

## DRAINAGE DESIGN EXCEPTION

To: Maricopa County Department of Transportation (MCDOT)  
From: Zach Schmidt, P.E., CFM  
Kimley-Horn and Associates, Inc. (Kimley-Horn)  
Date: February 16, 2017  
Subject: TT345 MC 85 at 83<sup>rd</sup> Avenue and Center Lane Expansion  
Design Exceptions



Expires 06/30/19

## DESIGN STANDARD

Drainage Policies and Standards for Maricopa County, Arizona Table 6.9 states that the minimum velocity for the design storm shall be 5 feet per second (fps) for the design peak discharge (Q). The design peak discharge is based on the 2-year storm event per the City of Phoenix standards.

## CONSTRAINTS

Small storm drains are being used to convey runoff from the north side of MC 85 to the south side at numerous locations. The existing terrain is very flat from north to south. The storm drains will discharge into new retention basins being constructed with the project. Runoff is being routed to the south side due to north properties not having the ability to store their half-street frontage runoff. The velocity at several of the storm drain systems is approximately three (3) fps. Velocity requirements for these small storm drains are not being met due to the following constraints:

- New retention basins being constructed in temporary drainage easements limit the outfall depth creating shallow pipe slopes. Modifications to the slopes would deepen the bottom of the basins. Therefore, grading for the retention basins would fall outside of the temporary drainage easements.
- Several utilities would conflict with the new storm drain if deepened

This request is for a design exception for the minimum velocities. **Attachment A** is the MCDOT Design Exception Approval Form.

## ALTERNATIVES

Two different designs are shown in **Attachment B** for the various locations. The two different designs are:

- Best Design – Design if velocity requirements were met. The storm drain profiles would be lowered to increase velocities.
- Design Exception – Current design that shows the constraints

StormCAD results are provided in **Attachment B**.

## EFFECTS OF DESIGN EXCEPTION

Velocities less than 5 fps may require increased maintenance to clean out dropped sediment in the pipe. However, two important factors may decrease the amount of sediment reaching the storm drain. Improvements made as part of this project will reduce the amount of runoff from adjacent undeveloped

properties reaching the roadway. Basins, small maintenance berms and curb and gutter will limit the amount of runoff reaching the new roadway. The second piece is several of the undeveloped properties along MC 85 are being developed/constructed. With these two factors, the storm drains are only designed for pavement runoff in MC 85.

## ***Attachments***

**Attachment A– Design Exception Approval Form**

**Attachment B– Construction Plans & Supporting Documentation**

## Attachment A– Design Exception Approval Form



**DESIGN EXCEPTION APPROVAL FORM**

*(Insert or attach additional information if it helps clarify the request)*

<b>Project: MC 85 at 83<sup>rd</sup> Avenue &amp; Center Lane Expansion</b>	
<b>Project Number: TT345</b>	
<b>Project Manager: Ben Markert</b>	<b>Date: February 16, 2018</b>
<b>Project Manager Signature:</b> <i>Ben Markert</i>	
<b>Project Management Branch Manager Signature:</b> <i>[Signature]</i>	

<b>Recommended for Approval</b>	
<i>With conditions (if any):</i>	
<b>Engineering Division Manager: STEVE WILCOX</b>	
<b>Signature:</b> <i>Steve Wilcox</i>	<b>Date: 2/21/2018</b>

<b>Recommended for Approval</b>	
<i>With conditions (if any):</i>	
<b>Transportation Systems Management Division Manager: NICOLAAS SWART</b>	
<b>Signature:</b> <i>[Signature]</i>	<b>Date: 2/22/2018</b>

<b>Recommended for Approval</b>	
<i>With conditions (if any):</i>	
<b>Maintenance Division Manager:</b>	
<b>Signature:</b> <i>[Signature]</i>	<b>Date: 03/08/2018</b>



**Maricopa County  
Department of Transportation**

<b>Recommended for Approval</b>	
<i>With conditions (if any):</i>	
Permit, Construction and Inspection Division Manager: ALFRED ERIVES	
Signature: 	Date: 2/22/2018
<b>Approved:</b>	
<i>With conditions (if any):</i>	
Maricopa County Department of Transportation Director: JENNIFER TOTH	
Signature: 	Date: 03/08/2018



**Attachment B- Construction Plans & Supporting Documentation**

COUNTY: MARICOPA COUNTY  
 DEPARTMENT OF PUBLIC WORKS  
 ENGINEERING DIVISION  
 PROJECT NO. 17345  
 MC 85 AT 89D AVENUE & CENTER TURN LANE EXPANSION  
 PROJECT NO. 17345

DESIGNED: Z. Schmitt  
 DRAWN: D. Turner  
 CHECKED: L. Mann  
 DATE: 10/00/17  
 10/00/17  
 10/00/17

