HDD PA-WA-0103.0000-RD (S16, S250)

Given the design, the threat of inadvertent return has been reduced to the maximum extent practicable and in this case that threat is considered to be medium. Implementing this design, along with adherence to the Pennsylvania Pipeline Project Inadvertent Return Contingency Plan will ensure inadvertent impacts, if they were to occur, are also minimized to the maximum extent.

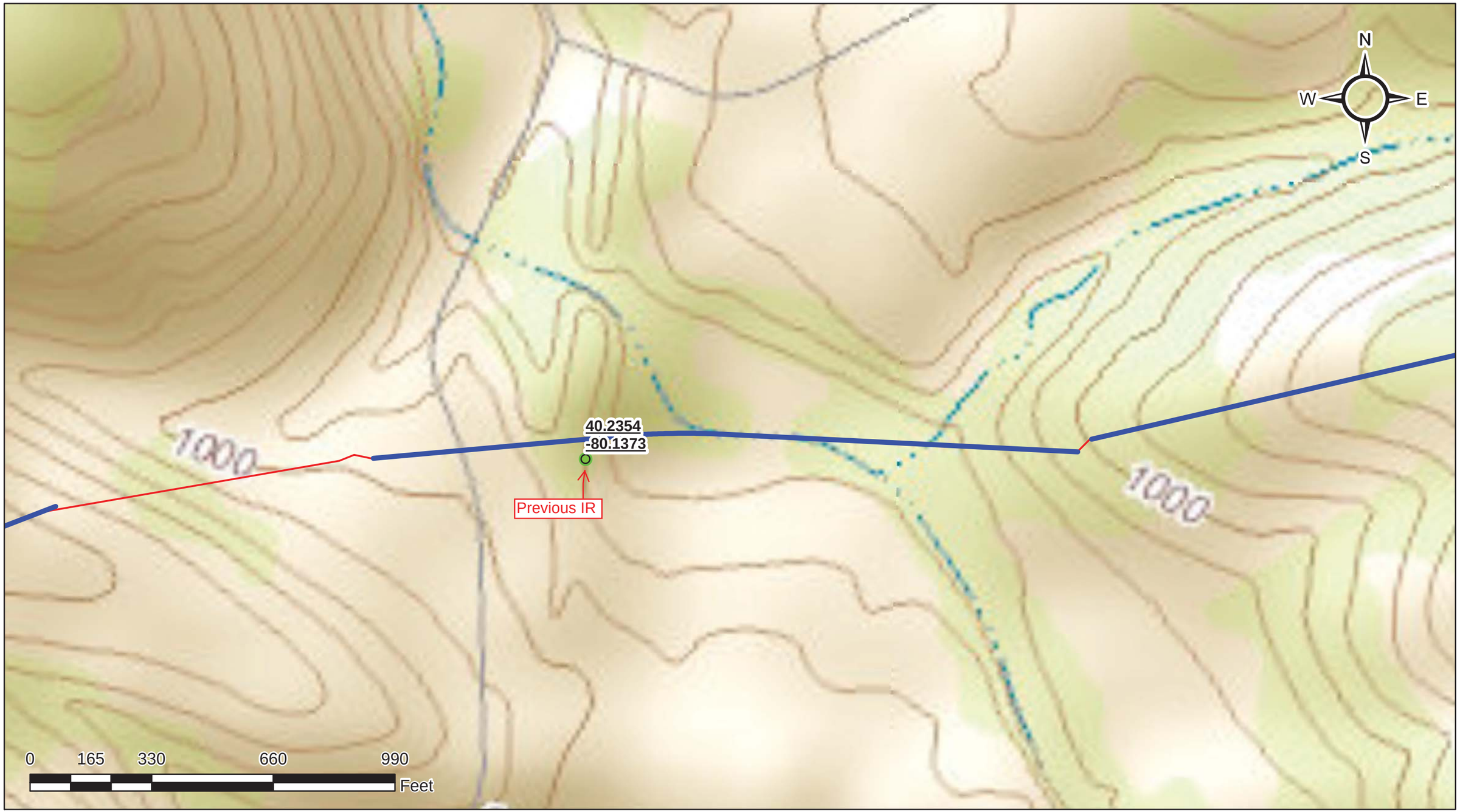
A geotechnical boring was not completed for this drill location for either the ME1 project or the current ME2 project. The lack of a geotechnical report, and a waterway require an increase in the risk assessment for potential environmental impacts of inadvertent returns. The depth of crossing at the road and the creek are such that the potential for inadvertent returns, and their impacts, is mitigated to an extent. The environmental risk for inadvertent returns associated with this drill is a medium. As such it is recommended that additional inspection in the area surrounding the drill be in place to monitor for potential inadvertent returns.

