INNERARITY ISLAND UTILITIES SYSTEM
EVALUATION REPORT

Prepared by:

KH&A
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Prepared for:
Innerarity Island Development Corporation

JANUARY 2014

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BACKGROUND

The Innerarity Island Development Corporation (IIDC) provides water and wastewater service to the residents of Innerarity Island in southwestern Escambia County, FL (see Exhibit A for location map). Water is purchased from the Emerald Coast Utilities Authority (ECUA) and resold to the residents. Wastewater is collected in a gravity sewer system and conveyed via a system of lift stations and force mains to ECUA lift station No. 380. Wastewater is metered at the forcemain leaving the island. IIDC pays for wastewater independently of the potable water purchased. Water and sewer services provided by IIDC are subject to regulation by the Public Service Commission of the State of Florida.

In an effort to explore the possibility of transferring the water & sewer infrastructure to ECUA for ownership, operation and maintenance, the IIDC commissioned Kenneth Horne & Associates, Inc. (KHA) to prepare an evaluation of the systems and identify any maintenance and capital improvement requirements that would be prerequisite for ECUA acceptance. The purpose of this report is to document the results of that investigation. The approximate geographic limits of the IIDC franchise area is depicted in Exhibit A.

SUMMARY OF INVESTIGATIVE SERVICES

Onsite investigative services of existing conditions were performed throughout the IIDC franchise area to evaluate the existing water and sewer systems. This investigation included the following services:

- Locate and flag existing utility lines
- Survey all right-of-ways, easements, and marked utilities
- Video inspection and cleaning of all sewer lines
- Fire hydrant and dead-end flush valve testing and evaluation
- Manhole and lift station inspections
- Potholing of utilities to determine size and materials of construction
- Evaluation of the existing water and sewer capacity versus anticipated future needs

The results of these investigations were then analyzed to determine where deficiencies in the systems might exist and what remedial action would likely be required for ECUA acceptance. System maps, video inspection reports, and manhole inspection reports are included in the appendices to this report. While KHA is familiar with ECUA standards and has strived to evaluate the system accordingly, these recommendations are subject to review and concurrence from ECUA staff. A map of the water and wastewater infrastructure as surveyed by Merrill Parker Shaw, Inc. is included with this report.

EXECUTIVE SUMMARY

While recognizing that the final authority on what constitutes minimum requirements for ECUA acceptance will rest with the ECUA staff and Board of Directors, KHA has estimated those requirements and associated costs as follows:

Water system improvements would consist of: a) relatively minor main relocations to remove encroachments of the water facilities from private properties, b) water service renewals to remove polybutylene tubing and replace aging meters, and c) main size improvements along the primary trunk line in combination with construction of finished water storage to enhance fire flow capacity. The estimated cost for water related improvements is approximately $1.6 million. Should fire flow enhancements be deemed unnecessary at this time, the estimated cost would be reduced to less than $0.5 million.

Sanitary sewer system improvements would consist primarily of: a) relocation of sewer and force mains as necessary to eliminate encroachments onto private property, and b) correction of slope deficiencies in the sanitary sewer system by either reconstruction of substantial portions of the gravity collections system or replacement with a low pressure system. The reconstruction alternative would involve either replacement or major rehabilitation of all lift stations on the island while the low pressure option would replace all gravity collection on the island leaving only the relatively new gravity collection in the Russell Bayou development in service. The estimated cost for sewer related improvements is either $4.5 million for replacement of conventional gravity sewer or $2.3 million for installation of a low pressure system on the island.

It is estimated that the development time for these improvements allowing for design, permitting, bidding, and construction could be in the range of two to three years.

DETAILED FINDINGS

Water System

The water system provides domestic water to 190 customers via a distribution system consisting of approximately 41,300 linear feet of water main in sizes from 8" down to 2", see Table 1 below. Water purchased from the ECUA is metered through a 6" meter located at the east end of the causeway to Innerarity Island.

Table 1
Water Distribution System

Water Main	
Size	Total Length (LF)
2 inch	3,484
3 inch	3,332
4 inch	7,356
6 inch	24,208
8 inch	2,919
Total	41,299

There are currently a total of 602 single family detached residential lots within the various development phases of Innerarity Island and Russell Bayou. In addition to the 602 single family detached residential lots, the IIDC reports 68 Townhome style units on the north side of Innerarity Point Road just across the causeway. Of the 602 single family detached residential lots, approximately 190 are currently developed and approximately 412 are undeveloped. See Exhibit B for graphical depiction.

A summary of the existing and projected water demand for the Island based upon both current water customers and the potential number of customers should all of the lots be built out is provided in Table 2 below. Design flow rate has been assumed to be 350 GPD per unit.

Table 2
IIDC Domestic Water Demand

	No. of Users	Gallons per day at 350 g/residence	Usage per month (30 days) g/month	Average gpm	Peak* gpm
Current	258	90.300	2,709,000	63	241
Build Out	670	234,500	7,035,000	163	622

* Peak - Avg GDP x 3.82

Table 3 below provides a comparison of total water purchased from ECUA in 2012 versus the total water metered and billed to IIDC customers.

Table 3
IIDC Water Purchased Versus ECUA Water Billed

	IIDC Metered Flow for 2012*
	Gallons
January	3,339,471
February	1,898,497
March	1,612,493
April	2,216,243
May	3,177,883
June	5,184,828
July	2,930,416
August	2,320,286
September	2,613,637
October	4,107,992
November	3,957,775
December	3,339,471
Total 2012	36,698,992

* Includes metered flow to townhomes and non-residential users.

Given the existing projected and metered flow data to the island, it is the writer's opinion that the existing water distribution infrastructure is sufficient to meet the domestic demand for current and foreseeable short term growth needs. It is possible, that system demands might warrant main size increases to ensure sufficient pressure at peak demand times at some point in time between current development density and buildout density.

The results of fire flow testing for the fire hydrants within the IIDC franchise are provided in Table 4.

Table 4
Innerarity Island Development Corporation
Fire Hydrant Test Results

Hydrant	Test Date	Nozzle Size	Pitot Reading	GPM	Ref Hydrant	Static B	Residual B	Projected @ 20 psig
1	5/14/2013	2.5	475	475		62	8	414
2	5/14/2013	2.5	8	475	22	62	12	432
3	5/14/2013	2.5	5	375		62	8	325
4	5/14/2013	2.5	5	375	5	62	8	328
5	5/14/2013	2.5	5	375		62	8	328
6	5/14/2013	2.5	5	411	7	58	5	343
7	5/14/2013	2.5	6	411	8	58	6	347
8	5/14/2013	2.5	5	411	7	58	6	347
9	5/14/2013	2.5	5	375	10	56	5	311
10	5/14/2013	2.5	5	375		58	5	313
11	5/14/2013	2.5	6	411	10	54	6	341
12	5/14/2013	2.5	6	411	11	61	6	351
13	5/14/2013	2.5	6	411	12	61	6	352
14	5/14/2013	2.5	8	475	13	61	8	413
15	5/14/2013	2.5	5	375	14	58	5	313
15*	11/4/2013	2.5	13	575	17	80	10	
16	5/14/2013	2.5	5	375	15	54	5	308
16*	11/4/2013	2.5	13	600	15	80	10	
17	5/14/2013	2.5	5	375		54	5	308
18	5/14/2013	2.5	5	375	6			308
19	5/14/2013	2.5	6	411	18	58	6	347
20	5/14/2013	2.5	8	475	19	60	8	412
21	5/14/2013	2.5	5	375	19	54	5	308
22	5/14/2013	2.5	8	475	2	62	8	432
23	5/14/2013	2.5	5	375	22	60	5	316
24	5/14/2013	2.5	5	375	23	58	5	313
25	5/14/2013	2.5	1	168	24	58	0	134
25*	11/4/2013	2.5	15	650	24	72	10	
26	5/14/2013	2.5	10	531	25	55	10	463
27	5/14/2013	2.5	10	531	26	56	10	
28	5/14/2013	2.5	10	531	27	58	10	468
29	5/14/2013	2.5	8	475	27	58	8	409
30	5/14/2013	2.5	10	531	27	56	10	465
31	5/14/2013	2.5	6	411	18	52	6	338
32	5/14/2013	2.5	7	444	18	54	7	373
33	5/14/2013	2.5	6	411	15	54	6	341

* Retest following valving adjustment @ ECUA point of service.

Water System Deficiencies and Possible Corrections Identified

1) Deficiency:
Utility Encroachments Beyond Right-of-Way and/or Easement Lines. Exhibit C provides graphic representation of the locations where water distribution and sewer collection lines are installed outside the right-way per the survey. Table 5 below provides a quantitative summary of these encroachments.

Table 5
Quantitative Summary of Water and Sewer Line Encroachments

Mark	Street	Size	Water (LF)	Force Main (LF)	Sewer (LF)	Manholes (EA)	Asphalt (SY)	Private	Developed
1	Shores Circle	4"	60					P	U
2	Red Cedar Street	3"		300				P	U-D
3	Red Cedar Street (East)	8" PVC			170	1		P	D
4	Innerarity Circle	8" Clay			100	2		P	D
5	Innerarity Circle	No Size	100				33	P	D
6	Innerarity Circle	3"	170					P	U-D
7	Greenway	No Size	40					P	D
8	Innerarity Road	4"		See 2				P	D
9	Atoll Drive	6"	110					P	U-D
10	Atoll Drive	6"	40					P	U
11	Boca Ciega Drive	8" PVC			210	3		P	U
12	Bocaccio Drive	6"	120					P	U
13	Bocaccio Drive	3"	10					P	U
14	Bocaccio Drive	3"	30					P	U
15	Boca Ciega Drive	6"	60					P	U
16	Boca Ciega Drive	6"	60					P	U
17	Boca Ciega Drive	6"	100					RBHOA	RETENTION
18	Narwhal Drive	6"	60					P	U
19	Narwhal Drive	6"	160					P	U
20	Narwhal Drive	3"	20					RBHOA	POOL
21	Narwhal Drive	6"	250					P	U
22	Narwhal Drive	6"	100					RBHOA	LIFT STAT
23	Tarpon Drive	3"	40					P	U
24	Innerarity Road	8" PVC			70	3		P	D
25	Innerarity Road	8" PVC			200	1		P	U
26	Innerarity Road	6"	30					ITHA	D
27	North Shore Road	3"		30				P	U
28	Seascape Circle	2"	25					IIDC	U
29	North Shore Road	6"	210					P	U
TOTAL			1795	330	750	10	33		

Solution:

The encroachments should be eliminated by removal and replacement of the encroaching utilities to a location within the existing right-of-way. The estimated cost of these relocations is depicted below in line items #1 and #2 of Table 6. A limited number of these encroachments may be mitigated by securing additional easements or right-of-way.

2) Deficiency:

Fire Flow Capacity. The Florida Fire Code (2010) requires a minimum of 1,000 gpm fire protection water flow to one and two family dwellings (Section 18.4.5.1.1). This value can be reduced by 50% if dwellings are provided with sprinkler protection and by 25% if the residences are spaced 30 feet apart. Sprinkler protection is not provided to the dwellings, however the residences are generally 30' apart. The desired fire flow at each hydrant is therefore 750gpm. The Ten States Standards for water distribution systems states that the minimum acceptable pressure in the water distribution is 20 psig (Part 8, paragraph 2.1). The Escambia County "Land Development Code" requires a 500 feet maximum distance from a residence to a fire hydrant (Part II, Article 4, Section 4.04.12).

As documented in Table 4 above, there are no locations where fire flow capacity and associated residual pressure met or exceeded the accepted standards to support new residential development at the time the tests were conducted. Exhibit D provides a graphic representation of the areas of the development currently within the required 500 feet of a fire hydrant. Note that there are two areas of current residential development outside the 500 foot radius.

Solution:

Potential measures to improve fire flow capacity include: a) increasing distribution main size around main "loop" and along the entire length of Innerarity Point Road (see Exhibit E), b) adding finished water storage at the west end of the island, and c) adding three new fire hydrants to close gaps in fire hydrant coverage. Below, Table 6 details the estimated costs for these improvements.

We have assumed replacement of the existing 6" main along Innerarity Point Road and North Shore Road with an 8" water main (approximately 8,800 LF) and adding 250,000 gallons of finished water storage on the west side of the island. For estimating purposes, elevated storage has been assumed. It is possible that ECUA may prefer ground storage with high service pumps.

3) Deficiency:

Material of Residential Water Services. The originally installed water service tubing was determined to be primarily of polybutylene material. This material has since been discovered to have a short life span. Therefore, ECUA and other utility providers have ongoing programs to eliminate its use within distribution systems. While some services within the IIDC franchise area have already been replaced or partially repaired, it is believed that most of the services still contain some segments of polybutylene tubing. ECUA staff has also noted that the meter boxes and meter types must be upgraded to meet their current standard.

Solution:

Replacement of the water services from the main tap through the meter and box will be required for ECUA acceptance. Therefore, line item #3 of Table 6 below includes cost allowances for these replacements. The estimated cost of a new meter at each existing service is $550 and the allowance for the replacement of the service line is an estimated average of $350. The ECUA impact fee of $845 is also included in the table as a separate item.

Table 6
Water System Probable Cost Estimate

Item	Description	Quantity	Unit	Unit Price	Amount
1	WATER MAIN RELOCATES	1795	LF	$12	21,540
2	CONNECT TO EXISTING	78	EA	$225	17,550
3	WATER SERVICE RENEWALS	198	EA	$350	69,300
4	REPLACE WATER METERS	198	EA	$550	108,900
5	NEW FIRE HYDRANTS	3	EA	$3,200	9,600
6	NEW 8" WATER MAIN	8800	LF	$22	193,600
7	250,000 FINISHED WATER STORAGE	1	EA	$800,000	800,000
	SUB TOTAL				$1,220,490
	CONTINGENCY @ 15%				$183,074
	CONSTRUCTION TOTAL				**$1,220,490**
				10% ADMINISTRATIVE	122,049
				6.8% DESIGN	82,993
				3.5% CA	42,717
	WATER SERVICE IMPACT FEE	198	EA	$845.00	167,310
	PROJECT TOTAL				**$1,635,559**
NOTE: EACH HOMEOWNER WILL BE REQUIRED TO SIGN SERVICE AGREEMENT AND PAY A $21.50 DEPOSIT.					

Sewer System

The sanitary sewer system provides wastewater collection and conveyance to 135 customers via a gravity collection system consisting of approximately 27,600 linear feet of 8" gravity sewer, three secondary lift stations and two primary lift stations, see Table 7 below. The attached survey documents the location of each system feature including line size and material of construction.

Table #7
Wastewater Collection System

Gravity Sewer			
Size	Material	Total Length (LF)	
8 inch	PVC	25,817	
8 inch	VCP	1,741	
TOTAL		27,558	
Sewer Forcemain			
Size		Total Length (LF)	
2 inch		917	
3 inch		1,636	
4 inch		1,955	
6 inch		3,599	
TOTAL		8,107	
Liftstations			
Sta.	Diameter	Depth	Pump*
Russell Bayou	6'	20.40'	Submersible
1	6'	20.46'	Submersible
2	4'	16.51'	Grinder
3	4'	11.54'	Grinder
4	4'	12.78'	Grinder

* All pumps are duplex.

Russell Bayou Pumps are Hydromatic S-4P 7.5 HP

The two primary lift stations transfer the collected waste water to the existing ECUA lift station at the east end of the island. The ECUA lift station transfers the waste water to the ECUA waste water collection system via an existing eight-inch forcemain on Innerarity Point Road. This wastewater flow is measured by a flow meter located in the discharge line at the ECUA lift station site. Wastewater billing is based upon the flow recorded at the wastewater meter and is independent of the quantity of potable water purchased from ECUA. Table 8 provides the monthly wastewater generation rate as measured form the meter at the ECUA lift station site.

Table 8
ECUA Sewer Metered

	ECUA Metered Flow (gal)
January	817,198
February	755,781
March	833,722
April	845,530
May	747,277
June	738,058
July	1,491,003
August	874,770
September	1,261,854
October	861,255
November	734,152
December	646,651
Total 2012	10,607,251

Sewer System Deficiencies and Possible Corrections Identified

The sewer lines were cleaned and camera inspected to determine the condition of each line segment. Visual inspections of all manholes were also completed by KHA in collaboration with ECUA staff. A table summarizing the results of these inspections is attached as Exhibit F. The list below provides a detailed description of the deficiencies noted.

1) *Utility Encroachments Beyond Right-of-Way and/or Easement Lines.* Similar to the water system mentioned above, there are several sewer collection line segments that appear to encroach upon private property according to the survey. Exhibit C provides graphic representation of the locations where sewer system lines, gravity and force mains, are installed outside the right-way. Table 5 provides a quantitative summary of these encroachments.

2) *Insufficient Slopes.* Many of the gravity sewer system segments between manholes do not have adequate slope to support gravity flow in accordance with industry standards. While no history of chronic chokes or clogs exists, the industry standard and ECUA standard both require a minimum of 0.4% slope for 8" gravity lines. Exhibit G shows the location of line segments that do not meet the minimum slope.

3) *Infiltration/Inflow.* A comparison of the 2012 flow data (as estimated from run time reports at the ECUA lift station) to rainfall for the same period indicates two occurrences of distinct correlation between rainfall and run-time spikes. The video reports as completed by SBP and the manhole inspections revealed several infiltration/inflow points. Some of these may warrant immediate attention as a cost saving measure.

   It was also observed that numerous manholes are constructed at or below surrounding grade and lack inflow seals.

4) *Lift Stations*: The following are individual evaluations and required corrections for each of the system's lift stations.

   a. Russell Bayou Lift Station: The existing lift station was built to meet the ECUA Lift Station Standards in effect at the time of construction. The electrical system does not, however, meet current electrical requirements.

      The following ECUA requirements will need to be completed before this station would be acceptable by ECUA. 1. Replace electrical control system with a current ECUA design panel and wiring system including the installation of a SCADA system with antenna. New panel to be a minimum of 12" above FEMA flood level. 2. Install guide rails for pump removal. 3. Replace the wet well top with a hatch designed for guide rail pump removal. (Raise top of lift station to above FEMA flood level.) 4. Replace wet well piping with stainless steel and install above grade valve system based on ECUA Standards. 5. Line wet well for corrosion resistance.

   b. Lift Station #1: The existing lift station does not meet ECUA Design Standards.

      The following ECUA requirements will need to be completed before this station would be acceptable by ECUA. 1. Replace electrical with a current 3 phase ECUA design panel and wiring system including the installation of a SCADA system with antenna. New panel to be a minimum of 12" above FEMA flood level. 2. Install new 3 phase pumps with guide rails for pump removal. 3. Replace the wet well top with a hatch designed for guide rail pump removal. 4. Replace wet well piping with stainless steel and install above grade valve system based on ECUA Standards. 5. Line wet well for corrosion resistance.

   c. Lift Station # 2: The existing lift station utilizes a deep 4' diameter manhole in the roadway for the wet well and a 1 phase duplex grinder pump system. The existing lift station does not meet ECUA Standards.

      The following ECUA requirements will need to be completed before this station would be acceptable by ECUA. 1. Install a new minimum 6' diameter wet well outside the roadway right-of-way. 2. Replace electrical with a current 3 phase ECUA design panel and wiring system including the installation of a SCADA system with

antenna. New panel to be a minimum of 12" above FEMA flood level. 3. Install new 3 phase pumps with guide rails for pump removal. Pumps to be at least 5 HP - 3 phase. 3 phase may be accomplished using a VFD system if 3 phase power is unavailable. 4. The wet well top shall have a hatch designed for guide rail pump removal. (Raise top of lift station to above FEMA flood level.) 5. Replace wet well piping with stainless steel and install above grade valve system based on ECUA Standards. 6. Line wet well for corrosion resistance.

d. Lift Station # 3: The existing lift station utilizes a deep 4' diameter manhole in the roadway for the wet well and a 1 phase duplex grinder pump system. The existing lift station does not meet ECUA Standards.