**Kimley»Horn**  
 DRAINAGE PLANS  
 STA 1235+00 TO STA 1239+50  
 SHEET 018 OF 048

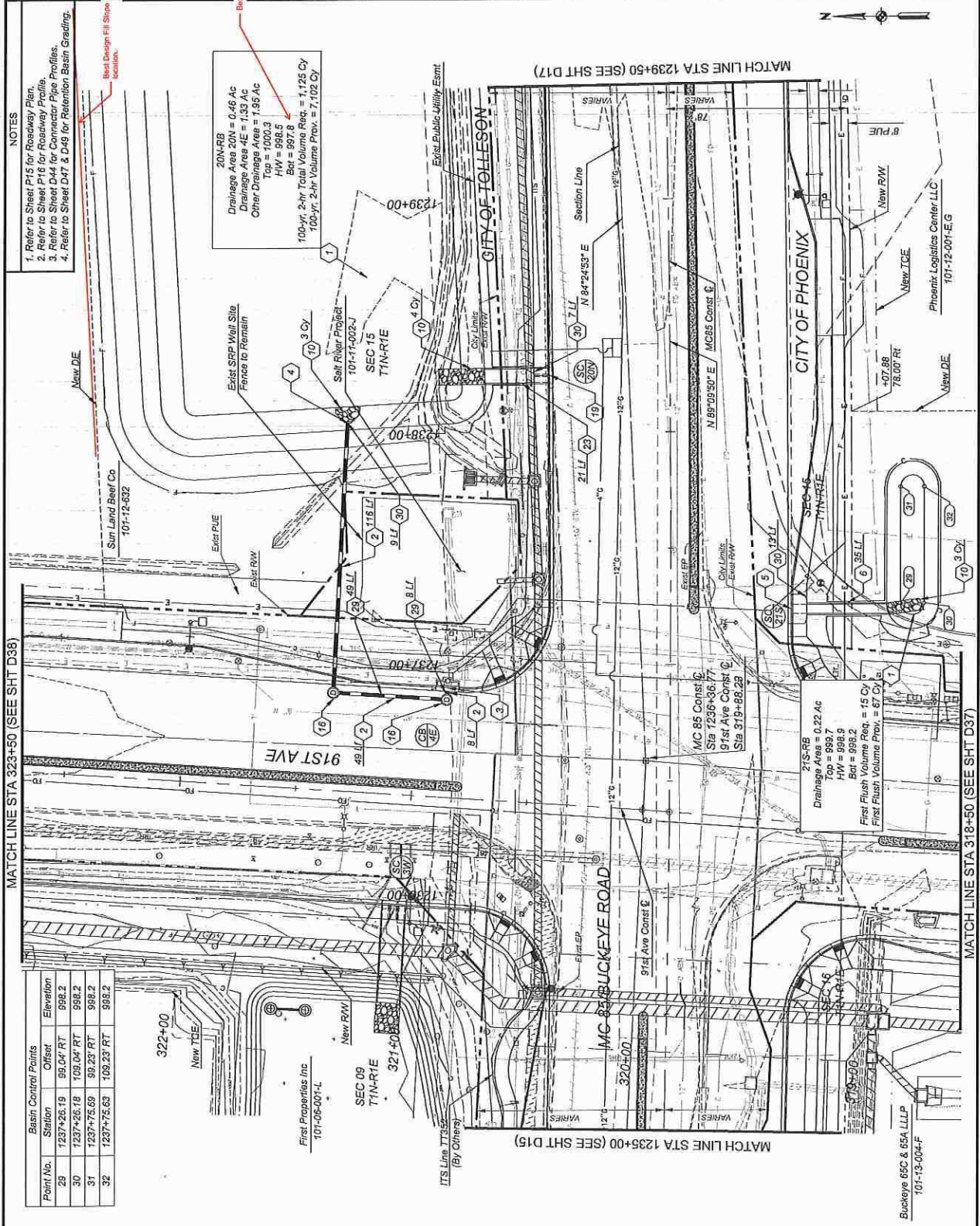
TOWN: 300  
 SHEET NO.: 185  
 PROJECT NO.: 17345  
 STATE: AZ  
 REGION: 8

REMOVAL/RELOCATE BY OTHERS

CONSTRUCTION

1. Retention Basin Excavation See Detail DB 7:69 Cy  
 2. 18" Storm Drain, R6RCP, Class V 179 LF  
 3. Catch Basin Per COP Std Det P1569-1, M-2, L=L=3" Sta 320+87.41, 47' RT (91st Ave) 1 Ea  
 4. Heelwall Per MAG Std Det 501, 'U' Type Sta 321+38.04, 157.99' RT (91st Ave) 1 Ea  
 5. Scupper MAG Std Det 206-1, 1-4" Curb Opening Sta 1237+23.76, 52.00' RT 1 Ea  
 6. Concrete Spillway Per Det DA, 1-4" Curb Opening 35 LF  
 7. Dumped Riprap, D150s± 10 Cy  
 8. Storm Drain Manhole Per COP Std Det P1520 & MAG Det 529 2 Ea  
 9. Scupper See Detail DD, 2-2'-6" Curb Openings Sta 320+87.41, 42.00' RT (91st Ave) 1 Ea  
 10. Scupper See Detail DD, 2-2'-6" Curb Openings Sta 321+36.42, 42.00' RT (91st Ave) 1 Ea  
 11. Concrete Spillway Per Det DA, 2-2'-6" Curb Openings 21 LF  
 12. Concrete Pipe Encasement Per MAG Std Det 507 57 LF  
 13. Handrail Per MAG Std Det 145 29 LF

Basin Control Points, See Table this Sheet  
 SCALE: Hor: 1"=20'  
 20' 0' 20' 40'  
 602-283-1100  
 BLUE STAKE  
 SCALE IN FEET



NOTES  
 1. Refer to Sheet P15 for Roadway Plan.  
 2. Refer to Sheet P16 for Roadway Profile.  
 3. Refer to Sheet D44 for Connector Pipe Profiles.  
 4. Refer to Sheet D47 & D49 for Retention Basin Grading.

Best Design Fill Slope location.

20M-RB  
 Drainage Area 20N = 0.46 Ac  
 Drainage Area 4E = 1.33 Ac  
 Other Drainage Area = 1.95 Ac  
 Top = 1000.3  
 HW = 998.5  
 Bot = 997.8  
 100-yr, 2-hr Total Volume Req. = 1,125 Cy  
 100-yr, 2-hr Volume Prov. = 7,102 Cy

27S-RB  
 Drainage Area = 0.22 Ac  
 Top = 995.7  
 HW = 995.9  
 Bot = 995.2  
 100-yr, 2-hr Total Volume Req. = 45 Cy  
 100-yr, 2-hr Volume Prov. = 67 Cy

21S-RB  
 Drainage Area = 0.22 Ac  
 Top = 995.7  
 HW = 995.9  
 Bot = 995.2  
 100-yr, 2-hr Total Volume Req. = 45 Cy  
 100-yr, 2-hr Volume Prov. = 67 Cy

Part No.	Station	Offset	Elevation
29	1237+26.19	99.04' RT	998.2
30	1237+26.19	109.04' RT	998.2
31	1237+75.69	99.23' RT	998.2
32	1237+75.69	109.23' RT	998.2

Basin Control Points  
 First Properties Inc  
 101-06-001-L  
 SEC 09  
 TIN-RVE  
 321+40  
 New RWI  
 New TCE  
 322+00  
 City of Tolleson  
 City of Phoenix  
 Phoenix Logistics Center, LLC  
 101-12-001-E,G  
 Buckeye 65C & 65A, LLLP  
 101-13-004-F



**NOTES**

1. Refer to Sheet P15 for Roadway Plan.
2. Refer to Sheet P16 for Retention Profile.
3. Refer to Sheet D16 for Drainage Plan

Best Design Fill Slope location.

Best Design Fill Slope location.