Revised: January 30, 2017

A PADEP request for more information regarding the ME1 inadvertent return and its consequences for the current ME2 project at this location was made in January 2017. It is believed that the inadvertent return experienced during the ME1 drill was caused by previous ground disturbance for a railroad bed leading up to the crossing of Little Cartiers Creek. The release of 700 gallons of drilling fluid was contained quickly before impacting any aquatic resources including Little Chartiers Creek.

The drill profile has been altered to reflect a drill about 20 feet deeper than ME1, and to between 82 feet and 96 feet below Little Chartiers Creek. The drill will now enter/exit 1,480 feet from the western edge of the creek and enter/exit 600 feet from the eastern edge. The drill will also pass about 100 feet below Linden Creek Road and 35 feet below Stream 250.

The area is a cultural resource and the pipeline cannot cross without the horizontal directional drill. Since there was a previous inadvertent return at this location additional environmental inspectors will be on site and the drilling contractor will more frequently monitor the mud pressures throughout the drill.



Legend

- HDD Path
- Proposed Centerline

DRAWN	CHECKED	APPROVED	DATE	REV NO.	DESCRIPTION
AW	RB	RB	11/21/16	A	ISSUED FOR REVIEW

PREPARED BY: TETRA (303) 79

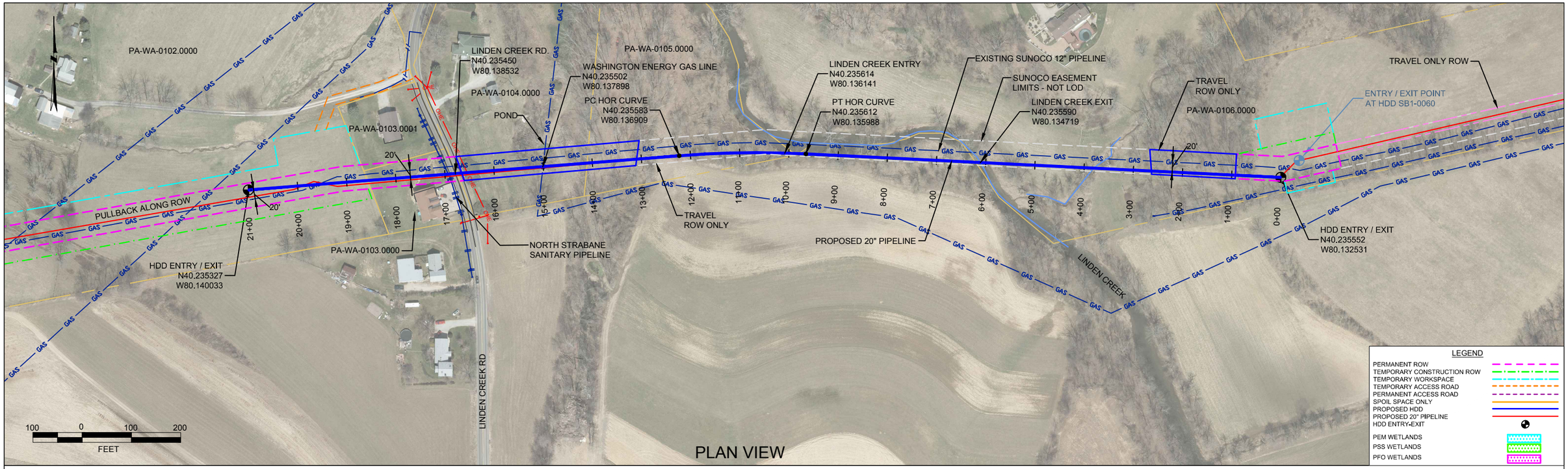
Sunoco Pipeline L.P.