   The following ECUA requirements will need to be completed before this station would be acceptable by ECUA. 1. Install a new minimum 6' diameter wet well outside the roadway right-of-way. 2. Replace electrical with a current 3 phase ECUA design panel and wiring system including the installation of a SCADA system with antenna. New panel to be a minimum of 12" above FEMA flood level. 3. Install new 3 phase pumps with guide rails for pump removal. Pumps to be at least 5 HP - 3 phase. 3 phase may be accomplished using a VFD system if 3 phase power is unavailable. 4. The wet well top shall have a hatch designed for guide rail pump removal. (Raise top of lift station to above FEMA flood level.) 5. Replace wet well piping with stainless steel and install above grade valve system based on ECUA Standards. 6. Line wet well for corrosion resistance.

e. Lift Station # 4: The existing lift station utilizes a deep 4' diameter manhole in the roadway for the wet well and a 1 phase duplex grinder pump system. The existing lift station does not meet ECUA Standards.

   The following ECUA requirements will need to be completed before this station would be acceptable by ECUA. 1. Install a new minimum 6' diameter wet well outside the roadway right-of-way. 2. Replace electrical with a current 3 phase ECUA design panel and wiring system including the installation of a SCADA system with antenna. New panel to be a minimum of 12" above FEMA flood level. 3. Install new 3 phase pumps with guide rails for pump removal. Pumps to be at least 5 HP - 3 phase. 3 phase may be accomplished using a VFD system if 3 phase power is unavailable. 4. The wet well top shall have a hatch designed for guide rail pump removal. (Raise top of lift station to above FEMA flood level.) 5. Replace wet well piping with stainless steel and install above grade valve system based on ECUA Standards. 6. Line wet well for corrosion resistance.

5) *System Capacity*: The gravity sewer system comprised of 8" gravity sewer line segments, manholes and lift stations have adequate capacity for the current population and potential future growth with the following limitations. 1) The gravity lines, although sufficient in placement and size, have many segments of inadequate slope for proper operation. 2) The

lift stations transferring the waste water from the community are adequate in size for the current population but do not meet all FDEP and ECUA guidelines.

Possible Solutions to Sanitary Sewer System:

The deficiencies in the sewer system listed above can be addressed by removal and replacement of the existing portions of the sewer with insufficient slopes and reconstruction and/or rehabilitation of the sanitary sewer lift stations to meet ECUA and FDEP standards, or by replacement of the bulk of the collection system on the island with a low pressure system (see Exhibit H for graphical depiction of low pressure system). Note there could be substantial resistance from the existing customer base to the low pressure alternative. Having had gravity sewer service for many years, the customers may be averse to the reliability and aesthetic issues associated with individual grinder stations.

Conceptual cost estimates for each of these alternatives are presented below. See Tables 9 and 10.

Table 9
Sewer Rehab Conventional System Probable Cost Estimate

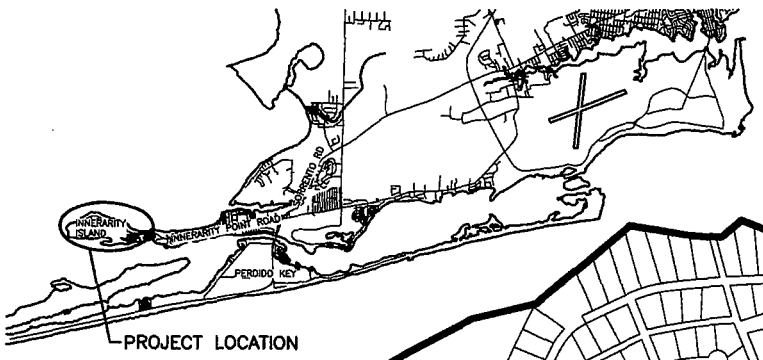
Item	Description	Quantity	Unit	Unit Price	Amount
1	MAIN ISLAND GRAVITY SWR REBUILD	20500	LF	$125	2,562,500
2	SANITARY SEWER LS'S	3	EA	$170,000	510,000
3	RUSSELL BAYOU SWR MH (116-118)	451	LF	$125	56,375
4	RUSSELL BAYOU LS IMPROVEMENTS	1	LS	$135,000	135,000
5	INSERTS FOR RUSSELL BAYOU MHS	26	EA	$175	4,550
	SUBTOTAL				3,268,425
	CONTINGENCY AT 15%				490,264
	CONSTRUCTION TOTAL				**3,758,689**
				10% ADMINISTRATIVE	375,869
				6.00 DESIGN	234,918
				3.5% CA	131,554
	PROJECT TOTAL				**$4,501,029.78**

Table 10
Low Pressure Sewer System Probable Cost Estimate

Item	Description	Quantity	Unit	Unit Price	Amount
1	MH REMOVAL & STREET PATCH	96	EA	$1,500	144,000
2	GROUT EX. SS	20500	LF	$2.25	46,125
3	3" PVC FORCE MAIN	19960	LF	$8	159,680
4	4" PVC FORCE MAIN	2440	LF	$10	24,400
5	6" PVC FORCE MAIN	3270	LF	$12	39,240
6	3" GATE VALVE	43	EA	$450	19,350
7	4" GATE VALVE	5	EA	$575	2,875
8	6" GATE VALVE	4	EA	$750	3,000
9	STREET CUT & PATCH FOR FM	960	SY	$35	33,600
10	SERVICE CONNECTIONS	137	EA	$450	61,650
11	GRINDER INSTALLATION	137	EA	$6,500	890,500
12	RUSSELL BAYOU LS IMPROVEMENTS	1	LS	$195,000	195,000
13	INSERTS FOR RUSSELL BAYOU MHS	26	EA	$175	4,550
14	RUSSELL BAYOU SWR MH (116-118)	451	LF	$125	56,375
	SUBTOTAL				1,680,345
	CONTINGENCY AT 15%				252,052
	CONSTRUCTION TOTAL				**1,932,397**
				10% ADMINISTRATIVE	193,240
				6.4% DESIGN	120,775
				3.5% CA	67,634
	PROJECT TOTAL				**$2,314,045.11**

CONCLUSION

Assuming ECUA concurrence with the remedial measures recommended herein, the estimated cost for rehabilitation of the water system is $1.6 million and the estimated cost for rehabilitation of the sewer collection system is $4.5 million. Therefore, the total estimated cost for completion of these remedial measures is $6.1 million assuming conventional gravity sewer rehabilitation or $3.9 million if the low pressure sewer alternative is selected. It is estimated that once initiated, the design-permitting-bidding phase for the recommended improvements would be eight to twelve months and construction could take twelve to eighteen months. Therefore, total time from commencement to completion is estimated to be in the range of twenty to thirty months.



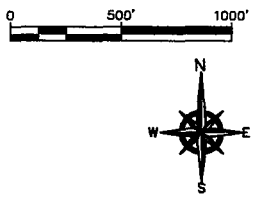


EXHIBIT A

KH&A Kenneth Horne & Associates, Inc.
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NO.	REVISIONS	APPROVED BY	DATE
1			
2			
3			
4			
5			

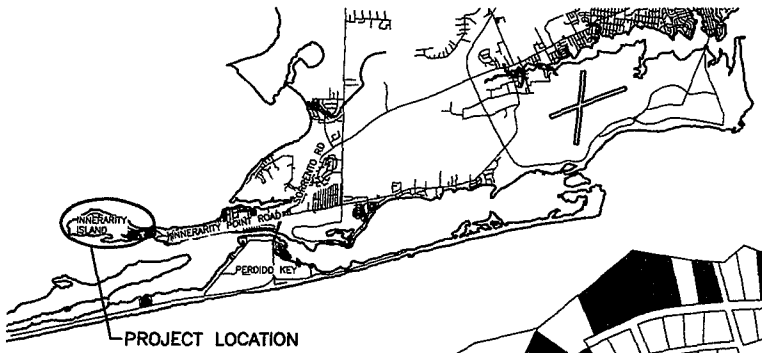
PROJECT NAME: II UTILITY TRANSFER

IIDC FRANCHISE AREA

PROJECT NO.: 2013-11

BY: DIC DATE: DEC 2013

SHEET 1 OF 1



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LEGEND

- DEVELOPED RESIDENTIAL
- UNDEVELOPED RESIDENTIAL
- COMMON AREA–DEVELOPED

PARCEL COUNT:

UNDEVELOPED RESIDENTIAL:	412
DEVELOPED RESIDENTIAL:	190
COMMON AREA–DEVELOPED:	1
TOTAL	603

EXHIBIT B

KH&A Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9th, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471–9005 INFO@KH–A.COM FAX (850) 471–0093

NO.	REVISIONS	APPROVED BY	DATE
1			
2			
3			
4			
5			

PROJECT NAME: II UTILITY TRANSFER
DEVELOPED PARCELS
PROJECT NO.: 2013–11
BY: DIC DATE: DEC 2013
SHEET 1 OF 1

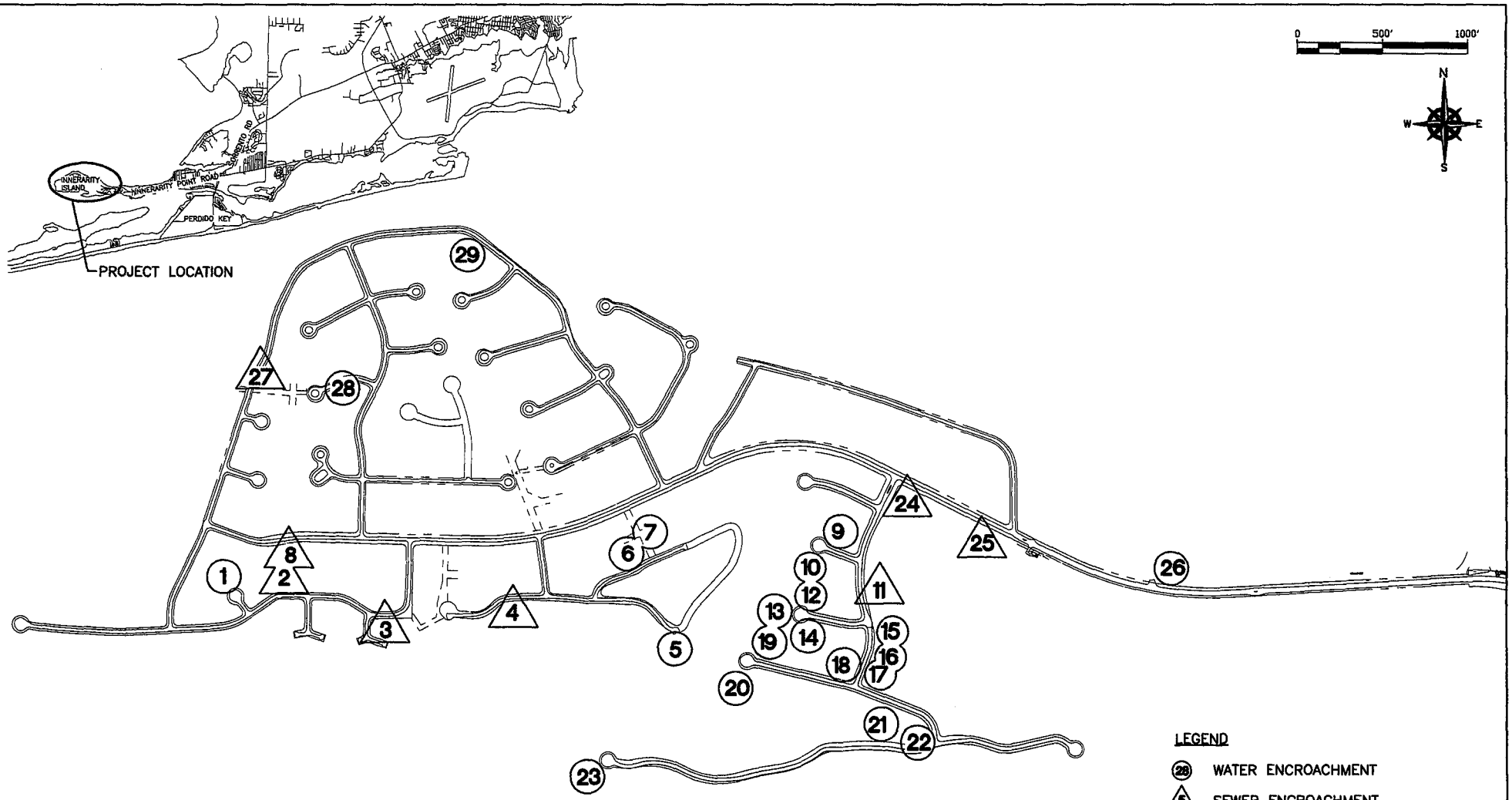

EXHIBIT C

KH&A Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9th, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

NO.	REVISIONS	APPROVED BY	DATE
1			
2			
3			
4			
5			

PROJECT NAME: II UTILITY TRANSFER

UTILITY ENCROACHMENT-KEY SHEET

PROJECT NO.: 2013-11

BY: DIC DATE: DECEMBER 2013

SHEET 1 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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(IN FEET)

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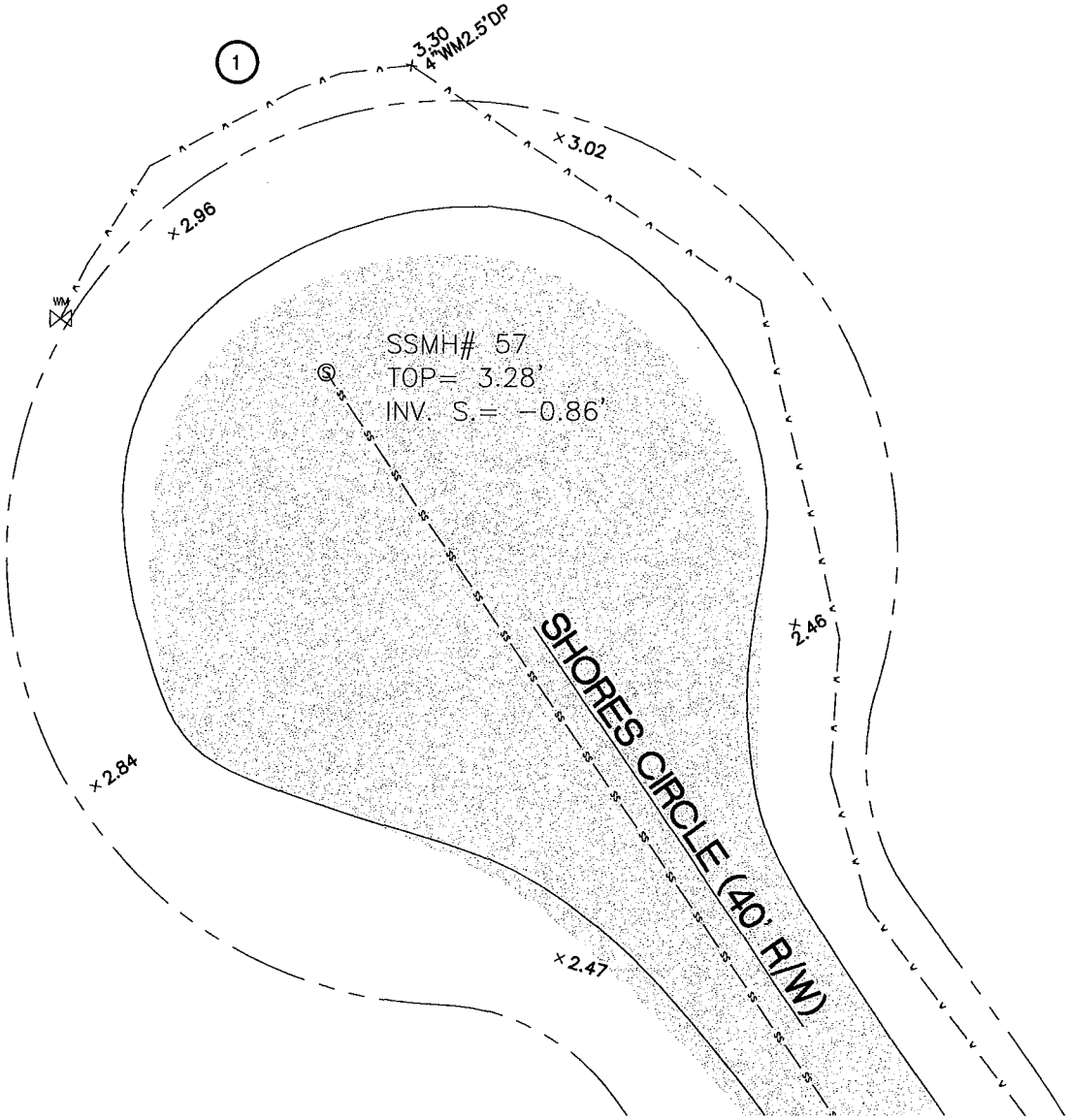

EXHIBIT C

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CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 1
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	2 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

