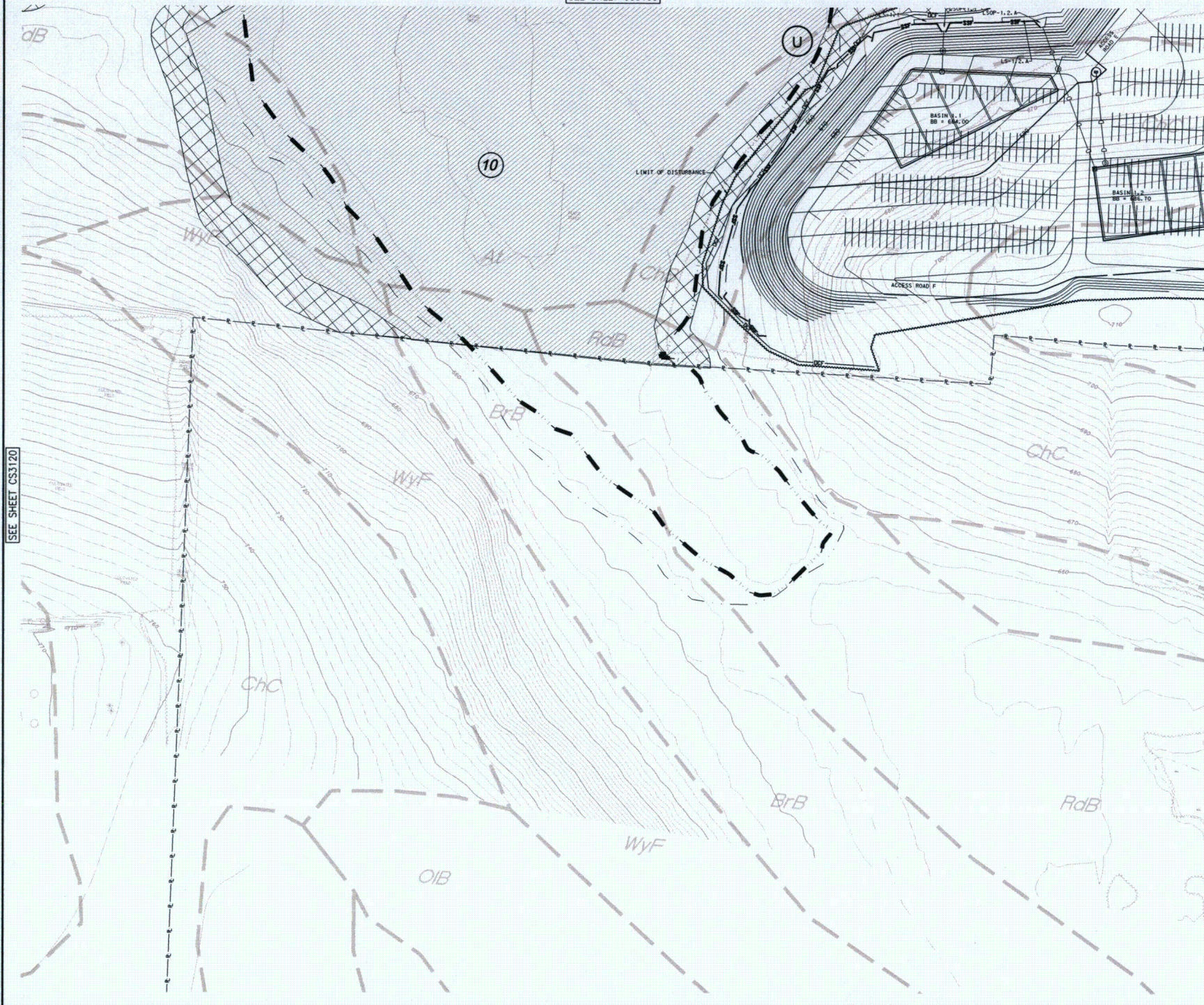
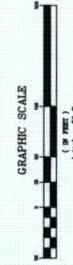


SEE SHEET CS3120

SEE SHEET CS3103

SEE SHEET CS3107



Pennoni Associates Inc.

100 N. Wilson-Berry Boulevard  
Willsboro, NY 12895 (518) 834-2800

Engineers • Surveyors • Planners • Landscape Architects

DATE	06/15/2011
APPROVED	JPM
PROJECT NO.	CS3121

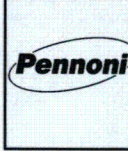
JOB NO.	PPL30002
SHEET	23 OF 44

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BELL BEND NUCLEAR POWER PLANT  
JOINT PERMIT PLANS  
PPL BELL BEND, LLC  
38 BROADWAY, SUITE 2  
BRIDGE, NY 10510

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR  
AND FIELD SURVEY BEFORE PROCEEDING WITH THE WORK

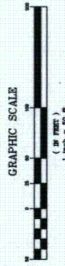
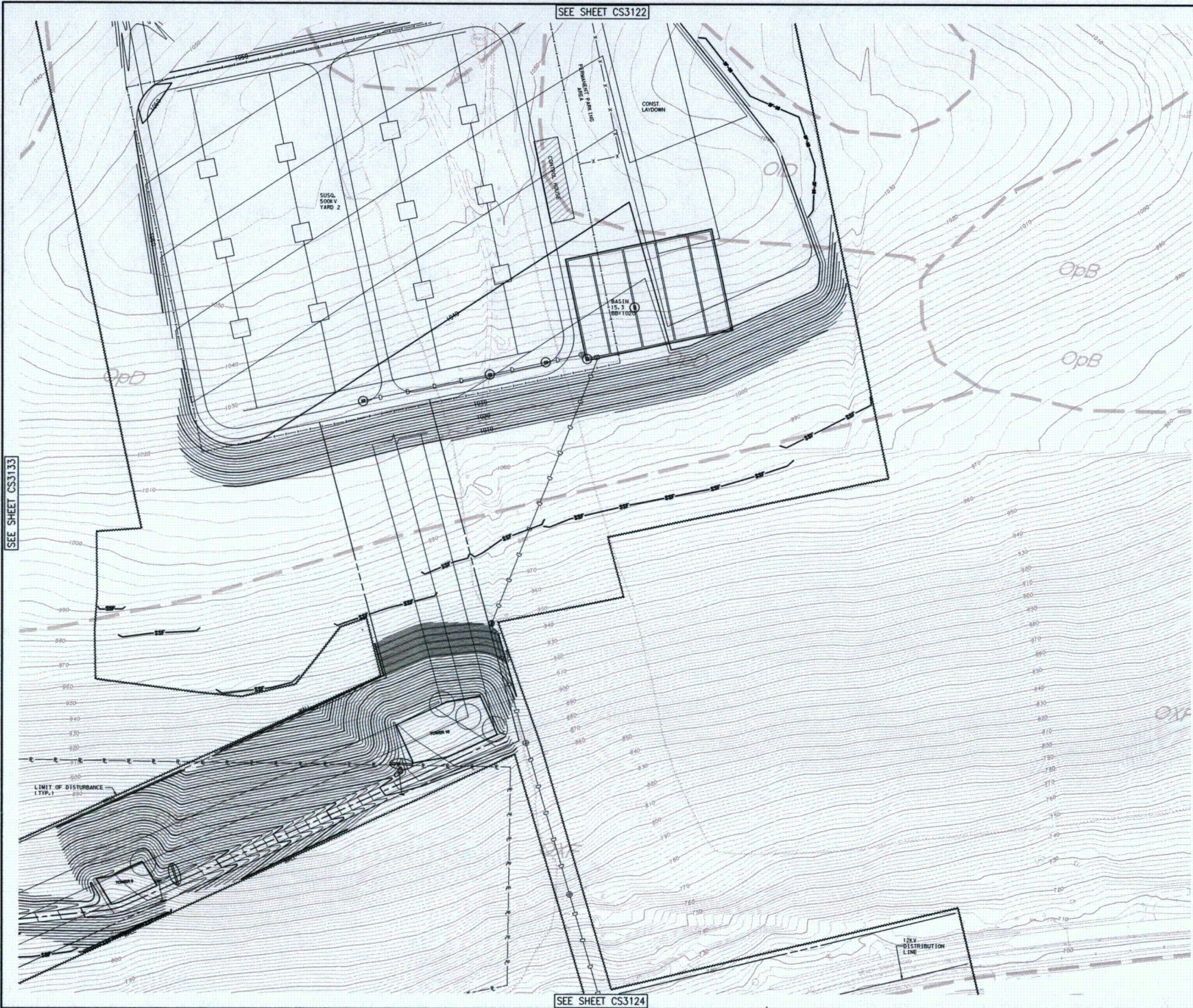
NO. OF SHEETS	44
NO. OF SHEETS USED	44
DATE	06/15/2011
BY	JPM