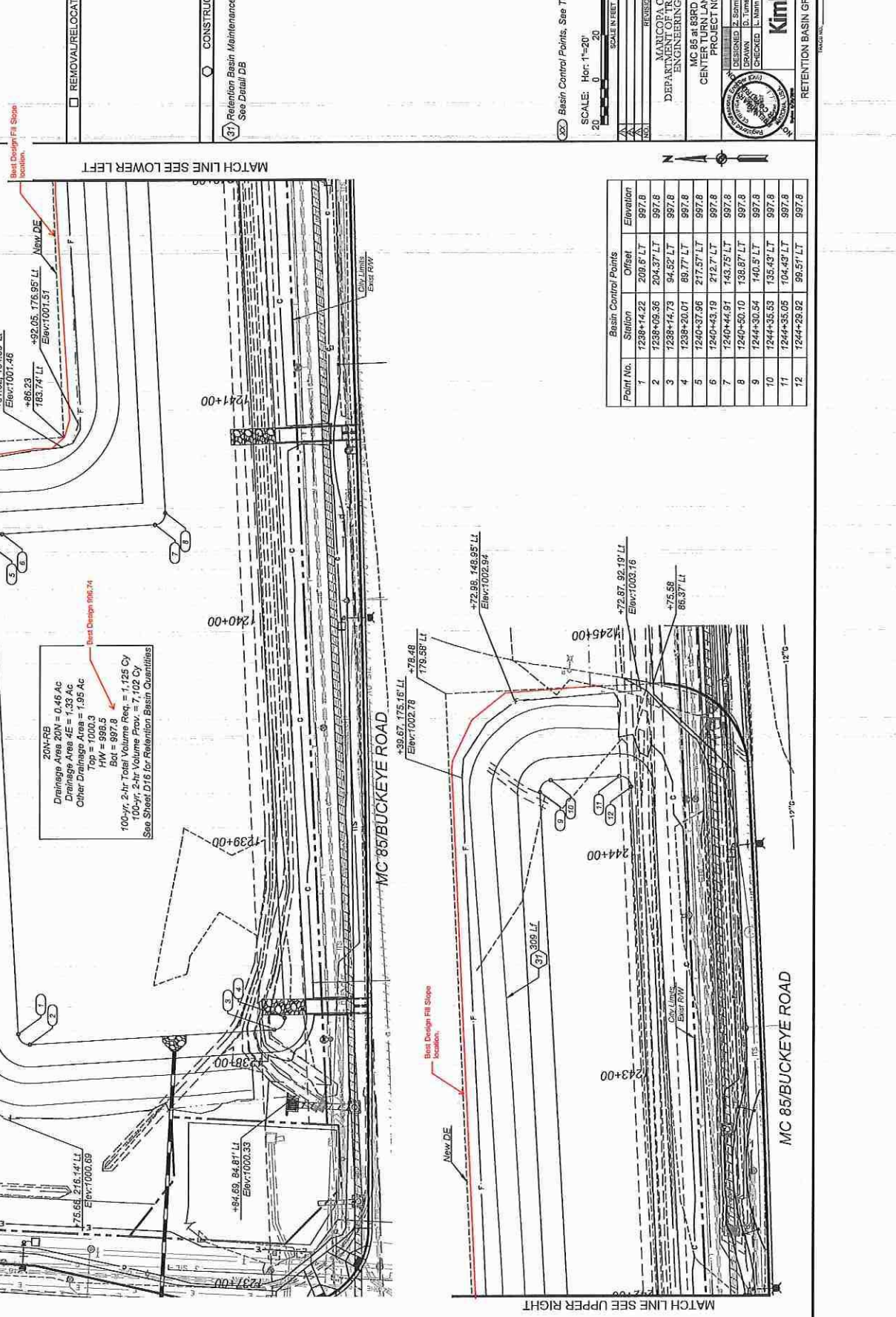
20K-RB  
Drainage Area 20N = 0.48 Ac  
Drainage Area 4E = 1.33 Ac  
Other Drainage Area = 1.95 Ac  
Top = 1000.3  
SOL = 892.8

100-yr, 2-hr Total Volume Req. = 1,125 Cy  
100-yr, 2-hr Volume Prov. = 7,102 Cy  
See Sheet D16 for Retention Basin Quantities

Best Design Fill Slope location.

Best Design Fill Slope location.

Best Design Fill Slope location.



Point No.	Station	Offset	Elevation
1	1238+14.22	209.6' LT	997.8
2	1238+09.36	204.37' LT	997.8
3	1238+14.73	94.92' LT	997.8
4	1238+20.07	89.77' LT	997.8
5	1240+37.96	217.57' LT	997.8
6	1240+43.19	212.7' LT	997.8
7	1240+44.91	143.75' LT	997.8
8	1240+50.10	138.87' LT	997.8
9	1244+30.54	140.5' LT	997.8
10	1244+35.53	135.43' LT	997.8
11	1244+35.05	104.43' LT	997.8
12	1244+29.92	99.51' LT	997.8

