THE BRIDGE END BENT GRAPHICS COMPUTER PROGRAM

USER'S MANUAL

PRESENTED BY THE

GEORGIA DEPARTMENT OF TRANSPORTATION

OFFICE OF BRIDGE DESIGN

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1.0 DESCRIPTION OF PROGRAM BREBNT

The "End Bent Graphics" program generates the following details for a typical end bent:

A. Plan view of Bent.
B. Elevation view of Bent.
C. Cross section views of Cap.
D. Quantities Table.
E. Elevation Table (If required).
F. Table of Beam Angles (If required).
G. Cross section view of Endpost (If required).
H. Cross section view of Backwall (If required).
I. Half scale Plan view of second bent (If required).
J. Half scale Elevation view of second bent (If required).

The "End Bent Graphics" program can also be used to generate the following details for a pile intermediate bent:

A. Plan view of Bent.
B. Elevation view of Bent.
C. Cross section views of Cap.
D. Quantities Table.
E. Elevation Table (If required).
F. Table of Beam Angles (If required).

2.0 INPUT DESCRIPTION OF PROGRAM BREBNT

The input file should be created in node CCC.
The input data cards MUST be in the following order:

1) "0" - data - comments/description
2) "1" - data - cap dimension data
3) "2" - data - cap step distances
4) "3" - data - bottom cap elevations and cap step elevations
5) "4" - data - centerline beam distances at centerline bearing
6) "5" - data - centerline beam angles at centerline bearing
7) "6" - data - cap pile data
8) "7" - data - wing wall, backwall and endpost data
9) "8" - data - wing wall, backwall and endpost elevation data

A. INDENTIFICATION (0 in cc 1)

1.) IDENTIFICATIONS AND COMMENTS (cc 3-79)

The identification consists of one line of input data containing pertinent identifying remarks. These comments will be placed in the identification card for the rebar quantities output.

B. CAP DIMENSION DATA (1 in cc 1)

The number one (1) in card column one is for identification of the cap dimension data.

1.) SCA (cc 4) Form: x

Enter the scale of the drawing. Choose from the following :

TYPE	SCALE SIZE
1	1/2 IN/FT
2	3/8 IN/FT
3	1/4 IN/FT

The default scale size is 3/8 in/ft.

2.) NB (cc 5-6) Form: xx

Enter the number of bents that this program will represent. All the bents represented MUST have the identical structural dimensions. Only the elevation data may vary from bent to bent. The default is that only 1 set of bent data should be entered.

3.) LA (cc 8) Form: x

Enter the number 1 if the first bent to be input is to be looking back at the bent in the elevation view. The default is that the first bent will be looking ahead. The second bent is assumed to be looking in the opposite direction of the first bent if the plot is to be an end bent. If the plot is to be a pile intermediate bent then all the bents are assumed to be looking in the same direction as the first.

B. CAP DIMENSION DATA CONT.

4.) BRG (cc 10) Form: x

Enter the number 1 if there is to be a dowel bar hole at the center of bearing. Enter the number 2 if there are to be two anchor bolt holes at the center of bearing. The default is that no holes will be placed in the beam bearing area.

5.) BRDIST (cc 11-15) Form: xx.xxx feet

Enter the distance from the front face of the cap to the centerline of bearing in feet. The default is that half the cap width will be the bearing distance.

6.) BCAP (cc 16-20) Form: xx.xxx feet

Enter the width of the cap in feet (No Default).

7.) DCAP (cc 21-25) Form: xx.xxx feet

Enter the depth of the cap in feet (No Default).

8.) NST (cc 26-27) Form: xx

Enter the number of cap steps for the bent (No Default). The maximum number of steps is 30.

9.) HDIST (cc 28-32) Form: xx.xxx feet

Enter the corner fillet horizontal distance in feet. When looking at the plan view the distance is measured at the intersection of the wingwall and the back face of the cap along the back face of the cap. See the bent illustration on page 11 for further explanation. The default is 2 feet if the plot is to be an end bent. This information is not required for a pile intermediate bent.

10.) VDIST (cc 33-37) Form: xx.xxx feet

Enter the corner fillet vertical distance in feet. When looking at the plan view the distance is measured perpendicular from the back face of the cap. See the bent illustration on page 11 for further explanation. The default is 2 feet if the plot is to be an end bent. This information is not required for a pile intermediate bent.

C. CAP STEP DISTANCES (2 in cc 1)

The number two (2) in card column one is for identification of the Cap Step Distance Data.

1.) CAP STEP DISTANCES

(CDIST 1 ....10) (cc 3-7, 8-12, 13-17, 18-22, 23-27, 28-32, 33-37, 38-42, 43-47, 48-52)

(CDIST 11 ...20) (cc 3-7, 8-12, 13-17, 18-22, 23-27, 28-32, 33-37, 38-42, 43-47, 48-52)

Form: xx.xxx feet

Enter the Cap Step Distances for each step in feet. The distances are measured along the front face of the cap when looking at the plan view. For example, CDIST 1 is the distance from the left edge of the cap to the beginning of the second step. CDIST 2 is the distance from where CDIST 1 ends to where CDIST 3 begins. See the bent illustration on page 11 for further clarification. If there are more than 10 steps, then for every increment of 10 steps, another line of input is required. For example, if there are 25 steps then 3 lines of input are required. The maximum number of steps is 30.

D. BOTTOM OF CAP ELEVATIONS AND CAP STEP ELEVATIONS (3 in cc 1)

The number three (3) in card column one is for identification of the Bottom of Cap Elevations and Cap Step Elevation Data. This data is required for each bent to be input.

1.) BN (cc 3-4) Form: xx

Enter the bent number for which the cap elevations are to be entered. This input is only needed for the first line of data for each bent (No Default). The number for the first bent entered will be the controlling digit for all the rebar numbers.

2.) LEFT (cc 5-10) Form: xxxx.xx

For each bent represented, enter the elevation of the left bottom corner of the cap in the first line of the Cap Step Elevation data.

3.) RIGHT (cc 11-16) Form: xxxx.xx

For each bent represented, enter the elevation of the right bottom corner of the cap in the first line of the Cap Step Elevation data.

D. BOTTOM OF CAP ELEVATIONS AND CAP STEP ELEVATIONS Cont.

4.) CAP STEP ELEVATIONS

STEP 1 .....10 (cc 17-22, 23-28, 29-34, 35-40, 41-46, 47-52, 53-58, 59-64, 65-70, 71-76)

STEP 11 .....20 (cc 17-22, 23-28, 29-34, 35-40, 41-46, 47-52, 53-58, 59-64, 65-70, 71-76)

Form: xxxx.xx

Enter the Cap Step Elevations for each bent to be represented. One line of input is required for every increment of 10 steps. For every additional line of cap step elevation data that is required the BN, LEFT, and RIGHT codes should be left blank.

E. CENTERLINE BEAM DISTANCES AT CENTERLINE BEARING (4 in cc 1)

The number four (4) in card column one is for identification of the Centerline Beam Distances at Centerline Bearing Data.

1.) CENTERLINE BEAM DISTANCES AT CENTERLINE BEARING

(BDIST 1 ....10) (cc 3-7, 8-12, 13-17, 18-22, 23-27, 28-32, 33-37, 38-42, 43-47, 48-52)

(BDIST 11 ...20) (cc 3-7, 8-12, 13-17, 18-22, 23-27, 28-32, 33-37, 38-42, 43-47, 48-52)

Form: xx.xxx feet

Enter the Centerline Beam Distance at the centerline bearing for each beam in feet. For example, BDIST 1 is distance from the left front face of the cap to the centerline of the first beam at the centerline of bearing. BDIST 2 is the distance from centerline beam 1 to centerline beam 2 at the centerline bearing. See the bent illustration on page 11 for further clarification. One line of input is required for every increment of 10 steps.

F. CENTERLINE BEAM ANGLES AT CENTERLINE BEARING (5 in cc 1)

The number five (5) in card column one is for identification of the Centerline Beam Angles at Centerline Bearing Data.

1.) R L (cc 3) Form: x

Enter the letter R if the bent is to be on a right skew. Enter the letter L if the bent is to be on a left skew. A right skew would be if the acute beam angle is measured counterclockwise from the centerline of the bearing to the centerline of the beam. A left skew would be if the acute beam angle is measured clockwise from the centerline of the bearing to the centerline of the beam. See the bent illustration on page 11 for further clarification. The default is a right skew.

2.) BEAM ANGLES

BEAM 1 .....10 (cc 4-10, 11-17, 18-24, 25-31, 32-38, 39-45, 46-52, 53-59, 60-66, 67-73)

BEAM 11 ....20 (cc 4-10, 11-17, 18-24, 25-31, 32-38, 39-45, 46-52, 53-59, 60-66, 67-73)

Form: xxx deg., xx min., xx sec.

Enter the beam angles in degrees, minutes, and seconds. If all the beam angles are identical then only the angle for BEAM 1 is required to be input. For a right skew, the acute angle is measured counterclockwise from the centerline of the bearing to the centerline of the beam. For a left skew, the acute angle is measured clockwise from the centerline of the bearing to the centerline of the beam. See the bent illustration on page 11 for further clarification.

G. CAP PILE DATA (6 in cc 1)

The number six (6) in card column one is for identification of the Cap Pile Data.

1.) PILE (cc 4) Form: x

PILE is the pile code. Enter the type of pile as follows:

TYPE	PILE	TYPE	PILE
1	10 BP 42	5	14 IN. SQ. PSC
2	12 BP 53	6	16 IN. SQ. PSC
3	14 BP 73	7	14 IN. Metal Shell
4	12 IN. SQ. PSC	8	16 IN. Metal Shell

2.) NS (cc 6) Form: x

Enter the number of stirrups over each pile. The default is 4.

G. CAP PILE DATA Cont.

3.) BATTER PILE LOCATION DISTANCES Form: xx.xxx (feet)
PILE 1 ....6 (cc 7-11, 12-16, 17-21, 22-26, 27-31, 32-36)
If additional piles are needed other than those located under the beams, then this input is required. These piles are assumed to be battered at 1.5:12. For example, PILE 1 is the distance from the left edge of the front face of cap to the first batter pile. PILE 2 is the distance from the first batter pile to the second batter pile. See the bent illustration on page 11 for further clarification.

H. WINGWALL, BACKWALL, AND END POST DATA (7 in cc 1)
The number seven (7) in card column one is for identification of the Wingwall, Backwall, and End Post Data. No data is required for a pile intermediate bent.

1.) BACKWALL WIDTH (cc 3-7) Form: xx.xxx (feet)
Enter the width of the backwall in feet. No backwall or end post will be placed if this data is left blank.

2.) END POST LENGTH (cc 8-12) Form: xx.xxx (feet)
Enter the length of the end post in feet. The default is 4 feet if a backwall and end post is to be drawn.

3.) WINGWALL LENGTH (cc 13-17) Form: xx.xxx (feet)
Enter the length of the wingwall in feet. A pile intermediate will be drawn if the wingwall length is left blank.

