

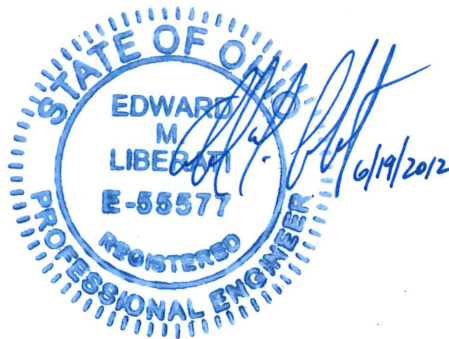
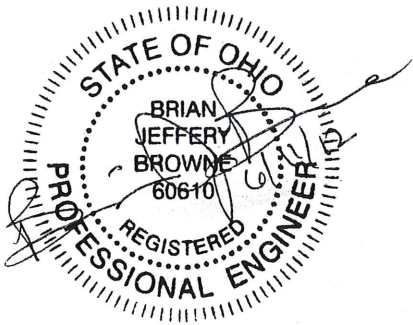
Proj 06-0468

ODOT 7-12
LAKE COUNTY

BRIDGE NO.
LAK-90-0377

SFN
4303636

MAPLE GROVE ROAD OVER I-90



Prepared By:

Checked By:

ERECTION PLAN AND CALCULATIONS

This plan was prepared in compliance with contract documents.

BY: Brian J. Browne, P.E.

DATE: June 11, 2012

**ODOT 7-12
BRIDGE NO. LAK-90-0377
LAKE COUNTY
ERECTION PLAN**

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ERECTION PLAN

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CALCULATIONS

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LAN - 90-0377

D LEWIS 6-10-12
✓

1) FWD PIECE WEIGHTS

FROM EXCEL SPREAD SHEETS

	<u>LENGTH</u>	<u>WEIGHT</u>
RA-FS1	82.3'	22,800 LB
FS1-FS2	100.7'	35,300 LB
FS2-FS3	116.13'	41,600 LB
FS3-FS4	109.2'	37,500 LB
FS4-FS5	122.6'	41,700 LB
FS5-FA	122.25'	41,500 LB

2) RIGGING WEIGHTS

CRANE BLOCK		1500 LB
BEAM CLAMP	2 @ 250 LB	500 LB
SPREADER (20')		1000 LB
CABLES		<u>500 LB</u>
		3500 LB USE <u>5000 LB</u> ✓

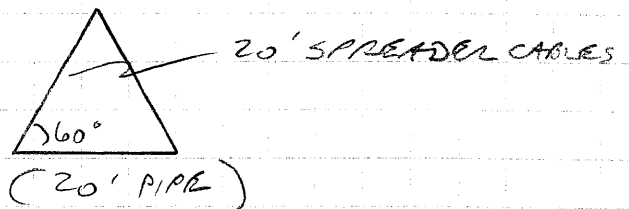
3) SIZE CABLES

WORST CASE 42"

$$42000 \text{ LB} / 2 = 21,000 \text{ LB} \checkmark$$

$$21,000 / \sin 60^\circ = 24,300 \text{ LB} \checkmark$$

∴ $1\frac{1}{4}$ " ϕ WIRE ROPE GOOD FOR 30000 LB > 24,300 LB OK ✓

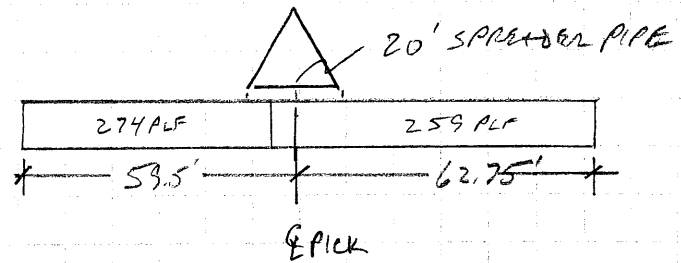


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4) CHECK STRESS IN GIRDER

$$\begin{aligned}M_{max} &= \frac{wL^2}{2} \\&= \frac{(259 \times 1.10)(62.25-10')^2}{2} \\&= \frac{(285 \text{ LB})(52.25')^2}{2} \\&= 389 \text{ ft-kip} \checkmark\end{aligned}$$



CHECK ALLOWABLE STRESS F_b AISC EQ F 1-8

$$F_b = \frac{12 \times 10^3 C_b}{l d / A_g} \leq .60 F_y$$

$$\begin{aligned}C_b &= 1.0 \\l &= 52.25' \times 12'' = 627'' \checkmark \\d &= 64'' \\A_g &= 18 \times 1'' = 18 \text{ in}^2 \checkmark\end{aligned}$$

$$= \frac{12000}{(627)(64) / 18} = 5.38 \text{ ksi} \checkmark$$

$$M_{allow} = S_x F_b = (1566) (5.38 \text{ ksi} / 12'') = 702 \text{ ft-kip} > 389 \text{ ft-kip}$$

∴ 20' SPREADER OK ✓

OK ✓
OK

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5) SIZE CRANE

<u>PICK</u>	<u>WEIGHT</u>	<u>RADIUS</u>	<u>GMK 5165 ALLOW</u>	
RA-FS1	22,800 LB	60'	42,200 LB	OK
FS1-FS2	35,300 LB	60'	42,200 LB	OK
FS2-FS3	41,600 LB	60'	42,200 LB	OK
FS3-FS4	37,500 LB	60'	42,200 LB	OK ✓
FS4-FS5	41,700 LB	60'	42,200 LB	OK
FS5-FA	41,500 LB	60'	42,200 LB	OK 2

GIRDER PICK WEIGHT CALCULATIONS
 SPREADSHEET CALCULATES CENTER OF GRAVITY OF COMPOSITE GIRDER SECTIONS
 MAXIMUM NUMBER OF SECTIONS IS 6

TOP FLANGE		WEB		BOTTOM FLANGE	
TOTAL LENGTH OF PIECE (FEET): 82.3					
SECTION 1					
WEIGHT:	2103.938	LENGTH:	2571.479	WEIGHT:	2103.938
STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0
FLANGE WIDTH (INCHES):	22.9	WEB HEIGHT (INCHES):	58886.87	FLANGE WIDTH (INCHES):	22.9
THICKNESS (INCHES):	1.125	THICKNESS (INCHES):	0.5	THICKNESS (INCHES):	1.125
SECTION 2					
WEIGHT:	510.4167	LENGTH:	1547.201	WEIGHT:	1148.438
STARTS AT (FEET) FROM LEFT:	45.8	STARTS AT (FEET) FROM LEFT:	45.8	STARTS AT (FEET) FROM LEFT:	45.8
FLANGE WIDTH (INCHES):	53.3	WEB HEIGHT (INCHES):	82465.79	FLANGE WIDTH (INCHES):	53.3
THICKNESS (INCHES):	1.250	THICKNESS (INCHES):	0.625	THICKNESS (INCHES):	1.25
SECTION 3					
WEIGHT:	1646.094	LENGTH:	2926.389	WEIGHT:	1646.094
STARTS AT (FEET) FROM LEFT:	60.8	STARTS AT (FEET) FROM LEFT:	60.8	STARTS AT (FEET) FROM LEFT:	60.8
FLANGE WIDTH (INCHES):	18	WEB HEIGHT (INCHES):	209383.1	FLANGE WIDTH (INCHES):	18
THICKNESS (INCHES):	1.25	THICKNESS (INCHES):	0.625	THICKNESS (INCHES):	1.25
SECTION 4					
WEIGHT:	0	LENGTH:	0	WEIGHT:	0
STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0
FLANGE WIDTH (INCHES):	0	WEB HEIGHT (INCHES):	0	FLANGE WIDTH (INCHES):	0
THICKNESS (INCHES):	0	THICKNESS (INCHES):	0	THICKNESS (INCHES):	0
SECTION 5					
WEIGHT:	0	LENGTH:	0	WEIGHT:	0
STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0
FLANGE WIDTH (INCHES):	0	WEB HEIGHT (INCHES):	0	FLANGE WIDTH (INCHES):	0
THICKNESS (INCHES):	0	THICKNESS (INCHES):	0	THICKNESS (INCHES):	0
SECTION 6					
WEIGHT:	0	LENGTH:	0	WEIGHT:	0
STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0	STARTS AT (FEET) FROM LEFT:	0
FLANGE WIDTH (INCHES):	0	WEB HEIGHT (INCHES):	0	FLANGE WIDTH (INCHES):	0
THICKNESS (INCHES):	0	THICKNESS (INCHES):	0	THICKNESS (INCHES):	0
TOP FLANGE TOTAL WEIGHT (LBS.): 4260.448					
SUMMARY TOP FLANGE MOMENTS: 193163.4					
TOTAL GIRDER WEIGHT: 16203.99					
DISTANCE FROM LT. TO C.G.: 47.58515					
ADD 10% MISCELLANEOUS					
ADD 5000LB SPREADER & RIGGING					
TOTAL PICK WEIGHT 22800					
WEB TOTAL WEIGHT (LBS.): 7045.069					
SUMMARY WEB MOMENTS: 350735.8					
BOTTOM FLANGE TOTAL WEIGHT (LBS.): 4898.469					
SUMMARY BOTTOM FLANGE MOMENTS: 227169.9					

GIRDER PICK WEIGHT CALCULATIONS
SPREADSHEET CALCULATES CENTER OF GRAVITY OF COMPOSITE GIRDER SECTIONS
MAXIMUM NUMBER OF SECTIONS IS 6

TOP FLANGE		WEB		BOTTOM FLANGE	
TOTAL LENGTH OF PIECE (FEET): 100.7		TOTAL LENGTH OF PIECE (FEET): 100.7		TOTAL LENGTH OF PIECE (FEET): 100.7	
SECTION 1	SECTION 1	SECTION 1	SECTION 1	SECTION 1	SECTION 1
LENGTH: 100.7	LENGTH: 13706.39	LENGTH: 13706.39	LENGTH: 13706.39	LENGTH: 100.7	LENGTH: 6938.859
STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0
FLANGE WIDTH (INCHES): 18	WEB HEIGHT (INCHES): 64	WEB HEIGHT (INCHES): 64	WEB HEIGHT (INCHES): 64	FLANGE WIDTH (INCHES): 18	FLANGE WIDTH (INCHES): 18
THICKNESS (INCHES): 1.125	THICKNESS (INCHES): 0.625	THICKNESS (INCHES): 0.625	THICKNESS (INCHES): 0.625	THICKNESS (INCHES): 1.125	THICKNESS (INCHES): 1.125
WEIGHT: 6938.859	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0
ARM: 50.35	ARM: 100.7	ARM: 100.7	ARM: 100.7	ARM: 50.35	ARM: 50.35
MOMENT: 349371.6	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 349371.6	MOMENT: 18
SECTION 2	SECTION 2	SECTION 2	SECTION 2	SECTION 2	SECTION 2
LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7
FLANGE WIDTH (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	FLANGE WIDTH (INCHES): 0	FLANGE WIDTH (INCHES): 0
THICKNESS (INCHES): 0.000	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0
WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0
ARM: 100.7	ARM: 100.7	ARM: 100.7	ARM: 100.7	ARM: 100.7	ARM: 100.7
MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0
SECTION 3	SECTION 3	SECTION 3	SECTION 3	SECTION 3	SECTION 3
LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7	STARTS AT (FEET) FROM LEFT: 100.7
FLANGE WIDTH (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	FLANGE WIDTH (INCHES): 0	FLANGE WIDTH (INCHES): 0
THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0
WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0
ARM: 100.7	ARM: 100.7	ARM: 100.7	ARM: 100.7	ARM: 100.7	ARM: 100.7
MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0
SECTION 4	SECTION 4	SECTION 4	SECTION 4	SECTION 4	SECTION 4
LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0
FLANGE WIDTH (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	FLANGE WIDTH (INCHES): 0	FLANGE WIDTH (INCHES): 0
THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0
WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0
ARM: 0	ARM: 0	ARM: 0	ARM: 0	ARM: 0	ARM: 0
MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0
SECTION 5	SECTION 5	SECTION 5	SECTION 5	SECTION 5	SECTION 5
LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0
FLANGE WIDTH (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	FLANGE WIDTH (INCHES): 0	FLANGE WIDTH (INCHES): 0
THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0
WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0
ARM: 0	ARM: 0	ARM: 0	ARM: 0	ARM: 0	ARM: 0
MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0
SECTION 6	SECTION 6	SECTION 6	SECTION 6	SECTION 6	SECTION 6
LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0	STARTS AT (FEET) FROM LEFT: 0
FLANGE WIDTH (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	WEB HEIGHT (INCHES): 0	FLANGE WIDTH (INCHES): 0	FLANGE WIDTH (INCHES): 0
THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0	THICKNESS (INCHES): 0
WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0	WEIGHT: 0
ARM: 0	ARM: 0	ARM: 0	ARM: 0	ARM: 0	ARM: 0
MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0	MOMENT: 0
TOP FLANGE TOTAL WEIGHT (LBS.): 6938.859		WEB TOTAL WEIGHT (LBS.): 13706.39		BOTTOM FLANGE TOTAL WEIGHT (LBS.): 6938.859	
SUMMARY TOP FLANGE MOMENTS: 349371.6		SUMMARY WEB MOMENTS: 690116.7		SUMMARY BOTTOM FLANGE MOMENTS: 349371.6	
TOTAL GIRDER WEIGHT: 27584.11		TOTAL GIRDER WEIGHT: 27584.11		TOTAL GIRDER WEIGHT: 27584.11	
DISTANCE FROM LT. TO C.G.: 50.35		DISTANCE FROM LT. TO C.G.: 50.35		DISTANCE FROM LT. TO C.G.: 50.35	
ADD 10% MISCELLANEOUS		ADD 10% MISCELLANEOUS		ADD 10% MISCELLANEOUS	
ADD 5000LB SPREADER & RIGGING		ADD 5000LB SPREADER & RIGGING		ADD 5000LB SPREADER & RIGGING	
TOTAL PICK WEIGHT		TOTAL PICK WEIGHT		TOTAL PICK WEIGHT	
35300		35300		35300	

GIRDER PICK WEIGHT CALCULATIONS
SPREADSHEET CALCULATES CENTER OF GRAVITY OF COMPOSITE GIRDER SECTIONS
MAXIMUM NUMBER OF SECTIONS IS 6

TOTAL LENGTH OF PIECE (FEET):		116.13		
TOP FLANGE				
SECTION 1	LENGTH:	69.58	WEIGHT:	5659.941
	STARTS AT (FEET) FROM LEFT:	0	ARM:	34.79
	FLANGE WIDTH (INCHES):	18	MOMENT:	203867.3
	THICKNESS (INCHES):	1.375		
SECTION 2	LENGTH:	46.55	WEIGHT:	2851.188
	STARTS AT (FEET) FROM LEFT:	69.58	ARM:	92.855
	FLANGE WIDTH (INCHES):	18	MOMENT:	264747
	THICKNESS (INCHES):	1		
SECTION 3	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	116.13	ARM:	116.13
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 4	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 5	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 6	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
TOP FLANGE TOTAL WEIGHT (LBS.):		8711.128		
SUMMARY TOP FLANGE MOMENTS:		468614.3		
WEB				
SECTION 1	LENGTH:	69.58	WEIGHT:	9470.611
	STARTS AT (FEET) FROM LEFT:	0	ARM:	34.79
	WEB HEIGHT (INCHES):	64	MOMENT:	329482.6
	THICKNESS (INCHES):	0.625		
SECTION 2	LENGTH:	46.55	WEIGHT:	6335.972
	STARTS AT (FEET) FROM LEFT:	69.58	ARM:	92.855
	WEB HEIGHT (INCHES):	64	MOMENT:	586326.7
	THICKNESS (INCHES):	0.625		
SECTION 3	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	116.13	ARM:	116.13
	WEB HEIGHT (INCHES):	64	MOMENT:	0
	THICKNESS (INCHES):	0.625		
SECTION 4	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	WEB HEIGHT (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 5	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	WEB HEIGHT (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 6	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	WEB HEIGHT (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
WEB TOTAL WEIGHT (LBS.):		15806.58		
SUMMARY WEB MOMENTS:		917809.3		
BOTTOM FLANGE				
SECTION 1	LENGTH:	69.58	WEIGHT:	5659.941
	STARTS AT (FEET) FROM LEFT:	0	ARM:	34.79
	FLANGE WIDTH (INCHES):	18	MOMENT:	203867.3
	THICKNESS (INCHES):	1.375		
SECTION 2	LENGTH:	46.55	WEIGHT:	2851.188
	STARTS AT (FEET) FROM LEFT:	69.58	ARM:	92.855
	FLANGE WIDTH (INCHES):	18	MOMENT:	264747
	THICKNESS (INCHES):	1		
SECTION 3	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	116.13	ARM:	116.13
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 4	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 5	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
SECTION 6	LENGTH:	0	WEIGHT:	0
	STARTS AT (FEET) FROM LEFT:	0	ARM:	0
	FLANGE WIDTH (INCHES):	0	MOMENT:	0
	THICKNESS (INCHES):	0		
BOTTOM FLANGE TOTAL WEIGHT (LBS.):		8711.128		
SUMMARY BOTTOM FLANGE MOMENTS:		468614.3		
TOTAL GIRDER WEIGHT: 33228.84				
DISTANCE FROM LT. TO C.G.: 55.82614				
ADD 10% MISCELLANEOUS				
ADD 5000LB SPREADER & RIGGING				
TOTAL PICK WEIGHT				41600

GIRDER PICK WEIGHT CALCULATIONS
SPREADSHEET CALCULATES CENTER OF GRAVITY OF COMPOSITE GIRDER SECTIONS
MAXIMUM NUMBER OF SECTIONS IS 6

TOTAL LENGTH OF PIECE (FEET):		109.2					
TOP FLANGE		WEB		BOTTOM FLANGE			
SECTION 1	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	3368.75 0 22 74112.5	WEIGHT: ARM: MOMENT:	3368.75 0 22 74112.5	44 0 18 1,250	WEIGHT: ARM: MOMENT:	
SECTION 2	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	3993.5 44 76.6 305902.1	WEIGHT: ARM: MOMENT:	3993.5 44 76.6 305902.1	65.2 44 18 1	WEIGHT: ARM: MOMENT:	
SECTION 3	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	0 109.2 0 0	WEIGHT: ARM: MOMENT:	0 109.2 0 0	0 109.2 0 0	WEIGHT: ARM: MOMENT:	
SECTION 4	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	0 0 0 0	WEIGHT: ARM: MOMENT:	0 0 0 0	0 0 0 0	WEIGHT: ARM: MOMENT:	
SECTION 5	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	0 0 0 0	WEIGHT: ARM: MOMENT:	0 0 0 0	0 0 0 0	WEIGHT: ARM: MOMENT:	
SECTION 6	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	0 0 0 0	WEIGHT: ARM: MOMENT:	0 0 0 0	0 0 0 0	WEIGHT: ARM: MOMENT:	
TOP FLANGE TOTAL WEIGHT (LBS.):		7362.25		BOTTOM FLANGE TOTAL WEIGHT (LBS.):		7362.25	
SUMMARY TOP FLANGE MOMENTS:		380014.6		SUMMARY WEB MOMENTS:		380014.6	

TOTAL GIRDER WEIGHT: 29587.83
DISTANCE FROM LT. TO C.G.: 53.11532
ADD 10% MISCELLANEOUS
ADD 5000LB SPREADER & RIGGING
TOTAL PICK WEIGHT 37500

GIRDER PICK WEIGHT CALCULATIONS
SPREADSHEET CALCULATES CENTER OF GRAVITY OF COMPOSITE GIRDER SECTIONS
MAXIMUM NUMBER OF SECTIONS IS 6

TOTAL LENGTH OF PIECE (FEET):		122.6	
TOP FLANGE			
SECTION 1	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 4065.469 ARM: 26.55 MOMENT: 107938.2	53.1 WEIGHT: 4065.469 0 ARM: 26.55 18 MOMENT: 107938.2 1.25
SECTION 2	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 4256.875 ARM: 87.85 MOMENT: 373966.5	69.5 WEIGHT: 4256.875 53.1 ARM: 87.85 18 MOMENT: 373966.5 1
SECTION 3	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 122.6 MOMENT: 0	0 WEIGHT: 0 0 ARM: 122.6 0 MOMENT: 0
SECTION 4	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 5	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 6	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
TOTAL GIRDER WEIGHT:		33331.91	
DISTANCE FROM LT. TO C.G.:		59.60463	
ADD 10% MISCELLANEOUS		36700	
ADD 5000LB SPREADER & RIGGING		5000	
TOTAL PICK WEIGHT		41700	

TOP FLANGE TOTAL WEIGHT (LBS.):		8322.344	
SUMMARY TOP FLANGE MOMENTS:		481904.7	
WEB			
SECTION 1	LENGTH: STARTS AT (FEET) FROM LEFT: WEB HEIGHT (INCHES): THICKNESS (INCHES):	WEIGHT: 7227.5 ARM: 26.55 MOMENT: 191890.1	53.1 WEIGHT: 7227.5 0 ARM: 26.55 64 MOMENT: 191890.1 0.625
SECTION 2	LENGTH: STARTS AT (FEET) FROM LEFT: WEB HEIGHT (INCHES): THICKNESS (INCHES):	WEIGHT: 9459.722 ARM: 87.85 MOMENT: 831036.6	69.5 WEIGHT: 9459.722 53.1 ARM: 87.85 64 MOMENT: 831036.6 0.625
SECTION 3	LENGTH: STARTS AT (FEET) FROM LEFT: WEB HEIGHT (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 122.6 MOMENT: 0	0 WEIGHT: 0 122.6 ARM: 122.6 64 MOMENT: 0 0.625
SECTION 4	LENGTH: STARTS AT (FEET) FROM LEFT: WEB HEIGHT (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 5	LENGTH: STARTS AT (FEET) FROM LEFT: WEB HEIGHT (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 6	LENGTH: STARTS AT (FEET) FROM LEFT: WEB HEIGHT (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
WEB TOTAL WEIGHT (LBS.):		16687.22	
SUMMARY WEB MOMENTS:		1022927	
BOTTOM FLANGE			
SECTION 1	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 122.6 MOMENT: 0	0 WEIGHT: 0 0 ARM: 122.6 0 MOMENT: 0
SECTION 2	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 3	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 4	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 5	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
SECTION 6	LENGTH: STARTS AT (FEET) FROM LEFT: FLANGE WIDTH (INCHES): THICKNESS (INCHES):	WEIGHT: 0 ARM: 0 MOMENT: 0	0 WEIGHT: 0 0 ARM: 0 0 MOMENT: 0
BOTTOM FLANGE TOTAL WEIGHT (LBS.):		8322.344	
SUMMARY BOTTOM FLANGE MOMENTS:		481904.7	

GIRDER PICK WEIGHT CALCULATIONS
 SPREADSHEET CALCULATES CENTER OF GRAVITY OF COMPOSITE GIRDER SECTIONS
 MAXIMUM NUMBER OF SECTIONS IS 6

TOP FLANGE		WEB		BOTTOM FLANGE	
TOTAL LENGTH OF PIECE (FEET): 122.25					
SECTION 1	LENGTH: 52.25	SECTION 1	LENGTH: 7111.806	SECTION 1	LENGTH: 4000.391
STARTS AT (FEET) FROM LEFT: 0	ARM: 26.125	STARTS AT (FEET) FROM LEFT: 0	ARM: 26.125	STARTS AT (FEET) FROM LEFT: 0	ARM: 26.125
FLANGE WIDTH (INCHES): 18	MOMENT: 103674.1	WEB HEIGHT (INCHES): 64	MOMENT: 185795.9	FLANGE WIDTH (INCHES): 18	MOMENT: 104510.2
THICKNESS (INCHES): 1.24		THICKNESS (INCHES): 0.625		THICKNESS (INCHES): 1.25	
SECTION 2	LENGTH: 70	SECTION 2	LENGTH: 9527.778	SECTION 2	LENGTH: 4287.5
STARTS AT (FEET) FROM LEFT: 52.25	ARM: 87.25	STARTS AT (FEET) FROM LEFT: 0	ARM: 87.25	STARTS AT (FEET) FROM LEFT: 0	ARM: 87.25
FLANGE WIDTH (INCHES): 18	MOMENT: 374084.4	WEB HEIGHT (INCHES): 64	MOMENT: 831298.6	FLANGE WIDTH (INCHES): 18	MOMENT: 374084.4
THICKNESS (INCHES): 1		THICKNESS (INCHES): 0.625		THICKNESS (INCHES): 1	
SECTION 3	LENGTH: 0	SECTION 3	LENGTH: 0	SECTION 3	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 122.25	ARM: 122.25	STARTS AT (FEET) FROM LEFT: 0	ARM: 122.25	STARTS AT (FEET) FROM LEFT: 0	ARM: 122.25
FLANGE WIDTH (INCHES): 0	MOMENT: 0	WEB HEIGHT (INCHES): 64	MOMENT: 0	FLANGE WIDTH (INCHES): 0	MOMENT: 0
THICKNESS (INCHES): 0		THICKNESS (INCHES): 0.625		THICKNESS (INCHES): 0	
SECTION 4	LENGTH: 0	SECTION 4	LENGTH: 0	SECTION 4	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 0	ARM: 0	STARTS AT (FEET) FROM LEFT: 0	ARM: 0	STARTS AT (FEET) FROM LEFT: 0	ARM: 0
FLANGE WIDTH (INCHES): 0	MOMENT: 0	WEB HEIGHT (INCHES): 0	MOMENT: 0	FLANGE WIDTH (INCHES): 0	MOMENT: 0
THICKNESS (INCHES): 0		THICKNESS (INCHES): 0		THICKNESS (INCHES): 0	
SECTION 5	LENGTH: 0	SECTION 5	LENGTH: 0	SECTION 5	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 0	ARM: 0	STARTS AT (FEET) FROM LEFT: 0	ARM: 0	STARTS AT (FEET) FROM LEFT: 0	ARM: 0
FLANGE WIDTH (INCHES): 0	MOMENT: 0	WEB HEIGHT (INCHES): 0	MOMENT: 0	FLANGE WIDTH (INCHES): 0	MOMENT: 0
THICKNESS (INCHES): 0		THICKNESS (INCHES): 0		THICKNESS (INCHES): 0	
SECTION 6	LENGTH: 0	SECTION 6	LENGTH: 0	SECTION 6	LENGTH: 0
STARTS AT (FEET) FROM LEFT: 0	ARM: 0	STARTS AT (FEET) FROM LEFT: 0	ARM: 0	STARTS AT (FEET) FROM LEFT: 0	ARM: 0
FLANGE WIDTH (INCHES): 0	MOMENT: 0	WEB HEIGHT (INCHES): 0	MOMENT: 0	FLANGE WIDTH (INCHES): 0	MOMENT: 0
THICKNESS (INCHES): 0		THICKNESS (INCHES): 0		THICKNESS (INCHES): 0	

TOP FLANGE TOTAL WEIGHT (LBS.): 8255.888
 SUMMARY TOP FLANGE MOMENTS: 477758.5

WEB TOTAL WEIGHT (LBS.): 16639.58
 SUMMARY WEB MOMENTS: 1017095

BOTTOM FLANGE TOTAL WEIGHT (LBS.): 8287.891
 SUMMARY BOTTOM FLANGE MOMENTS: 478694.6

TOTAL GIRDER WEIGHT: 33183.36
 DISTANCE FROM L.T. TO C.G.: 59.471

ADD 10% MISCELLANEOUS
 ADD 5000LB SPREADER & RIGGING

TOTAL PICK WEIGHT 41500

**COMPOSITE BEAM ANALYSIS
STANDARD BEAM SECTIONS WITH COVERPLATES**

STEEL = **A36** 50 Fy (ksi) = **50.00**
Fb (ksi) = **27.50**

ALLOWABLE OVERSTRESS = **1**
DESIGN ALLOWABLE STRESS = **27.50 ksi**

BEAM INFO

BEAM SIZE	AREA (in2)	DEPTH (in)	Ixx(in4)
GIRDER	40.00	64.00	13,653

0.625 WEB THK(in)

TOP COVER PLATE

BOTTOM COVERPLATE

WIDTH (in)	THICKNESS (in)	WIDTH (in)	THICKNESS (in)
18.0000	1.0000	18.0000	1.0000

SECTION	AREA (in2)	y (in)	yA (in2)
GIRDER	40.00	0.00	0.00
TOP PLATE	18.00	32.50	585.00
BOTT PLATE	18.00	-32.50	-585.00
SUMMARY =	76.00		0.00

DISTANCE (Y) FROM CENTROID OF BEAM TO CENTROID OF COMPOSITE SECTION =
yA/AREA = **0.00** (POSITIVE NUMBER IS UP, NEGATIVE DOWN)

SECTION PROPERTIES

SECTION	Ixx (in4)
GIRDER	13653
TOP PLATE	19014
BOTT PLATE	19014
51681 = Ixx COMPOSITE SECTION	

Sxx TOP **1566** USE FOR NEGATIVE MOMENT REGIONS
Sxx BOTTOM **1566** USE FOR POSITIVE MOMENT REGIONS

MAXIMUM ALLOWABLE NEGATIVE MOMENT = 3589 kip-feet
MAXIMUM ALLOWABLE POSITIVE MOMENT = 3589 kip-feet

COMPOSITE SECTION WEIGHT PER FOOT = 259 pounds

**COMPOSITE BEAM ANALYSIS
STANDARD BEAM SECTIONS WITH COVERPLATES**

STEEL = **A36** 50 Fy (ksi) = **50.00**
Fb (ksi) = **27.50**

ALLOWABLE OVERSTRESS = **1**
DESIGN ALLOWABLE STRESS = **27.50 ksi**

BEAM INFO

BEAM SIZE	AREA (in2)	DEPTH (in)	Ixx(in4)
GIRDER	40.00	64.00	13,653
0.625 WEB THK(in)			

TOP COVER PLATE		BOTTOM COVERPLATE	
WIDTH (in)	THICKNESS (in)	WIDTH (in)	THICKNESS (in)
18.0000	1.1250	18.0000	1.1250

SECTION	AREA (in2)	y (in)	yA (in2)
GIRDER	40.00	0.00	0.00
TOP PLATE	20.25	32.56	659.39
BOTT PLATE	20.25	-32.56	-659.39
SUMMARY =	80.50		0.00

DISTANCE (Y) FROM CENTROID OF BEAM TO CENTROID OF COMPOSITE SECTION =
yA/AREA = **0.00 (POSITIVE NUMBER IS UP, NEGATIVE DOWN)**

SECTION PROPERTIES

SECTION	Ixx (in4)
GIRDER	13653
TOP PLATE	21474
BOTT PLATE	21474
56600 = Ixx COMPOSITE SECTION	

Sxx TOP **1709** USE FOR NEGATIVE MOMENT REGIONS
Sxx BOTTOM **1709** USE FOR POSITIVE MOMENT REGIONS

MAXIMUM ALLOWABLE NEGATIVE MOMENT = 3916 kip-feet
MAXIMUM ALLOWABLE POSITIVE MOMENT = 3916 kip-feet

COMPOSITE SECTION WEIGHT PER FOOT = 274 pounds

**COMPOSITE BEAM ANALYSIS
STANDARD BEAM SECTIONS WITH COVERPLATES**

STEEL = 50 Fy (ksi) = 50.00
Fb (ksi) = 27.50

ALLOWABLE OVERSTRESS = 1
DESIGN ALLOWABLE STRESS = 27.50 ksi

BEAM INFO

BEAM SIZE	AREA (in2)	DEPTH (in)	Ixx(in4)
GIRDER	40.00	64.00	13,653

0.625 WEB THK(in)

TOP COVER PLATE

BOTTOM COVERPLATE

WIDTH (in)	THICKNESS (in)	WIDTH (in)	THICKNESS (in)
18.0000	1.3750	18.0000	1.3750

SECTION	AREA (in2)	y (in)	yA (in2)
GIRDER	40.00	0.00	0.00
TOP PLATE	24.75	32.69	809.02
BOTT PLATE	24.75	-32.69	-809.02
SUMMARY =	89.50		0.00

DISTANCE (Y) FROM CENTROID OF BEAM TO CENTROID OF COMPOSITE SECTION =
yA/AREA = 0.00 (POSITIVE NUMBER IS UP, NEGATIVE DOWN)

SECTION PROPERTIES

SECTION	Ixx (in4)
GIRDER	13653
TOP PLATE	26449
BOTT PLATE	26449
<hr/>	
	66551 = Ixx COMPOSITE SECTION

Sxx TOP 1994 USE FOR NEGATIVE MOMENT REGIONS
Sxx BOTTOM 1994 USE FOR POSITIVE MOMENT REGIONS

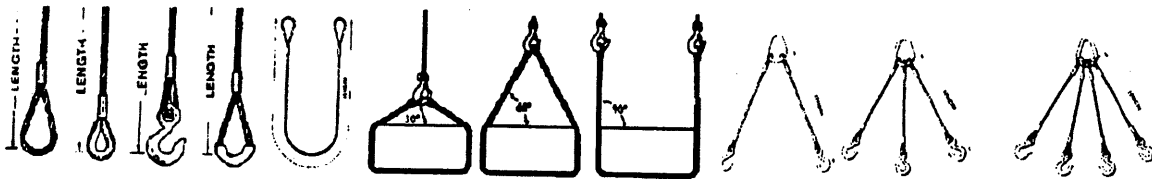
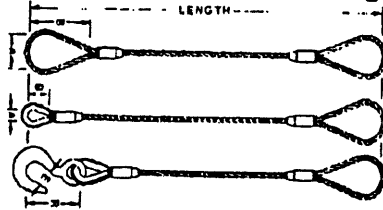
MAXIMUM ALLOWABLE NEGATIVE MOMENT = 4570 kip-feet
MAXIMUM ALLOWABLE POSITIVE MOMENT = 4570 kip-feet

COMPOSITE SECTION WEIGHT PER FOOT = 305 pounds

STANDARD MECHANICAL SPLICED SLINGS

The mechanical splice has a higher rated capacity than a hand splice. It can be furnished with thimbles and various types of fittings for use as a choker or erector sling.

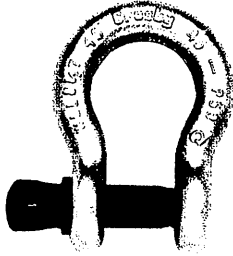
Single Part Body Mechanical Splice Slings



Rope Diameter (in.)	Loop Size (in.)	SINGLE LEG RATED CAPACITY (Tons)			TWO LEG RATED CAPACITY (Tons)			THREE LEG RATED CAPACITY (Tons)			FOUR LEG RATED CAPACITY (Tons)		
		Gold Circle Supreme (EIPS) IWRC			Gold Circle Supreme (EIPS) IWRC			Gold Circle Supreme (EIPS) IWRC			Gold Circle Supreme (EIPS) IWRC		
		Vertical	Choker	*Basket	15°	30°	45°	15°	30°	45°	15°	30°	45°
1/4	2x4	.65	.48	1.3	1.3	1.1	.92	1.9	1.7	1.4	2.5	2.3	1.8
5/16	2.5x5	1.0	.74	2.0	1.9	1.7	1.4	2.9	2.6	2.1	3.9	3.5	2.8
3/8	3x6	1.4	1.1	2.8	2.7	2.4	2.0	4.1	3.6	3.0	5.4	4.8	4.0
7/16	3.5x7	1.9	1.4	3.8	3.7	3.3	2.7	5.5	4.9	4.0	7.3	6.6	5.4
1/2	4x8	2.5	1.9	5.0	4.8	4.3	3.5	7.2	6.5	5.3	9.7	8.7	7.1
9/16	4.5x9	3.2	2.4	6.4	6.2	5.5	4.5	9.3	8.3	6.8	12.	11.	9.0
5/8	5x10	3.9	2.9	7.8	7.5	6.8	5.5	11.	10.	8.3	15.	14.	11.
3/4	6x12	5.6	4.1	11.	11.	9.7	7.9	16.	15.	12.	22.	19.	16.
7/8	7x14	7.6	5.6	15.	15.	13.	11.	22.	20.	16.	29.	26.	21.
1	8x16	9.8	7.2	20.	19.	17.	14.	28.	25.	21.	38.	34.	28.
1 1/8	9x18	12.	9.1	24.	23.	21.	17.	35.	31.	25.	46.	42.	34.
1 1/4	10x20	15.	11.	30.	29.	26.	21.	43.	39.	32.	58.	52.	42.
1 3/8	11x22	18.	13.	36.	35.	31.	25.	52.	47.	38.	70.	62.	51.
1 1/2	12x24	21.	16.	42.	41.	36.	30.	61.	55.	45.	81.	73.	59.
1 3/4	14x28	28.	21.	56.	54.	48.	40.	81.	73.	59.	108.	97.	79.
2	16x32	36.	28.	72.	70.	62.	51.	104.	94.	76.	139.	125.	102.
2 1/4	18x36	44.	35.	88.	85.	76.	62.	128.	114.	93.	170.	152.	124.
2 1/2	20x40	54.	42.	108.	104.	94.	76.	156.	140.	115.	209.	187.	153.
2 3/4	22x44	65.	51.	130.	126.	113.	92.						
3	24x28	77.	60.	154.	149.	133.	109.						

CAPACITIES SHOW EXTRA IMPROVED PLOW STEEL WIRE ROPE (EIPS).

SCREW PIN



G-209 S-209

Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 2, except for those provisions required of the contractor.

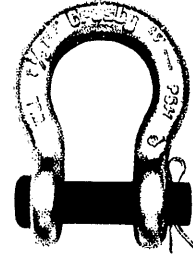
ANCHOR SHACKLES

Working Load Limit permanently shown on every shackle.

Forged, Quenched and Tempered, with alloy pins. Capacities 1/3 thru 150 tons. Shackles can be furnished proof tested with certificates to designated standards (i.e., ABS, Loyds, etc.).

Charges for proof testing and certification available upon request

ROUND PIN



G-213 S-213

Round pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 1, except for those provisions required of the contractor.

Working Load Limit (tons)	Nominal Shackle Size (in)	DIMENSIONS (in)							Weight (lbs)	
		Inside Length	Inside Width		Diameter		Tolerance Plus or Minus			
			at Pin	at Bow	Pin	Outside of Eye	Length	Width	213	209
† 1/2	3/16	7/8	3/8	1 1/16	1/4	9/16	1/16	1/16	—	.05
1/2	1/4	1 1/8	1/2	2 3/32	5/16	1 1/16	1/16	1/16	.13	.12
3/4	5/16	1 7/32	17/32	27/32	3/8	1 3/16	1/16	1/16	.17	.19
1	3/8	1 7/16	2 1/32	1 1/32	7/16	3 1/32	1/8	1/16	.25	.31
1 1/2	7/16	1 11/16	2 3/32	1 5/32	1/2	1 1/16	1/8	1/16	.38	.38
2	1/2	1 7/8	1 3/8	1 5/16	5/8	1 3/16	1/8	1/16	.70	.63
3 1/4	5/8	2 3/8	1 1/16	1 11/16	3/4	1 7/16	1/8	1/16	1.50	1.38
4 3/4	3/4	2 13/16	1 1/4	2	7/8	1 7/8	1/4	1/16	2.32	2.25
6 1/2	7/8	3 5/16	1 7/16	2 3/32	1	2 1/8	1/4	1/16	3.40	3.38
8 1/2	1	3 3/4	1 11/16	2 11/16	1 1/8	2 3/8	1/4	1/16	5.00	5.32
9 1/2	1 1/8	4 1/4	1 13/16	2 29/32	1 1/4	2 5/8	1/4	1/16	6.97	6.81
12	1 1/4	4 11/16	2 1/32	3 1/4	1 3/8	3	1/4	1/16	9.75	9.50
13 1/2	1 3/8	5 5/16	2 1/4	3 1/2	1 1/2	3 5/16	1/4	1/8	13.25	13.25
17	1 1/2	5 3/4	2 3/8	3 3/8	1 3/4	3 3/8	1/4	1/8	17.25	17.70
25	1 3/4	7	2 7/8	5	2	4 1/8	1/4	1/8	29.46	30.38
35	2	7 3/4	3 3/4	5 3/4	2 1/4	5	1/2	1/8	45.75	45.00
†55	2 1/2	10 1/2	4 3/8	7 1/4	2 3/4	6	1/2	1/4	—	85.75

†Furnished in screw pin only.

Samsel P/N				
Size	Round Pin Anchor		Screw Pin Anchor	
	Galvanized	Steel	Galvanized	Steel
1/3T		---	ASH 001	---
1/2 T	ASH 006	ASH 016	ASH 011	ASH 021
3/4 T	ASH 026	ASH 036	ASH 031	ASH 041
1 T	ASH 046	ASH 056	ASH 051	ASH 061
1.5 T	ASH 066	---	ASH 071	ASH 081
2 T	ASH 091	ASH 106	ASH 096	ASH 111
3.25 T	ASH 121	ASH 136	ASH 126	ASH 141
4.75 T	ASH 156	ASH 166	ASH 161	ASH 171
6.5 T	ASH 181		ASH 186	ASH 201
8.5 T	ASH 211	ASH 226	ASH 216	ASH 231
9.5 T	ASH 241	ASH 256	ASH 246	ASH 261
12 T	ASH 243	---	ASH 276	ASH 291
13.5 T			ASH 311	ASH 321
17 T	ASH 336	ASH 351	ASH 341	ASH 356
25 T	---	---	ASH 371	ASH 386
35 T	---	---	ASH 445	ASH 446
55 T	---	---	---	ASH 456

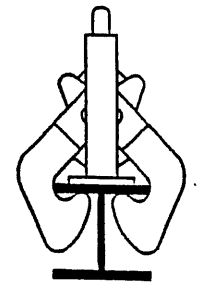
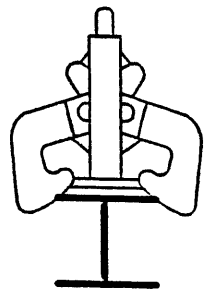
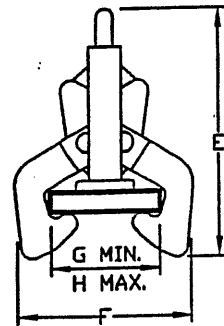
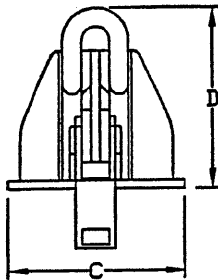
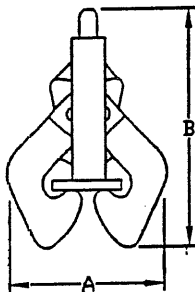
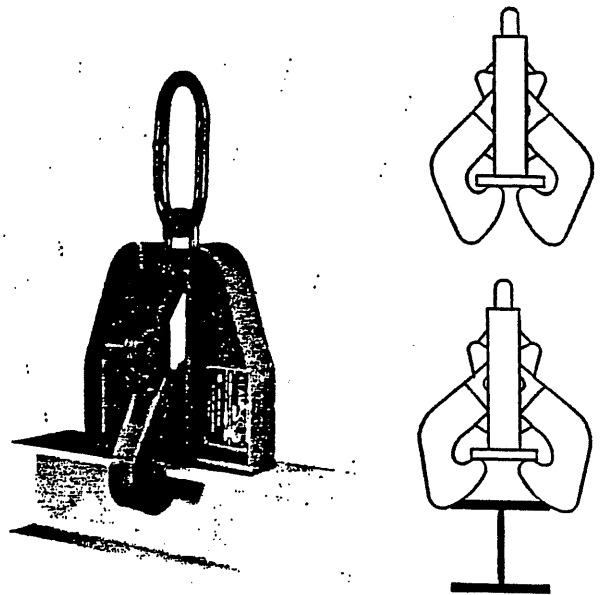
BEAM CLAMPS

Beam clamps provide an effective method for handling wide flange beam sections and plate girders. When lifting, they grip the beam at three points. When properly balanced and safely guided, the beam can be handled even if the clamp is slightly off center lengthwise.

