profile Report
Engineering Profile - ONSITE SYSTEM A (WSTF SD System.stc)



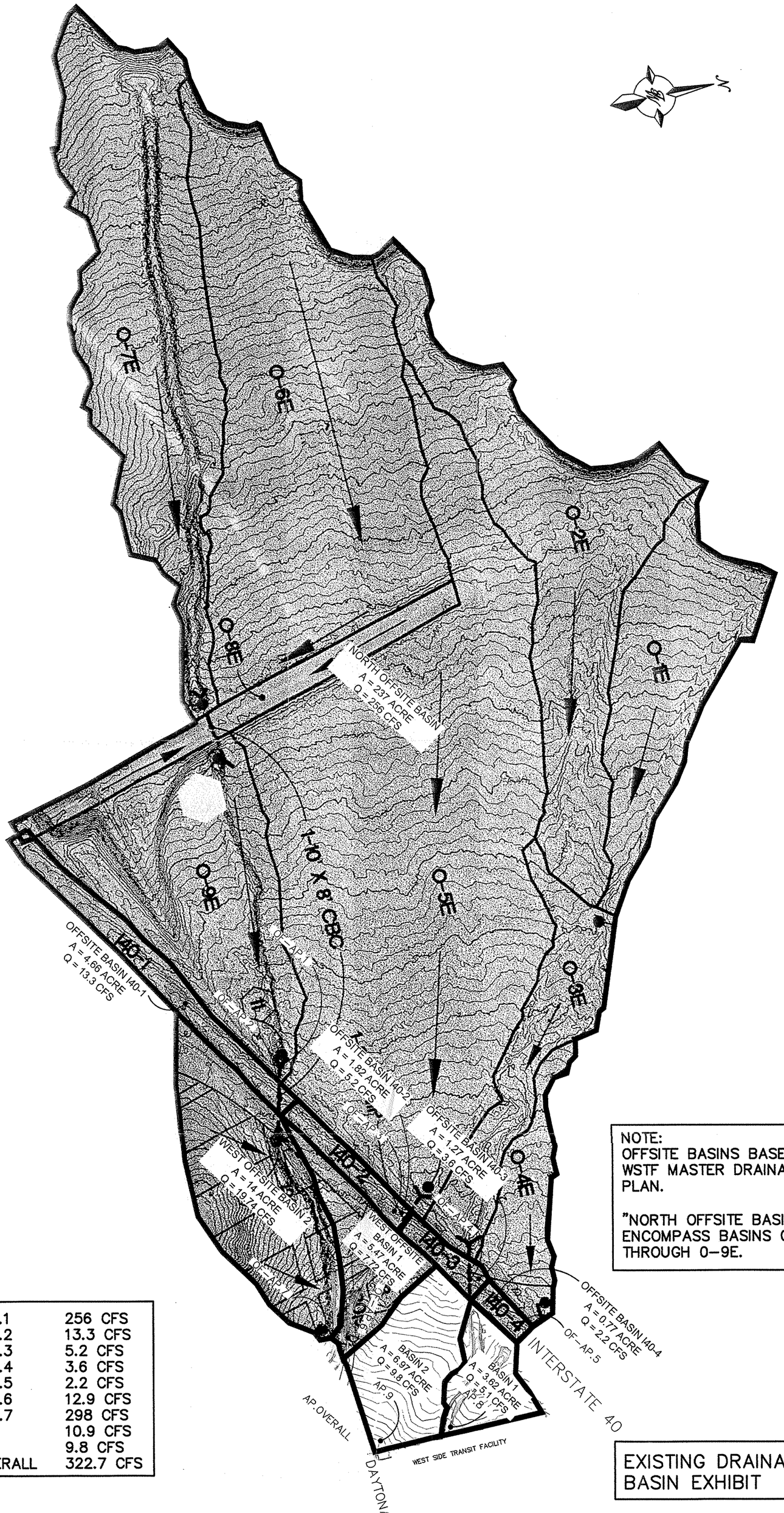
Profile Report
Engineering Profile - ONSITE SYSTEM B (WSTF SD System.stc)



