

MEMORANDUM FOR RECORD

20 MAY 2011

SUBJECT: 708 PACKAGE

1. ENCLOSED LETTER AND MEMO AND DRAWINGS PROVIDED BY APPLICANT (LARRY EVANS) AT MEETING 20 MAY 2011 AS ADVANCE OF LETTER TO BE SIGNED/MAILED SAME DAY.

Exemption (b)(6)

A solid black rectangular redaction box covers the text below the exemption label.

COL Alfred A. Pantano, Jr.
District Commander
U.S. Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, FL 32232-0019

Sir:

The Puerto Rico Electric Power Authority (PREPA) is working with the U.S. Army Corps of Engineers' Jacksonville District (District) Regulatory Division to secure a permit to construct the Via Verde pipeline in Puerto Rico. This project will provide PREPA with the capability to diversify fuels and deliver natural gas (NG) as an alternative fuel source for three power plants along the north shore of Puerto Rico.

As part of the ongoing evaluation, and PREPA's continual commitment to reduce; even further the environmental impacts of the project, the proposed pipeline corridor alignment was shifted and adjusted as it approached the Cambalache power plant near Arecibo. This change was necessary in order, among other efforts, to: (1) accommodate a relocation of the Cambalache metering station to an upland parcel and reduce impacts to wetlands, (2) avoid a Waste to Energy project to be constructed near PR-2, and (3) to keep a prudent distance from neighboring communities.

The adjusted alignment required the pipeline to cross underneath the Rio Santiago diversion channel just north of PR-22 before crossing back beneath the Rio Grande de Arecibo to arrive at the Cambalache meter station. The Rio Santiago diversion channel is part of the District's Rio Grande de Arecibo Flood Control Project. As the non-federal sponsor for that project, the Puerto Rico Department of Natural and Environmental Resources is asking for approval under 33 USC 408 to modify the project and allow PREPA to run the pipeline under the diversion channel using horizontal directional drilling technology (HDD). The proposed modification does not involve a significant change to the project's scope or exceed the level of ordinary District Operation and Maintenance responsibilities.

Please consider this letter to be a written request for a modification of the Rio Grande de Arecibo Flood Control Project. Attached please find a copy of the report providing information requested as part of a 408 Submittal Package. An additional copy has been also provided to the District's Regulatory Division and Programs and Project Management Division, for immediate action. Due to the importance of this project in relation to the economy of Puerto Rico, it is urged that all attention and support to this request be provided by your office.

Sincerely,

Hon. Daniel Galan Kercado
Secretary
Department of Natural and Environmental Resources

cc. [Redacted] North Permits Branch, CESAJ
[Redacted] Coastal/Navigation & Antilles Branch, CESAJ
[Redacted] Antilles Construction Office, CESAJ

Mailing addresses:

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U.S. Army Corps of Engineers
400 Ave Fernandez Juncos
San Juan, PR 00901-3223

Request for Project Modification

1. Description of project and modification:

The Puerto Rico Energy and Power Authority (PREPA) proposes to construct a 24-inch diameter steel natural gas (NG) pipeline from the EcoEléctrica LNG Terminal in Peñuelas north to the Cambalache Termoeléctricas Authority Central electric power plant in Arecibo, then east to the Palo Seco and San Juan power plants. The approximately 92 mile pipeline will be embedded (buried) for its entire length and will pass through the municipalities of Peñuelas Adjuntas, Utuado, Arecibo, Barceloneta, Manati, Vega Alta, Vega Baja, Dorado, Toa Baja, Cataño, Bayamón, and Guaynabo. Installation of the pipeline will require an initial construction right-of-way (ROW) approximately 100 feet wide and a permanent maintained post-construction ROW of 50 feet.

In a Real Estate Division Memo dated 20 January 2011, four flood control projects that the pipeline will pass near, or through, were identified. These projects were: Rio Grande de Arecibo, Rio Grande de Manati in Barceloneta, Rio Cibuco in Vega Baja and Rio La Plata in Dorado/Toa Alta, PR. In addition, the Via Verde pipeline is proposed to pass underneath the Rio Hondo/Rio Bayamon flood control channel(s).

The Real Estate Memo documented that except for the La Plata Project (future Construction Contract #3), the Pipeline would have no direct impact over USACE-DNER cost-share projects.

The pipeline project and its proximity to these Flood Control projects will be discussed in the order of approach from West to East as the project traverses from Arecibo to San Juan.

a. Rio Grande de Arecibo at Arecibo, P.R.

The project includes a floodwall and 2 miles of levee along the west side of the Arecibo River; channel improvements, a plug, and channel diversion on the Santiago River; and a short levee on the Tanama River. Construction began in year 2002 and was recently completed.

The Via Verde pipeline will approach the Federal Project from the south as it traverses North down the Grande de Arecibo valley from the interior. The pipeline corridor is located east of PR-10 and will not affect, nor approach, the Tanama Levee. The pipeline remains east of the Federal Project as it approaches, and passes underneath PR-22. The project modification request involves crossing the Santiago River Diversion Channel at 17° 27' 17" N, 66° 42' 26" W using horizontal directional drilling (HDD) technology. Project Construction Alignment Sheets (48.0-Z-321.43 and 321.44) and Horizontal Directional Drill profiles (48.0-Z-325.06 and 325.22) are attached as **Exhibit 1**. Within the river floodplain the pipeline will proceed north approximately 1,800 feet to another HDD crossing where the pipe will turn east and pass underneath the Rio Grande de Arecibo on its approach to the Cambalache power plant. For this 1,800 foot section, the pipe will be buried using standard open trench techniques. A typical trench cross section drawing is provided as **Exhibit 2**.

b. Rio Grande de Manati at Barceloneta, P.R.

The project consists of 5,200 meters of levee around the town of Barceloneta, and includes channel diversion and interior drainage facilities.

The Via Verde pipeline will approach the Federal Project from the West. The pipeline's 100-foot construction right-of-way (ROW) begins at the toe of slope of the Federal Levee. The pipe itself is located at the northern edge of this ROW and a minimum distance of 75-feet will separate the embedded pipe from the outer toe of the levee. As shown on the typical trench cross section in **Exhibit 2**, the embedded pipe will have no affect on the levee and will not change flow within the unnamed canal that passes through the levee at this location. The pipeline alignment, as the project passes north of the Federal Project and then South to PR-22, is depicted on the Project Construction Alignment Sheets (48.0-Z-321.56, 321.57 and 321.58) and, where the pipe will cross underneath the Manati River, Horizontal Directional Drill profile (48.0-Z-325.07) as **Exhibit 3**.

c. Rio Cibuco at Vega Baja, P.R. (Sec. 205)

The proposed project improvements include levees with culverts and a detention area for interior drainage. Project implementation included construction of the following flood control items: a 2,595 foot long levee in the eastern section of town; a 4,337 foot long levee in the northern section of town; and a 34.9 acre recreation area. In addition, PR Highway 688 was raised three meters to cross over the eastern levee and two meters to cross over the northern levee. The non-Federal sponsor is the Department of Natural and Environmental Resources. Project construction was initiated in 1994 and was completed in 1996.

Recent changes to the pipeline corridor alignment have eliminated any concerns with this Federal Project. The proposed pipeline will no longer proceed north of PR-22 along the Rio Indio and then back south down the valley west of PR-676. Instead, the pipeline will turn East when it meets PR-22 (east of PR-674) and run along the southern edge of the PR-22 ROW until it crosses underneath the highway to continue eastward until it meets with the PR-2 interchange. The project will have no affect on the eastern or northern levees, or the recreation area.

d. Rio de La Plata at Dorado/Toa Baja, P.R.

The Project plan calls for the construction of 7.0 miles of channel improvements in the Rio De La Plata and 7.6 miles of levees. The plan also includes the replacement of 3 bridges, recreation facilities, and mitigation for environmental impacts. Land acquisition process for the project was initiated in June 1995 and contract award was originally scheduled for 1997.

The Via Verde corridor will approach this Federal Project from the West as the pipe passes underneath PR-693 between PR-694 and PR-695. The pipeline alignment, from where the project passes north of PR-22 until it passes underneath the Rio de La Plata and PR-854 (the eastern edge of the proposed Federal Project) is depicted on the Project Construction Alignment Sheets (48.0-Z-321.81, 321.82, 321.83 and 321.84) and, where

the pipe will cross underneath the Rio de La Plata, Horizontal Directional Drill profile (48.0-Z-325.11) as **Exhibit 4**. The pipe will pass at a depth of -45 feet beneath the river bed and will have no affect on future channel improvement operations. Likewise, where the route of the proposed pipeline passes through a possible disposal area on the eastern edge of the future project, no interference is expected since the pipe will be buried with a minimum of 3-foot cover.

e. Rio Bayamon at Levittown, P.R.

The project to provide improvements to the flood control channel is pending Congressional funding. The Via Verde corridor will approach the Rio Hondo and Rio Bayamon channels from the west near the mouth of both channels at Boca Vieja Cove. The pipeline will cross both channels with a single HDD operation. The pipeline alignment and drill profile are depicted on Construction Alignment Sheet 48.0-Z-321.91 and Horizontal Directional Drill Sheet 48.0-Z-325.13, respectively, as **Exhibit 5**.