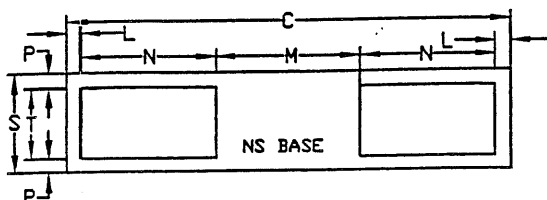
Good safety procedures providing control of the lifted beam must be used. Beams should be gripped as near to the center as possible. Snubbing lines at each end must be used to control excessive twisting and swinging, and to guide the beam to its proper place. Each lifting situation may have specific safety demands which should be used as required.

Beam clamps eliminate the need for slings, chokers, and spreader bars. The weight of the beam clamp automatically opens its tongs, which slide under the flanges of the beam. When the clamp is lifting, its center plate and gripping tongs work against each other - the heavier the beam, the greater the clamping pressure.

Model 'NS' clamps have a recessed base to accept studs welded to a beam surface.



Model No.	Working Load Limit Tons	Flang Grip		Wt. Lbs.	Dimensions								
		Width Range Mr. Max.	Depth		A	B	C	D	E	F	G	H	J
F-5	5	4to10	1	51	9 1/2	26	12	20	25 1/2	16 3/4	4	10	1
F-15	15	7to17	2	125	15 1/2	34	17	27	34 1/2	25	7	17	2
NS-15	15	7to17	2	120	16 1/2	34	17	27	34 1/2	25	7	17	2
F-25	25	16to24	3	244	23	48	22 1/4	36	53	37 1/4	16	24	3
NS-25	25	16to24	3	234	23	48	22 1/4	36	53	37 1/4	16	24	3
F-35	35	16to36	4	495	30	64	27 1/2	48	58	53	16	36	4
NS-35	35	16to36	4	484	30	64	27 1/2	48	58	53	16	36	4



Model Number	NS Base Dimensions, Inches						
	S	C	N	T	M	L	P
NS-15	4	16 1/2	4 1/2	2 1/2	6 1/2	1/2	3/4
NS-25	5 1/2	22 1/4	6 1/2	4	7 3/4	3/4	3/4
NS-35	6	27 1/2	8 1/2	4 1/2	9	3/4	3/4

WARNING: Decreasing the load by bumping or substantial imbalance can, under certain circumstances, loosen the grip. Do not use on flange widths less than those specified on the name plate. Do not exceed working load limit.

50 South Fourth Street • P.O. Box 577

Newark, Ohio 43058-0577 • (740) 345-4503

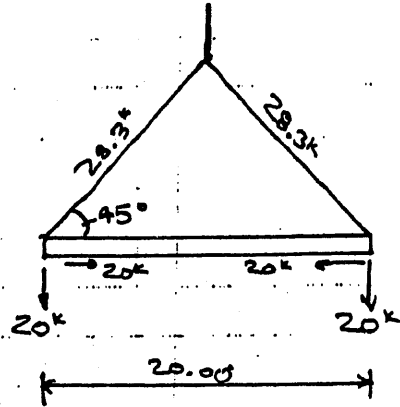
3227 Wick
 Oregon, Ohio 43616
 (419) 656-5241

SHEET NO. _____ OF _____
 CALCULATED BY BJS DATE 2/10/99
 CHECKED BY _____ DATE _____
 SCALE _____

SPREADER BEAM

- WANT 20 TON (90k) CAPACITY
- MIN. SPREADER $\alpha = 45^\circ$

$K = 1.0$ (PIN-PIN)
 $L = 20'$



1) STD. STEEL PIPE (AISC 3-36)

$L = 20' = 67k$ A36 STEEL, 18.97#/FT, 36k Steel

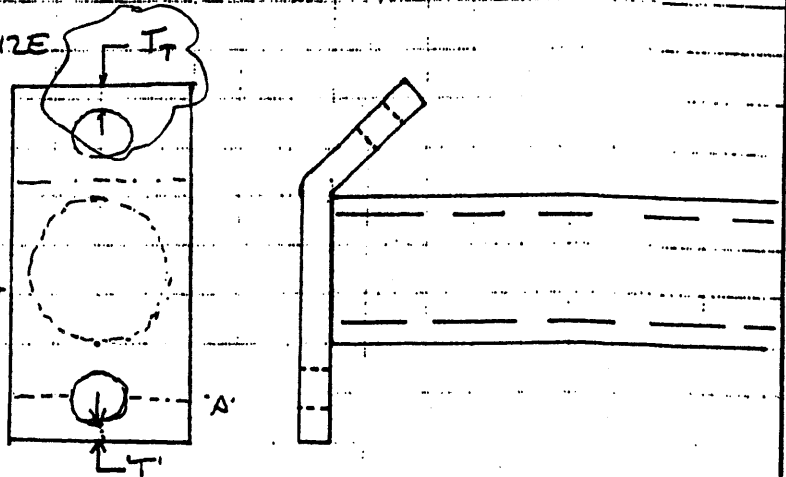
TOTAL WT = $20' \times 18.97 \text{#/ft} = 380 \text{LBS.}$

2) DESIGN END PLATES & WELD SIZE

a) FIND 'T' - MIN. REQ. DIST.

2 TYPES OF FAILURE MAY OCCUR

- 1) SHEAR AT 'T'
- 2) TENSION TEAR AT 'A-A'



$$T_h = F_y A_g$$

$$T_n = F_u A_n$$

USE 2" DIA HOLE
 ASSUME 3/4" TH. PL.

$$f_u = \frac{T}{A_g} = \frac{20k}{.75T} \leq .60F_u = .6(36) = 21.6 \text{ksi}$$

$$(21.6)(.75T) = 20k$$

$$T = 1.24" \text{ (MIN)} \quad \underline{\underline{\text{USE } 2"}}$$

3) Should be no load on weld, USE 3/16 all around E7018 Electrode

SPREADER BEAM

2A) CHECK REQ'D EDGE DISTANCE FOR HOLE IN TOP OF END PLATE

CHECK SHEAR AT T_f

$$f_u = \frac{T}{A_g} = \frac{28.3k}{.75(T_f)} \leq .60F_u = .6(36) = 21.6 \text{ ksi}$$

$$(21.6)(.75T_f) = 28.3k$$

$$T_f = 1.75" \quad \text{USE } \underline{\underline{2" \text{ OK}}}$$

BRIAN J. BROWNE, P.E.

3227 Wick

Oregon, Ohio 43616

(419) 656-5241

JOB _____

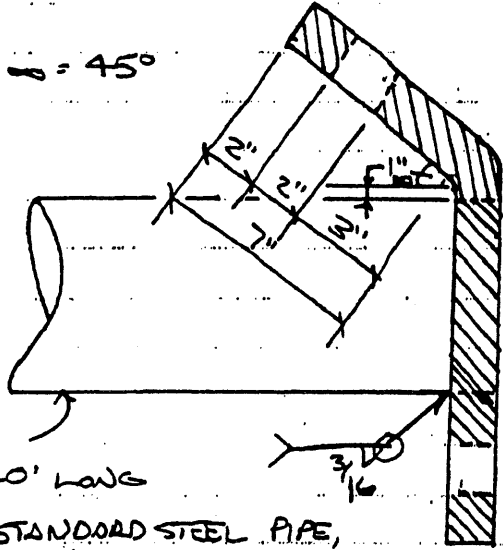
SHEET NO. 1 OF 1

CALCULATED BY BJB DATE 2/10/99

CHECKED BY _____ DATE _____

SCALE _____

$\theta = 45^\circ$



20' LONG

STANDARD STEEL PIPE,
6" DIA.

A36 STEEL SECTION A-A

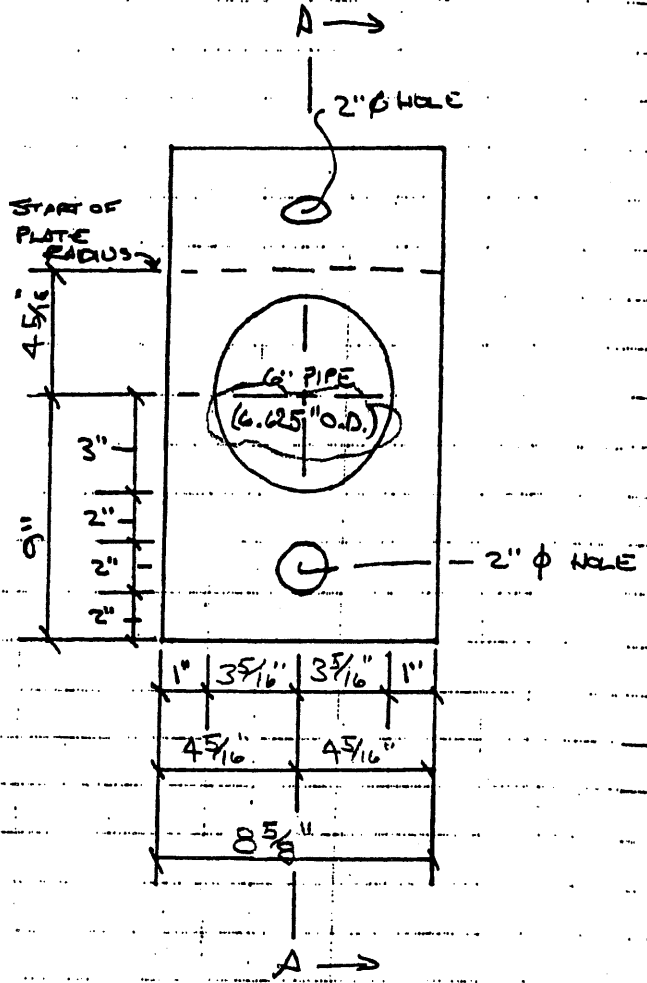
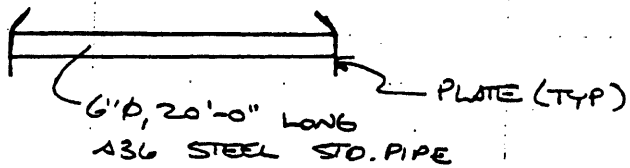


PLATE DETAIL - 2 REQ'D

SPREADER PIPE PLAN & DETAILS



SPREADER BEAM

Box 1/24/01

CHECK PIPE TO PLATE WELDS

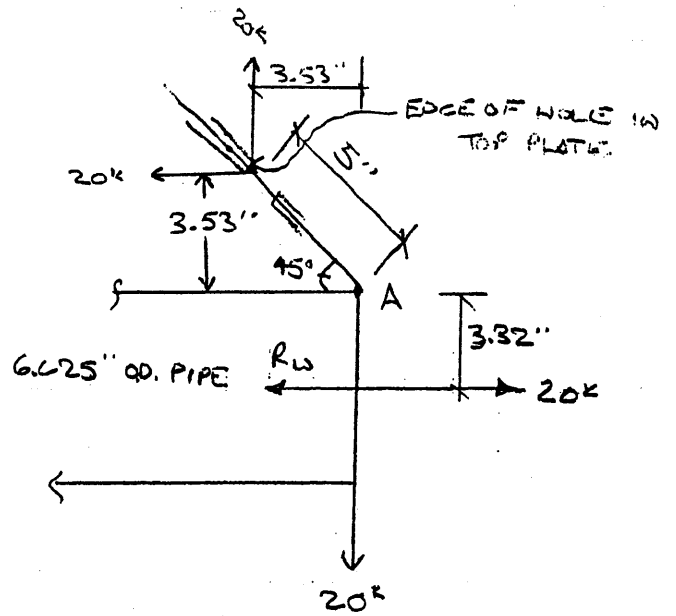
$$\begin{aligned} \sum M_A &= (3.53'')(20k) - (3.53'')(20k) \\ &\quad - 3.32''(20k) + (3.32'')(R_w) \\ &= 66.4k'' - 3.32''R_w \end{aligned}$$

$$R_w = 20k$$

3/16" FILLET WELD, E70XX (SMAW)

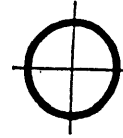
Good For 2.78 k/1"

$$CIRC. = 2\pi r = 20.8'' \times 2.78 k/1'' = 57k > 20k \text{ OK}$$



$F_y = 36 \text{ ksi}$

COLUMNS
Standard steel pipe
Allowable concentric loads in kips



Nominal Dia.	12	10	8	6	5	4	3½	3
Wall Thickness	0.375	0.365	0.322	0.280	0.258	0.237	0.226	0.216
Wt./ft	49.56	40.48	28.55	18.97	14.62	10.79	9.11	7.58

F_y		36 ksi							
Effective length in ft KL with respect to radius of gyration	0	315	257	181	121	93	68	58	48
	6	303	246	171	110	83	59	48	38
	7	301	243	168	108	81	57	46	36
	8	299	241	166	106	78	54	44	34
	9	296	238	163	103	76	52	41	31
	10	293	235	161	101	73	49	38	28
	11	291	232	158	98	71	46	35	25
	12	288	229	155	95	68	43	32	22
	13	285	226	152	92	65	40	29	19
	14	282	223	149	89	61	36	25	16
	15	278	220	145	86	58	33	22	14
	16	275	216	142	82	55	29	19	12
	17	272	213	138	79	51	26	17	11
	18	268	209	135	75	47	23	15	10
	19	265	205	131	71	43	21	14	9
	20	261	201	127	67	39	19	12	
	22	254	193	119	59	32	15	10	
	24	246	185	111	51	27	13		
	25	242	180	106	47	25	12		
	26	238	176	102	43	23			
	28	229	167	93	37	20			
	30	220	158	83	32	17			
	31	216	152	78	30	16			
	32	211	148	73	29				
	34	201	137	65	25				
	36	192	127	58	23				
	37	186	120	55	21				
	38	181	115	52					
	40	171	104	47					

Properties								
Area A (in. ²)	14.6	11.9	8.40	5.58	4.30	3.17	2.68	2.23
I (in. ⁴)	279	161	72.6	28.1	15.2	7.23	4.79	3.02
r (in.)	4.38	3.67	2.94	2.25	1.88	1.51	1.34	1.16
B } Bending factor	0.333	0.398	0.500	0.657	0.789	0.987	1.12	1.29
a/10 ⁶	41.7	23.9	10.8	4.21	2.26	1.08	0.717	0.447

Note: Heavy line indicates Kl/r of 200.

Norm
Wall
V

Effective length in ft KL with respect to radius of gyration

Area A
I (in.⁴)
r (in.)
B } Be
factor
a/10⁶

Note:

ERECTION PLAN

GENERAL NOTES:

1. The fabricator is Stupp Bridge.
2. The erector will be Youngstown Bridge, LLC.
3. Temporary bracing will be installed at each substructure unit for the first beam set. Temporary bracing will be installed perpendicular to the beams.
4. LIFTING SEQUENCE AS FOLLOWS:
 - a. Unload and set Field Splice 5 to Fwd Abutment
 - b. Unload and set Field Splice 4 to Field Splice 5
 - c. Unload and set Field Splice 3 to Field Splice 4
 - d. Unload and set Field Splice 2 to Field Splice 3
 - e. Unload and set Rear Abutment to Field Splice 1
 - f. Unload and set Field Splice 1 to Field Splice 2
5. Beam erection sequence may change based on site conditions and crane location.
6. The crane for setting the Beams will be a Grove GMK5165(165ton Hydraulic Truck Crane) on full outriggers, full counterweight, boom as required, or equivalent. ✓
7. The crane operator may select a different configuration based on the chart in the crane. If necessary the information will be provided to the Project Engineer
8. If a different crane is used, the load chart will be provided to the Project Engineer to verify capacities. The use of a different crane should not constitute a change to the procedure and a complete re-submittal will not be required.
9. Cross-frames will be installed as erection progresses, or temporary braces will be clamped across the top flanges of adjacent beams as shown at a maximum spacing of 30'. ✓
10. OSHA approved fall protection will be in place prior to lifting beams.
11. The crane location and staging areas shown are approximate. We reserve the right to move either to accommodate sight conditions at the actual time of erection. In no case will the capacities of the crane's load chart be exceeded.
12. Splices designated to be made in the air, per ODOT CMS 513.22, shall have not less than one-half of the holes filled with pins or snug tight bolts (preferably half bolts and half pins) before member is released from hoisting equipment. ✓

GROVE[®]

GMK5165

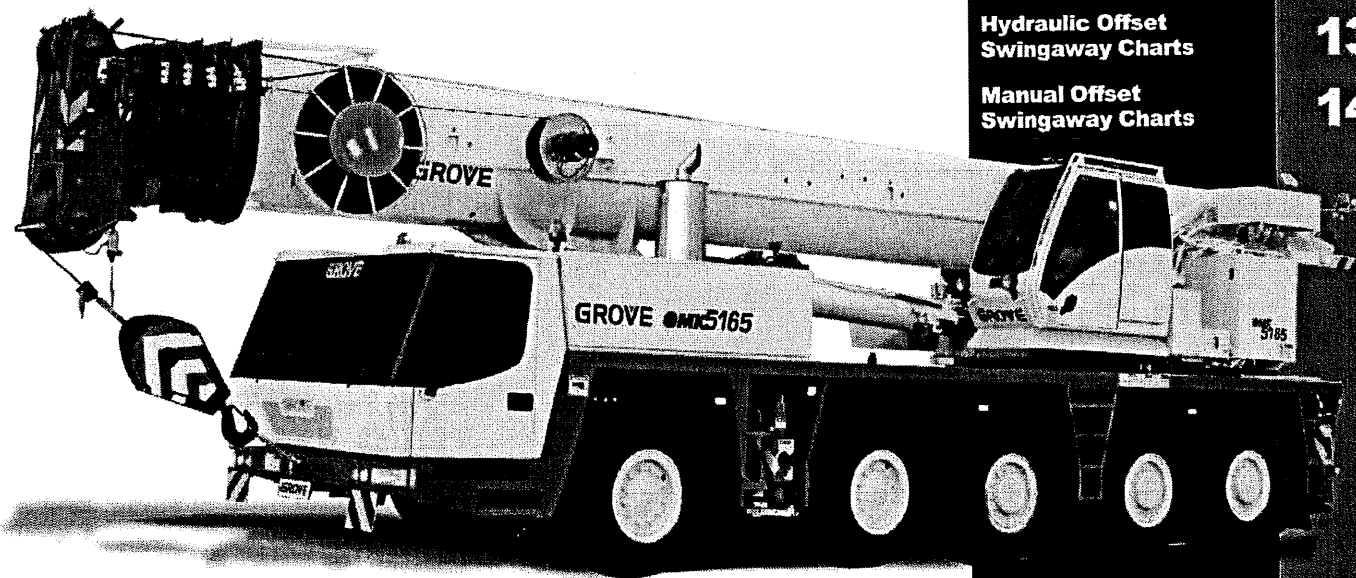
product guide

features

- 165-ton (130 mt) capacity
- 42-197 ft. (12.9-60 m) 6-section full power boom
- 42-197 ft. (12.9-60 m) 6-section full power boom
- Patented TWIN-LOCK™ boom pinning system
- 36-59 ft. (11-18 m) bifold lattice swingaway, hydraulic luffing or manual offset
- 88,400 lb. (40 000 kg) counterweight with hydraulic removal system
- 510 hp (380 kW) Mercedes OM 502 LA 8 cylinder turbo-charged diesel engine. Daimler Chrysler, 16 speed G240-16 transmission
- Independent hydro-pneumatic MEGATRAK™ suspension
- All wheel steering

contents

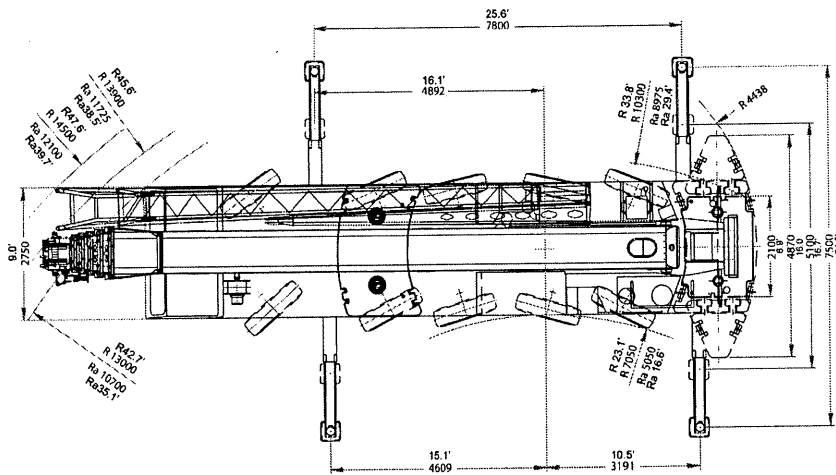
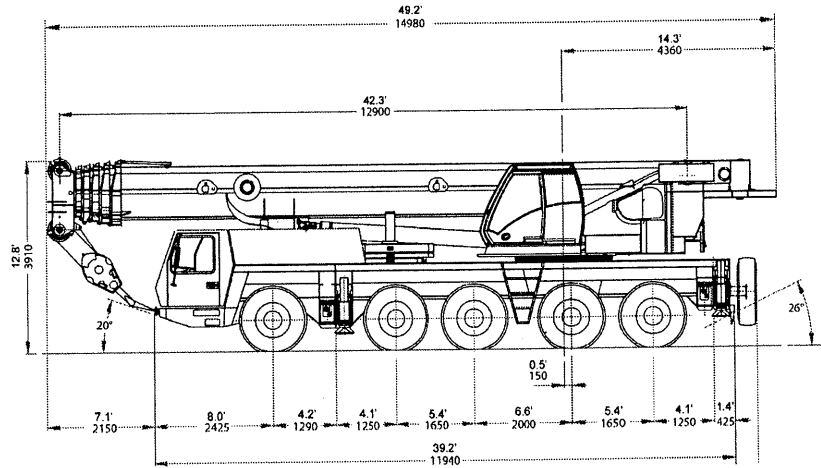
Features	2
Specifications	3
Dimensions	5
Counterweight Dimensions	6
Travel Proposal	7
Working Range Main Boom	8
Main Boom Charts	9
Load Charts	10
Working Range Manual Offset Swingaway	11
Working Range Hydraulic Offset Swingaway	12
Hydraulic Offset Swingaway Charts	13
Manual Offset Swingaway Charts	14



All Terrain Crane

dimensions

5



Ra = Radius all wheels steered

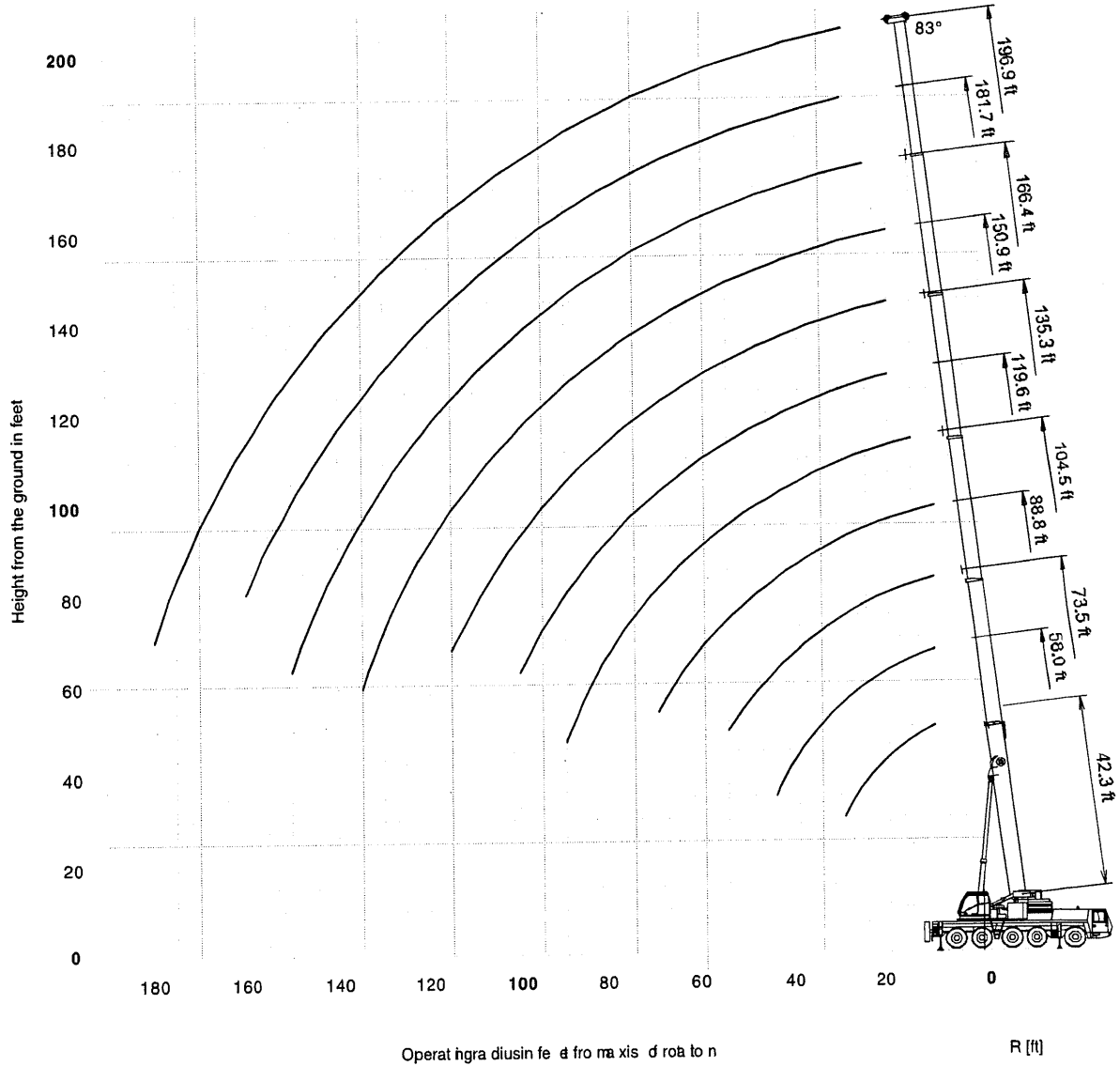
Basic Weights - lb. (kg.)	Axles 1-3		Axles 4 & 5		Total	
Mercedes power, 20.5R25 tires, 10X6X10 drive/steer, 2nd oil cooler, outrigger pads, auxiliary hoist and driver.	66,528	(30 177)	43,415	(19 693)	109,943	(49 870)
Additions:						
10X8X10 drive /steer	772	(350)	22	(10)	794	(360)
Electric driveline retarder	-66	(-30)	727	(330)	661	(300)
14.00R25 spare tire with bracket	-340	(-154)	924	(419)	584	(265)
16.00R25 spare tire with bracket	-423	(-192)	1,140	(517)	715	(325)
20.5R25 spare tire with bracket	-487	(-221)	1,296	(588)	809	(367)
Brackets for swingaway	183	(83)	71	(32)	254	(115)
Hose reel for luffing swingaway	523	(237)	-203	(-92)	320	(145)
36 ft. - 56 ft. (11 m - 18 m) swingaway	3,982	(1 806)	-829	(-376)	3,153	(1 430)
Auxiliary boom nose	364	(165)	-209	(-95)	154	(70)
5,500 lb. (2 500 kg.) section 8 pinned to superstructure	-3,045	(-1 381)	8,556	(3 881)	5,512	(2 500)
5,500 lb. (2 500 kg.) section 1 stowed on carrier	5,020	(2 277)	205	(93)	5,225	(2 370)
Substitutions						
14.00R25 tires	-1,349	(-612)	-900	(-408)	-2,249	(-1 020)
16.00R25 tires	-555	(-252)	-371	(-168)	-926	(-420)
Removals:						
Boom assembly	-32,522	(-14 752)	-1,076	(-488)	-33,598	(-15 240)
Front outriggers	-3,757	(-1 704)	626	(284)	-3,131	(-1 420)
Rear outriggers	1,437	(652)	-4,744	(-2 152)	-3,307	(-1 500)
Front and rear outrigger floats	-168	(-76)	-273	(-124)	-441	(-200)

GAK 5165

working range

42'-197' main boom

88







5165

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.





GROVE

load charts

 42-197 ft.
(12.8-60.0 m)
  88,400 lb.
(40,100 kg)
  100%
24'7" Spread
  360°

Feet	Pounds (thousands)										
	42'	58'	73'	89'	104'	119'	135'	150'	166'	181'	197'
8	240.0										
10	215.0	199.0	186.0	143.0							
15	168.0	165.0	154.0	143.0	110.0						
20	136.0	137.0	132.0	125.0	108.0	84.0	62.0	45.0			
25	113.0	114.0	114.0	110.0	98.0	78.0	62.0	45.0			
30	92.0	97.0	96.0	95.0	90.0	72.0	61.0	45.0	35.2	25.6	22.0
35		83.0	83.0	82.0	82.0	66.0	56.0	45.0	35.2	25.6	22.0
40		72.0	72.0	71.0	72.0	60.0	51.0	45.0	35.2	25.6	22.0
45		61.0	64.0	62.0	61.0	56.0	47.0	41.4	35.2	25.6	22.0
50			56.0	56.0	53.0	52.0	42.6	38.4	34.8	25.6	22.0
55			48.0	50.0	47.0	47.0	39.2	35.6	32.4	25.6	22.0
60				43.4	41.4	42.2	35.8	32.8	29.8	25.6	22.0
65				38.2	37.6	37.8	32.6	29.8	27.8	25.6	22.0
70				34.0	35.4	34.0	30.2	27.4	25.8	24.4	21.6
75				27.2	32.0	30.8	28.0	25.4	24.0	23.0	20.6
80					29.0	27.6	26.4	23.8	22.2	21.4	19.6
85					26.2	24.8	25.2	22.0	20.8	20.0	18.6
90					23.8	22.4	23.8	20.8	19.4	18.8	17.8
95						21.0	21.6	19.0	18.2	17.6	17.0
100						20.0	19.6	17.0	17.0	16.4	16.0
105							18.0	15.8	15.6	15.0	14.8
110							16.4	14.8	14.2	13.8	13.6
115							15.0	14.0	12.8	12.8	12.8
120								13.4	11.6	12.0	12.0
125								12.8	10.4	11.6	11.4
130								12.2	9.8	11.0	10.8
135								11.2	9.4	10.4	10.0
140									8.8	10.0	9.0
145									8.4	9.2	8.2
150									8.0	8.4	7.4
155										7.8	6.8
160										7.0	6.0
165											5.4
170											4.8
175											4.4
180											3.8

*Over rear

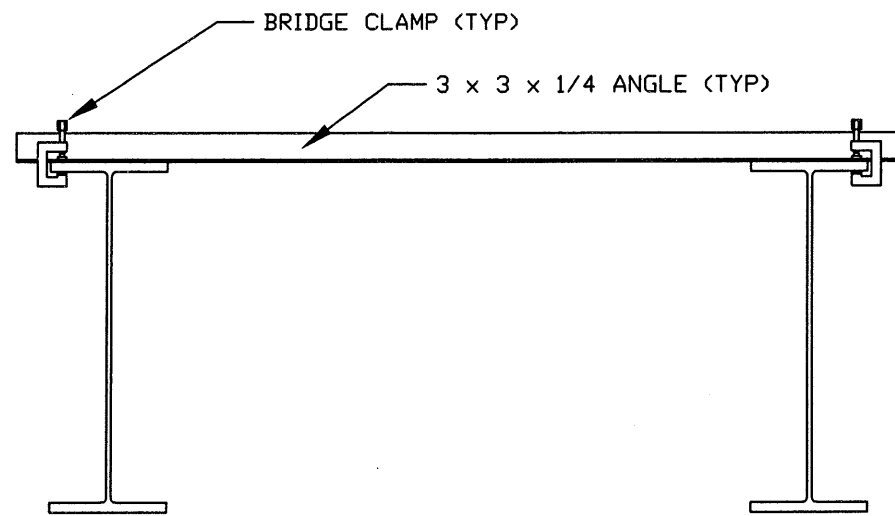
 42-197 ft.
(12.8-60.0 m)
  46,200 lb.
(21,000 kg)
  100%
24'7" Spread
  360°

Feet	Pounds (thousands)										
	42'	58'	73'	89'	104'	119'	135'	150'	166'	181'	197'
10	210.0	199.0	186.0	143.0							
15	164.0	163.0	154.0	143.0	110.0						
20	131.0	132.0	131.0	124.0	108.0	84.0	62.0	45.0			
25	107.0	108.0	101.0	93.0	89.0	78.0	62.0	45.0	35.2	25.6	22.0
30	85.0	85.0	78.0	76.0	70.0	69.0	61.0	45.0	35.2	25.6	22.0
35		68.0	65.0	62.0	61.0	57.0	53.0	45.0	35.2	25.6	22.0
40		55.0	54.0	51.0	51.0	48.0	44.0	42.8	35.2	25.6	22.0
45		46.0	46.0	45.0	43.8	40.6	41.0	36.4	35.2	25.6	22.0
50			40.0	40.2	37.8	35.6	35.6	31.2	30.6	25.6	22.0
55			34.8	35.2	33.0	32.8	31.0	28.2	28.6	25.6	22.0
60				30.6	29.0	29.8	27.4	26.4	23.2	23.8	22.0
65				26.6	25.8	26.4	24.2	24.4	21.6	22.4	21.0
70				23.4	22.6	23.8	21.6	21.8	20.2	20.4	18.8
75					19.8	21.4	19.2	19.4	19.0	18.2	16.6
80					17.6	19.0	17.2	17.6	17.8	16.4	14.8
85					15.4	16.8	15.4	15.8	16.0	14.8	13.2
90					13.8	15.0	13.8	14.2	14.4	13.2	11.8
95						13.6	12.2	13.2	13.2	11.8	10.4
100						12.8	11.0	12.4	11.8	10.8	9.4
105							10.4	11.4	10.8	9.6	8.2
110							9.8	10.4	9.8	8.6	7.2
115							9.2	9.2	8.6	7.8	6.4
120								8.4	7.8	7.0	5.6
125								7.6	6.8	6.0	4.8
130								6.8	6.0	5.4	4.2
135								6.0	5.4	4.6	3.6
140									4.8	4.0	3.0
145									4.0	3.4	2.4
150									3.6	2.8	
155										2.2	

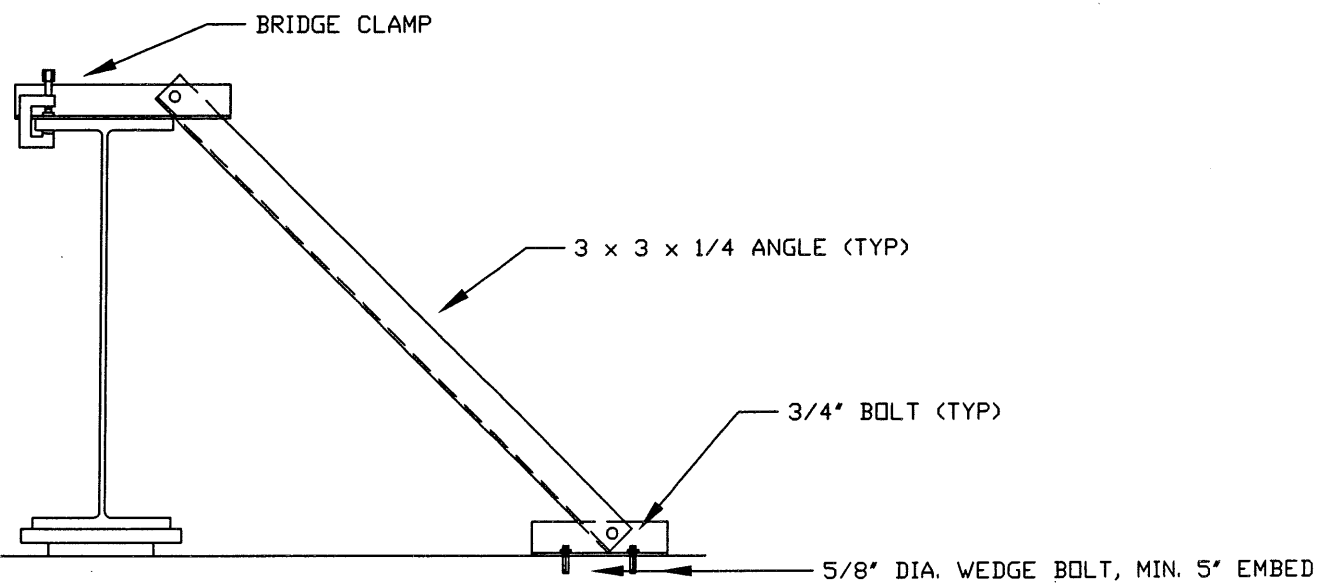
THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

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GMK 5165



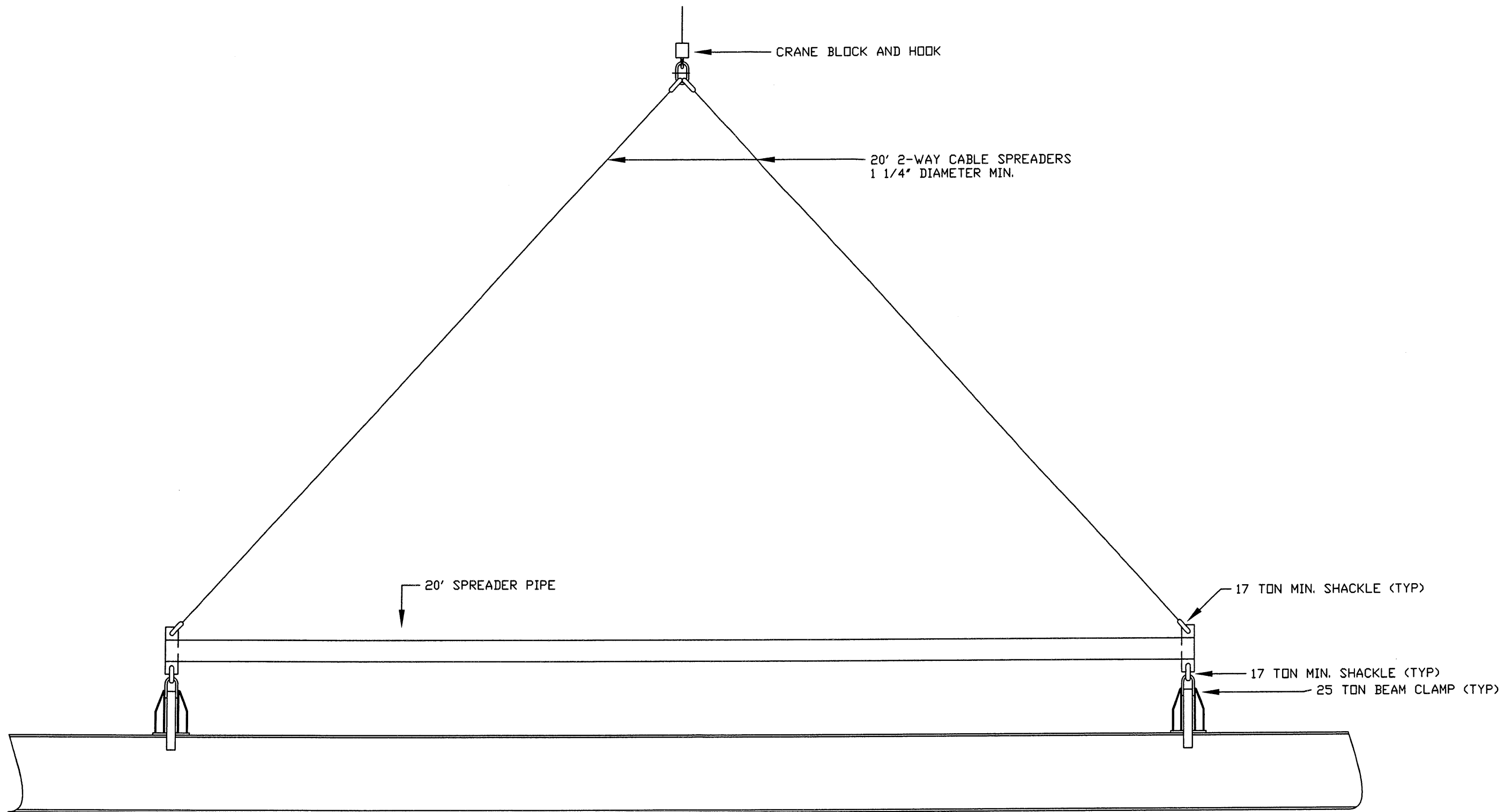
TEMPORARY BRACE DETAILS
(MAX. SPACING 30')