DEVELOPED BASIN INLET CALCULATIONS (INCLUDING DAYTONA ROAD INLETS) - updated 7/19/2012

Basin Name	Basin Area (acre)	Basin Peak Flow (cfs)	Inlet Name (per schematic)	Available Head (ft)	Inlet Capacity (cfs)	Inlet Type
I40-3	1.22	2.88	Headwall Inlet 1	7.5	9.1	Headwall Inlet
I40-4	0.77	1.82	Headwall Inlet 3	3	5.8	Headwall Inlet
Basin A	1.56	6.09	DI5	1.5	13.4	Single Type D
Basin B	1.52	5.95	DI12	1	11.0	Single Type D
Basin C	1.66	6.5	DI7	1	11.0	Single Type D
Basin D	0.48	2.11	DI13	1	11.0	Dock Trench Drain
Basin E	0.92	3.58	DI14	1	11.0	Single Type D
Basin F	0.8	3.15	DI15	2	15.5	Single Type D
Basin G	0.57	2.23	DI8	1	11.0	Single Type D
Daytona 1	0.32	1.38	DI16	0.5	---	Grated Curb Inlet Type A
Basin H + Daytona 2	0.6	2.47	DI18	0.5	---	Grated Curb Inlet Type A

Notes:
- All inlet calculations include a 50% clogging factor for total effective inlet area.
- Single Type D Grate Effective Area = 2.28 sf with 50% clogging factor, based on area calculations from COA standard drawing.
- See Bentley Flowmaster reports for Inlet calculations for Grated Curb Inlets



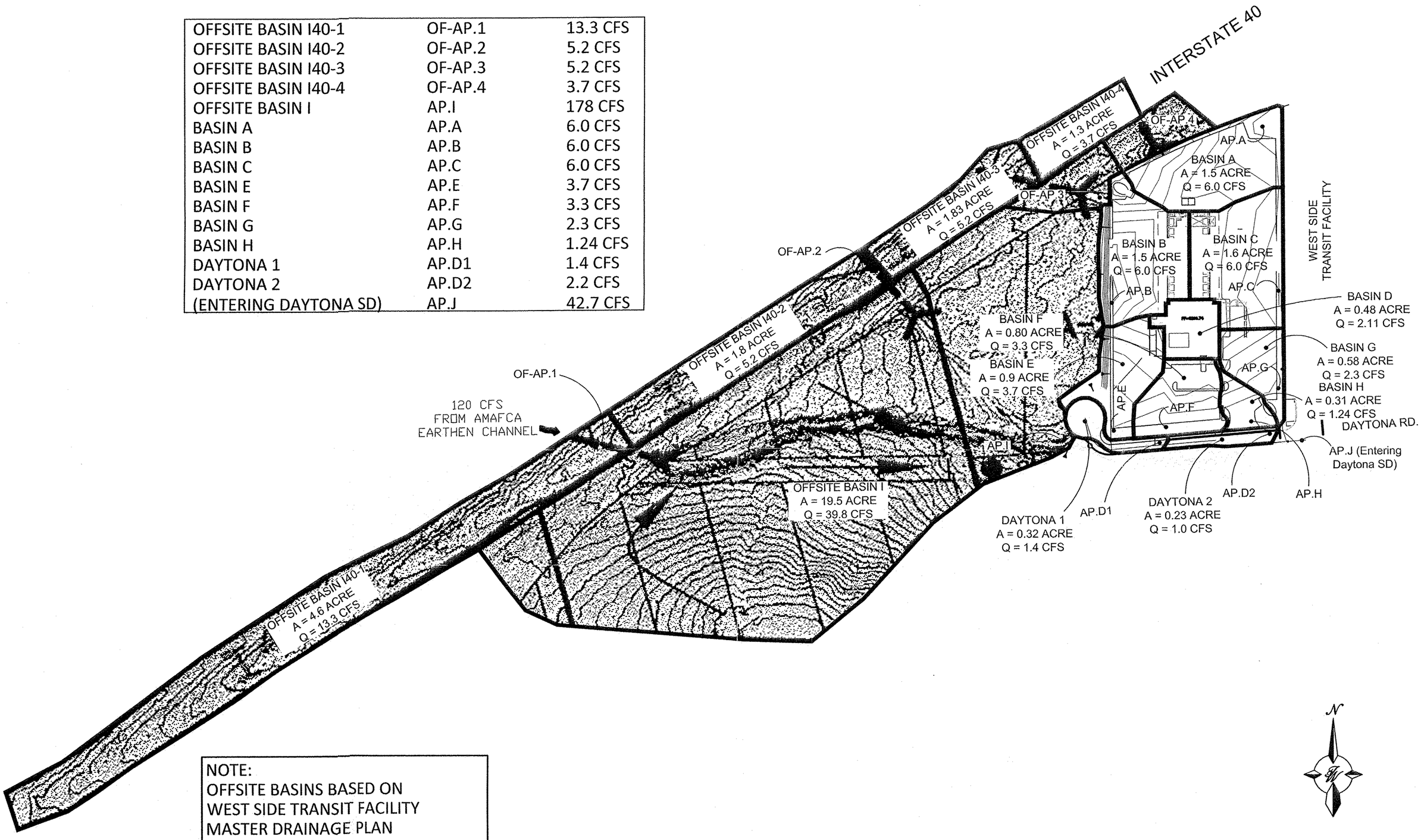
OF–AP.1	256 CFS
OF–AP.2	13.3 CFS
OF–AP.3	5.2 CFS
OF–AP.4	3.6 CFS
OF–AP.5	2.2 CFS
OF–AP.6	12.9 CFS
OF–AP.7	298 CFS
AP.8	10.9 CFS
AP.9	9.8 CFS
AP.OVERALL	322.7 CFS

NOTE:
OFFSITE BASINS BASED ON WSTF MASTER DRAINAGE PLAN.