Purpose/need for modification:

The project corridor must cross into the Grande de Arecibo Federal Flood Control Project for three basic purposes:

1. Avoid a Waste to Energy project to be constructed nearby PR-2,
2. To accommodate relocation of the Cambalache metering station to an upland parcel and reduce impacts to wetlands and,
3. To maintain a prudent distance from neighboring communities

The project modification request does not involve the other identified Federal projects since the proposed pipeline will not impact them.

2. *Technical Analysis:*

- Geotechnical Evaluation:

The proposed modification will not affect the structural integrity of the Federal project. Initially, it was mistakenly thought the pipeline would cross underneath the levee. Closer review of the aerial photos, the project boundary maps and the final pipeline corridor alignment drawings confirmed the Via Verde project would only cross underneath the Rio Santiago diversion channel. As shown on the HDD drawings (**Exhibit 1**) the pipe's entry and exit points will be located 500 feet from the edge of the channel. In addition, the pipe will be placed at -50 feet below the bed of the channel. Geotechnical borings were conducted and are provided in **Exhibit 6**. At the design depth of -50 feet, the pipe will be located in a layer of gray fine to medium silty sand with some organic silt. Immediately above this layer is a 15-foot thick stratum of gray, organic, silty clay. There is no indication the technique to be used for the HDD crossing (standard HDD procedures using Bentonite, etc) will affect operation of the channel.

After the pipe is embedded, all overburden will be removed and disposed of in an approved upland site outside of the Federal Project boundary. The construction ROW will be restored to pre-construction grade and condition and allowed to revegetate. Only deep rooted, woody vegetation would be precluded from re-establishing within a 50-foot zone immediately above the buried pipe (for structural integrity considerations). Access to the construction site(s) will use available surface roads.

- **Structural:**

The HDD crossing will not affect the structural integrity, or operation, of the channel. No permanent ancillary structures are proposed within the Federal Project boundary.

- **Hydraulic/Hydrology:**

The pipeline will not change groundwater hydrology or the flow characteristics within the channel. No changes to water surface profiles or flow distribution is anticipated. Since the pipe will be embedded to a depth of at least 5-feet, the project will not change or affect the flood storage capacity of the flood basin. There will be no upstream or downstream impacts from the proposed project. Placement of the pipeline will result in no impact to floodplain management.

- **Operation and Maintenance:**

The pipeline will not affect or impede in any way future operation or maintenance of the channel or the Flood Control Project in general. Routine maintenance and inspections of the pipe will be done remotely using a pipeline inspection gauge (PIG). No permanent ancillary facilities such as mainline valve stations, metering stations or maintenance/access roads will be constructed in the section of the pipe that would fall within the boundaries of the Federal Project.

3. Real Estate Analysis:

Embedment of the pipeline will initially require a 100-foot wide construction right-of-way (ROW) while the pipe sections are welded together and placed in the trench. After construction and placement is completed, a 50-foot wide maintenance ROW will be used to ensure deep rooted vegetation does not grow back over the buried pipeline. A 150-foot wide restrictive easement will also be used to ensure inappropriate development does not occur over the pipeline in the future. The Puerto Rico Planning Board is considering a restriction for the entire pipeline corridor that would address this easement.

4. Discussion of Residual Risk:

The modification proposal does not seek to degrade, raise, or realign the Federal Project. There is no anticipated system impact from the pipe alignment. The proposed work will not approach or affect the levee constructed further to the east (several thousand meters distance) nor will it approach or affect the Rio Tanama levee in the south. Placement of the pipe within the Flood Control Project will result in no increased threat or risk to life or property. The pipeline will be embedded for its entire length and there is no expected risk of damage as a result of flooding that may occur within the river basin. No assistance under PL 84-99 is expected.

5. Discussion of Executive Order 11988 Considerations:

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities" for the following actions:

- acquiring, managing, and disposing of federal lands and facilities;
- providing federally-undertaken, financed, or assisted construction and improvements;
- conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

With regard to the Via Verde project, there are no practicable alternative routes available that would avoid construction within the floodplain at this location. The pipeline corridor route was altered, and incursion into the Grande de Arecibo flood control project required, to avoid a Waste to Energy project the Government of Puerto Rico is constructing at PR-2.

The proposed modification to the Federal Project and the incursion into the floodplain will not carry associative permanent facilities that would be at risk from future flood events. The pipeline will run underneath the Rio Santiago channel at a depth of -50 feet (safe from flood impacts) and the section of pipe that will extend northward from the HDD exit point within the floodplain will also be embedded for its entire length before the pipe exits the floodplain via another HDD crossing under the Grande de Arecibo River.

6. Administrative Record:

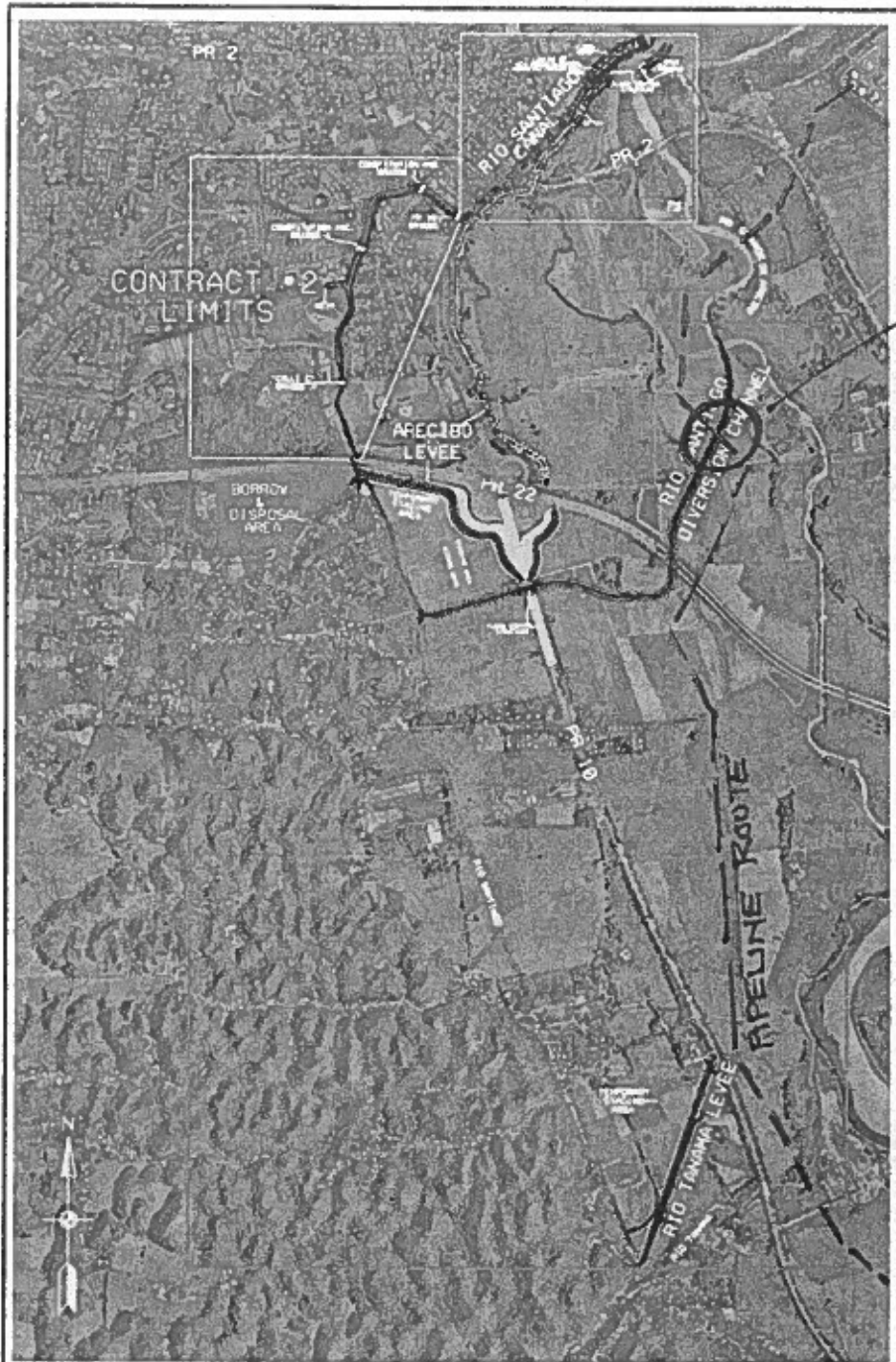
The Via Verde total plan of development for the project is being evaluated by the Jacksonville District's regulatory Division. The appropriate NEPA process will be determined and undertaken by the Regulatory Division. POC: Robert B. Barron

7. Environmental Protection Compliance:

See 6. (above)

EXHIBIT 1

- Rio Grande de Arecibo Flood Control Project Map
- Construction Alignment Sheet 48.0-Z-321.43_Rev 3
- Construction Alignment Sheet 48.0-Z-321.44_Rev 2
- Horizontal Directional Drill Sheet 48.0-Z-325.22_Rev 2
- Horizontal Directional Drill Sheet 48.0-Z-325.06_Rev 1