TEMPORARY BRACE DETAILS
FOR FIRST BEAM SET, TYPICAL EACH SUBSTRUCTURE UNIT

BRICON ENGINEERING, LLC
3429 BOSTON MILLS ROAD
RICHFIELD, OHIO 44286
(330) 523-0504
FAX: (330) 659-0278

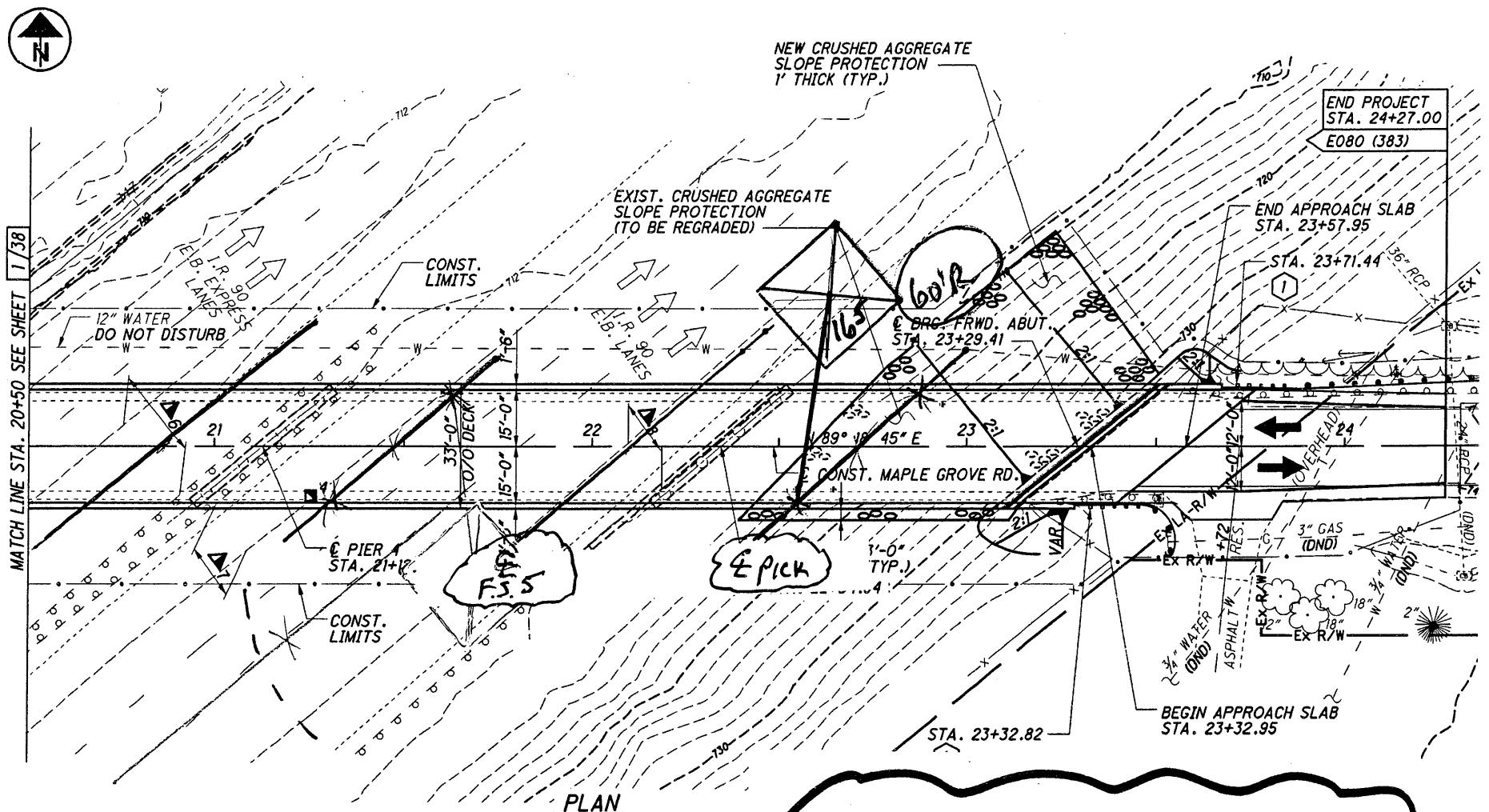
JOB:	ODOT 7(12), ERECTION PLAN		
DESCRIPTION:	BR. NO. LAK-90-0377		
CALCULATED BY:	DRL	DATE:	6/10/12
CHECKED BY:	BJB	DATE:	6/11/12
SCALE:	NONE		
SHEET NO.:	1	OF	2



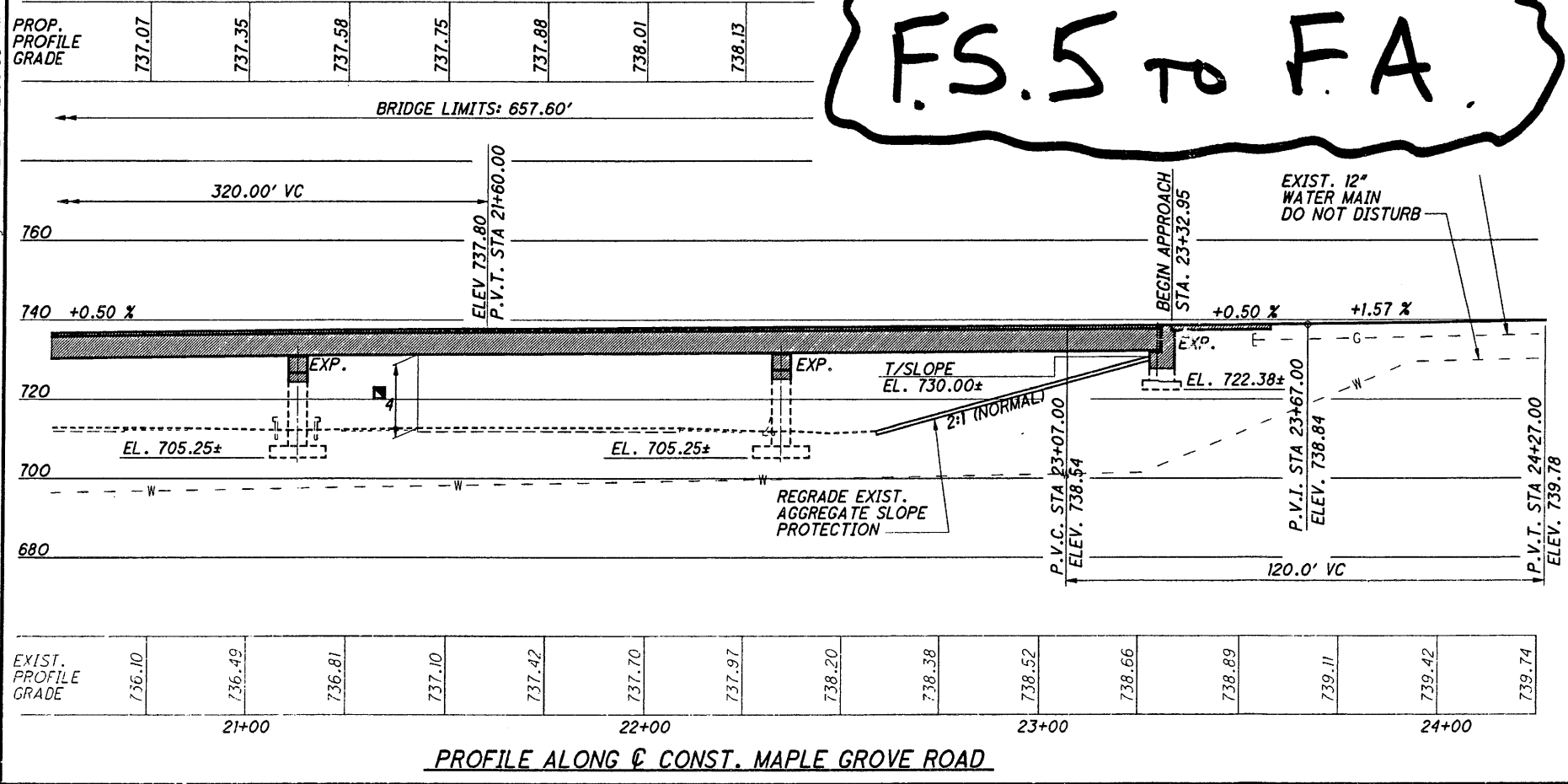
RIGGING DETAIL W/ 20' SPREADER

BRICON ENGINEERING, LLC 3429 BOSTON MILLS ROAD RICHFIELD, OHIO 44286 (330) 523-0504 FAX: (330) 659-0278	JOB: ODOT 7(12), ERECTION PLAN	
	DESCRIPTION: BR. NO. LAK-90-0377	
	CALCULATED BY: DRL	DATE: 6/10/12
	CHECKED BY: BJB	DATE: 6/11/12
	SCALE: NONE	
SHEET NO: 2		OF 2

P:\3019 LAK-90-03.77\83489\structures\sheets\000_0377CSP002.dgn 9/12/2011 2:30:55 PM JSGuest



F.S.5 TO F.A.



MAPLE GROVE ROAD DESIGN TRAFFIC:
 2012 ADT = 9,670 2012 ADTT = 387
 2032 ADT = 10,040 2032 ADTT = 402
 DIRECTIONAL DISTRIBUTION = 0.53

HORIZONTAL CLEARANCE:

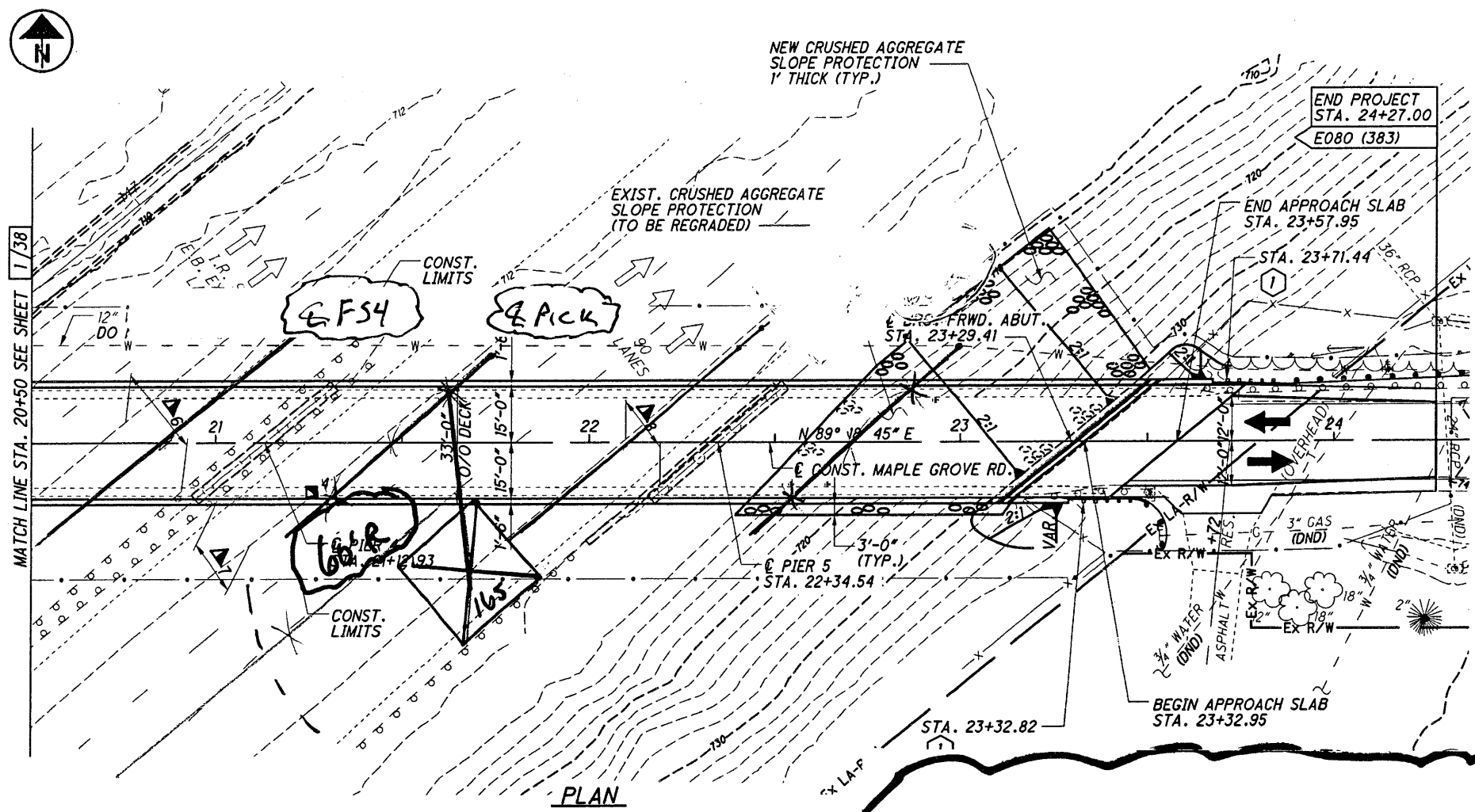
1	14.24' ACTUAL *	12.0' REQUIRED
2	16.81' ACTUAL *	6.0' REQUIRED
3	23.35' ACTUAL *	14.0' REQUIRED
4	15.32' ACTUAL *	4.0' REQUIRED
5	14.49' ACTUAL *	4.0' REQUIRED
6	23.97' ACTUAL *	14.0' REQUIRED
7	14.67' ACTUAL *	6.0' REQUIRED
8	15.25' ACTUAL *	12.0' REQUIRED

VERTICAL CLEARANCE:

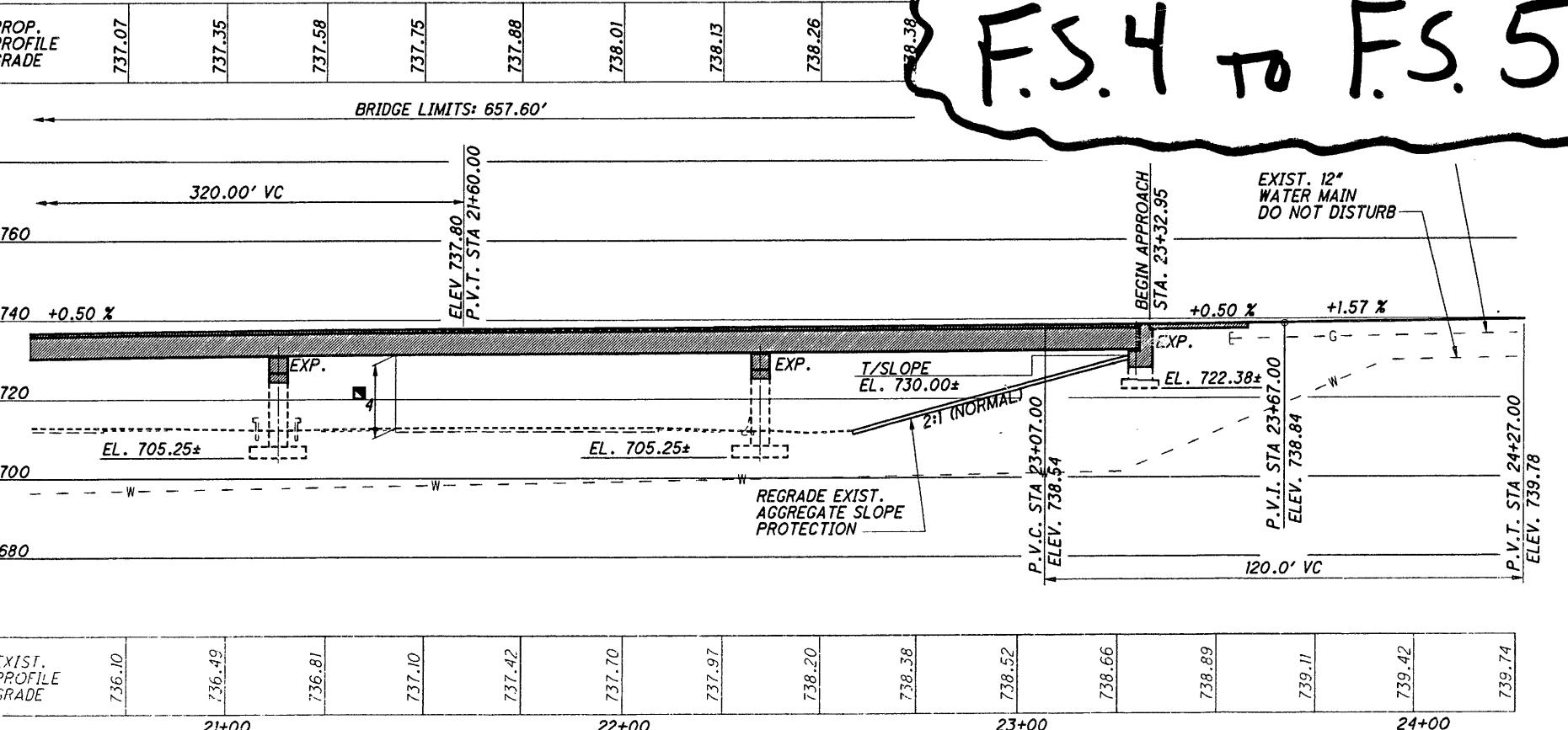
1	18.30' PROPOSED	16.50' REQUIRED	16.64' EXISTING
2	22.28' PROPOSED	16.50' REQUIRED	21.99' EXISTING
3	16.80' PROPOSED	16.50' REQUIRED	16.36' EXISTING
4	18.50' PROPOSED	16.50' REQUIRED	17.81' EXISTING

* GUARDRAIL LOCATION DETERMINED BY AERIAL PHOTOGRAPH. DISTANCE TO GUARDRAIL/BARRIER DETERMINED BY CAD.
 (DND) DO NOT DISTURB

LAK-90-3.77 **SITE PLAN** **LAKE COUNTY** **DESIGNED** **DRAWN** **REVIEWED** **DATE** **DESIGN AGENCY**
 BRIDGE NO. LAK-90-0377 STA. 16+75.35 STA. 23+32.95 RHC RHC EDW 5-19-11 JONES-STUCKEY LTD., INC.
 PID NO. 83489 MAPLE GROVE RD. OVER I.R. 90 WJV WJV 4303656 STRUCTURE FILE NUMBER 1655 W. MARKET STREET, SUITE 355
 AKRON, OHIO 44313



PLAN



PROFILE ALONG C CONST. MAPLE GROVE ROAD

F.S. 4 TO F.S. 5

MAPLE GROVE ROAD DESIGN TRAFFIC:
 2012 ADT = 9,670 2012 ADTT = 387
 2032 ADT = 10,040 2032 ADTT = 402
 DIRECTIONAL DISTRIBUTION = 0.53

HORIZONTAL CLEARANCE:

▲ ₁	14.24' ACTUAL *	12.0' REQUIRED
▲ ₂	16.81' ACTUAL *	6.0' REQUIRED
▲ ₃	23.35' ACTUAL *	14.0' REQUIRED
▲ ₄	15.32' ACTUAL *	4.0' REQUIRED
▲ ₅	14.49' ACTUAL *	4.0' REQUIRED
▲ ₆	23.97' ACTUAL *	14.0' REQUIRED
▲ ₇	14.67' ACTUAL *	6.0' REQUIRED
▲ ₈	15.25' ACTUAL *	12.0' REQUIRED

VERTICAL CLEARANCE:

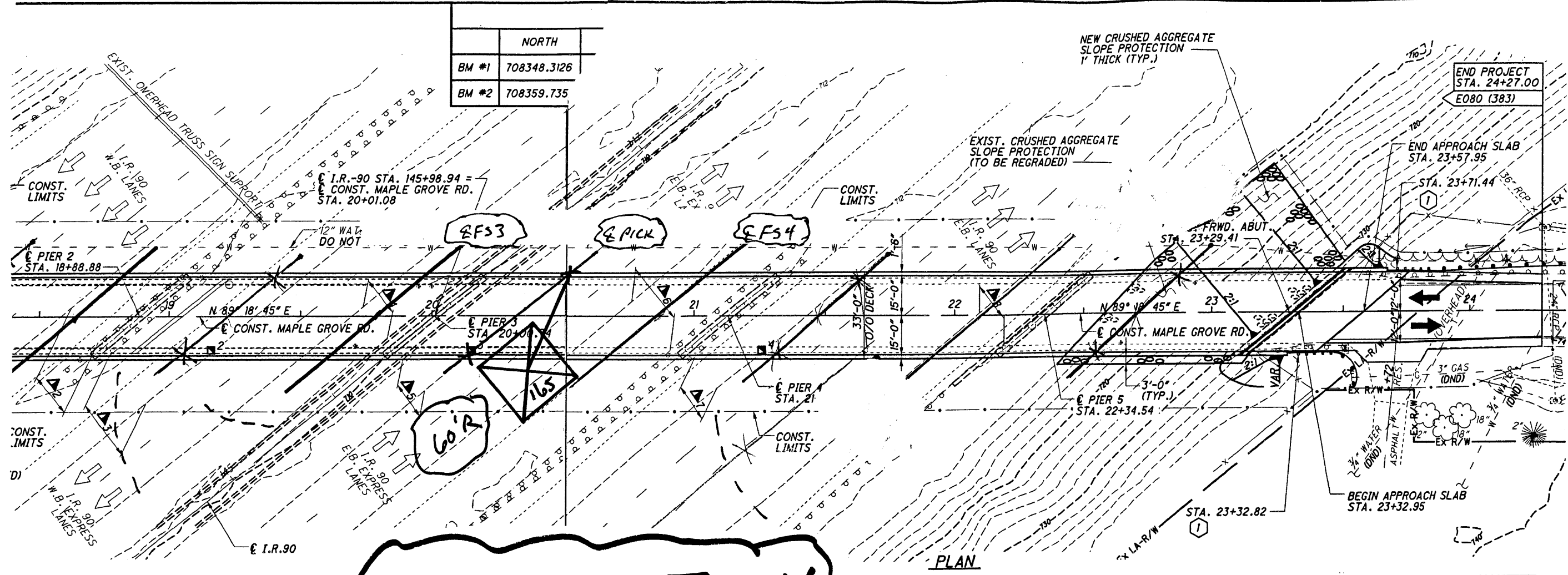
■ ₁	18.30' PROPOSED	16.50' REQUIRED	16.64' EXISTING
■ ₂	22.28' PROPOSED	16.50' REQUIRED	21.99' EXISTING
■ ₃	16.80' PROPOSED	16.50' REQUIRED	16.36' EXISTING
■ ₄	18.50' PROPOSED	16.50' REQUIRED	17.81' EXISTING

* GUARDRAIL LOCATION DETERMINED BY AERIAL PHOTOGRAPH. DISTANCE TO GUARDRAIL/BARRIER DETERMINED BY CAD.
 (DND) DO NOT DISTURB

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LAK-90-3.77	SITE PLAN	DESIGN AGENCY JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44315
PID No. 83489	BRIDGE NO. LAK-90-0377 MAPLE GROVE RD. OVER I.R. 90	DATE 5-19-11
2/38	LAKE COUNTY STA. 16+75.35 STA. 23+32.95	REVIEWED EDW
24	DRAWN RHC	STRUCTURE FILE NUMBER 4303636
60	CHECKED WJV	REVISED

NORTH	
BM #1	708348.3126
BM #2	708359.735



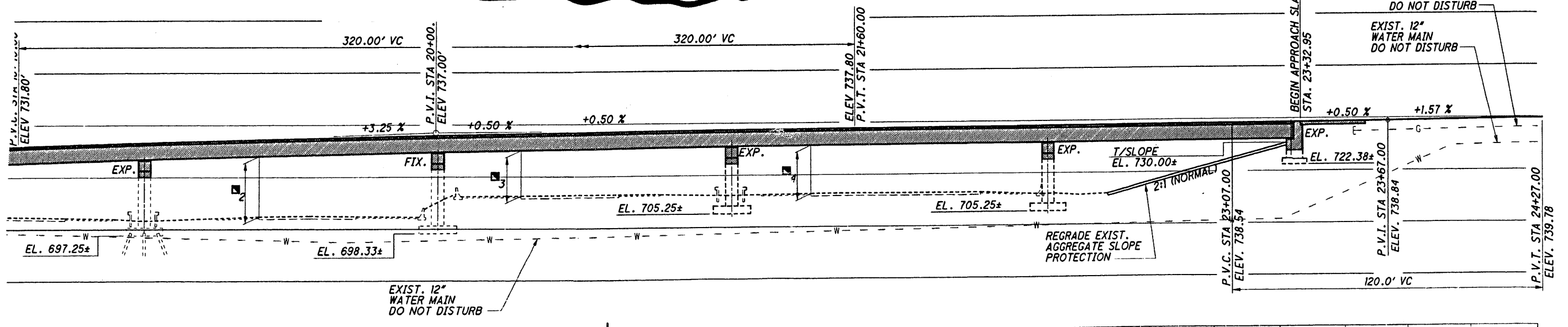
F.S. 3 TO F.S. 4

732.12	732.88	733.60	734.25	734.86
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BRIDGE LIMITS: 657.

737.88	738.01	738.13	738.26	738.38	738.51	738.65	738.84	739.09	739.39	739.75
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S: 657.60'



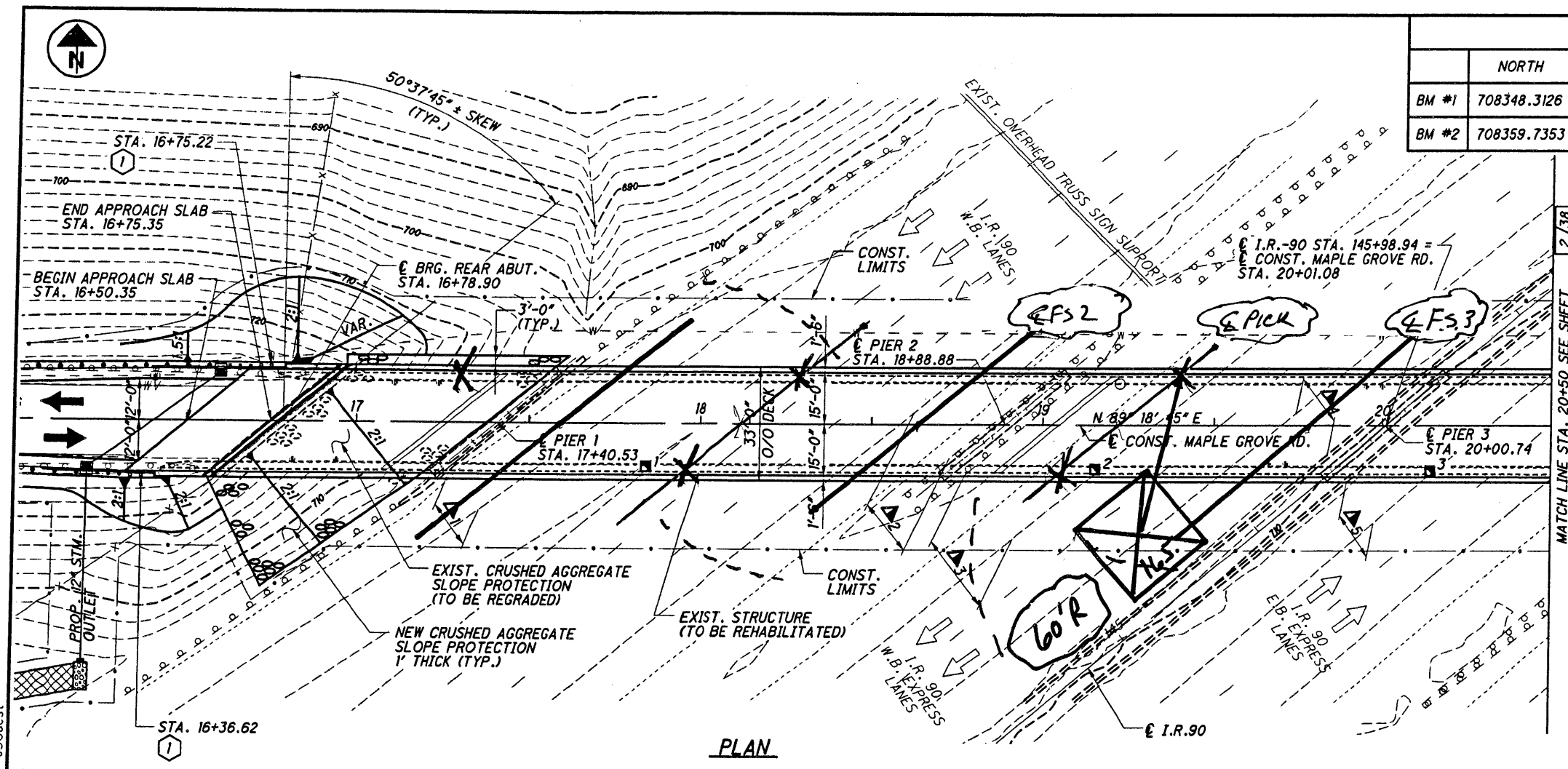
731.55	732.20	732.83	733.38	733.88	734.39	734.87	735.32	735.71
19+00				20+00				

736.81	737.10	737.42	737.70	737.97	738.20	738.38	738.52	738.66	738.89	739.11	739.42	739.74
25'-0" LC				22+00				23+00				24+00

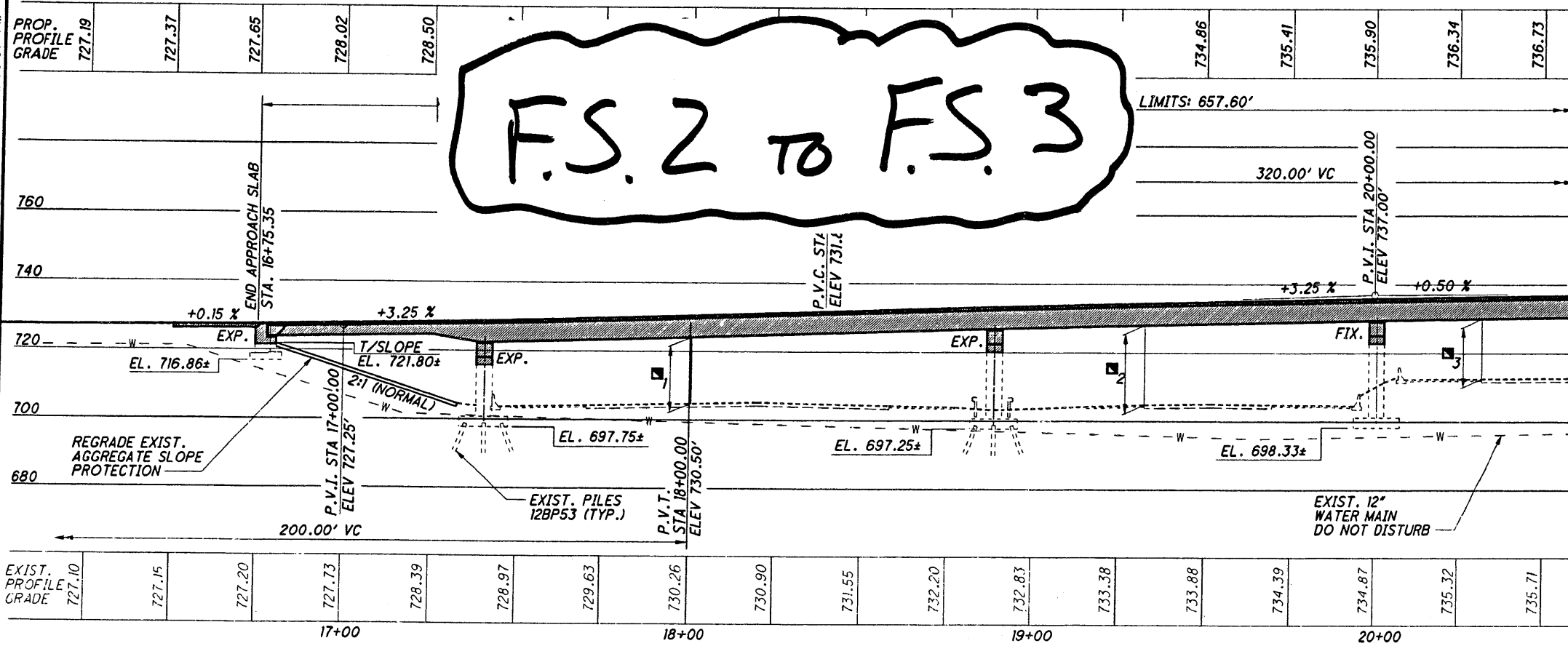
CONST. MAPLE GROVE ROAD

COORDINATES: LATITUDE N41°26' LONGITUDE W81°26'

PROFILE ALONG C CONST. MAPLE GROVE ROAD



PLAN



PROFILE ALONG C CONST. MAPLE GROVE ROAD

BENCHMARKS						
	NORTH	EAST	CONST. STATION	OFFSET	ELEVATION	REMARKS
BM #1	708348.3126	2259872.853	13+89.73	16.59' RT.	728.70	I.P.S.
BM #2	708359.7353	2261518.752	30+35.65	24.92' RT.	745.83	I.P.S.

NOTES

- EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS
- FOR ADDITIONAL SITE PLAN DATA, SEE SHEET 2/38

LEGEND

- BRIDGE TERMINAL ASSEMBLY, TYPE I (FIRST POST LOCATION)

EXISTING STRUCTURE

TYPE:	ROLLED BEAM (SPAN 1) CONTINUOUS RIVETED STEEL GIRDERS (SPANS 2 TO 6) (HINGE JOINTS IN SPANS 1 & 3) WITH REINFORCED CONCRETE DECK SLAB AND SUBSTRUCTURE
SPANS:	62'-0", 148'-4", 112'-0", 112'-0", 121'-6", 95'-0" C/C BEARINGS
ROADWAY:	24'-0" F/F 2'-0" SAFETY CURB
LOADING:	CF 130(57) ORIGINAL
SKEW:	50°37'45" L.F.
APPROACH SLABS:	25'-0" (AS-1-54) (SPECIAL DESIGN)
ALIGNMENT:	TANGENT
CROWN:	0.016±
WEARING SURFACE:	1 1/4" CONCRETE OVERLAY
STRUCTURAL FILE NUMBER:	4303636
DATE BUILT:	1963
DISPOSITION:	TO BE REHABILITATED

PROPOSED STRUCTURE

PROPOSED WORK:	REPLACE EXISTING DECK SLAB WITH NEW NON-COMPOSITE DECK SLAB & REPLACE EXISTING STEEL GIRDERS. MODIFY EXISTING ABUTMENTS AND WINGWALLS & REPLACE EXISTING PIER CAPS. REPLACE EXISTING BEARINGS WITH NEW ELASTOMERIC BEARINGS & SEAL CONCRETE SURFACES.
TYPE:	CONTINUOUS, NON-COMPOSITE ASTM A709 GRADE 50 STEEL GIRDERS (PAINTED) WITH REINFORCED CONCRETE DECK SLAB AND SUBSTRUCTURE (PORTIONS OF EXISTING SUBSTRUCTURE UNITS ARE TO BE SALVAGED)
SPANS:	61'-7 1/2", 148'-4 1/4", 111'-10 3/8", 112'-2 1/4", 121'-7 3/8", 94'-10 1/2" C/C BEARINGS
ROADWAY:	30'-0" TOE/TOE PARAPETS
LOADING:	HS20 (CASE II) AND ALTERNATE MILITARY LOADING. FWS = 60 PSF
SKEW:	50°37'45" L.F.
ALIGNMENT:	TANGENT
CROWN:	0.016
WEARING SURFACE:	1" MONOLITHIC CONCRETE
APPROACH SLABS:	25'-0" LONG (AS-1-81)
COORDINATES:	LATITUDE N41°36'21" LONGITUDE W81°26'00"

DESIGN AGENCY: JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44313

DATE: 5-19-11

REVIEWED: EDW

STRUCTURE FILE NUMBER: 4303636

DRAWN: RHC

DESIGNED: RHC

CHECKED: WJV

LAKE COUNTY: STA. 16+75.35 STA. 23+32.95

SITE PLAN: BRIDGE NO. LAK-90-0377 MAPLE GROVE RD. OVER I.R. 90

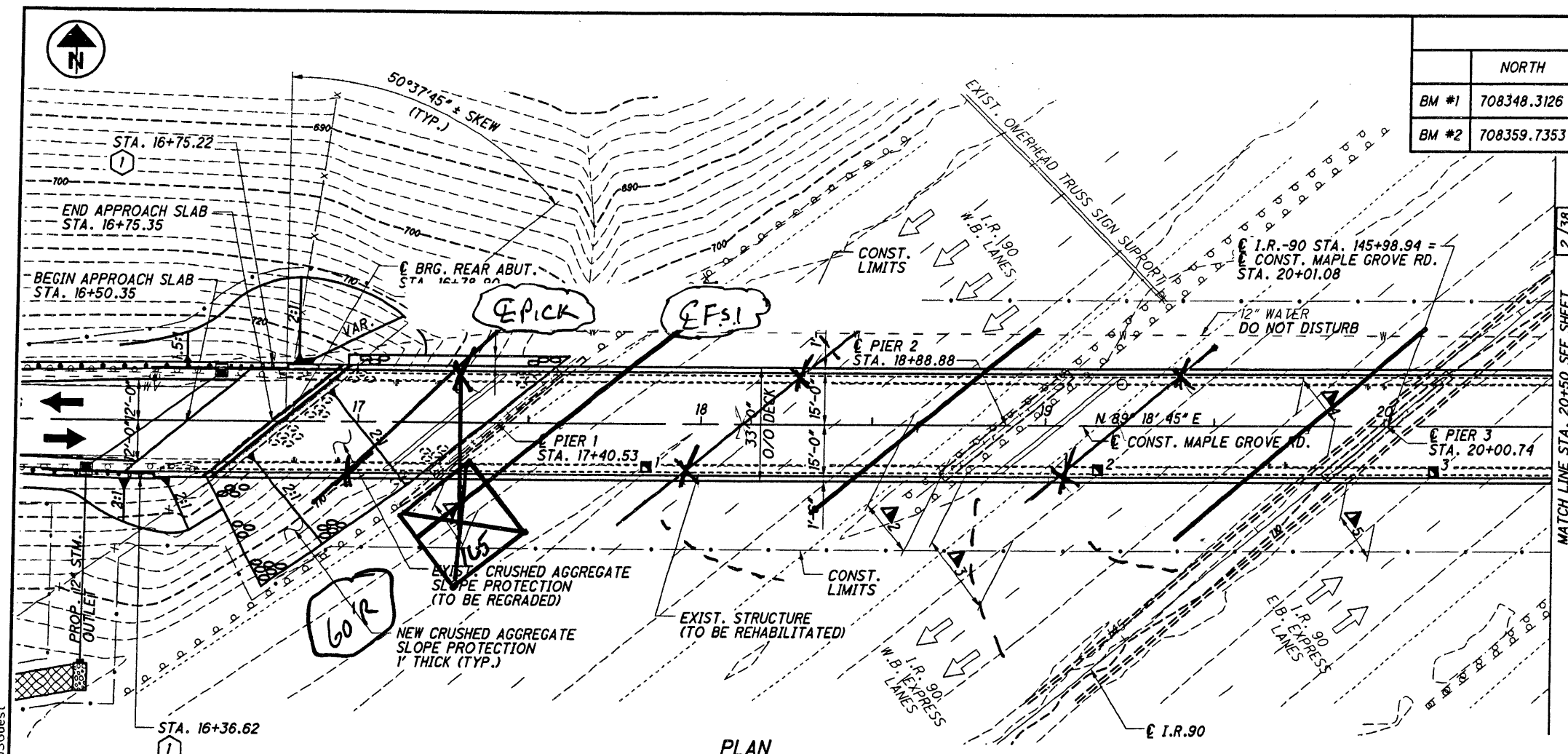
LAK-90-3.77

PID No. 83489

1/38

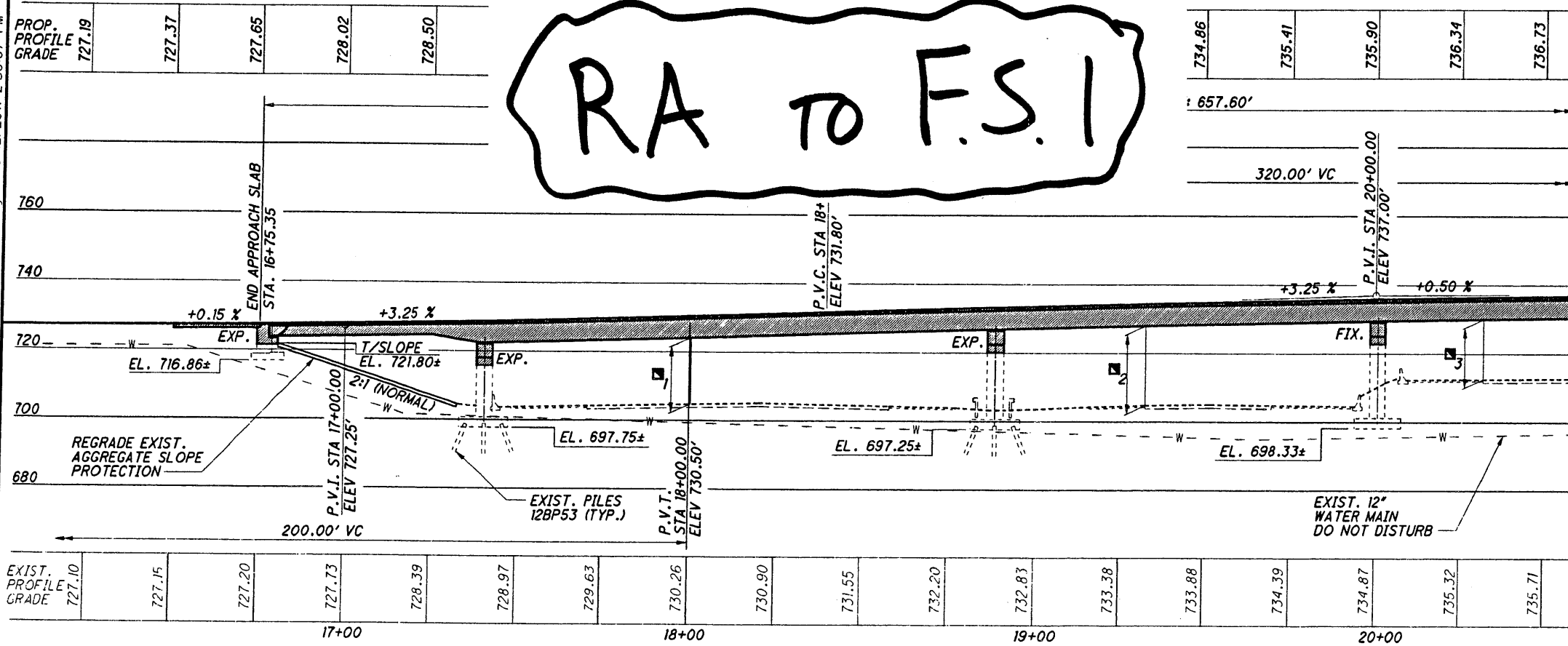
23/60

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PLAN

RA TO F.S.1



PROFILE ALONG C CONST. MAPLE GROVE ROAD

BENCHMARKS

	NORTH	EAST	CONST. STATION	OFFSET	ELEVATION	REMARKS
BM #1	708348.3126	2259872.853	13+89.73	16.59' RT.	728.70	I.P.S.
BM #2	708359.7353	2261518.752	30+35.65	24.92' RT.	745.83	I.P.S.