"NORTH OFFSITE BASIN" ENCOMPASS BASINS 0–1E THROUGH 0–9E.

EXISTING DRAINAGE BASIN EXHIBIT

OFFSITE BASIN I40-1	OF-AP.1	13.3 CFS
OFFSITE BASIN I40-2	OF-AP.2	5.2 CFS
OFFSITE BASIN I40-3	OF-AP.3	5.2 CFS
OFFSITE BASIN I40-4	OF-AP.4	3.7 CFS
OFFSITE BASIN I	AP.I	178 CFS
BASIN A	AP.A	6.0 CFS
BASIN B	AP.B	6.0 CFS
BASIN C	AP.C	6.0 CFS
BASIN E	AP.E	3.7 CFS
BASIN F	AP.F	3.3 CFS
BASIN G	AP.G	2.3 CFS
BASIN H	AP.H	1.24 CFS
DAYTONA 1	AP.D1	1.4 CFS
DAYTONA 2	AP.D2	2.2 CFS
(ENTERING DAYTONA SD)	AP.J	42.7 CFS

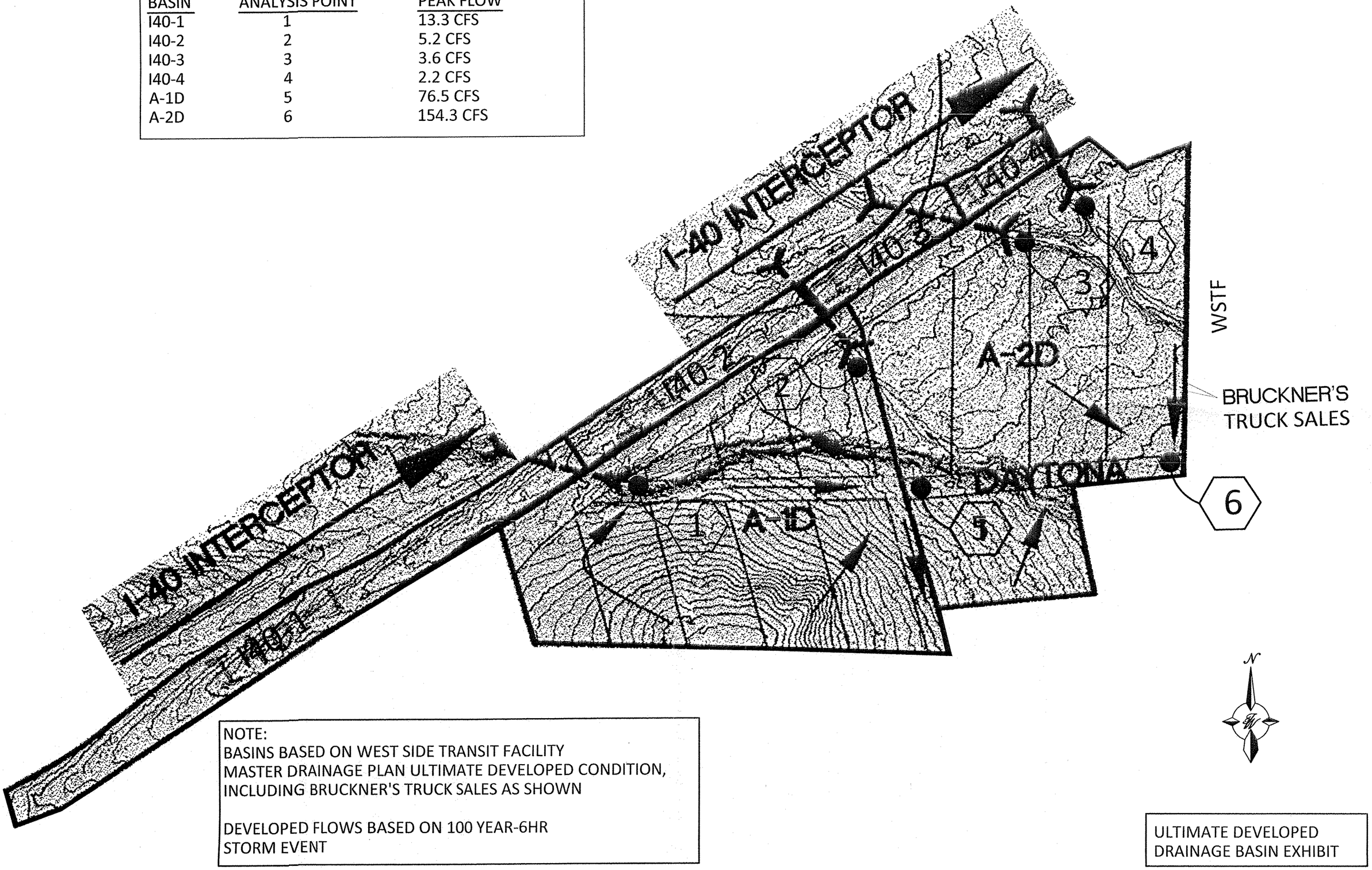


NOTE:
OFFSITE BASINS BASED ON
WEST SIDE TRANSIT FACILITY
MASTER DRAINAGE PLAN

ALL FLOW FOR DEVELOPED
CONDITION BASED ON 100 YEAR-6HR
STORM EVENT

INTERIM DRAINAGE
BASIN EXHIBIT

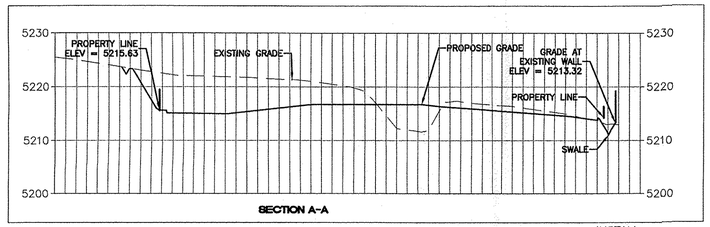
BASIN	ANALYSIS POINT	PEAK FLOW
I40-1	1	13.3 CFS
I40-2	2	5.2 CFS
I40-3	3	3.6 CFS
I40-4	4	2.2 CFS
A-1D	5	76.5 CFS
A-2D	6	154.3 CFS



NOTE:
BASINS BASED ON WEST SIDE TRANSIT FACILITY MASTER DRAINAGE PLAN ULTIMATE DEVELOPED CONDITION, INCLUDING BRUCKNER'S TRUCK SALES AS SHOWN

DEVELOPED FLOWS BASED ON 100 YEAR-6HR STORM EVENT

ULTIMATE DEVELOPED DRAINAGE BASIN EXHIBIT



SECTION A-A

LEGEND

- CURB & GUTTER
- BOUNDARY LINE
- EASEMENT
- CENTERLINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- SCREEN WALL
- RETAINING WALL
- 5010 CONTOUR MAJOR
- 5011 CONTOUR MINOR
- x 5048.25 SPOT ELEVATION
- FLOW ARROW
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- 5010 EXISTING CONTOUR MAJOR
- 5011 EXISTING CONTOUR MINOR
- x 5048.25 EXISTING SPOT ELEVATION

KEYED NOTE:

- (A) CURB & GUTTER PER COA STD DWG #2415B
- (B) 6" CURB & GUTTER (SEE DETAIL SHEET C6)
- (C) UNIDIRECTIONAL RAMP (SEE DETAIL SHEET C7)
- (D) WIRE ENCLOSED RIPRAP, CLASS "A" 1.0 FT. THICK OVER NON-WOVEN GEOTEXTILE CLASS "1"
- (E) VALLEY GUTTER
- (F) HC RAMP (SEE DETAIL SHEET C7)