HDD crossing location



RIO GRANDE DE ARECIBO
FLOOD CONTROL PROJECT

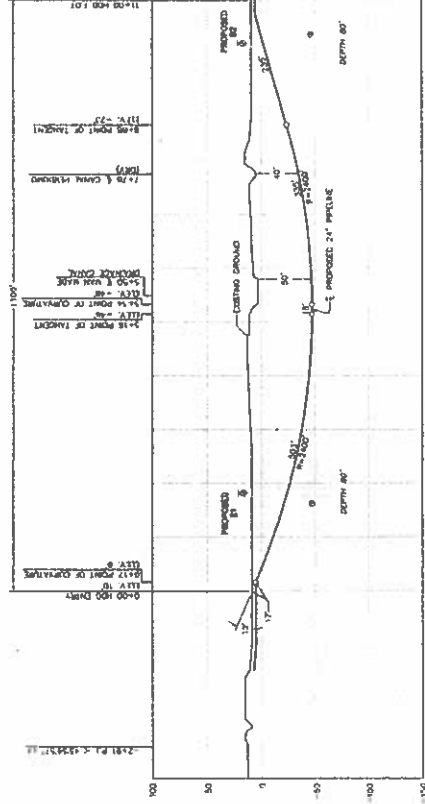
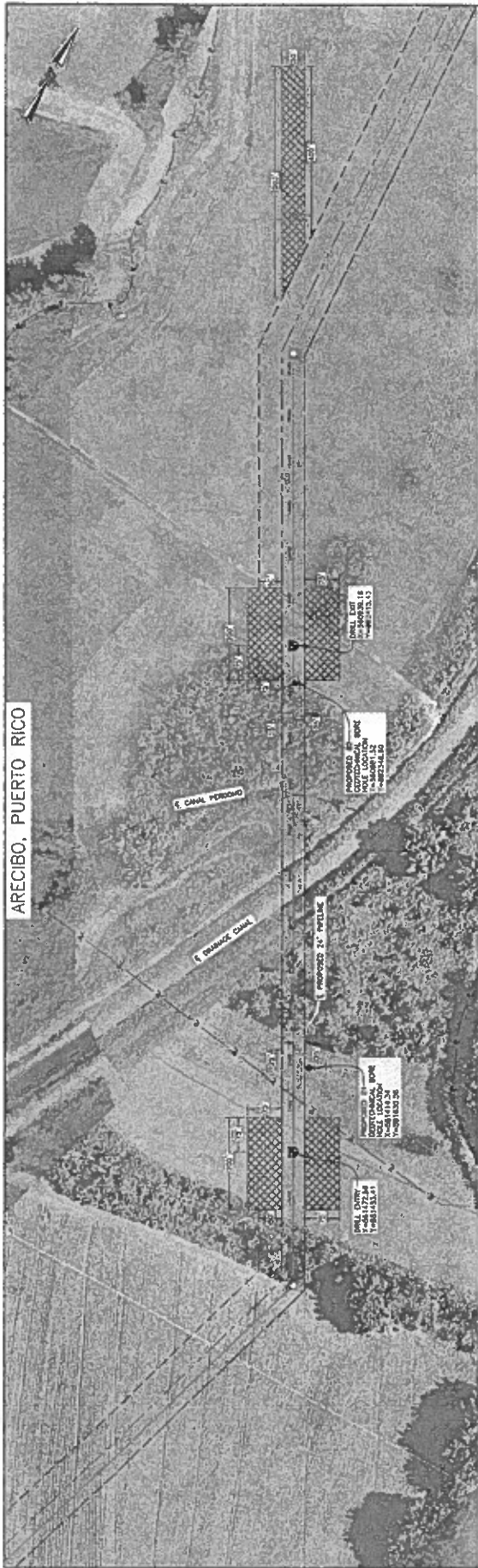


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PROJECT NO: 48.0-2331-43	DATE: 12/15/14



<p>PROPOSED VIA VERDE PIPELINE CONSTRUCTION ALPHABETIC SHEET LOCATED TO SAN JUAN 874-ARROYO, PUERTO RICO</p> <p>PRELIMINARY</p>	
<p>48.0-2331-43 43 OF 96 3</p>	
<p>DATE: 12/15/14</p>	
<p>DRAWN BY: [Name]</p>	
<p>CHECKED BY: [Name]</p>	
<p>PROJECT NO: 48.0-2331-43</p>	
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ARECIBO, PUERTO RICO



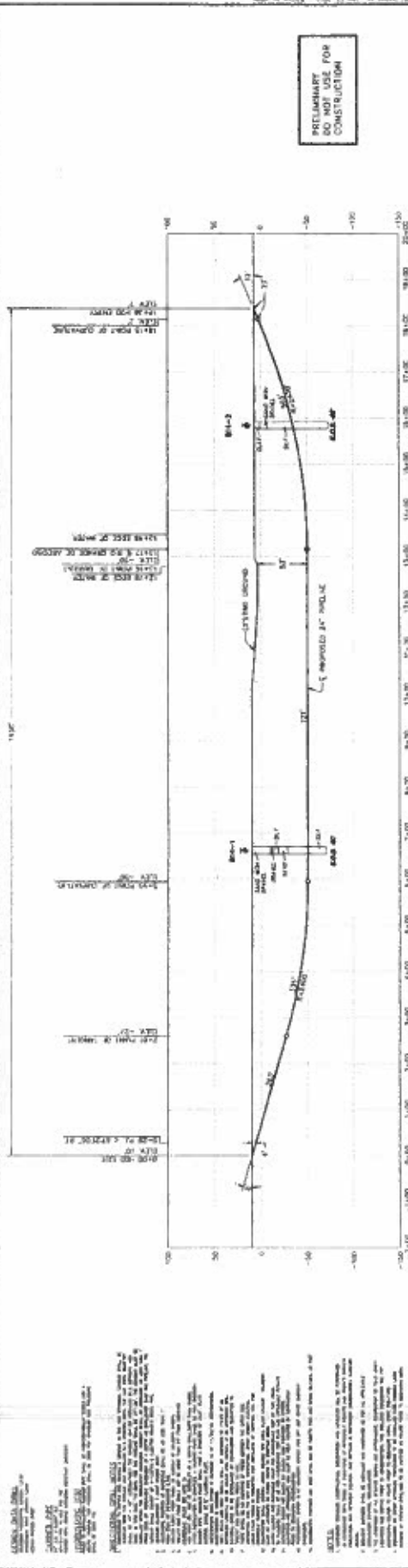
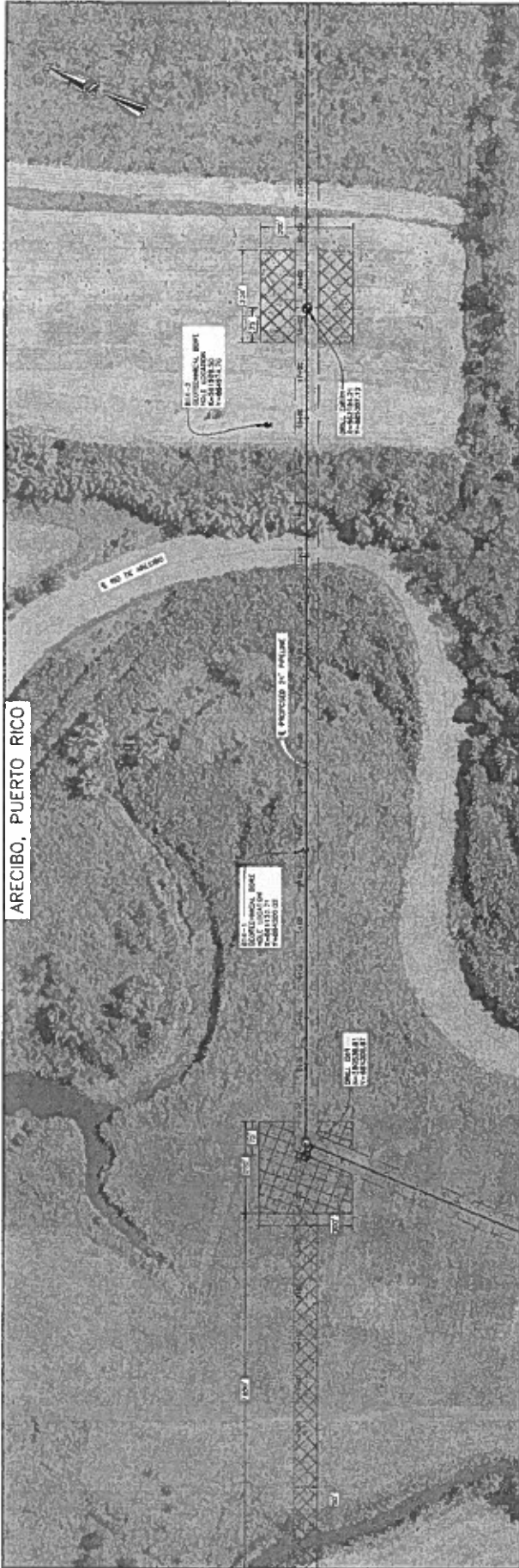
PRELIMINARY
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CONSTRUCTION

© 2014 THE ENGINEER, INC.