NOTES

- EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS
- FOR ADDITIONAL SITE PLAN DATA, SEE SHEET 2/38

LEGEND

- BRIDGE TERMINAL ASSEMBLY, TYPE I (FIRST POST LOCATION)

EXISTING STRUCTURE

TYPE:	ROLLED BEAM (SPAN 1) CONTINUOUS RIVETED STEEL GIRDERS (SPANS 2 TO 6) (HINGE JOINTS IN SPANS 1 & 3) WITH REINFORCED CONCRETE DECK SLAB AND SUBSTRUCTURE
SPANS:	62'-0", 148'-4", 112'-0", 112'-0", 121'-6", 95'-0" C/C BEARINGS
ROADWAY:	24'-0" F/F 2'-0" SAFETY CURB
LOADING:	CF 130(57) ORIGINAL
SKIEW:	50°37'45" L.F.
APPROACH SLABS:	25'-0" (AS-1-54) (SPECIAL DESIGN)
ALIGNMENT:	TANGENT
CROWN:	0.016±
WEARING SURFACE:	1 1/4" CONCRETE OVERLAY
STRUCTURAL FILE NUMBER:	4303636
DATE BUILT:	1963
DISPOSITION:	TO BE REHABILITATED

PROPOSED STRUCTURE

PROPOSED WORK:	REPLACE EXISTING DECK SLAB WITH NEW NON-COMPOSITE DECK SLAB & REPLACE EXISTING STEEL GIRDERS. MODIFY EXISTING ABUTMENTS AND WINGWALLS & REPLACE EXISTING PIER CAPS. REPLACE EXISTING BEARINGS WITH NEW ELASTOMERIC BEARINGS & SEAL CONCRETE SURFACES.
TYPE:	CONTINUOUS, NON-COMPOSITE ASTM A709 GRADE 50 STEEL GIRDERS (PAINTED) WITH REINFORCED CONCRETE DECK SLAB AND SUBSTRUCTURE (PORTIONS OF EXISTING SUBSTRUCTURE UNITS ARE TO BE SALVAGED)
SPANS:	61'-7 1/2", 148'-4 1/4", 111'-10 3/8", 112'-2 1/4", 121'-7 3/8", 94'-10 1/2" C/C BEARINGS
ROADWAY:	30'-0" TOE/TOE PARAPETS
LOADING:	HS20 (CASE II) AND ALTERNATE MILITARY LOADING. FWS = 60 PSF
SKIEW:	50°37'45" L.F.
ALIGNMENT:	TANGENT
CROWN:	0.016
WEARING SURFACE:	1" MONOLITHIC CONCRETE
APPROACH SLABS:	25'-0" LONG (AS-1-81)
COORDINATES:	LATITUDE N41°36'21" LONGITUDE W81°26'00"

DESIGN AGENCY: JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44315

DATE: 5-19-11

REVIEWED: EDW

STRUCTURE FILE NUMBER: 4303636

DESIGNED: RHC

CHECKED: WJV

LAKE COUNTY STA. 16+75.35 STA. 23+32.95

SITE PLAN: BRIDGE NO. LAK-90-0377 MAPLE GROVE RD. OVER I.R. 90

LAK-90-3.77

PID No. 83489

1/38

23/60

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BENCHMARKS

	NORTH	EAST	CONST. STATION	OFFSET	ELEVATION	REMARKS
BM #1	708348.3126	2259872.853	13+89.73	16.59' RT.	728.70	I.P.S.
BM #2	708359.7353	2261518.752	30+35.65	24.92' RT.	745.83	I.P.S.

NOTES

- EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS
- FOR ADDITIONAL SITE PLAN DATA, SEE SHEET 2/38.

LEGEND

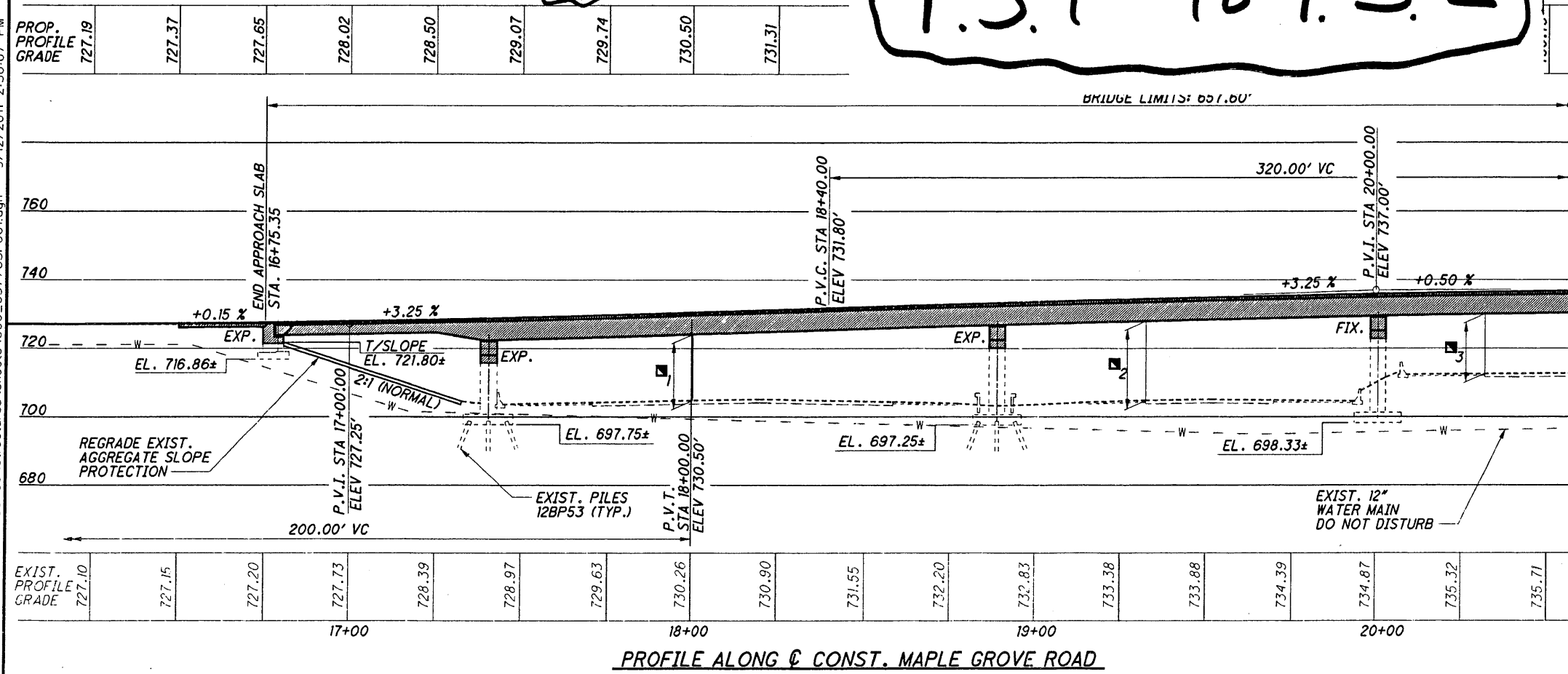
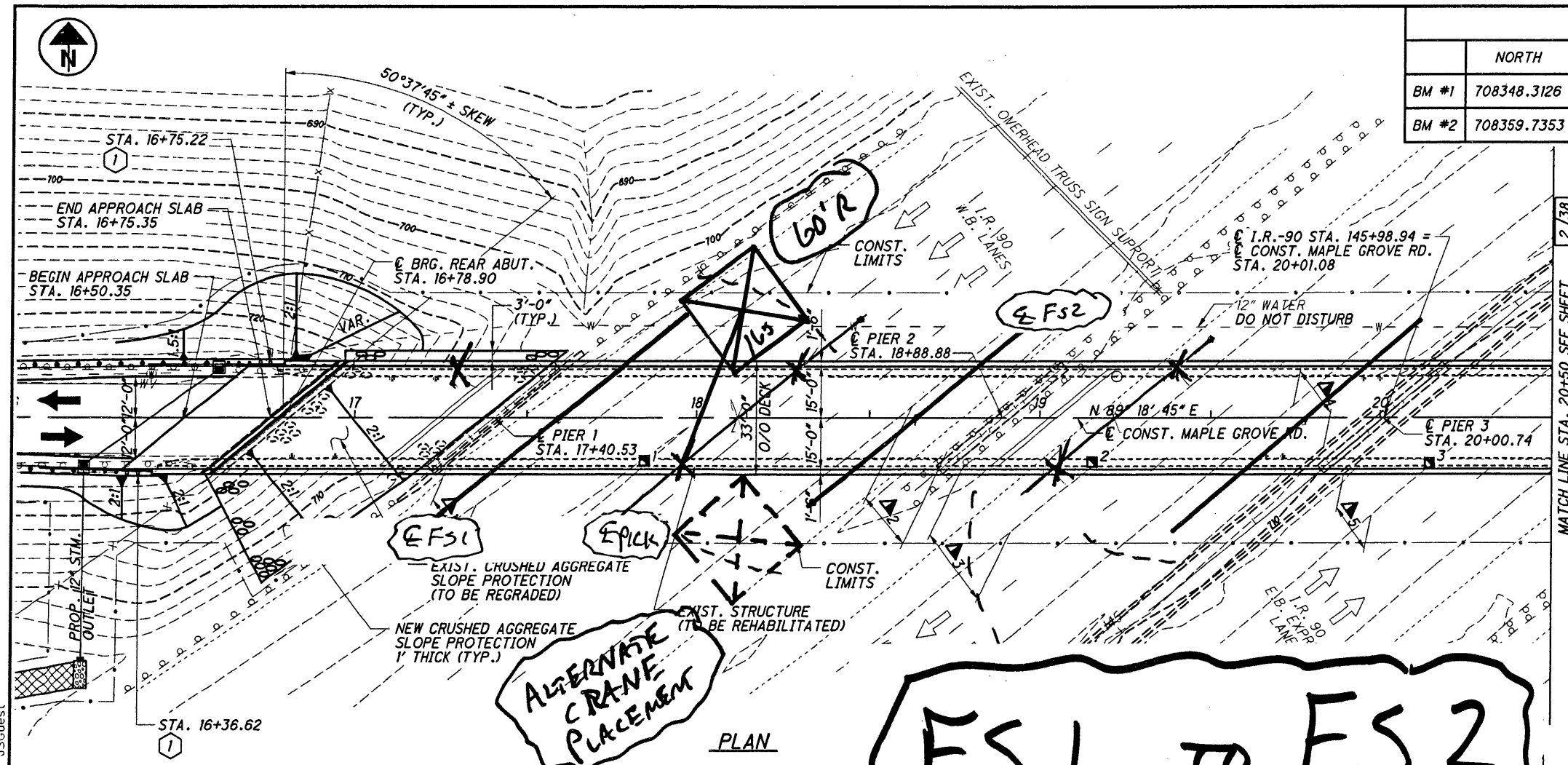
- ① BRIDGE TERMINAL ASSEMBLY, TYPE 1 (FIRST POST LOCATION)

EXISTING STRUCTURE

TYPE:	ROLLED BEAM (SPAN 1) CONTINUOUS RIVETED STEEL GIRDERS (SPANS 2 TO 6) (HINGE JOINTS IN SPANS 1 & 3) WITH REINFORCED CONCRETE DECK SLAB AND SUBSTRUCTURE
SPANS:	62'-0"±, 148'-4"±, 112'-0"±, 112'-0"±, 121'-6"±, 95'-0"± C/C BEARINGS
ROADWAY:	24'-0"± F/F 2'-0" SAFETY CURB
LOADING:	CF 130(57) ORIGINAL
SKEW:	50°37'45"± L.F.
APPROACH SLABS:	25'-0" (AS-1-54) (SPECIAL DESIGN)
ALIGNMENT:	TANGENT
CROWN:	0.016±
WEARING SURFACE:	1 1/4"± CONCRETE OVERLAY
STRUCTURAL FILE NUMBER:	4303636
DATE BUILT:	1963
DISPOSITION:	TO BE REHABILITATED

PROPOSED STRUCTURE

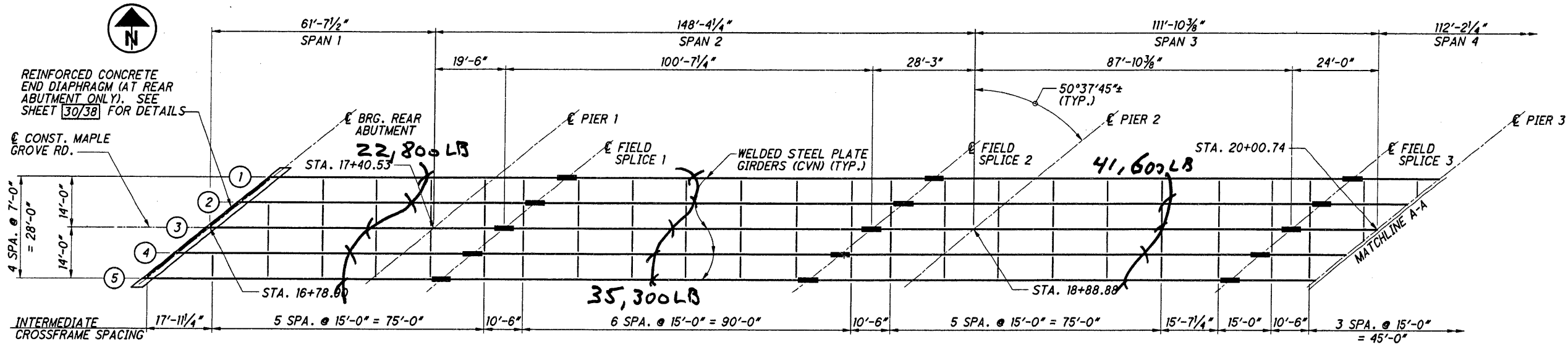
PROPOSED WORK:	REPLACE EXISTING DECK SLAB WITH NEW NON-COMPOSITE DECK SLAB & REPLACE EXISTING STEEL GIRDERS. MODIFY EXISTING ABUTMENTS AND WINGWALLS & REPLACE EXISTING PIER CAPS. REPLACE EXISTING BEARINGS WITH NEW ELASTOMERIC BEARINGS & SEAL CONCRETE SURFACES.
TYPE:	CONTINUOUS, NON-COMPOSITE ASTM A709 GRADE 50 STEEL GIRDERS (PAINTED) WITH REINFORCED CONCRETE DECK SLAB AND SUBSTRUCTURE (PORTIONS OF EXISTING SUBSTRUCTURE UNITS ARE TO BE SALVAGED)
SPANS:	61'-7 1/2"±, 148'-4 1/4"±, 111'-10 3/8"±, 112'-2 1/4"±, 121'-7 3/8"±, 94'-10 1/2"± C/C BEARINGS
ROADWAY:	30'-0" TOE/TOE PARAPETS
LOADING:	HS20 (CASE II) AND ALTERNATE MILITARY LOADING. FWS = 60 PSF
SKEW:	50°37'45"± L.F.
ALIGNMENT:	TANGENT
CROWN:	0.016
WEARING SURFACE:	1" MONOLITHIC CONCRETE
APPROACH SLABS:	25'-0" LONG (AS-1-81)
COORDINATES:	LATITUDE N41°36'21" LONGITUDE W81°26'00"



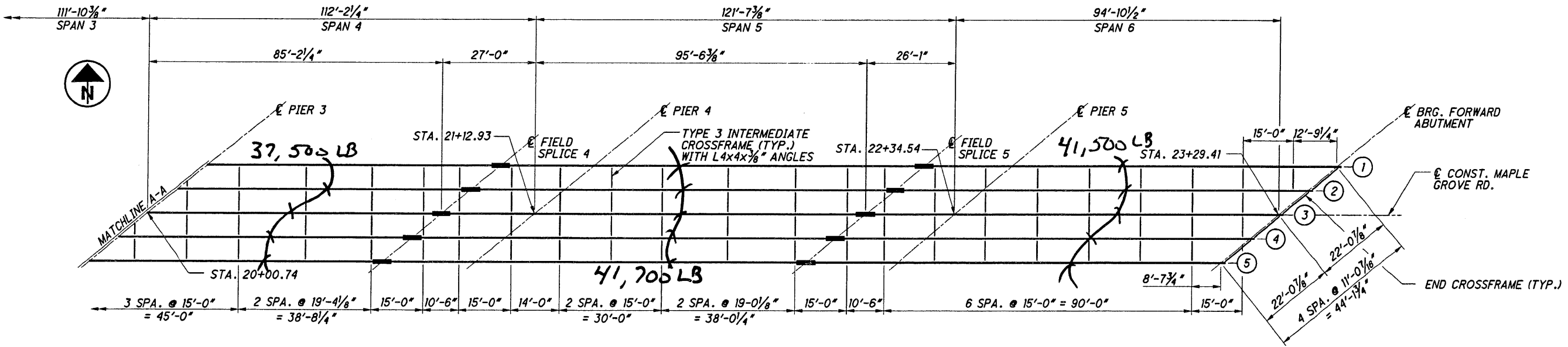
DESIGN AGENCY: JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44313
 DATE: 5-19-11
 REVIEWED: EDW
 STRUCTURE FILE NUMBER: 4303636
 DRAWN: RHC
 CHECKED: WJV
 LAKE COUNTY
 STA. 16+75.35
 STA. 23+32.95
 SITE PLAN
 BRIDGE NO. LAK-90-0377
 MAPLE GROVE RD. OVER I.R. 90
 LAK-90-3.77
 PID No. 83489
 1/38
 23/60

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PLAN
SPANS 1 TO 3

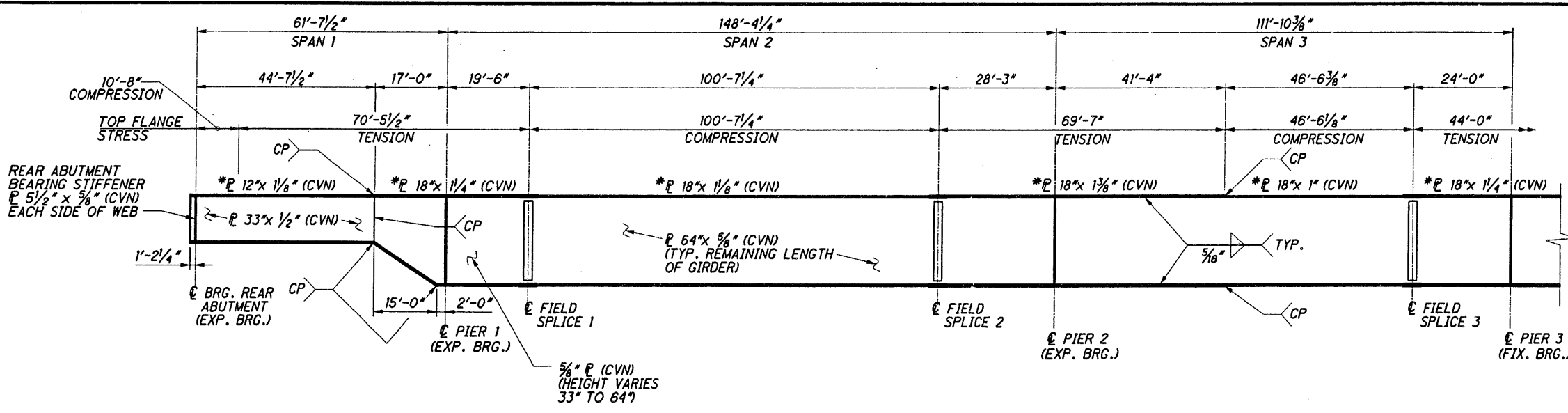


PLAN
SPANS 4 TO 6

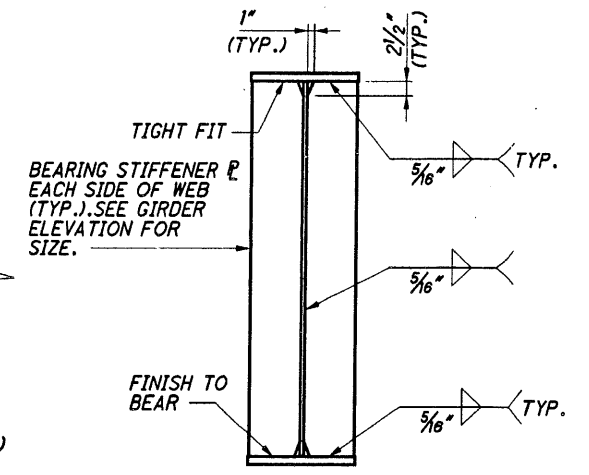
NOTES:

1. ALL STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 50 UNLESS OTHERWISE NOTED.
2. (CVN): WHERE A SHAPE OR PLATE IS DESIGNATED (CVN), FURNISH MATERIAL THAT MEETS THE MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN 711.01
3. PAINTING OF STRUCTURAL STEEL: ALL STEEL GIRDERS, CROSSFRAMES AND STIFFENERS SHALL BE PAINTED USING A TWO-COLOR SCHEME AS DETAILED ON SHEET [27/38].
4. FOR DEFLECTION AND CAMBER, SEE SHEETS [24/38] THRU [26/38].
5. FOR ADDITION GIRDER DETAILS, SEE SHEETS [23/38] & [27/38].
6. SEE STD DWG. GSD-1-96 FOR DETAILS NOT SHOWN.

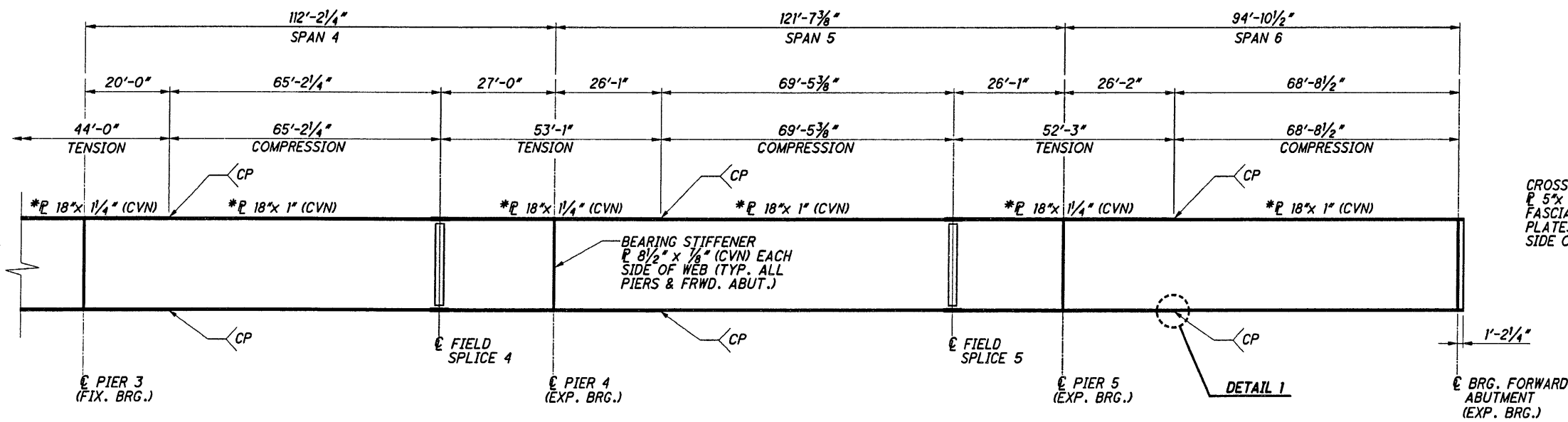
DESIGNED	RHC	CHECKED	WJV
DRAWN	RHC	REVISOR	
REVIEWED	EDW	DATE	5-19-11
DESIGN AGENCY	JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44313		
STRUCTURE FILE NUMBER	4303636		
FRAMING PLAN			
BRIDGE NO. LAK-90-0377 MAPLE GROVE RD. OVER I.R. 90			
LAK-90-3.77		PID No. 83489	
22/38		44/60	



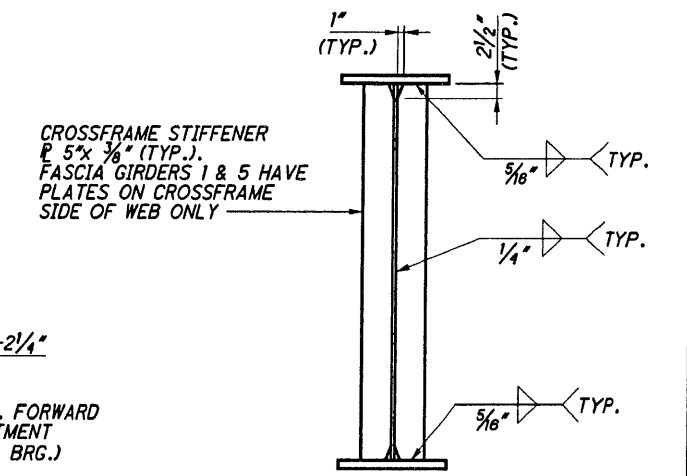
GIRDER ELEVATION
SPANS 1 TO 3



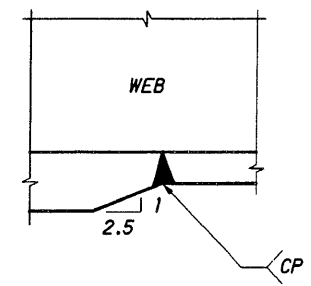
BEARING STIFFENER
DETAIL
PIER & FRWD. ABUT. SHOWN,
REAR ABUT. IS SIMILAR



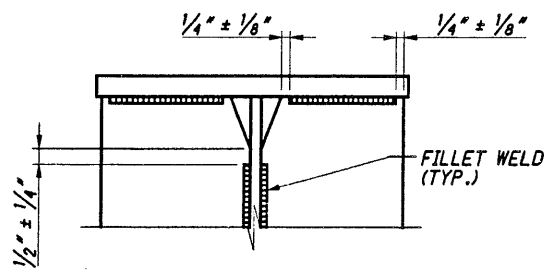
GIRDER ELEVATION
SPANS 4 TO 6



CROSSFRAME STIFFENER
DETAIL



DETAIL 1
TYP. FOR EACH FLANGE
THICKNESS TRANSITION
(TOP FLANGE SIMILAR)



TYPICAL STIFFENER WELD DETAIL

LEGEND:

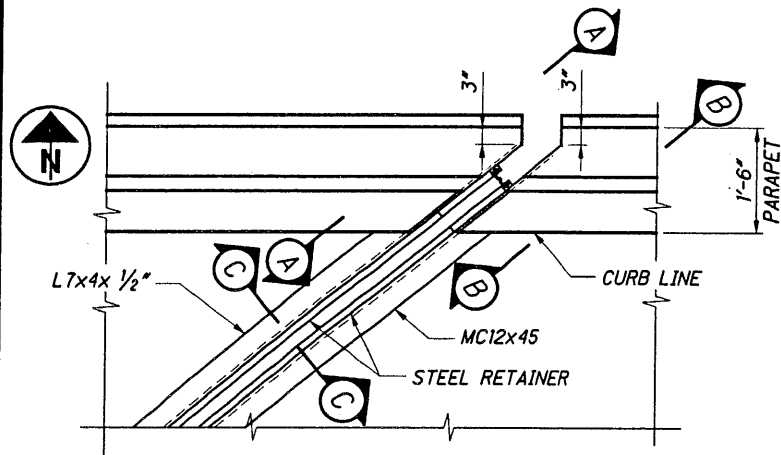
- * TOP & BOT. FLANGE \bar{r} 'S IDENTICAL
- CP COMPLETE JOINT PENETRATION WELD

NOTE:

WELD ATTACHMENTS OF SUPPORTS FOR CONCRETE DECK FINISHING MACHINE TO AREAS OF THE FASCIA GIRDER DESIGNATED "COMPRESSION". DO NOT WELD ATTACHMENTS TO AREAS DESIGNATED "TENSION". FILLET WELDS TO COMPRESSION FLANGES SHALL BE AT LEAST 1" FROM EDGE OF FLANGE, BE NO MORE THAN 2" LONG, AND BE AT LEAST 1/4" FOR THICKNESSES UP TO 1/4" OR 5/16" FOR GREATER THAN 3/4" THICK.

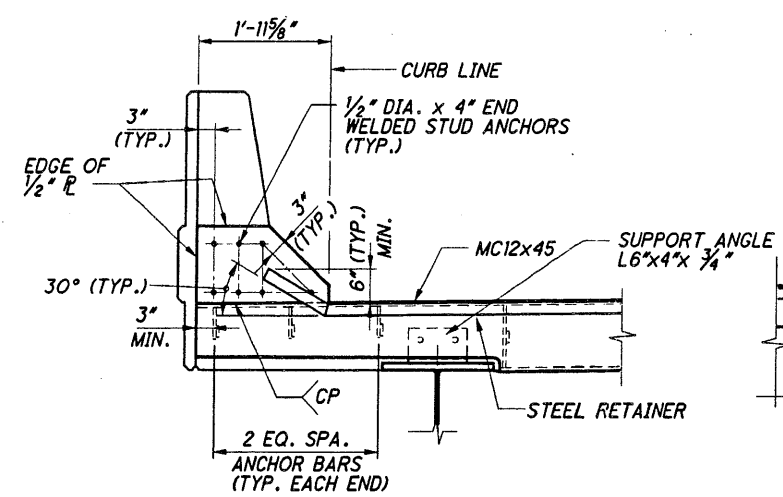
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DESIGN AGENCY JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44313	
DATE 5-19-11	REVIEWED EDW
DRAWN RHC	REVISOR WJV
STRUCTURE FILE NUMBER 4303636	
GIRDER ELEVATION & DETAILS	
BRIDGE NO. LAK-90-0377 MAPLE GROVE RD. OVER I.R. 90	
LAK-90-3.77	PID No. 83489
23 / 38	45 / 60

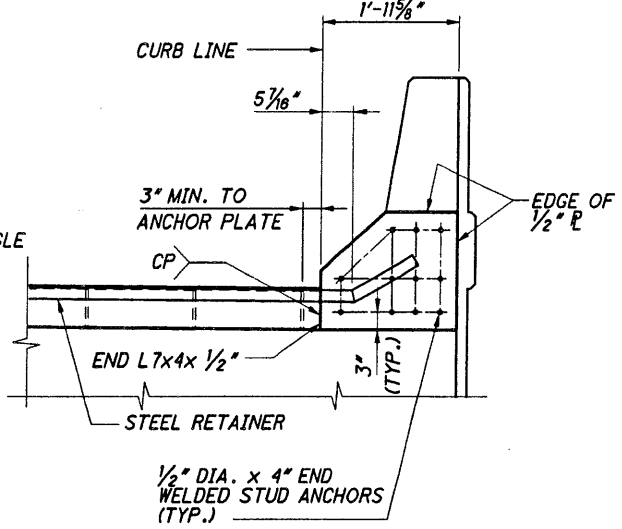


PARTIAL PLAN VIEW

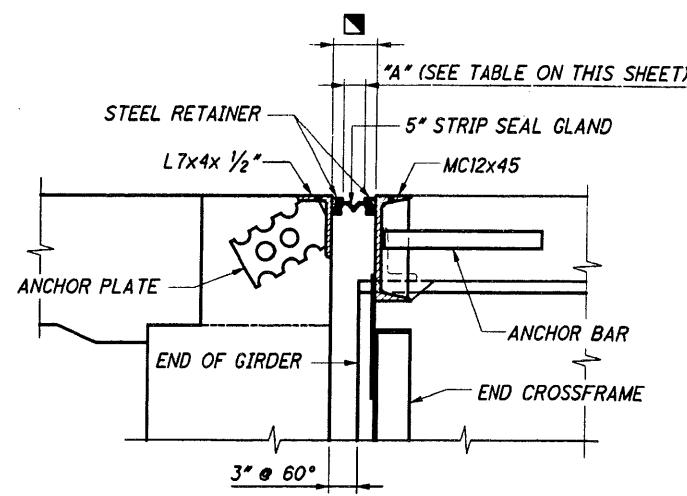
REAR ABUT. LEFT SHOWN, FRWD. ABUT. RIGHT SIMILAR
REAR ABUT. RIGHT & FRWD. ABUT. LEFT OPPOSITE HAND



VIEW A



VIEW B

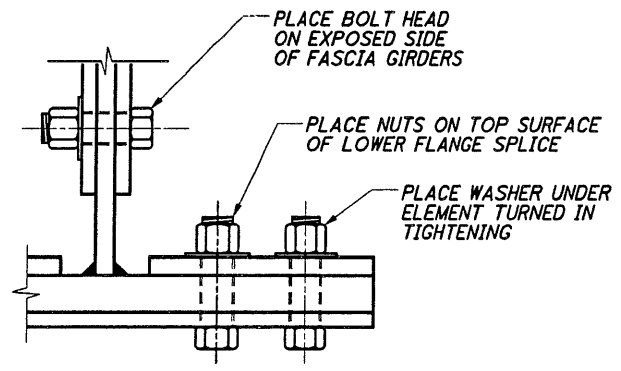


SECTION C

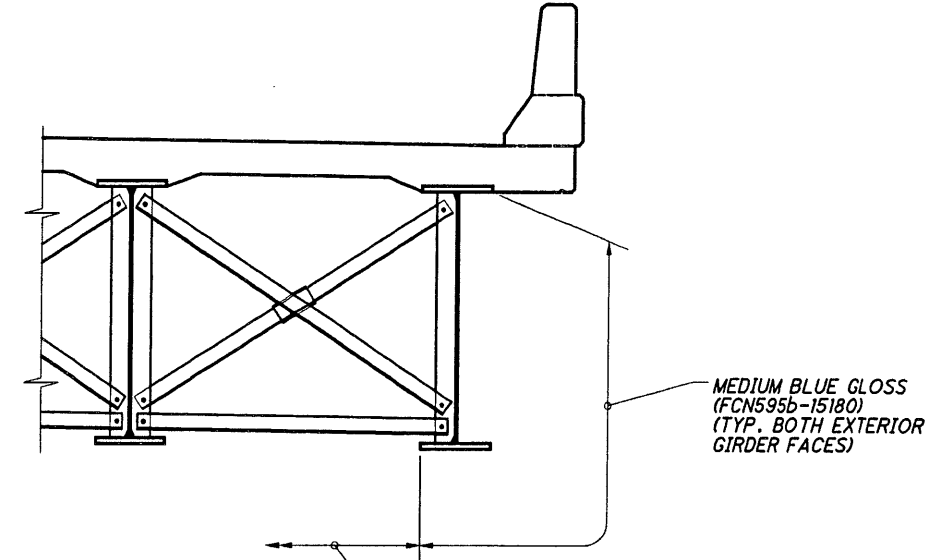
CONCRETE END BLOCK
NOT SHOWN FOR CLARITY

JOINT INSTALLATION TABLE

AMBIENT TEMPERATURE AT JOINT INSTALLATION (°F)	DIMENSION "A" (IN.)	
	REAR ABUT.	FRWD. ABUT.
90	2 1/8"	2"
80	2 1/4"	2 1/4"
70	2 3/8"	2 3/8"
60	2 5/8"	2 1/2"
50	2 3/4"	2 3/4"
40	2 7/8"	2 7/8"
30	3"	3"

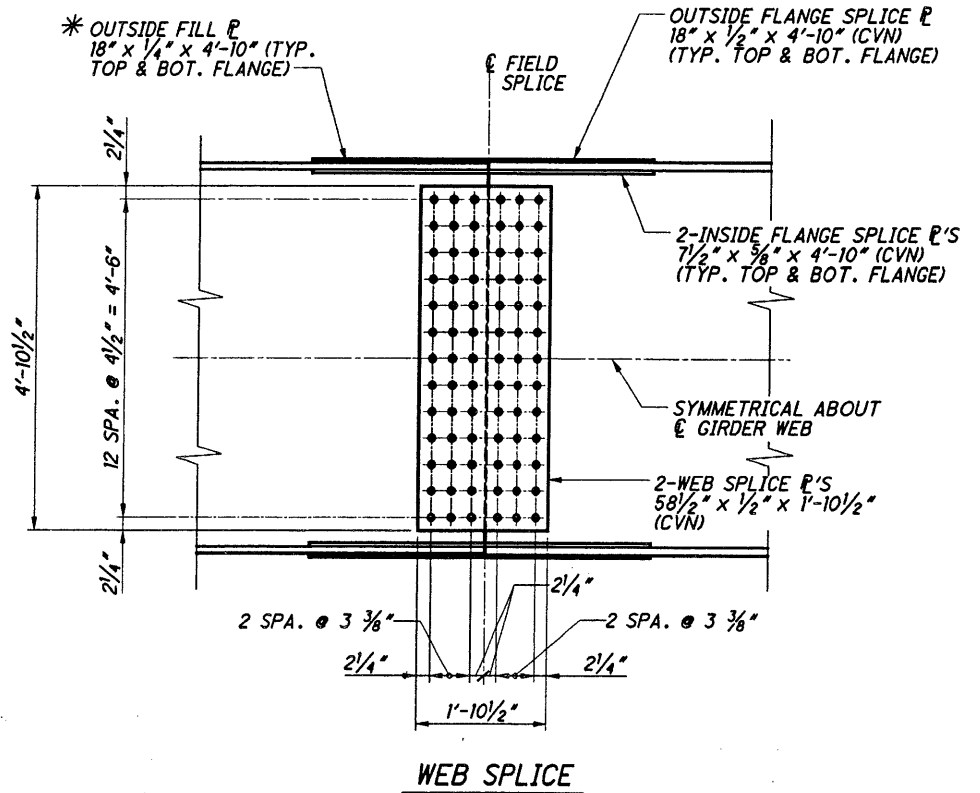


FIELD SPLICE PARTIAL SECTION
BOLT ORIENTATION DETAIL

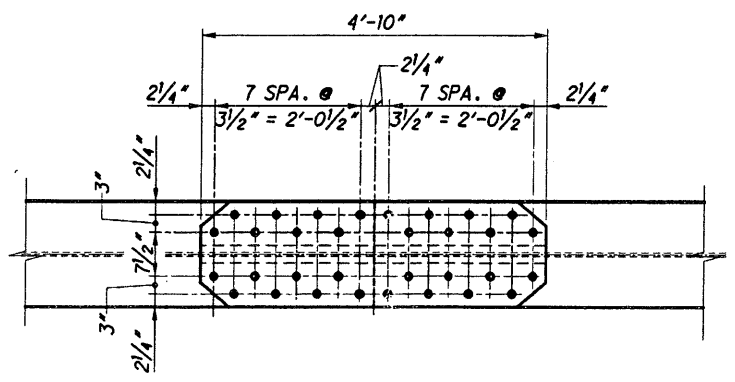


GIRDER PAINTING DETAIL

- LEGEND:**
- THIS DIMENSION IS THE SUM OF 2 x STEEL RETAINER WIDTH + "A"
 - * FILL P IS 18" x 1/4" x 4'-10" AT FIELD SPLICE 1
 - CP COMPLETE PENETRATION JOINT WELD
- NOTES:**
- ALL FASTENERS SHALL BE 1/2" DIAMETER A325, TYPE I, GALVANIZED HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
 - FOR ADDITIONAL STRUCTURAL STEEL NOTES, SEE SHEET 22/38.
 - FOR ADDITIONAL EXPANSION JOINT DETAILS, SEE STD. DWG. EXJ-4-87



WEB SPLICE



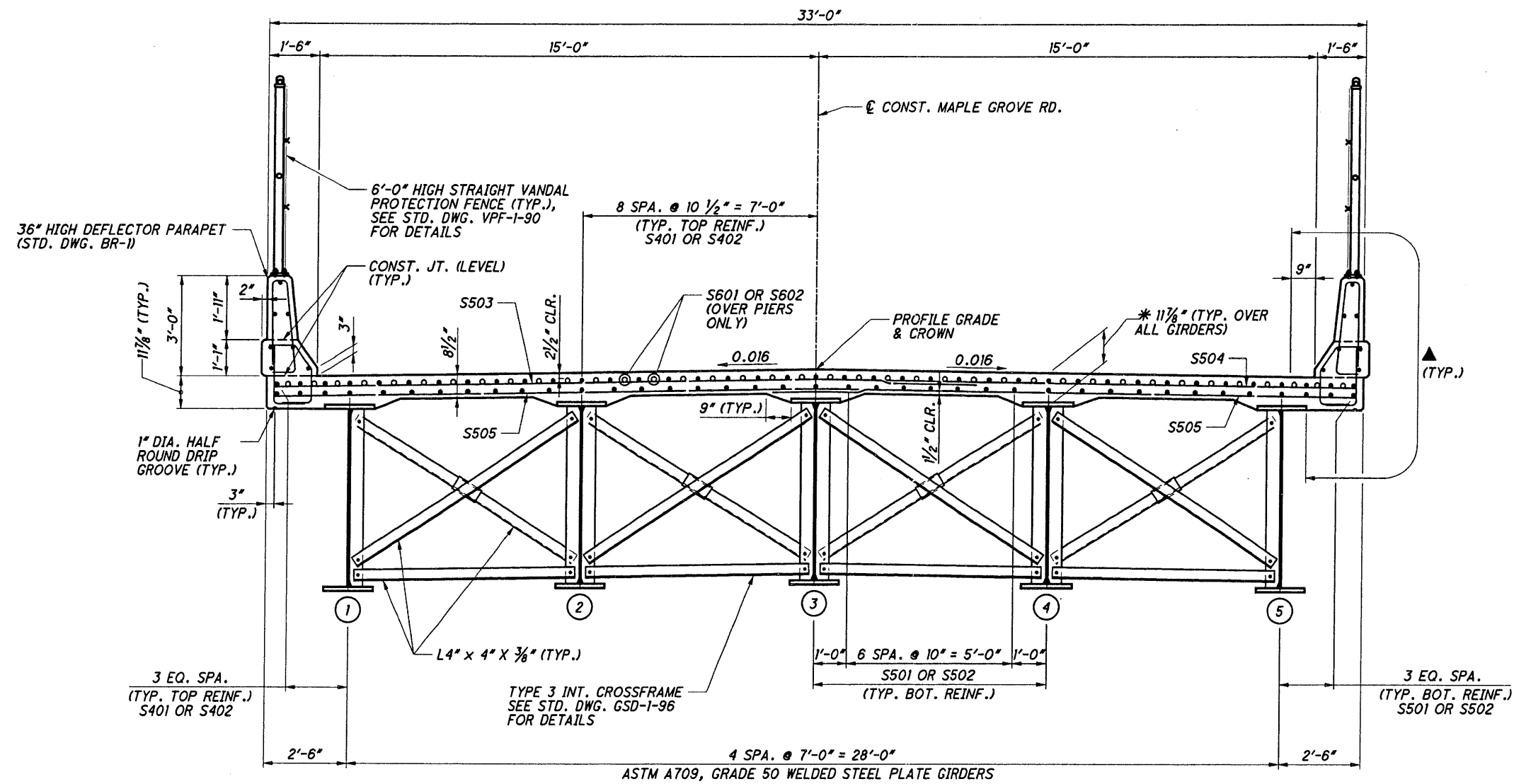
FLANGE SPLICE

FIELD SPLICE DETAILS
TYP. ALL FIELD SPLICE LOCATIONS

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DESIGN AGENCY: JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44313
 DATE: 5-19-11
 REVIEWED: EDW
 STRUCTURE FILE NUMBER: 4303636
 DRAWN: RHC
 CHECKED: WJV
 DESIGNED: RHC
 BRIDGE NO.: LAK-90-0377
 MAPLE GROVE RD., OVER I.R.-90
LAK-90-3.77
 PID No. 83489
 27/38
 49
 60

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TRANSVERSE SECTION

- LEGEND:**
- ▲ LIMITS OF ITEM 512, SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
 - * MEASURED FROM TOP SURFACE OF DECK TO TOP OF GIRDER WEB. ACTUAL THICKNESS MAY VARY. SEE NOTE 2.