Pennoni Associates Inc. Engineers • Surveyors • Planners • Landscape Architects

100 N. Wilson-Berry Boulevard  
Wilson-Berry, PA 17070 (717) 824-2000

**BELL BEND NUCLEAR POWER PLANT**

**JOINT PERMIT PLANS**

**PPL BELL BEND, LLC**

38 BERRY AVE, SUITE 2  
BELL BEND, PA 17003

**Pennoni**

NO. 0001	1	REVISION	DATE
NO. 0002	2	REVISION	DATE
NO. 0003	3	REVISION	DATE
NO. 0004	4	REVISION	DATE

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR  
AND MUST BE WITHIN THE TOLERANCES SPECIFIED  
IN THE PERMITTING AGENCIES' REQUIREMENTS.

JOB NO.  
PPL00002

SHEET 25 OF 44

DATE  
06/15/2011

APPROVED  
JPM

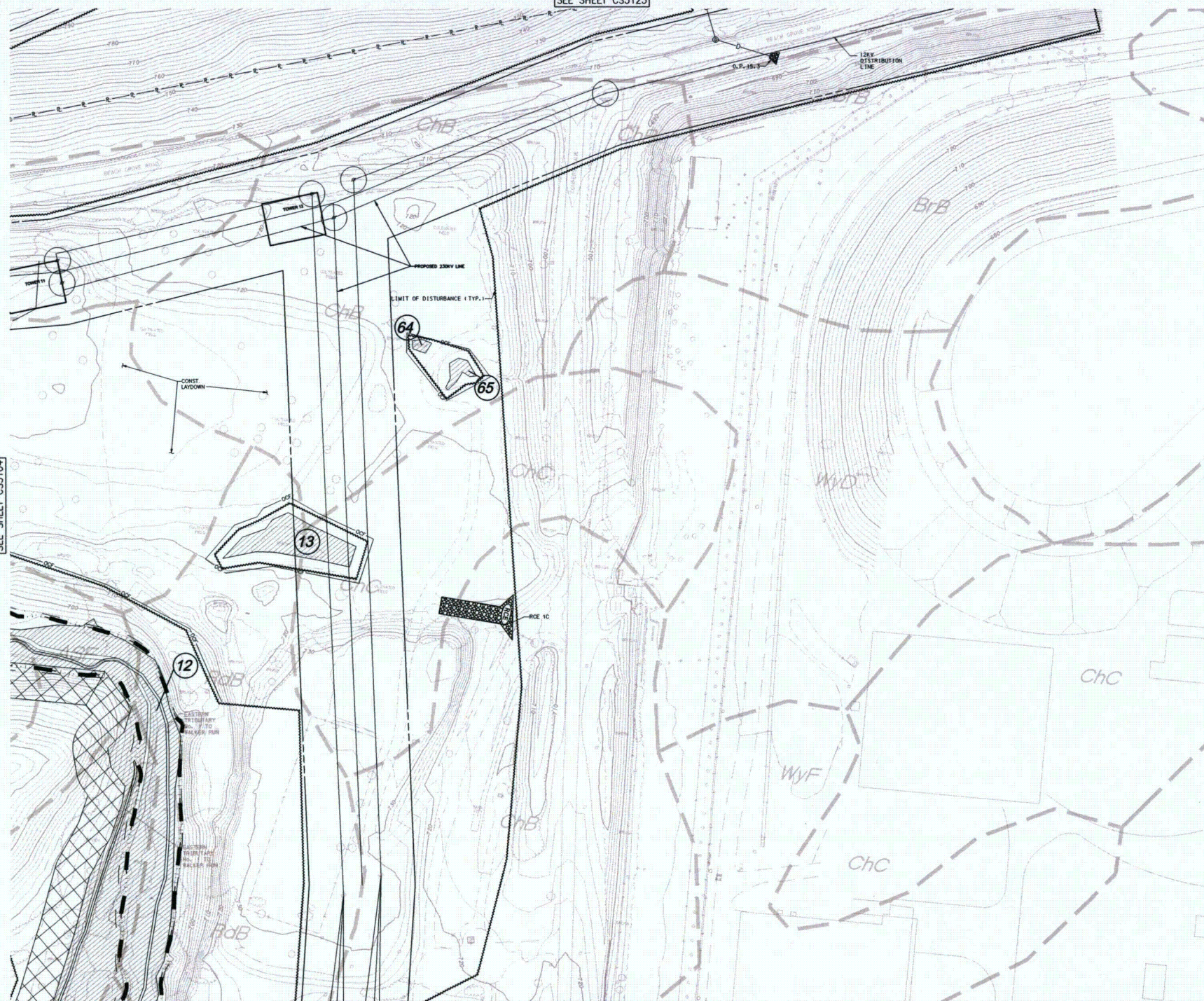
**CS3123**



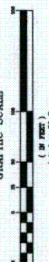
SEE SHEET CS3104

SEE SHEET CS3123

SEE SHEET CS3125



GRAPHIC SCALE



Pennoni Associates Inc.

100 N. Wilson-Berry Boulevard  
Wilkes-Barre, PA 18702 (717) 894-2800

Engineers • Surveyors • Planners • Landscape Architects

BELL BEND NUCLEAR POWER PLANT

SCALE: 1"=50'

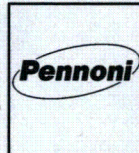
JOINT PERMIT PLANS

PPL BELL BEND, LLC  
IN BELL BEND, PA 16803

ALL DIMENSIONS SHOWN ON THESE PLANS ARE TO BE CONSIDERED AS APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR VERIFYING THE ACCURACY OF ALL DIMENSIONS AND LOCATIONS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR VERIFYING THE ACCURACY OF ALL DIMENSIONS AND LOCATIONS SHOWN ON THESE PLANS.

DATE: 06/15/2011  
APPROVED: JPM

CS3124



NO.	DATE	BY	REVISION
1	06/15/2011	JPM	ISSUED FOR PERMIT
2	06/15/2011	JPM	REVISED





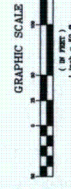








SEE SHEET CS3114



Pennoni Associates Inc.