- NOTES:**
1. THE PROPOSED PIPELINE IS TO BE INSTALLED AT A DEPTH OF 60 INCHES.
 2. THE PROPOSED PIPELINE IS TO BE INSTALLED IN A TRENCH WITH 12 INCHES OF SAND FILL.
 3. THE PROPOSED PIPELINE IS TO BE INSTALLED IN A TRENCH WITH 12 INCHES OF SAND FILL.
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<p>VIA VERDE PIPELINE PROJECT HORIZONTAL DIRECTIONAL DRILL PROPOSED VIA VERDE PIPELINE DRAINAGE CANAL HDD ARECIBO, PUERTO RICO</p>		<p>DATE: 03-11-2011 DRAWN BY: [Name] CHECKED BY: [Name] SCALE: 1" = 100'</p>	<p>PROJECT NO.: 48.0-2-325.22 SHEET NO.: 1 OF 1</p>
<p>GENERAL NOTES:</p>		<p>REVISIONS:</p>	
<p>LEGEND:</p>		<p>APPENDIX:</p>	

ARECIBO, PUERTO RICO



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**VIA VERDE
PIPELINE PROJECT**

**HORIZONTAL DIRECTIONAL DRILL
PROPOSED VIA VERDE PIPELINE
RED BRIDGE AND ANCHORS
ARECIBO, PUERTO RICO**

SCALE: H. 1" = 40' V. 1" = 20'

DATE: 11/10/10

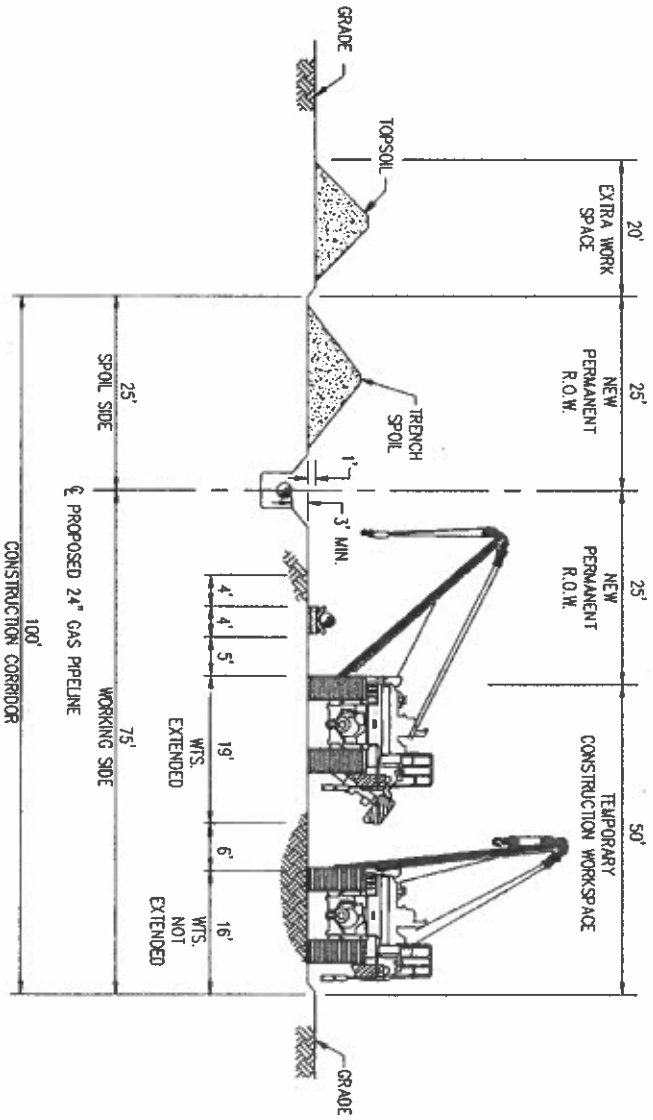
PROJECT NO: 48-D-2-305.06

SHEET NO: 1 OF 1

NO.	DESCRIPTION	DATE	BY	CHECKED
1	ISSUED FOR PERMITS	11/10/10
2

EXHIBIT 2

- Typical trench cross section sheet 48.0-Z-326.16_Rev 1



SECTION

- NOTES:
1. STRIPPING OF TOPSOIL SHALL EXTEND TO AREAS REQUIRED TO BE DISTURBED OR GRADED ON THE WORKING SIDE.
 2. IN WETLAND AREAS, A GEOTEXTILE FABRIC AND SOIL PAD SHALL BE INSTALLED TO PROVIDE A TEMPORARY SURFACE FOR USE BY CONSTRUCTION EQUIPMENT.
 3. INSTALL RIBBON ORBIC CABLE IN SAME TRENCH AS PIPELINE WHERE PRACTICAL (6' ABOVE TOP OF PIPELINE AND TO SPOIL). IF IMPRACTICAL TO INSTALL IN SAME TRENCH, THEN INSTALL IN SEPARATE TRENCH TO FEEL FROM PIPELINE ON SPOIL SIDE OF RIGHT-OF-WAY. PROVIDE JOE MINIMUM COVER TO TOP OF CABLE.
 4. PLASTIC OR POLYETHYLENE TAPE WITH THE PRINTED WARNING MESSAGE "CAUTION BURIED GAS PIPELINE BELOW" SHALL BE INSTALLED AS A SURFACE WARNING. THE MESSAGE SHALL BE 6" WIDE AND BORED APPROXIMATELY 12" TO 18" ABOVE THE PIPELINE, BUT A MINIMUM OF 10 SECONDS PUSHERS GRASS.

NO.	ISSUED FOR	BY	DATE	CHK'D	APP'D	DATE	PROJECT	DATE	NO.
1	ISSUED FOR ID	BR	11/29/16	CHK'D	APP'D		VA VERDIE PIPELINE PROJECT	PROPOSED VA VERDIE PIPELINE TYPICAL CROSS SECTION FULL WIDTH TOP-SOIL SEGREGATION	48.0-2-224.16

EXHIBIT 3

- Rio Grande de Manati Flood Control Project Map
- Construction Alignment Sheet 48.0-Z-321.56_Rev 1
- Construction Alignment Sheet 48.0-Z-321.57_Rev 1
- Construction Alignment Sheet 48.0-Z-321.58_Rev 3
- Horizontal Directional Drill Sheet 48.0-Z-325.07_Rev 1

Atlantic Ocean



LEVEE

BARCELONETA



RIO GRANDE DE MANATI



Rio Grande De Manati

PUERTO RICO

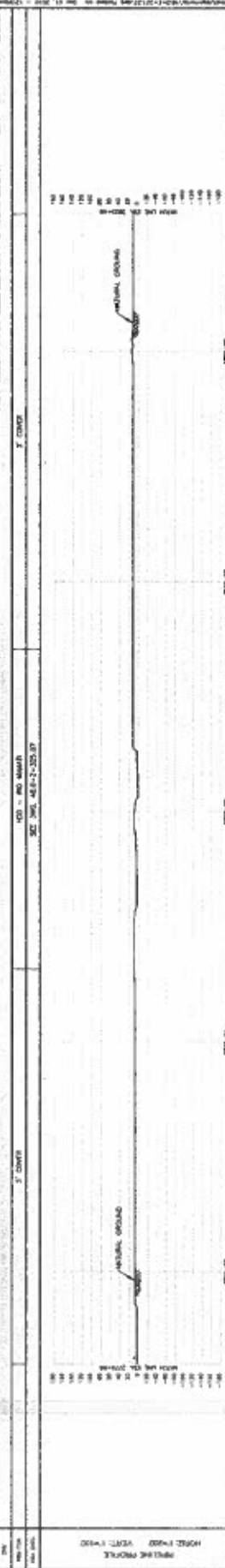
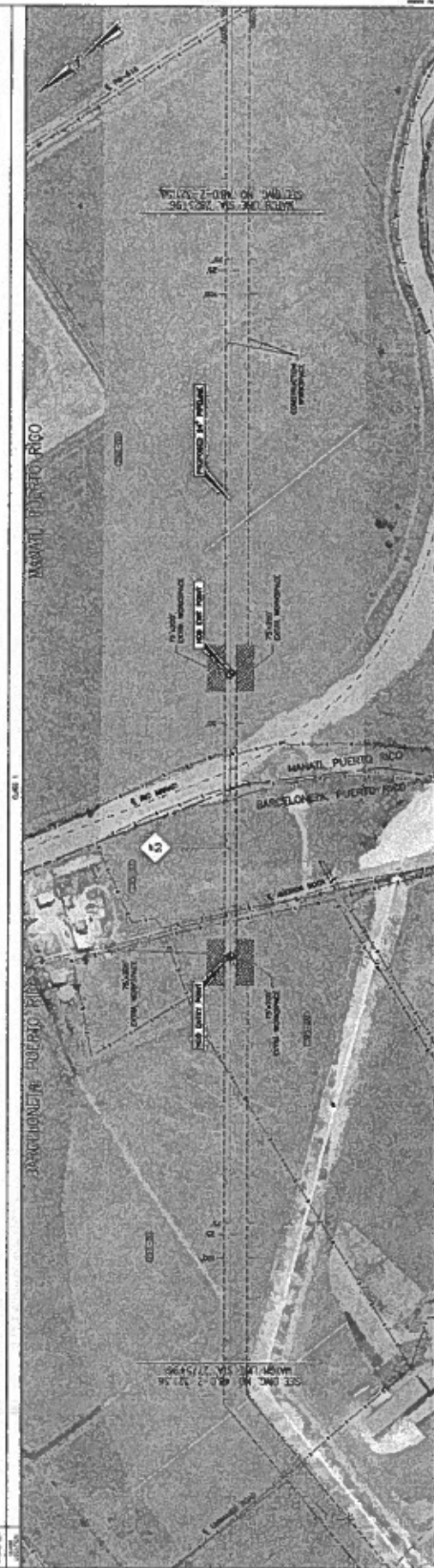
LOCATION MAP