4.) WINGWALL ANGLES
a.) LEFT (cc 18-24) Form: xxx deg., xx min., xx sec.
Enter the left wingwall angle in degrees, minutes, and seconds. For a right skew, the acute angle is measured counterclockwise from a line running parallel to the front face of the cap to the wingwall. For a left skew, the acute angle is measured clockwise from a line running parallel to the front face of the cap to the wingwall. See the bent illustration on page 11 for further explanation. The default will be that LEFT will be the same as the first centerline beam angle.

b.) RIGHT (cc 25-31) Form: xxx deg., xx min., xx sec.
Enter the right wingwall angle in degrees, minutes, and seconds. For a right skew, the acute angle is measured counterclockwise from a line running parallel to the front face of the cap to the wingwall. For a left skew, the acute angle is measured clockwise from a line running parallel to the front face of the cap to the wingwall. See the bent illustration on bent illustration on page 11 for further explanation. The default will be that RIGHT will be the same as LEFT.

H. WINGWALL, BACKWALL, AND END POST DATA Cont.

5.) NP (cc 33) Form: x

Enter the number of piles in each wingwall. No piles will be placed if this data is left blank. If there is at least 1 pile, then a pile is assumed at the end of the wing (PILE 1).

6.) WING PILE DISTANCES
PILE 2 (cc 34-38) or
PILE 3 (cc 39-43) Form: xx.xxx (feet)

Enter the wing pile distances if there is more than 1 pile per wing. The distance is measured from the front face of wing along the wing. PILE 1 is already assumed at the end of the wing if there is at least 1 pile.

I. WINGWALL, BACKWALL, AND END POST ELEVATION DATA (8 in cc 1)

The number eight (8) in card column one is for identification of the Wingwall, Backwall, and End Post Data. This data is required for each bent to be input. No data is required for a pile intermediate bent.

1.) TOP OF WINGWALL ELEVATION

a.) LEFT WING F.F. CAP (cc 3-8) Form: xxxx.xx

Enter the elevation for the top of the left wingwall at the front face of the cap (No Default).

b.) LEFT WING END OF WING (cc 9-14) Form: xxxx.xx

Enter the elevation for the top of the left wingwall at the end of the wing. The default is the LEFT WING F.F. CAP elevation.

c.) RIGHT WING F.F. CAP (cc 15-20) Form: xxxx.xx

Enter the elevation for the top of the right wingwall at the front face of the cap (No Default).

d.) RIGHT WING END OF WING (cc 21-26) Form: xxxx.xx

Enter the elevation for the top of the right wingwall at the end of the wing. The default is the RIGHT WING F.F. CAP elevation.

I. WINGWALL, BACKWALL, AND END POST ELEVATION DATA Cont.

2.) TOP OF BACKWALL ELEVATION

a.) LEFT (cc 27-32) Form: xxxx.xx

Enter the elevation for the top of the backwall at the left side of the bent (No Default). This data is not required if the bent does not have a backwall.

b.) MID (cc 33-38) Form: xxxx.xx

Enter the elevation for the top of the backwall at the middle of the bent. The default will be the average elevation for the top of the backwall at the left side and the right side of the bent. This data is not required if the bent does not have a backwall.

c.) RIGHT (cc 39-44) Form: xxxx.xx

Enter the elevation for the top of the backwall at the right side of the bent (No Default). This data is not required if the bent does not have a backwall.

3.) TOP OF END POST ELEVATION

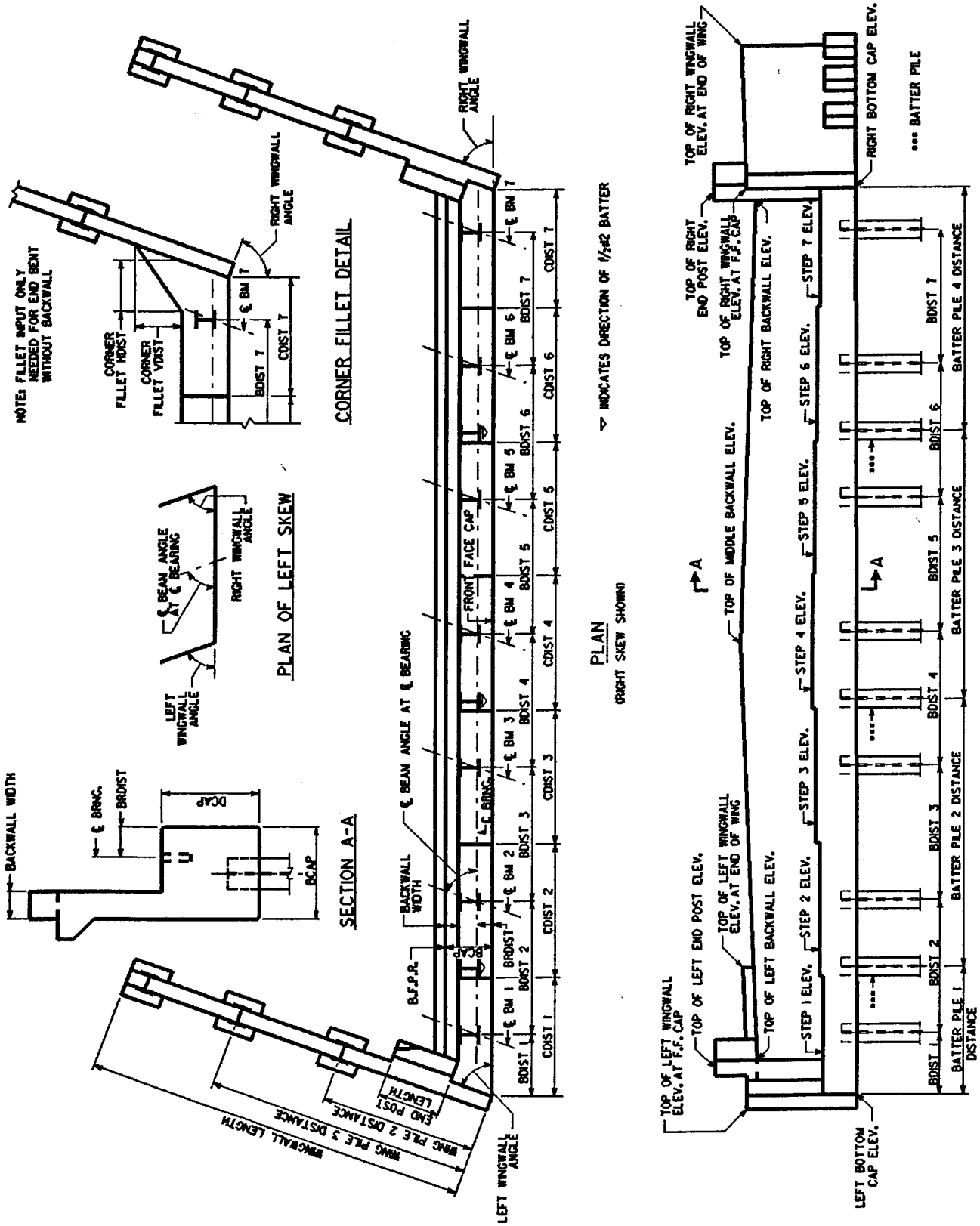
a.) LEFT (cc 45-50) Form: xxxx.xx

Enter the elevation for the top of the left end post. The default is 2'-8" above the top of the left backwall elevation. This data is not required if the bent does not have a backwall.

b.) RIGHT (cc 51-56) Form: xxxx.xx

Enter the elevation for the top of the right end post. The default is 2'-8" above the top of the right backwall elevation. This data is not required if the bent does not have a backwall.

BENT DIAGRAM



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PROJECT NO., COUNTY, NAME, DATE, REMARKS, ETC.

0	

CAP DATA

		SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NST	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
1											

DETAIL OPTIONS - FOR CAP

SCALE	LA	BRG
1 = 1/2"/FT.	0 = LOOKING AHEAD (DEF.)	1 = DOWEL BAR
2 = 3/8"/FT.	1 = LOOKING BACK	2 = ANCHOR BOLTS
3 = 1/4"/FT.		

		CAP STEP DISTANCES (FT)									
		CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST 9	CDIST 10
2											
2											
2											

			BOT. CAP ELEV.		CAP STEP ELEVATIONS									
		BN	LEFT	RIGHT	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
3														
3														
3														
3														
3														
3														

		℄ BEAM DISTANCES AT ℄ BEARING (FT)									
		BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
4											
4											
4											

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CAP DATA

		℄ BEAM ANGLES AT ℄ BEARING																													
	L R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
	3	DEG	MIN	SEC 18	DEG	MIN	SEC 17	DEG	MIN	SEC 24	DEG	MIN	SEC 31	DEG	MIN	SEC 38	DEG	MIN	SEC 45	DEG	MIN	SEC 52	DEG	MIN	SEC 59	DEG	MIN	SEC 66	DEG	MIN	SEC 73
5	X																														
5	X																														
5	X																														

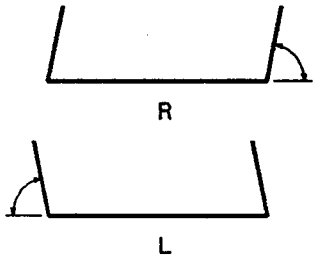
			BATTER PILE LOCATION DISTANCES (FT)					
	PILE 3	NS 6	PILE 1 11	PILE 2 16	PILE 3 21	PILE 4 26	PILE 5 31	PILE 6 36
6	X	X						

WINGWALL, BACKWALL, AND END POST DATA

				WINGWALL ANGLES								
	BACKWALL	END POST	WINGWALL	LEFT			RIGHT				WING PILE DISTANCE (FT)	
	WIDTH (FT) 3 7	LENGTH (FT) 12	LENGTH (FT) 17	DEG	MIN	SEC 24	DEG	MIN	SEC 31	NP 33	PILE 2 38	PILE 3 43
7	X									X		

	TOP OF WINGWALL ELEVATION								
	LEFT WING		RIGHT WING		TOP OF BACKWALL ELEVATION			TOP OF END POST ELEV.	
	F.F. CAP 3 8	END OF WING 14	F.F. CAP 20	END OF WING 26	LEFT 32	MID 38	RIGHT 44	LEFT 50	RIGHT 56
8	X								
8	X								

SKEW CODE L/R



PILE - PILE TYPE OPTIONS

BLANK = NO PILES
1 = 10BP42
2 = 12BP53
3 = 14BP73
4 = 12 IN. SQ. PSC
5 = 14 IN. SQ. PSC
6 = 16 IN. SQ. PSC
7 = 14 IN. O.D. METAL SHELL
8 = 16 IN. O.D. METAL SHELL

5.0 HOW TO RUN BREBNT

Before you attempt to run the program, insure that the input file has been created in node CCC as required. The program BREBNT will run only in node CCC.

- To run the program (BREBNT) in node CCC the user must be out of the graphics mode.