INSTALL 18" SD INLET HEADWALL W/GRATE INV=5213.00 SEE DETAIL SHEET C8

INSTALL 18" SD INLET HEADWALL W/GRATE INV=5211.50 SEE DETAIL SHEET C8

INSTALL 4' TYPE "E" MH RIM=5316.32 INV IN(N)=5208.54 INV IN(W)=5208.54 INV OUT=5208.34

INSTALL 4' TYPE "E" MH RIM=5218.92 INV IN=5210.21 INV OUT=5210.01

INSTALL 4' TYPE "E" MH RIM=5215.97 INV IN(N)=5207.03 INV IN(W)=5207.03 INV OUT=5206.84

INSTALL SINGLE TYPE "D" DROP-INLET GRATE=5213.00 INV OUT=5209.05

INSTALL SINGLE TYPE "D" DROP-INLET GRATE=5212.06 INV IN=5206.64

INSTALL SINGLE TYPE "D" DROP-INLET GRATE=5210.45 INV IN=5203.29 INV OUT=5203.19

INSTALL SINGLE TYPE "D" DROP-INLET GRATE=5210.45 INV OUT=5203.19

REMOVE EXISTING SD STRUCTURE INSTALL GRATED 6' MH GRATE=5211.92 INV IN=5204.20 INV OUT=5204.10

EXISTING HEADWALL AND 42" SD INV=4204.10

EXISTING 4' MANHOLE RIM=5207.81 INV=5199.77

EXISTING SD MH RIM=5202.81

INSTALL SINGLE TYPE "D" DROP-INLET GRATE=5209.89 INV OUT=5204.05

INSTALL 18" RCP CONNECT TO EXISTING 36" RCP INV=5197.71

INSTALL SINGLE TYPE "C" DROP-INLET GRATE=5205.70 INV OUT=5200.20

INSTALL 6' MH RIM=5206.17 INV IN(N)=5192.17 INV IN(W)=5191.67 INV OUT=5191.67

CONNECT 48" SD INV=5191.67

INSTALL SINGLE TYPE "D"DROP-INLET GRATE=5207.77 INV IN=5201.72 INV OUT=5201.52

NEW 42" SD @1.38%

INSTALL SINGLE TYPE "C" DROP-INLET GRATE=5209.70 INV IN=5198.45 INV OUT=5198.45

INSTALL 6' MH RIM=5210.41 INV IN(N)=5195.73 INV IN(W)=5195.63 INV OUT=5195.53

NEW 36" SD @1.38%

SECTION B-B SEE DETAIL SHEET C8

INSTALL 6' MH RIM=5212.50 INV IN=5199.03 INV OUT=5198.50

NEW 18" SD @1.0%

CONNECT 12" RCP SD TO 18" RCP INV=5206.34

12" RCP SD CONNECT TO DOCK WELL DRAIN INV=5212.24

SECTION C-C SEE DETAIL SHEET C8

SECTION D-D SEE DETAIL SHEET C8

3:1 MAX SLOPE TYPICAL

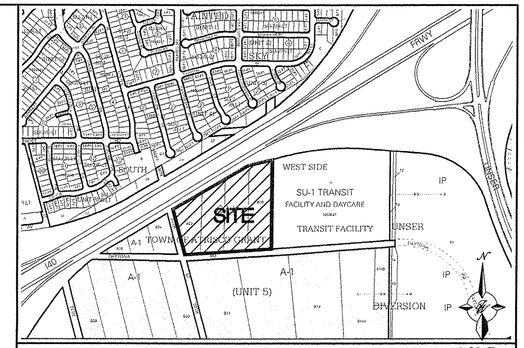
RUNDOWN

INSTALL 110' OF METAL BARRIER PER COA STD DWG 2625

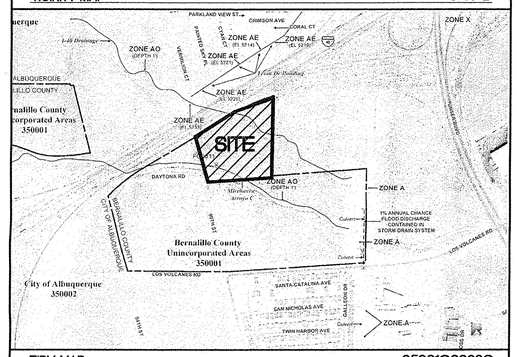
18" SD @1.0%

24" SD @1.0%

FF=5216.74



VICINITY MAP: J-09-Z



FIRM MAP: 35001C0328G

GRAPHIC SCALE

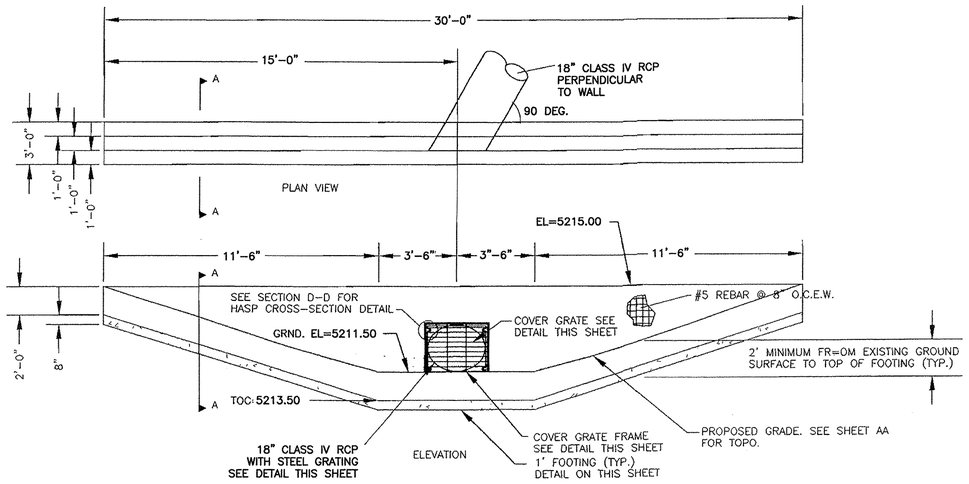
50 25 0 25 50

SCALE: 1"=50'