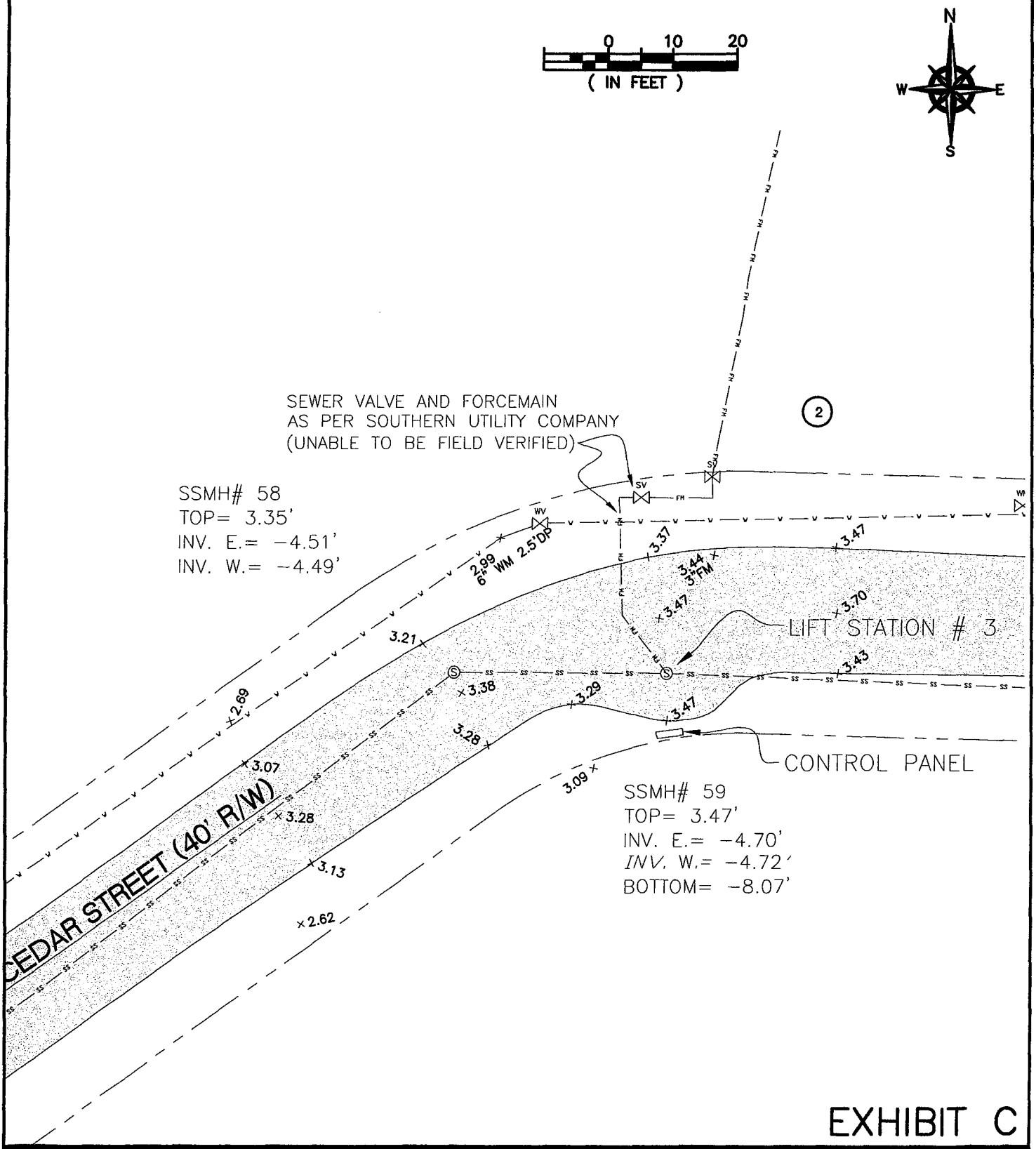

EXHIBIT C

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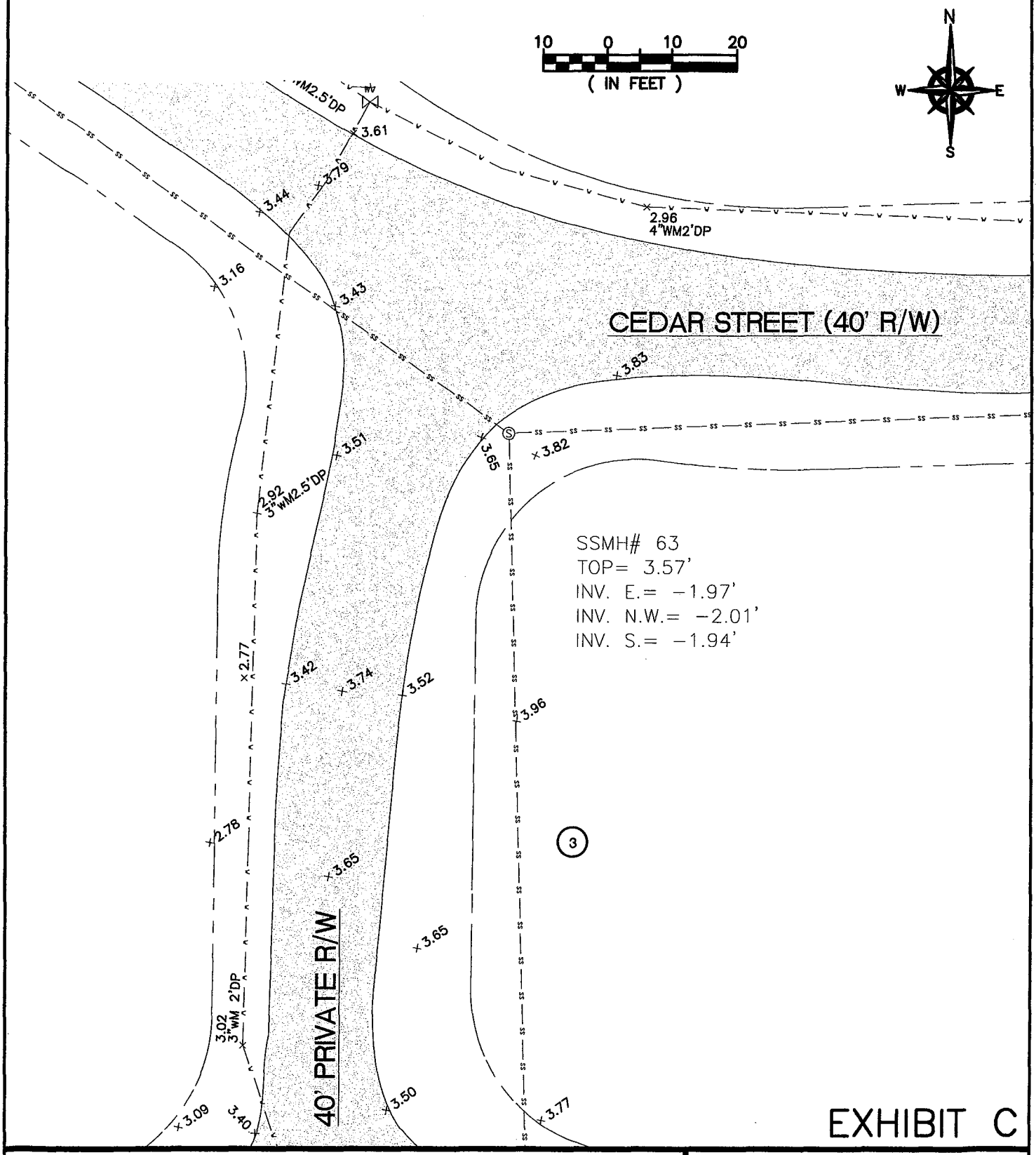
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 2
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	3 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 3
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	4 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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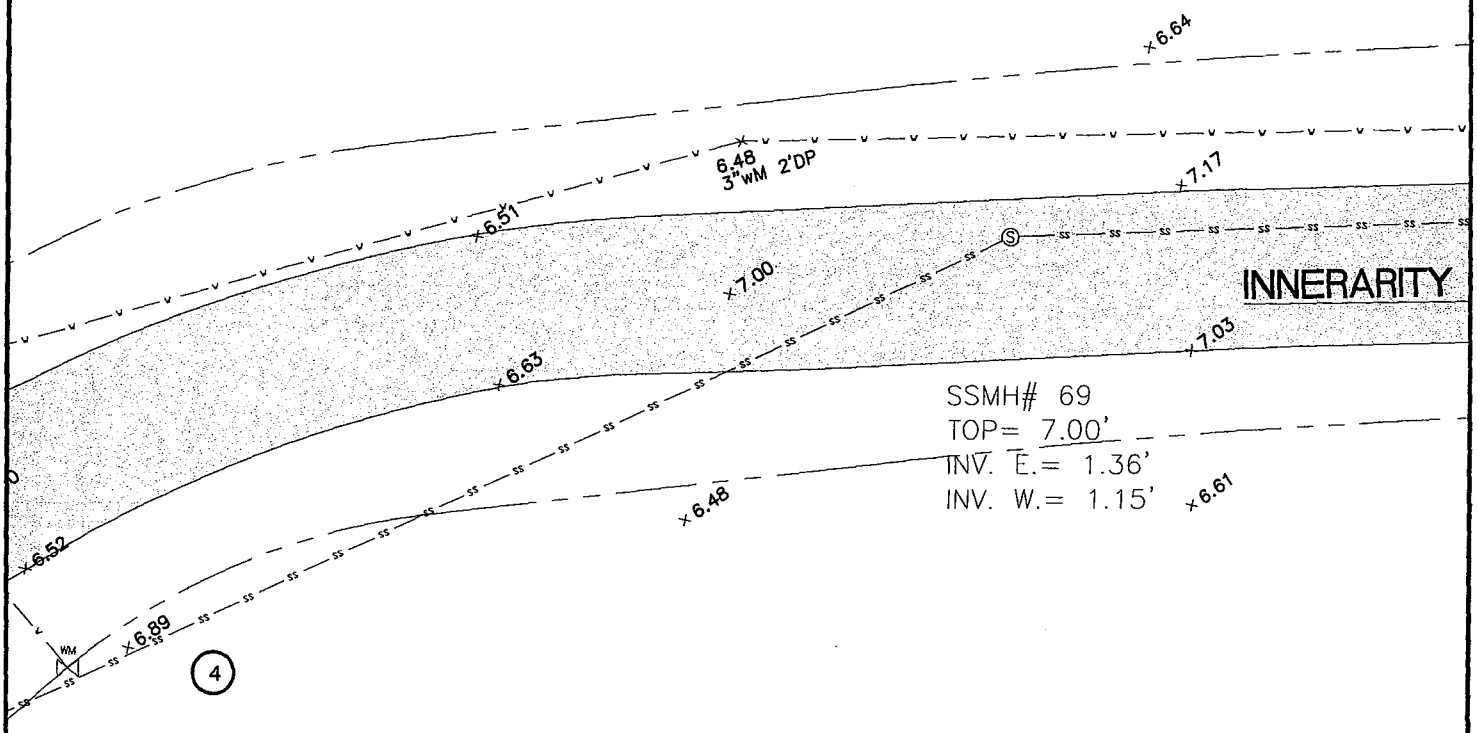

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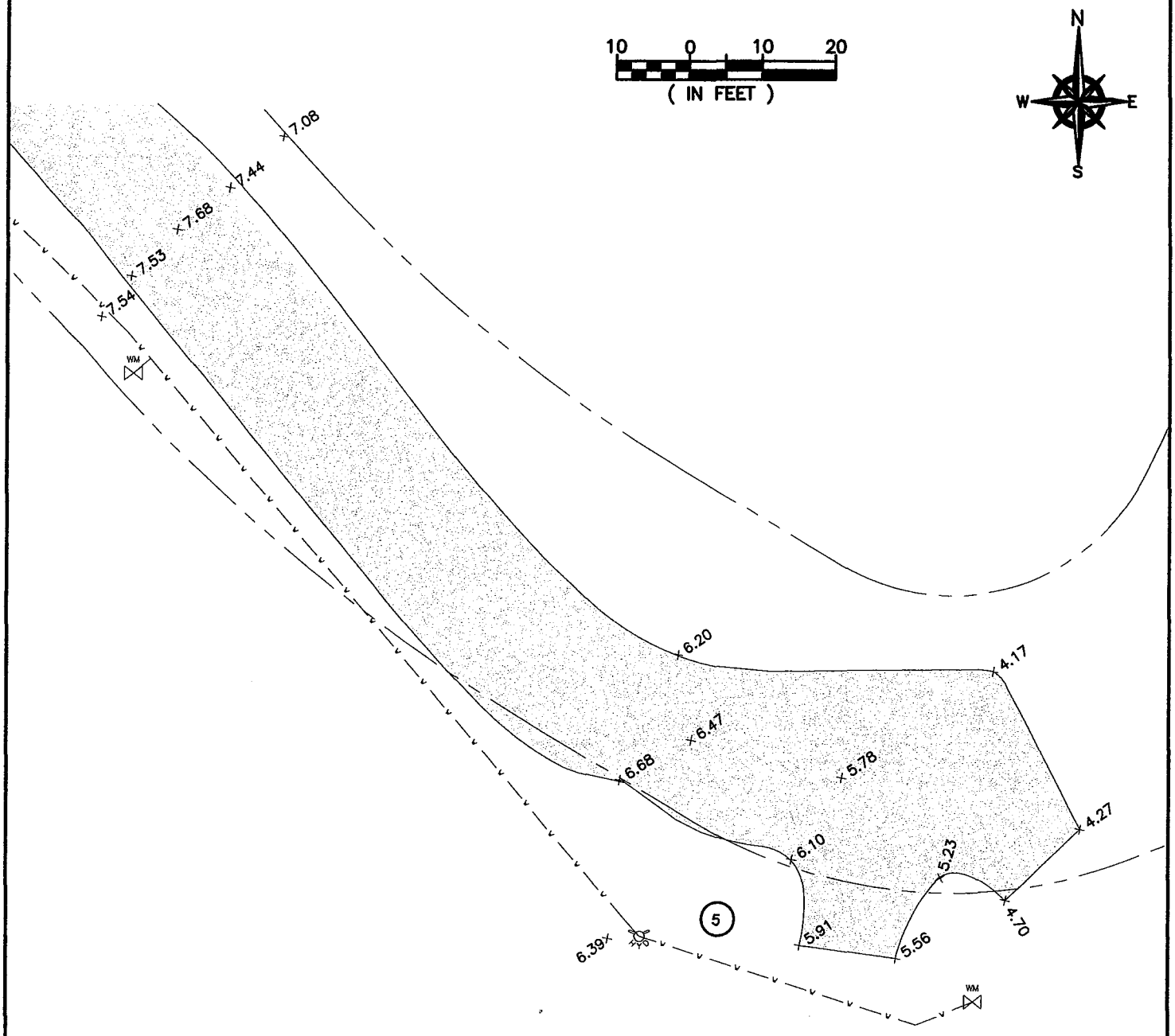
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 4
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	5 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 5
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	6 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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(IN FEET)

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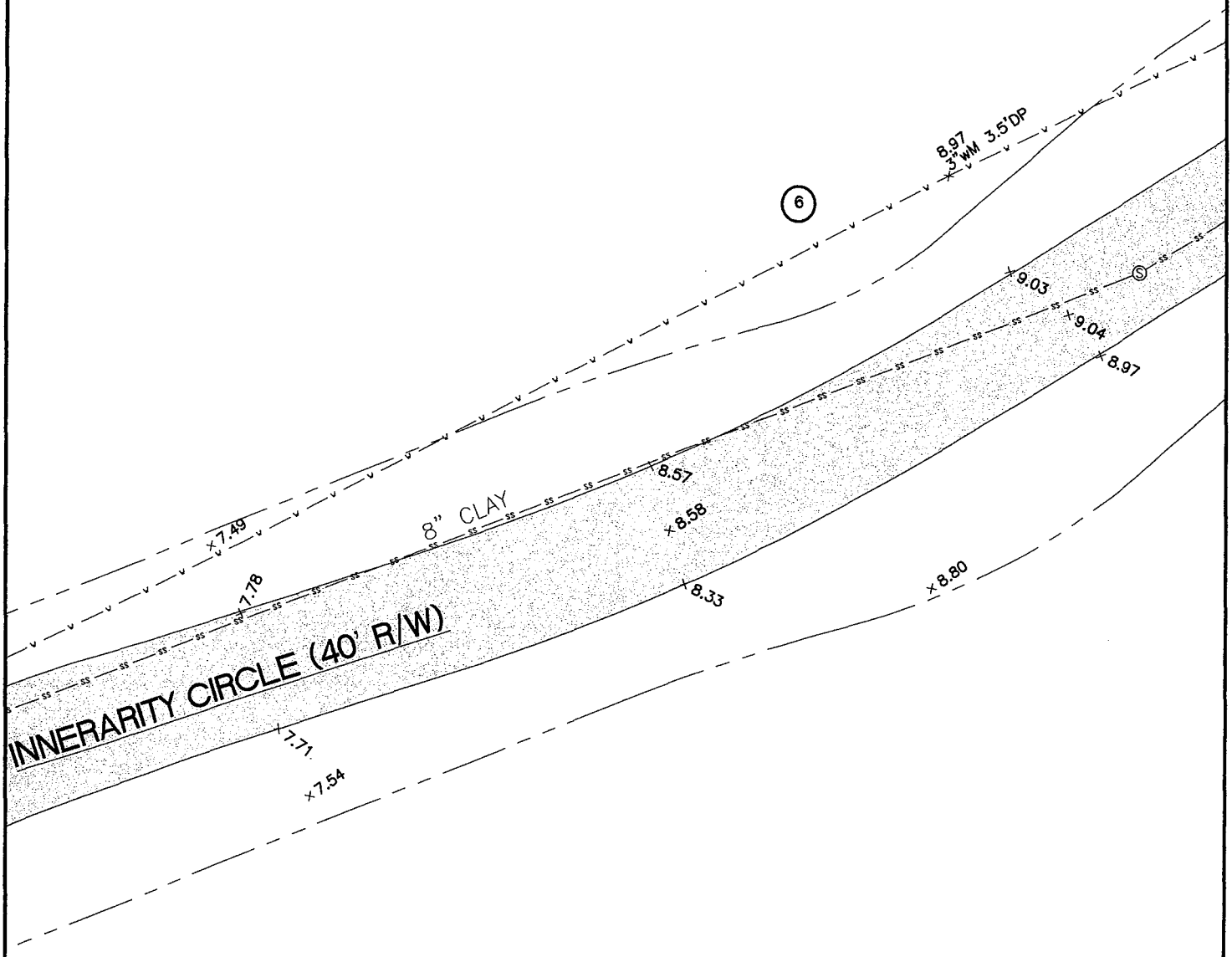

EXHIBIT C

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PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 6
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	7 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

EXHIBIT C

Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
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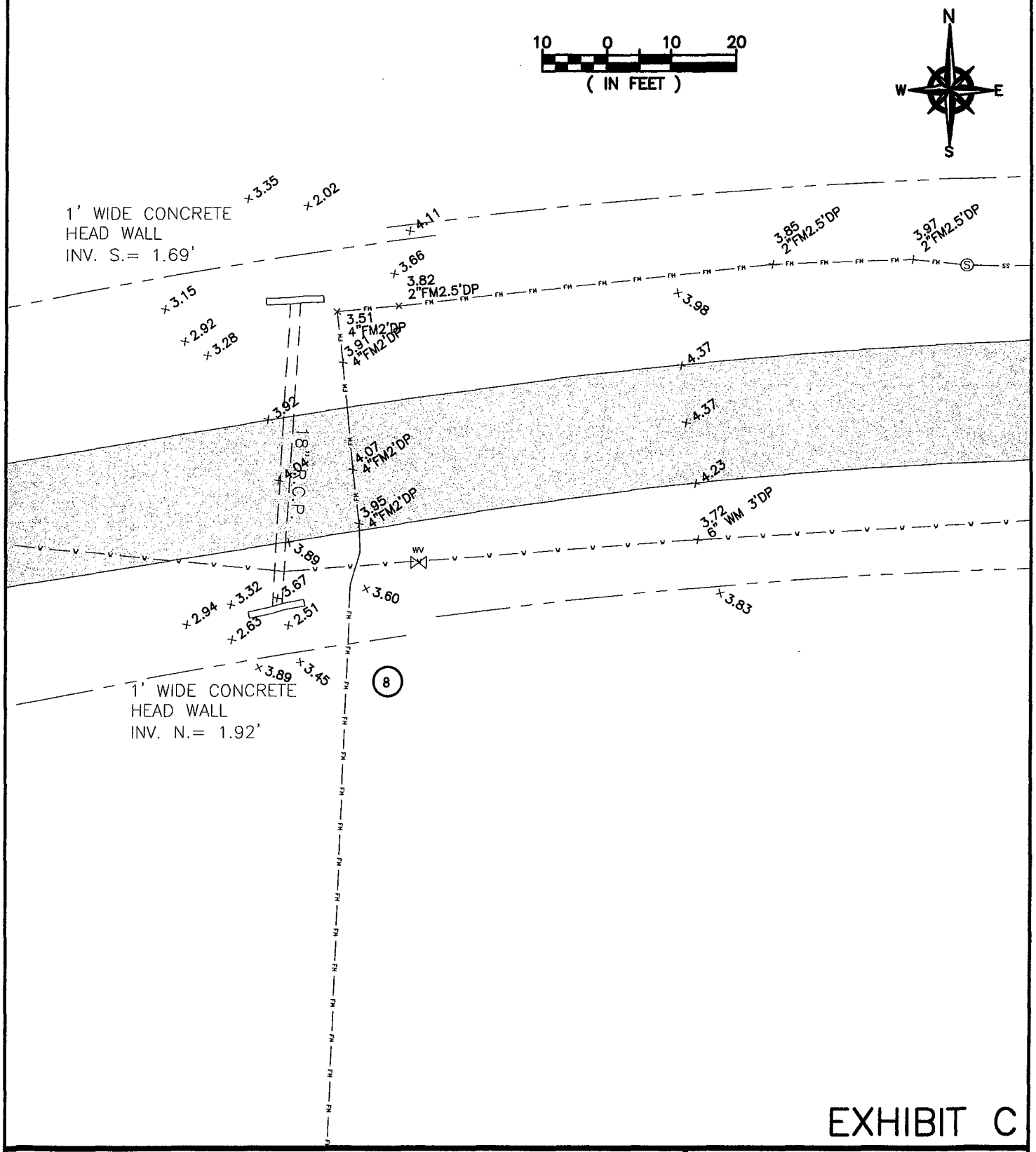
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 7	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	8 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 8	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	9 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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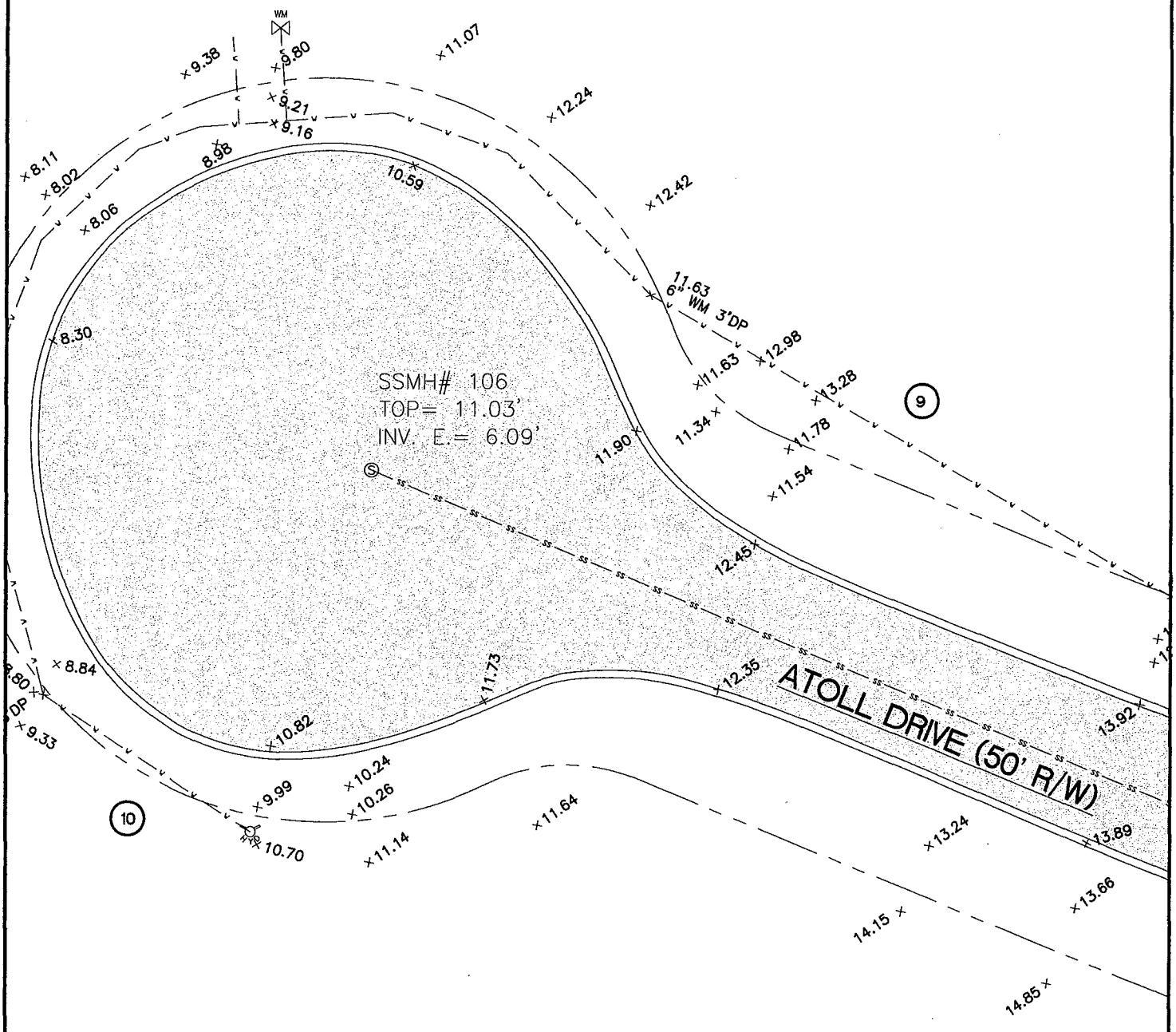