PUERTO RICO

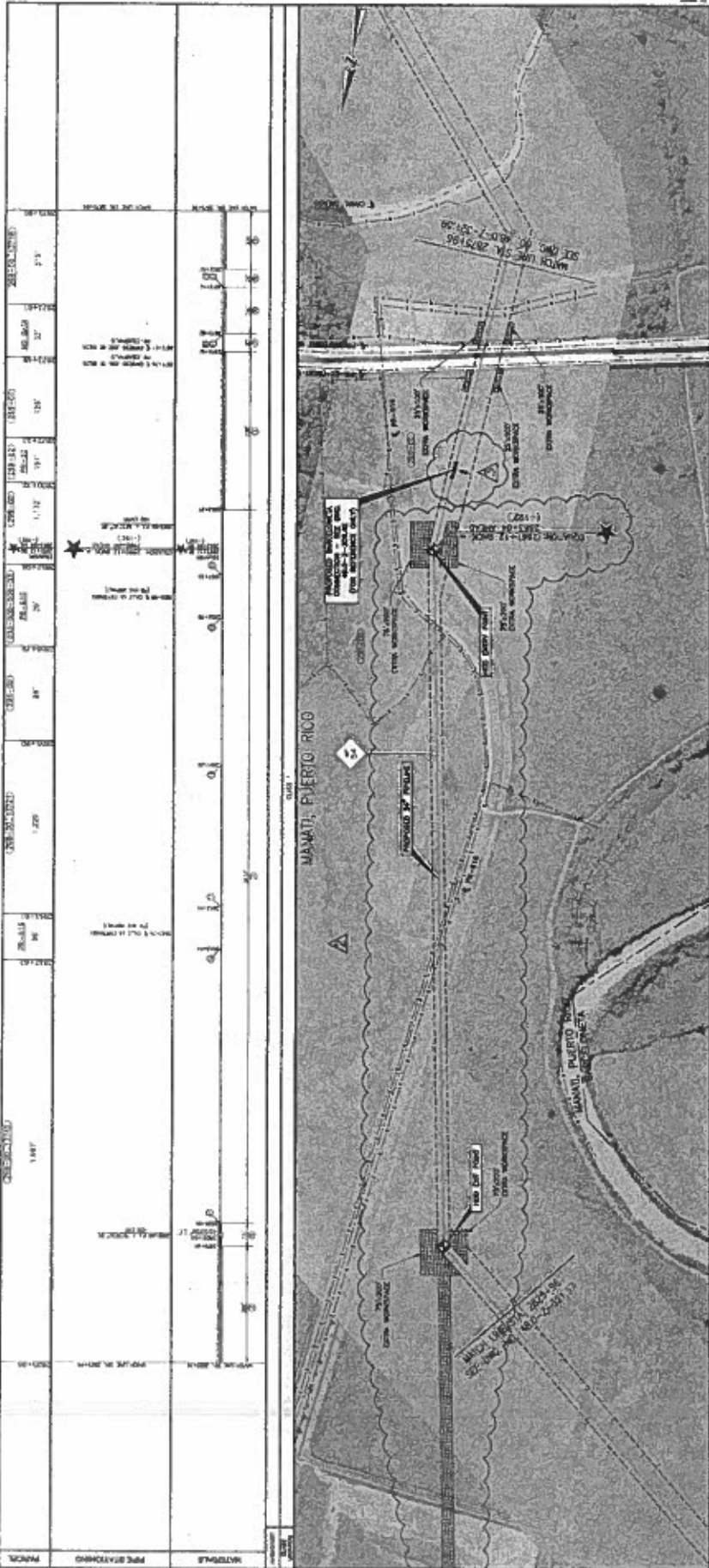
U.S. VIRGIN ISLANDS

RIO GRANDE DE MANATI
BACELONETA, PR

SECTION	120'	050'	150'	200'	250'	300'	350'	400'	450'	500'	550'	600'	650'	700'	750'	800'	850'	900'	950'	1000'
DATE																				
REVISIONS	1. 01/15/2010 2. 02/10/2010 3. 03/15/2010 4. 04/20/2010 5. 05/25/2010 6. 06/30/2010 7. 07/31/2010 8. 08/31/2010 9. 09/30/2010 10. 10/31/2010 11. 11/30/2010 12. 12/31/2010																			
SCALE	1" = 100'																			
PROJECT	VIA VERDE PIPELINE PROJECT																			
CONTRACT	CONTRACT NO. 48-0-3-321.57																			
DATE	DATE: 08/13/2010																			
DRAWN BY	DRAWN BY: [Name]																			
CHECKED BY	CHECKED BY: [Name]																			
DATE	DATE: [Date]																			
SCALE	SCALE: 1" = 100'																			
PROJECT	PROJECT: VIA VERDE PIPELINE PROJECT																			
CONTRACT	CONTRACT: 48-0-3-321.57																			
DATE	DATE: 08/13/2010																			
DRAWN BY	DRAWN BY: [Name]																			
CHECKED BY	CHECKED BY: [Name]																			
DATE	DATE: [Date]																			



VIA VERDE PIPELINE PROJECT CONTRACT NO. 48-0-3-321.57 PROPOSED VIA VERDE PIPELINE FROM ELECTROA TO SAN JUAN STA. 0+00 TO STA. 10+00 SHEET NO. 57 OF 96	
SCALE 1" = 100'	DATE 08/13/2010
DRAWN BY [Name]	CHECKED BY [Name]
DATE [Date]	SCALE 1" = 100'
PROJECT VIA VERDE PIPELINE PROJECT	CONTRACT 48-0-3-321.57
DATE 08/13/2010	DRAWN BY [Name]
CHECKED BY [Name]	DATE [Date]
SCALE 1" = 100'	PROJECT VIA VERDE PIPELINE PROJECT
CONTRACT 48-0-3-321.57	DATE 08/13/2010
DRAWN BY [Name]	CHECKED BY [Name]
DATE [Date]	SCALE 1" = 100'



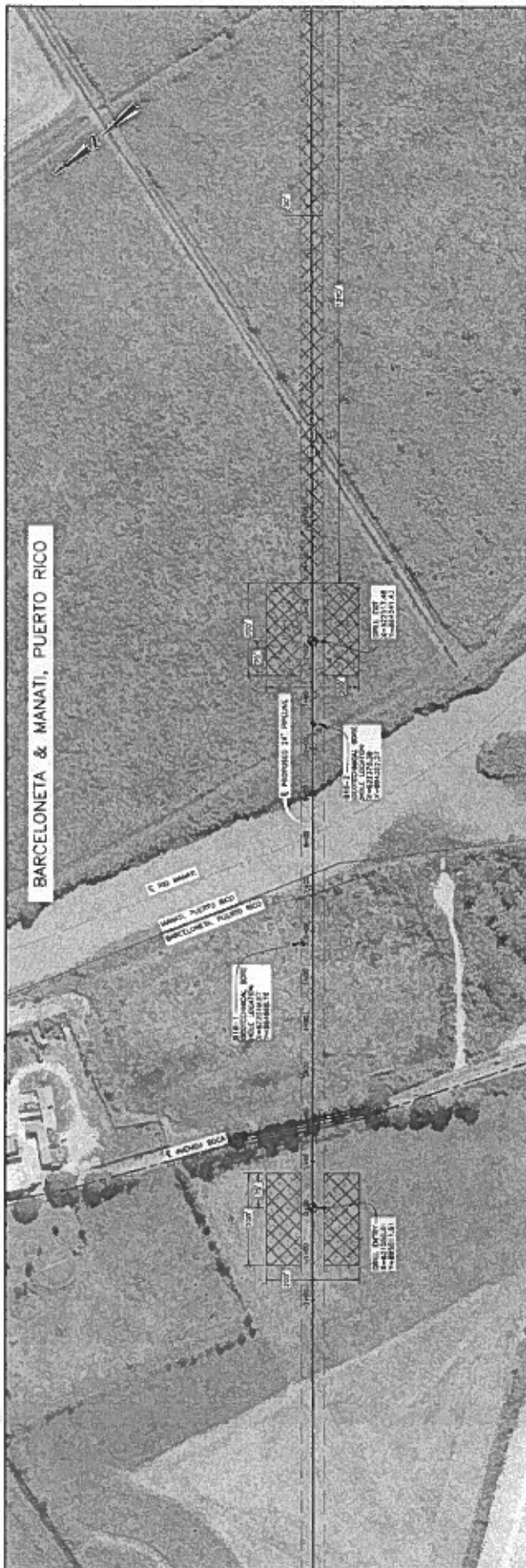
PANEL 3 OF 3		DATE: 07/11/02		SCALE: AS SHOWN	
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SHEET: 3 OF 3		DATE: 07/11/02		SCALE: AS SHOWN	
PROJECT: VIA VERDE PIPELINE PROJECT		DRAWN: R. J. GARCIA		CHECKED: J. J. GARCIA	
SHEET: 3 OF 3		DATE: 07/11/02		SCALE: AS SHOWN	