MATCH LINE SEE LOWER LEFT

MATCH LINE SEE UPPER RIGHT

MC 85/BUCKEYE ROAD

MC 85/BUCKEYE ROAD

10/20/17

3:22:12pm

10/20/17



PROJECT NO.	TTM45	SHEET NO.	103	TOTAL SHEETS	300
PROJECT STATE	AZ	REVISION		RECORD DRAWING	

**NOTES**

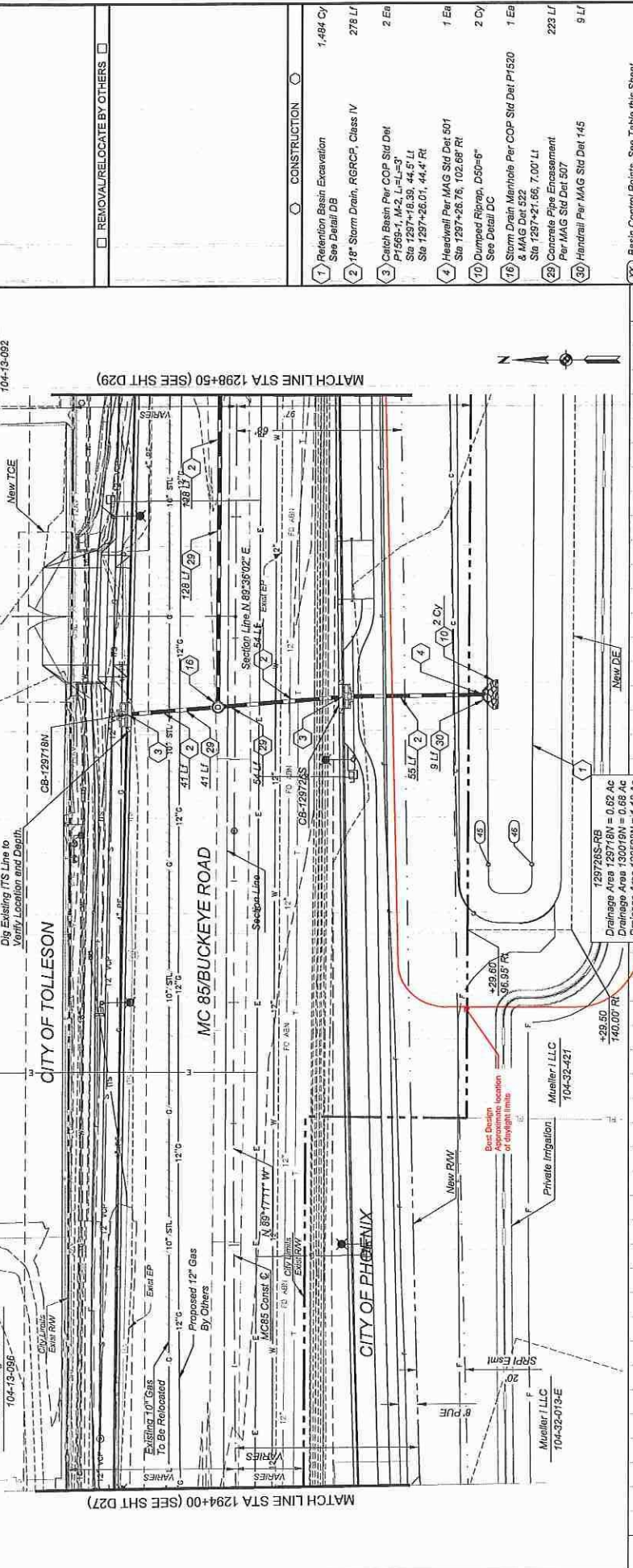
1. Refer to Sheet P23 for Roadway Plans
2. Refer to Sheet P24 for Proposed Profiles
3. Refer to Sheet D24 for Connector Pipe Profiles.

Kent W Burger & Shelly K Burger  
104-13-092

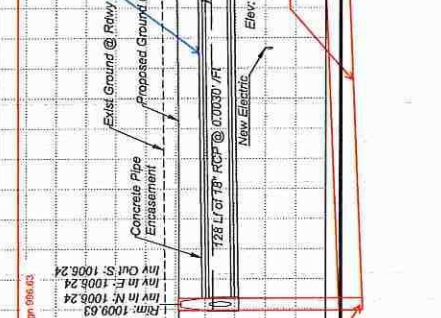
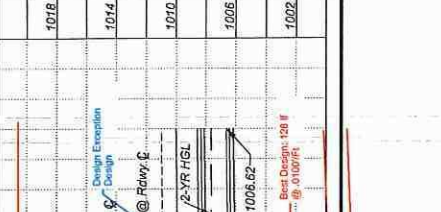
EMC Holdings LLC  
104-13-094

Note: Contractor to Hand Dig Existing ITS Line to Verify Location and Depth.

Point No.	Station	Offset	Elevation
45	1296+49.64	105.48 RT	1005.4
46	1296+49.69	123.53 RT	1005.4



- 1 Retention Basin, Excavation See Detail DB 1.484 Cy
- 2 18\"/>
- 3 Catch Basin Per COP Std Det P1265-1, M2, L=J=3' Sta 1297+16.39, 44.5' LI Sta 1297+26.01, 44.4' RI
- 4 Hand-dig Per MAG Std Det 501 Sta 1297+26.76, 102.68' RI
- 10 Dumped Riprap, D50=6\"/>
- 16 Storm Drain Manhole Per COP Std Det P1320 & MAG Det 522 Sta 1297+21.66, 7.00' LI
- 29 Concrete Pipes Enhancement Per MAG Std Det 507
- 30 Handrail Per MAG Std Det 145



1018	1014	1010	1006	1002
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MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION

MC 85 at 63RD AVENUE & CENTER TURN LANE EXPANSION PROJECT NO. 11945

DESIGNED BY: S. Schmidt  
DRAWN BY: D. Turner  
CHECKED BY: M. Mann

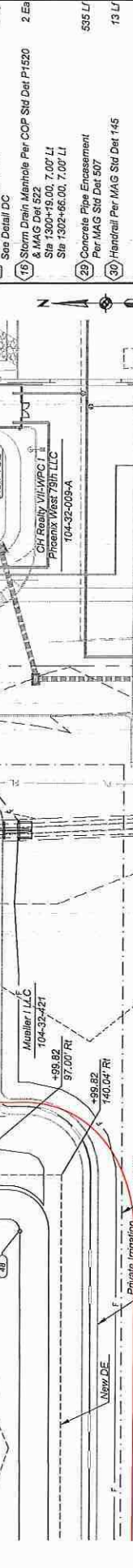
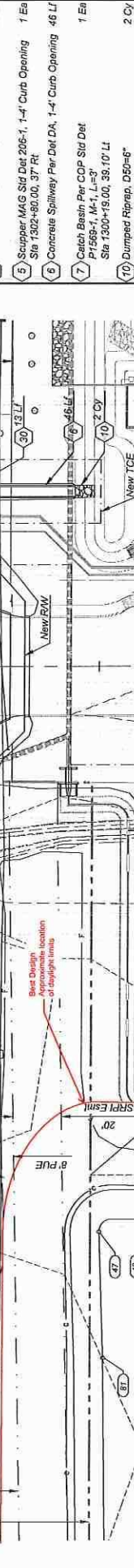
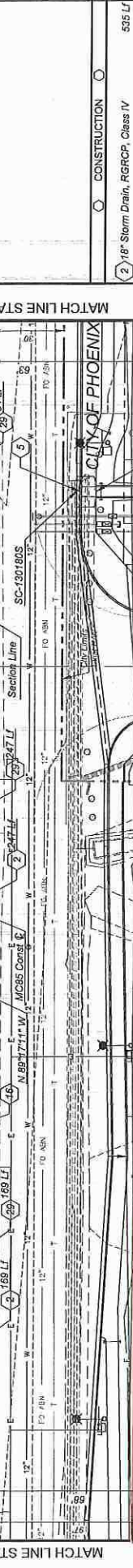
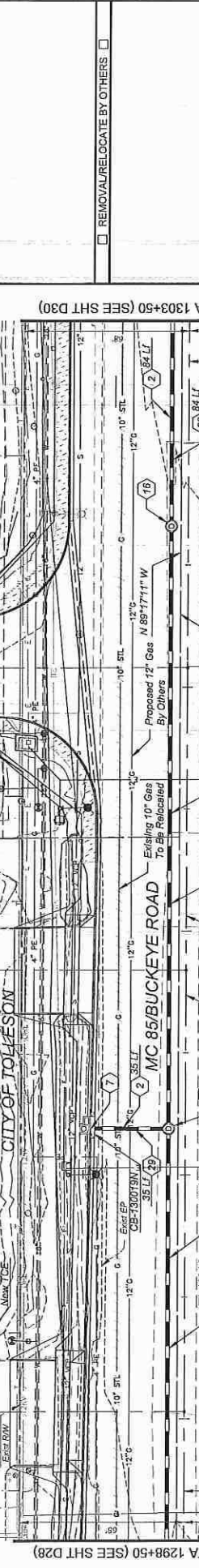
DATE: 10/20/17  
10/20/17  
10/20/17