- When the user is in the dollar prompt mode, he may start the deck section program by typing

  BREBNT

  - The program will prompt

    Enter Input File:
    Enter Intergraph Output File:__.INT
    Enter Output Name For Concrete Quantities:
    Enter Output Name For Rebar Quantities:

    - The Intergraph Output File must have the INT trailer so that the graphics conversion program can be run.

    - The Concrete quantities will be per end bent.

    - The Output for the Rebar quantities is actually the input for the RBAR Quantities Program (BRRBAR). See the Quantity Discussion on page 15.

  - When the program is completed the dollar prompt will appear.

- Run the conversion program that takes the INT File and creates the Graphics Design File (DGN) by typing

  GATRANS

  - The program will prompt

    Enter INT file for graphics translation : filename.INT

    This is a batch job and will take some time to create a graphics file called filename.DGN.

    To check on the completion of the GATRANS program, type SH QUE to see if the batch job is completed.

6.0 QUANTITY DISCUSSION

A.) Concrete Quantities

The Concrete Quantity output will include the following:

- A listing of the input data.

- A listing of the Concrete Quantities per bent, broken down with the following data:
    - Cap
    - Wingwalls
    - Pile Boxes
    - Corner Fillets
    - Backwall
    - End Posts
    - Paving Rest
    - Minus Total Pile Volume

- A summary of the quantities per bent with a quantity summary.

B.) Steel Quantities

The output file for the steel quantities is actually the input for the Rebar Quantities Program (BRRBAR). This file can be edited or it can be used as is for the BRRBAR program. Since this file is in Node CCC the user must NET over the file to Node BBB so that BRRBAR can be run. The steel quantities are listed per bent.

7.0 SPECIAL CONSIDERATIONS

When running BREBNT, the following special considerations need to be addressed :

1.) A bent graphics file created with 1/4 in/ft scale may have overlapping text.

2.) No more than 30 cap steps can run on this program. If more steps are needed the user can conform the input to give a close representation of the structure.

3.) Wingwall vertical bars will be variable if the top elevations for the wing at the front face of the cap and at the end of the wing vary by more than 2 inches.

4.) If the left and right wingwall vertical bars are of constant length but vary between wing by more than 2 inches, then the left wing bar number will have the trailer letter "A" and the right wing will have the trailer letter "B".

5.) If along any cap step the depth of the cap becomes 9 inches larger then the DCAP dimension input, then step steel will be placed at that step.

6.) The input MUST conform to whether the bent is looking back or ahead. Follow the bent illustration as shown on page 11. For example, Beam 1 on the bent illustration is always considered to be on the left side of the illustration whether the bent is looking back or ahead. Therefore, if the bent is to be looking back, the actual last beam data should be placed in the program's beam 1 data input.

7.) The top of the end post is drawn level. For severe slopes, the drawing should be modified to provide an elevation at the back of the endpost so it will match the roadway slope.

8.) For the pile intermediate bent, there will be bearing holes placed from each face of the cap at the input bearing distance (BRDIST).

9.) For the pile intermediate bent, there is a constant elevation for the back and ahead part of the bent for every step. Therefore, if one beam size is used at the back span and then another beam size is used for the ahead span then the cap must be adjusted.

10.) For the pile intermediate bent, the exterior piles are not battered in the transverse direction.

9.0 EXAMPLE PROBLEMS

The example problems consist of the following options:

1.) Example Problem 1 ..... page 18
- 6 beams
- Superelevated
- Right skew with variable wingwall and beam angles
- 1 bent
- 12 in. P.S.C. piles
- Step steel
- Step elevations adjusted for exterior facia beams

2.) Example Problem 2 ..... page 24
- 7 beams
- Crown
- Backwall
- Left skew with 85 degree constant wingwall and beam angle
- 2 bents
- 10 BP 42 piles
- Extra batter piles

3.) Example Problem 3 ..... page 30
- 13 beams
- Superelevated
- Left skew with 75 degree constant wingwall and beam angle
- 1 bent
- 12 BP 53 piles

4.) Example Problem 4 ..... page 36
- 6 beams
- Superelevated
- Backwall
- Right skew with 90 degree constant wingwall and beam angle
- 2 pile boxes per wingwall
- 1 bent
- 16 in. O.D. metal shell piles

5.) Example Problem 5 ..... page 42
- 9 beams
- Crown
- Intermediate pile bent
- Right skew with 70 degree constant beam angle
- 3 bents
- 16 in. P.S.C. piles

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PROJECT NO., COUNTY, NAME, DATE, REMARKS, ETC.

0	EXAMPLE 1 - 6 STEPS, SUPERELEVATED, VARIABLE ANGLES, FACIA BEAMS

CAP DATA

	SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NST	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
1	3	1		1		30.00	20.00	6		

DETAIL OPTIONS - FOR CAP

SCALE	LA	BRG
1 = 1/2"/FT.	0 = LOOKING AHEAD (DEF.)	1 = DOWEL BAR
2 = 3/8"/FT.	1 = LOOKING BACK	2 = ANCHOR BOLTS
3 = 1/4"/FT.		

CAP STEP DISTANCES (FT)

	CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST 9	CDIST 10
2	8.250	7.333	7.333	7.333	7.333	7.250				
2										
2										

	BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
3	4	121.51	120.91	123.51	121.61	120.05	123.95	123.84	122.99				
3													
3													
3													
3													
3													

℄ BEAM DISTANCES AT ℄ BEARING (FT)

	BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
4	4.365	7.333	7.333	7.333	7.333	7.333				
4										
4										

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

CAP DATA

		℄ BEAM ANGLES AT ℄ BEARING																													
	L/R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
		DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
5	R	70	0	0	70	30	15	71	0	30	71	30	45	72	1	0	72	31	15												
5																															
5																															

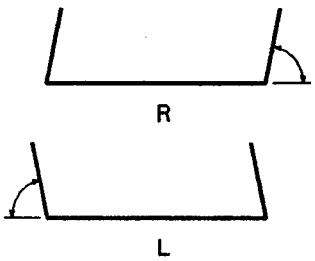
		BATTER PILE LOCATION DISTANCES (FT)						
	PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
6	4							

WINGWALL, BACKWALL, AND END POST DATA

				WINGWALL ANGLES								
	BACKWALL	END POST	WINGWALL	LEFT			RIGHT				WING PILE DISTANCE (FT)	
	WIDTH (FT)	LENGTH (FT)	LENGTH (FT)	DEG	MIN	SEC	DEG	MIN	SEC	NP	PILE 2	PILE 3
7			15.00.0	69	29	45	73	1	30	1		

	TOP OF WINGWALL ELEVATION						
	LEFT WING		RIGHT WING		TOP OF BACKWALL ELEVATION			TOP OF END POST ELEV.	
	F.F. CAP	END OF WING	F.F. CAP	END OF WING	LEFT	MID	RIGHT	LEFT	RIGHT
8	121.95.3	121.92.7	121.89.5	121.86.9					
8									

SKEW CODE L/R



PILE - PILE TYPE OPTIONS

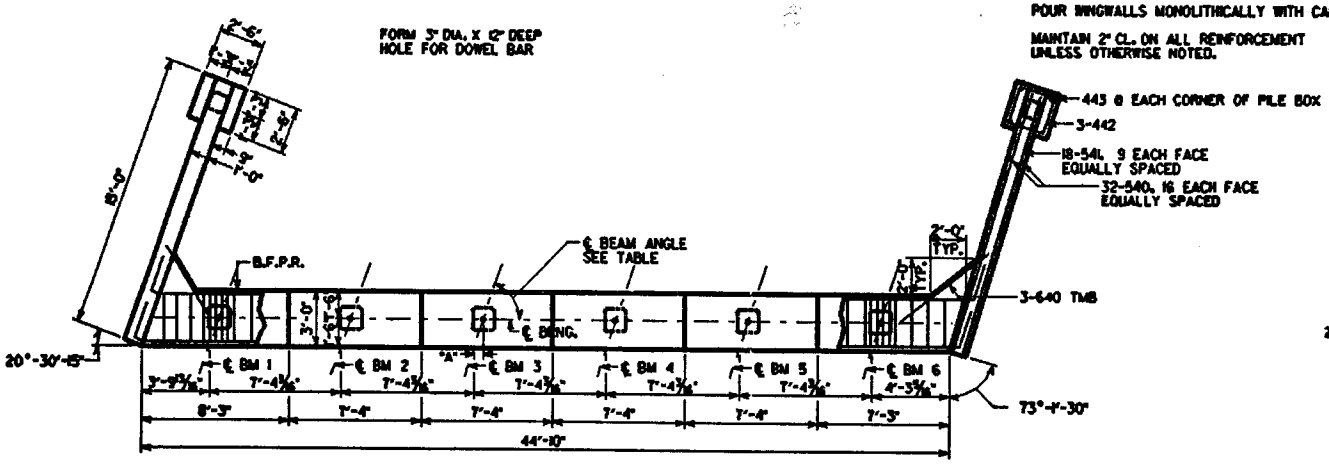
BLANK = NO PILES
1 = 10BP42
2 = 12BP53
3 = 14BP73
4 = 12 IN. SQ. PSC
5 = 14 IN. SQ. PSC
6 = 16 IN. SQ. PSC
7 = 14 IN. O.D. METAL SHELL
8 = 16 IN. O.D. METAL SHELL

SCALE SIZE IS 1/4 IN/FT

FORM 3" DIA. X 12" DEEP HOLE FOR DOWEL BAR

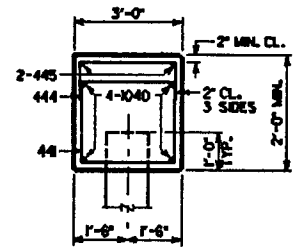
POUR WINGWALLS MONOLITHICALLY WITH CAP.