100 N. Willow-Berry Boulevard  
 Winter-Burn, PA 19702 610 979 884-2000

Engineers • Surveyors • Planners • Landscape Architects

DATE	06/15/2011
BY	JFM
APPROVED	
SCALE	1"=50'
PROJECT	PPL50902
SHEET	28 OF 44
CS3127	

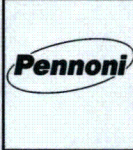
BELL BEND NUCLEAR POWER PLANT

JOINT PERMIT PLANS

PPL BELL BEND, LLC

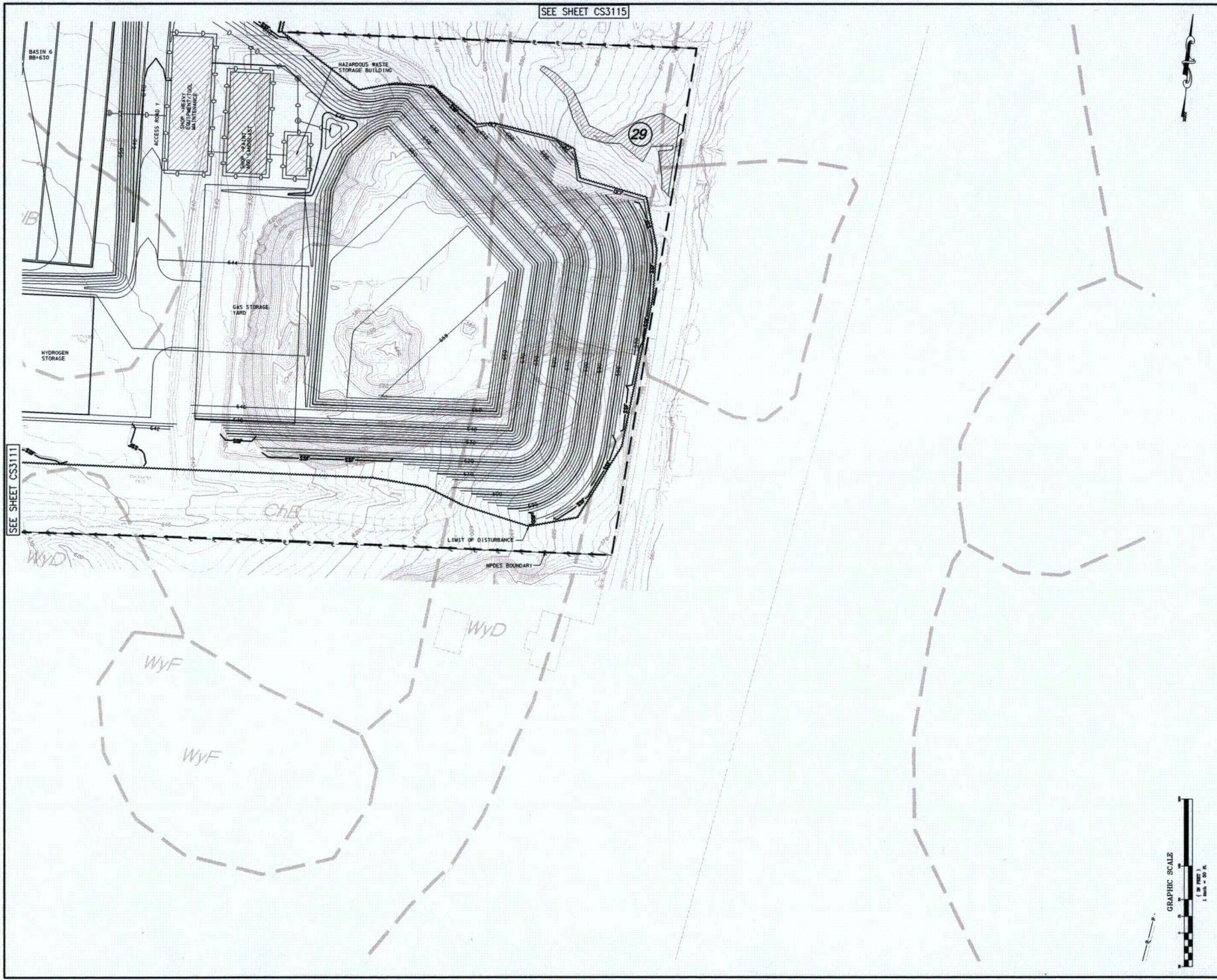
ALL DIMENSIONS MUST BE OBTAINED BY CONTRACTOR  
 FIELD SURVEYING AND FIELD MEASUREMENTS  
 MUST BE MADE BEFORE PROCEEDING WITH THE WORK

NO.	1
DATE	06/15/2011
BY	JFM
APPROVED	
SCALE	1"=50'
PROJECT	PPL50902
SHEET	28 OF 44





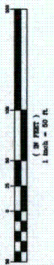
CS3128.dwg 06/15/2011 10:00 AM



SEE SHEET CS3115

SEE SHEET CS3111

GRAPHIC SCALE



Pennoni Associates Inc.

100 N. Willow-Burns Boulevard  
Willow-Burns, PA 18702 (610) 884-2200

Engineers • Surveyors • Planners • Landscape Architects

<p><b>BELL BEND NUCLEAR POWER PLANT</b></p> <p><b>JOINT PERMIT PLANS</b></p> <p><b>PPL BELL BEND, LLC</b></p> <p>30 BROADWAY, SUITE 100 BOSTON, MA 02108</p>		<p><b>Pennoni</b></p>												
<p>PROJECT NO. PPL150902</p> <p>SHEET 30 OF 44</p>	<p>DATE 06/15/2011</p> <p>APPROVED JPM</p>	<table border="1"> <tr> <th>NO.</th> <th>REVISION</th> <th>DATE</th> <th>BY</th> </tr> <tr> <td>1</td> <td>REVISED DRAWING</td> <td></td> <td>JPM</td> </tr> <tr> <td>2</td> <td>REVISED DRAWING</td> <td></td> <td>JPM</td> </tr> </table>	NO.	REVISION	DATE	BY	1	REVISED DRAWING		JPM	2	REVISED DRAWING		JPM
NO.	REVISION	DATE	BY											
1	REVISED DRAWING		JPM											
2	REVISED DRAWING		JPM											

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR  
ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR  
ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR





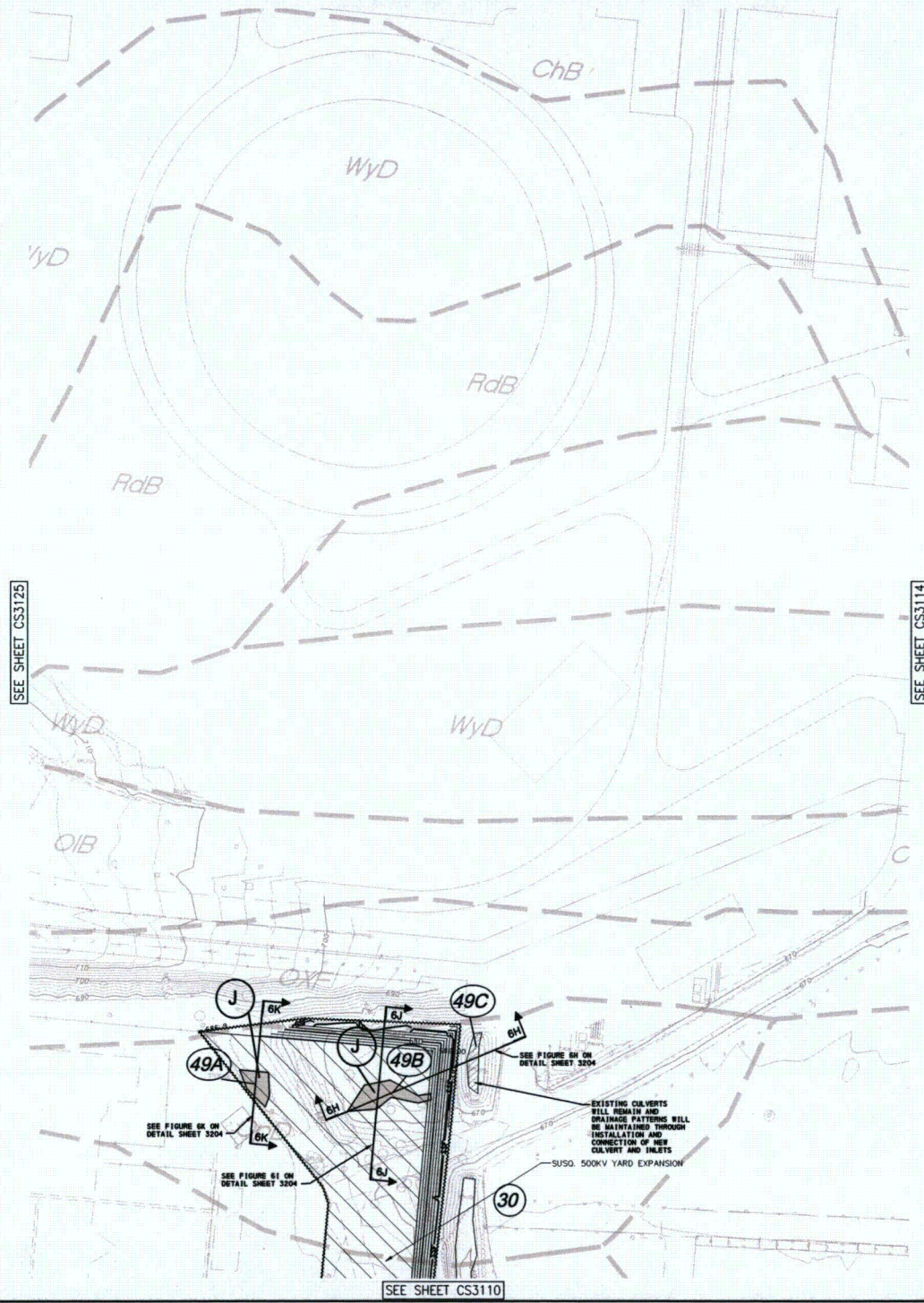












Pennoni Associates Inc.

100 N. Wilson-Burre Boulevard  
 Wilson-Burre, PA 17092 (717) 824-2800

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# BELL BEND NUCLEAR POWER PLANT

JOINT PERMIT PLANS

PPL BELL BEND, LLC  
 30 BROADWAY, SUITE 100  
 SPRINGFIELD, MA 01103

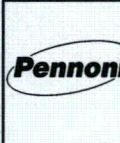
PROJECT NO.	PPL000002
SHEET	34 OF 44

DATE	06/15/2011
WCK	
APPROVED	
DATE	06/15/2011

CS3132

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR  
 AND CORRECTIONS MUST BE RECORDED IN THE FIELD

NO.	DATE	REVISIONS
1		ISSUED SHEET
2		ISSUED SHEET
3		ISSUED SHEET
4		ISSUED SHEET
5		ISSUED SHEET
6		ISSUED SHEET
7		ISSUED SHEET
8		ISSUED SHEET
9		ISSUED SHEET
10		ISSUED SHEET



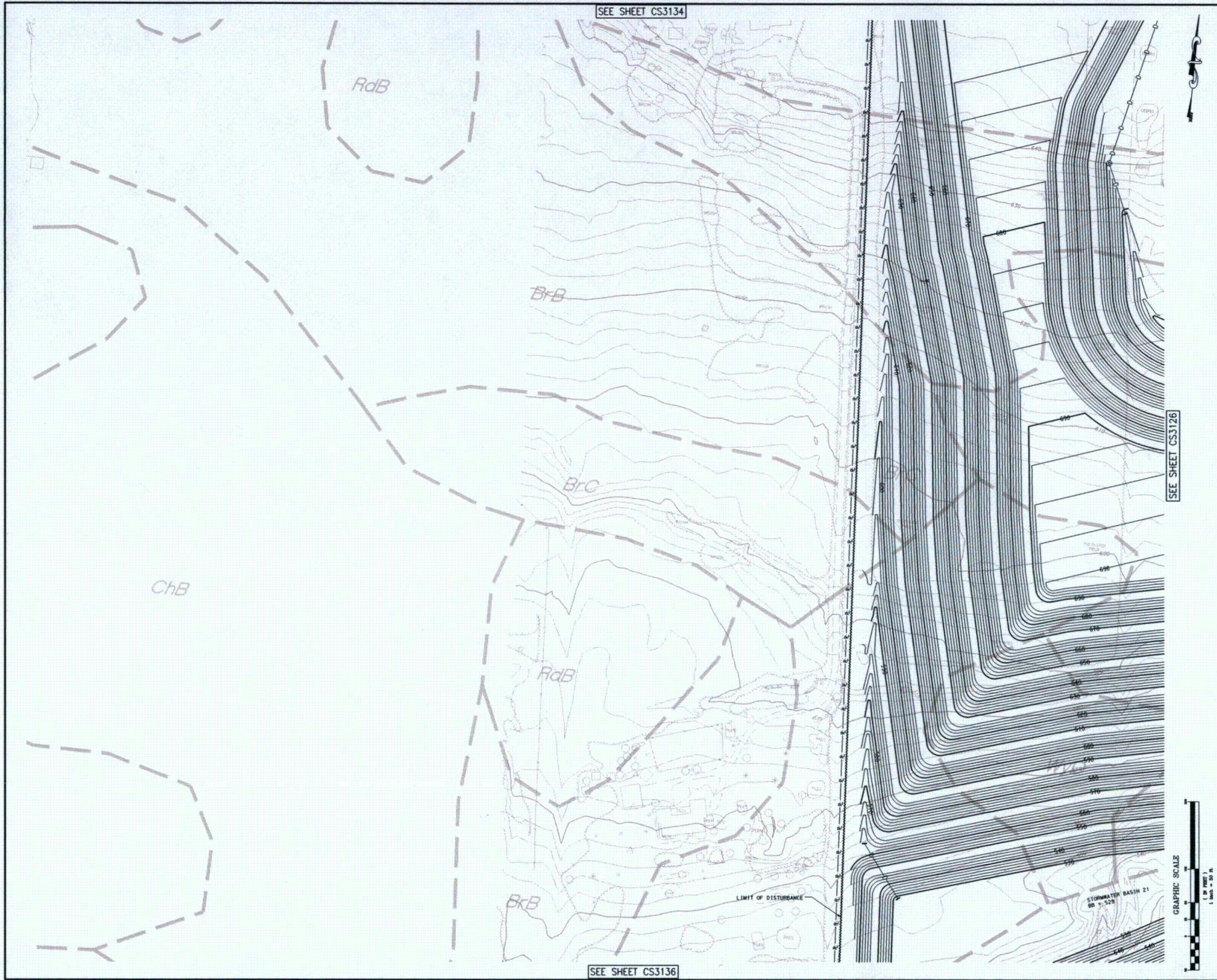












Pennoni Associates Inc.

100 N. Willow-Berry Boulevard  
Willow-Berry, PA 18702 (610) 864-2800

Engineers • Surveyors • Planners • Landscape Architects

DATE	06/15/2011	BY	JPM
PROJECT NO.	PPL50992	SHEET	37 OF 44
CS3135			

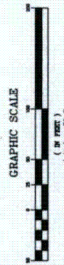
BELL BEND NUCLEAR POWER PLANT  
JOINT PERMIT PLANS  
PPL BELL BEND, LLC  
38 BENTLEY LANE, SUITE 1  
BENTLEY, PA 15805

DATE	06/15/2011	BY	JPM
PROJECT NO.	PPL50992	SHEET	37 OF 44
CS3135			

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND FIELD MEASUREMENTS MUST BE USED TO VERIFY DIMENSIONS AND RECORD THEM IN THE FIELD.			
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Pennoni Associates Inc.