- NOTES:**
1. FOR DECK SLAB PLAN AND ADDITIONAL PARAPET DETAILS, SEE SHEETS [29/38] AND [34/38].
 2. DECK SLAB CONCRETE QUANTITY: THE ESTIMATED QUANTITY OF DECK SLAB CONCRETE IS BASED ON THE CONSTANT DECK SLAB THICKNESS, AS SHOWN, PLUS THE QUANTITY OF CONCRETE THAT FORMS EACH BEAM HAUNCH. THE ESTIMATE ASSUMES A CONSTANT HAUNCH THICKNESS OF 2 INCHES AND A CONSTANT HAUNCH WIDTH OUTSIDE THE EDGE OF EACH BEAM/GIRDER FLANGE OF 9 INCHES. DEVIATE FROM THIS HAUNCH THICKNESS AS NECESSARY TO PLACE THE DECK SURFACE AT THE FINISHED GRADE. THE ALLOWABLE TOLERANCE FOR THE HAUNCH WIDTH OUTSIDE THE EDGE OF EACH BEAM/GIRDER FLANGE IS ± 3 INCHES.

THE HAUNCH THICKNESS WAS MEASURED AT THE CENTERLINE OF THE BEAM, FROM THE SURFACE OF THE DECK TO THE BOTTOM OF THE TOP FLANGE MINUS THE DECK SLAB THICKNESS. THE AREA OF ALL EMBEDDED STEEL PLATES HAS BEEN DEDUCTED FROM THE HAUNCH QUANTITY IN ACCORDANCE WITH 511.24.
 3. ALL INTERMEDIATE CROSSFRAME MEMBERS SHALL BE FULLY TIGHTENED AND WELDED ACCORDING TO CMS 513 PRIOR TO DECK PLACEMENT.

DESIGNED RHC	DRAWN MDC	REVIEWED EDW	DATE 5-19-11	DESIGN AGENCY JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44313
CHECKED WJV	REVISED	STRUCTURE FILE NUMBER 4303636		
TRANSVERSE SECTION				
BRIDGE NO. LAK-90-0377				
MAPLE GROVE RD. OVER I.R. 90				
LAK-90-3.77		PID No. 83489		
28/38		50/60		

NOTES:

1. ELASTOMERIC BEARINGS: THE ELASTOMER SHALL HAVE A HARDNESS OF 50 DUROMETER. THE BEARINGS WERE DESIGNED UNDER DIVISION I, SECTION 14.6.6 (METHOD A) OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.
2. WELDING: CONTROL WELDING SO THAT THE PLATE TEMPERATURE AT THE ELASTOMER BONDED SURFACE DOES NOT EXCEED 300° F AS DETERMINED BY THE USE OF PYROMETRIC STICKS OR OTHER TEMPERATURE MONITORING DEVICES.
3. BEARING REPOSITIONING: IF THE STEEL IS ERECTED AT AN AMBIENT TEMPERATURE HIGHER THAN 80° F OR LOWER THAN 40° F AND THE BEARING SHEAR DEFLECTION EXCEEDS 1/8 OF THE BEARING HEIGHT AT 60° F (±) 10° F, RAISE THE GIRDERS TO ALLOW THE BEARING TO RETURN TO THEIR UNDEFORMED SHAPE AT 60° F (±) 10° F.
4. GRADE 50 STEEL SHALL BE USED FOR ALL STEEL PLATES. THE LOAD PLATE SHALL BONDED BY VULCANIZED TO THE LAMINATED ELASTOMERIC PAD DURING THE MOLDING PROCESS.
5. ANCHOR RODS SHALL BE GALVANIZED AS PER CMS 711.02. ANCHOR RODS SHALL EXTEND 1 INCH ABOVE THE LOAD PLATE.
6. BASIS OF PAYMENT: THE UNIT PRICE BID SHALL INCLUDE ALL MATERIALS, LABOR, TESTING AND INCIDENTALS NECESSARY TO FURNISH AND INSTALL THE LAMINATED ELASTOMERIC BEARINGS AND STEEL LOAD PLATES. PAYMENT WILL BE MADE AT THE CONTRACT PRICE FOR ITEM 516 - ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN.
7. FOR THE LOCATION OF DETAILS 1 & 2, SEE SHEET 21/38

PTFE AND STAINLESS STEEL SLIDING SURFACES

(ABUTMENTS, PIERS 1 & 5)

8. PTFE SURFACE:

FINISHED UNFILLED DIMPLED LUBRICATED PTFE SHEETS SHALL BE MADE FROM 100 PERCENT VIRGIN PTFE RESIN AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

TENSILE STRENGTH ASTM D4894 - 2800 PSI (MINIMUM)
 ELONGATION ASTM D4894 - 200 PERCENT (MINIMUM)
 SPECIFIC GRAVITY ASTM D792 - 2.13 (MINIMUM)
 MELTING POINT - ASTM D4894 - 623° F (±2° F)

THE SHEET SHALL BE RECESSED AND EPOXY BONDED INTO THE STEEL SUBSTRATE. THE SHOULDERS OF THE RECESS SHALL BE SHARP AND SQUARE AND THE DEPTH SHALL BE EQUAL TO ONE-HALF OF THE PTFE THICKNESS.

PTFE SHEET SHALL BE COMMERCIALY ETCHED ON ITS BONDING SIDE.

THE BONDING SURFACE OF THE SUBSTRATE PLATE SHALL BE CLEANED OF RUST, SCALE, OIL AND GREASE BY BLAST CLEANING AND THEN WIPED CLEAN WITH A CLEANING SOLVENT. BLAST CLEANING SHALL BE PERFORMED WITHIN A MAXIMUM OF FOUR HOURS TO BONDING.

THE ADHESIVE MATERIAL, THE BONDING PROCEDURES TO BE USED, AND SURFACE PREPARATION SHALL CONFORM TO THE REQUIREMENTS OF FEDERAL SPECIFICATION MMM-A-134 AND THE MANUFACTURER'S RECOMMENDATIONS. THE ADHESION BETWEEN THE PTFE AND STEEL SUBSTRATE SHALL BE TESTED IN ACCORDANCE WITH ASTM D429, METHOD B. THE MINIMUM PEEL STRENGTH SHALL BE 25 POUNDS PER INCH.

AFTER COMPLETION OF THE BONDING OPERATION, THE PTFE SURFACE SHALL BE FREE FROM BUBBLES.

9. STAINLESS STEEL PLATES:

THE STAINLESS STEEL SHEET SURFACE SHALL CONFORM TO ASTM A167 OR A240 TYPE 304 AND SHALL HAVE A #8 MIRROR FINISH OR BETTER.

THE STAINLESS STEEL SHALL BE ATTACHED TO THE LOAD PLATE BY A CONTINUOUS SEAL WELD AROUND ITS ENTIRE PERIMETER. WELDS SHALL BE PREQUALIFIED BY TEST WELDS PREPARED, WELDED AND TESTED IN ACCORDANCE WITH 6.7 OF ANSI/AWS D1.3, STRUCTURAL WELDING CODE - SHEET STEEL. AFTER WELDING, THE STAINLESS STEEL SHEET SHALL BE FLAT, FREE FROM WRINKLES AND IN CONTINUOUS CONTACT WITH ITS BACKING PLATE. NO ROUGHNESS FROM THE WELD PROTRUDING ABOVE THE SURFACE OF THE STAINLESS STEEL WILL BE PERMITTED.

10. LUBRICANT:

LUBRICANTS SHALL BE SILICONE GREASE WHICH SATISFIES MILITARY SPECIFICATIONS MIL-S8660.

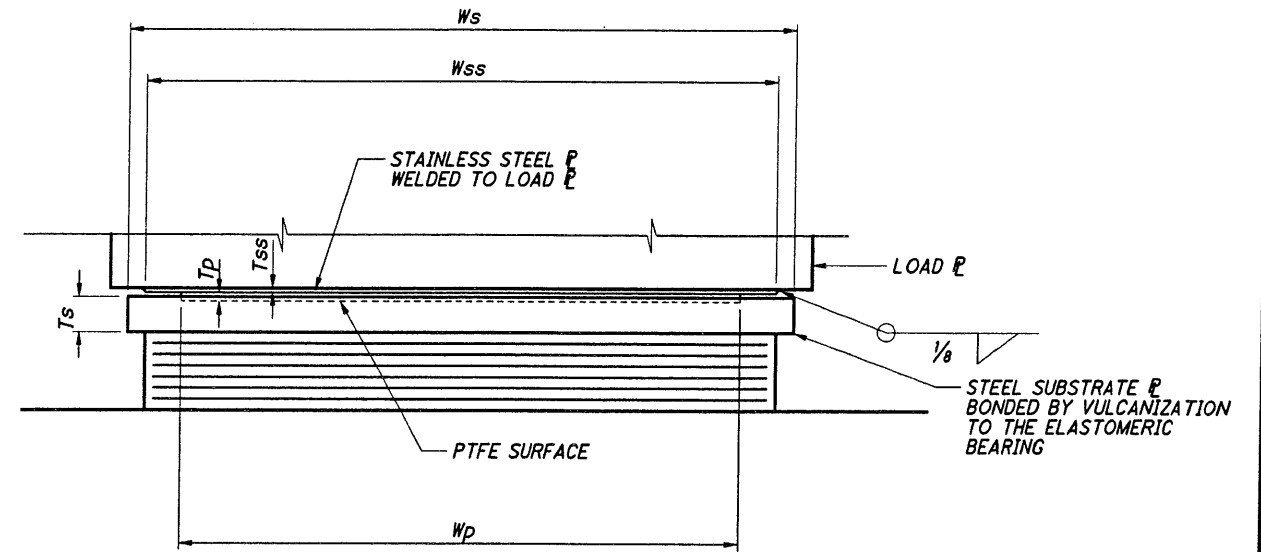
11. TESTING OF THE SLIDING SURFACES:

IN ADDITION TO THE TESTS REQUIRED FOR METHOD A DESIGN, A MATERIAL FRICTION TEST FOR THE SLIDING SURFACES SHALL BE PERFORMED PER DIVISION II, SECTION 18.7.2.2 AND 18.7.4.2 OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

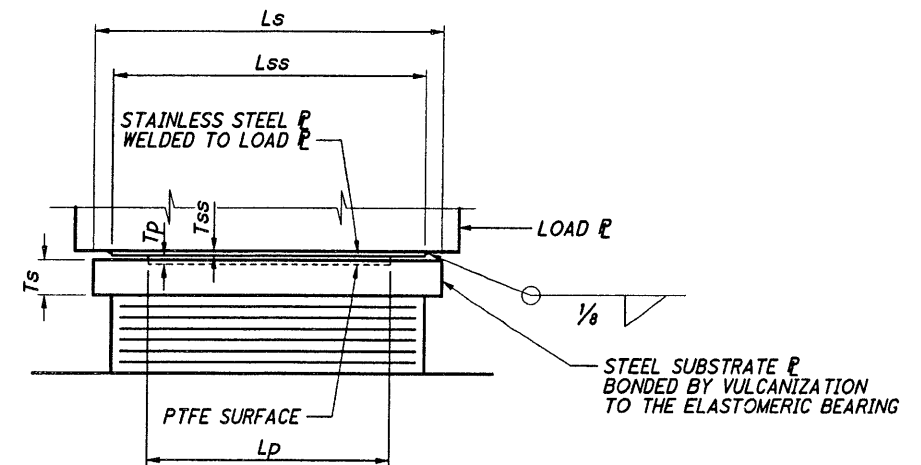
12. INSTALLATION OF SLIDING BEARINGS:

A REPRESENTATIVE FROM THE BEARING MANUFACTURER SHALL BE PRESENT ON SITE FOR A SUFFICIENT PERIOD OF TIME TO ENSURE THAT THE CONTRACTOR IS INSTALLING THE BEARINGS PROPERLY.

13. THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, LABOR, TESTING, SUBSTRATE PLATES, STAINLESS STEEL PLATES, PTFE SURFACES, LUBRICANT AND INCIDENTALS NECESSARY TO FURNISH AND INSTALL THE SLIDING PLATES. PAYMENT WILL BE MADE AT THE CONTRACT PRICE FOR ITEM 516, BEARING DEVICE MISC.: ELASTOMERIC BEARING WITH INTERNAL LAMINATES, LOAD PLATE AND PTFE (NEOPRENE), AS PER PLAN.



DETAIL 1



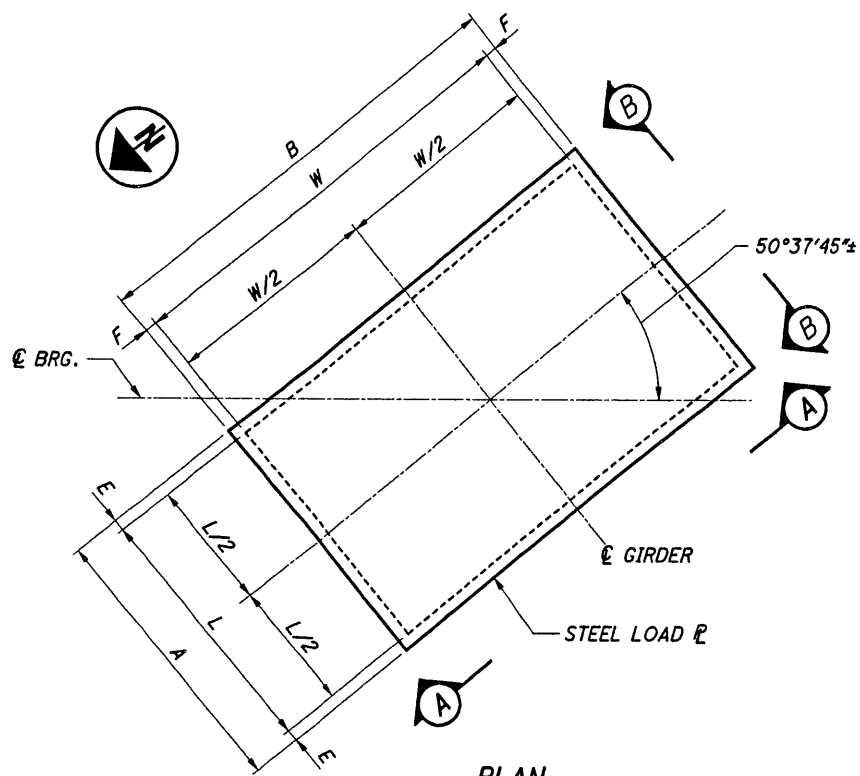
DETAIL 2

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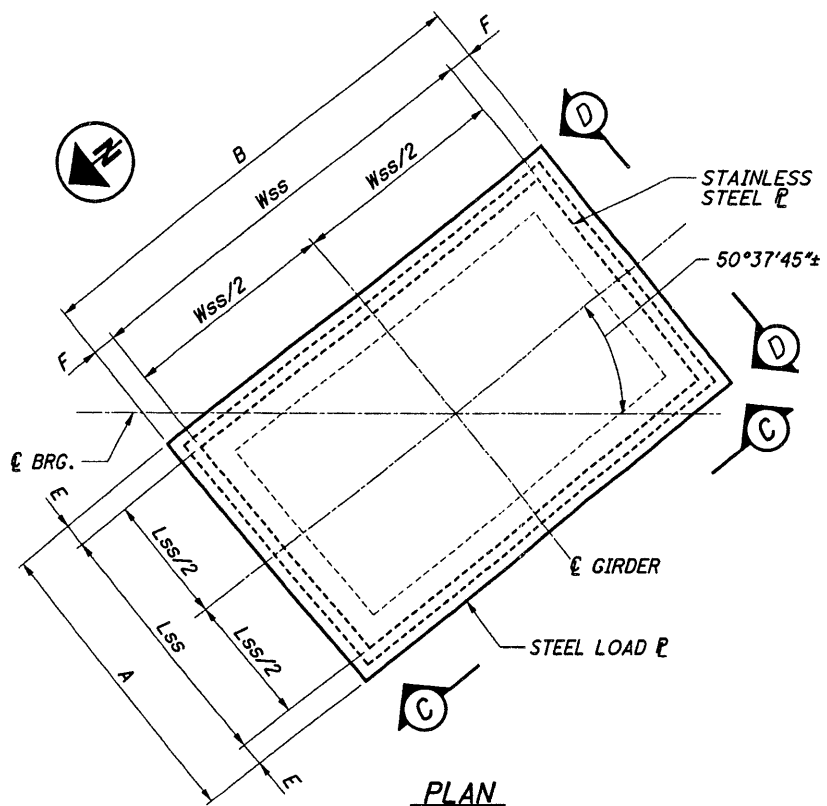
DESIGNED	RHC	CHECKED	WJV
DRAWN	JMW	REVISOR	
REVIEWED	EDW	DATE	5-19-11
DESIGN AGENCY	JONES-STUCKEY LTD., INC. 1655 W. MARKET STREET, SUITE 355 AKRON, OHIO 44313		
BEARING DETAILS			
BRIDGE NO. LAK-90-0377			
MAPLE GROVE RD. OVER I.R. 90			
LAK-90-3.77		PID No. 83489	
20/38		42/60	

BEARING SCHEDULE

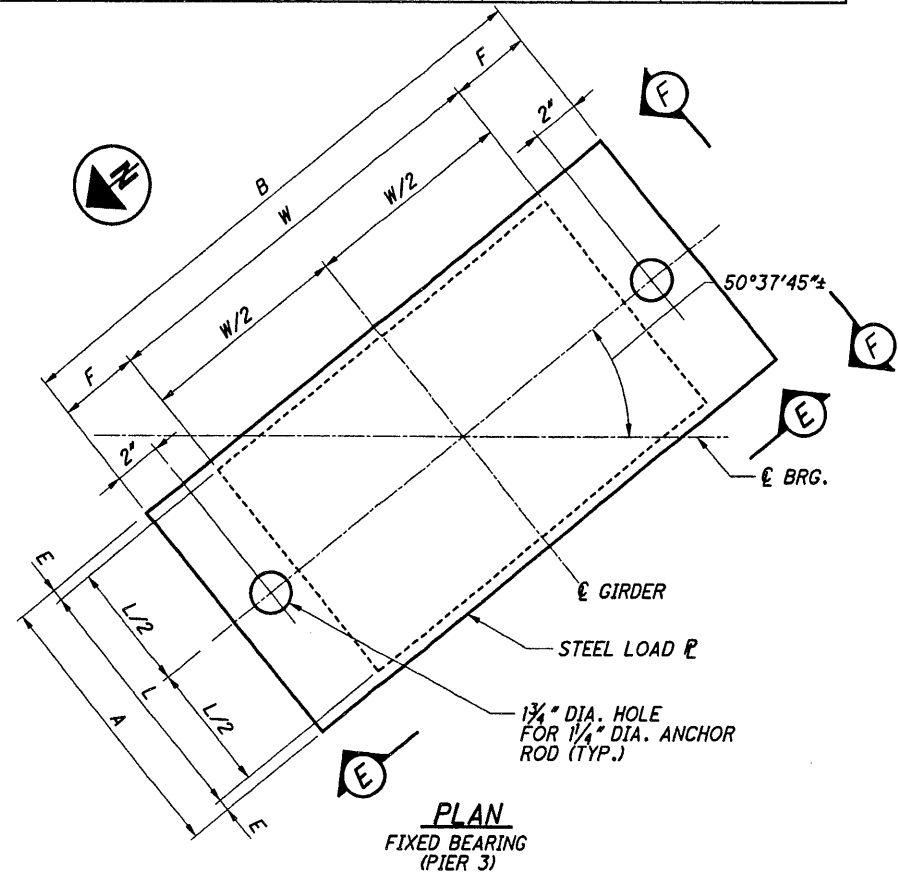
	LOAD PLATE						ELASTOMERIC PAD						STEEL LAMINATES NO. THICK.	STAINLESS STEEL PLATE			STEEL SUBSTRATE PLATE			PTFE SURFACE			TYPE	DEAD LOAD (K)	LIVE * LOAD (K)	TOTAL LOAD (K)	
	A	B	E	F	G	H	L	W	T	NO. OF INTER. LAYERS	ti	te		Lss	Wss	Tss	Ls	Ws	Ts	Lp	Wp	Tp					
														* WITHOUT IMPACT													
REAR. ABUT.	12"	14"	1/2"	1"	1 1/2"	1 1/8"	8"	11"	1.71"	4	0.25"	0.17"	5	0.0747	11"	12"	1/8"	9"	12"	1"	6"	10"	1/4"	EXP	34.5	40.6	75.1
PIER 1	17"	25"	1/2"	1/2"	2 5/16"	2 1/16"	14"	23"	2.79"	4	0.45"	0.31"	5	0.0747	16"	24"	1/8"	15"	24"	1"	12"	22"	1/4"	EXP	212.9	68.3	281.2
PIER 2	17"	24"	1/2"	1/2"	2 5/16"	2 1/16"	16"	23"	3.37"	5	0.46"	0.31"	6	0.0747	-	-	-	-	-	-	-	-	-	EXP	265.1	81.1	346.2
PIER 3	14"	28"	1/2"	3"	2 5/16"	2 1/16"	13"	22"	2.35"	4	0.37"	0.25"	5	0.0747	-	-	-	-	-	-	-	-	-	FIX	180.5	71.0	251.5
PIER 4	15"	24"	1/2"	1/2"	2 5/16"	2 1/16"	14"	23"	3.32"	5	0.45"	0.31"	6	0.0747	-	-	-	-	-	-	-	-	-	EXP	215.6	73.1	288.7
PIER 5	17"	25"	1/2"	1/2"	2 5/16"	2 3/8"	14"	23"	2.79"	4	0.45"	0.31"	5	0.0747	16"	24"	1/8"	15"	24"	1"	12"	22"	1/4"	EXP	214.6	70.3	284.9
FRWD. ABUT.	13"	20"	1/2"	3"	1 1/2"	1 1/8"	9"	13"	1.71"	4	0.25"	0.17"	5	0.0747	12"	14"	1/8"	10"	14"	1"	7"	12"	1/4"	EXP	61.3	45.0	106.3



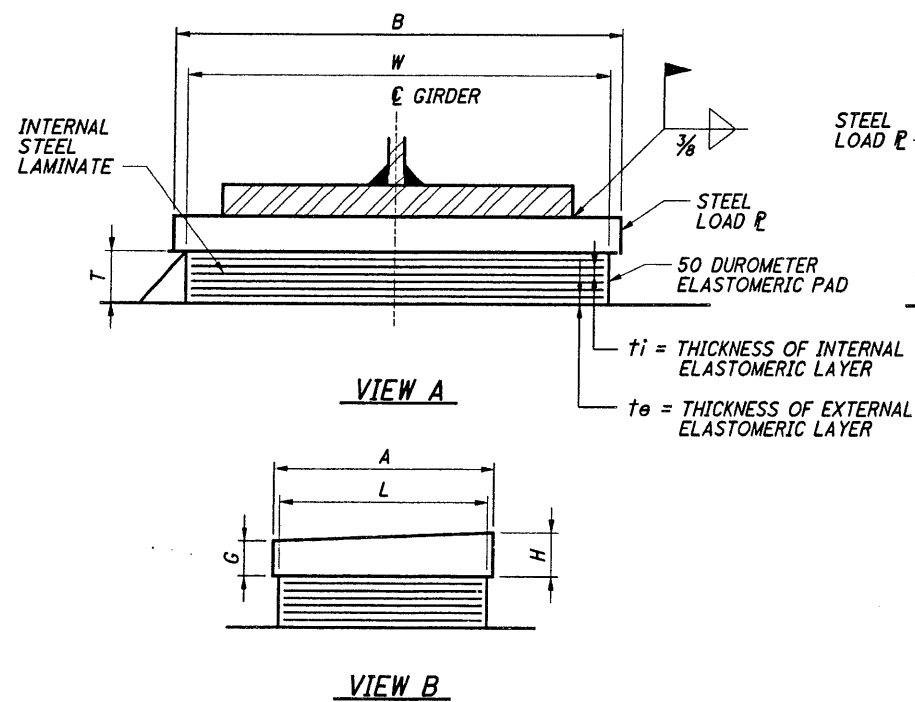
PLAN
EXPANSION BEARING
(PIERS 2 & 4)



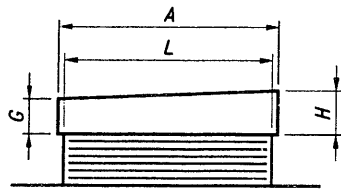
PLAN
EXPANSION BEARING WITH PTFE
(PIERS 1 & 5, ABUTMENTS)



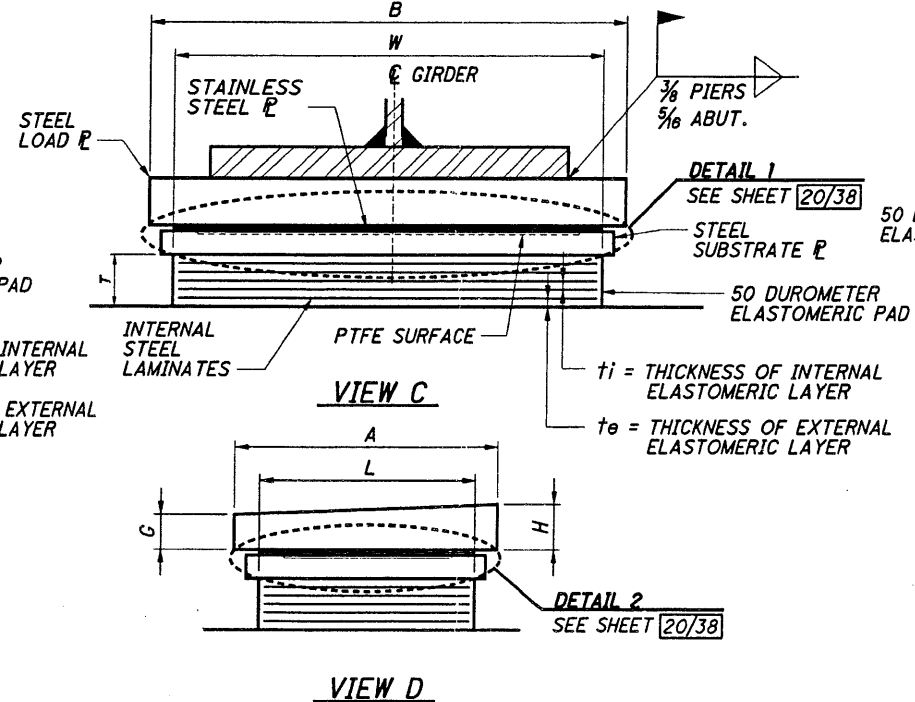
PLAN
FIXED BEARING
(PIER 3)



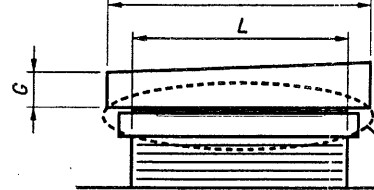
VIEW A



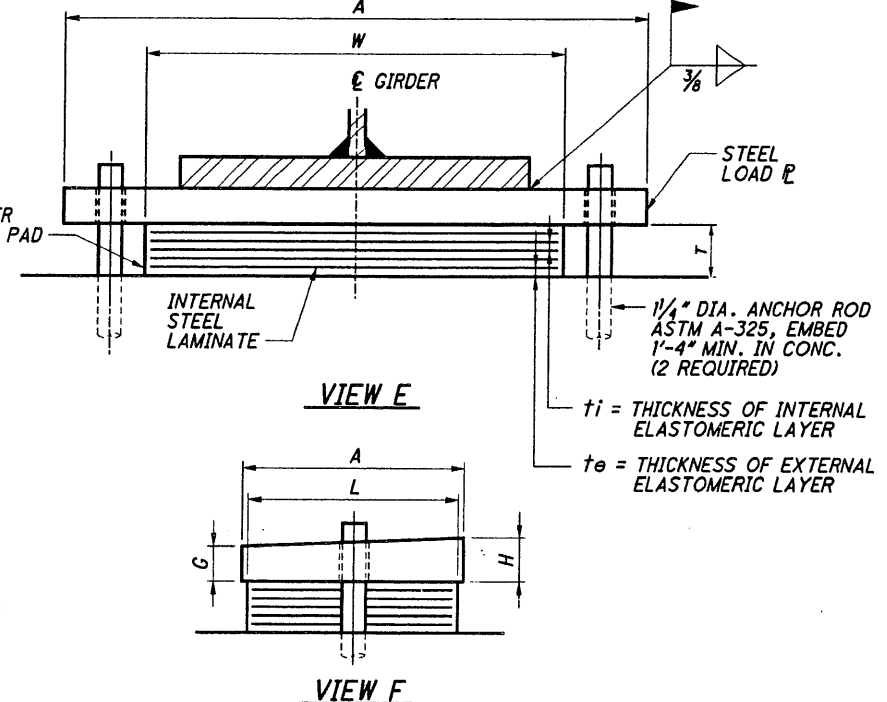
VIEW B



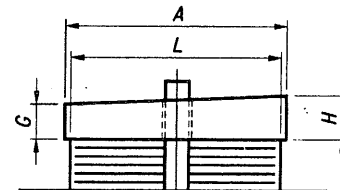
VIEW C



VIEW D



VIEW E



VIEW F

P:\3019 LAK-90-03.77\83489\structures\sheets\000_0377CBR001.dgn 9/12/2011 1:40:18 PM JSGuest

BEARING DETAILS

BRIDGE NO. LAK-90-0377
MAPLE GROVE RD. OVER I.R. 90

LAK-90-3.77
PID No. 83489

21/38

43/60

DESIGNED: RHC
CHECKED: WJV


DRAWN: JMW
REVISED:

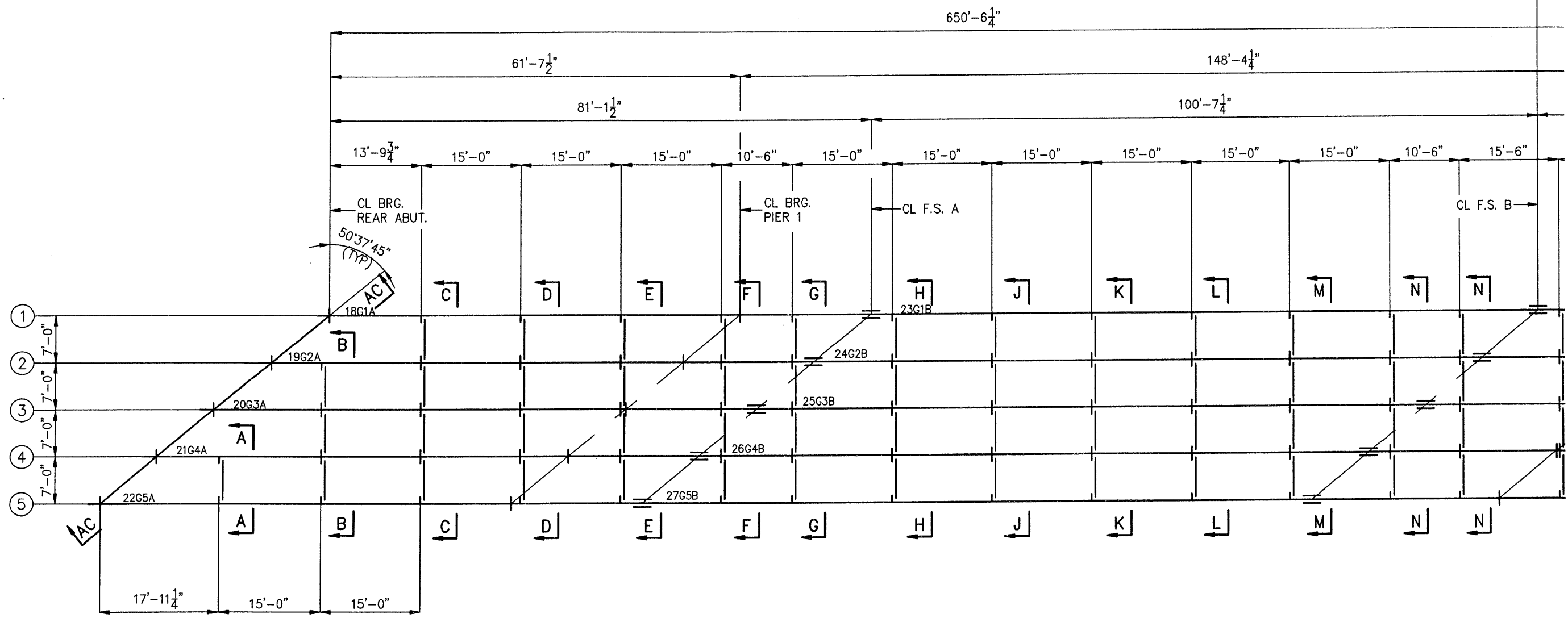
REVIEWED: EDW
DATE: 5-19-11

STRUCTURE FILE NUMBER: 4303636

DESIGN AGENCY: JONES-STUCKEY LTD., INC.
1655 W. MARKET STREET, SUITE 355
AKRON, OHIO 44313

STUPP BRIDGE COMPANY, 3800 WEBER ROAD, ST. LOUIS, MO 63125 LAST SAVED: 4/30/2012 11:15 AM BY: ENGR

MATCH LINE A 




FRAMING PLAN
(ALL DIM'S HORIZONTAL)



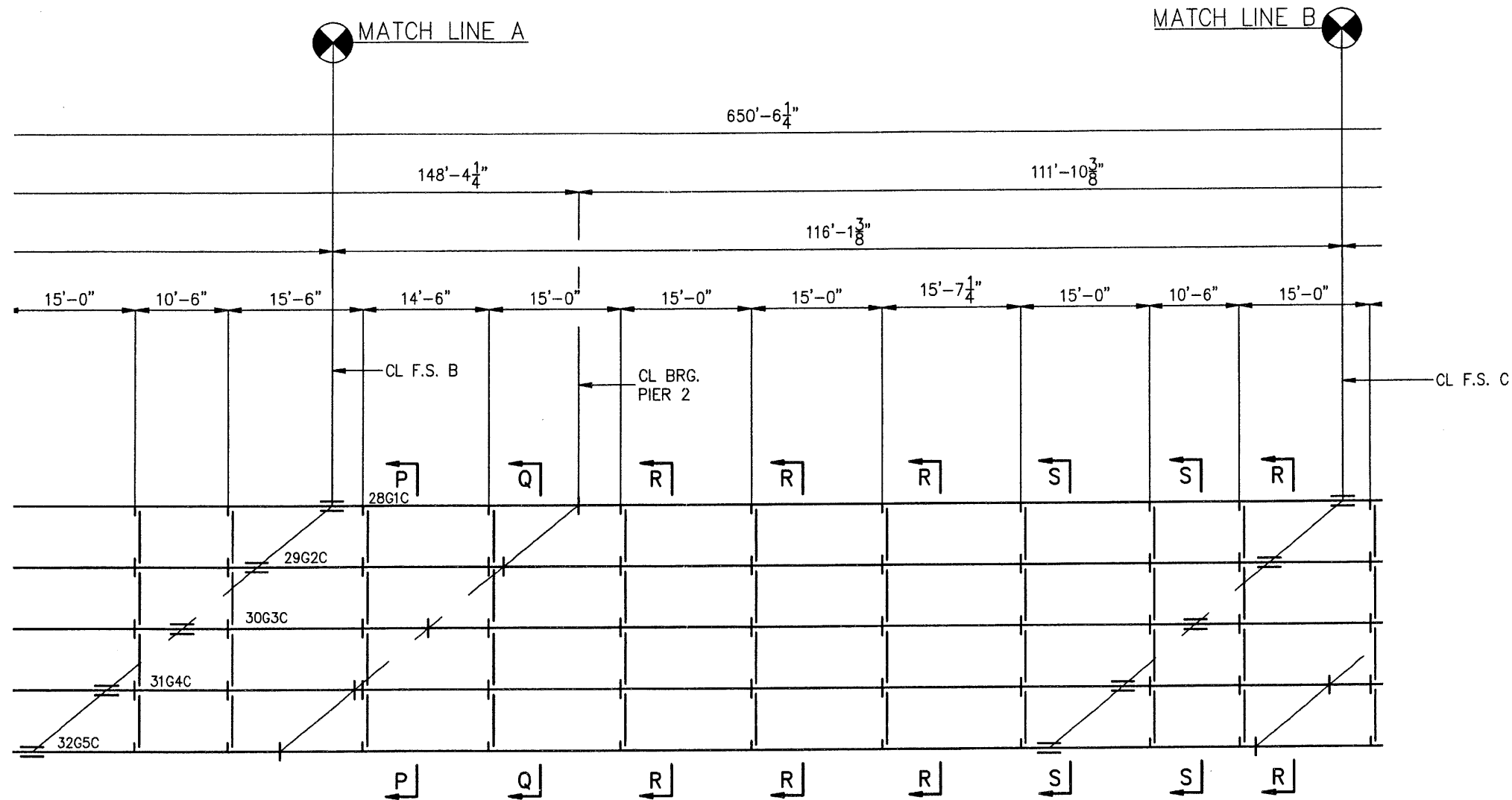
MAY 28 2012



- NOTES:**
 1) REFER TO SHEET GN1 FOR GENERAL NOTES.
 2) REFER TO SHEETS E6 THRU E12 FOR SECTIONS.

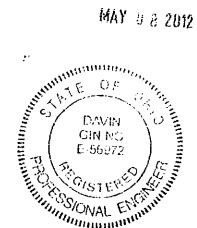
 DIVISION of Stupp Bros., Inc.		REV. 0	BY N/A	DATE N/A	CHK N/A	N/A	DESCRIPTION
		BRIDGE No. LAK-90-0377 MAPLE GROVE RD OVER I.R. 90					
DR. NEB	CREATION DATE: 01/24/2012	PROJECT No. 120007		JOB NO. 00450			
	EDITED DATE: 04/02/2012-12:38:03	LOCATION LAKE COUNTY, OHIO		DWG. NO. E1		1 OF 1	
	CHK. DATE: 02/10/2012	CONTRACT ID LAK83489					
CHK. JCF	APPROVAL DATE: 04/30/2012	STA. 20+00.00					

STUPP BRIDGE COMPANY, 3800 WEBER ROAD, ST. LOUIS, MO 63125 LAST SAVED: 4/30/2012 11:15 AM BY: ENOR



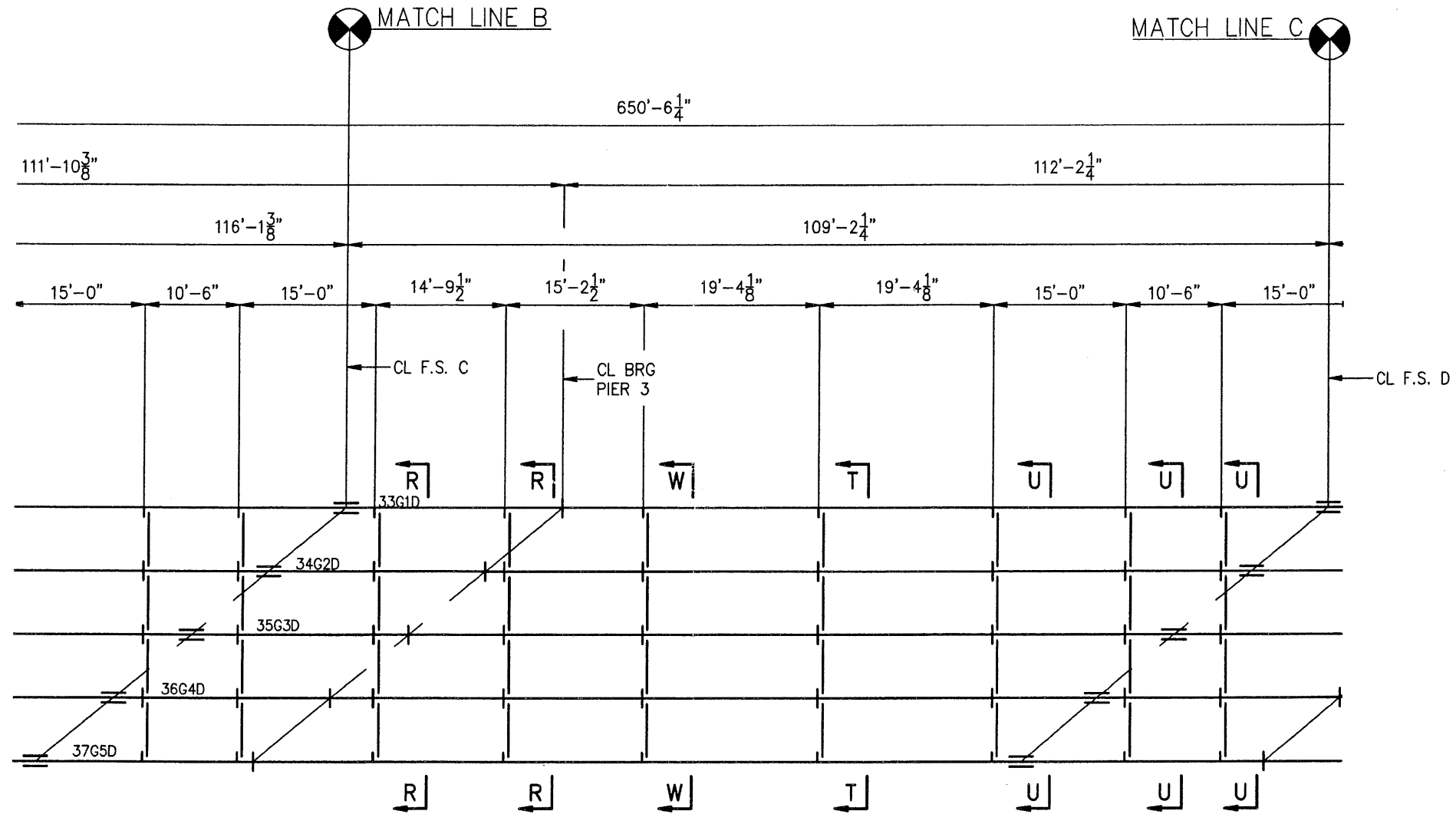
FRAMING PLAN
(ALL DIM'S HORIZONTAL)

- NOTES:**
- 1) REFER TO SHEET GN1 FOR GENERAL NOTES.
 - 2) REFER TO SHEETS E6 THRU E12 FOR SECTIONS.