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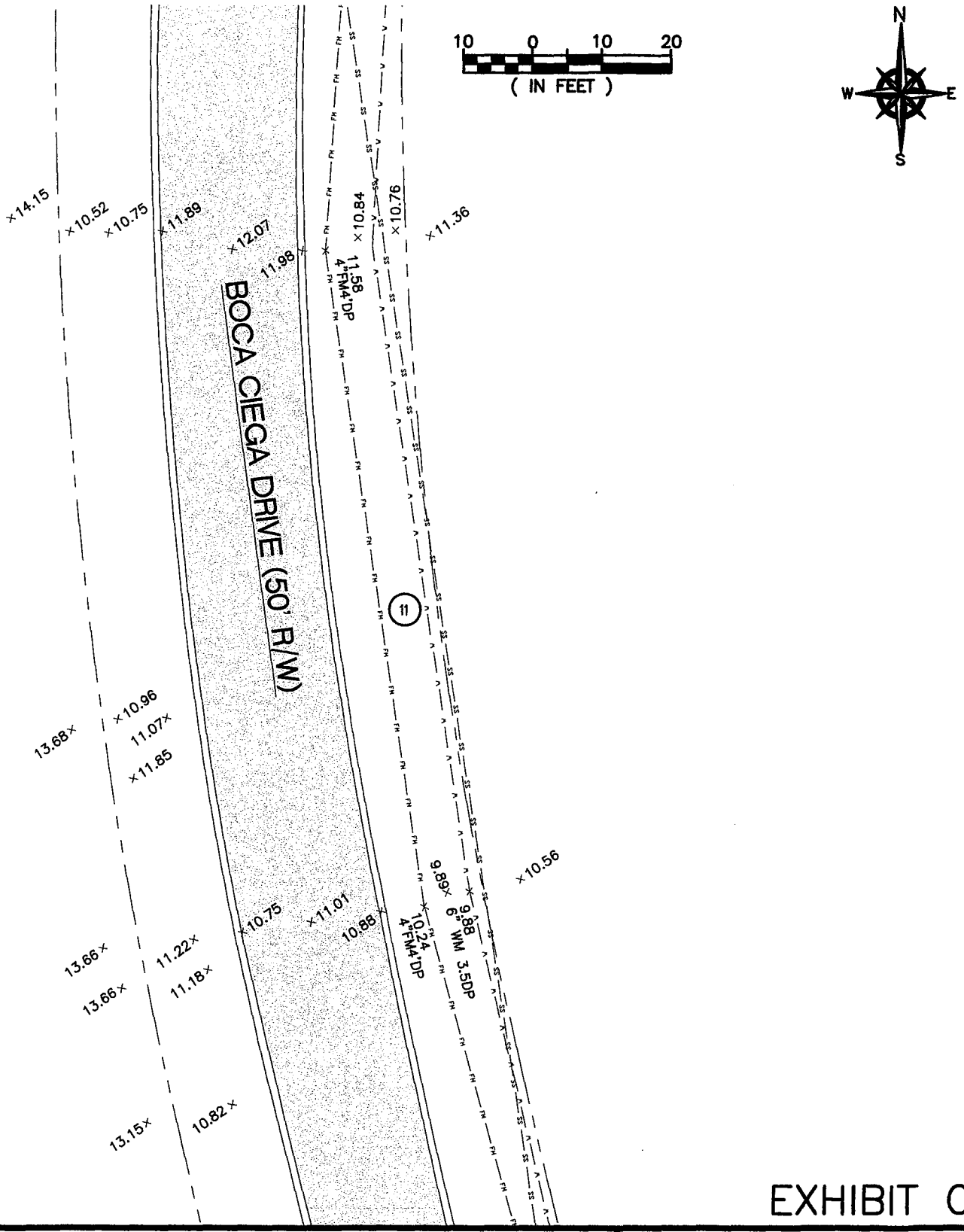
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAILS 9&10	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	10 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 11
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	11 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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(IN FEET)

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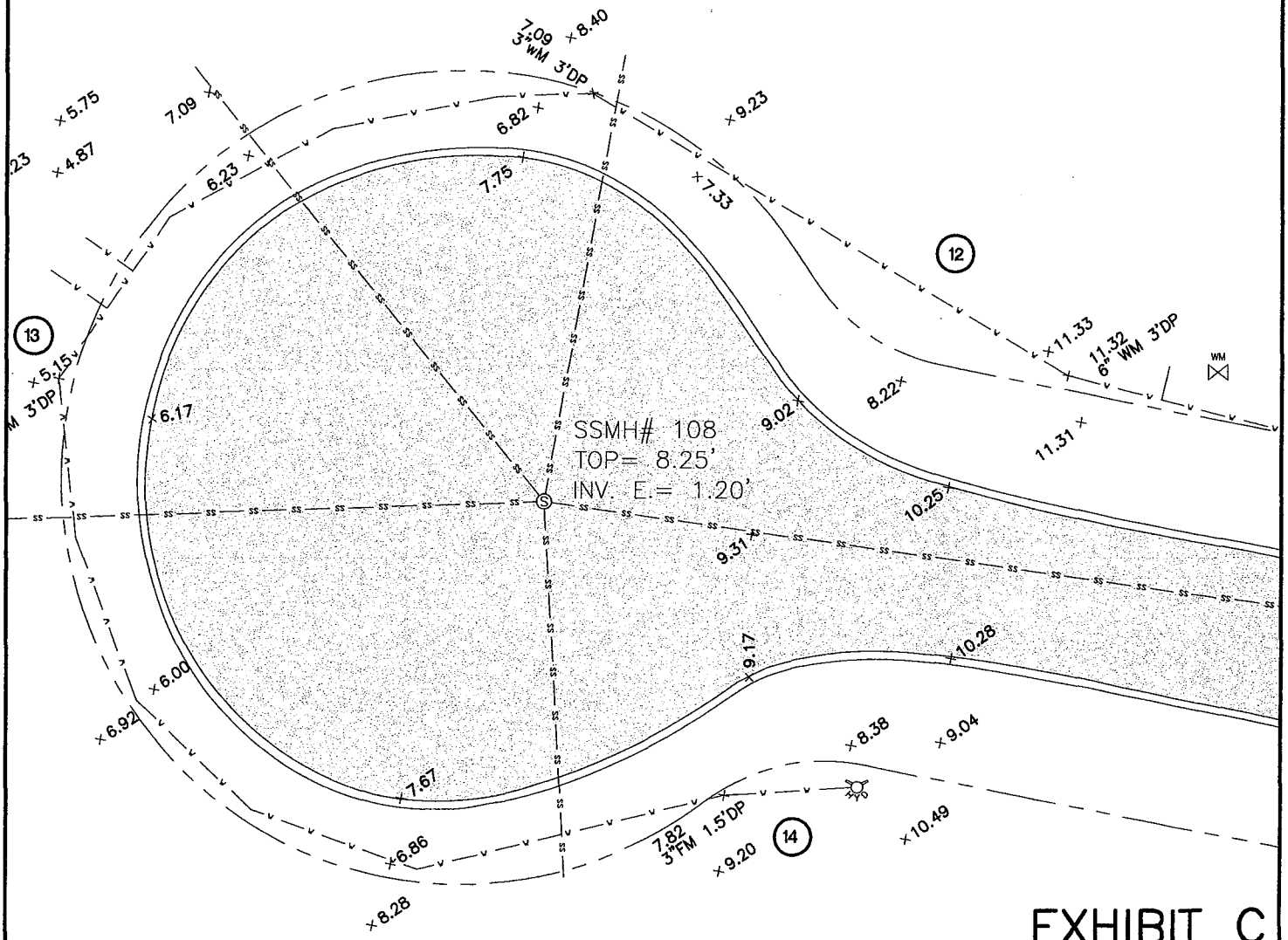

EXHIBIT C

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CIVIL ENGINEERS
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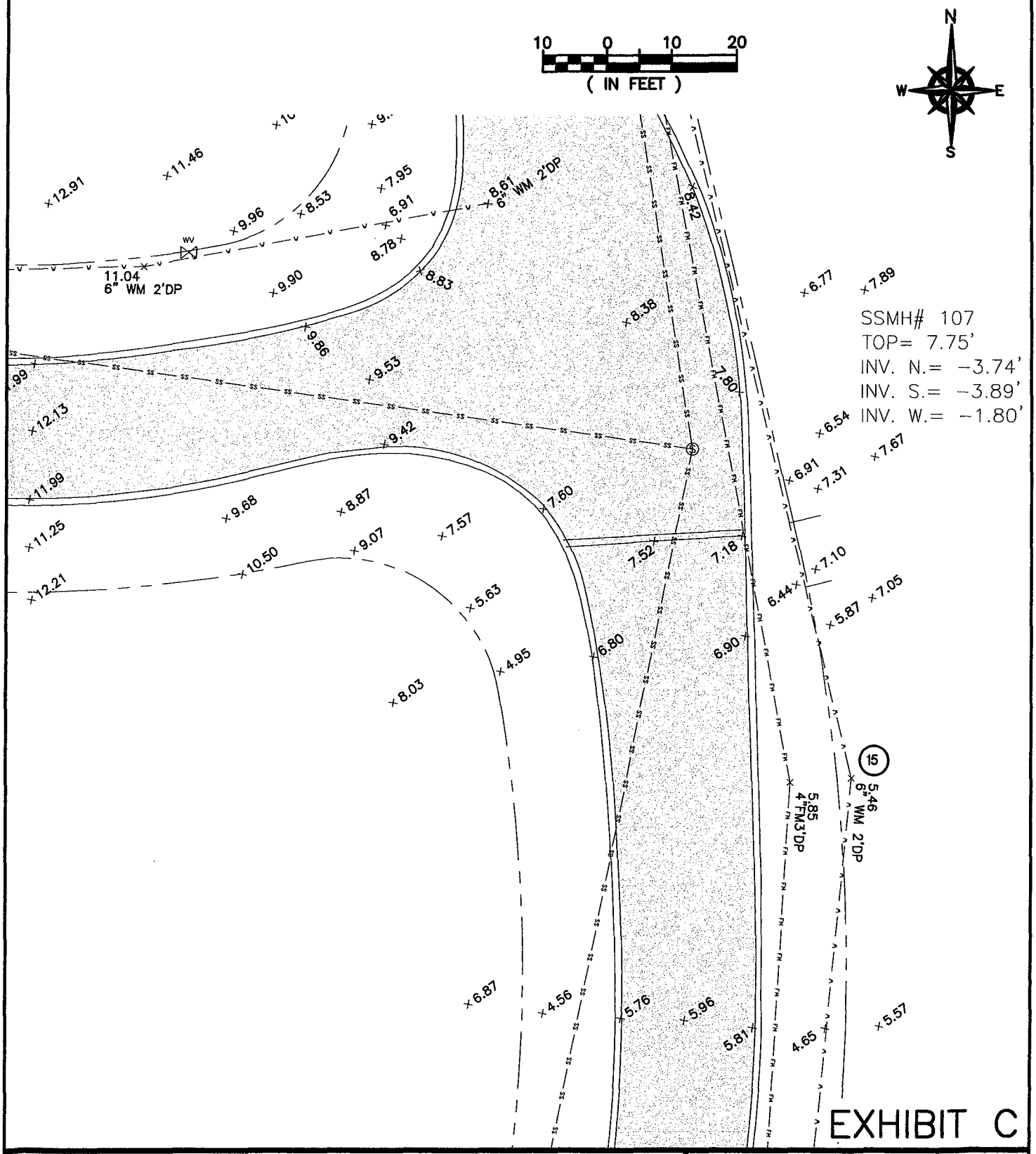
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAILS 12,13,&14	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	12 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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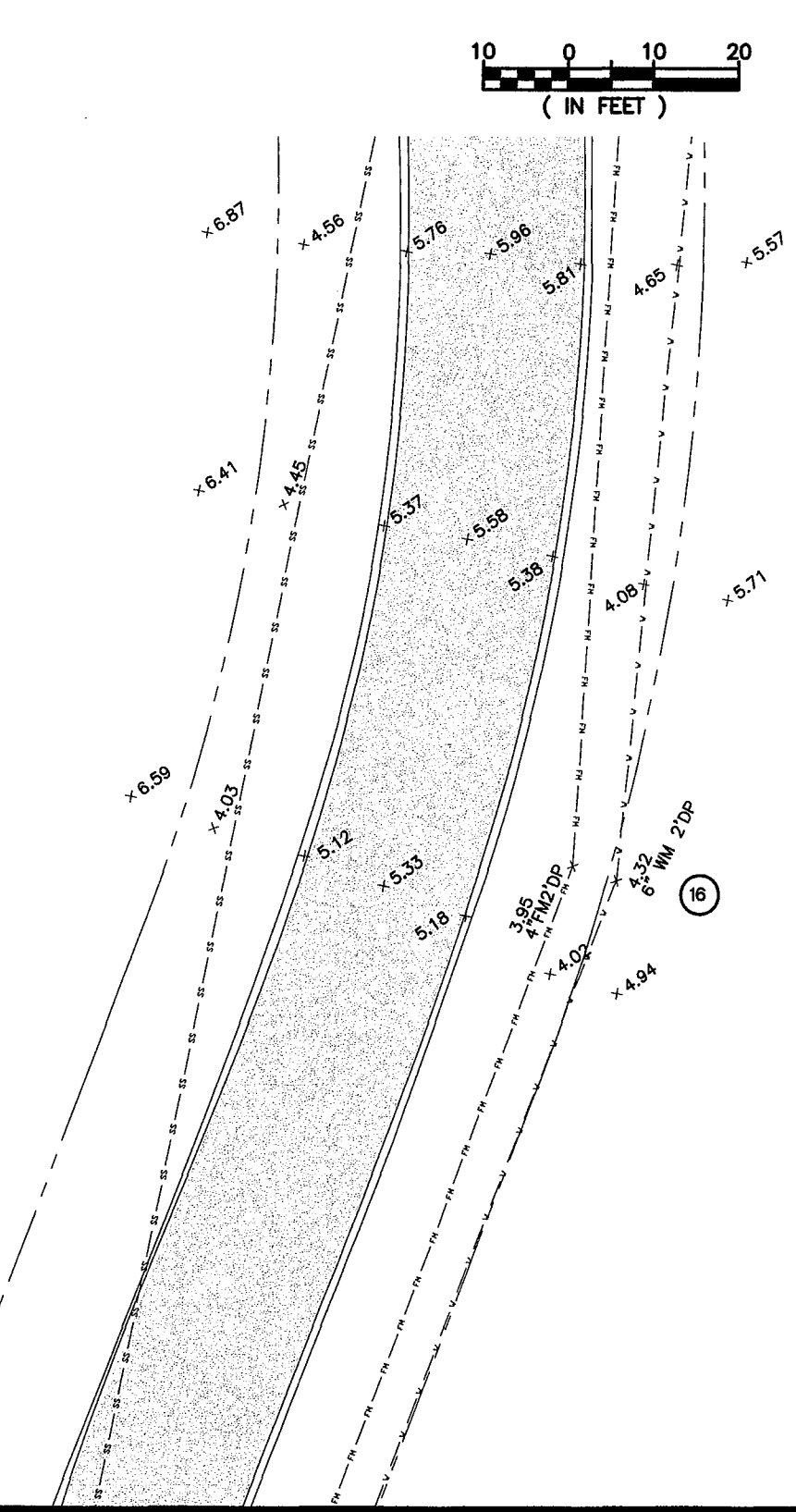
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 15	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	13 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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CIVIL ENGINEERS
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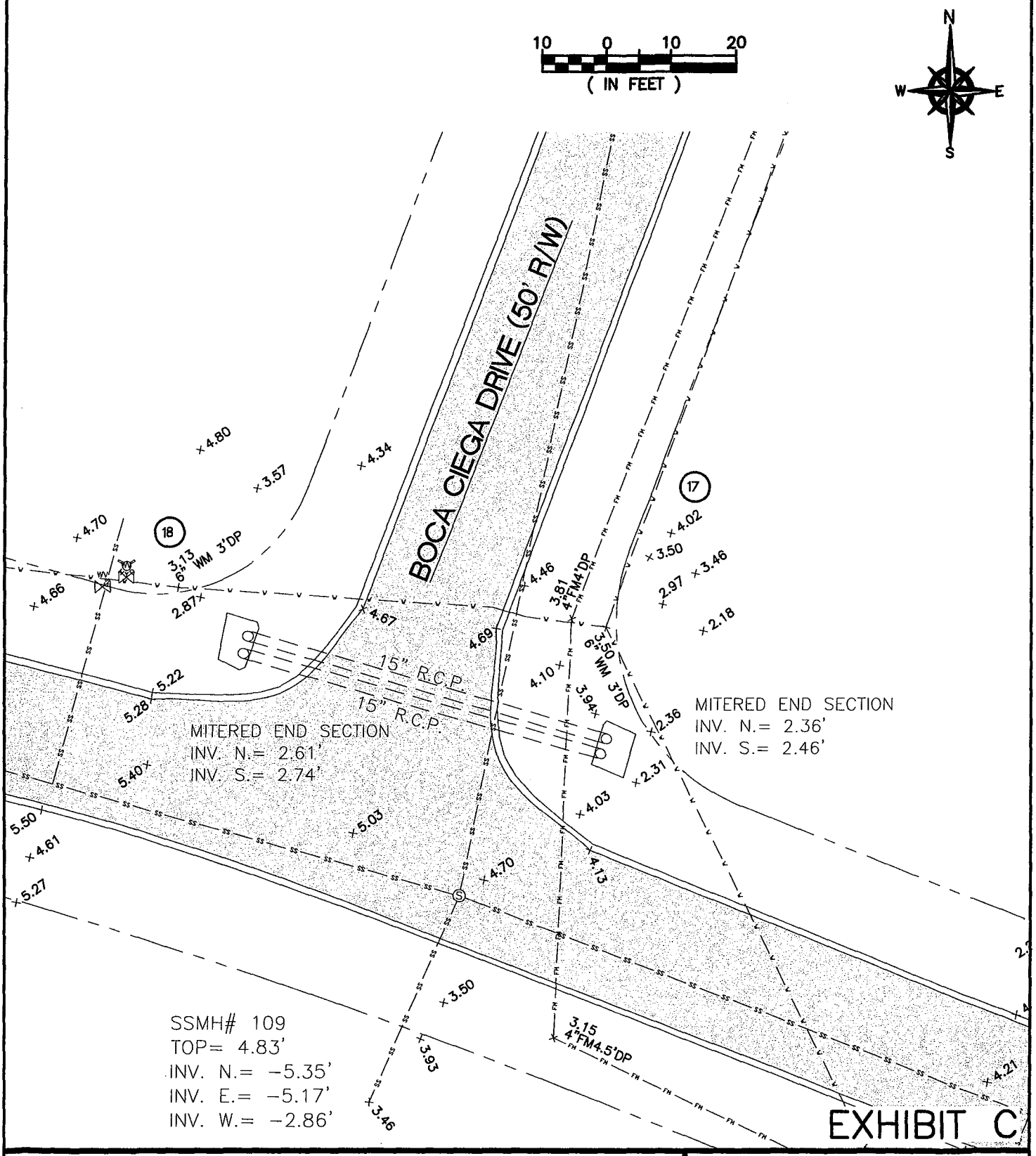
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 16	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	14 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAILS 17&18	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	15 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