**Kimley-Horn**

DRAINAGE PLANS  
Sht 1294-50 to Sht 1298-50



Point No.	Station	Chisat	Elevation
47	1299+76.66	100.71 RT	1005.4
48	1299+76.83	123.05 RT	1005.4
81	1299+24.73	102.41 RT	1005.4



NOTES

1. Refer to Sheet P41 for Roadway Plan
2. Refer to Sheet P42 for Retention Basin Profile
3. Refer to Sheet P45 for Concrete Pipe Profile

REMOVAL/RELOCATE BY OTHERS

- 2) 18" Storm Drain, RGRCP, Class IV 535 LF
- 5) Scupper MAG Sid Det 206-1, 1-4" Curb Opening 1 Ea
- 6) Concrete Spillway Per Det DA, 1-4" Curb Opening 46 LF
- 7) Catch Basin Per COP Sid Det P1529, 14" x 10" 1 Ea
- 10) Dumped Riprap, D50=6" See Detail DC 2 Cy
- 16) Storm Drain Manhole Per COP Sid Det P1520 & MAG Det 523 2 Ea
- 19) Storm Drain Manhole Per COP Sid Det P1520 & MAG Det 523 2 Ea
- 29) Concrete Pipe Encasement Per MAG Sid Det 507 535 LF
- 30) Handrail Per MAG Sid Det 145 19 LF

SCALE: Hor: 1"=20' Vert: 1"=4'  
 20 0 20 40  
 SCALE IN FEET

Basin Control Points. See Table this Sheet

MARICOPA COUNTY  
 DEPARTMENT OF TRANSPORTATION  
 ENGINEERING DIVISION

MC 85 at 83RD AVENUE &  
 CENTER TURN LANE EXPANSION  
 PROJECT NO. 17345

Kimley-Horn  
 DRAINAGE PLANS  
 Sta 1298+50 to Sta 1303+50

12/4.09pm  
 10/20/17



STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
AZ	TT345	167	333	

DATE	DESIGNED BY	CHECKED BY
10/20/17	Z. Schmitt	D. Turner
DATE	DRAWN BY	CHECKED BY
10/20/17	D. Turner	M. Horn
DATE	BY	DATE
10/20/17		10/20/17

REMOVAL/RELOCATE BY OTHERS

**NOTES**

1. Refer to Sheet P43 for Roadway Plan.
2. Refer to Sheet P44 for Roadway Profile.
3. Refer to Sheet D45 for Connector Pipe Profile.