MAINTAIN 2" CL. ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

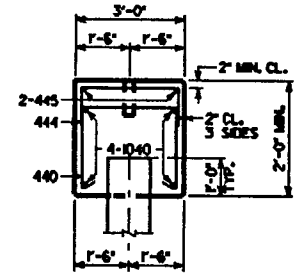


PLAN

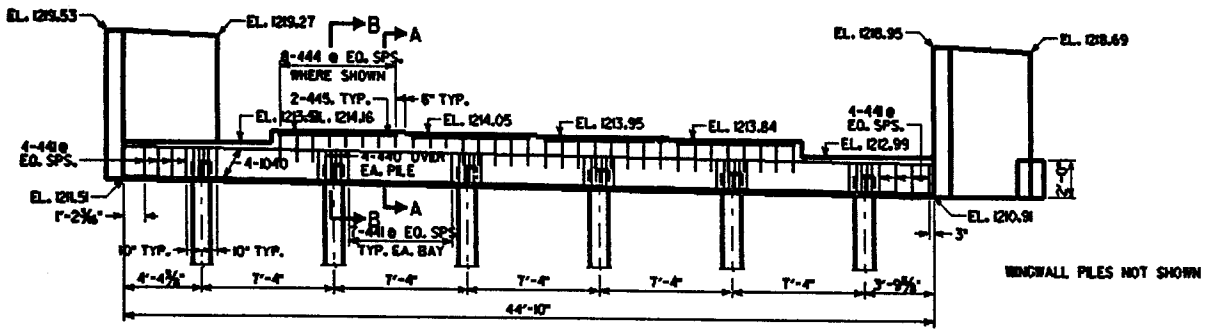
SUBSTRUCTURE QUANTITIES	
ITEM	BENT 4
CU YD CLASS "A" CONCRETE	21.95
LB BAR REINFORCEMENT STEEL	



SECTION A-A



SECTION B-B



WINGWALL PILES NOT SHOWN

ELEVATION

BENT 4
(LOOKING AHEAD)

TABLE OF BEAM ANGLES AND OFFSETS		
BEAM NUMBER	BEAM ANGLE	OFFSET "A"
BEAM 1	70°- 0'- 0"	6 5/16"
BEAM 2	70°-30'-15"	6 3/16"
BEAM 3	71°- 0'-30"	6 5/16"
BEAM 4	71°-30'-45"	6'
BEAM 5	72°- 1'- 0"	5 13/16"
BEAM 6	72°-31'-15"	5 11/16"

ALL PILES SHALL BE 12 IN. SQ. PSC

PLAN DRIVING OBJECTIVE

ALL PILES SHALL BE DRIVEN TO A DRIVING RESISTANCE OF XX TONS AFTER A MINIMUM TIP ELEVATION OF XX IS ACHIEVED.

EXAMPLE 1 - 6 STEPS, SUPERELEVATED, VARIABLE ANGLES, FACIA BEAMS

CAP DATA

SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NSTEP	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
3	1	0	1	0.000	3.000	2.000	6	2.000	2.000

CAP STEP DISTANCES (FT)

CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST9	CDIST 10
8.250	7.333	7.333	7.333	7.333	7.250	0.000	0.000	0.000	0.000

BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	CAP STEP ELEVATIONS STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
4	1211.51	1210.91	1213.51	1214.16	1214.05	1213.95	1213.84	1212.99	0.00	0.00	0.00	0.00

CENTER LINE BEAM DISTANCES AT CENTERLINE BEARING (FT)

BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
4.365	7.333	7.333	7.333	7.333	7.333	0.000	0.000	0.000	0.000

CENTERLINE BEAM ANGLES AT CENTERLINE BEARING

R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
L	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
R	70	0	0	70	30	15	71	0	30	71	30	45	72	1	0	72	31	15	0	0	0	0	0	0	0	0	0	0	0	0

BATTER PILE LOCATION DISTANCES (FT)

PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
4	4	0.000	0.000	0.000	0.000	0.000	0.000

WINGWALL ANGLES

BACKWALL WIDTH (FT)	END POST LENGTH (FT)	WINGWALL LENGTH (FT)	LEFT DEG	LEFT MIN	LEFT SEC	RIGHT DEG	RIGHT MIN	RIGHT SEC	NP	WING PILE DISTANCES PILE 2	WING PILE DISTANCES PILE 3
0.000	0.000	15.000	69	29	45	73	1	30	1	0.000	0.000

TOP OF WINGWALL ELEVATION

LEFT WING F.F. CAP	LEFT WING END OF WING	RIGHT WING F.F. CAP	RIGHT WING END OF WING	TOP OF BACKWALL ELEVATIONS LEFT	TOP OF BACKWALL ELEVATIONS MIDDLE	TOP OF BACKWALL ELEVATIONS RIGHT	TOP OF END POST ELEVATIONS LEFT	TOP OF END POST ELEVATIONS RIGHT
1219.53	1219.27	1218.95	1218.69	0.00	0.00	0.00	0.00	0.00

QUANTITIES FOR BENT NUMBER 4

CONCRETE QUANTITY IN CAP	=	12.61 CU YD
CONCRETE QUANTITY IN WINGS	=	8.78 CU YD
CONCRETE QUANTITY IN PILE BOXES	=	0.56 CU YD
CONCRETE QUANTITY IN FILLETS	=	0.30 CU YD
MINUS TOTAL PILE VOLUME	=	-0.30 CU YD
TOTAL CONCRETE QUANTITY IN BENT	=	21.95 CU YD

```
*B06    1000 EXAMPLE 1 - 6 STEPS, SUPERELEVATED, VARIABLE ANGLES, FACIA BEAMS
UBENT  4          11000
  440        24      3255 2 8   1 8   1 8
  441        43      2544 2 8   1 8
  442         6      2544 2 2   2 2
  443   1 8   8       1
  444        32       2   2 8   1 6   1 6
  445   610   8       1
K 2
V 540  VARY  64   756 1
  541  14 8  36       1
K 2
  640   5 0   6       1
K 2
 1040         4       6  45 4   0 6   2 0   2 0                        73 21
K 2
Z
```

GEORGIA DEPARTMENT OF TRANSPORTATION - OFFICE OF BRIDGE DESIGN

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

PROJECT NO., COUNTY, NAME, DATE, REMARKS, ETC.

0	EXAMPLE 2 - 7 STEPS, CROWN, BACKWALL, CONSTANT ANGLE, 2 BENTS

CAP DATA

	SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NST	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
1	3	2	1	2	1.000	3.000	2.000	7		

DETAIL OPTIONS - FOR CAP

SCALE	LA	BRG
1 = 1/2"/FT.	0 = LOOKING AHEAD (DEF.)	1 = DOWEL BAR
2 = 3/8"/FT.	1 = LOOKING BACK	2 = ANCHOR BOLTS
3 = 1/4"/FT.		

CAP STEP DISTANCES (FT)

	CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST 9	CDIST 10
2	7.750	8.750	8.750	8.750	8.750	8.750	8.700			
2										
2										

CAP STEP ELEVATIONS

	BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
3	1	7.89.81	7.89.81	7.92.02	7.92.22	7.92.42	7.92.62	7.92.42	7.92.22	7.92.02			
3	5	7.88.81	7.88.81	7.91.02	7.91.22	7.91.42	7.91.62	7.91.42	7.91.22	7.91.02			
3													
3													
3													
3													

℄ BEAM DISTANCES AT ℄ BEARING (FT)

	BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
4	3.375	8.750	8.750	8.750	8.750	8.750	8.750			
4										
4										

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

CAP DATA

		℄ BEAM ANGLES AT ℄ BEARING																													
	L R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
		DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
5	L	85	0	0																											
5																															
5																															

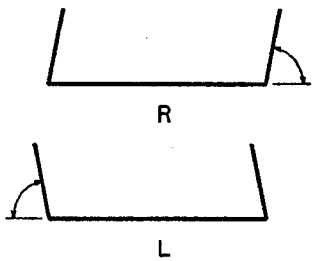
			BATTER PILE LOCATION DISTANCES (FT)					
	PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
6	1		7.750	17.500	8.750	17.500		

WINGWALL, BACKWALL, AND END POST DATA

	BACKWALL	END POST	WINGWALL	WINGWALL ANGLES							WING PILE DISTANCE (FT)	
				LEFT			RIGHT			NP		
	WIDTH (FT)	LENGTH (FT)	LENGTH (FT)	DEG	MIN	SEC	DEG	MIN	SEC		PILE 2	PILE 3
7	8.33	40.00	125.00	85	0	0				1		

	TOP OF WINGWALL ELEVATION				TOP OF BACKWALL ELEVATION			TOP OF END POST ELEV.	
	LEFT WING		RIGHT WING						
	F.F. CAP	END OF WING	F.F. CAP	END OF WING	LEFT	MID	RIGHT	LEFT	RIGHT
8	796.83	797.10	796.83	797.10	796.20	797.00	796.20	798.86	798.86
8	796.13	795.40	796.13	795.40	795.20	796.00	795.20	797.86	797.86

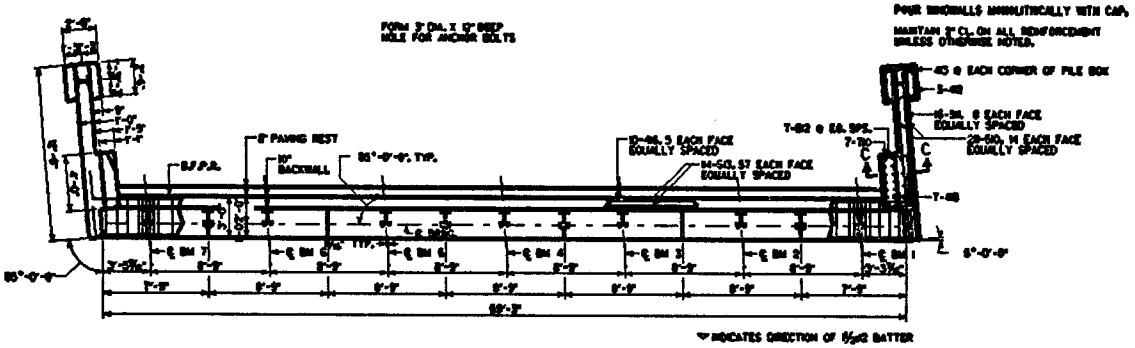
SKEW CODE L/R



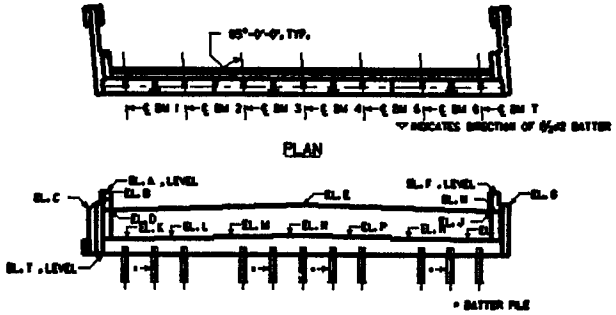
PILE - PILE TYPE OPTIONS

BLANK = NO PILES
1 = 10BP42
2 = 12BP53
3 = 14BP73
4 = 12 IN. SQ. PSC
5 = 14 IN. SQ. PSC
6 = 16 IN. SQ. PSC
7 = 14 IN. O.D. METAL SHELL
8 = 16 IN. O.D. METAL SHELL