100 N. Willow-Barry Boulevard  
Willow-Barry, PA 17102 (717) 844-2000

Engineers • Surveyors • Planners • Landscape Architects

PROJECT NO.	PPL50902
SHEET	36 OF 44
DATE	06/15/2011
BY	JPL
CHECKED BY	
SCALE	1"=50'
PROJECT	CS3136

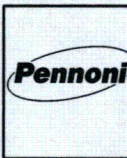
BELL BEND NUCLEAR POWER PLANT

JOINT PERMIT PLANS

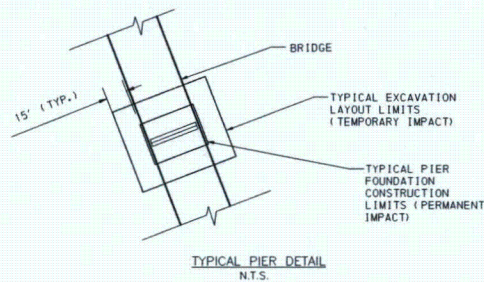
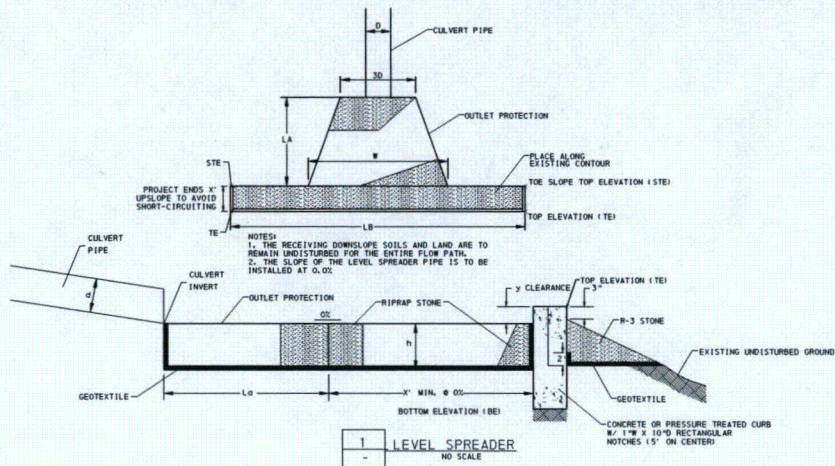
PPL BELL BEND, LLC  
30 BROAD LANE, SUITE 1  
BETHLEHEM, PA 18013

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR  
AND FIELD MEASUREMENTS MUST BE USED TO  
DETERMINE THE EXISTING CONDITIONS

DATE	NO.	REVISIONS
06/15/11	1	REVISED DATA
06/15/11	2	FINAL DIMENSIONS
06/15/11	3	BY



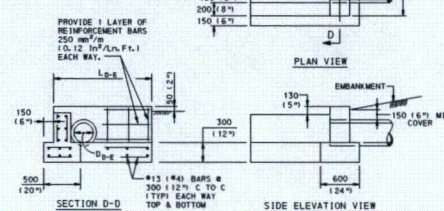




#### ENDWALL NOTES

1. PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH THE REQUIREMENTS OF PUBLICATION 408, SECTION 605 AND SECTION 114.
2. THIS STANDARD DEPICTS THE SHAPE AND DIMENSIONS REQUIRED FOR UNIFORMITY AND COMPATIBILITY. PERMIT ONLY ITEMS SUPPLIED BY A MANUFACTURER LISTED IN BULLETIN 15. FOR DEVIATIONS OR MODIFICATIONS TO THE STANDARDS, SUBMIT SHOP DRAWINGS FOR APPROVAL.
3. USE CLASS A CONCRETE OR BETTER & CHAMFER EXPOSED EDGES AT 25 (1").
4. PROVIDE PIPE OPENING SIZE IN PRECAST UNITS AT LEAST 50 (2") BUT NOT MORE THAN 100 (4") LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE. FOR TYPE D-E AND E-S ENDWALLS PROVIDE MIN. 200 (8") WALL WEIGHT OVER THE PIPE.
5. PROVIDE SUITABLE LIFTING DEVICES FOR HANDLING AND INSTALLATION OF PRECAST ENDWALLS. GALVANIZE METAL DEVICES AS SPECIFIED IN PUB 408, SECTION 1105.
6. PROVIDE NON-SHRINK EPOXY GROUT THROUGHOUT THE CONTACT SURFACE WHEN CONNECTING WING AND HEADWALL SECTION TO BASE SECTION. PROVIDE JOINT SEALANT MATERIAL ALONG INTERFACE BETWEEN WING AND HEADWALL SECTION AND BASE SECTION.
7. PROVIDE MORTAR BED OF 25 (1") PLACED ON TOP OF THE SUBBASE MATERIAL FOR LEVELING PURPOSES, WHEN REQUIRED.
8. PROVIDE REINFORCEMENT, 250 mm (10") (0.12 in./ft.) IN ACCORDANCE WITH PUBLICATION 408, SECTION 109.
9. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN ( ) PARENTHESES.

- NOTES:
- LOCAL CONDITIONS WILL GOVERN DIMENSION  $A_{D-E}$ .
  - $L_{D-E} = 2.5D_{D-E} + 300 (12")$



TYPE D-E ENDWALL

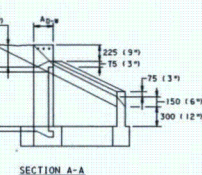
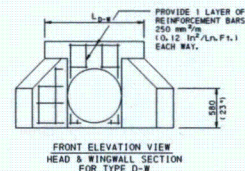
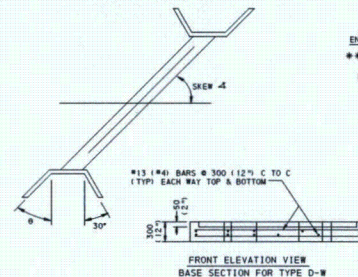


TABLE A (ENGLISH)  
2 : 1 EMBANKMENT SLOPES

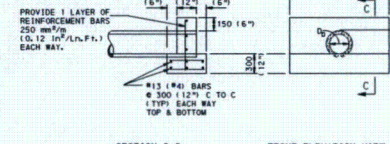
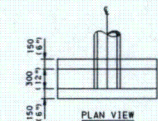
PIPE DIAMETER	SKEW 4° 30' TO 45°	SKEW 4° 35'	SKEW 4° 40'	SKEW 4° 45°	SKEW 4° 50°	SKEW 4° 55°	SKEW 4° 60°	SKEW 4° 65°	SKEW 4° 70°	SKEW 4° 75°	SKEW 4° 80°	SKEW 4° 85°	SKEW 4° 90°	SKEW 4° 95°	SKEW 4° 100°											
	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>	L <sub>g</sub>											
36	5.8	0	4.6	6.0	0.33	4.9	6.2	0.5	5.2	6.5	0.67	5.7	7.0	0.75	6.2	8.3	8.0	11.1	1.75	11.7	19.6	5.0	23.0	4.6	12	
42	6.3	0	5.8	6.6	0.33	6.1	6.9	0.5	6.5	7.3	0.67	7.1	7.8	0.75	7.8	8.3	1.33	10.0	12.5	1.75	14.6	22.5	5.0	28.8	5.8	12
48	6.9	0	6.9	7.2	0.33	7.3	7.5	0.5	7.8	8.0	0.67	8.5	8.5	0.75	9.4	10.3	1.33	12.0	14.0	1.75	17.5	25.0	5.0	34.0	6.8	12
54	7.5	0	8.0	7.8	0.33	8.5	8.2	0.5	9.4	8.7	0.67	9.9	9.3	0.75	10.9	11.3	1.33	14.0	15.9	1.75	20.5	28.2	5.0	40.0	8.0	12
60	8.1	0	9.2	8.4	0.33	9.8	8.8	0.5	10.4	9.4	0.67	11.3	10.1	0.75	12.5	12.3	1.33	16.0	16.9	1.75	23.4	31.1	5.0	46.0	9.2	15
72	9.2	0	11.5	9.6	0.33	12.2	10.1	0.5	13.0	10.8	0.67	14.1	11.7	0.75	15.6	14.3	1.33	20.0	19.8	1.75	29.2	36.9	5.0	57.6	11.5	15

TYPE D-W ENDWALL

(SEE TABLE A FOR DIMENSIONS NOT INDICATED.)