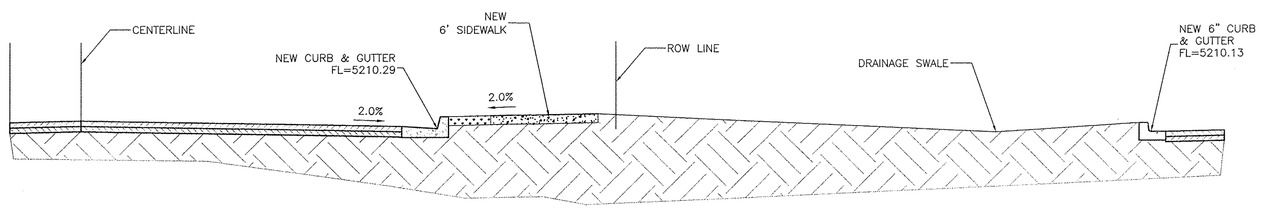
RECEIVED
JUL 10 2012
HYDROLOGY SECTION

ROUGH GRADING APPROVAL DATE

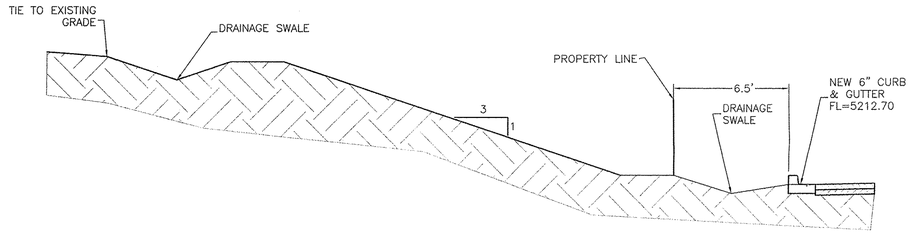
ENGINEER'S SEAL	BRUCKNERS TRUCK SALES	DRAWN BY BJF
	GRADING AND DRAINAGE PLAN	DATE 7/19/12
		2011073_GRB
		SHEET # C2
RONALD R. BOHANNAN P.E. #7868	TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	JOB # 2011073