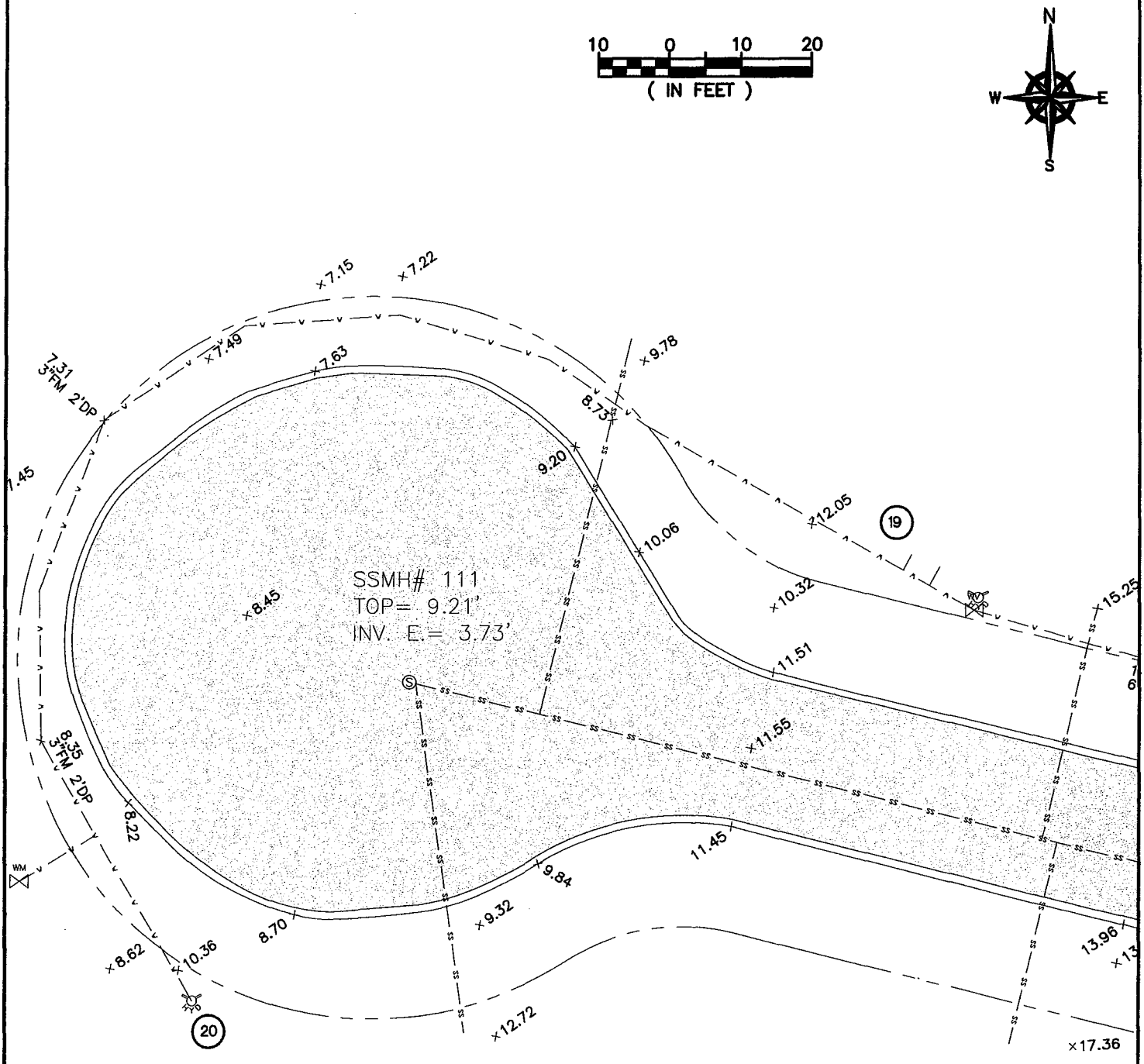
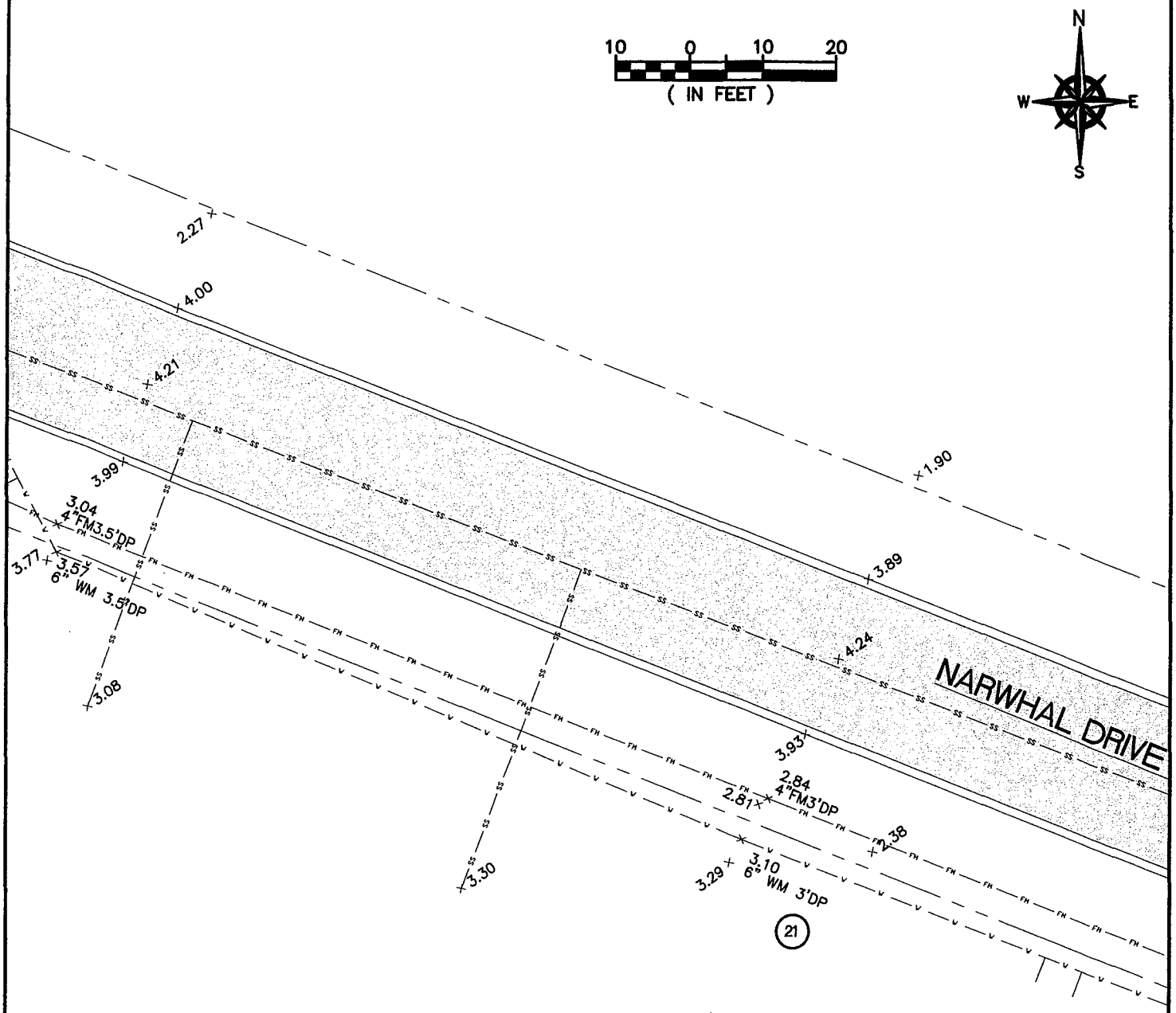


EXHIBIT C

Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAILS 19&20	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	16 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION



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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 21-1
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	17 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

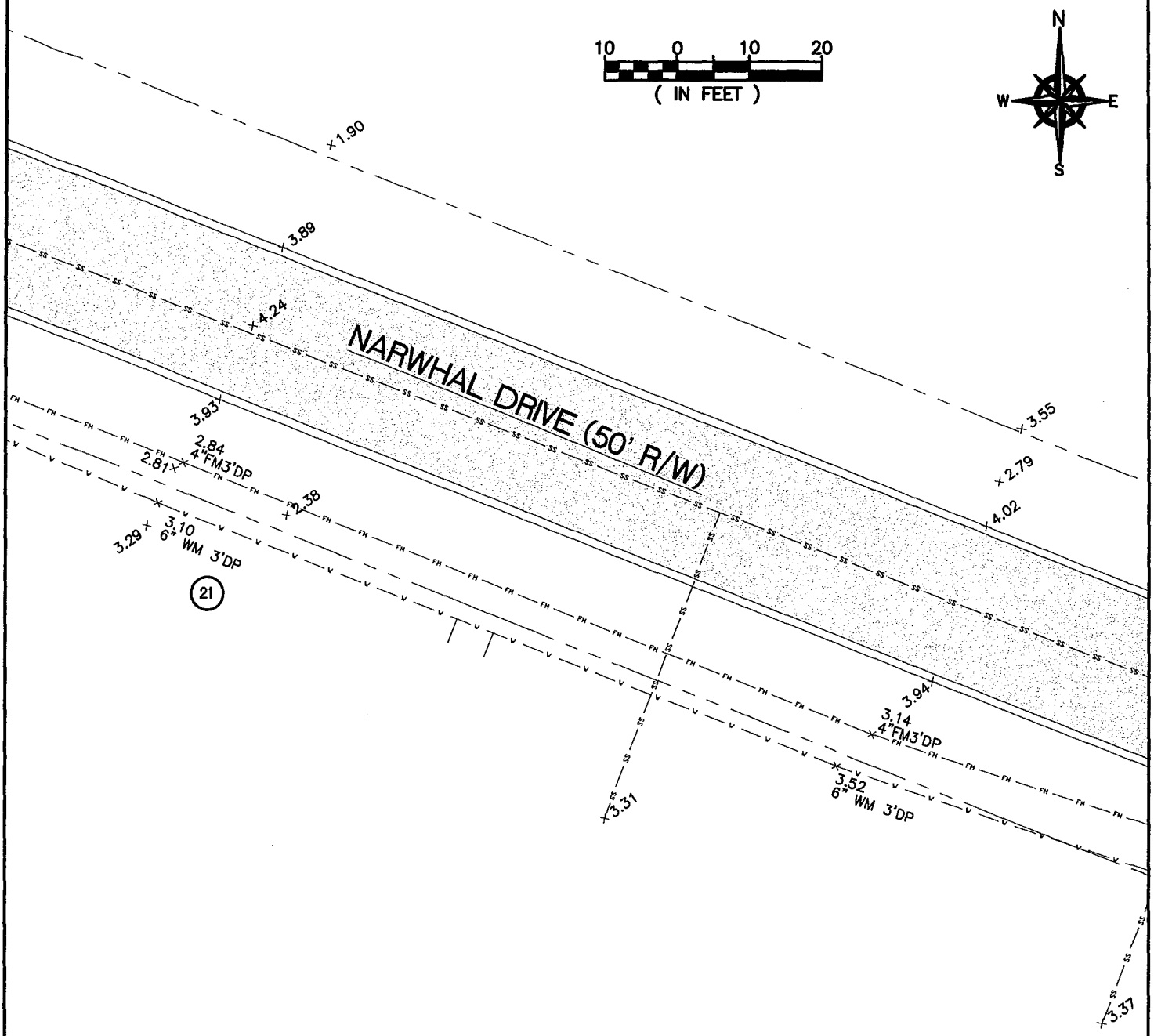

EXHIBIT C

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CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 21-2	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	18 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

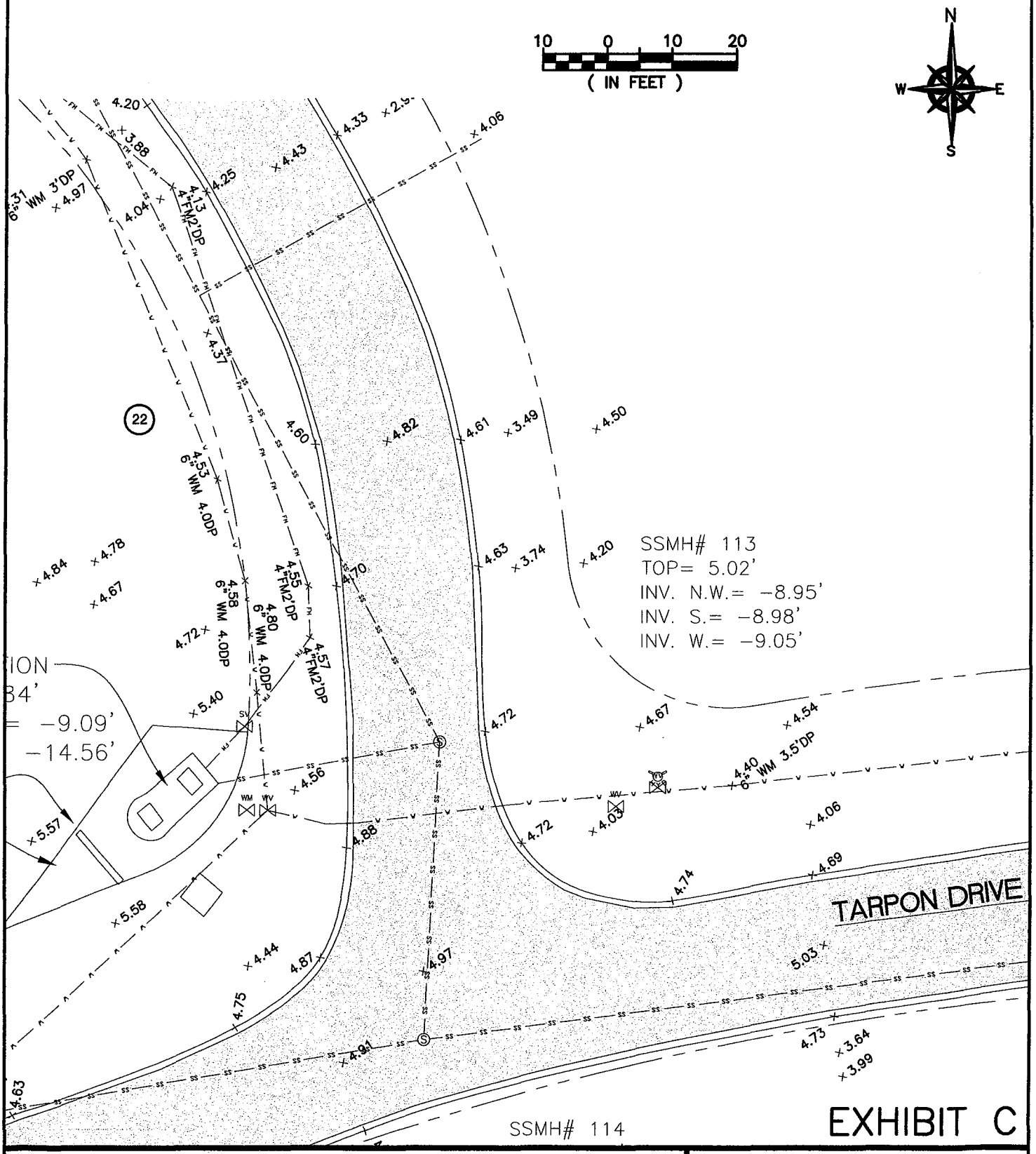

EXHIBIT C

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CIVIL ENGINEERS
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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAILS 22	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	19 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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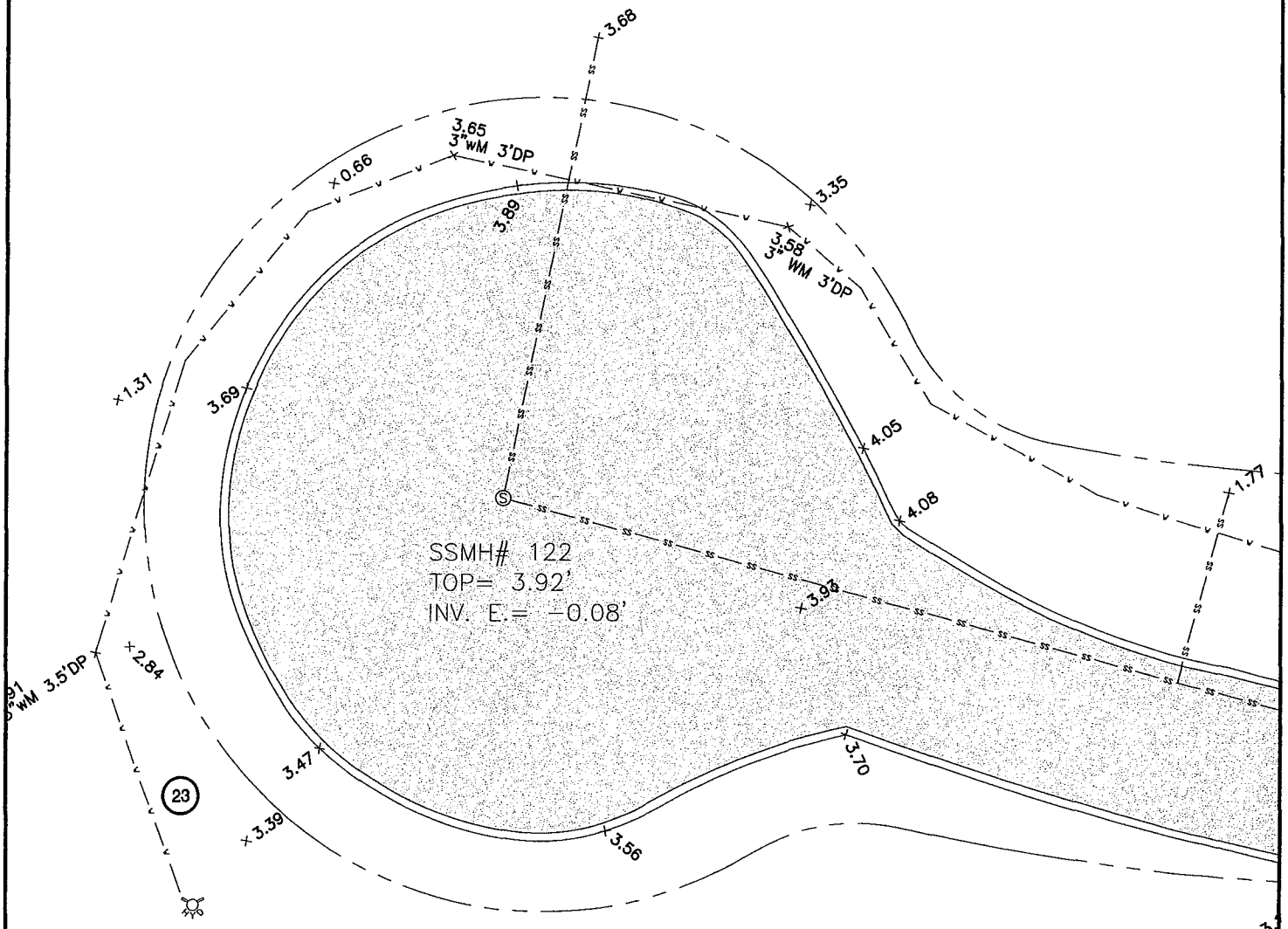