D22592 UB II  
New Wincup-AJ LLC  
104-15-028-A

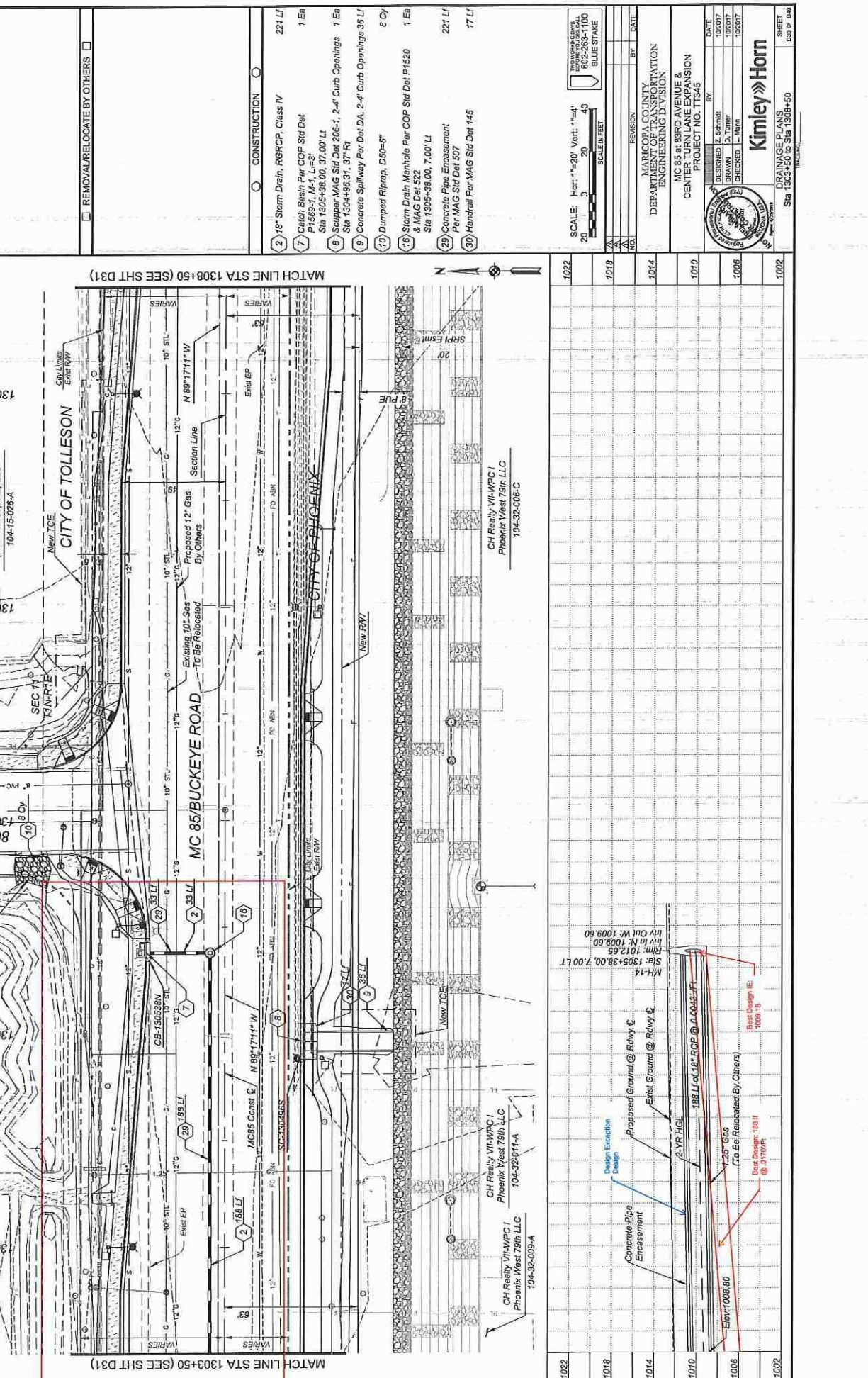
8100 West Buckeye LLC  
104-13-520

City of Tolleson  
City Limits  
Exit RW

City of Phoenix  
City Limits  
Exit RW

CH Realty VII-WPC I  
Phoenix West 79th LLC  
104-32-091-A

CH Realty VII-WPC I  
Phoenix West 79th LLC  
104-32-096-C



1022	CONSTRUCTION	221 LF
1021	2" 8" Storm Drain, R6RCP, Class IV	1 Ea
1020	Catch Basin Per COP Sid Det P1565-1, M-1, L=33'	1 Ea
1019	Sta 1305+38.00, 37.00' LI	1 Ea
1018	Scupper MAG Sid Det 206-1, 2-4" Curb Openings	36 LF
1017	Sta 1304+66.31, 37' Rt	8 Cy
1016	Concrete Spillway Per Det DA, 2-4" Curb Openings	1 Ea
1015	Dumped Riprap, D50=6"	221 LF
1014	Storm Drain Manhole Per COP Sid Det P1520	1 Ea
1013	8" MAG Det 522	17 LF
1012	Sta 1305+38.00, 7.00' LI	
1011	Concrete Pipe Encasement	
1010	Per MAG Sid Det 507	
1009	Handrail Per MAG Sid Det 145	
1008		
1007		
1006		
1005		
1004		
1003		
1002		

SCALE: Hor: 1"=20' Vert: 1"=4'

INVESTIGATING: 602-263-1100

BLUE STAKE

SCALE IN FEET

RESUBMIT

MAHICOPA COUNTY  
DEPARTMENT OF UTILITIES  
ENGINEERING DIVISION

MC 85 BUCKEYE AVENUE &  
CENTER TURNpike EXPANSION  
PROJECT NO. TT345

DESIGNED BY: Z. Schmitt  
DRAWN BY: D. Turner  
CHECKED BY: M. Horn

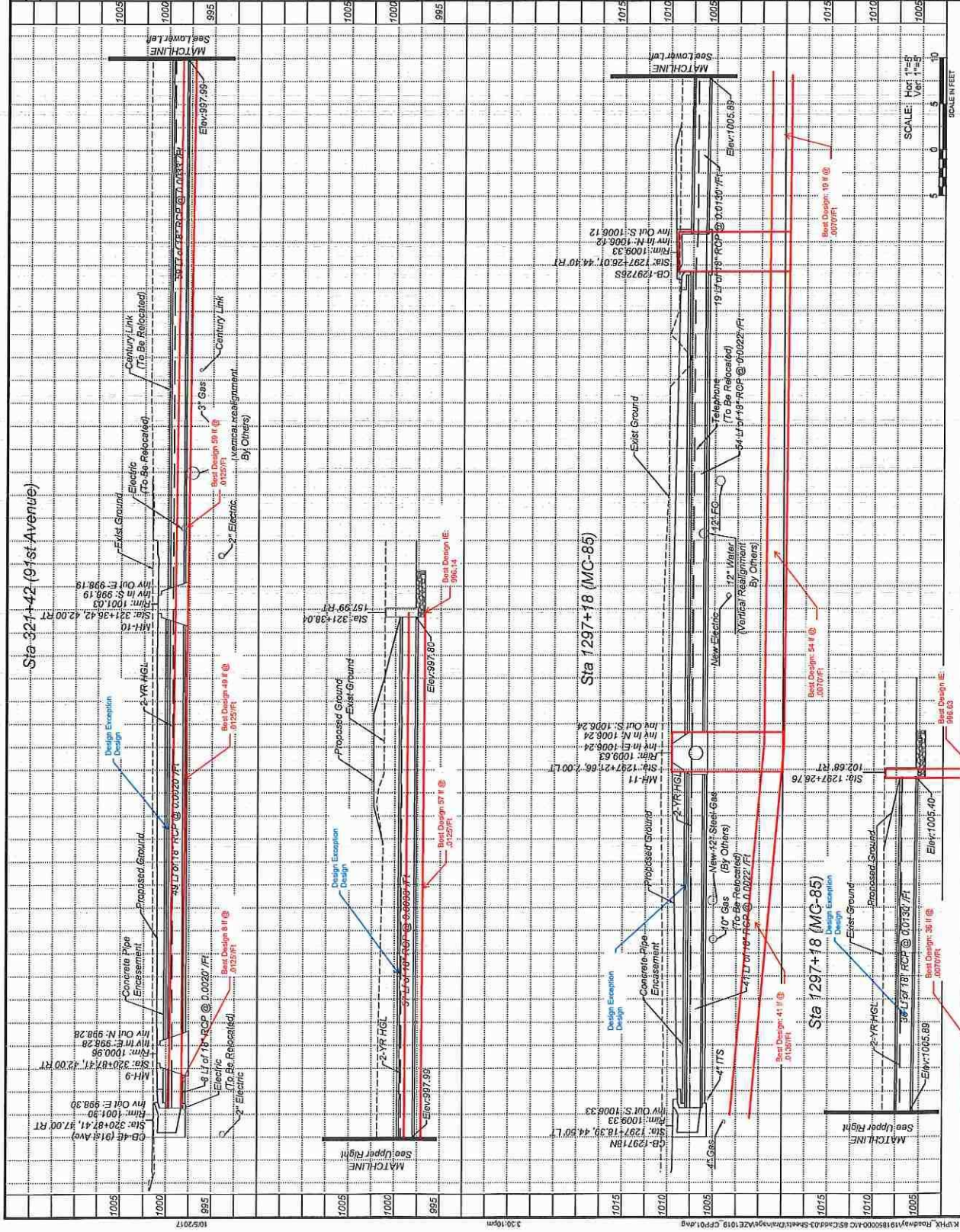
DATE: 10/20/17

**Kimley»Horn**

DRAINAGE PLANS  
Sht. 1303+50 to Sht. 1308+50



FINAL	STATE	PROJECT NO.	SHEET	TOTAL SHEETS	RECORD DRAWING
2	AZ	17345	124	238	



Refer to Sheet U03 for Water Relocation Details.