	REV.	BY	DATE	CHK.	DESCRIPTION
	0	N/A	N/A	N/A	N/A
DR. NEB	BRIDGE No. LAK-90-0377 MAPLE GROVE RD OVER I.R. 90				Shop Released Date 04/30/2012
CHK. JCF	PROJECT No. 120007 LOCATION LAKE COUNTY, OHIO CONTRACT ID LAK83489 STA. 20+00.00				JOB NO. 00450 DWC. NO. E2 1 OF 1
	CREATION DATE: 02/02/2012		EDITED DATE: 04/02/2012-12:41:29		APPROVAL DATE: 04/30/2012

STUPP BRIDGE COMPANY, 3800 WEBER ROAD, ST. LOUIS, MO 63125 LAST SAVED: 4/30/2012 11:16 AM BY: ENGR



FRAMING PLAN
(ALL DIM'S HORIZONTAL)



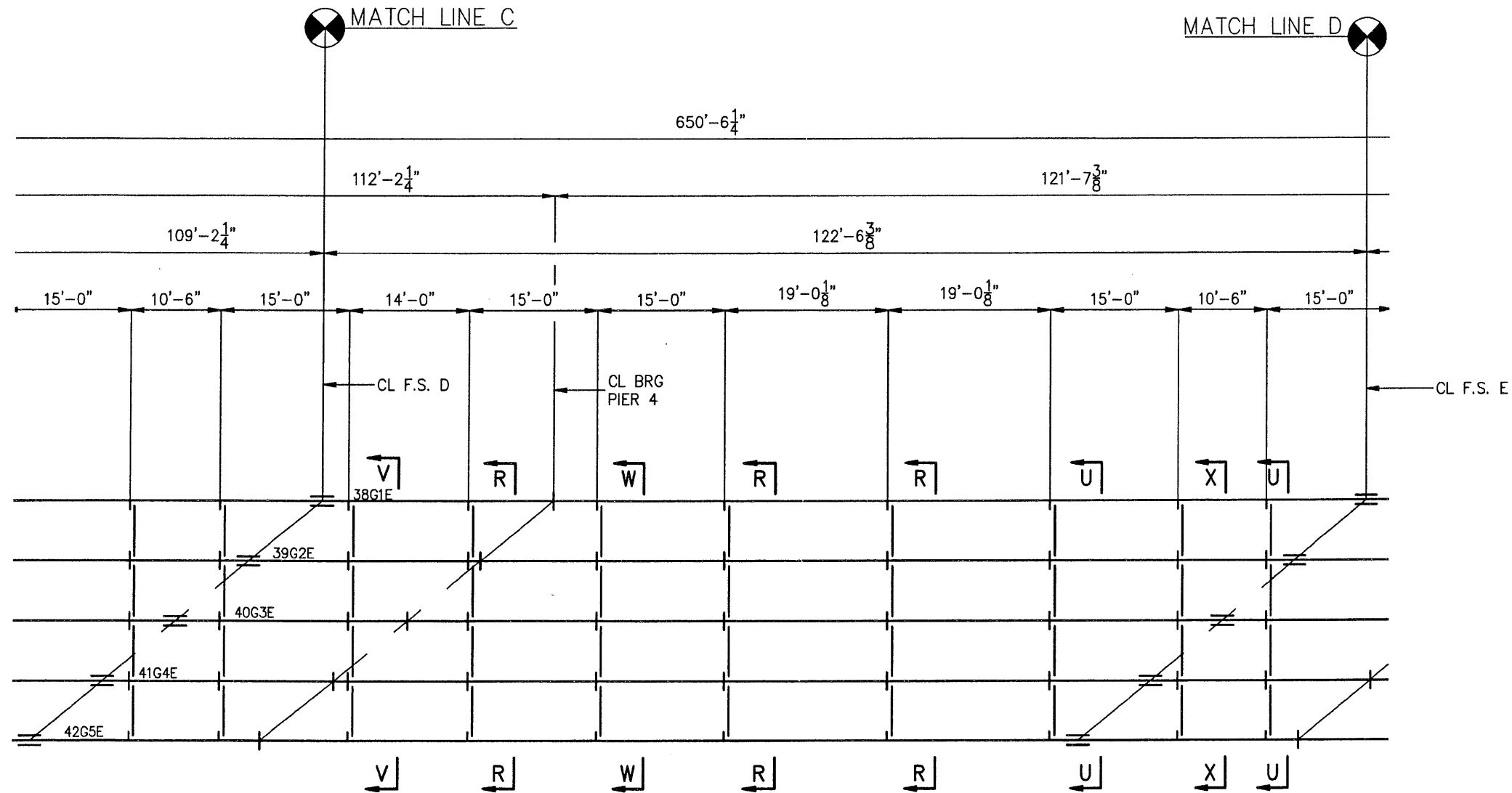
MAY 08 2012



- NOTES:**
 1) REFER TO SHEET GN1 FOR GENERAL NOTES.
 2) REFER TO SHEETS E6 THRU E12 FOR SECTIONS.

STUPP BRIDGE COMPANY <small>Division of Stupp Bros., Inc.</small>	REV. 0	BY N/A	DATE N/A	CHK. N/A	N/A	DESCRIPTION
	BRIDGE No. LAK-90-0377					Shop Released Date
DR. NEB	CREATION DATE: 02/02/2012		PROJECT No. 120007		JOB NO. 00450	
CHK. JCF	EDITED DATE: 04/02/2012-12:50:20		LOCATION LAKE COUNTY, OHIO		DWG. NO. E3	
	CHK. DATE: 04/02/2012		CONTRACT ID LAK83489		1 OF 1	
	APPROVAL DATE: 04/30/2012		STA. 20+00.00			

STUPP BRIDGE COMPANY, 3800 WEBER ROAD, ST. LOUIS, MO 63125 LAST SAVED: 4/30/2012 11:16 AM BY: ENGR

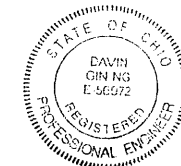


FRAMING PLAN
(ALL DIM'S HORIZONTAL)



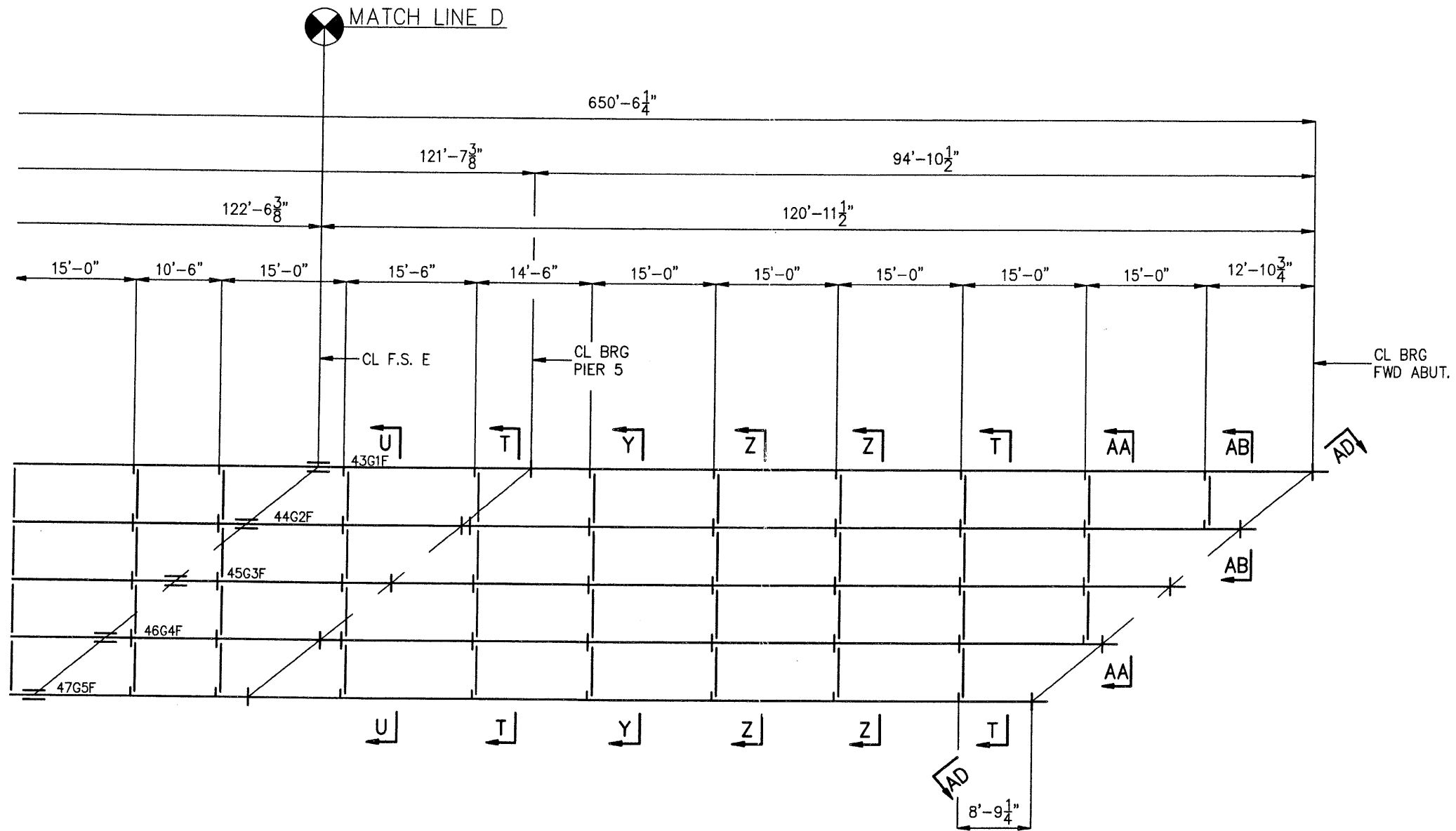
- NOTES:**
 1) REFER TO SHEET GN1 FOR GENERAL NOTES.
 2) REFER TO SHEETS E6 THRU E12 FOR SECTIONS.

MAY 6 8 2012



	REV.	BY	DATE	CHK.	DESCRIPTION
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DR. NEB	BRIDGE No. LAK-90-0377 MAPLE GROVE RD OVER I.R. 90				Shop Released Date 04/30/2012
CHK. JCF	PROJECT No. 120007 LOCATION LAKE COUNTY, OHIO CONTRACT ID LAK83489 STA. 20+00.00				JOB NO. 00450
	CREATION DATE: 02/02/2012 EDITED DATE: 04/02/2012-12:57:21 CHK. DATE: 04/02/2012 APPROVAL DATE: 04/30/2012				DWG. NO. E4 1 OF 1

STUPP BRIDGE COMPANY, 3800 WEBER ROAD, ST. LOUIS, MO 63125 LAST SAVED: 4/30/2012 11:16 AM BY: ENGR




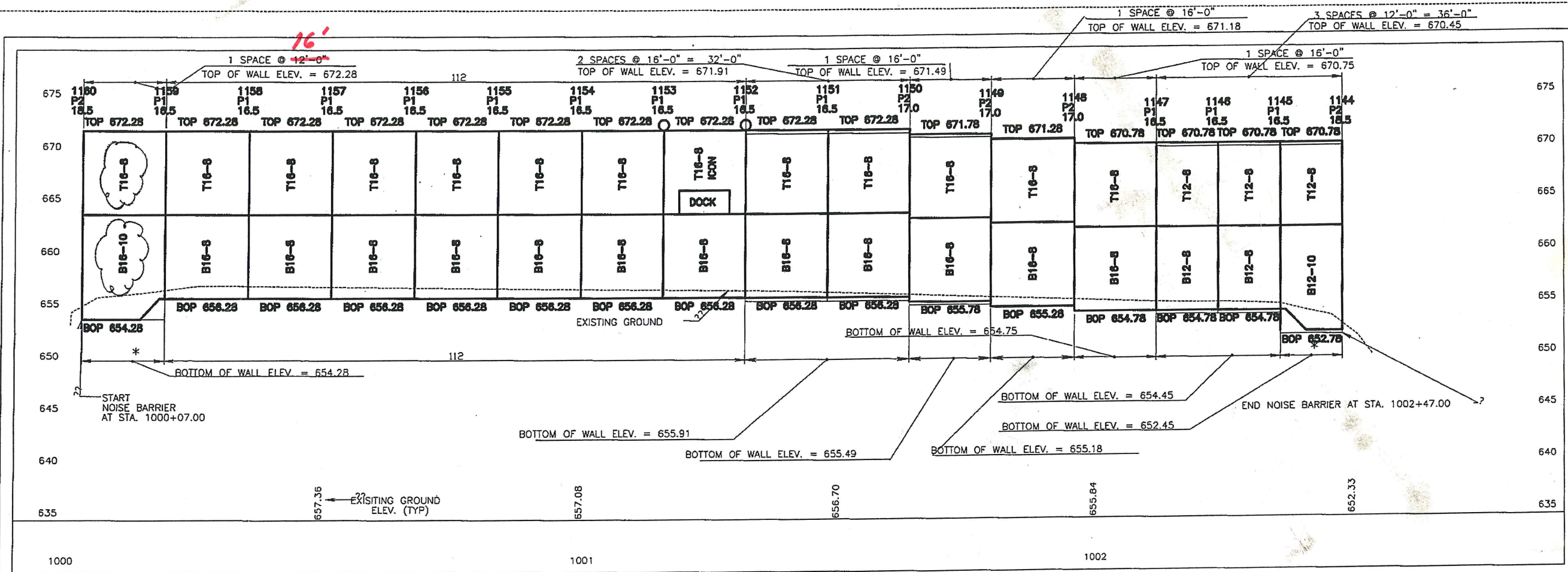
FRAMING PLAN
(ALL DIM'S HORIZONTAL)



- NOTES:**
- 1) REFER TO SHEET GN1 FOR GENERAL NOTES.
 - 2) REFER TO SHEETS E6 THRU E12 FOR SECTIONS.



REV.	BY	DATE	CHK.	DESCRIPTION
0	N/A	N/A	N/A	N/A
				BRIDGE No. LAK-90-0377 MAPLE GROVE RD OVER I.R. 90 Shop Released Date 04/30/2012
DR. NEB	CREATION DATE: 02/02/2012 EDITED DATE: 04/02/2012-13:01:07		PROJECT No. 120007 LOCATION LAKE COUNTY, OHIO	
CHK. JCF	CHK. DATE: 04/02/2012 APPROVAL DATE: 04/30/2012		CONTRACT ID LAK83489 STA. 20+00.00	
			JOB NO.	00450
			DWG. NO.	E5 1 OF 1



NOTES:

1. BOTTOM ELEVATIONS SHOWN ON PROFILE ARE FOR THE BOTTOM OF THE PANEL, NOT THE FINISHED GRADE LINE.
2. TOP ELEVATIONS SHOWN ARE THE MINIMUM TOP ELEVATIONS.
3. SEE SHEETS 101/524 TO 213/524 FOR NOISE BARRIER PLANS.
4. IF DRAINAGE STRUCTURES ARE DAMAGED DURING INSTALLATION OF DRILLED SHAFTS, THEY WILL BE REPAIRED OR RE-ROUTED TO AVOID THE DRILLED SHAFTS AT NO ADDITIONAL COST TO THE STATE.
5. ALL DRILLED SHAFTS LENGTHS SHALL BE 11'-0" EXCEPT FOR NOISE BARRIER 1, AND WHERE NOTED OTHERWISE THE DRILLED SHAFTS SHALL BE 15'-0".
6. * DRILLED SHAFTS SHALL BE 15'-0" DEEP.

Wall #1
 12 @ 16' wide x 16' high 3072 sf
 2 @ 12' wide x 16' high 384 sf
 1 @ 12' wide x 18' high 216 sf
 1 @ 16' w x 18' H 288 sf
 3960 sf 14'-20'
 Sht 320

CHECKED
 E.T.B.
 S.C.T.

NOISE BARRIER 1 PROFILE
 STA. 10000+07.00 STA. 10002+47.00

LAK-2-0.00

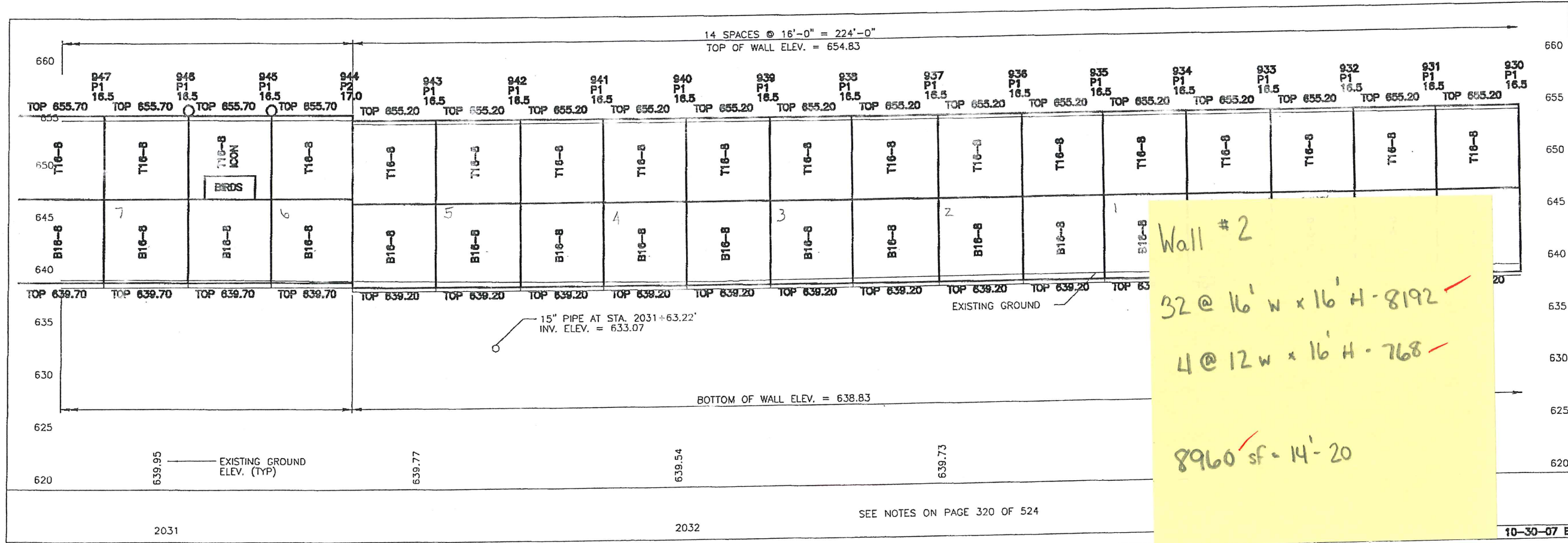
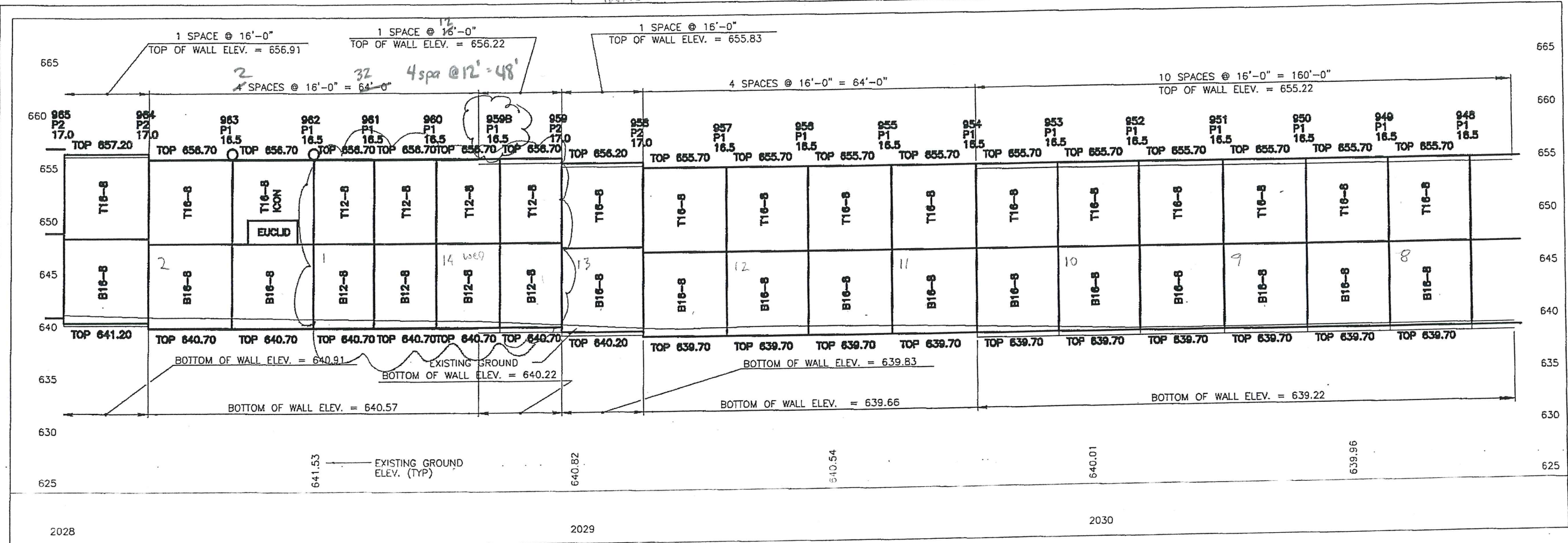
320
 524

10-30-07 BK

REVISED

Bottom 32-16x8
4-12x8

Top 32-16x8
4-12x8



CALCULATED
ETB
CHECKED
SCT

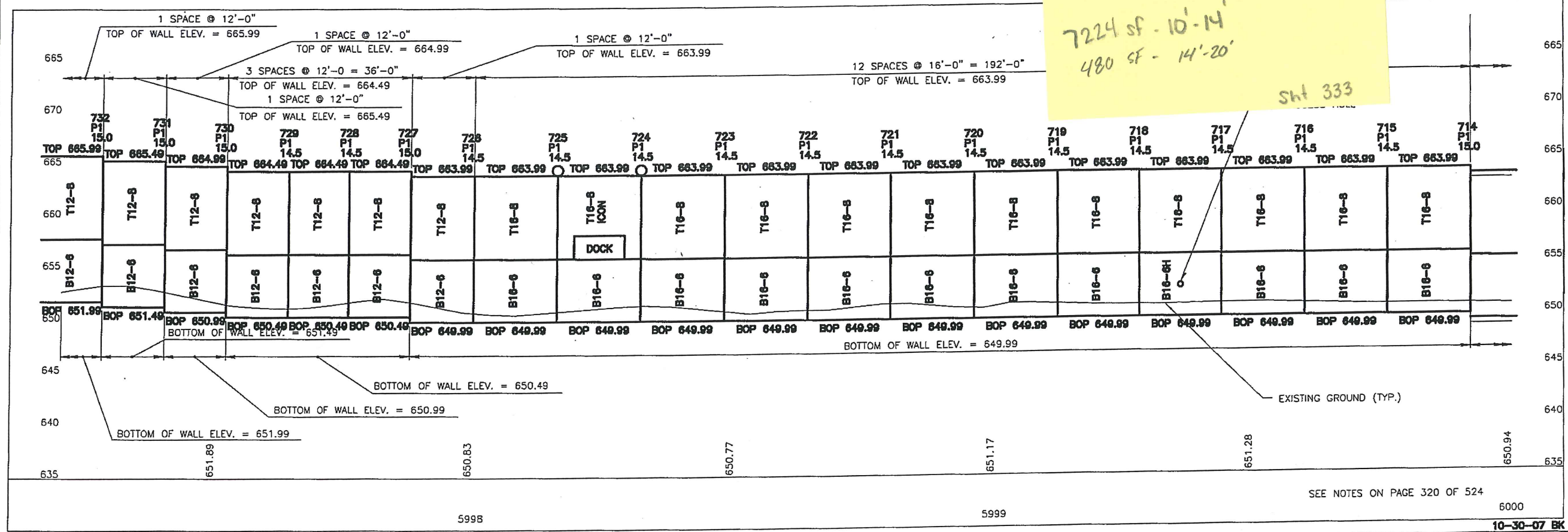
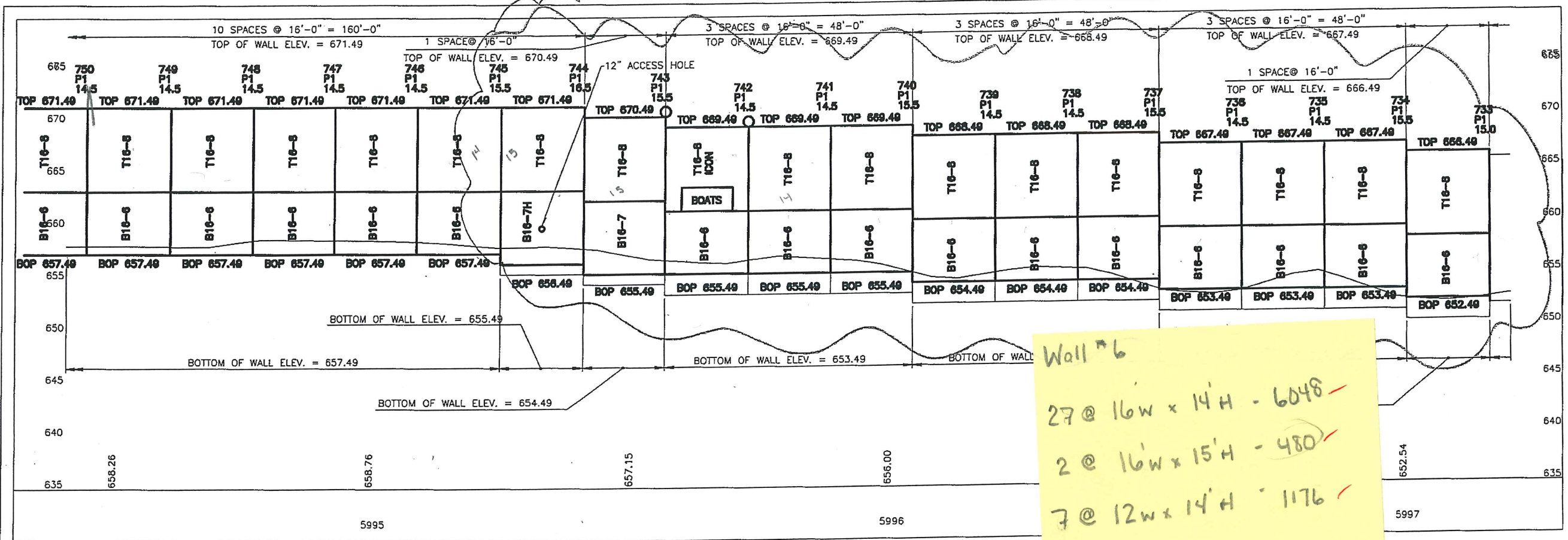
NOISE BARRIER 2 PROFILE
STA. 2028+00.00 TO STA. 2033+60.00

LAK-2-0.00

326
524

10-30-07 BK
REVISED

SEE NOTES ON PAGE 320 OF 524



Wall #6
 27 @ 16'w x 14'H - 6048
 2 @ 16'w x 15'H - 480
 7 @ 12'w x 14'H - 1176
 7224 SF - 10'-14'
 480 SF - 14'-20'
 Sht 333

CALCULATED
AUG

CHECKED
SCT

NOISE BARRIER 6 PROFILE
 STA. 5994+40.00 TO STA. 6000+00.00

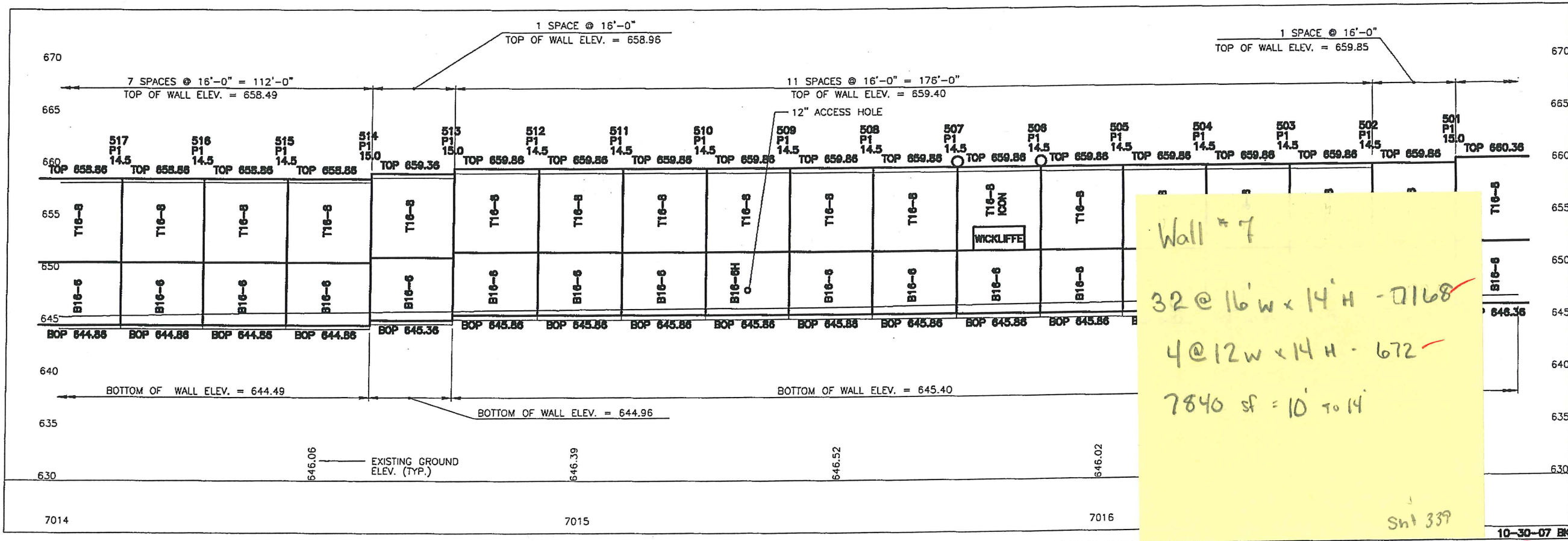
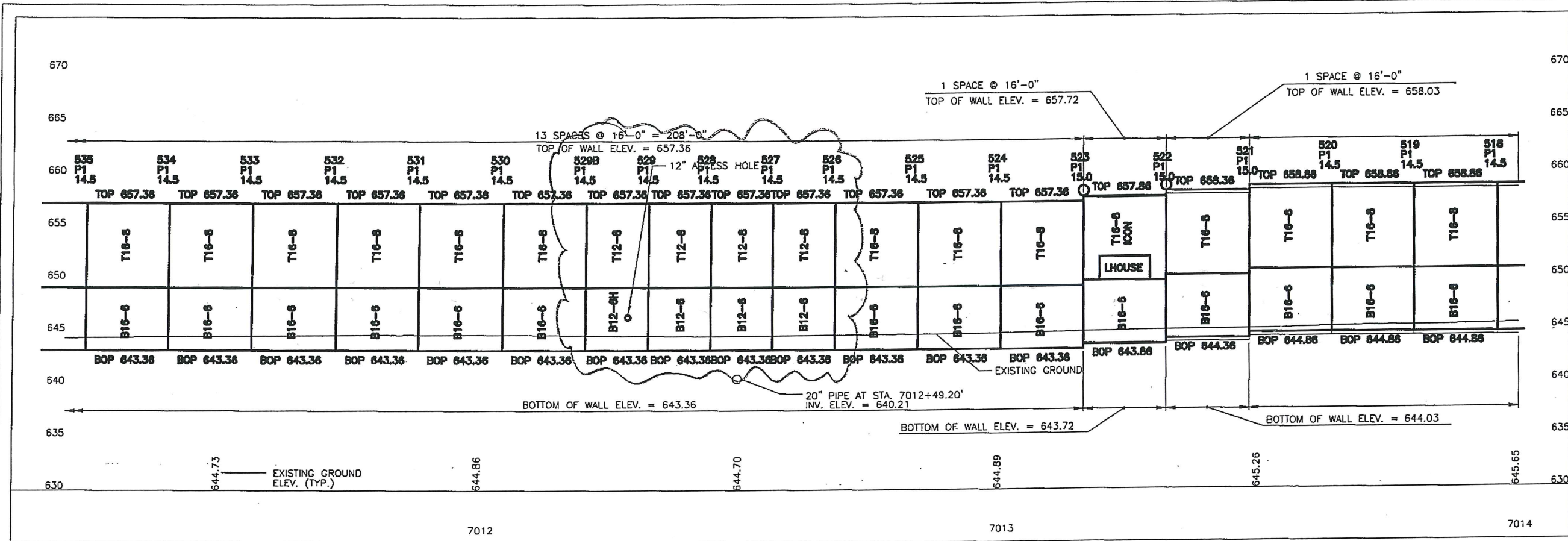
LAK-2-0.00

SEE NOTES ON PAGE 320 OF 524

333
524

10-30-07 BK

REVISED



Wall # 7
 32 @ 16' w x 14' h - 7168
 4 @ 12' w x 14' h - 672
 7840 sf = 10' to 14'
 Sht 339

CALCULATED
ETB
CHECKED
SCT

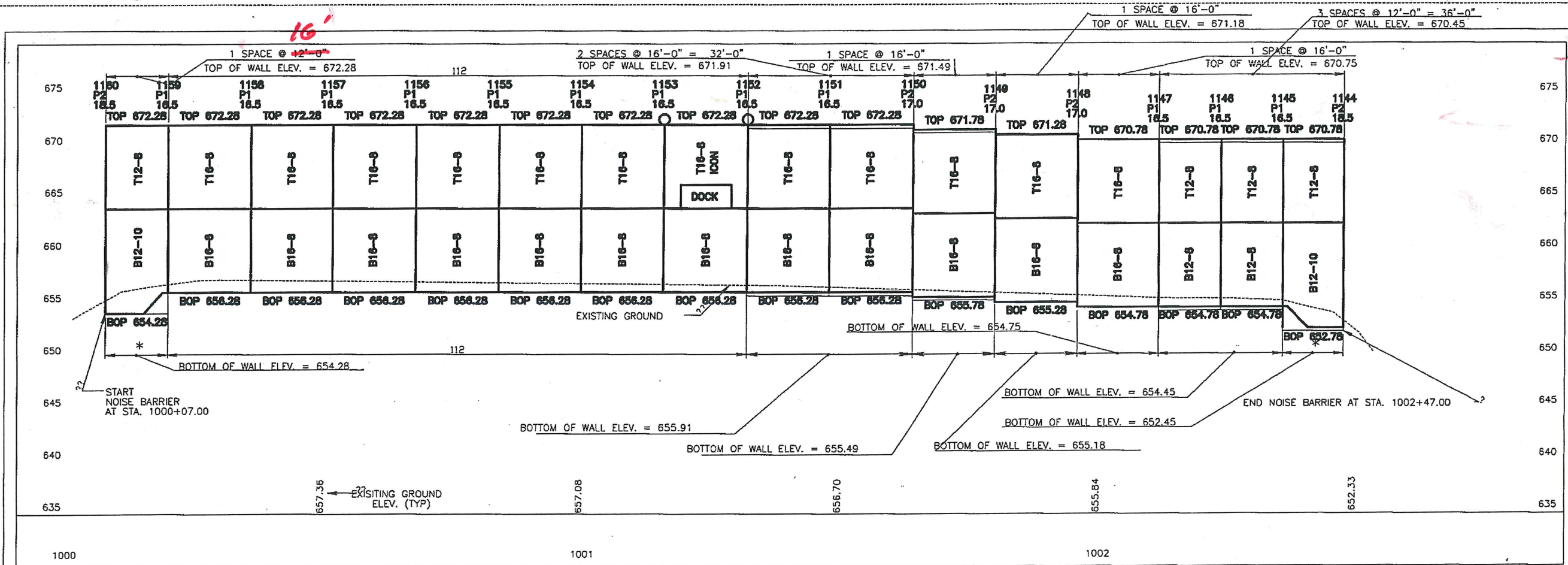
NOISE BARRIER 7 PROFILE
 STA. 7011+20.00 TO STA. 7016+80.00

LAK-2-0.00

339
524

10-30-07 BK

REVISED



NOTES:

1. BOTTOM ELEVATIONS SHOWN ON PROFILE ARE FOR THE BOTTOM OF THE PANEL, NOT THE FINISHED GRADE LINE.
2. TOP ELEVATIONS SHOWN ARE THE MINIMUM TOP ELEVATIONS.
3. SEE SHEETS 101/524 TO 213/524 FOR NOISE BARRIER PLANS.
4. IF DRAINAGE STRUCTURES ARE DAMAGED DURING INSTALLATION OF DRILLED SHAFTS, THEY WILL BE REPAIRED OR RE-ROUTED TO AVOID THE DRILLED SHAFTS AT NO ADDITIONAL COST TO THE STATE.
5. ALL DRILLED SHAFTS LENGTHS SHALL BE 11'-0" EXCEPT FOR NOISE BARRIER 1, AND WHERE NOTED OTHERWISE THE DRILLED SHAFTS SHALL BE 15'-0".
6. * DRILLED SHAFTS SHALL BE 15'-0" DEEP.