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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 23	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	20 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

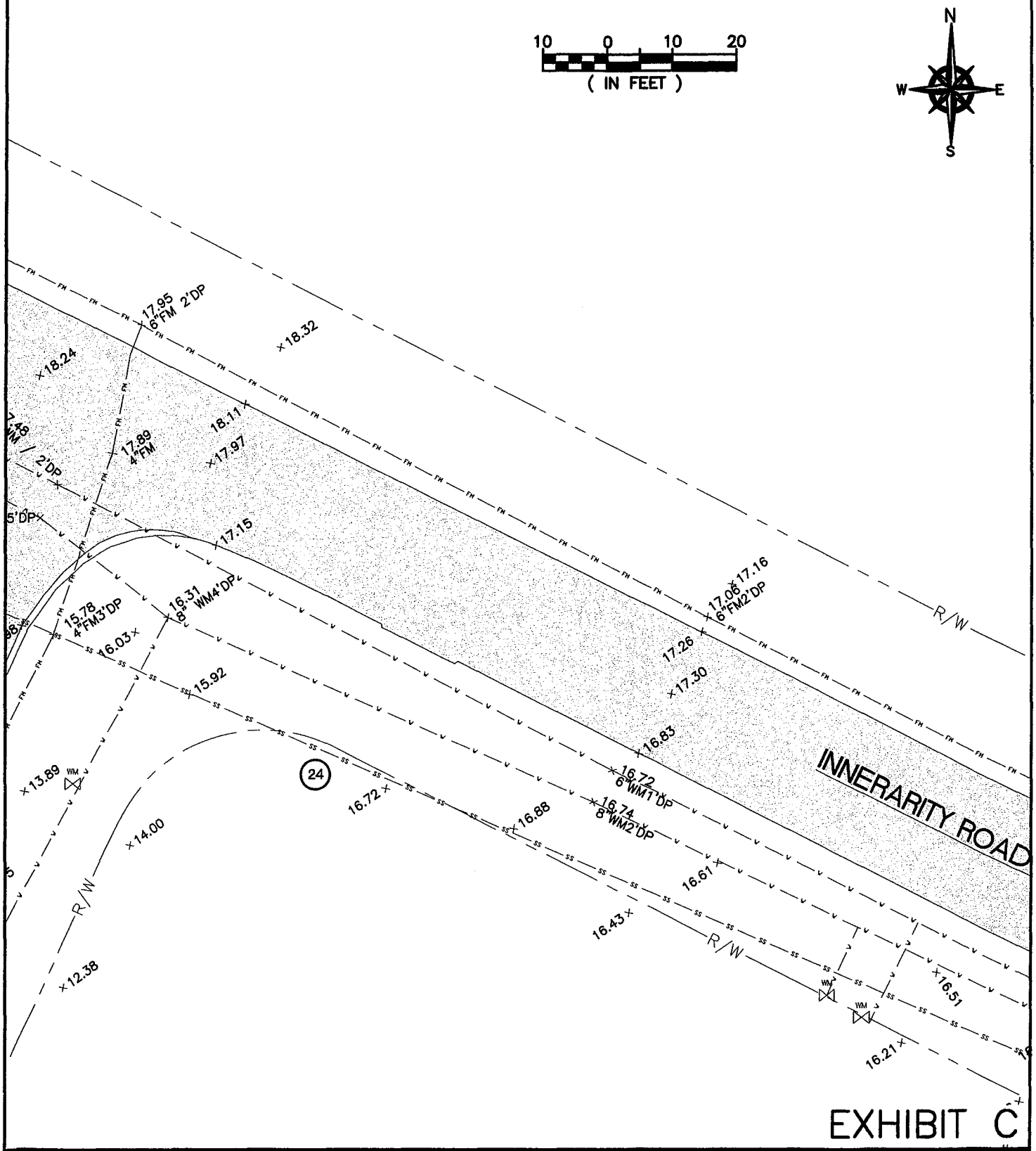

EXHIBIT C

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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 24
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	21 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

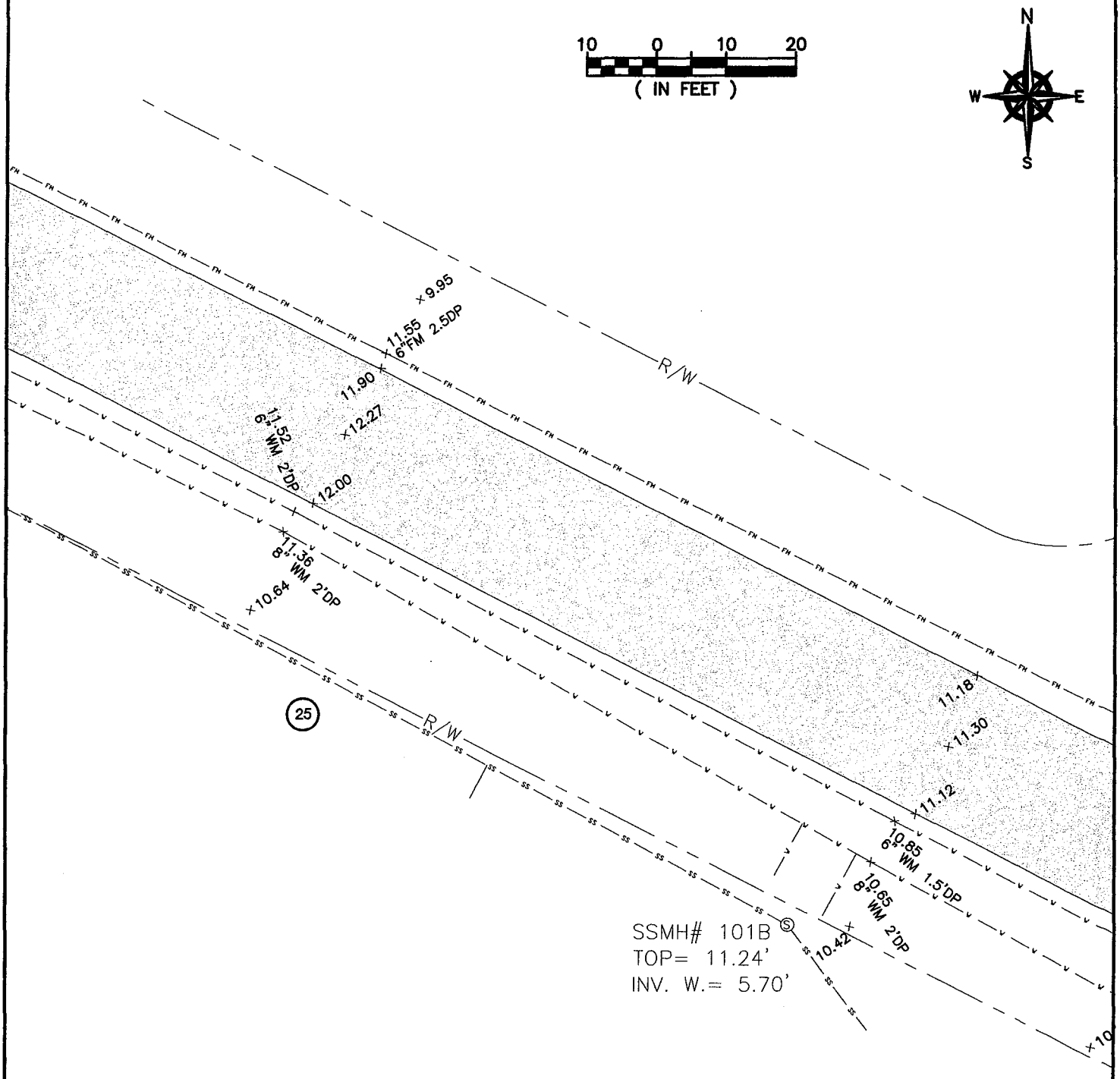

EXHIBIT C

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7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 25
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	22 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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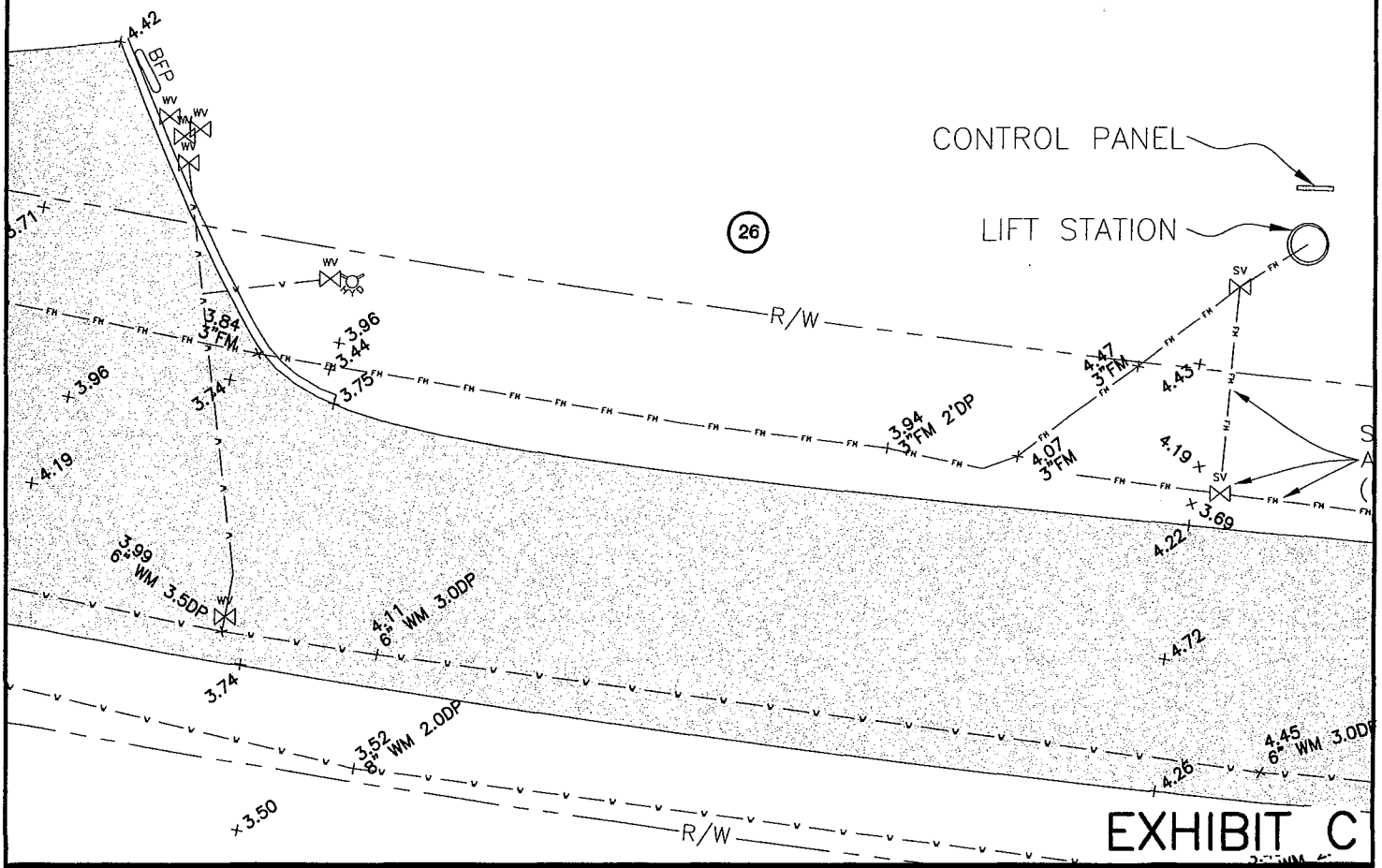

EXHIBIT C

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CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 26	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	23 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

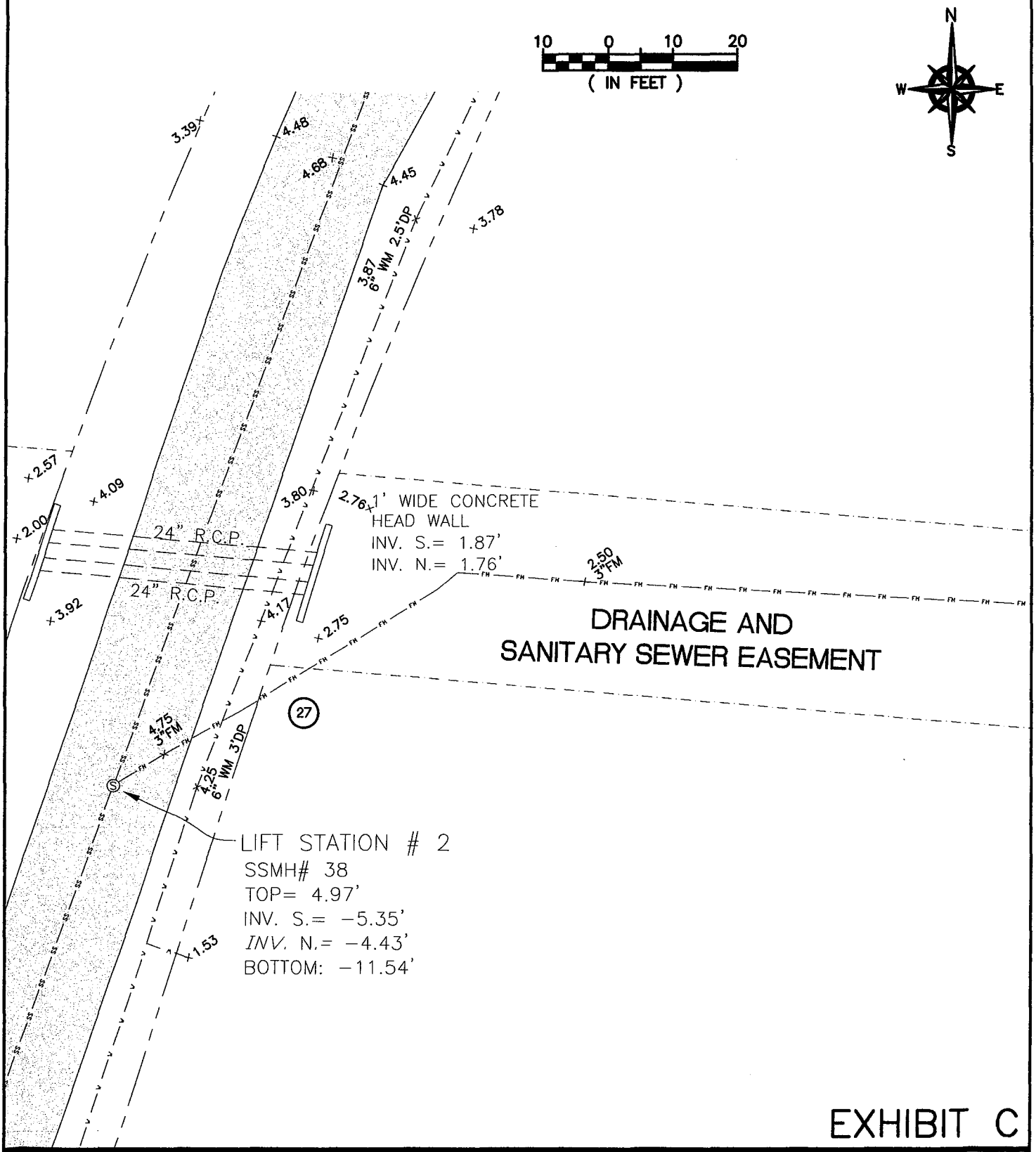

EXHIBIT C

Kenneth Horne & Associates, Inc.
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PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
	UTILITY ENCROACHMENT DETAIL 27
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	24 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

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(IN FEET)

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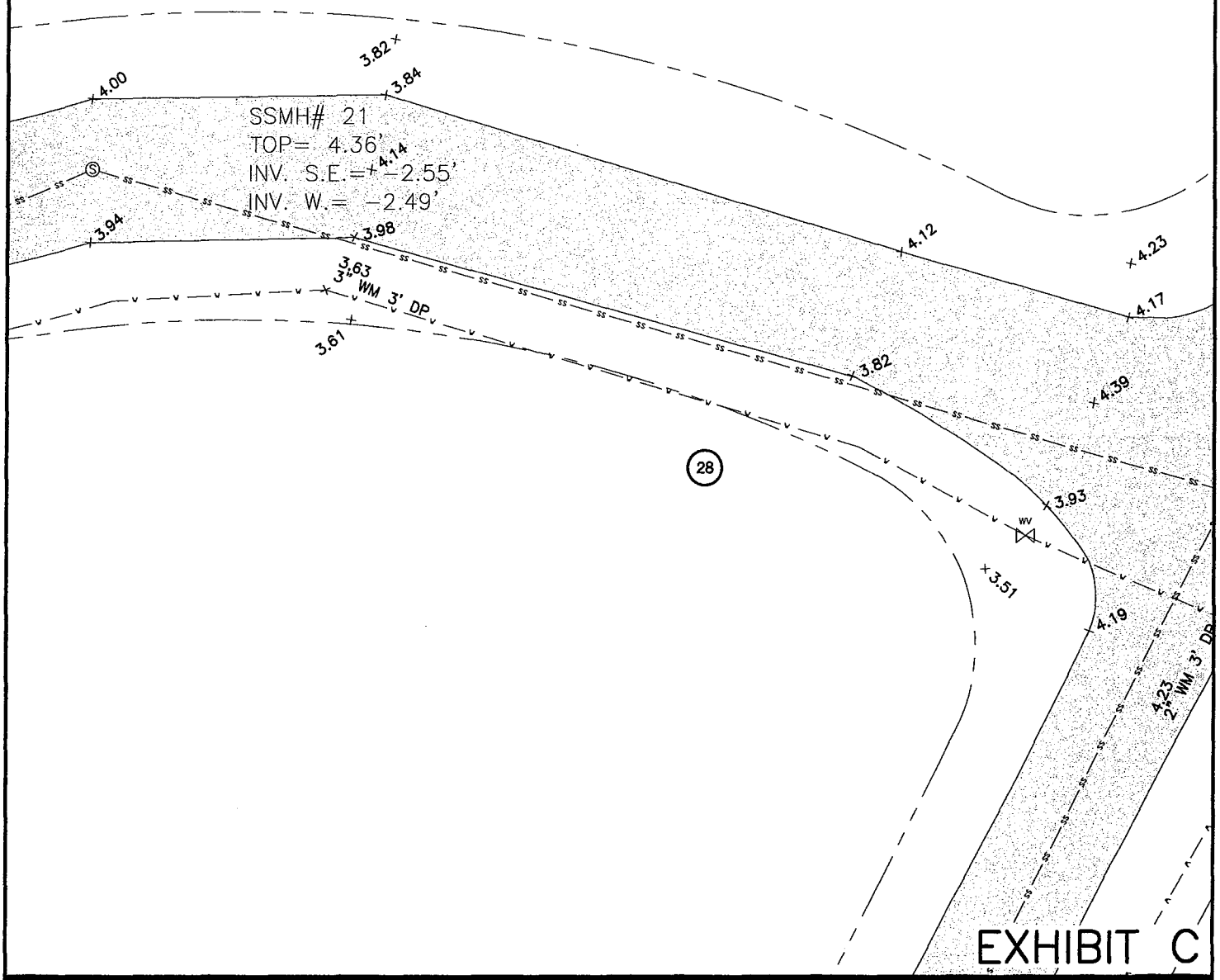