PENNSYLVANIA PIPELINE PROJECT

INADVERTENT RETURN ASSESSMENTS

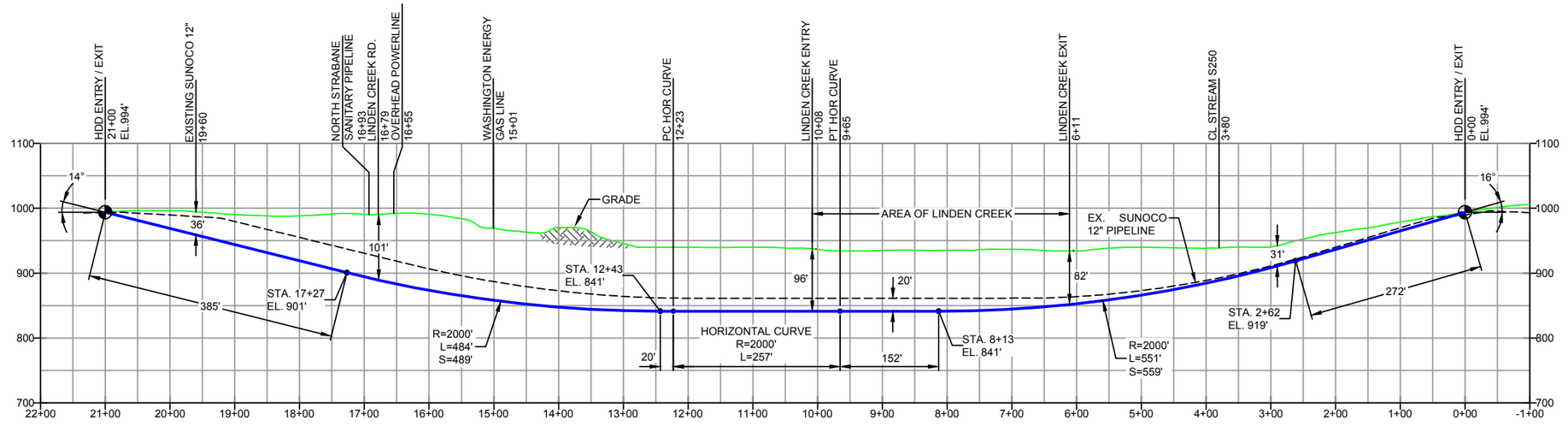
DRAWN:	AW	CHECKED:	RB
DATE:	11/21/16	SCALE:	AS SHOWN

PA-WA-0103-RD-HDD



PLAN VIEW

PROFILE VIEW



WASHINGTON COUNTY, PENNSYLVANIA, NORTH STRABANE TOWNSHIP
S1B-0050

DESIGN AND CONSTRUCTION:

1. CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXITING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
2. THE MINIMUM SEPARATION DISTANCE FROM EXISTING SUBSURFACE UTILITIES SHALL NOT BE LESS THAN 10 FEET AS MEASURED FROM THE OUTSIDE EDGE OF THE UTILITY TO OUTSIDE OF PROPOSED PIPELINE.
3. DESIGNED IN ACCORDANCE WITH CFR 49 195 & ASME B31.4
4. CROSSING PIPE SPECIFICATION:
   HDD HORZ. LENGTH (L=):2100'
   HDD PIPE LENGTH (S=):2133'
   20" x 0.456" W.T., X-65, API-5L, PSL2, ERW, BFW, DRL
   COATING: 14-16 MILS OF 3M SCOTCHKOTE TM 6233 FBE WITH 40 MILS MIN. DFT POWERCRETE R95
5. SEAM FACTOR 1.0, DESIGN FACTOR 0.50 (HOOP STRESS).
6. DESIGN PRESSURE: 1480 PSIG, TEST PRESSURE: 1850 PSIG
7. INSTALLATION METHOD: HORIZONTAL DIRECTIONAL DRILL (HDD).
8. PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
9. CARRIER PIPE NOT ENCASED.
10. PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
11. CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF HDD PIPE STRING TO MINIMUM 1850 PSIG.

NOTES

1. ALL COORDINATES SHOWN ARE IN LATITUDE AND LONGITUDE. ALL MSL ELEVATIONS ARE NAD83
2. STATIONING IS BASED ON HORIZONTAL DISTANCES.
3. ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP ARE NOT RESPONSIBLE FOR LOCATION OF FOREIGN UTILITIES SHOWN IN PLOT PLAN OR PROFILE. THE INFORMATION SHOWN HEREON IS FURNISHED WITHOUT LIABILITY ON THE PART OF ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP, FOR ANY DAMAGES RESULTING FROM ERRORS OR OMISSIONS THEREIN.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES. CONTACT ONE CALL AT 811 PRIOR TO DIGGING.
5. SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
4	DESIGN CHANGE - INCREASED DEPTH OF DRILL	MRS	01/30/17	CMG	01/30/17	JL	01/30/17
3	REVISED PER ENGINEERING COMMENTS	MRS	08/19/16	RMB	08/19/16	AAW	08/19/16
2	ADDED "CLEARING ROW ONLY" ANNOTATION	MRS	03/23/16	RMB	03/23/16	AAW	03/23/16
1	REVISED PER COMMENTS FROM REI REVIEW 12-18-15	MRS	12/18/15	RMB	12/18/15	AAW	12/18/15
0	ISSUED FOR CONSTRUCTION	DLM	11/30/15	RMB	11/30/15	AAW	11/30/15

Sunoco Logistics Partners L.P.

TETRA TECH ROONEY
(303) 792-5911

SUNOCO PIPELINE, L.P.

HORIZONTAL DIRECTIONAL DRILL
LINDEN CREEK ROAD
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=200'

DWG. NUMBER: PA-WA-0103.0000-RD-PRELIM