SCALE SIZE IS 1/4 IN/FT

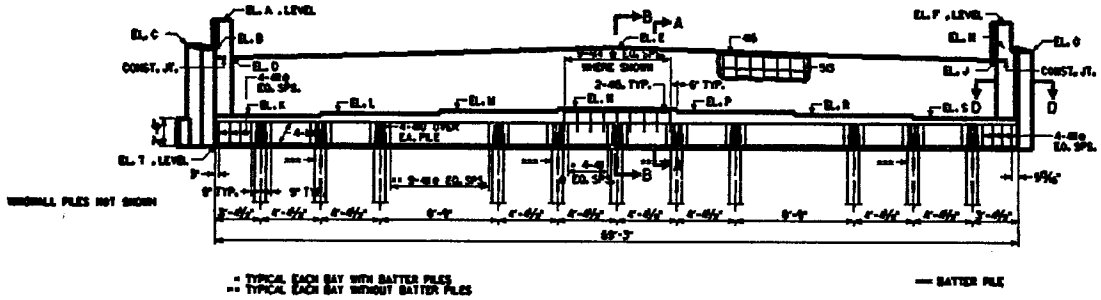


PLAN

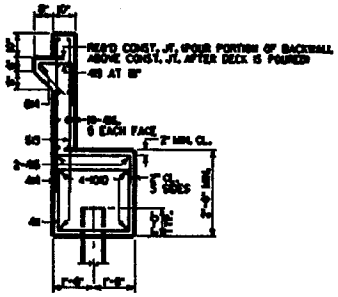


PLAN

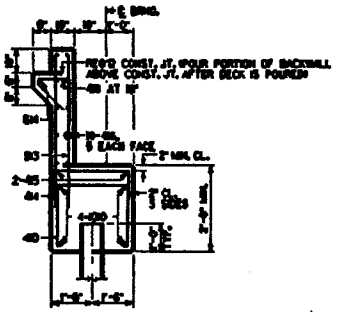
ELEVATION
BENT 5
(LOOKING AHEAD)



ELEVATION
BENT 1
(LOOKING BACK)



SECTION A-A



SECTION B-B

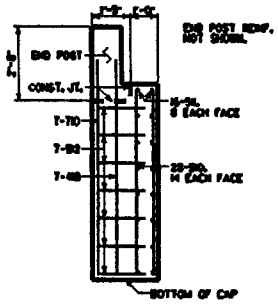
TABLE OF ELEVATIONS																	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
BENT 1	798.86	798.83	797.10	796.20	797.00	798.86	798.83	797.10	796.20	792.02	792.22	792.42	792.62	792.42	792.22	792.02	789.81
BENT 5	797.86	796.63	795.40	795.20	796.00	797.86	796.63	795.40	795.20	796.02	796.22	796.42	796.62	796.42	796.22	796.02	793.81

SUBSTRUCTURE QUANTITIES		
ITEM	BENT 1	BENT 5
CU YD CLASS "M" CONCRETE	35.81	35.63
LB BAR REINFORCEMENT STEEL		

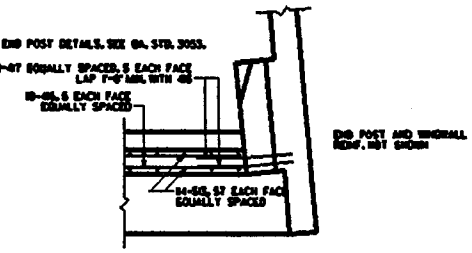
ALL PILES SHALL BE STEEL H, 10BP42

PLAN DRIVING OBJECTIVE

ALL PILES SHALL BE DRIVEN TO A DRIVING RESISTANCE OF XX TONS AFTER A MINIMUM TIP ELEVATION OF XX IS ACHIEVED.



SECTION C-C



SECTION D-D

EXAMPLE 2 - 7 STEPS, CROWN, BACKWALL, CONSTANT ANGLE, 2 BENTS

CAP DATA

SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NSTEP	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
3	2	1	2	1.000	3.000	2.000	7	2.000	2.000

CAP STEP DISTANCES (FT)

CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST9	CDIST 10
7.750	8.750	8.750	8.750	8.750	8.750	7.750	0.000	0.000	0.000

BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	CAP STEP ELEVATIONS STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
1	789.81	789.81	792.02	792.22	792.42	792.62	792.42	792.22	792.02	0.00	0.00	0.00
5	788.81	788.81	791.02	791.22	791.42	791.62	791.42	791.22	791.02	0.00	0.00	0.00

CENTER LINE BEAM DISTANCES AT CENTERLINE BEARING (FT)

BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
3.375	8.750	8.750	8.750	8.750	8.750	8.750	0.000	0.000	0.000

CENTERLINE BEAM ANGLES AT CENTERLINE BEARING

R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
L	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
L	85	0	0	85	0	0	85	0	0	85	0	0	85	0	0	85	0	0	85	0	0	0	0	0	0	0	0	0	0	0

BATTER PILE LOCATION DISTANCES (FT)

PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
1	4	7.750	17.500	8.750	17.500	0.000	0.000

WINGWALL ANGLES

BACKWALL WIDTH (FT)	END POST LENGTH (FT)	WINGWALL LENGTH (FT)	LEFT DEG	LEFT MIN	LEFT SEC	RIGHT DEG	RIGHT MIN	RIGHT SEC	NP	WING PILE DISTANCES PILE 2	WING PILE DISTANCES PILE 3
0.833	4.000	12.500	85	0	0	85	0	0	1	0.000	0.000

TOP OF WINGWALL ELEVATION

LEFT WING F.F. CAP	LEFT WING END OF WING	RIGHT WING F.F. CAP	RIGHT WING END OF WING	TOP OF BACKWALL ELEVATIONS LEFT	TOP OF BACKWALL ELEVATIONS MIDDLE	TOP OF BACKWALL ELEVATIONS RIGHT	TOP OF END POST ELEVATIONS LEFT	TOP OF END POST ELEVATIONS RIGHT
796.83	797.10	796.83	797.10	796.20	797.00	796.20	798.86	798.86
796.13	795.40	796.13	795.40	795.20	796.00	795.20	797.86	797.86

QUANTITIES FOR BENT NUMBER 1

CONCRETE QUANTITY IN CAP	=	16.30 CU YD
CONCRETE QUANTITY IN WINGS	=	6.63 CU YD
CONCRETE QUANTITY IN PILE BOXES	=	0.56 CU YD
CONCRETE QUANTITY IN BACKWALL	=	7.48 CU YD
CONCRETE QUANTITY IN PAVING REST	=	1.16 CU YD
CONCRETE QUANTITY IN END POST	=	3.73 CU YD
MINUS TOTAL PILE VOLUME	=	-0.04 CU YD
TOTAL CONCRETE QUANTITY IN BENT	=	35.81 CU YD

QUANTITIES FOR BENT NUMBER 5

CONCRETE QUANTITY IN CAP	=	16.30 CU YD
CONCRETE QUANTITY IN WINGS	=	6.44 CU YD
CONCRETE QUANTITY IN PILE BOXES	=	0.56 CU YD
CONCRETE QUANTITY IN BACKWALL	=	7.48 CU YD
CONCRETE QUANTITY IN PAVING REST	=	1.16 CU YD
CONCRETE QUANTITY IN END POST	=	3.73 CU YD
MINUS TOTAL PILE VOLUME	=	-0.04 CU YD
TOTAL CONCRETE QUANTITY IN BENT	=	35.63 CU YD

```
*B06    1000 EXAMPLE 2 - 7 STEPS, CROWN, BACKWALL, CONSTANT ANGLE, 2 BENTS
UBENT  1          11000
W             1 25100
K 2
S 410        44      3255 2 8   1 8   1 8
S 411        58      2544 2 8   1 8
S 412         6      2544 2 2   2 2
S 413   1 8   8       1
S 414         9       2   2 8   1 6   1 6
S 415   8 3   2       1
S 416  56 1  10       1
S 417        20       4   1 8   1 8                                    5
S 418   7 9  14       1
S 419        39      46   1 6   1 2   0 4   0 8   0 8
K 2
V 510  VARY  56   682 1
S 511  12 2  32       1
S 512        14      2544 3 8   1 9
S 513   5 9 114       1
S 514  56 1   1       1
K 2
S 710   8 3  14       1
K 2
S1010         4       6  59 9   0 6   2 0   2 0                      85  5
K 2
UBENT  5          11000
W             1 25100
K 2
R 410        44
R 411        58
R 412         6
R 413         8
R 414         9
R 415         2
R 416        10
R 417        20
R 418        14
R 419        39
K 2
V 510  VARY  56   662
R 511        32
R 512        14
R 513       114
R 514         1
K 2
R 710        14
K 2
R1010         4
K 2
Z
```

GEORGIA DEPARTMENT OF TRANSPORTATION - OFFICE OF BRIDGE DESIGN

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

PROJECT NO., COUNTY, NAME, DATE, REMARKS, ETC.

0	EXAMPLE 3 - 13 STEPS, SUPERELEVATED, CONSTANT ANGLE, 1 BENT

CAP DATA

		SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NST	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
1	X	3	1	1	1		3.00	2.000	13	3.000	3.000

DETAIL OPTIONS - FOR CAP

SCALE	LA	BRG
1 = 1/2"/FT.	0 = LOOKING AHEAD (DEF.)	1 = DOWEL BAR
2 = 3/8"/FT.	1 = LOOKING BACK	2 = ANCHOR BOLTS
3 = 1/4"/FT.		

CAP STEP DISTANCES (FT)

		CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST 9	CDIST 10
2	X	6.000	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
2	X	6.500	6.500	7.000							
2	X										

		BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
3	X	1	24.000	24.240	24.221	24.241	24.261	24.281	24.301	24.321	24.341	24.361	24.381	24.401
3	X				24.421	24.441	24.461							
3	X													
3	X													
3	X													
3	X													

℄ BEAM DISTANCES AT ℄ BEARING (FT)

		BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
4	X	2.750	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500
4	X	6.500	6.500	6.500							
4	X										

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

CAP DATA

		℄ BEAM ANGLES AT ℄ BEARING																													
	L/R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
		DEG	MIN	SEC 10	DEG	MIN	SEC 17	DEG	MIN	SEC 24	DEG	MIN	SEC 31	DEG	MIN	SEC 38	DEG	MIN	SEC 45	DEG	MIN	SEC 52	DEG	MIN	SEC 59	DEG	MIN	SEC 66	DEG	MIN	SEC 73
5	L	75	0	0																											
5																															
5																															

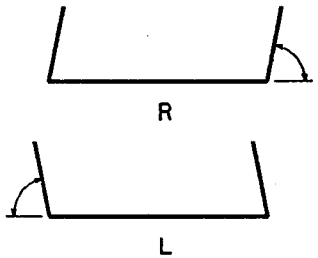
		BATTER PILE LOCATION DISTANCES (FT)						
	PILE 3	NS 6	PILE 1 11	PILE 2 16	PILE 3 21	PILE 4 26	PILE 5 31	PILE 6 36
6	2							

WINGWALL, BACKWALL, AND END POST DATA

		BACKWALL	END POST	WINGWALL	WINGWALL ANGLES							WING PILE DISTANCE (FT)	
					LEFT			RIGHT					
		WIDTH (FT) 3 7	LENGTH (FT) 12	LENGTH (FT) 17	DEG	MIN	SEC 24	DEG	MIN	SEC 31	NP 33	PILE 2 38	PILE 3 43
7				1000	75	0	0	75	0	0			

	TOP OF WINGWALL ELEVATION				TOP OF BACKWALL ELEVATION			TOP OF END POST ELEV.	
	LEFT WING		RIGHT WING						
	F.F. CAP 3 8	END OF WING 14	F.F. CAP 20	END OF WING 26	LEFT 32	MID 38	RIGHT 44	LEFT 50	RIGHT 56
8	247.00	246.60	249.40	249.00					
8									