INDICATED CALL  
602-263-1100  
BLUE STAGE

NO.	REVISION	BY	DATE

MARICOPA COUNTY  
DEPARTMENT OF TRANSPORTATION  
ENGINEERING DIVISION  
MC 85 at 83RD AVENUE &  
CENTER TURN LANE EXPANSION  
PROJECT NO. 17345

DESIGNED	Z. Schmidt	BY	
DRAWN	D. Turner	CHECKED	
DATE	10/20/17		
	10/20/17		
	10/20/17		



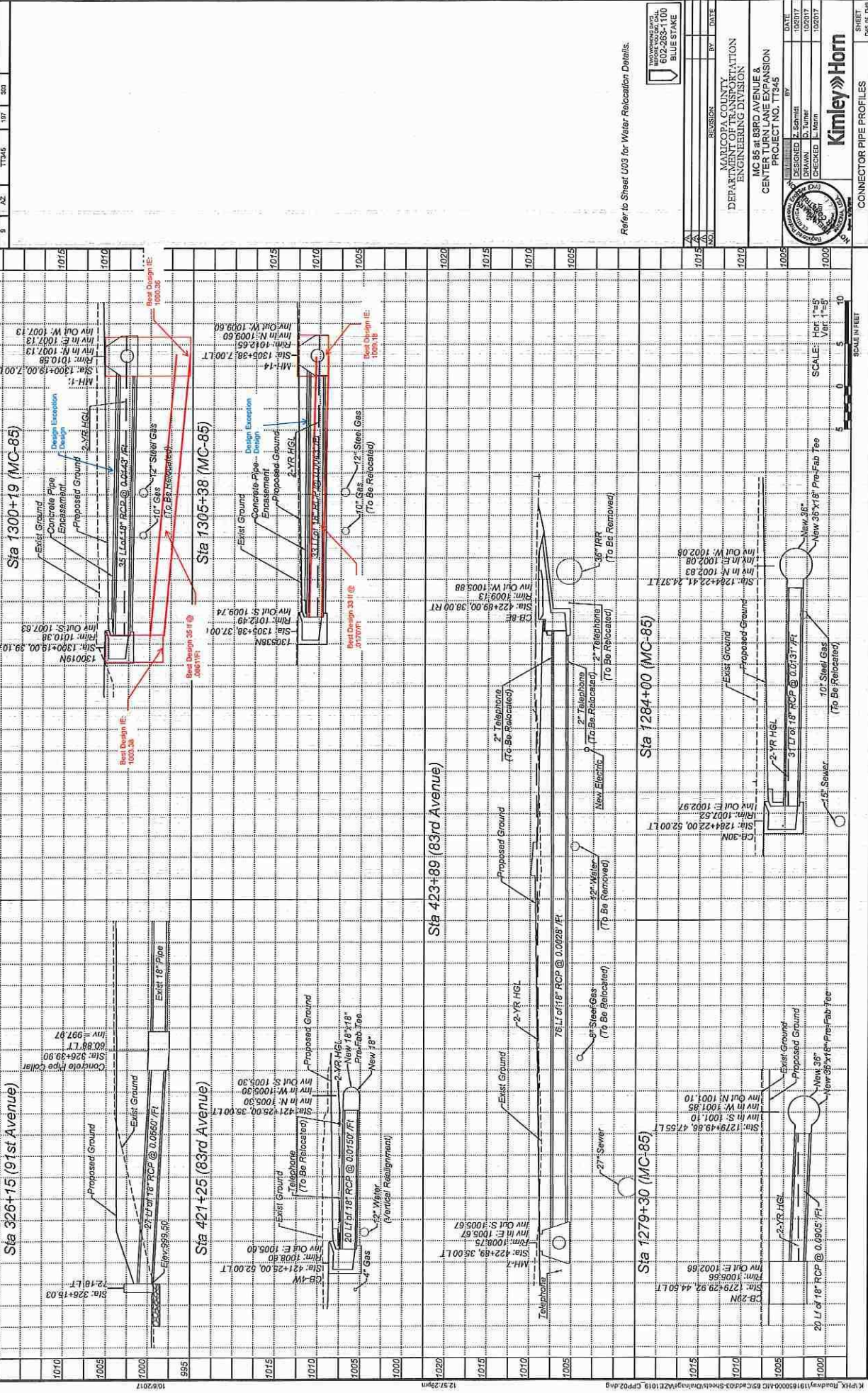
**Kimley-Horn**

CONNECTOR PIPE PROFILES  
SHEET  
041 OF 040



CLIENT	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
3	AE	17345	197	301	

1010	1015	1020	1025	1030	1035	1040	1045	1050	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120	1125	1130	1135	1140	1145	1150	1155	1160	1165	1170	1175	1180	1185	1190	1195	1200
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Refer to Street U03 for Water Relocation Details.