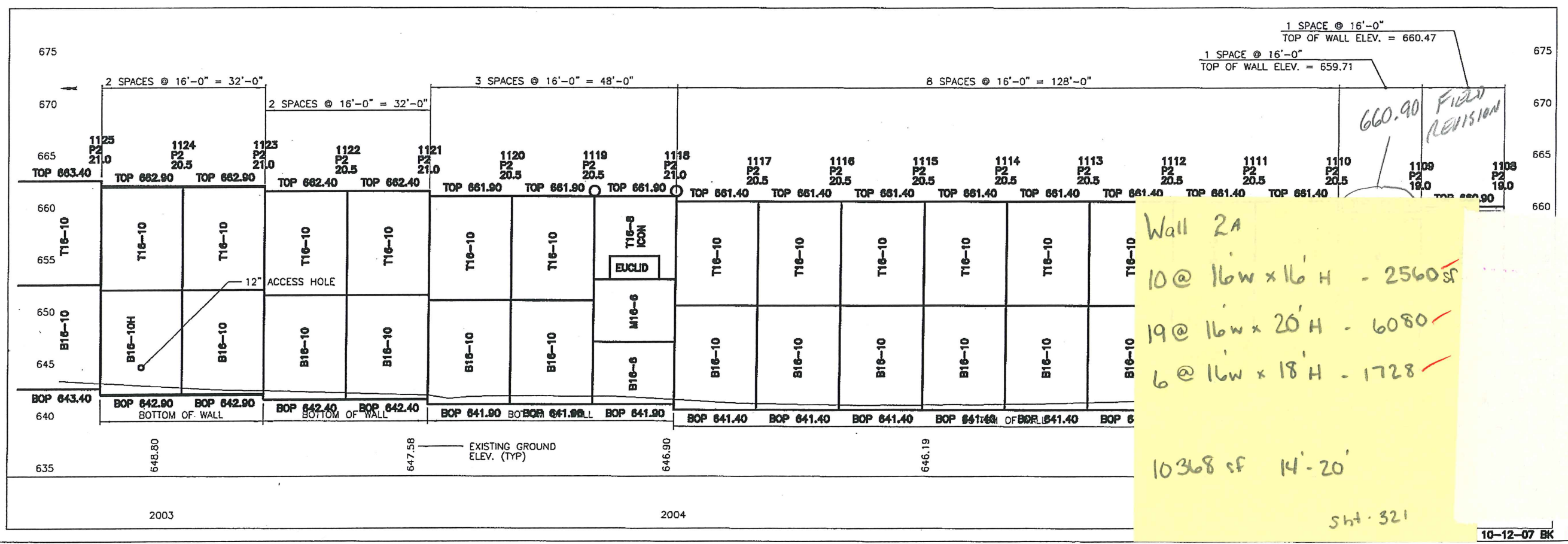
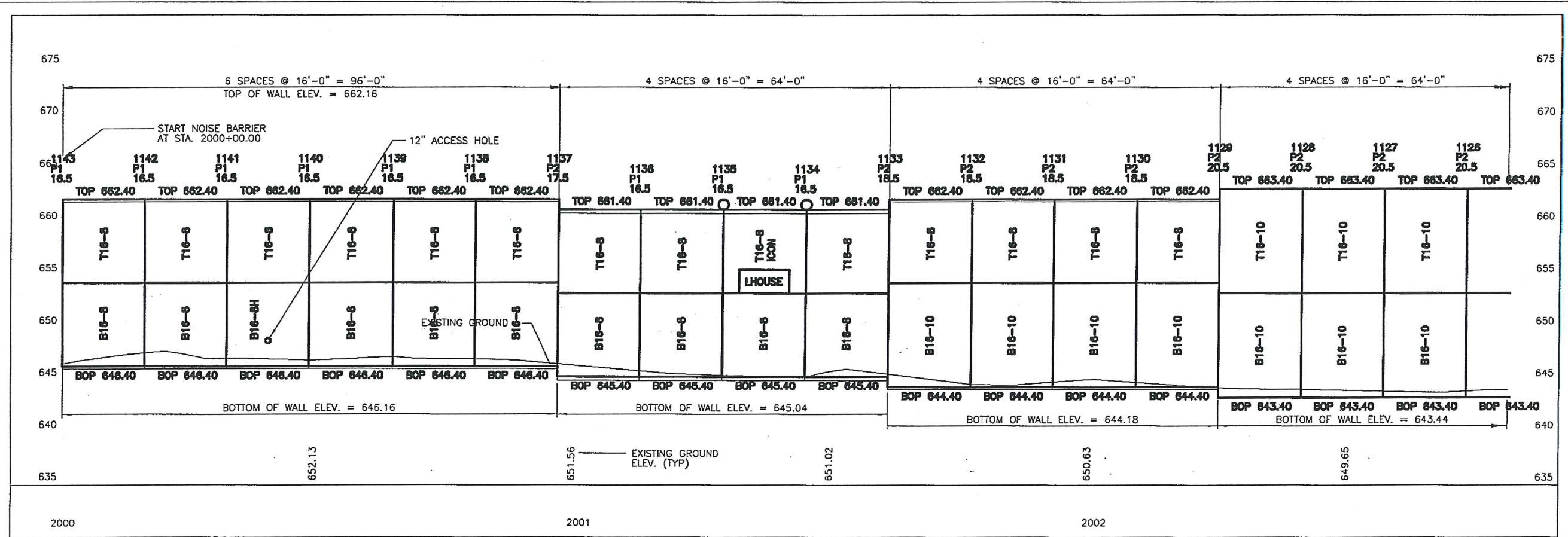
SEE
REVISED
SHEET

CALCULATED
ETB
CHECKED
SCT

NOISE BARRIER 1 PROFILE
STA. 10000+07.00 STA. 10002+47.00

LAK-2-0.00

320
524

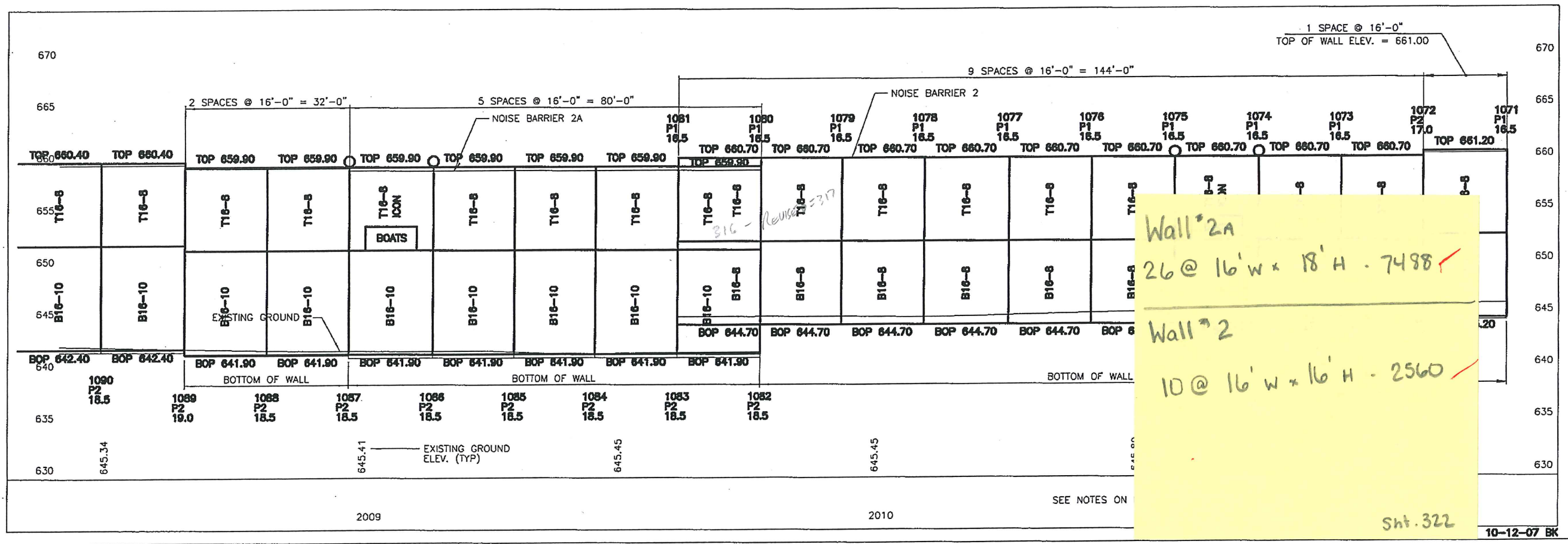
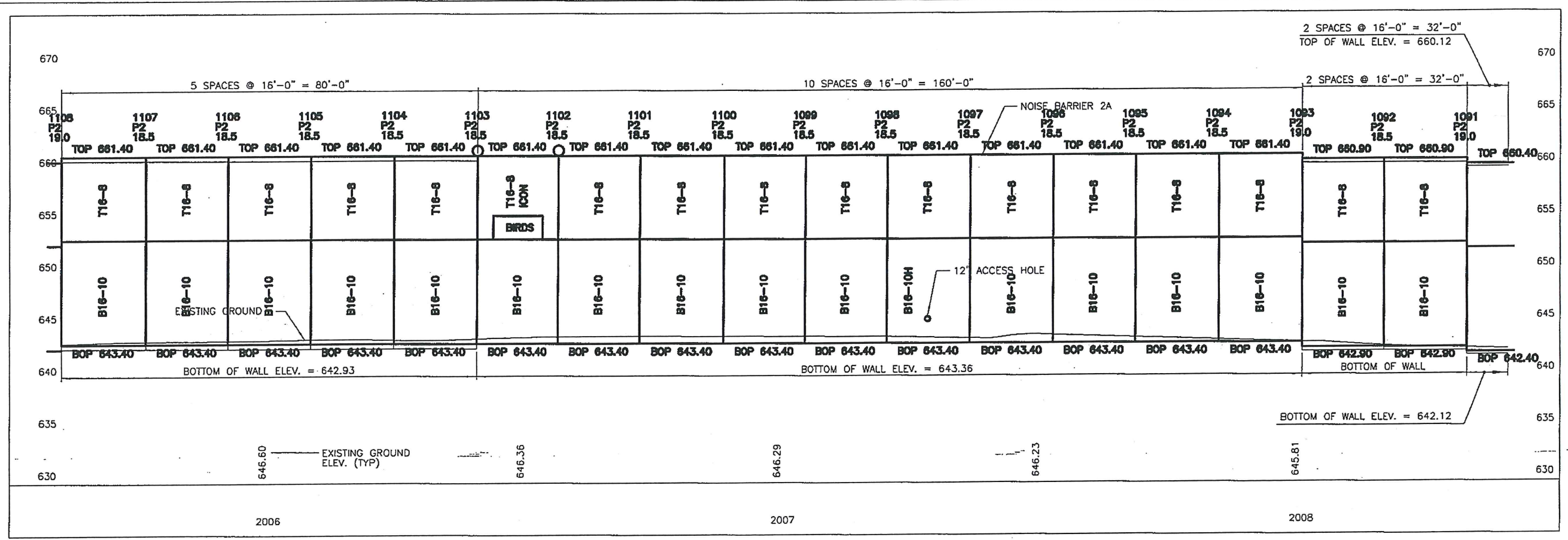


CALCULATED
ETB
ENTERED
SCT

NOISE BARRIER 2A PROFILE
 STA. 2000+00.00 TO STA. 2005+60.00

Wall 2A
 10 @ 16w x 16' H - 2560 SF
 19 @ 16w x 20' H - 6080 SF
 6 @ 16w x 18' H - 1728 SF
 10368 SF 14'-20'
 5ht-321

0. C
 2,560.00 +
 6,080.00 +
 1,728.00 +
 10,368.00 =



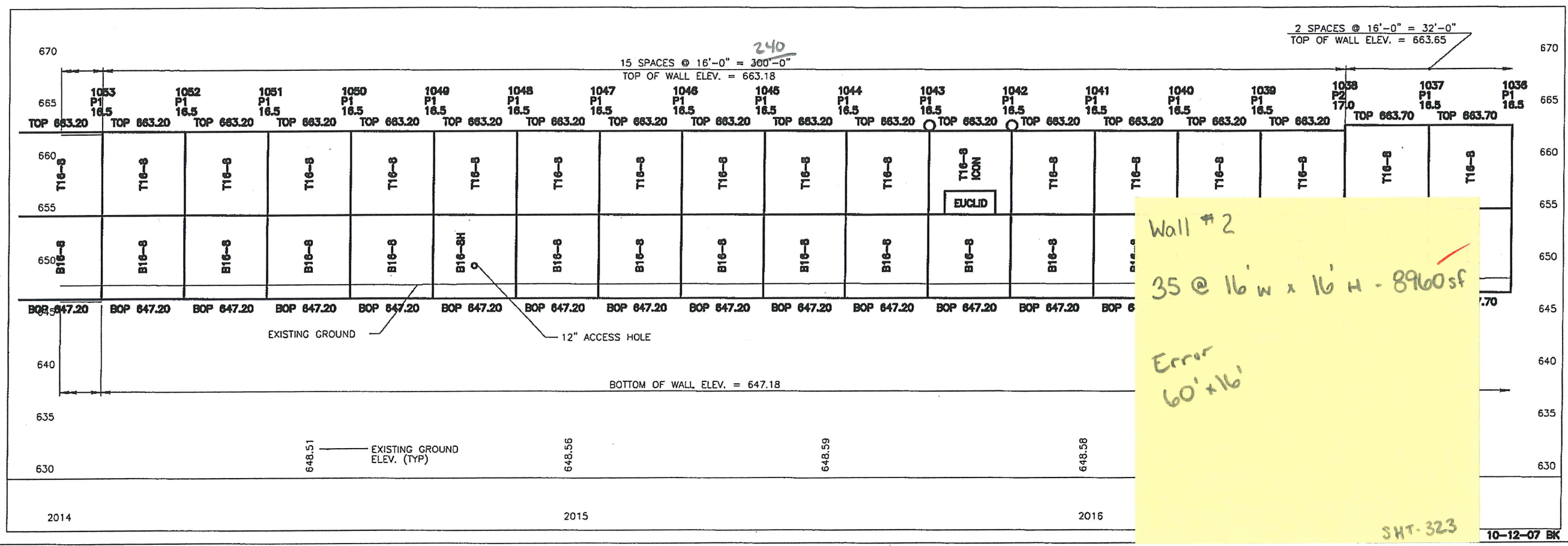
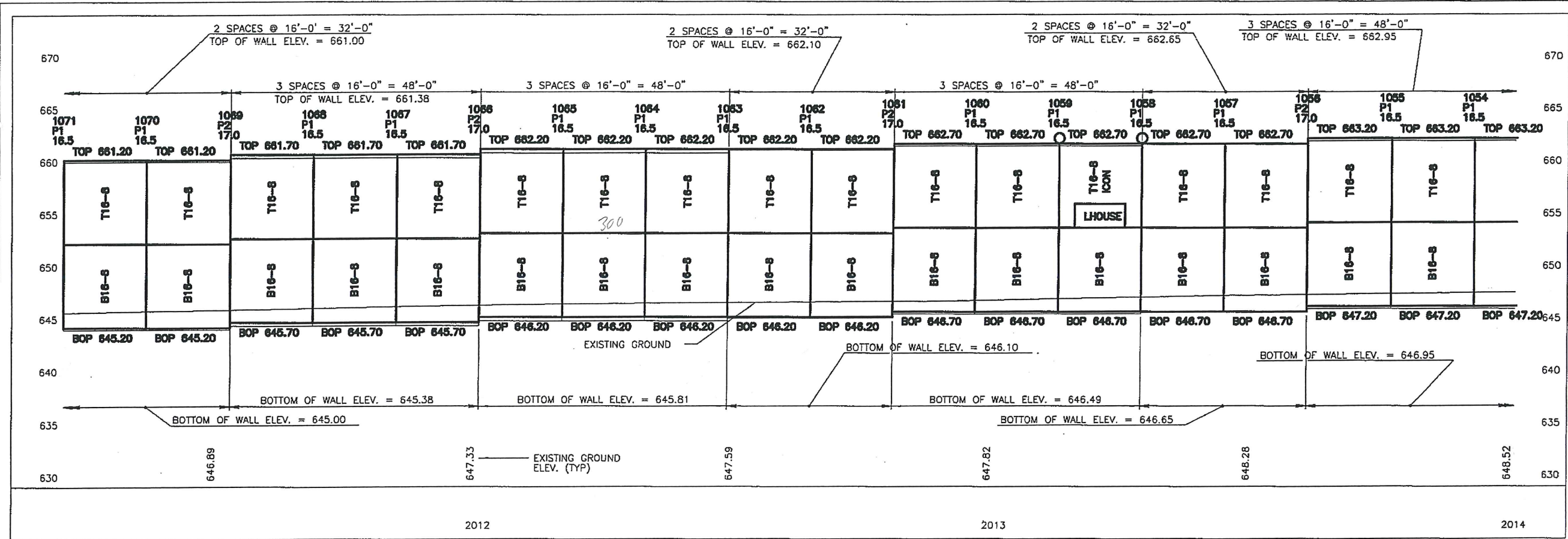
NOISE BARRIER 2A AND 2 PROFILE
STA. 2005+60.00 TO STA. 2011+20.00

LAK-2-0.00

322
524

Sht. 322

10-12-07 BK



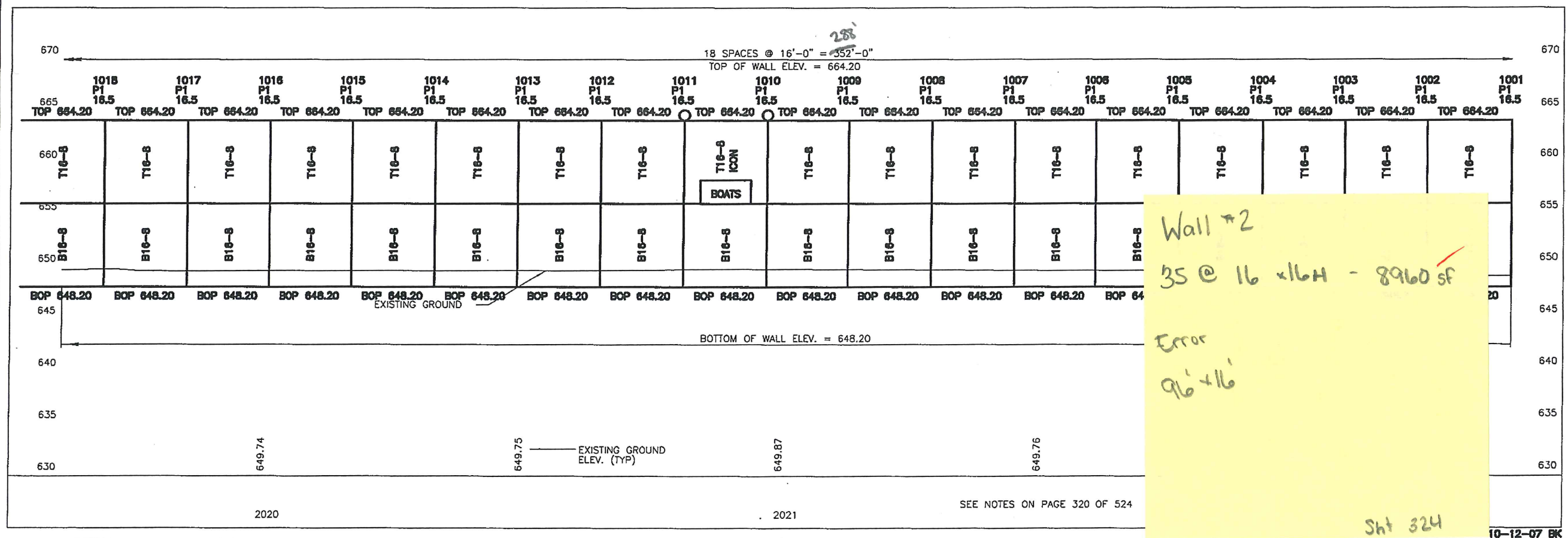
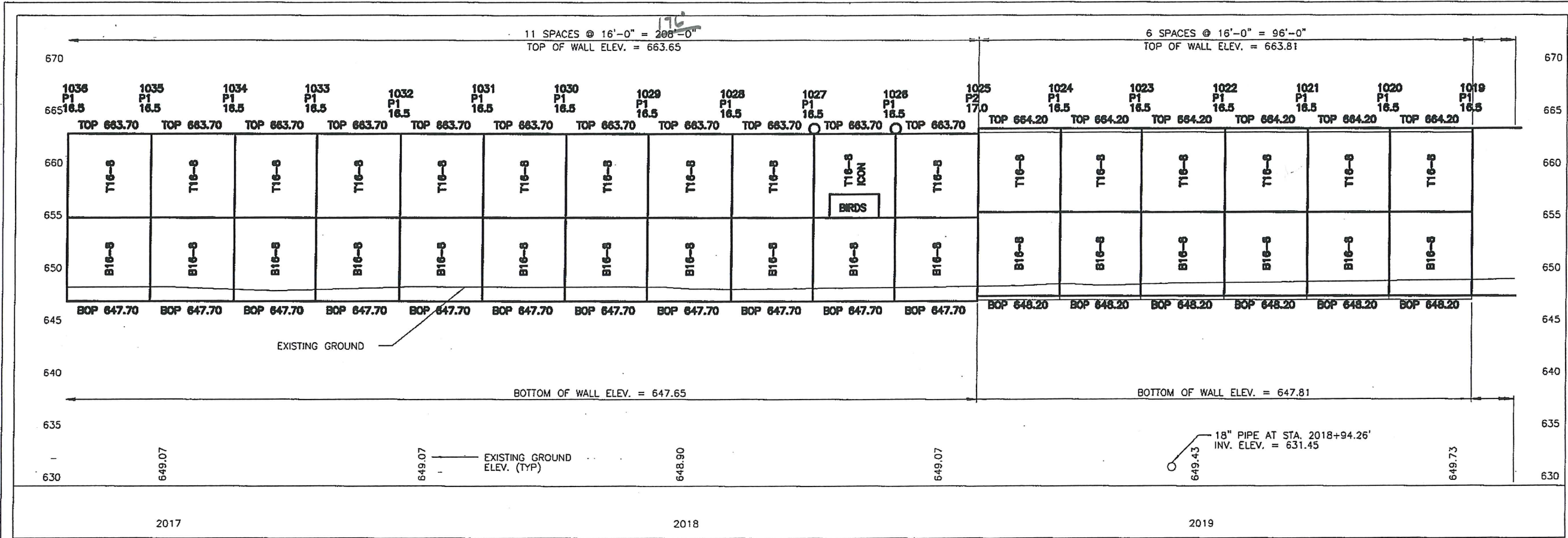
NOISE BARRIER 2 PROFILE
 STA. 2011+20.00 TO STA. 2016+80.00

LAK-2-0.00

323
 524

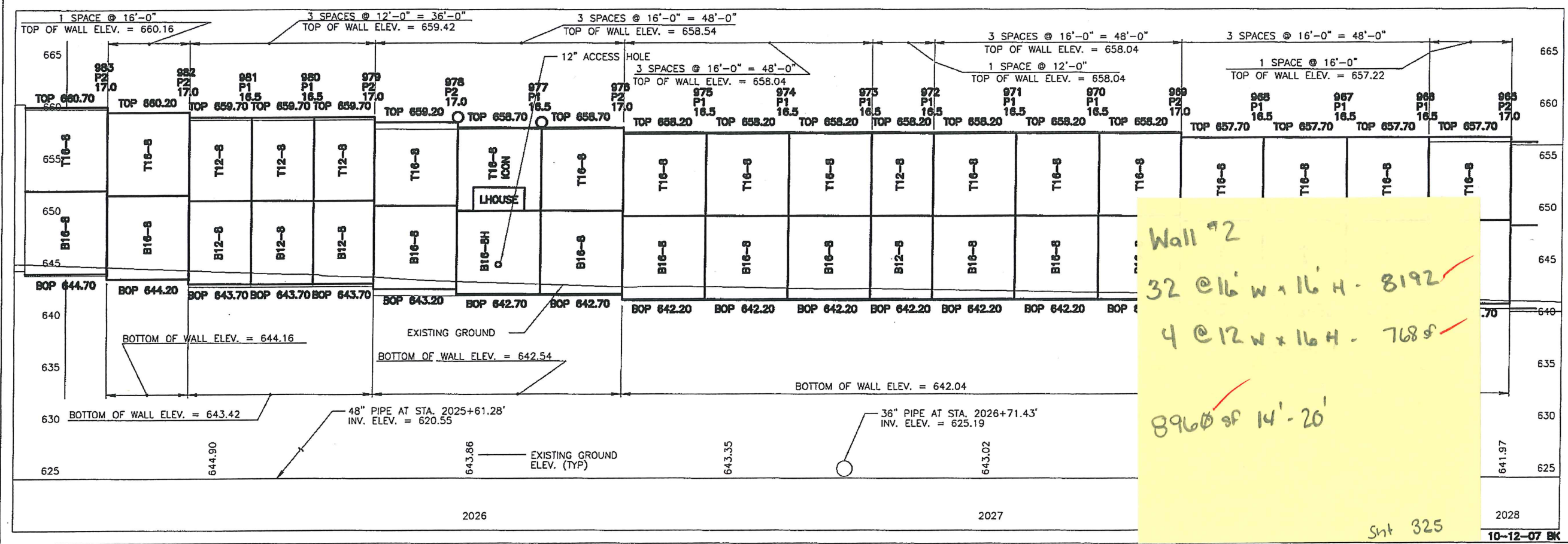
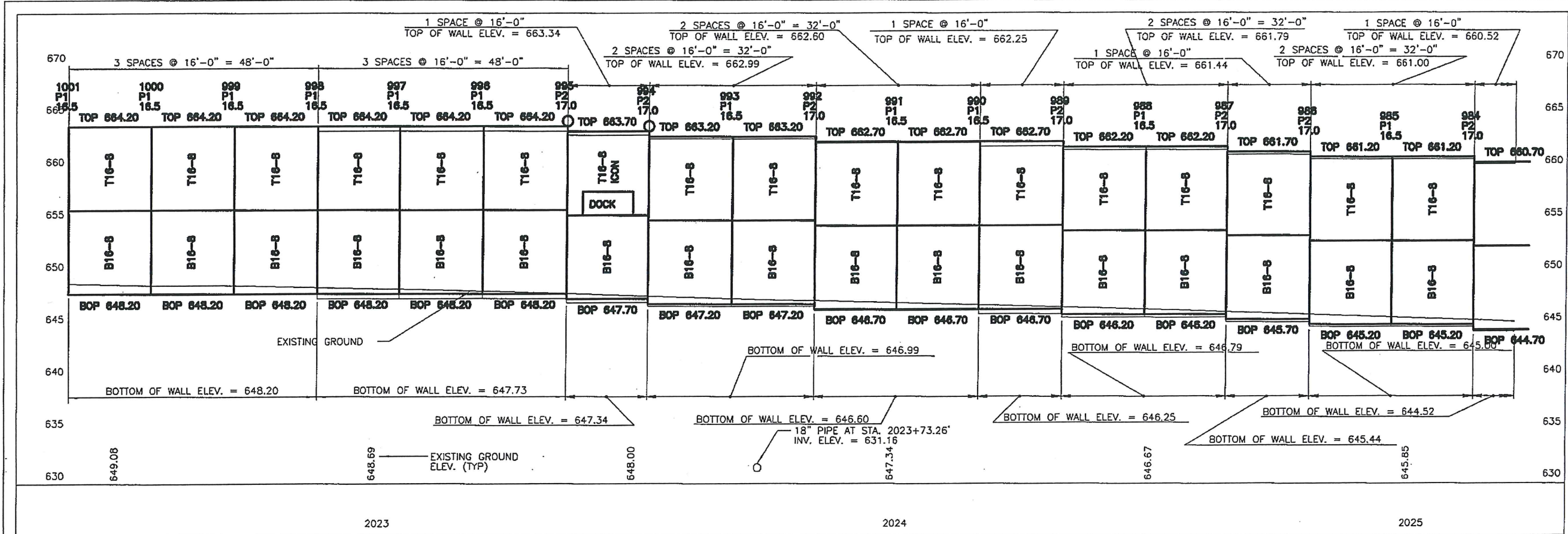
SHT-323

10-12-07 BK



Wall #2
 35 @ 16 x 16H - 8960 SF
 Error
 96' x 16'

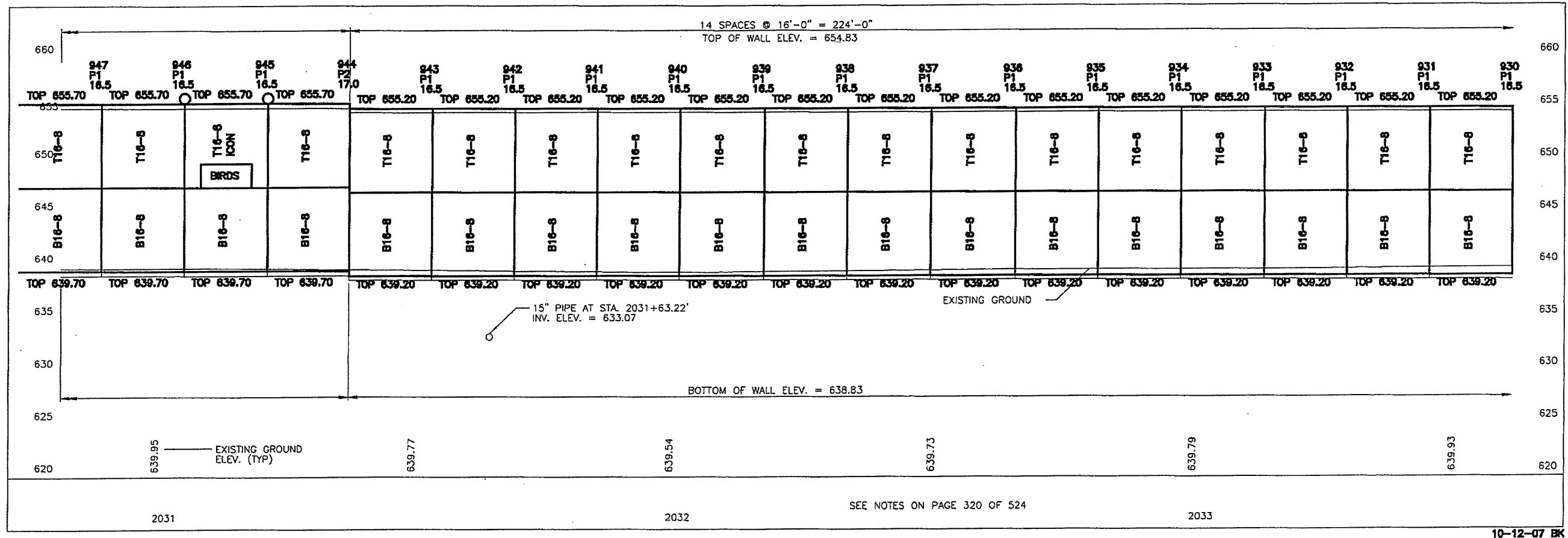
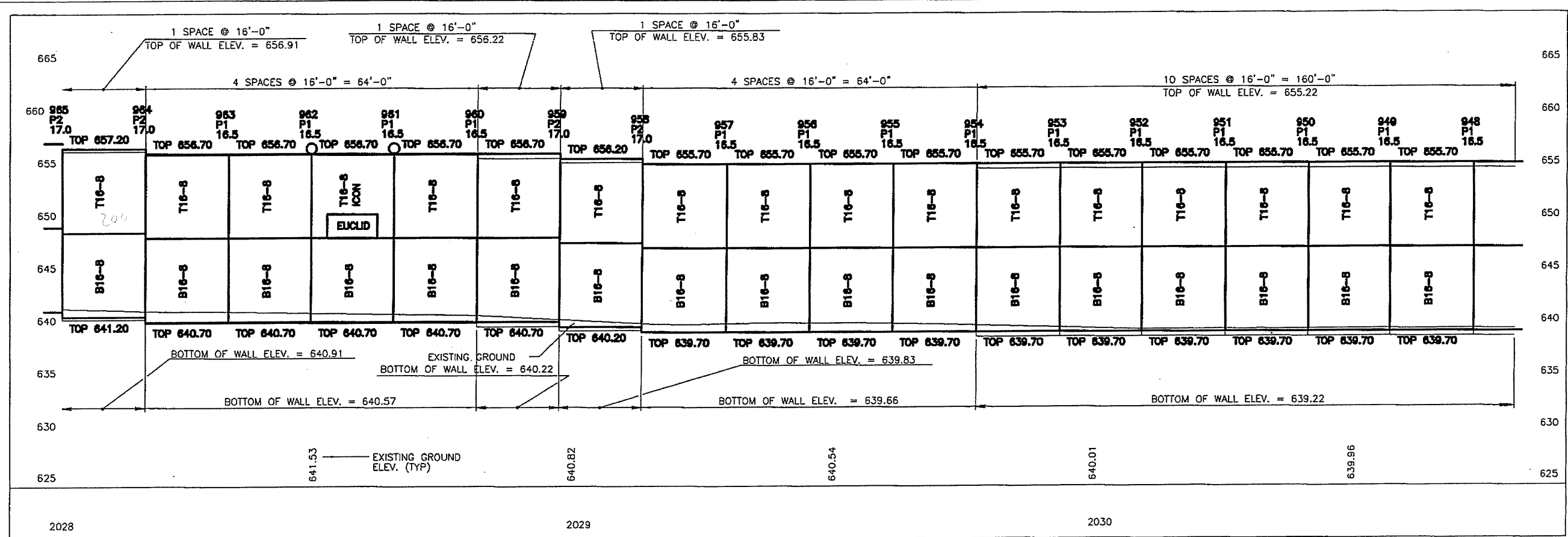
CALCULATED ETB
 CHECKED SCT
 NOISE BARRIER 2 PROFILE
 STA. 2016+80.00 TO STA. 2022+40.00
 LAK-2-0.00
 324
 524
 10-12-07 BK
 Sh1 324
 SEE NOTES ON PAGE 320 OF 524



Wall #2
 32 @ 16' W x 16' H - 8192 ✓
 4 @ 12' W x 16' H - 768 ✓
 8960 SF 14'-20'

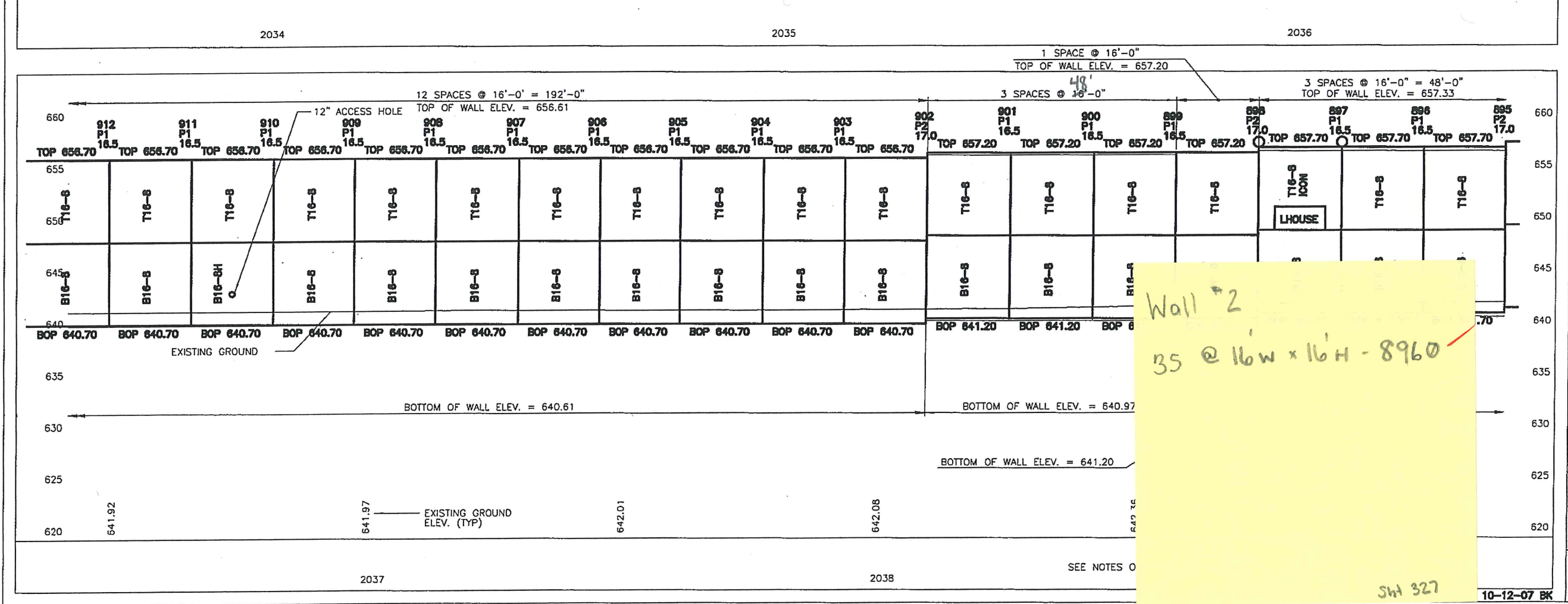
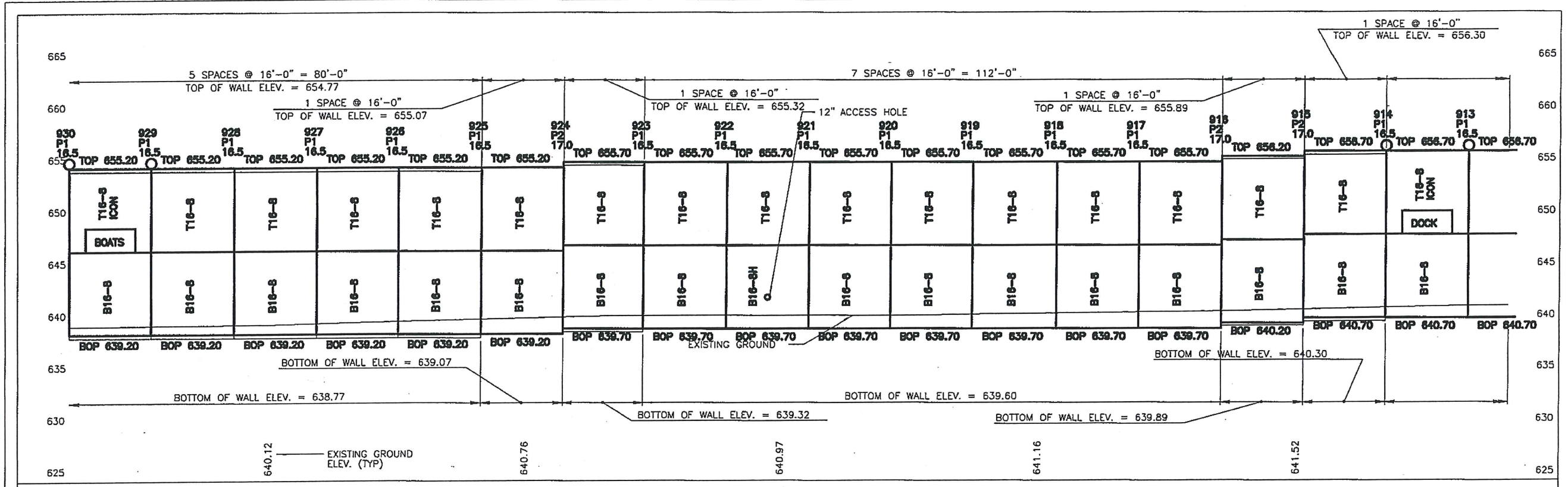
CALCULATED ETB CHECKED SCT
 NOISE BARRIER 2 PROFILE
 STA. 2022+40.00 TO STA. 2028+00.00
 LAK-2-0.00
 325
 524
 Sht 325
 10-12-07 BK

SEE REVISED SHEET



CALCULATED
 E1B
 CHECKED
 SCT
 NOISE BARRIER 2 PROFILE
 STA. 2028+00.00 TO STA. 2033+60.00
 LAK-2-0.00
 326
 524
 10-12-07 BK

SEE NOTES ON PAGE 320 OF 524



Wall #2
35 @ 16'w x 16'H - 8960

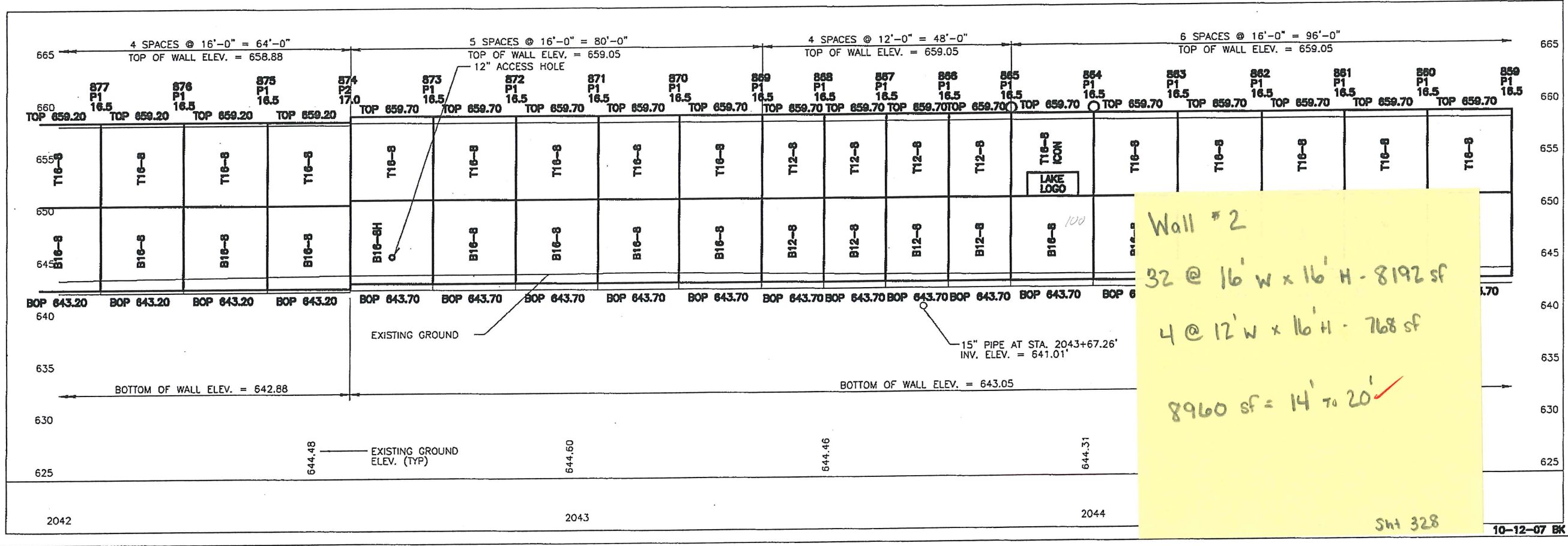
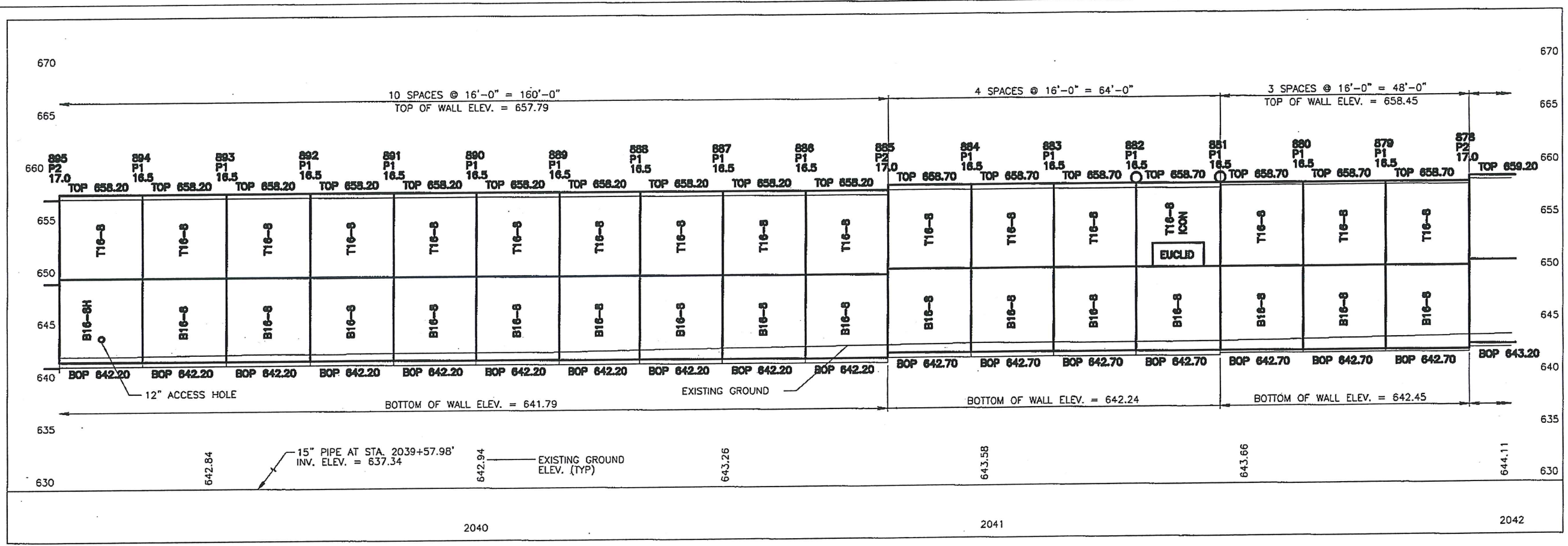
CALCULATED
ETB
CHECKED
SCT

NOISE BARRIER 2 PROFILE
STA. 2033+60.00 TO STA. 2039+20.00

LAK-2-0.00

327
524

10-12-07 BK



Wall #2
 32 @ 16' W x 16' H - 8192 sf
 4 @ 12' W x 16' H - 768 sf
 8960 sf = 14' to 20'