SKEW CODE L/R



PILE - PILE TYPE OPTIONS

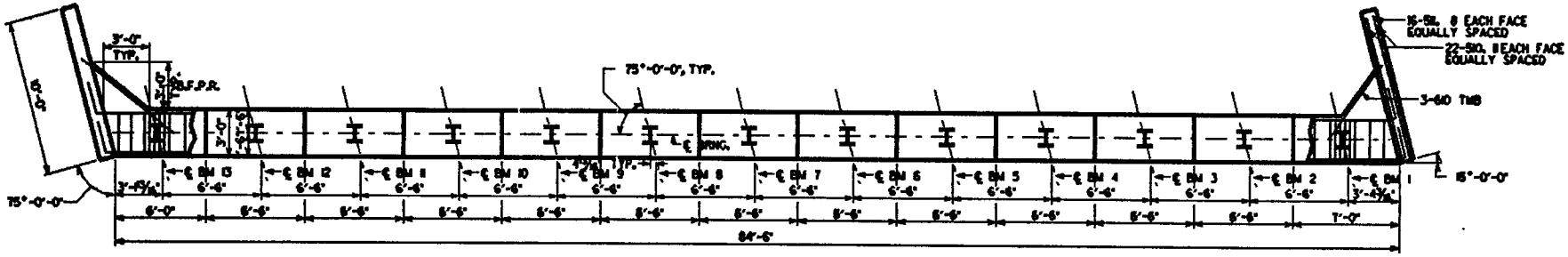
BLANK = NO PILES
1 = 10BP42
2 = 12BP53
3 = 14BP73
4 = 12 IN. SQ. PSC
5 = 14 IN. SQ. PSC
6 = 16 IN. SQ. PSC
7 = 14 IN. O.D. METAL SHELL
8 = 16 IN. O.D. METAL SHELL

SCALE SIZE IS 1/4 IN/FT

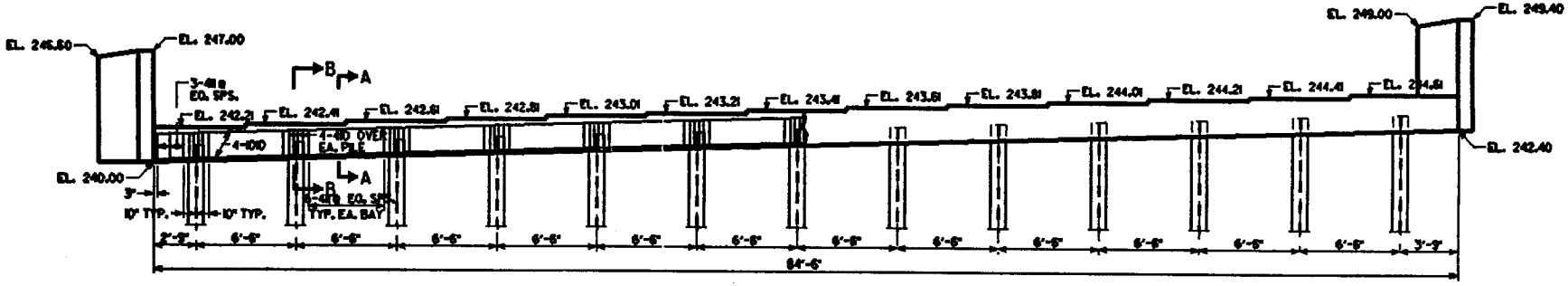
FORM 3" DIA. X 12" DEEP HOLE FOR DOWEL BAR

POUR WINGWALLS MONOLITHICALLY WITH CAP.

MAINTAIN 2" CL. ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

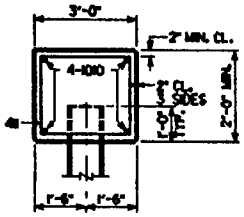


PLAN

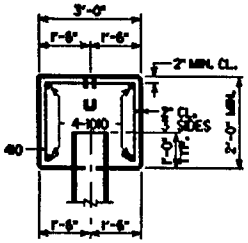


ELEVATION

BENT 1
(LOOKING BACK)



SECTION A-A



SECTION B-B

SUBSTRUCTURE QUANTITIES	
ITEM	BENT 1
CU YD CLASS "A" CONCRETE	26.50
LB BAR REINFORCEMENT STEEL	

ALL PILES SHALL BE STEEL H, 12BP53

PLAN DRIVING OBJECTIVE

ALL PILES SHALL BE DRIVEN TO A DRIVING RESISTANCE OF XX TONS AFTER A MINIMUM TIP ELEVATION OF XX IS ACHIEVED.

EXAMPLE 3 - 13 STEPS, SUPERELEVATED, CONSTANT ANGLE, 1 BENT

CAP DATA

SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NSTEP	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
3	1	1	1	0.000	3.000	2.000	13	3.000	3.000

CAP STEP DISTANCES (FT)

CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST9	CDIST 10
6.000	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500

CDIST 11	CDIST 12	CDIST 13	CDIST 14	CDIST 15	CDIST 16	CDIST 17	CDIST 18	CDIST19	CDIST 20
6.500	6.500	7.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
1	240.00	242.40	242.21	242.41	242.61	242.81	243.01	243.21	243.41	243.61	243.81	244.01

CAP STEP ELEVATIONS

STEP 11	STEP 12	STEP 13	STEP 14	STEP 15	STEP 16	STEP 17	STEP 18	STEP 19	STEP 20
244.21	244.41	244.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CENTER LINE BEAM DISTANCES AT CENTERLINE BEARING (FT)

BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
2.750	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500	6.500

BDIST 11	BDIST 12	BDIST 13	BDIST 14	BDIST 15	BDIST 16	BDIST 17	BDIST 18	BDIST 19	BDIST 20
6.500	6.500	6.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000

CENTERLINE BEAM ANGLES AT CENTERLINE BEARING

R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
L	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
L	75	0	0	75	0	0	75	0	0	75	0	0	75	0	0	75	0	0	75	0	0	75	0	0	75	0	0	75	0	0

BEAM 11			BEAM 12			BEAM 13			BEAM 14			BEAM 15			BEAM 16			BEAM 17			BEAM 18			BEAM 19			BEAM 20		
DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
75	0	0	75	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BATTER PILE LOCATION DISTANCES (FT)

PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
2	4	0.000	0.000	0.000	0.000	0.000	0.000

WINGWALL ANGLES

BACKWALL WIDTH (FT)	END POST LENGTH (FT)	WINGWALL LENGTH (FT)	LEFT DEG	LEFT MIN	LEFT SEC	RIGHT DEG	RIGHT MIN	RIGHT SEC	NP	WING PILE DISTANCES PILE 2	WING PILE DISTANCES PILE 3
0.000	0.000	10.000	75	0	0	75	0	0	0	0.000	0.000

TOP OF WINGWALL ELEVATION

LEFT WING F.F. CAP	LEFT WING END OF WING	RIGHT WING F.F. CAP	RIGHT WING END OF WING	TOP OF BACKWALL ELEVATIONS LEFT	TOP OF BACKWALL ELEVATIONS MIDDLE	TOP OF BACKWALL ELEVATIONS RIGHT	TOP OF END POST ELEVATIONS LEFT	TOP OF END POST ELEVATIONS RIGHT
247.00	246.60	249.40	249.00	0.00	0.00	0.00	0.00	0.00

QUANTITIES FOR BENT NUMBER 1

CONCRETE QUANTITY IN CAP	=	20.78 CU YD
CONCRETE QUANTITY IN WINGS	=	5.04 CU YD
CONCRETE QUANTITY IN FILLETS	=	0.74 CU YD
MINUS TOTAL PILE VOLUME	=	-0.05 CU YD
TOTAL CONCRETE QUANTITY IN BENT	=	26.50 CU YD

```
*B06    1000 EXAMPLE 3 - 13 STEPS, SUPERELEVATED, CONSTANT ANGLE, 1 BENT
UBENT  1          11000
  410        52      3255 2 8   1 8   1 8
  411        78      2544 2 8   1 8
K 2
V 510  VARY  44   646 1
  511   9 8  32       1
K 2
  610   7 3   6       1
K 2
 1010         4       6  43 9   0 6   2 0                                0 15
 1011         4       4  44 3   2 0                                      75
K 2
Z
```

GEORGIA DEPARTMENT OF TRANSPORTATION - OFFICE OF BRIDGE DESIGN

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

PROJECT NO., COUNTY, NAME, DATE, REMARKS, ETC.

0	EXAMPLE 4 - 6 STEPS, SUPERELEVATED, 90 DEGREE, BACKWALL

CAP DATA

		SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NST	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
1	X	X 3	1	X	X 1		30.0	20.0	6		

DETAIL OPTIONS - FOR CAP

SCALE	LA	BRG
1 = 1/2"/FT.	0 = LOOKING AHEAD (DEF.)	1 = DOWEL BAR
2 = 3/8"/FT.	1 = LOOKING BACK	2 = ANCHOR BOLTS
3 = 1/4"/FT.		

CAP STEP DISTANCES (FT)

		CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST 9	CDIST 10
2	X	7.0	7.0	7.0	7.0	7.0	7.0				
2	X										
2	X										

BOT. CAP ELEV. / CAP STEP ELEVATIONS

		BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
3	X	5	101.0	102.50	103.30	103.60	103.90	104.20	104.50	104.80				
3	X													
3	X													
3	X													
3	X													
3	X													

℄ BEAM DISTANCES AT ℄ BEARING (FT)

		BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
4	X	3.50	7.0	7.0	7.0	7.0	7.0				
4	X										
4	X										

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

CAP DATA

		℄ BEAM ANGLES AT ℄ BEARING																													
	L R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
		DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
5	R	90	0	0																											
5																															
5																															

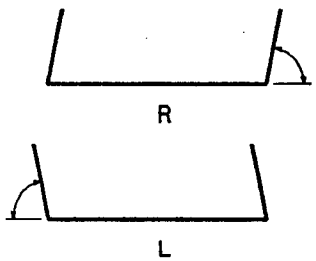
		BATTER PILE LOCATION DISTANCES (FT)						
	PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
6	8							

WINGWALL, BACKWALL, AND END POST DATA

				WINGWALL ANGLES								
	BACKWALL	END POST	WINGWALL	LEFT			RIGHT				WING PILE DISTANCE (FT)	
	WIDTH (FT)	LENGTH (FT)	LENGTH (FT)	DEG	MIN	SEC	DEG	MIN	SEC	NP	PILE 2	PILE 3
7	8.33	4.000	21.000	90	0	0	90	0	0	2	11.000	

	TOP OF WINGWALL ELEVATION								
	LEFT WING		RIGHT WING		TOP OF BACKWALL ELEVATION			TOP OF END POST ELEV.	
	F.F. CAP	END OF WING	F.F. CAP	END OF WING	LEFT	MID	RIGHT	LEFT	RIGHT
8	108.00	107.80	109.50	109.30	107.30		108.80	109.97	114.7
8									