PRELIMINARY
NOT FOR CONSTRUCTION

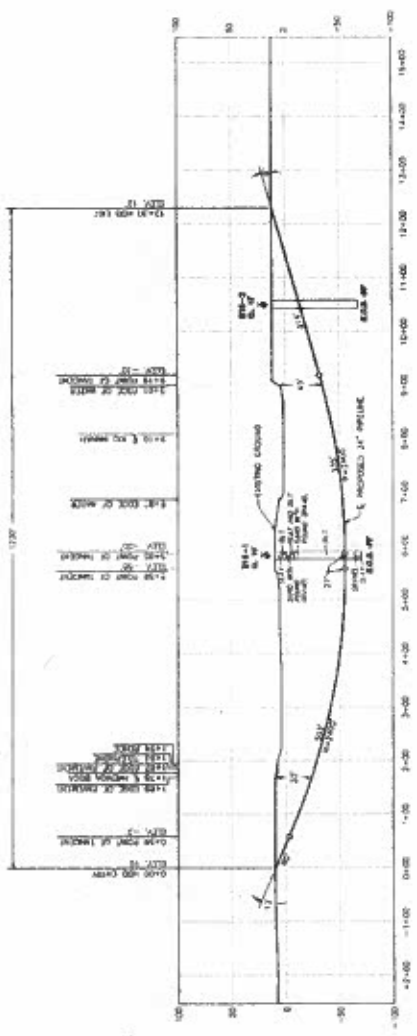
VIA VERDE PIPELINE PROJECT
CONSTRUCTION ALIGNMENT SHEET
PROPOSED VIA VERDE PIPELINE
FROM COLUMBIA TO SAN JUAN
PIPER TO BOZO

PROJECT NO: 48-0-2-321-06
 SHEET NO: 3 OF 3

BARCELONETA & MANATI, PUERTO RICO



PRELIMINARY
DO NOT USE FOR
CONSTRUCTION



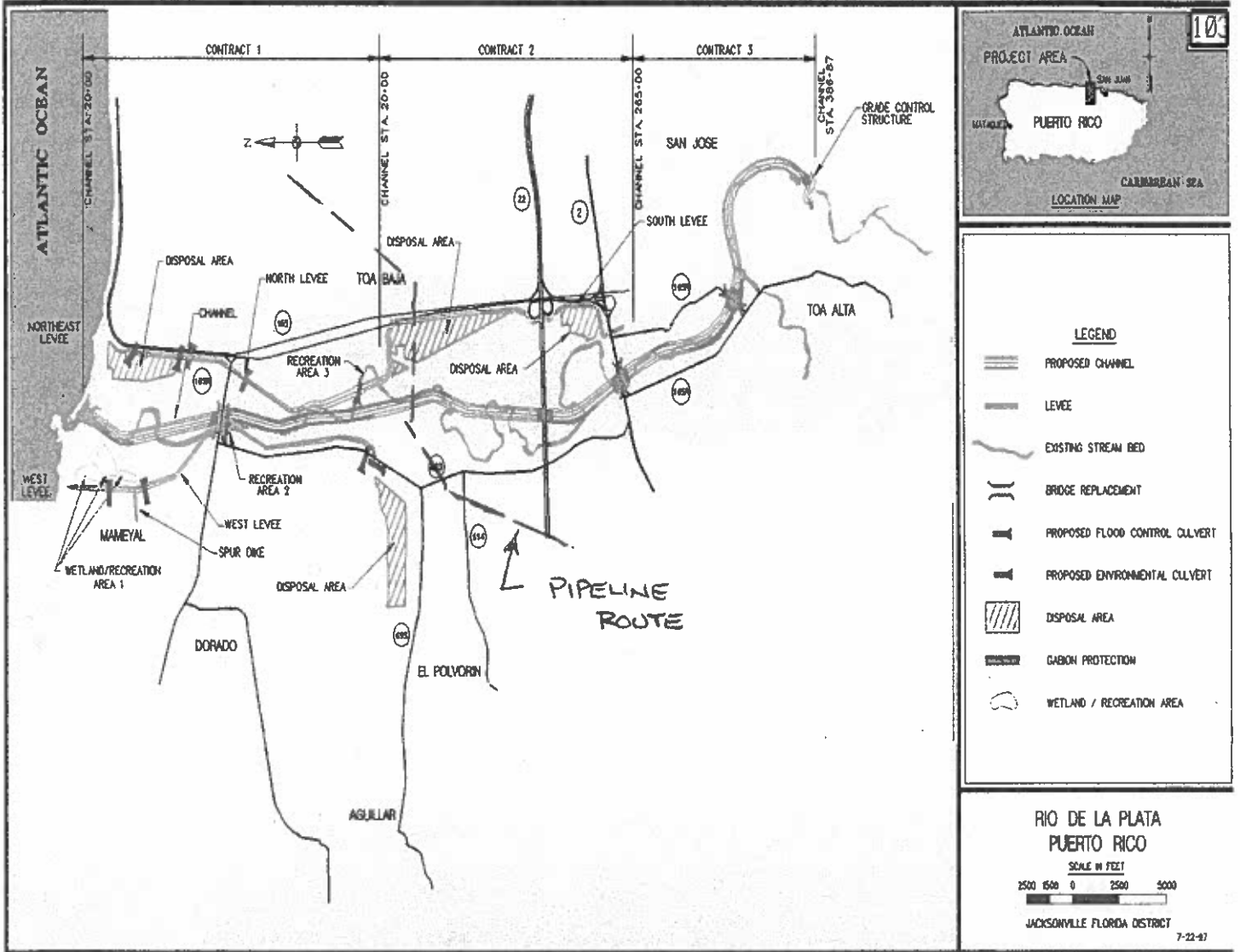
GENERAL NOTES:

1. THE PROPOSED PIPELINE IS TO BE INSTALLED AT A DEPTH OF 48 INCHES BELOW FINISHED GROUND SURFACE.
2. THE PIPELINE SHALL BE MADE OF 24 INCH DIAMETER POLYETHYLENE GLASS REINFORCED PIPE (PEGR) WITH A WALL THICKNESS OF 1.5 INCHES.
3. THE PIPELINE SHALL BE INSTALLED IN A TRENCH WITH A MINIMUM WIDTH OF 36 INCHES AND A MINIMUM COVER OF 48 INCHES.
4. THE TRENCH SHALL BE BACKFILLED WITH 3/4 INCH MAXIMUM SIZE GRANULAR MATERIAL TO A MINIMUM DENSITY OF 95%.
5. THE PIPELINE SHALL BE INSTALLED IN A STRAIGHT LINE UNLESS OTHERWISE NOTED.
6. THE PIPELINE SHALL BE INSTALLED IN A LINE WITH THE EXISTING GROUND SURFACE UNLESS OTHERWISE NOTED.
7. THE PIPELINE SHALL BE INSTALLED IN A LINE WITH THE EXISTING GROUND SURFACE UNLESS OTHERWISE NOTED.
8. THE PIPELINE SHALL BE INSTALLED IN A LINE WITH THE EXISTING GROUND SURFACE UNLESS OTHERWISE NOTED.
9. THE PIPELINE SHALL BE INSTALLED IN A LINE WITH THE EXISTING GROUND SURFACE UNLESS OTHERWISE NOTED.
10. THE PIPELINE SHALL BE INSTALLED IN A LINE WITH THE EXISTING GROUND SURFACE UNLESS OTHERWISE NOTED.

VIA VERDE PIPELINE PROJECT HORIZONTAL DIRECTIONAL DRILL PROPOSED VIA VERDE PIPELINE FROM MANATI TO BARCELONETA MP 12.1 - 12.8 BARCELONETA & MANATI, PUERTO RICO SHEET NO. 48.0-2-325.07 1 OF 1	
DATE: 08/14/2013 DRAWN BY: J. J. GARCIA CHECKED BY: J. J. GARCIA SCALE: AS SHOWN PROJECT NO.: 48.0-2-325.07	DATE: 08/14/2013 DRAWN BY: J. J. GARCIA CHECKED BY: J. J. GARCIA SCALE: AS SHOWN PROJECT NO.: 48.0-2-325.07
DATE: 08/14/2013 DRAWN BY: J. J. GARCIA CHECKED BY: J. J. GARCIA SCALE: AS SHOWN PROJECT NO.: 48.0-2-325.07	DATE: 08/14/2013 DRAWN BY: J. J. GARCIA CHECKED BY: J. J. GARCIA SCALE: AS SHOWN PROJECT NO.: 48.0-2-325.07