EXHIBIT C

KH&A Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
(850) 471-9005 INFO@KH-A.COM FAX (850) 471-0093

PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 28	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	25 OF 26

NOTE:
SEE KEY SHEET FOR ADDITIONAL INFORMATION

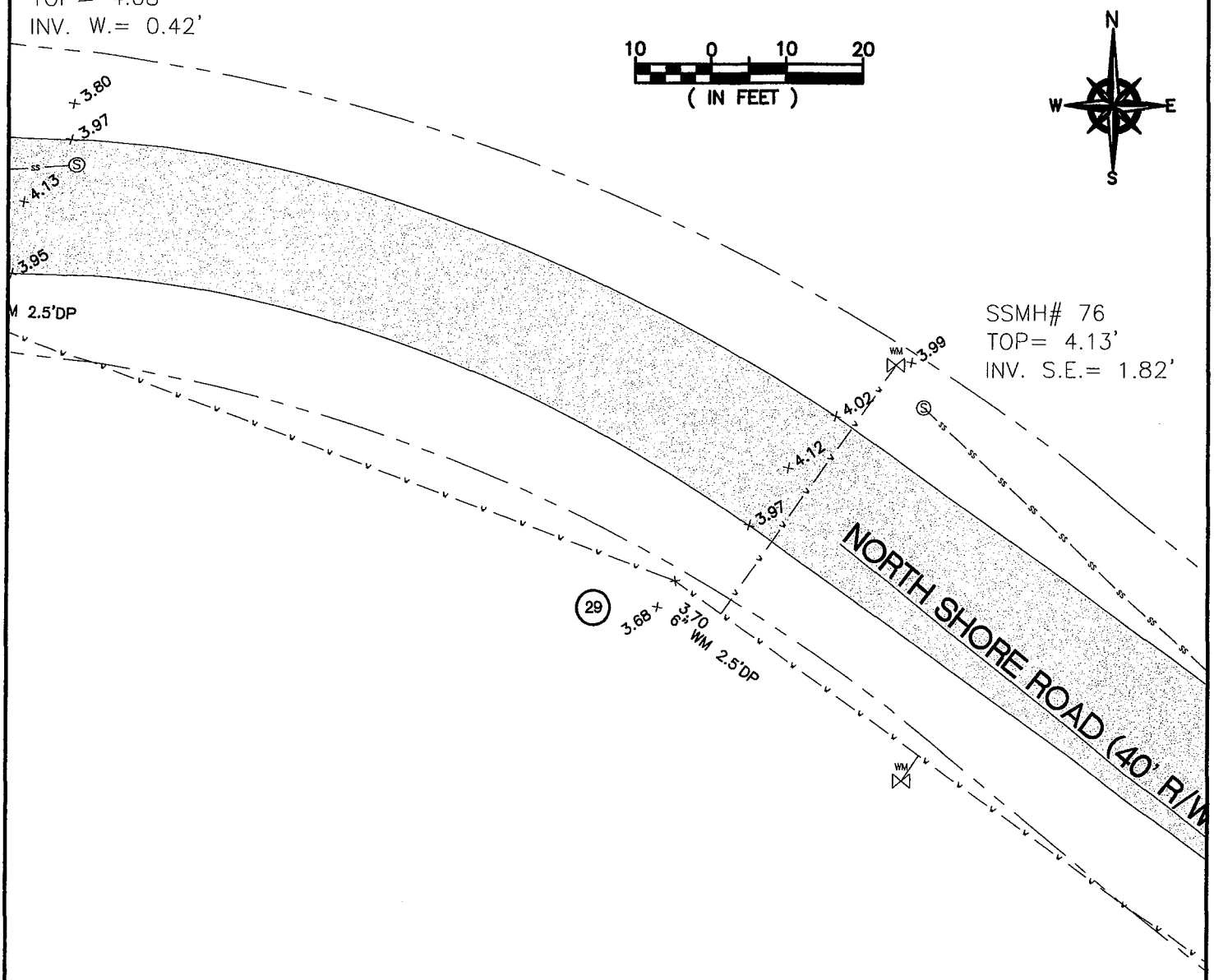

EXHIBIT C

Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
PO BOX 10669, PENSACOLA, FLORIDA 32524
7201 NORTH 9TH AVENUE, SUITE 6, PENSACOLA, FLORIDA 32504
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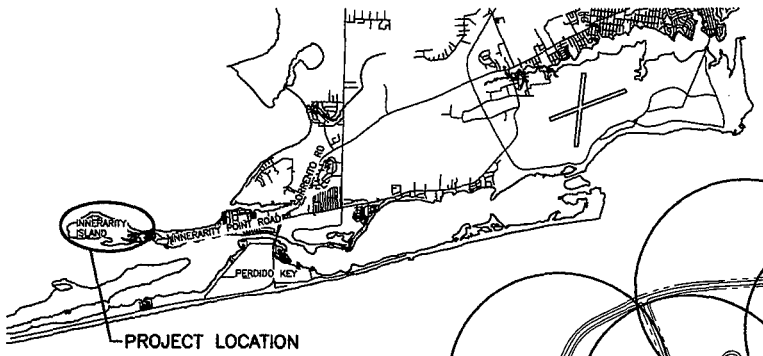
PROJECT NAME:	II UTILITY TRANSFER
UTILITY ENCROACHMENT DETAIL 29	
PROJECT NO.:	2013-11
BY: DIC	DATE: DEC 2013
SHEET:	26 OF 26



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LEGEND:

– DEFICIENT AREAS

NOTE:
CIRCLES INDICATE 500' RADIUS AROUND ALL EXISTING FIRE HYDRANTS

EXHIBIT D

Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
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PROJECT NAME: II UTILITY TRANSFER

FIRE HYDRANT LOCATIONS

PROJECT NO.: 2013-11

BY: DIC DATE: DEC 2013

SHEET 1 OF 1

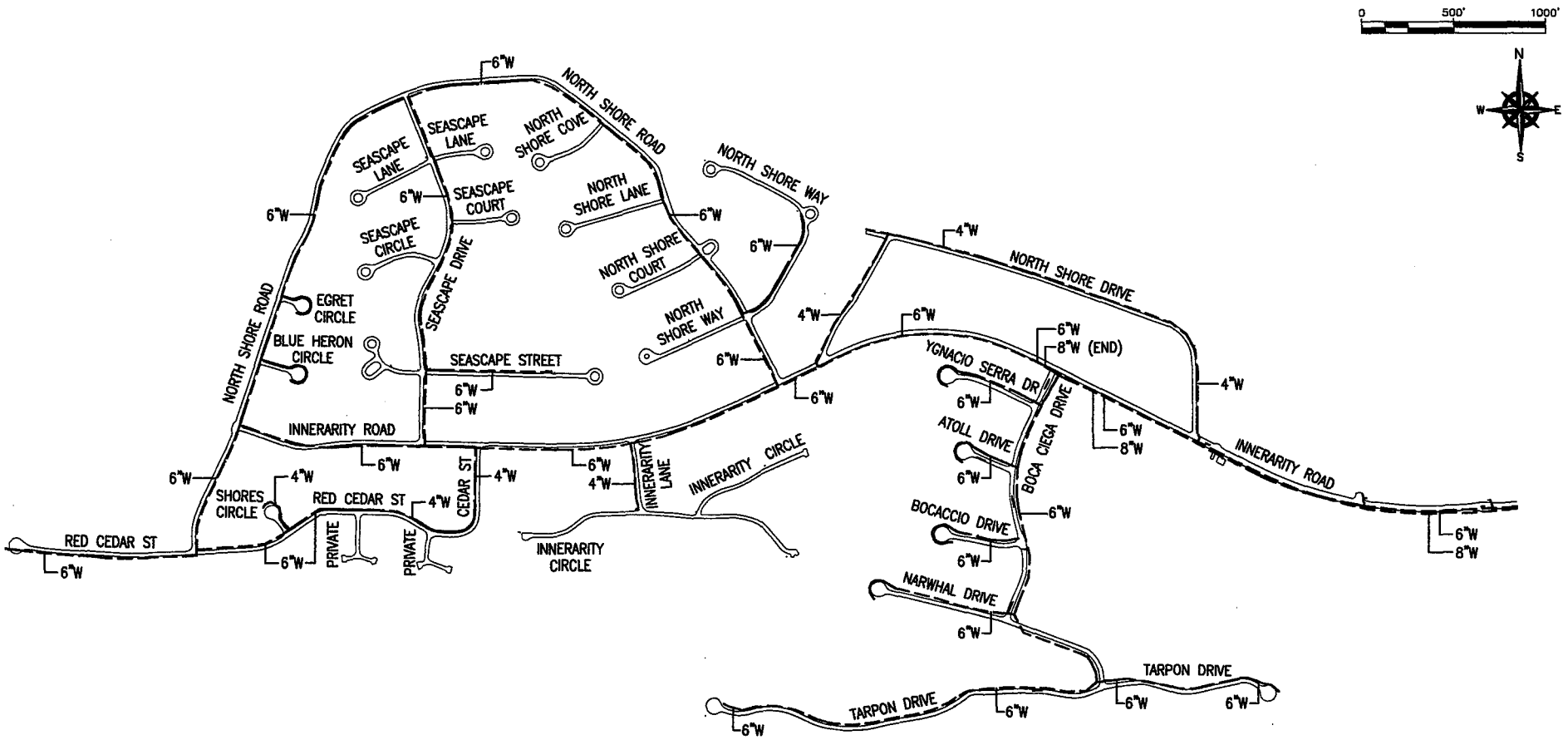

EXHIBIT E_1

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NO.	REVISIONS	APPROVED BY	DATE
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PROJECT NAME: INNERARITY ISLAND
UTILITY TRANSFER
EXISTING WATER LAYOUT
PROJECT NO.: 2013-11
BY: RT DATE: DEC 2013
SHEET 1 OF 2

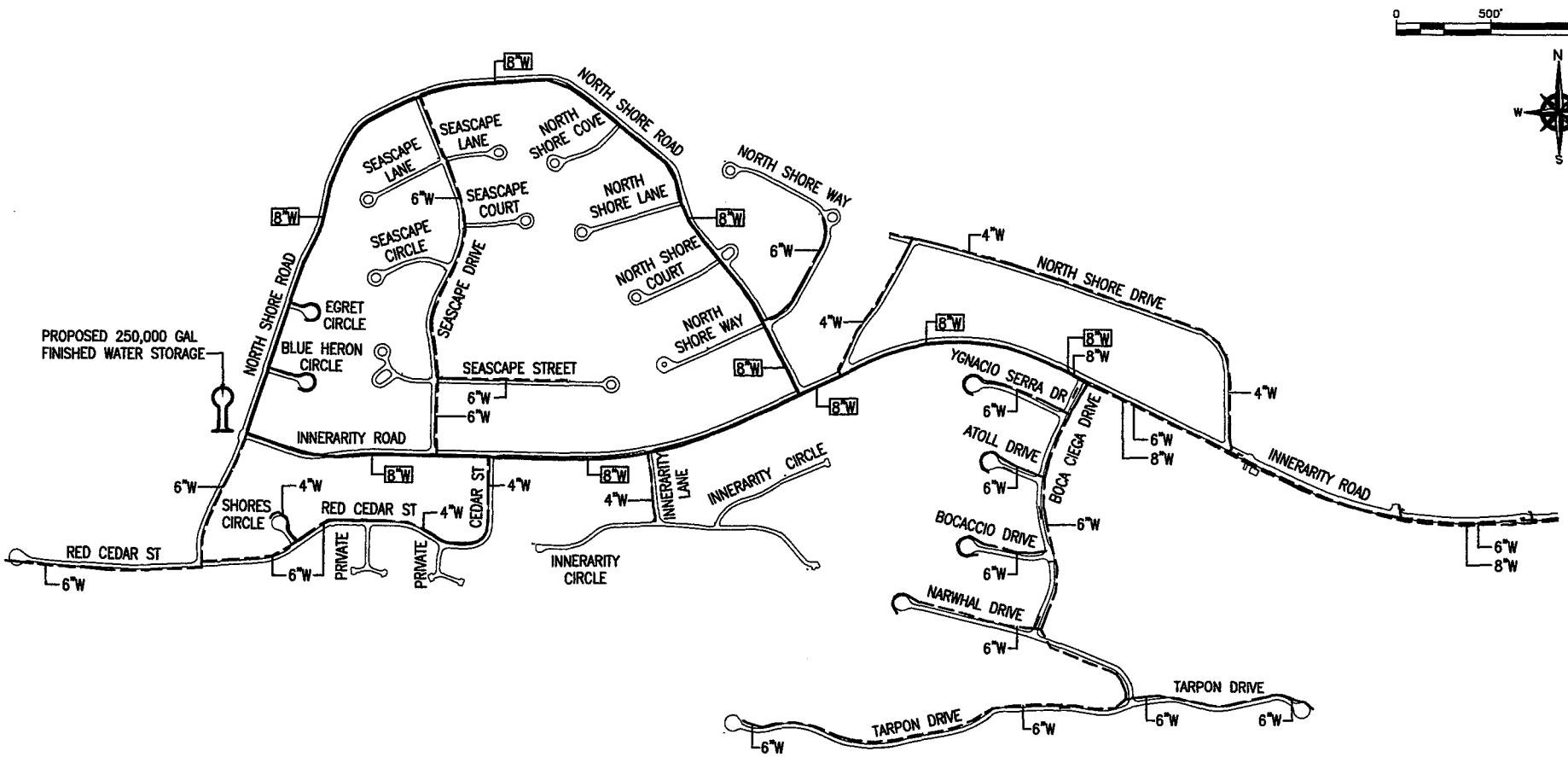

EXHIBIT E_2

Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
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NO.	REVISIONS	APPROVED BY	DATE
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PROJECT NAME: INNERARITY ISLAND
UTILITY TRANSFER
PROPOSED WATER LAYOUT
PROJECT NO.: 2013-11
BY: RT DATE: DEC 2013
SHEET 2 OF 2

Upstream MH No.	Upstream MH Invert El.	Downstream MH No.	Downstream MH Invert El.	Distance	Slope	Connecting Pipe Size	Connecting Pipe Material	ECUA Depth	ECUA Condition	ECUA Comments	Deficiency Comments from SEF Reports	Comment on Survey	Drop Across Manhole
54A		54	-9.33	217.62		8	PVC					Lamphole-No Invert	
54	-3.24	53	-4.31	228.49	0.47%	8	PVC	5'-3"	Good			To Lift Station #4	0.05
52	-1.91	53	-2.73	157.05	0.74%	8	PVC	4'-0"	Good			To Lift Station #4	
Bottom El.		-10.01		*Top El.*		2.77				*Manhole Lift Station (53)*		*Lift Station #4 Data*	
51	-0.35	50	-1.32	207.32	0.48%	8	PVC	3'8"	Good				
50	-1.37	55	-2.94	366.73	0.41%	8	PVC	5'-6"	Good				0.05
55	-2.89	56	-3.66	139.97	0.55%	8	PVC	5'4"	Good				0.05
57	-0.85	56	-2.39	153.62	0.94%	8	PVC	4'-2"	Good		Broken Pipe - Soil Visible		
56	-3.76	55	-4.49	152.4	0.48%	8	PVC	6'-2"	Good				1.37
59	-4.51	58	-4.72	32.79	0.64%	8	PVC	7'10"	Good			To Lift Station #3	0.02
59-Inserted							PVC	11'-5"	Good				0.02
60	-3.48	58	-4.70	179.61	0.65%	8	PVC	8'-0"	Good			To Lift Station #3	0.80
Bottom El.		-9.07		*Top El.*		3.47				*Manhole Lift Station (59)*		*Lift Station #3 Data*	
61	-1.85	60	-2.33	218.2	0.42%	8	PVC	5'-5"	Fair	Signs of I&I around top of pipe			0.13
61A		61	-1.98			8	PVC					LH 61A	
61B		61	-1.85	81.68		8	PVC					LH 61B	
62	-2.61	60	-3.33	201.24	0.36%	8	PVC	5'-3"	Good				0.05
63	-2.01	62	-2.56	150.48	0.36%	8	PVC	5'-5"	Good				0.07
64	-1.43	63	-1.94	139.33	0.36%	8	PVC	5'-1"	Fair	Signs of I&I and roots			0.13
64A		64	-1.58			8	PVC					LH 64A	
64B		64	-1.93			8	PVC					LH 64B	
65	-1.07	63	-1.97	238.45	0.38%	8	PVC	4'-3"	Good				0.43
66	-0.12	65	-0.92	241.15	0.33%	8	PVC	4'-2"	Good		Line Broken		
49	-0.85	50	-1.24	128.35	0.51%	8	PVC	4'0"	Good				0.05
48	-0.03	49	-0.59	126.31	0.47%	8	PVC	3'-10"	Good				
47	0.29	48	-1.30	306.18	0.52%	8	PVC	3'-8"	Good				1.19
44	0.16	48	-1.24	299.37	0.47%	8	PVC	3'-5"	Good				0.07
45	0.51	44	0.23	78.99	0.48%	8	PVC	3'-5"	Fair	Needs to be cleaned			
12	0.3	13	-1.94	357.6	0.69%	8	PVC	3'-9"	Bad	Aggregate showing on walls, 2" force main #3			2.17
13-Inserted						8	PVC	7'-0"	Good				0.02
14	-0.3	13	-1.98	354.41	0.49%	8	PVC	5'-0"	Good				0.14
15	1.14	14	-2.18	283.66	0.48%	8	PVC	5'-2"	Good				0.09
16	2.14	15	1.22	200.5	0.35%	8	PVC	3'-9"	Good				0.04
17	3.4	16	2.16	240.43	0.51%	8	PVC	3'-9"	Good				0.05
18	3.91	17	3.35	161.24	0.35%	8	PVC	3'-5"	Good				0.03
19A	5.42	19	3.97	345.25	0.42%	8	PVC	4'-0"	Poor	Roots inside MH	Large Joint Offset, Line Broken		0.02
19	5.16	19A	5.44	172.53	0.41%	8	PVC	5'-0"	Fair	Needs to be cleaned			
67A	-0.18	68	-0.63	90.93	0.55%	8	PVC	4'-1"	Good				0.08
67	0.35	67A	-0.09	142.88	0.31%	8	PVC	4'-3"	Good				0.18
68	0.3	67	0.22	173.11	0.05%	8	VCP	3'-5"	Poor	Roots around top of manhole	Longitudinal Crack		0.01
69	1.15	68	0.29	290.48	0.30%	8	VCP	5'-10"	Good		Circumferential Fracture, Infiltration Gusher, Long. Fract.		0.21
70	1.52	68	1.05	150.09	0.29%	8	VCP	6'-0"	Good		Line Broken, Circumferential Fracture, Infiltration Gusher		0.07
71	2.79	70	1.99	255.1	0.31%	8	VCP	4'-9"	Poor	Signs of I&I and roots around bottom and sides of MH			0.05
73	3.27	71	2.75	148.05	0.32%	8	VCP	4'-2"	Good		Longitudinal Crack		0.05
74	4.14	73	3.32	201.51	0.41%	8	VCP	4'-5"	Fair	Signs of I&I and roots around top of MH			0.13
75	4.62	74	4.27	99.98	0.26%	8	VCP	4'-2"	Fair	Signs of I&I and roots around top of MH	Longitudinal Fracture		
72	3.75	71	2.83	257.17	0.36%	8	VCP	5'-2"	Poor	Signs of I&I and roots around bottom of MH	Hole Void Visible, Line Brk., Defective Rpr., Int. Gusher		0.09
43	-1.51	41	-3.03	347.75	0.35%	8	PVC	5'-0"	Good		Circumferential Crack		0.67
42	0.24	41	-1.39	239.66	0.85%	8	PVC	4'-0"	Good				
41	-2.1	39	-4.80	338.09	0.51%	8	PVC	9'-0	Fair	Needs to be cleaned			1.71
40	0.09	39	-4.93	150.34	3.27%	8	PVC	4'-0"	Good				
39	-4.73	38	-5.25	123.47	0.48%	8	PVC	9'-5"	Good			To Lift Station #2	0.05
38-Inserted							PVC	18'-0"	Good				0.92
37	-5.8	38	-4.43	134.57	0.47%	8	RCP	9'-0"	Good			To Lift Station #2	0.20
Bottom El.		-11.54		*Top El.*		4.97				*Manhole Lift Station (38)*		*Lift Station #2 Data*	
36	-3.01	37	-3.80	188.82	0.42%	8	PVC	7'-0"	Good				0.02
35	-2.18	36	-3.03	196.65	0.44%	8	PVC	8'-5"	Good				0.15
34	-0.93	35	-2.01	226.25	0.45%	8	PVC	4'-0"	Good				0.01
33	-0.33	34	-0.85	89.07	0.53%	8	PVC	3'-5"	Good				0.03
32	0.21	33	-0.82	100.48	0.51%	8	PVC	4'-0"	Good			Possible Bust or Ponding in MH 32	0.35
32	-0.17	29	-2.77	244.77	0.26%	8	PVC	4'-0"	Good			Possible Bust or Ponding in MH 32	0.35
29	-0.95	26	-1.65	263.07	0.26%	8	PVC	5'-5"	Good				0.12
28	-0.74	26	-1.63	403.94	0.24%	8	PVC	4'-5"	Poor	Needs to be wipe in or walls			
27	-1.27	28	-1.92	276.88	0.24%	8	PVC	5'-0"	Poor	Needs to be wipe in around pipes & wall	Line Broken, Infiltration Gusher, Root Ball in Lateral		
25	-1.95	25	-2.06	160.4	0.07%	8	PVC	8'-0"	Good				0.80
25	-2.02	23	-2.85	180.01	0.37%	8	PVC	5'-0"	Poor	Walls leaking/Needs to be wipe in			0.02
24	-2.72	23	-2.83	317.74	-0.03%	8	PVC	5'-0"	Bad	Walls leaking badly/Needs to be wipe in		Slopes Wrong Direction-Ponding or Bust	