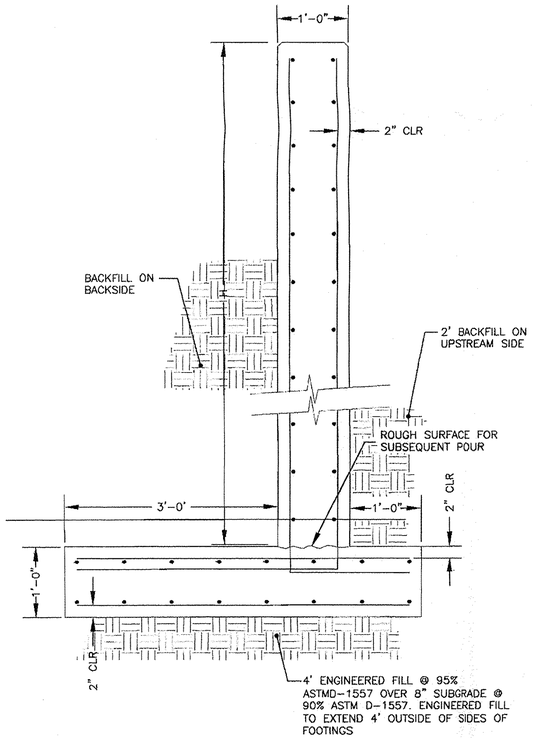
18" SD HEAD WALL - SECTION A-A



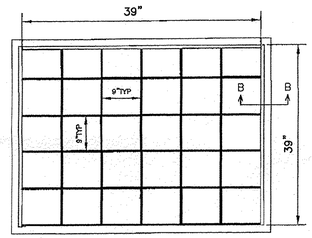
SECTION B-B



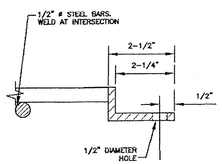
SECTION C-C



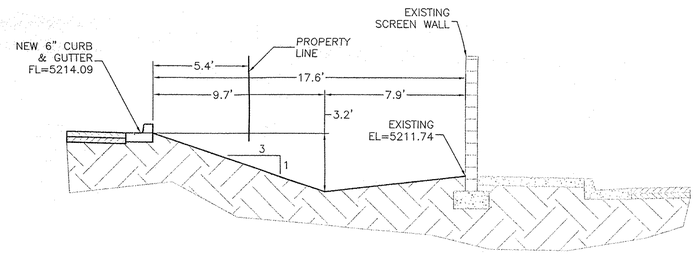
36" SD HEAD WALL - SECTION A-A



18" SD HEAD WALL - COVER GRATE

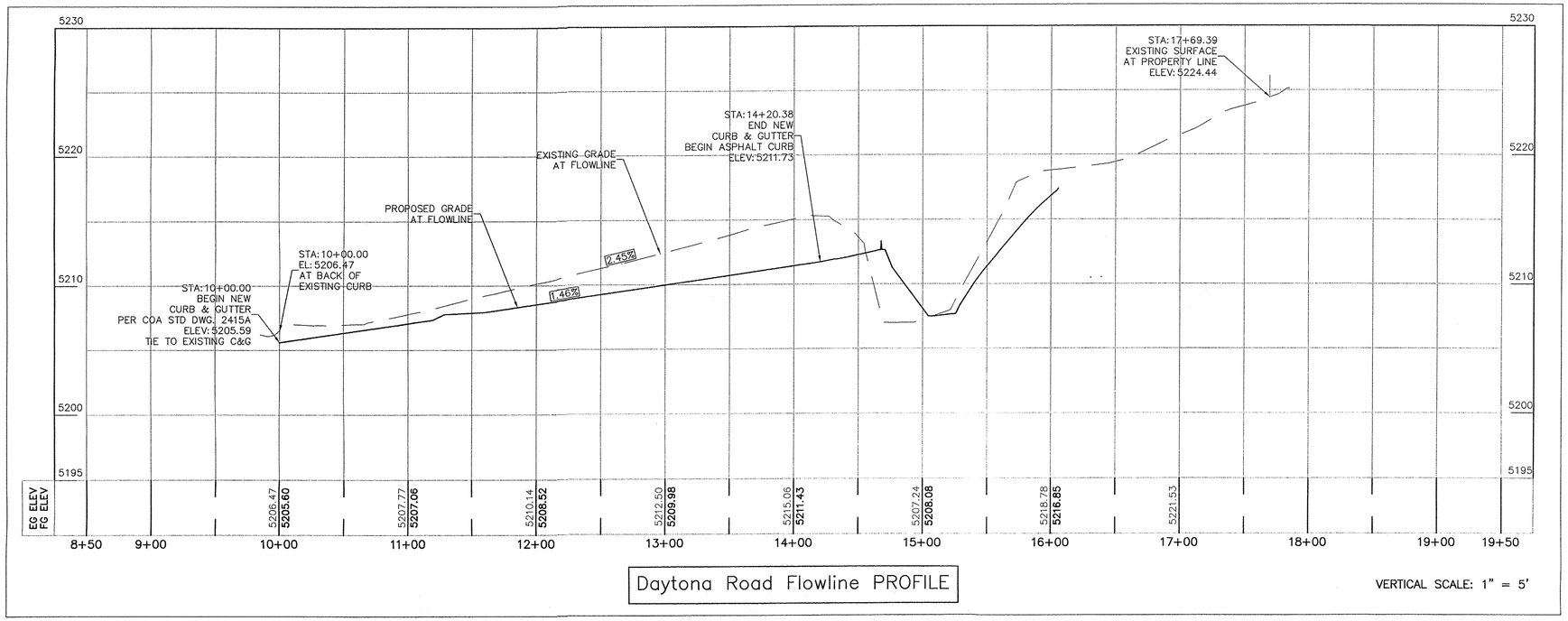


36" SD HEAD WALL - SECTION B-B



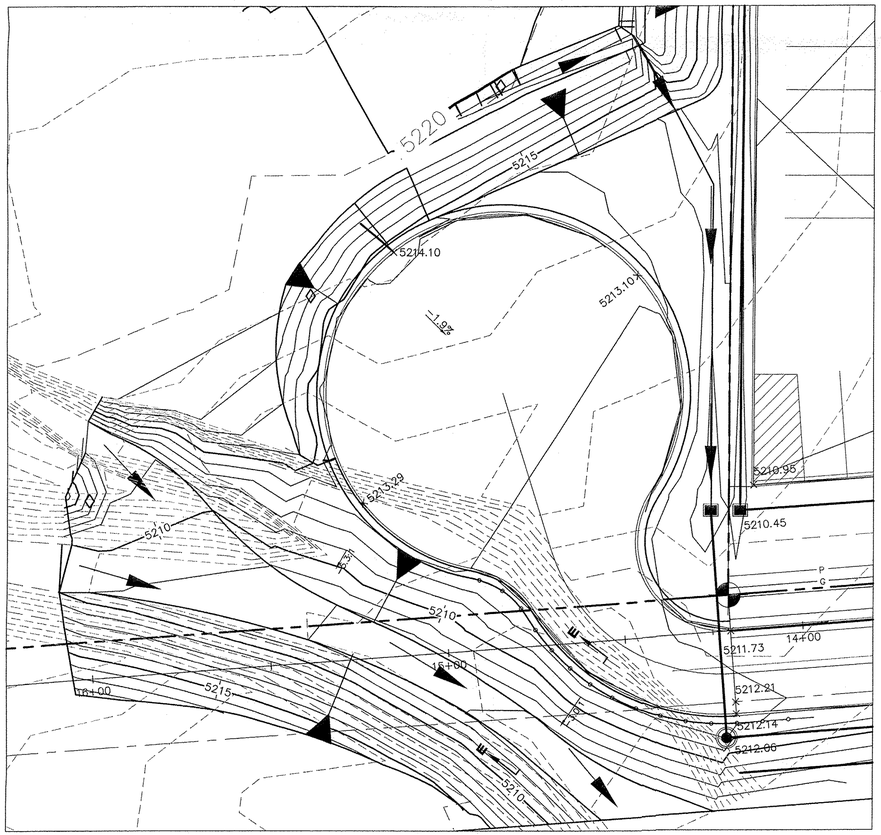
SECTION D-D

ENGINEER'S SEAL	BRUCKNERS TRUCK SALES	DRAWN BY BJF
	DETAIL SHEET	DATE 7/19/12
		2011073_DTB
	TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.tierrawestllc.com	SHEET # C8