APPROVED FOR CONSTRUCTION	DATE
DESIGNED BY	DATE
CHECKED BY	DATE
DRAWN BY	DATE
PROJECT NO.	17345
PROJECT NAME	MC 85 at 83RD AVENUE & CENTER TURN LANE EXPANSION
ENGINEERING DIVISION	
<b>Kimley-Horn</b>	
CONNECTOR PIPE PROFILES	



1010	1015	1020	1025	1030	1035	1040	1045	1050	1055	1060	1065	1070	1075	1080	1085	1090	1095	1100	1105	1110	1115	1120	1125	1130	1135	1140	1145	1150	1155	1160	1165	1170	1175	1180	1185	1190	1195	1200
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# Best Design

## FlexTable: Conduit Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Diameter (in)	Flow (cfs)	Velocity (ft/s)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Start) (ft)	Invert (Stop) (ft)
CO-18	T-1	O-6	22.4	0.013	0.0084	12.0	2.70	4.66	990.00	987.38	988.45	988.38	987.51	987.38
CO-2S	2S	O-5	43.8	0.013	0.0110	18.0	2.40	4.98	988.43	984.60	984.09	984.09	982.93	982.59
CO-1S	1S	1N1S	47.1	0.013	0.0069	18.0	4.50	4.99	988.42	984.00	985.54	985.50	984.25	984.00
CO-11	MH-9	MH-10	53.9	0.013	0.0124	18.0	2.10	5.02	1,000.96	1,001.01	998.75	998.26	998.20	997.59
CO-10	CB-4E	MH-9	14.7	0.013	0.0125	18.0	2.10	5.02	1,001.30	1,000.96	998.85	998.87	998.30	998.20
CO-12	MH-10	O-3	105.8	0.013	0.0125	18.0	2.10	5.02	1,001.01	997.80	998.14	997.64	997.59	996.14
CO-15	10N	H-1	57.6	0.013	0.0280	18.0	0.80	5.04	993.90	989.70	990.73	990.61	990.40	989.11
CO-20	MH-11	CB-129726S	54.0	0.013	0.0070	18.0	4.80	5.07	1,009.63	1,009.33	998.42	998.39	997.39	997.01
CO-24	MH-12	MH-11	149.8	0.013	0.0100	18.0	2.90	5.08	1,010.58	1,009.63	1,001.01	998.55	1,000.36	997.39
CO-22	MH-14	MH-13	94.5	0.013	0.0170	18.0	1.50	5.09	1,012.65	1,011.59	1,009.64	1,005.10	1,009.18	1,004.56
CO-21	CB-130538N	MH-14	47.0	0.013	0.0170	18.0	1.50	5.09	1,012.49	1,012.65	1,010.20	1,009.77	1,009.74	1,009.18
CO-23	MH-13	MH-12	109.0	0.013	0.0170	18.0	1.50	5.09	1,011.59	1,010.58	1,005.02	1,001.15	1,004.56	1,000.36
CO-1N	1N	1S	127.5	0.013	0.0110	18.0	2.60	5.10	988.42	988.42	985.74	985.60	985.13	984.25
CO-2N	2N	2S	126.7	0.013	0.0250	18.0	1.00	5.18	988.43	988.43	985.30	984.11	984.93	982.93
CO-129726S	CB-129726S	O-4	67.3	0.013	0.0069	18.0	6.30	5.37	1,009.33	1,005.40	998.26	998.13	997.01	996.63
CO-25	CB-130019N	MH-12	53.8	0.013	0.0861	18.0	1.40	8.83	1,010.38	1,010.58	1,003.82	1,001.15	1,003.38	1,000.36
CO-17	CB-1E	T-1	31.5	0.013	0.0569	18.0	2.70	9.27	991.46	990.00	988.58	988.55	987.96	987.51
CO-19	CB-129718N	MH-11	53.2	0.013	0.0970	18.0	1.90	10.08	1,009.33	1,009.63	1,001.85	998.55	1,001.33	997.39



# Design Exception

## FlexTable: Conduit Table

Label	Start Node	Stop Node	Length (Scaled) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Diameter (in)	Flow (cfs)	Velocity (ft/s)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Start) (ft)	Invert (Stop) (ft)
CO-18	T-1	O-6	22.4	0.013	0.0084	12.0	2.70	4.66	990.00	987.38	988.45	988.38	987.51	987.38
CO-25	2S	O-5	43.8	0.013	0.0029	18.0	2.40	3.07	988.43	984.60	986.11	986.10	984.69	984.60
CO-15	1S	1N1S	47.1	0.013	0.0069	18.0	4.50	4.99	988.42	984.00	985.54	985.50	984.25	984.00
CO-11	MH-9	MH-10	53.9	0.013	0.0020	18.0	2.10	2.58	1,000.96	1,001.01	999.37	999.35	998.28	998.19
CO-10	CB-4E	MH-9	14.7	0.013	0.0020	18.0	2.10	2.58	1,001.30	1,000.96	999.40	999.40	998.30	998.28
CO-12	MH-10	O-3	105.8	0.013	0.0033	18.0	2.10	3.12	1,001.01	997.80	999.34	999.30	998.19	997.80
CO-15	10N	H-1	57.6	0.013	0.0280	18.0	0.80	5.04	993.90	989.70	990.73	990.61	990.40	989.11
CO-20	MH-11	CB-129726S	54.0	0.013	0.0022	18.0	4.80	3.18	1,009.63	1,009.33	1,007.42	1,007.30	1,006.24	1,006.12
CO-24	MH-12	MH-11	149.8	0.013	0.0030	18.0	2.90	3.26	1,010.58	1,009.63	1,007.89	1,007.52	1,007.13	1,006.24
CO-22	MH-14	MH-13	94.5	0.013	0.0043	18.0	1.50	3.11	1,012.65	1,011.59	1,010.07	1,008.98	1,009.60	1,008.44
CO-21	CB-130538N	MH-14	47.0	0.013	0.0043	18.0	1.50	3.12	1,012.49	1,012.65	1,010.23	1,010.19	1,009.74	1,009.60
CO-23	MH-13	MH-12	109.0	0.013	0.0053	18.0	1.50	3.36	1,011.59	1,010.58	1,008.89	1,007.99	1,008.44	1,007.13
CO-1N	1N	1S	127.5	0.013	0.0110	18.0	2.60	5.10	988.42	988.42	985.74	985.60	985.13	984.25
CO-2N	2N	2S	126.7	0.013	0.0030	18.0	1.00	2.44	988.43	988.43	986.13	986.13	984.93	984.69
CO-129726S	CB-129726S	O-4	67.3	0.013	0.0130	18.0	6.30	6.87	1,009.33	1,005.40	1,007.09	1,006.90	1,006.12	1,005.40
CO-25	CB-130019N	MH-12	53.8	0.013	0.0143	18.0	1.40	4.69	1,010.38	1,010.58	1,008.07	1,007.99	1,007.63	1,007.13
CO-17	CB-1E	T-1	31.5	0.013	0.0569	18.0	2.70	9.27	991.46	990.00	988.58	988.55	987.96	987.51
CO-19	CB-129718N	MH-11	53.2	0.013	0.0022	18.0	1.90	2.62	1,009.33	1,009.63	1,007.53	1,007.52	1,006.33	1,006.24