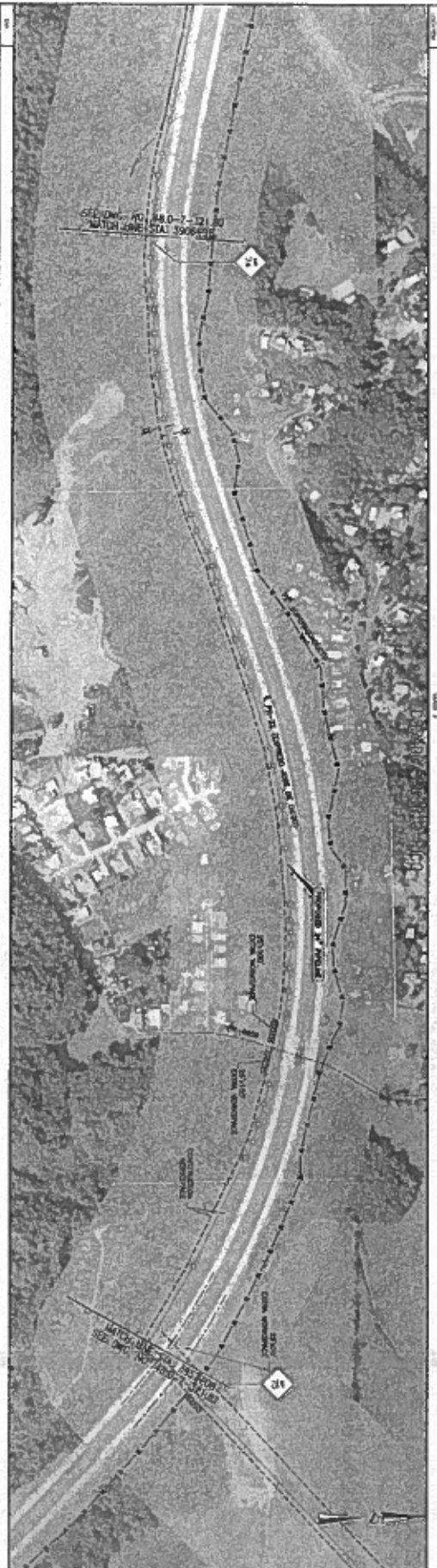
EXHIBIT 4

- Rio de La Plata Flood Control Project Map
- Construction Alignment Sheet 48.0-Z-321.81_Rev 1
- Construction Alignment Sheet 48.0-Z-321.82_Rev 1
- Construction Alignment Sheet 48.0-Z-321.83_Rev 1
- Construction Alignment Sheet 48.0-Z-321.84_Rev 1
- Horizontal Directional Drill Sheet 48.0-Z-325.11_Rev 1

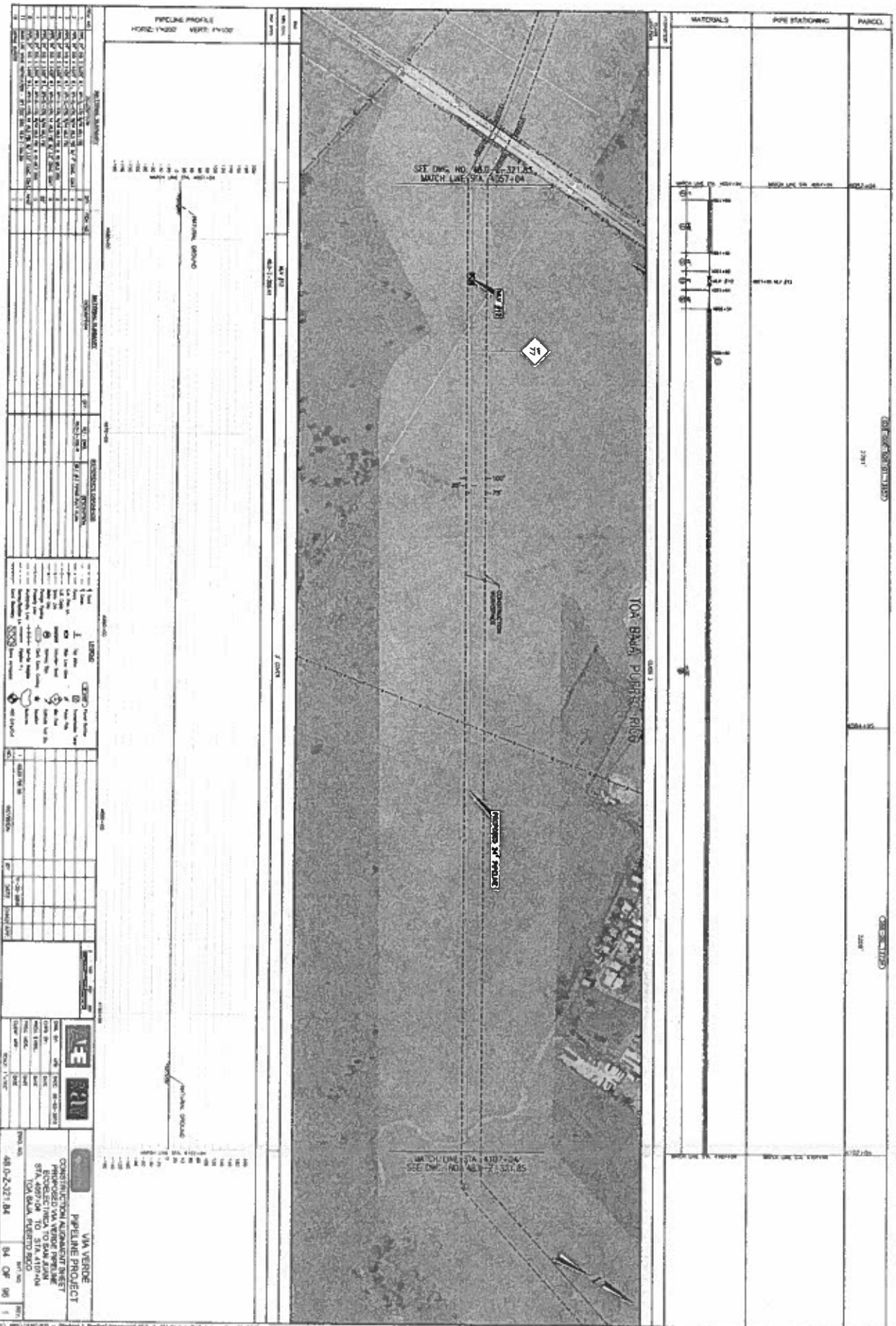


Rio De La Plata Project

NO.	DESCRIPTION	AMOUNT	UNIT	TOTAL
1	PIPE	1000	FT	1000
2	CONCRETE	100	YD	100
3	GRAVEL	500	YD	500
4	ROCK	200	YD	200
5	BRICK	100	YD	100
6	CEMENT	50	YD	50
7	WATER	1000	MG	1000
8	ELECTRICITY	1000	KWH	1000
9	LABOR	1000	HOUR	1000
10	TRAVEL	1000	MILE	1000
11	INSURANCE	1000	DOLLAR	1000
12	TOTAL			10000



MATERIALS	PIPE STATIONING	PARCEL
PIPE	3906+00	3906+00
CONCRETE	3906+00	3906+00
GRAVEL	3906+00	3906+00
ROCK	3906+00	3906+00
BRICK	3906+00	3906+00
CEMENT	3906+00	3906+00
WATER	3906+00	3906+00
ELECTRICITY	3906+00	3906+00
LABOR	3906+00	3906+00
TRAVEL	3906+00	3906+00
INSURANCE	3906+00	3906+00
TOTAL	3906+00	3906+00