RONALD R. BOHANNAN P.E. #7868		JOB # 2011073



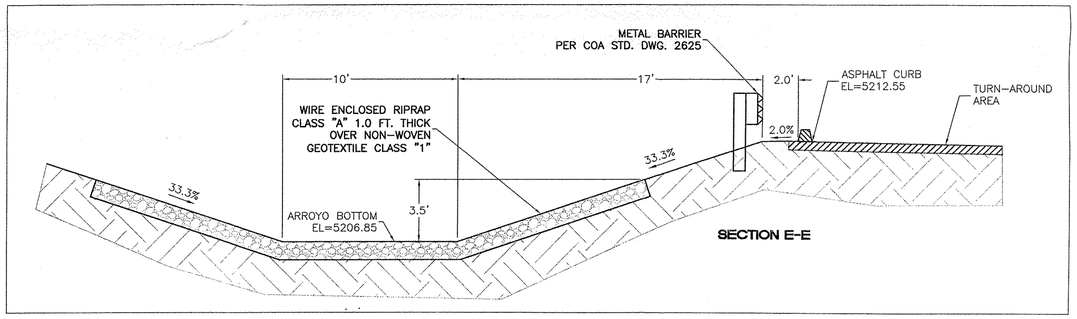
Daytona Road Flowline PROFILE

VERTICAL SCALE: 1" = 5'

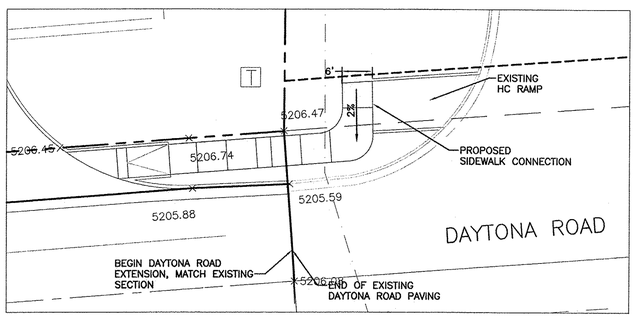


TURN-AROUND AND ARROYO DETAIL

SCALE: 1"=20'



SECTION E-E



SIDEWALK CONNECTION DETAIL

ENGINEER'S SEAL

RONALD R. BOHANNAN P.E. #7868

BRUCKNERS TRUCK SALES

DETAIL SHEET

TIERRA WEST, LLC
5571 MIDWAY PARK PLACE NE
ALBUQUERQUE, NM 87109
(505) 858-3100
www.tierrawestllc.com

DRAWN BY: BJF

DATE: 7/19/12

2011073_GRB

SHEET # C9

JOB # 2011073