EXHIBIT F

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NO.	REVISIONS	APPROVED BY	DATE
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PROJECT NAME: II UTILITY TRANSFER
SEWER DATA TABULATION
AND INSPECTION RESULTS
PROJECT NO.: 2013-11
BY: DIC DATE: DEC 2013
SHEET 1 OF 2

Upstream MH		Downstream MH		Distance	Slope	Connecting Pipe		ECUA	ECUA	ECUA	Deficiency Comments from SBP Reports	Comment on Survey	Drop Across Manhole
No.	Invert El.	No.	Invert El.			Size	Material	Depth	Condition	Comments			
23	-2.89	20	-2.99	210.93	0.14%	8	PVC	5'-0"	Poor	Walls leaking/Needs to be wipe in			0.05
21	-2.55	20	-3.09	188.83	0.35%	8	PVC	8'-6"	Good				0.05
22	-1.92	21	-2.49	266.76	0.22%	8	PVC	6'-0"	Good				
20	-3.12	9	-4.13	273.82	0.37%	8	PVC	7'-5"	Good				0.13
9	-4.21	8	-4.86	318.55	0.20%	8	PVC	9'-0"	Good				0.09
10	-2.8	8	-3.78	233.33	0.42%	8	PVC	7'-8"	Good				0.12
11	-2.33	10	-2.86	118.4	0.29%	8	PVC	7'-2"	Fair	Signs of I&I			
3	-5.02	7	-5.32	304.67	0.10%	8	PVC	10'-5"	Good				1.50
7	-5.35	2	-5.50	314.25	0.18%	8	PVC	10'-8"	Good				0.05
2	-5.51	1	-5.97	257.92	0.21%	8	PVC	10'-2"	Good		Line Broken, Infiltration Gusher		0.05
1	-5.92	LS1	-6.57	72.1	0.35%	8	PVC	11'-5"	Good				0.05
Bottom El.		-13.89		Top El.		6.57				Lift station #1		Lift Station #1 Data	
13	-2.03	9	-3.52	329	0.45%	8	PVC	4'-0"	Good				0.09
30	-0.05	29	-0.70	291.11	0.21%	8	PVC	4'-0"	Good				0.01
31	0.42	30	-0.05	371.87	0.14%	8	PVC	3'-0"	Good				
76	1.86	77	1.24	293.35	0.20%	8	PVC	2'-0"	Good		Large Joint Offset, Defective Repair Patch, Fine Roots		
75	1.72	77	1.25	220.23	0.21%	8	PVC	2'-0"	Good		Large Joint Offset, Defective Repair		0.06
75A		76	1.19	162.56		8	PVC					Lamphole-No Invert	
77	1.19	80	0.39	344.14	0.23%	8	PVC	3'-5"	Good				0.05
80	0.33	81	-0.10	176.9	0.24%	8	PVC	4'-0"	Good				0.08
82	0.53	81	-0.14	269.09	0.26%	8	PVC	4'-0"	Good				0.10
82A		82	0.49	264.85		8	PVC					Lamphole-No Invert	
84	-0.11	84	-1.05	324.61	0.28%	8	PVC	5'-0"	Poor	Grease in main-needs to be cleaned	Large Joint Offset, Loose Sealing Ring		0.04
84A		84	0.17	51.02		8	PVC					Lamphole-No Invert	
85	0.83	84	0.35	338.54	0.10%	8	PVC	4'-0"	Poor	Walls leaking/Needs to be cleaned/Grease in main			0.10
86	1	85	0.75	116.1	0.13%	8	PVC	5'-0"	Good				
94	-1.12	87	-1.54	210.6	0.20%	8	PVC	7'-0"	Good				1.43
87	-1.7	88	-2.54	174.97	0.48%	8	PVC	7'-0"	Good				0.05
88	-2.62	99	-3.04	400.53	0.10%	8	PVC	8'-6"	Poor	Needs to be cleaned			0.16
99	-3.11	100	-3.33	140.48	0.16%	8	PVC	8'-5"	Good				0.07
100	-3.65	LS1	-4.55	209.04	0.43%	8	PVC	9'-0"	Good				0.32
91	-1.78	85	-2.45	174.03	0.38%	8	PVC	7'-0"	Poor	Walls leaking/Needs to be wipe in			0.00
92	-1.03	91	-1.78	239.08	0.28%	8	PVC	5'-5"	Good				0.06
93	-0.5	92	-0.94	160.5	0.27%	8	PVC	5'-5"	Good				0.03
94	0.44	93	-0.47	395.95	0.23%	8	PVC	5'-0"	Good				0.05
94A		94	0.50	163.56		8	PVC				Large Joint Offset, Defective Repair, Loose Sealing Ring	Lamphole-No Invert	
122	-0.03	121	-0.50	139.31	0.37%	8	PVC	3'-10"	Good				
121	-0.83	120	-1.52	257.31	0.44%	8	PVC	5'-3"	Fair	Conc. broken around ring/cover			0.05
120	-1.93	119	-3.62	239.3	0.66%	8	PVC	7'-3"	Good				0.11
119	-3.58	118	-5.13	398.45	0.40%	8	PVC	7'-10"	Fair	Conc. broken around ring/cover			0.01
118	-5.21	117	-5.87	271.73	0.26%	8	PVC	8'-8"	Good				0.05
117	-5.14	116	-6.86	175.72	0.25%	8	PVC	10'-10"	Fair				0.17
116	-6.66	115	-7.70	255.65	0.41%	8	PVC	11'-7"	Fair	Conc. broken around ring/cover			0.01
115	-7.73	114	-8.51	190.56	0.41%	8	PVC	12'-11"	Fair	Conc. broken around ring/cover			0.03
123	-3.03	114	-5.97	224.24	0.42%	8	PVC	10'-2"	Good		Infiltration Weeper, Water Level Sags		0.11
124	-3.56	123	-5.52	271.45	0.94%	8	PVC	8'-8"	Good				0.05
125	-0.85	124	-3.23	252.48	1.05%	8	PVC	4'-10"	Good		Infiltration Dripper		0.02
126	-0.23	125	-0.85	98.07	0.45%	8	PVC	4'-3"	Good				
114	-6.74	113	-8.86	45.57	0.53%	8	PVC	13'-3"	Fair	East Pipe 1' higher than rollout			1.77
113	-8.05	RB LS	-8.09	34.8	0.11%	8	PVC	13'-7"	Good			To Russell Bayou Lift Station	0.10
Bottom El.		-14.56		Top El.		5.34						Russell Bayou LS Data	
112	-8.33	113	-8.86	183.25	0.29%	8	PVC	12'-4"	Fair	Conc. broken around ring/cover	Deformed Pipe		0.05
109	-5.17	112	-8.21	408.9	0.75%	8	PVC	8'-11"	Fair	Needs Rollout for north pipe			2.49
110	0.27	109	-2.56	274.73	1.14%	8	PVC	13'-0"	Good		Infiltration Dripper		0.21
111	3.73	110	0.43	387.99	0.94%	8	PVC	5'-3"	Fair	Conc. broken around ring/cover			
107	-3.89	109	-5.25	291.66	0.37%	8	PVC	11'-4"	Fair	Needs Rollout for west pipe			2.09
108	1.2	107	-1.50	403.13	0.74%	8	PVC	8'-10"	Good				
105	-2.17	107	-3.74	373.95	0.41%	8	PVC	11'-5"	Good				0.13
106	5.05	105	-2.15	252.55	3.20%	8	PVC	4'-5"	Good		Large Joint Offset, Loose Sealing Ring		
102	-0.25	105	-2.09	340.57	0.52%	8	PVC	5'-10"	Fair	Needs Rollout for west pipe			1.87
104	5.65	103	4.86	247.35	0.40%	8	PVC	4'-3"	Good				
103	4.5	102	1.59	218.43	1.34%	8	PVC	7'-11"	Good				0.18
101	2.1	102	-0.22	181.03	1.28%	8	PVC	13'-7"	Good				0.30
101A	3.35	101	2.40	204.11	0.47%	8	PVC	12'-3"	Fair	Conc. Debris in MH			0.40
101B	5.7	101A	3.75	494.81	0.39%	8	PVC	5'-3"	Poor	Needs new lid	Longitudinal Fracture		

EXHIBIT F

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SHEET 2 OF 2

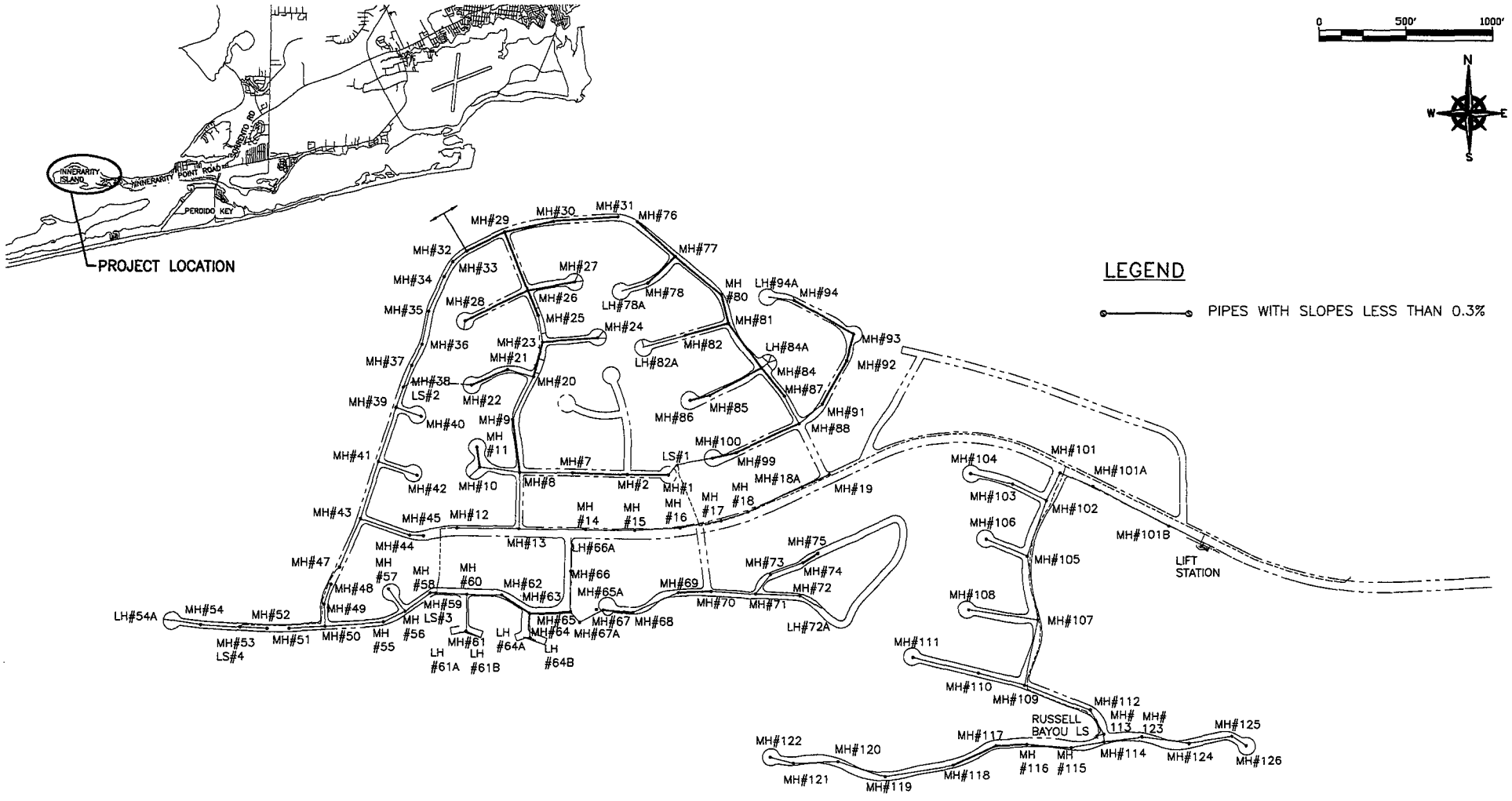

EXHIBIT G

Kenneth Horne & Associates, Inc.
CIVIL ENGINEERS
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7201 NORTH 9th, SUITE 6, PENSACOLA, FLORIDA 32504
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NO.	REVISIONS	APPROVED BY	DATE
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PROJECT NAME: II UTILITY TRANSFER

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PROJECT NO.: 2013-11

BY: DIC DATE: DEC 2013

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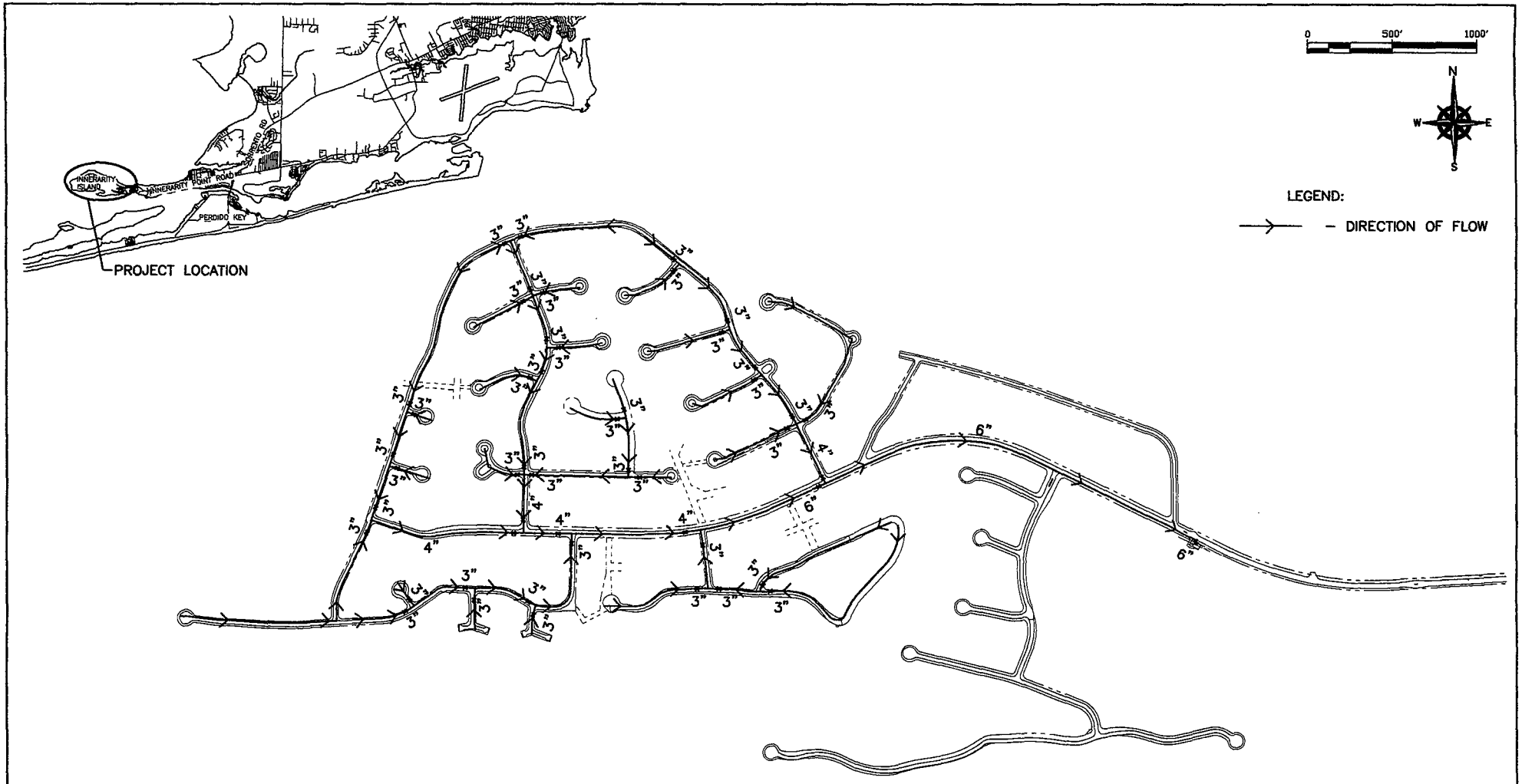

EXHIBIT H

KH&A Kenneth Horne & Associates, Inc.
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NO.	REVISIONS	APPROVED BY	DATE
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PROJECT NAME: II UTILITY TRANSFER

LOW PRESURE SEWER EXHIBIT

PROJECT NO.: 2013-11

BY: DIC DATE: DEC 2013

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