SKEW CODE L/R



PILE - PILE TYPE OPTIONS

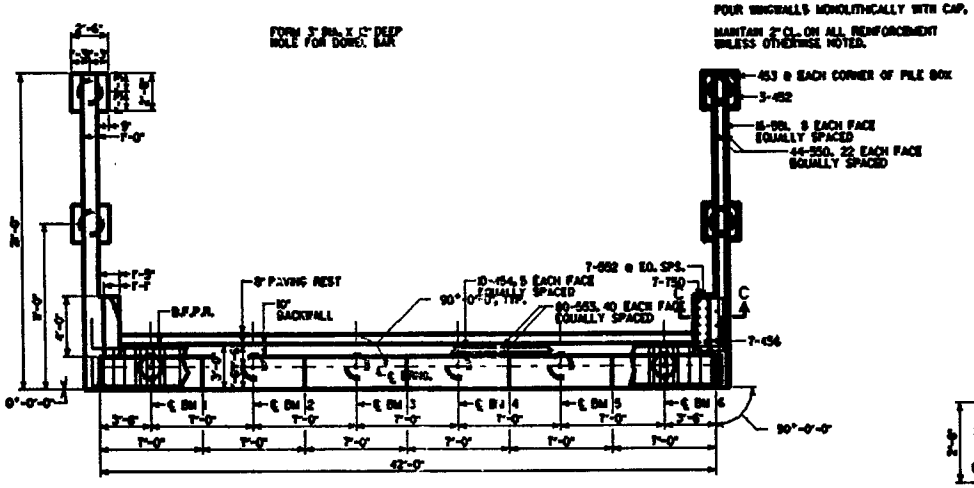
BLANK = NO PILES
1 = 10BP42
2 = 12BP53
3 = 14BP73
4 = 12 IN. SQ. PSC
5 = 14 IN. SQ. PSC
6 = 16 IN. SQ. PSC
7 = 14 IN. O.D. METAL SHELL
8 = 16 IN. O.D. METAL SHELL

SCALE SIZE IS 1/4 IN/FT

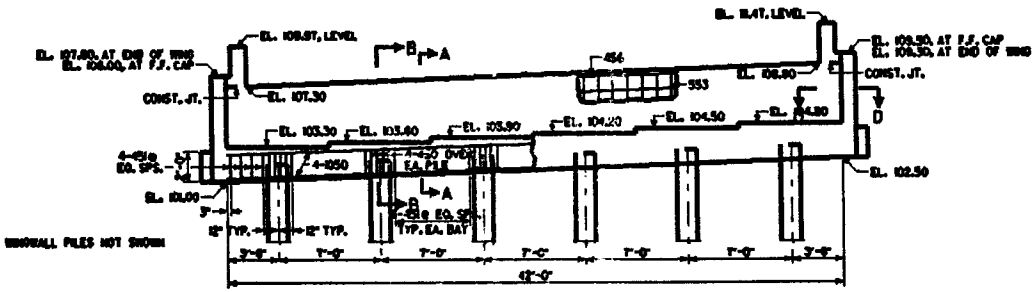
FORM 3" DIA. X 1" DEEP HOLE FOR DOWEL BAR

POUR WINGWALLS MONOLITHICALLY WITH CAP.

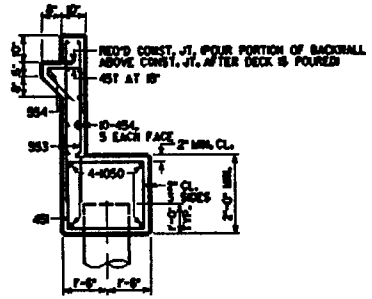
MAINTAIN 2" CL. ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.



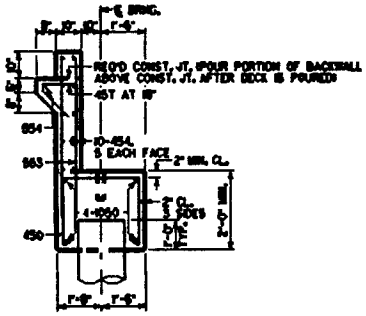
PLAN



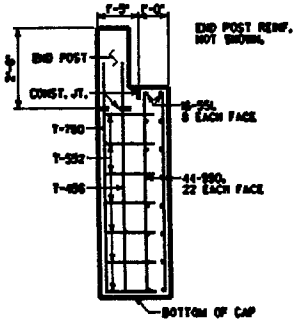
ELEVATION
BENT 5
(LOOKING AHEAD)



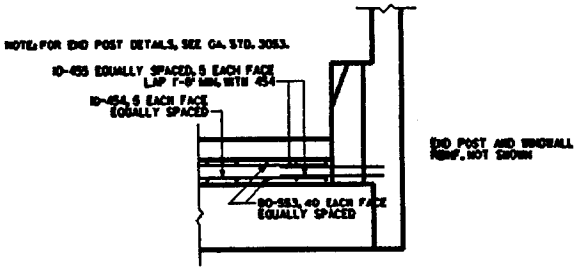
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

SUBSTRUCTURE QUANTITIES	
ITEM	BENT 5
CU YD CLASS "A" CONCRETE	3.33
LB BAR REINFORCEMENT STEEL	

ALL PILES SHALL BE 18 IN. METAL SHELL

PLAN DRIVING OBJECTIVE

ALL PILES SHALL BE DRIVEN TO A DRIVING RESISTANCE OF XX TONS AFTER A MINIMUM TIP ELEVATION OF XX IS ACHIEVED.

EXAMPLE 4 - 6 STEPS, SUPERELEVATED, 90 DEGREE, BACKWALL

CAP DATA

SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NSTEP	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
3	1	0	1	0.000	3.000	2.000	6	2.000	2.000

CAP STEP DISTANCES (FT)

CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST9	CDIST 10
7.000	7.000	7.000	7.000	7.000	7.000	0.000	0.000	0.000	0.000

BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	CAP STEP ELEVATIONS STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
5	101.00	102.50	103.30	103.60	103.90	104.20	104.50	104.80	0.00	0.00	0.00	0.00

CENTER LINE BEAM DISTANCES AT CENTERLINE BEARING (FT)

BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
3.500	7.000	7.000	7.000	7.000	7.000	0.000	0.000	0.000	0.000

CENTERLINE BEAM ANGLES AT CENTERLINE BEARING

R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
L	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
R	90	0	0	90	0	0	90	0	0	90	0	0	90	0	0	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BATTER PILE LOCATION DISTANCES (FT)

PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
8	4	0.000	0.000	0.000	0.000	0.000	0.000

WINGWALL ANGLES

BACKWALL WIDTH (FT)	END POST LENGTH (FT)	WINGWALL LENGTH (FT)	LEFT DEG	LEFT MIN	LEFT SEC	RIGHT DEG	RIGHT MIN	RIGHT SEC	NP	WING PILE DISTANCES PILE 2	WING PILE DISTANCES PILE 3
0.833	4.000	21.000	90	0	0	90	0	0	2	11.000	0.000

TOP OF WINGWALL ELEVATION

LEFT WING F.F. CAP	LEFT WING END OF WING	RIGHT WING F.F. CAP	RIGHT WING END OF WING	TOP OF BACKWALL ELEVATIONS LEFT	TOP OF BACKWALL ELEVATIONS MIDDLE	TOP OF BACKWALL ELEVATIONS RIGHT	TOP OF END POST ELEVATIONS LEFT	TOP OF END POST ELEVATIONS RIGHT
108.00	107.80	109.50	109.30	107.30	0.00	108.80	109.97	111.47

QUANTITIES FOR BENT NUMBER 5

CONCRETE QUANTITY IN CAP	=	10.73 CU YD
CONCRETE QUANTITY IN WINGS	=	10.73 CU YD
CONCRETE QUANTITY IN PILE BOXES	=	1.11 CU YD
CONCRETE QUANTITY IN BACKWALL	=	4.83 CU YD
CONCRETE QUANTITY IN PAVING REST	=	0.81 CU YD
CONCRETE QUANTITY IN END POST	=	3.69 CU YD
MINUS TOTAL PILE VOLUME	=	-0.52 CU YD

TOTAL CONCRETE QUANTITY IN BENT	=	31.39 CU YD

```
*B06    1000 EXAMPLE 4 - 6 STEPS, SUPERELEVATED, 90 DEGREE, BACKWALL
UBENT  5          11000
W             1 25100
K 2
  450        24      3255 2 8   1 8   1 8
  451        43      2544 2 8   1 8
  452        12      2544 2 2   2 2
  453   1 8  16       1
  454  3810  10       1
  455   3 4  20       1
  456   7 8  14       1
  457        28      46   1 6   1 2   0 4   0 8   0 8
K 2
V 550  VARY  88   656 1
  551  20 8  32       1
  552        14      2544 3 8   1 9
  553   5 8  80       1
  554  3810   1       1
K 2
  750   8 2  14       1
K 2
 1050         4       2  42 6   2 0   2 0
K 2
Z
```

GEORGIA DEPARTMENT OF TRANSPORTATION - OFFICE OF BRIDGE DESIGN

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

PROJECT NO., COUNTY, NAME, DATE, REMARKS, ETC.

0	EXAMPLE 5 - 9 STEP 3, CROWN, INTERMEDIATE PILE BENT, CONSTANT ANGLE

CAP DATA

	SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NST	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
1	X 3	3	X	X 2		30.0	20.0	9		

DETAIL OPTIONS - FOR CAP

SCALE	LA	BRG
1 = 1/2"/FT.	0 = LOOKING AHEAD (DEF.)	1 = DOWEL BAR
2 = 3/8"/FT.	1 = LOOKING BACK	2 = ANCHOR BOLTS
3 = 1/4"/FT.		