2 ENDWALL DETAILS  
NO SCALE

PIPE DIAMETER	L <sub>g</sub>
450 AND 525 (18" AND 21")	1500 (5')
600 AND 675 (24" AND 27")	2100 (7')
750 AND 825 (30" AND 33")	2700 (9')
900 AND 975 (36" AND 39")	3000 (10')
1050 AND 1125 (42" AND 45")	3300 (11')
1200 AND 1275 (48" AND 51")	3600 (12')



TYPE D ENDWALL

#### ENGLISH UNITS EQUATION FOR SKEWED DIAMETER

$$SD = \frac{D}{\cos \theta}$$

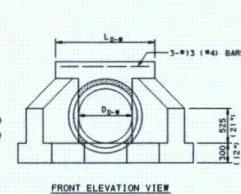
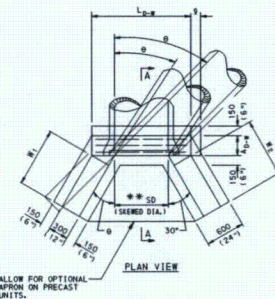
$$L_{D-W} = SD + 2.3'$$

$$N_1 = \frac{2D \sin \theta - 2.0'}{\cos \theta}$$

FOR 2:1 SLOPE

$$N_2 = \frac{D}{\cos \theta} (10 \sin^2 \theta - 0.5 - \frac{1}{10})$$

(FOR VARIABLE SLOPE WHEN X EQUALS HORIZONTAL DIMENSION OF THE SLOPE DESIGNATION.)





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DATE 06/15/2011	APPROVED JPM	CS3202
TIME 10:00 AM	WEEK	

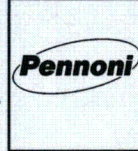
SHEET 40 OF 44	JPM NO. PPL100902
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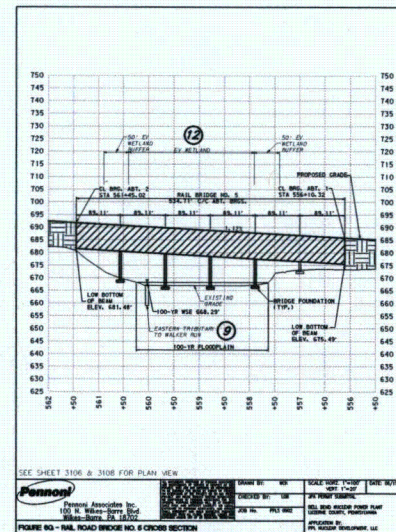
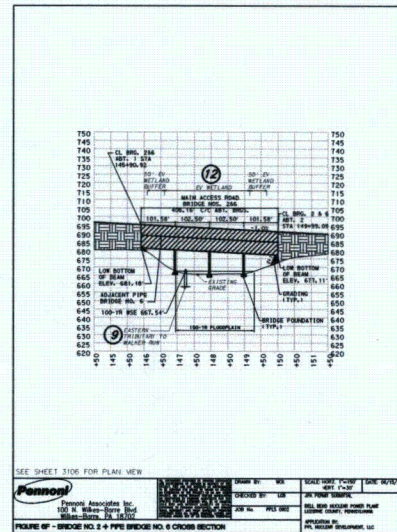
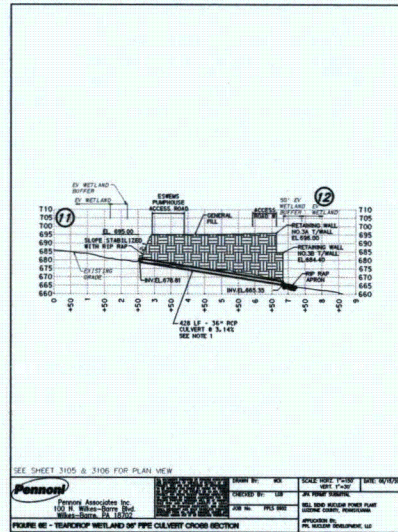
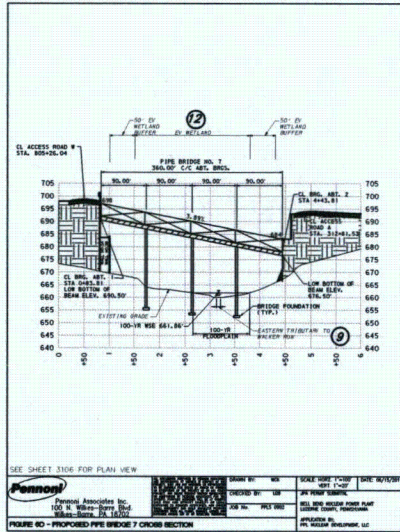
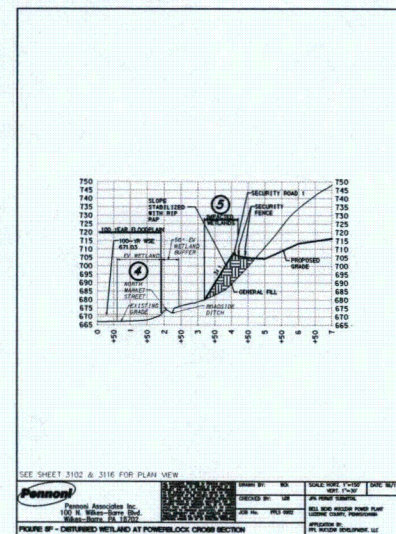
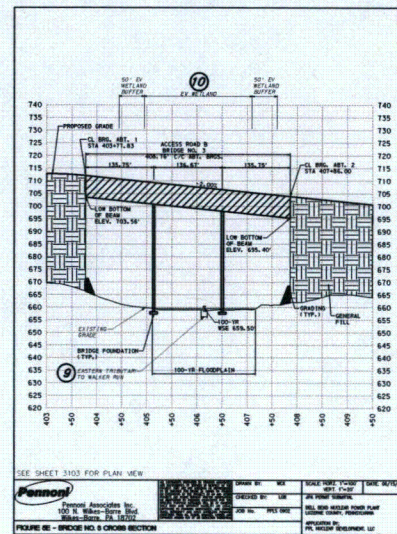
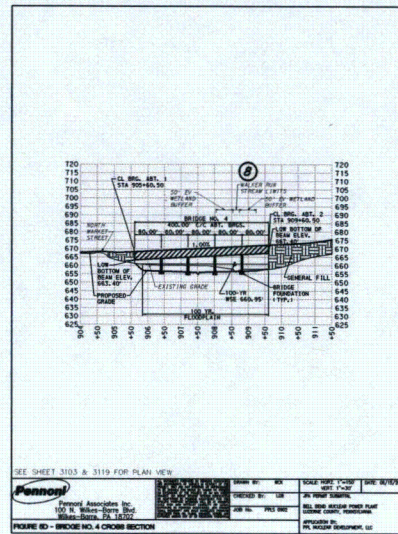
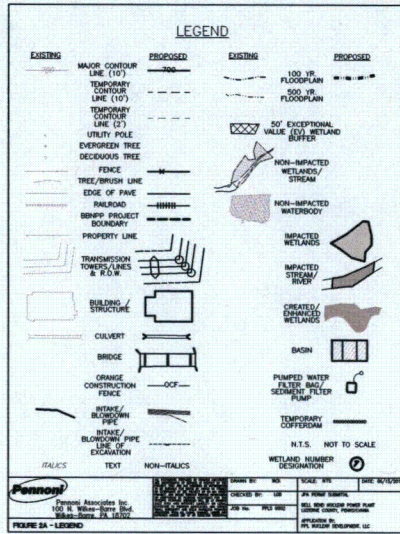
BELL BEND NUCLEAR POWER PLANT INTENTIONALLY LEFT BLANK PPL BELL BEND, LLC 38 BENDY LANE, SUITE 100 BEND, PA 18003
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ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND FIELD MEASUREMENTS MUST BE USED TO DETERMINE THE EXISTING CONDITIONS OF THE WORK
--