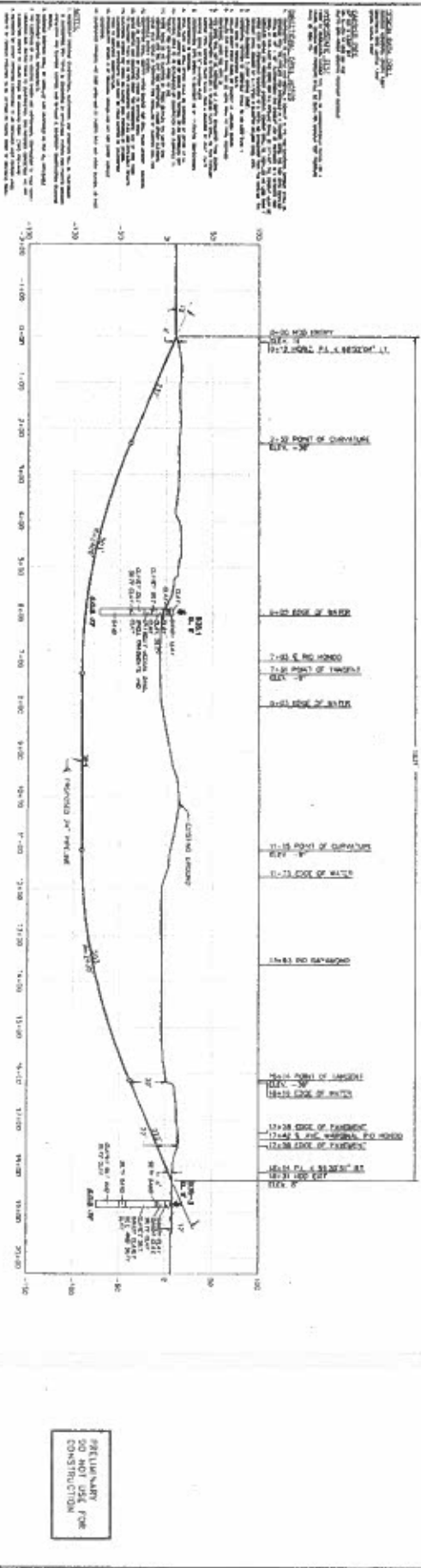
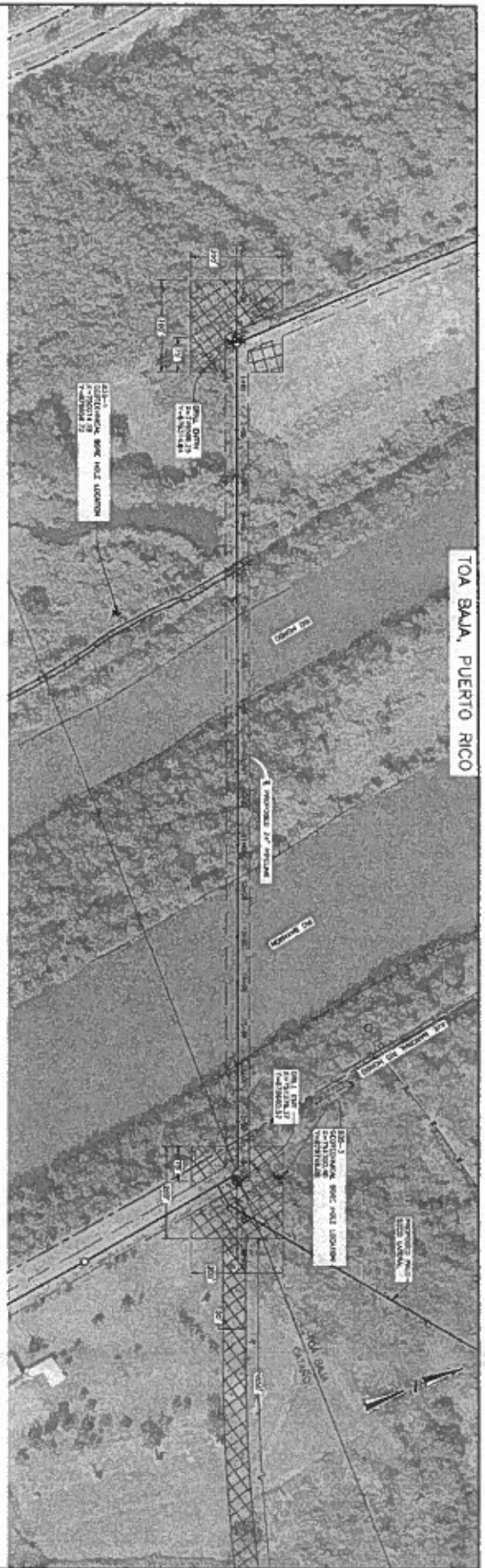
4817-21-321.25 94 OF 98 1

VIA VERSION
 PRELIMINARY PROJECT
 COMPLETION ADVISORY
 PROPOSED VIA VERDOR PRELIM
 RECONSTRUCTION TO SAN JUAN
 STN, SAN JUAN, PUNTA RENA
 DATE: 11/10/10
 4817-21-321.25

EXHIBIT 5

- Construction Alignment Sheet 48.0-Z-321.91_Rev 2
- Horizontal Directional Drill Sheet 48.0-Z-325.13_Rev 1 (1 of 2)

TOA BAJA, PUERTO RICO



GENERAL INFORMATION		DESIGN INFORMATION		CONSTRUCTION INFORMATION		MATERIALS INFORMATION		REVISIONS		APPENDICES	
PROJECT NO.	48-D-2-205-13	DATE	03-20-2017	SCALE	AS SHOWN	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
PROJECT NAME	VIA VERDE PIPELINE PROJECT	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
CLIENT	TEA BAJA, PUERTO RICO	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
PROJECT LOCATION	TOA BAJA, PUERTO RICO	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
PROJECT DESCRIPTION	VIA VERDE PIPELINE PROJECT	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
PROJECT NO.	48-D-2-205-13	DATE	03-20-2017	SCALE	AS SHOWN	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
PROJECT NAME	VIA VERDE PIPELINE PROJECT	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
CLIENT	TEA BAJA, PUERTO RICO	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
PROJECT LOCATION	TOA BAJA, PUERTO RICO	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1
PROJECT DESCRIPTION	VIA VERDE PIPELINE PROJECT	DESIGNER	TECHNICAL SERVICES, INC.	CONTRACT NO.	48-D-2-205-13	NO. OF SHEETS	1 OF 2	DATE	03-20-2017	BY	1

EXHIBIT 6

- Aerial photograph image of Rio Santiago crossing with Core Boring location
- Geo Engineering Inc. Core Boring B-2 data sheet (3 pages)



648 pixel(s)

B-2 (W-18,458000 W-66,707996)

40

Platanal

© 2011 Europa Technologies

Image © 2011 GeoEye

© 2011 Google

lat 18.458760° long -86.707514° elevation 0m (ft)

© 2010 Google

Alt. 0m 2603ft (8)

GEO ENGINEERING INC.

BORING NO. B-2 Canal

SHEET 1 OF 3

START DATE 4/8/2011

COMPLTN. DATE _____

PROJECT Via Verde Pipeline

LOCATION Peñuelas-Guaynabo, PR

CLIENT RAY Architects and Engineers PROJECT NO. GEO-750-2010

BORING LOCATION MP 40 (Canal Crossing)

DRILL RIG BK51 SAMPLER: HAMMER WT. 140 DROP 30

FOREMAN L. Olivo CHECKED CRP

COMPLETION DEPTH 80.00ft.

WATER DEPTH:
DURING DRILLING (ft.) _____
AFTER COMPLETION (ft.) 12

DEPTH (FT)	SPT N VALUE (BLOWS/FT)	FIELD VALUES					SYMBOL	MATERIAL DESCRIPTION	U.S.C.S. DESIGNATION	MOISTURE CONTENT					DEPTH (FT)
		SPT	W%	PL	LL	PI				W%	PL	LL	PI	q_u	
0	9	10	30				Dark brown sandy clay (Topsoil and Alluvial)		30					1.5	A
12	6	10	16				Light brown silty sand and clayey sand (Alluvial)		16					1.0	A
5	5	10	15				Light brown, dark brown mottled, clay		15					1.0	A
5	5	10	50				Dark gray, organic silty clay		50						
10	10	10	23				Dark gray, organic silty clay		23						
10	12	10	15				Brown medium gravelly sand with traces of silt (Alluvial)		15						
10	10	10	16				Brown medium gravelly sand with traces of silt (Alluvial)		16						
15	13	10	18				Brown medium gravelly sand with traces of silt (Alluvial)		18						
15	11	10	22				Brown medium gravelly sand with traces of silt (Alluvial)		22						
20	6	10	29				(coarse)		29						
20	26	10	17				(coarse)		17						
20	4	10	45				Dark greenish gray, organic silty clay and clayey silt		45						
25	5	10	46				Dark greenish gray, organic silty clay and clayey silt		46						
25	21	10	57				Dark greenish gray, organic silty clay and clayey silt		57						

U.S.C.S. - UNIFIED SOIL CLASSIFICATION SYSTEM DESIGNATION.
W%, PL, LL AND PI - NATURAL WATER CONTENT, PLASTIC LIMIT,
LIQUID LIMIT AND PLASTICITY INDEX (RESPECTIVELY)

q_u - UNCONFINED COMPRESSION STRENGTH; REPORTED VALUES
OBTAINED FROM:
A. POCKET PENETROMETER
B. SPRING TEST
C. UNCONFINED COMPRESSION TEST
D. TRIAXIAL TEST
E. VANE TEST

GEO ENGINEERING INC.

BORING NO. B-2 Canal

SHEET 2 OF 3

LOCATION MP 40 (Canal)

COMPLETION DEPTH 60ft.

DEPTH (FT)	SPT N VALUE (BLOWS/FT)	FIELD VALUES	SYMBOL	MATERIAL DESCRIPTION	U.S.C.S. DESIGNATION	MOISTURE CONTENT					DEPTH (FT)	
						W% ●	W%	PL	LL	PI		c_u (ksi)
26	26	SPT 102030405060	[Symbol]	Gray fine to medium, silty sand (Alluvial)		10	20					30
4	4		[Symbol]	Gray and dark gray, organic silty clay with peat inclusions		63	63					35
2	2		[Symbol]			40						40
9	9		[Symbol]			52						45
17	17		[Symbol]	Gray fine to medium silty sand with few dark gray organic silt		23						60
7	7		[Symbol]	Greenish gray, organic clayey silt and silty clay		53						55
Push/18"			[Symbol]	Light brown clay (Alluvial)		53						60
6	6		[Symbol]	Dark brownish gray, organic clayey silt		50						65

1.0 A

0.9 A

GEO ENGINEERING INC.

BORING NO. B-2 Canal
 SHEET 3 OF 3
 LOCATION MP 40 (Canal)
 COMPLETION DEPTH 80ft.

DEPTH (FT)	SPT N VALUE (BLOWS/FT)	FIELD VALUES					SYMBOL	MATERIAL DESCRIPTION	U.S.C.S. DESIGNATION	MOISTURE CONTENT					DEPTH (FT)
		SPT								W%	PL	LL	PI	$\rho_w \rho_b$	
70	21	10	20	30	40	50	60		23						70
75	9								44						75
80	16								76					1.5 A	80
85															85
90															90
95															95
100															100
105															105

Dark gray, slightly organic fine to medium silty sand

(and sandy silt)

Dark gray, organic clayey silt

End of Boring