CAP STEP DISTANCES (FT)

	CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST 9	CDIST 10
2	7.75	8.75	8.75	8.75	8.75	8.75	8.75	8.75	7.75	
2										
2										

BOT. CAP ELEV. / CAP STEP ELEVATIONS

	BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
3	2	240.00	240.00	242.21	242.41	242.61	242.81	243.01	242.81	242.61	242.41	242.21	
3	3	241.00	241.00	243.21	243.41	243.61	243.81	244.01	243.81	243.61	243.41	243.21	
3	4	242.00	242.00	244.21	244.41	244.61	244.81	245.01	244.81	244.61	244.41	244.21	
3													
3													
3													

℄ BEAM DISTANCES AT ℄ BEARING (FT)

	BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
4	33.75	8.750	8.750	8.750	8.750	8.750	8.750	8.750	8.750	
4										
4										

BRIDGE END BENT GRAPHICS PROGRAM (BREBNT)

CAP DATA

			℄ BEAM ANGLES AT ℄ BEARING																														
		L R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
1		3	DEG	MIN	SEC 10	DEG	MIN	SEC 17	DEG	MIN	SEC 24	DEG	MIN	SEC 31	DEG	MIN	SEC 38	DEG	MIN	SEC 45	DEG	MIN	SEC 52	DEG	MIN	SEC 59	DEG	MIN	SEC 66	DEG	MIN	SEC 73
5	X	R	70	0	0																											
5	X																															
5	X																															

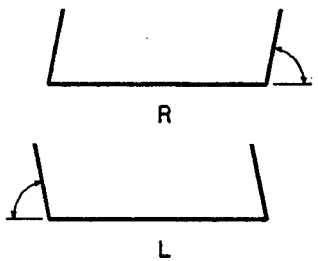
				BATTER PILE LOCATION DISTANCES (FT)					
		PILE 3	NS 6	PILE 1 11	PILE 2 16	PILE 3 21	PILE 4 26	PILE 5 31	PILE 6 36
6	X	X 6	X 5						

WINGWALL, BACKWALL, AND END POST DATA

					WINGWALL ANGLES								
		BACKWALL	END POST	WINGWALL	LEFT			RIGHT				WING PILE DISTANCE (FT)	
1		WIDTH (FT) 3 7	LENGTH (FT) 12	LENGTH (FT) 17	DEG	MIN	SEC 24	DEG	MIN	SEC 31	NP 33	PILE 2 38	PILE 3 43
7	X										X		

		TOP OF WINGWALL ELEVATION								
		LEFT WING		RIGHT WING		TOP OF BACKWALL ELEVATION			TOP OF END POST ELEV.	
1		F.F. CAP 3 8	END OF WING 14	F.F. CAP 20	END OF WING 26	LEFT 32	MID 38	RIGHT 44	LEFT 50	RIGHT 56
8	X									
8	X									

SKEW CODE L/R

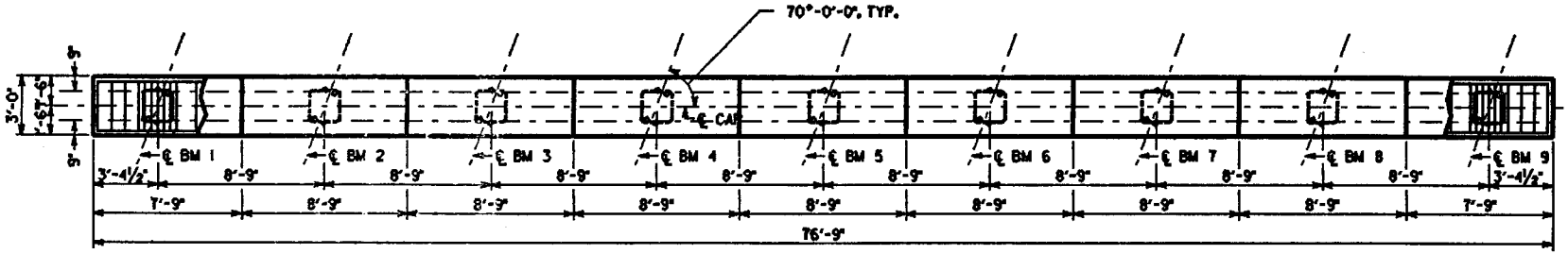


PILE - PILE TYPE OPTIONS

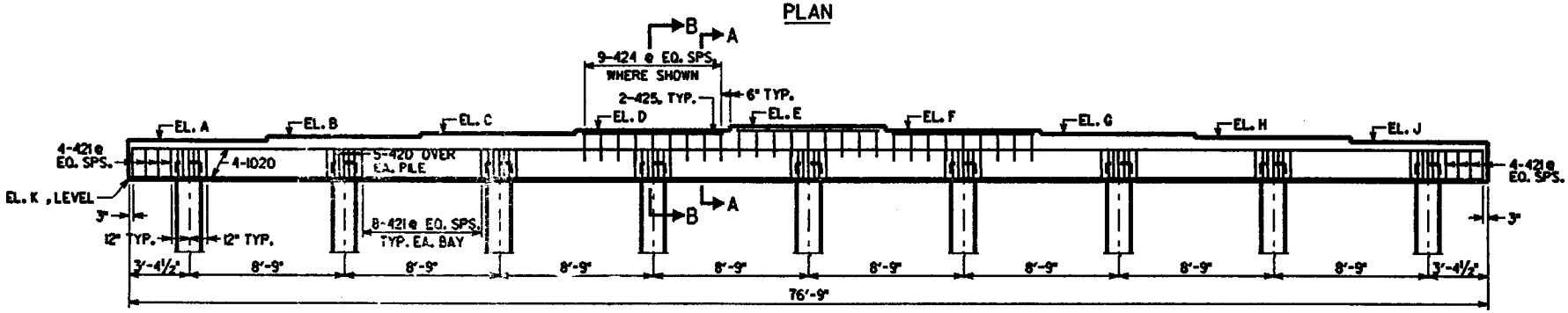
BLANK = NO PILES
1 = 10BP42
2 = 12BP53
3 = 14BP73
4 = 12 IN. SQ. PSC
5 = 14 IN. SQ. PSC
6 = 16 IN. SQ. PSC
7 = 14 IN. O.D. METAL SHELL
8 = 16 IN. O.D. METAL SHELL

TEXT SIZE IS 1/4 IN/FT

FORM 3" DIA. X 12" DEEP HOLE FOR ANCHOR BOLTS

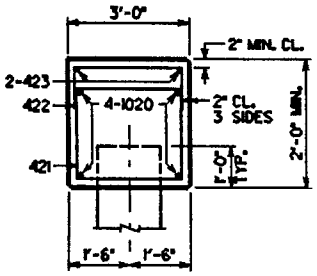


PLAN

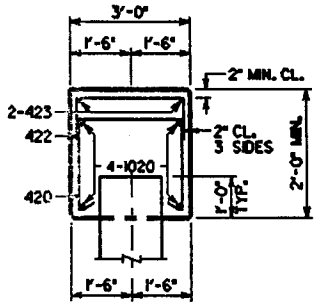


ELEVATION

BENT 2
(LOOKING AHEAD)



SECTION A-A



SECTION B-B

TABLE OF ELEVATIONS										
	A	B	C	D	E	F	G	H	J	K
BENT 2	242.21	242.41	242.61	242.81	243.01	242.81	242.61	242.41	242.21	240.00
BENT 3	243.21	243.41	243.61	243.81	244.01	243.81	243.61	243.41	243.21	241.00
BENT 4	244.21	244.41	244.61	244.81	245.01	244.81	244.61	244.41	244.21	242.00

SUBSTRUCTURE QUANTITIES			
ITEM	BENT 2	BENT 3	BENT 4
CU YD CLASS "A" CONCRETE	21.36	21.36	21.36
LB BAR REINFORCEMENT STEEL			

ALL PILES SHALL BE 16 IN. SQ. PSC

PLAN DRIVING OBJECTIVE

ALL PILES SHALL BE DRIVEN TO A DRIVING RESISTANCE OF XX TONS AFTER A MINIMUM TIP ELEVATION OF XX IS ACHIEVED.

EXAMPLE 5 - 9 STEPS, CROWN, INTERMEDIATE PILE BENT, CONSTANT ANGLE

CAP DATA

SCA	NB	LA	BRG	BRDIST (FT)	BCAP (FT)	DCAP (FT)	NSTEP	CORNER FILLET HDIST (FT)	CORNER FILLET VDIST (FT)
3	3	0	2	0.750	3.000	2.000	9	2.000	2.000

CAP STEP DISTANCES (FT)

CDIST 1	CDIST 2	CDIST 3	CDIST 4	CDIST 5	CDIST 6	CDIST 7	CDIST 8	CDIST9	CDIST 10
7.750	8.750	8.750	8.750	8.750	8.750	8.750	8.750	7.750	0.000

BN	BOT. CAP ELEV. LEFT	BOT. CAP ELEV. RIGHT	CAP STEP ELEVATIONS STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9	STEP 10
2	240.00	240.00	242.21	242.41	242.61	242.81	243.01	242.81	242.61	242.41	242.21	0.00
3	241.00	241.00	243.21	243.41	243.61	243.81	244.01	243.81	243.61	243.41	243.21	0.00
4	242.00	242.00	244.21	244.41	244.61	244.81	245.01	244.81	244.61	244.41	244.21	0.00

CENTER LINE BEAM DISTANCES AT CENTERLINE BEARING (FT)

BDIST 1	BDIST 2	BDIST 3	BDIST 4	BDIST 5	BDIST 6	BDIST 7	BDIST 8	BDIST 9	BDIST 10
3.375	8.750	8.750	8.750	8.750	8.750	8.750	8.750	8.750	0.000

CENTERLINE BEAM ANGLES AT CENTERLINE BEARING

R	BEAM 1			BEAM 2			BEAM 3			BEAM 4			BEAM 5			BEAM 6			BEAM 7			BEAM 8			BEAM 9			BEAM 10		
L	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC	DEG	MIN	SEC
R	70	0	0	70	0	0	70	0	0	70	0	0	70	0	0	70	0	0	70	0	0	70	0	0	70	0	0	0	0	0

BATTER PILE LOCATION DISTANCES (FT)

PILE	NS	PILE 1	PILE 2	PILE 3	PILE 4	PILE 5	PILE 6
6	5	0.000	0.000	0.000	0.000	0.000	0.000

WINGWALL ANGLES

BACKWALL WIDTH (FT)	END POST LENGTH (FT)	WINGWALL LENGTH (FT)	LEFT DEG	LEFT MIN	LEFT SEC	RIGHT DEG	RIGHT MIN	RIGHT SEC	NP	WING PILE DISTANCES PILE 2	WING PILE DISTANCES PILE 3
0.000	0.000	0.000	0	0	0	0	0	0	0	0.000	0.000

QUANTITIES FOR BENT NUMBER 2

CONCRETE QUANTITY IN CAP	=	21.96 CU YD
MINUS TOTAL PILE VOLUME	=	-0.59 CU YD
TOTAL CONCRETE QUANTITY IN BENT	=	21.36 CU YD

QUANTITIES FOR BENT NUMBER 3

CONCRETE QUANTITY IN CAP	=	21.96 CU YD
MINUS TOTAL PILE VOLUME	=	-0.59 CU YD
TOTAL CONCRETE QUANTITY IN BENT	=	21.36 CU YD

QUANTITIES FOR BENT NUMBER 4

CONCRETE QUANTITY IN CAP	=	21.96 CU YD
MINUS TOTAL PILE VOLUME	=	-0.59 CU YD
TOTAL CONCRETE QUANTITY IN BENT	=	21.36 CU YD

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*B06    1000 EXAMPLE 5 - 9 STEPS, CROWN, INTERMEDIATE PILE BENT, CONSTANT ANGLE
UBENT  2          11000
S 420        45      3255 2 8   1 8   1 8
S 421        72      2544 2 8   1 8
S 422        27       2   2 8   1 6   1 6
S 423   8 3   6       1
K 2
S1020  39 8   8       1
K 2
UBENT  3          11000
R 420        45
R 421        72
R 422        27
R 423         6
K 2
R1020         8
K 2
UBENT  4          11000
R 420        45
R 421        72
R 422        27
R 423         6
K 2
R1020         8
K 2
C 1020 BARS ARE LAPPED
Z
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