DATE	BY	DATE	BY
06/15/11	JPM	06/15/11	JPM

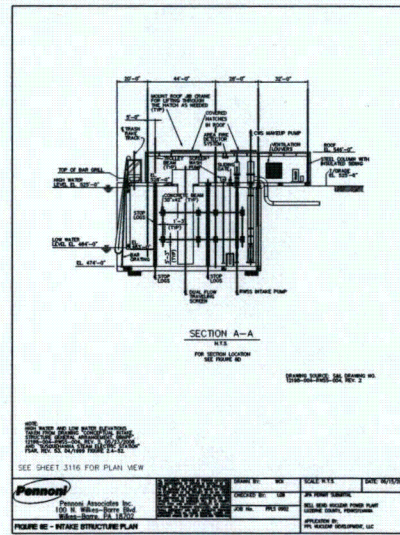
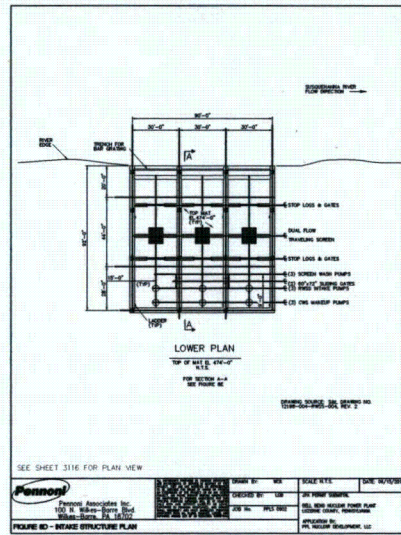
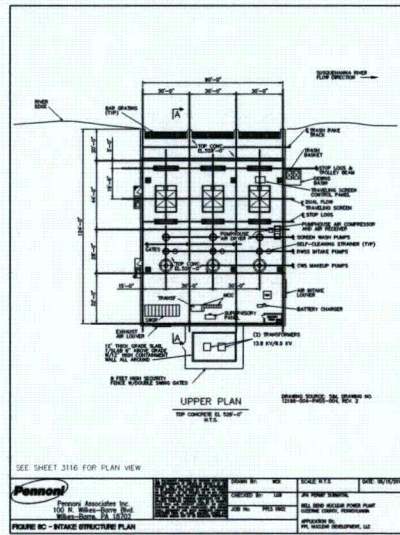
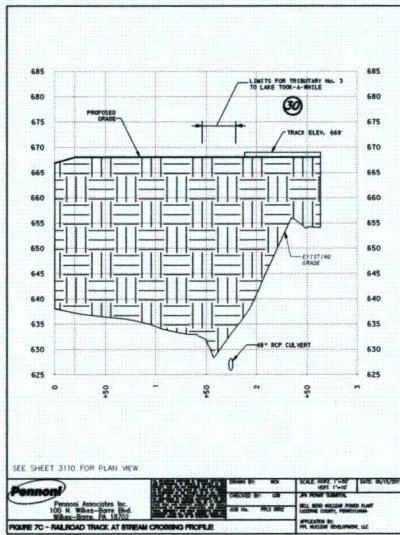
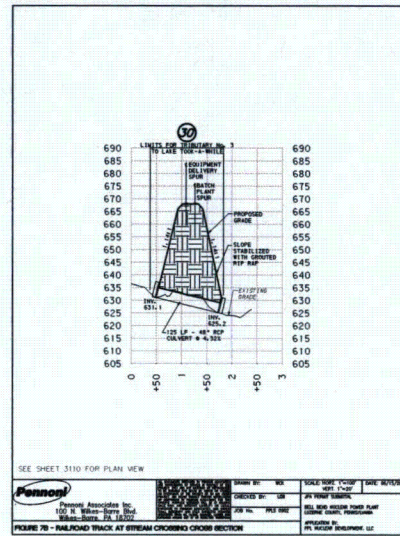
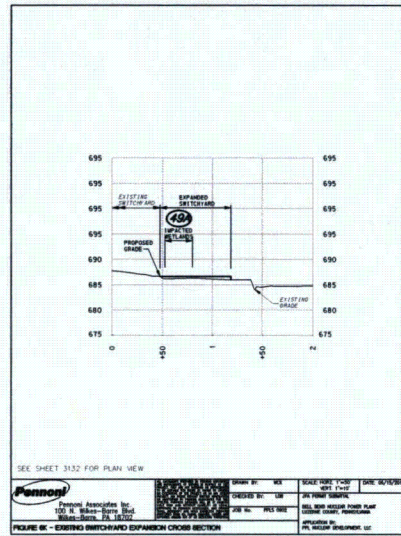
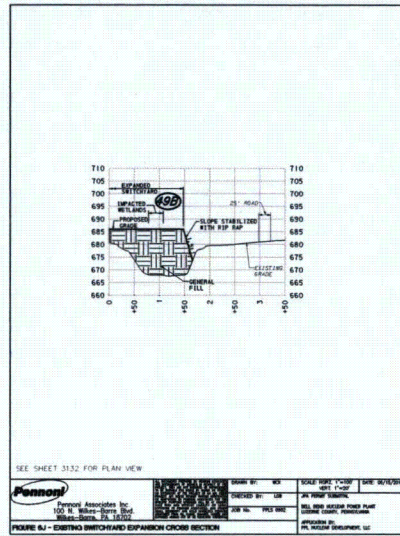
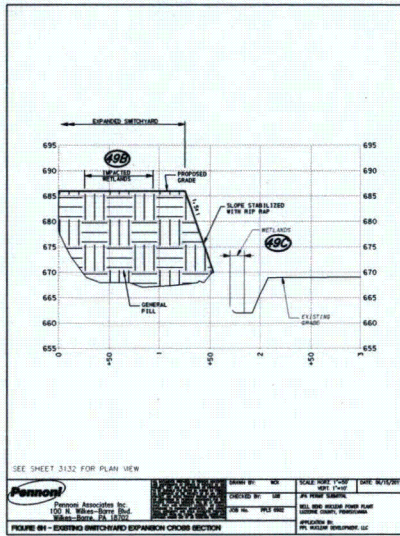






NOTE:  
INFORMATION FROM MISSING FIGURES ARE PROVIDED  
THROUGHOUT THE PLAN SET.





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NO.	DATE	BY	REVISIONS
1	06/15/2011	JPM	ISSUED FOR PERMIT
2	06/15/2011	JPM	ISSUED FOR PERMIT
3	06/15/2011	JPM	ISSUED FOR PERMIT

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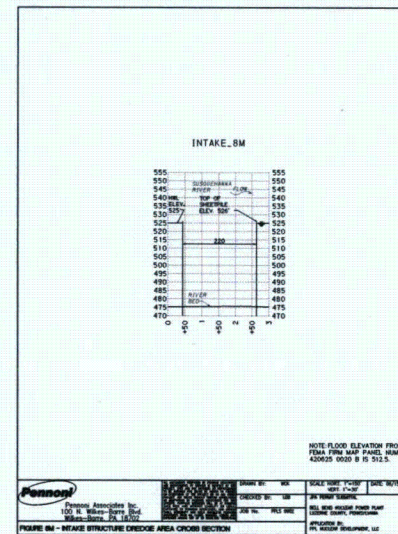
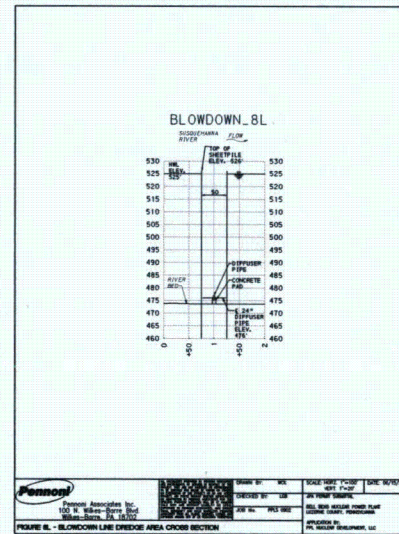
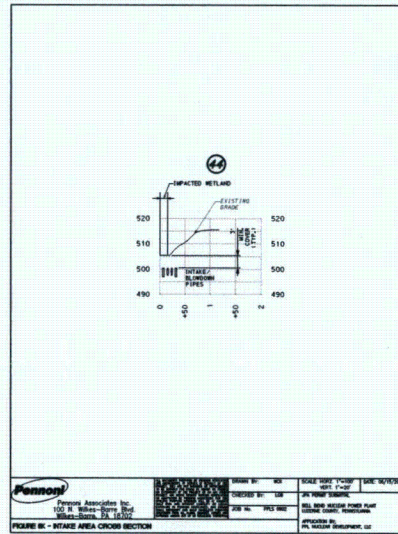
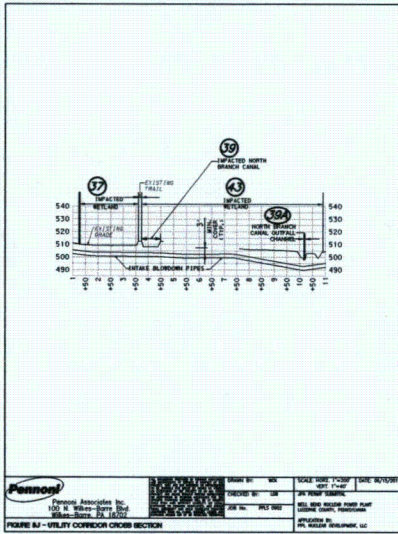
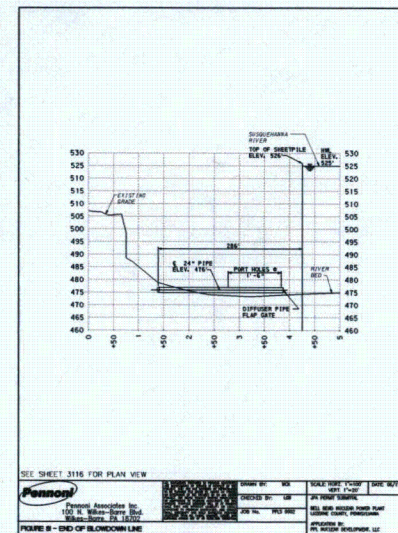
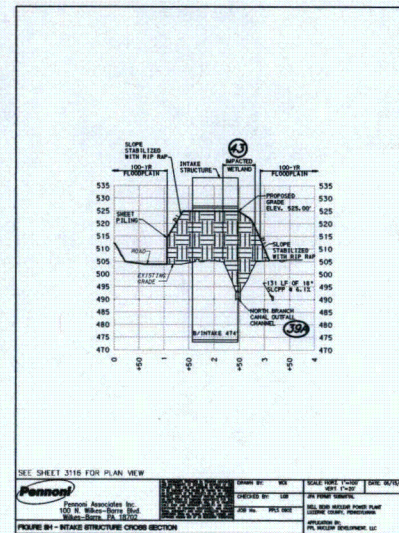
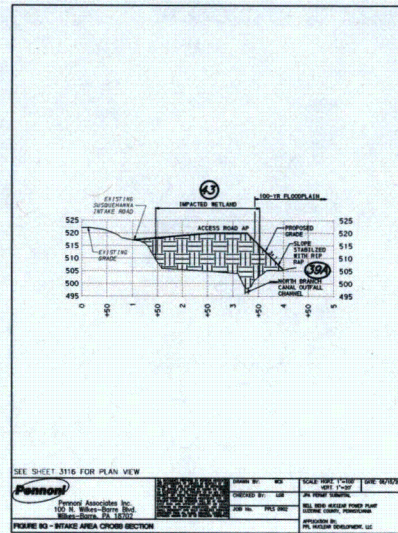
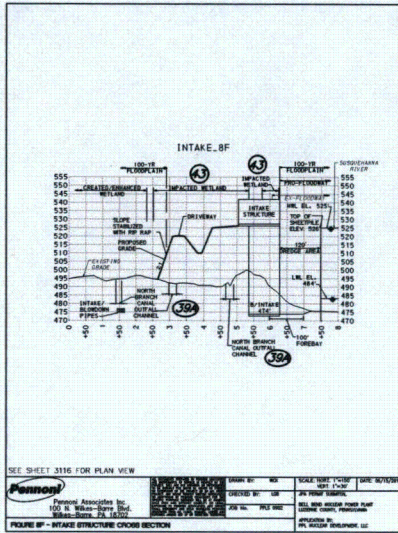
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Engineers • Surveyors • Planners • Landscape Architects



NO.	DATE	BY
1	06/15/2011	JPM
2	06/15/2011	JPM
3	06/15/2011	JPM
4	06/15/2011	JPM
5	06/15/2011	JPM

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR  
FIELD MEASUREMENTS MUST BE USED TO VERIFY THE  
DIMENSIONS BEFORE PROCEEDING WITH THE WORK

100 N. Wilson-Berry Road  
Warren, PA 15090  
TEL: 724.870.6844

BELL BEND NUCLEAR POWER PLANT  
JOINT PERMIT DETAILS  
PPL BELL BEND, LLC  
38 EXHIBIT A, SHEET 2  
BIRMINGHAM, AL 35203

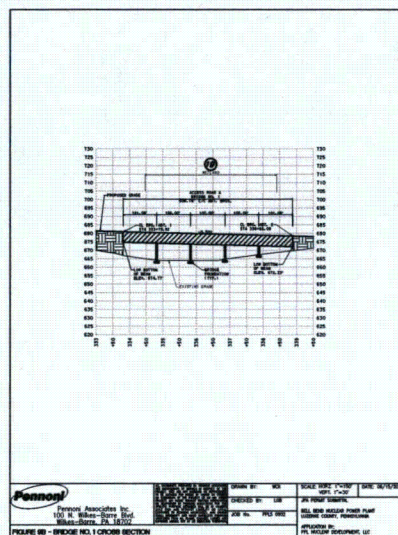
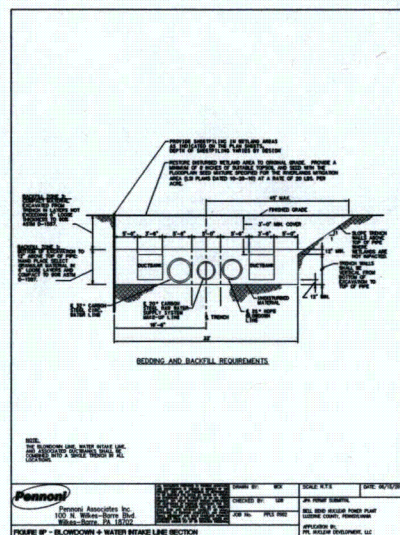
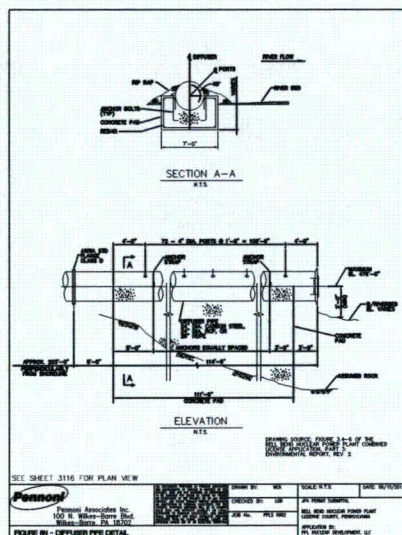
Pennoni Associates Inc.

DATE: 06/15/2011  
BY: JPM  
CHECKED BY: JPM  
APPROVED BY: JPM

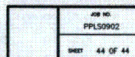
PROJECT: PPLS0902  
SHEET: 43 OF 84

CS3205





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THROUGHOUT THE PLAN SET.



BELL BEND NUCLEAR POWER PLANT

SALEM TOWNSHIP, PENNSYLVANIA  
JOINT PERMIT DETAILS

PPL BELL BEND, LLC



1/04/11	1	UPDATED FIGURE 8P	LOB
6/15/11	0	INITIAL SUBMISSION	LOB
DATE	NO.	DESCRIPTION	BY