CALCULATED
ETB

CHECKED
SCT

NOISE BARRIER 2 PROFILE
 STA. 2039+20.00 TO STA. 2044+80.00

LAK-2-0.00

328
524

Sht 328

10-12-07 BK



CALCULATED
 ETB
 DESIGNED
 SCT

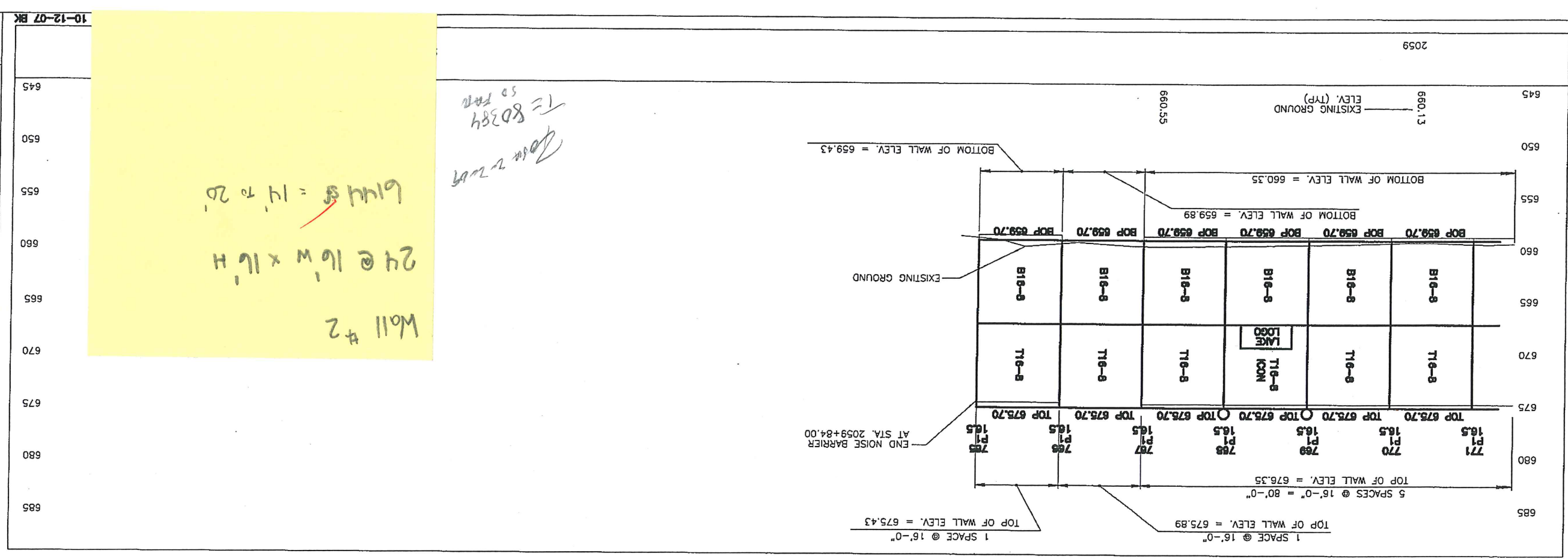
NOISE BARRIER 2 PROFILE
 STA. 2044+80.00 TO STA. 2050+40.00

LAK-2-0.00

329
 524

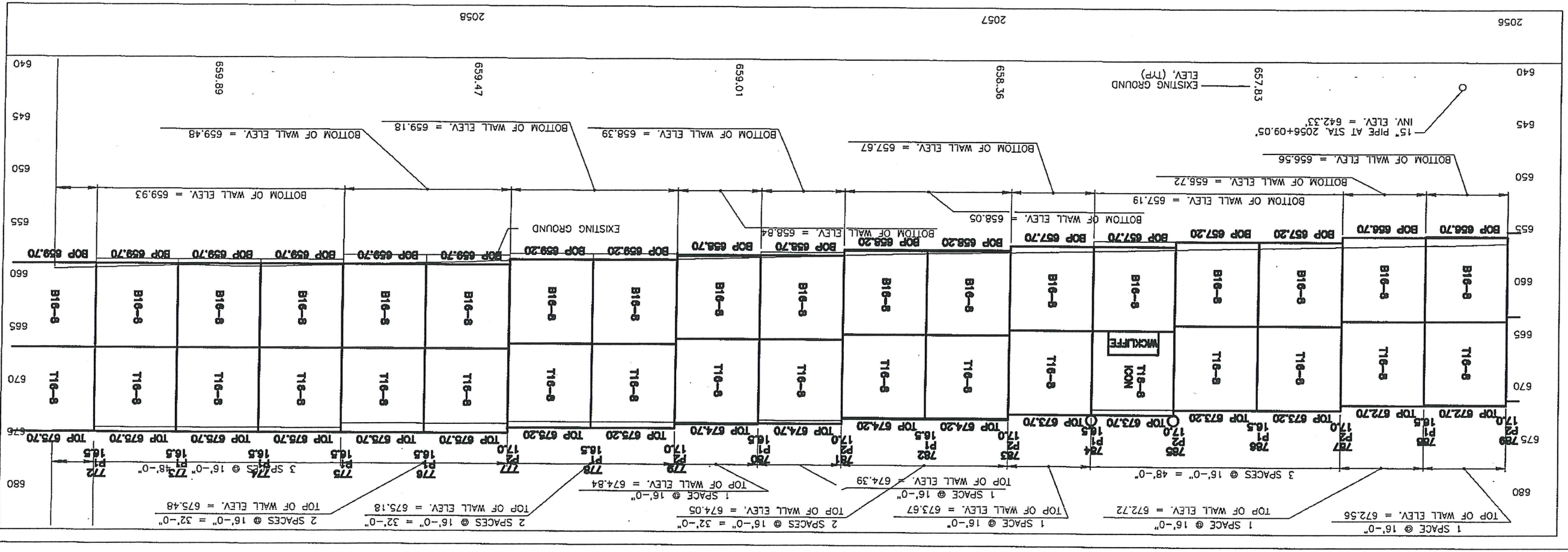
10-12-07 BK

Wall #2
 35 @ 16w x 16h
 8960 sf = 14' to 20' ✓



Wall #2
 24 @ 16' W x 16' H
 6' 11 1/4" = 14' to 20'

TE 80384
 50 FAN
 2004-2-20-09

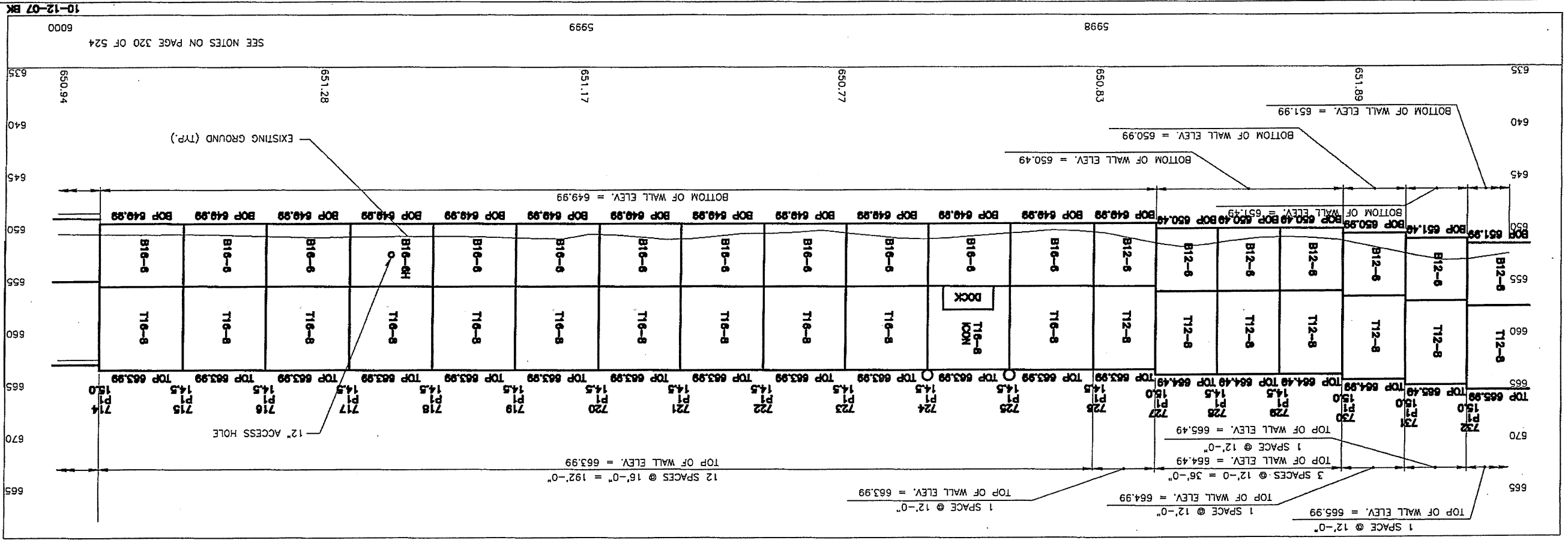
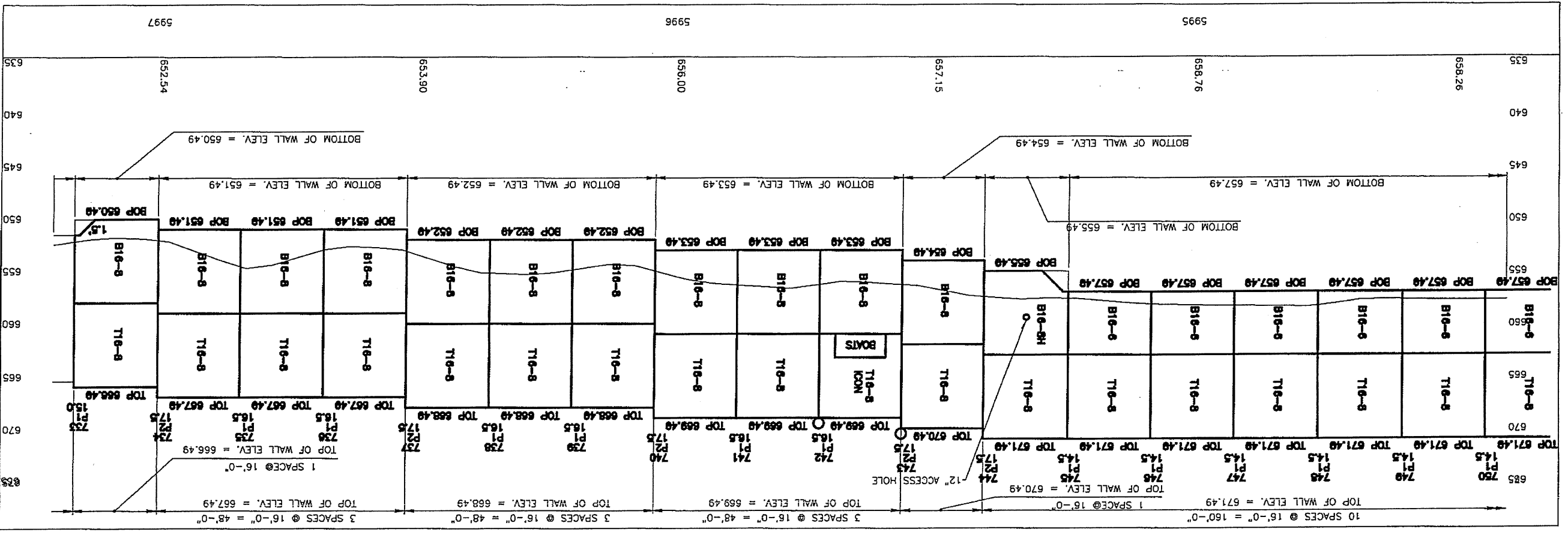


NOISE BARRIER 2 PROFILE
 STA. 2056+00.00 TO STA. 2059+84.00

331
 524

DATE: 10-12-07 BK
 CALCULATED: ETB
 CHECKED: SCT

SEE REVISED SHEET



CALCULATED
CHECKED
SCT

NOISE BARRIER 6 PROFILE
STA. 5994+40.00 TO STA. 6000+00.00

LAK-2-0.00

333
524

SEE NOTES ON PAGE 320 OF S24

EXISTING GROUND (TRP.)

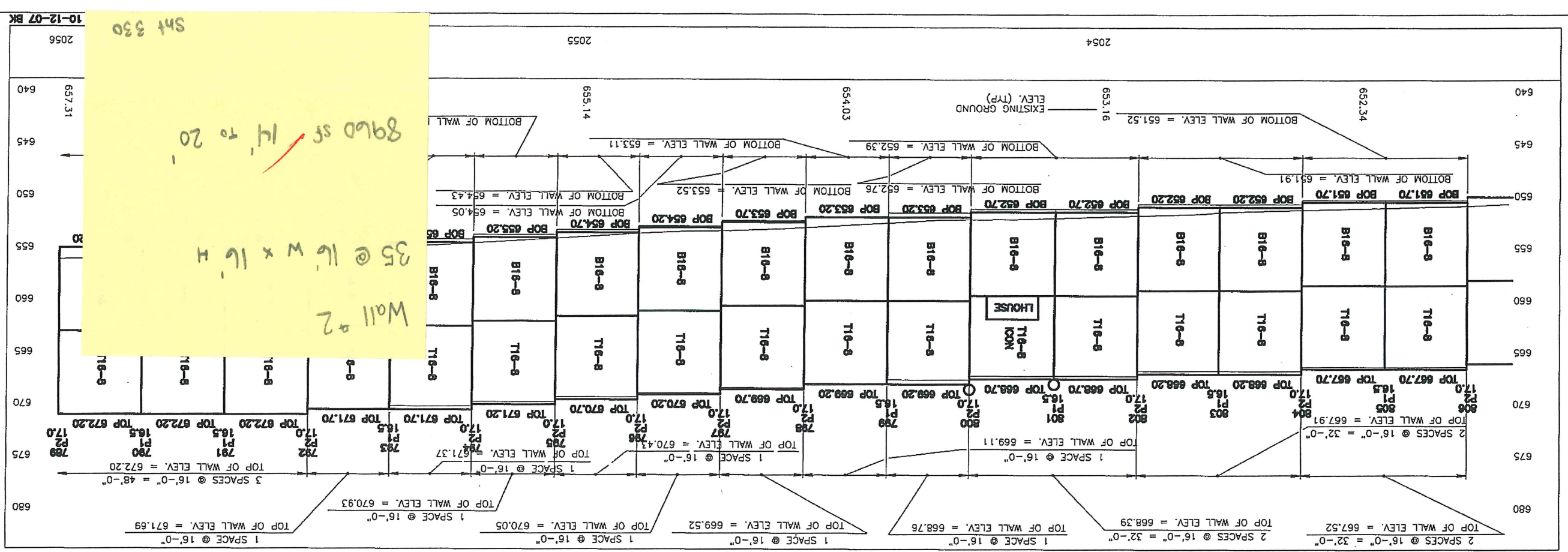
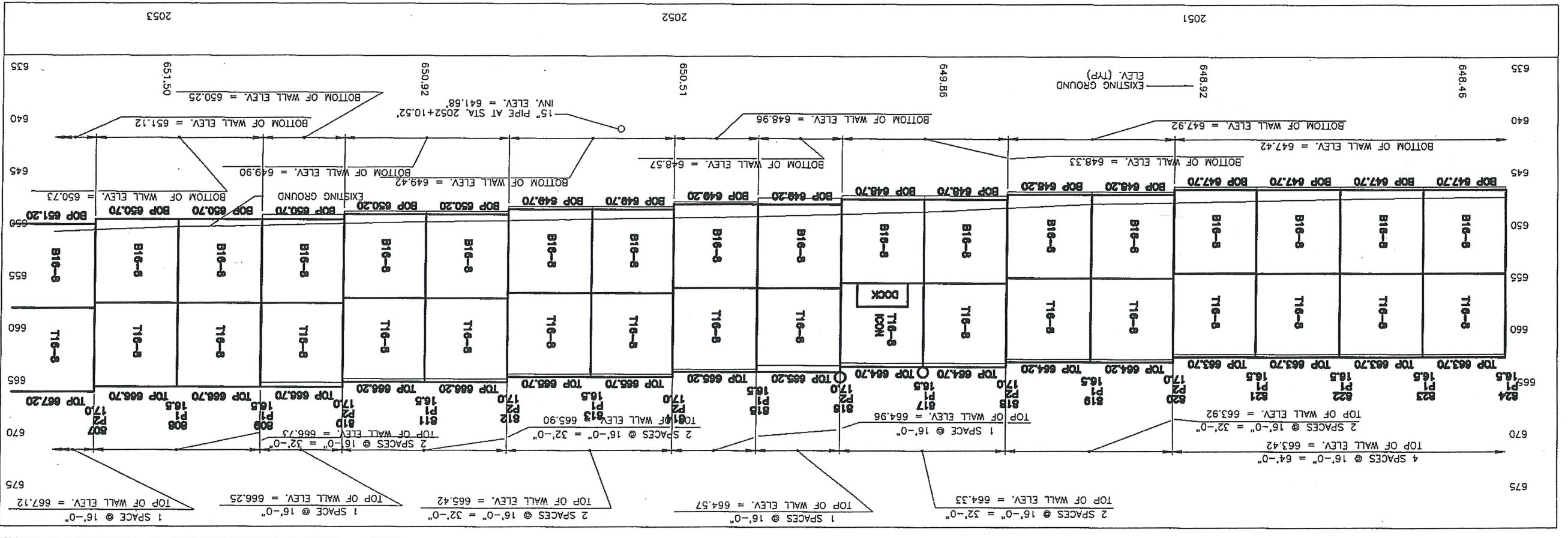
12" ACCESS HOLE

12" ACCESS HOLE

BOATS

DOCK

12" ACCESS HOLE



DESIGNED
SCI

CHECKED
FTB

CALCULATED
FTB

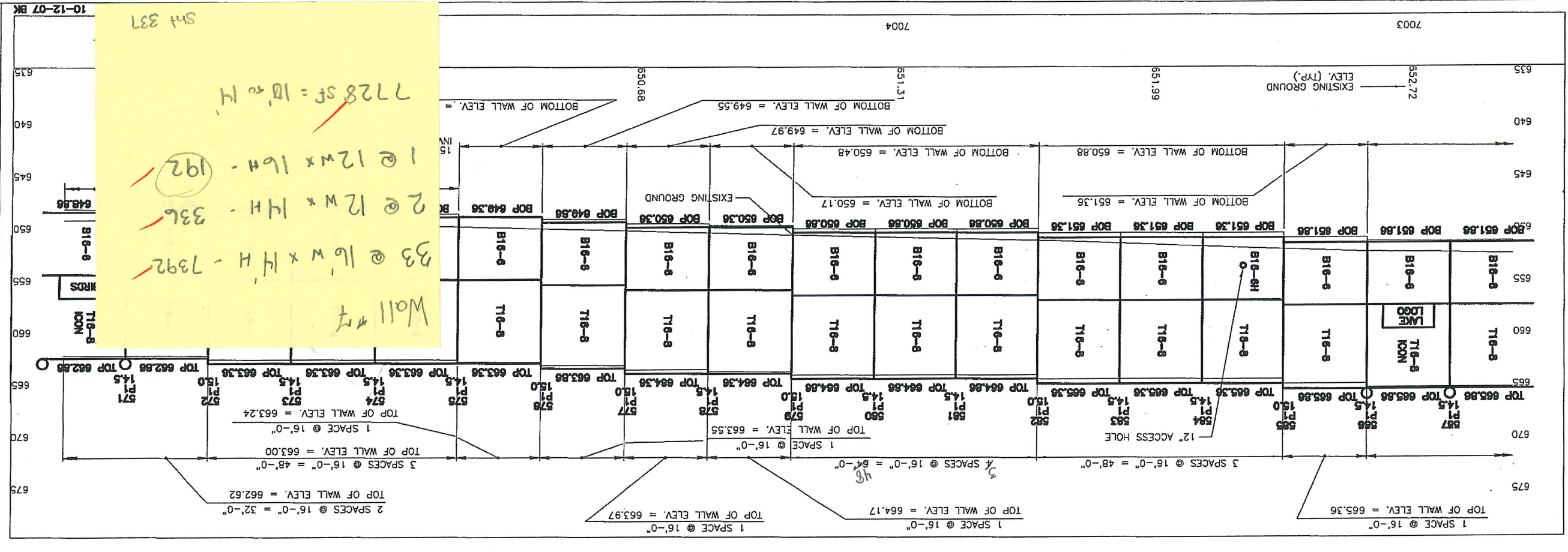
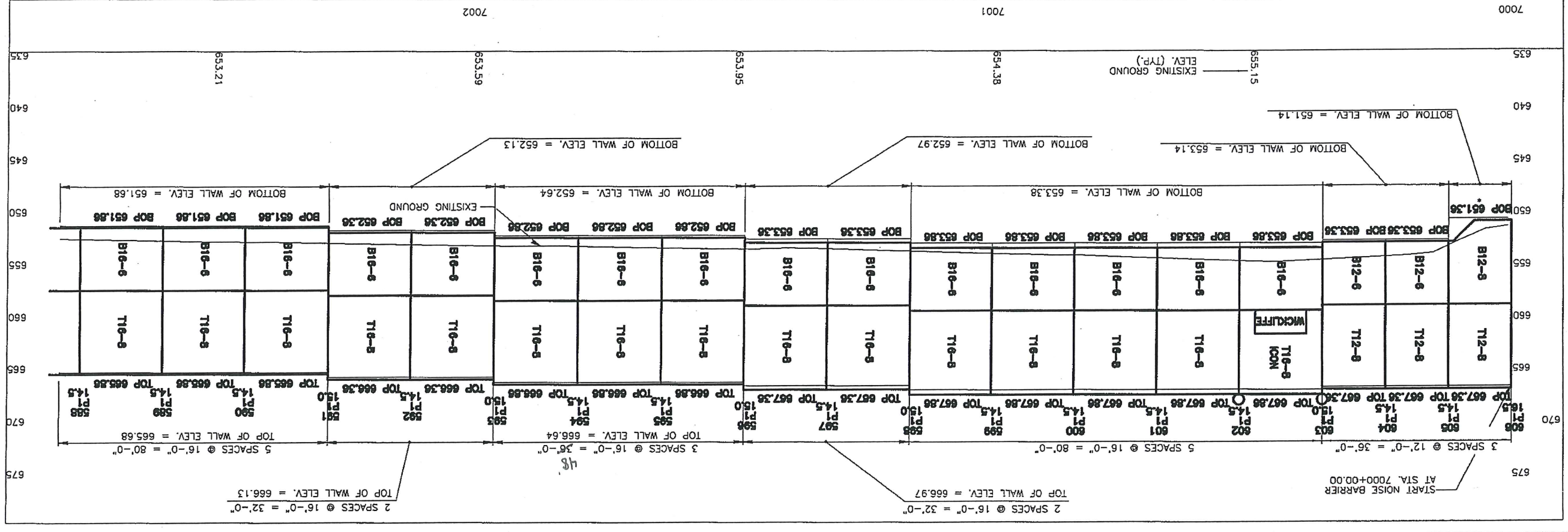
STA. 2050+40.00 TO STA. 2056+00.00

NOISE BARRIER 2 PROFILE

LAK-2-0.00

330

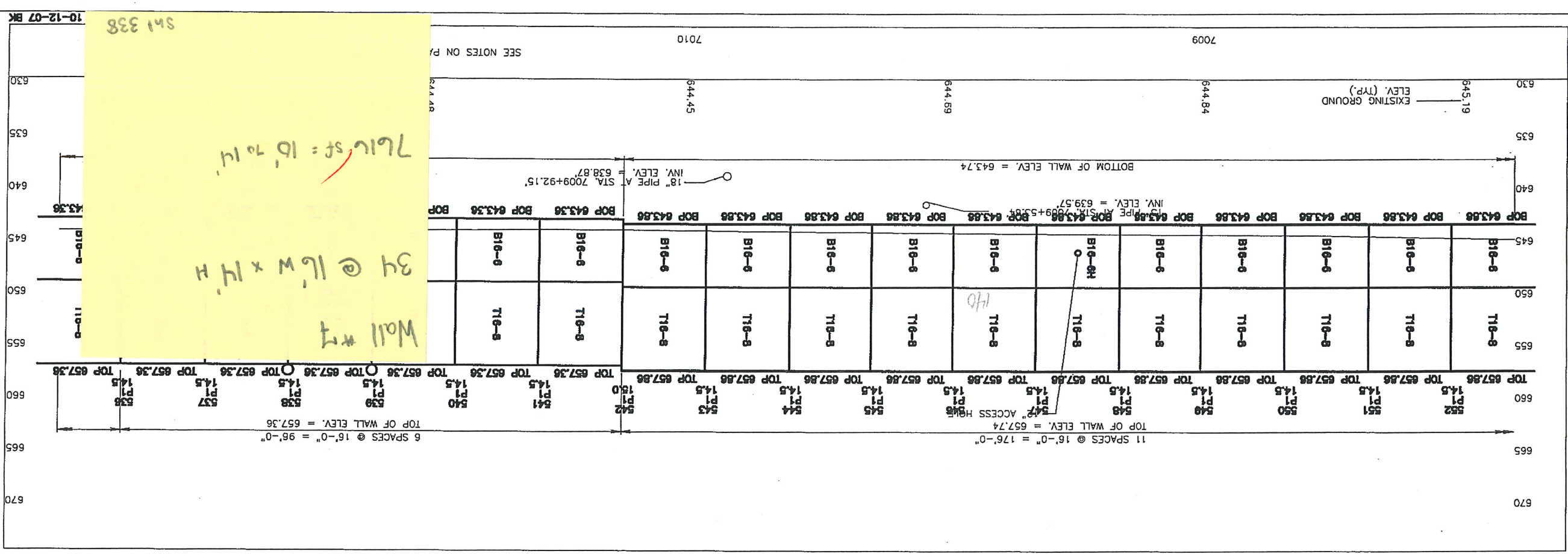
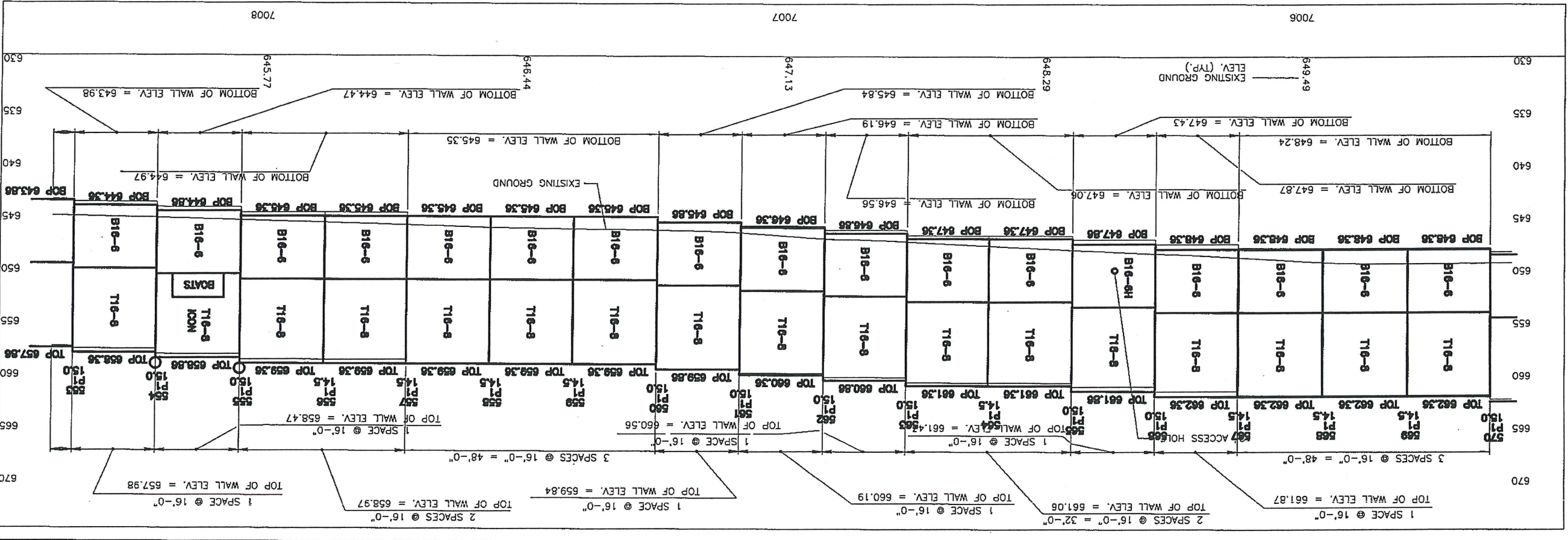
524



Wall #7
 33 @ 16' W x 14' H - 7392
 2 @ 12' W x 14' H - 336
 1 @ 12' W x 16' H - 192
 7728 SF = 10' x 14'

STA. 7000+00.00 TO STA. 7005+60.00
 NOISE BARRIER 7 PROFILE
 LAK-2-0.00
 524
 337
 10-12-07 BK

CALCULATED
 ETB
 CHECKED
 SCI



Wall #7
 34 @ 16' W x 14' H
 76' L x 15' 70' H

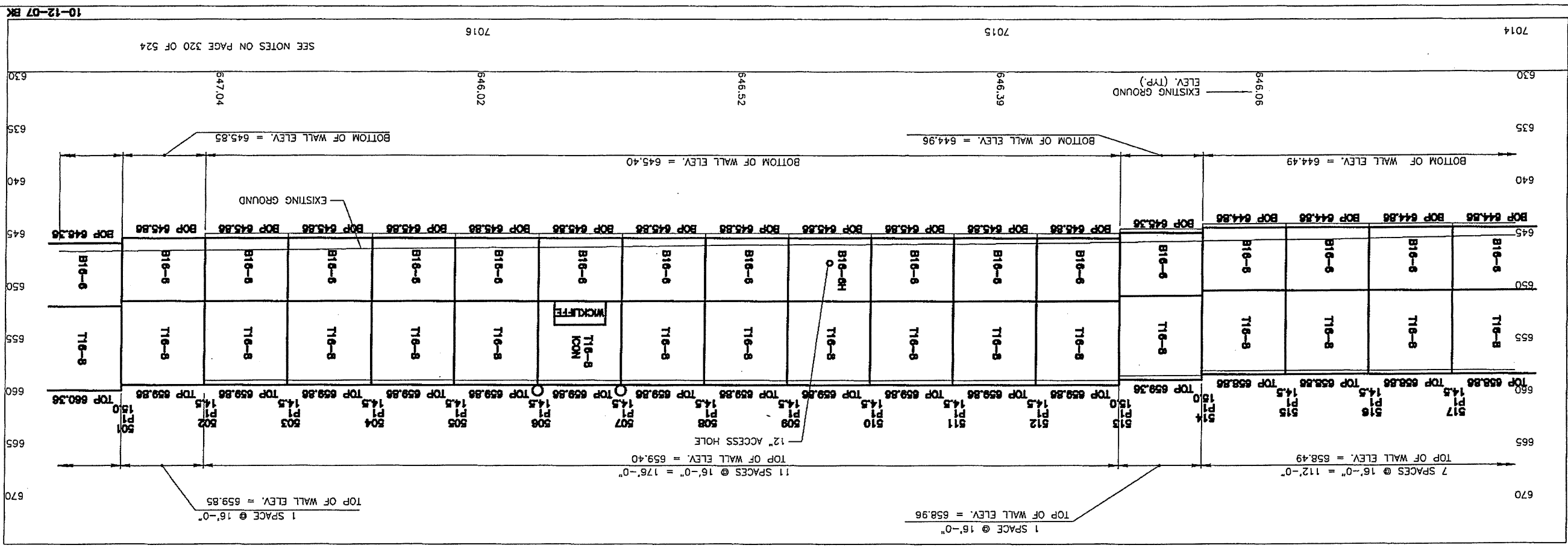
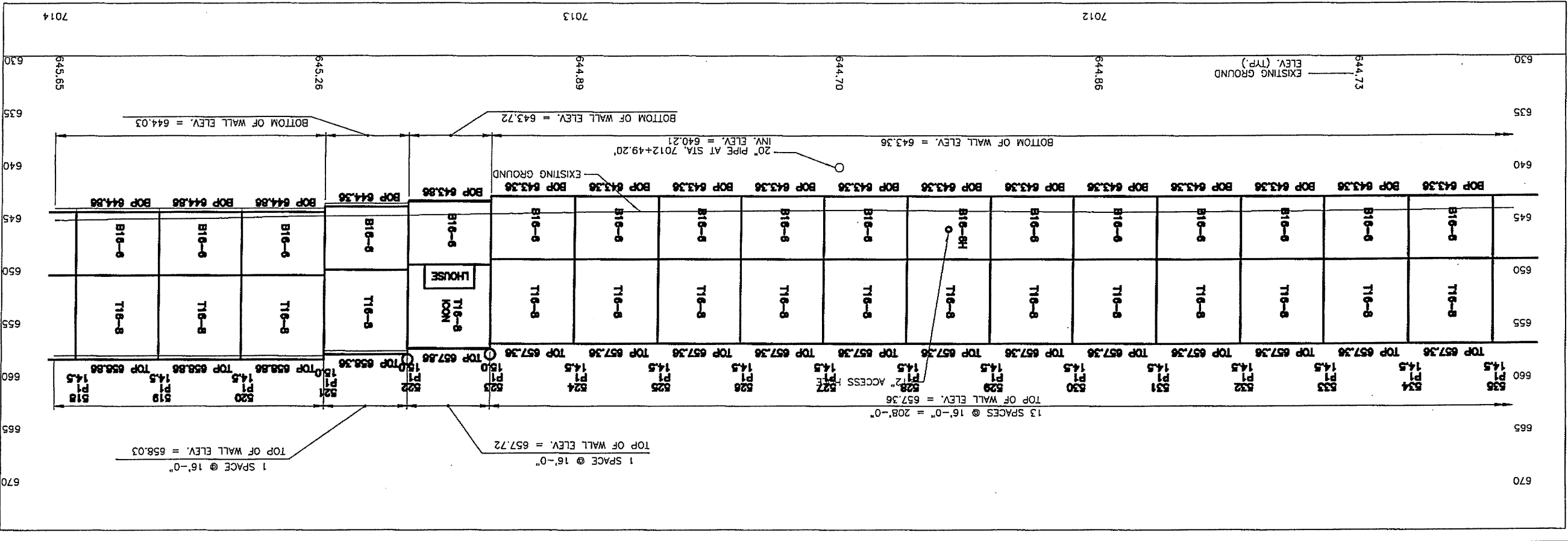
CALCULATED
 ETB
 CHECKED
 SCT

NOISE BARRIER 7 PROFILE
 STA. 7005+60.00 TO STA. 7011+20.00

LAK-2-0.00

338
524

SEE REVISED SHEET

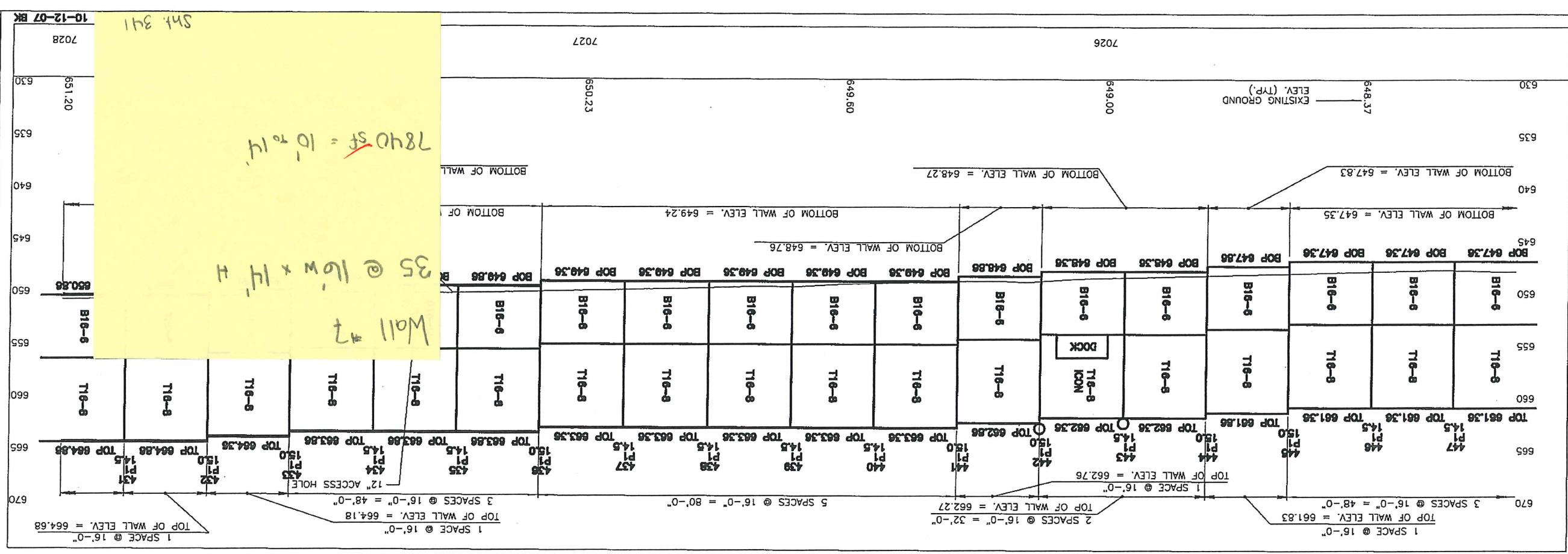
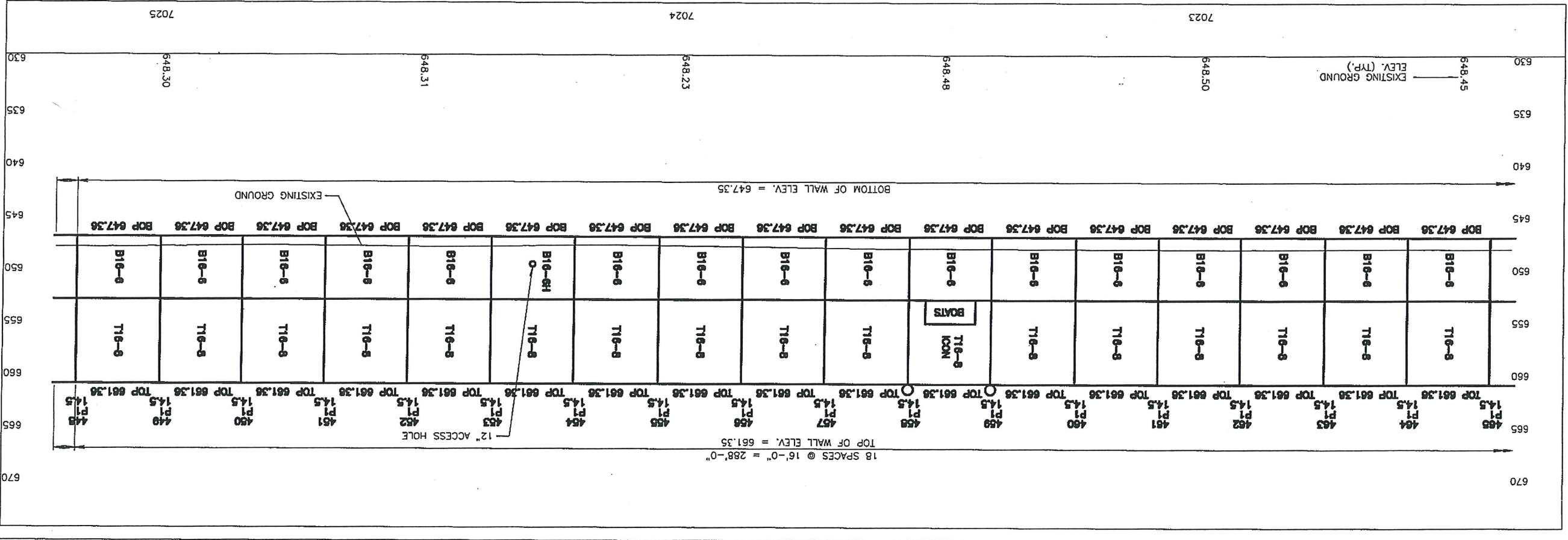


DATE PLOTTED
ETB
CHECKED
SCT

NOISE BARRIER 7 PROFILE
STA. 7011+20.00 TO STA. 7016+80.00

LAK-2-0.00

339
524

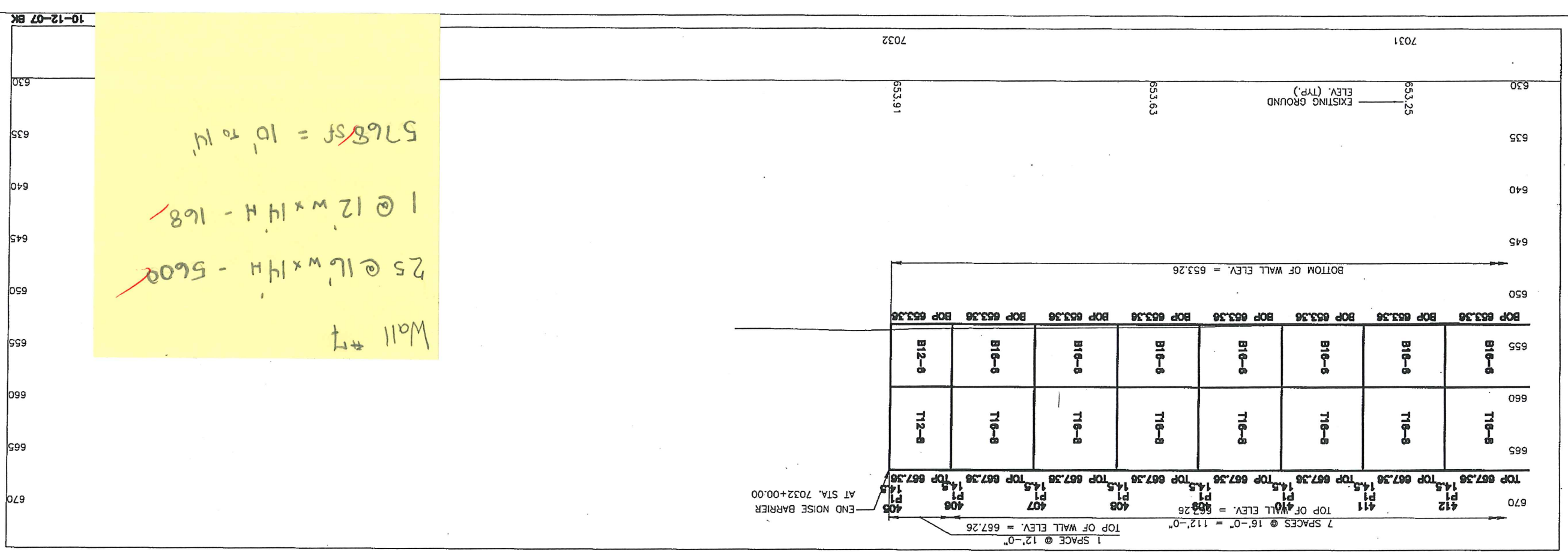


Wall #7
 35 @ 16' W x 14' H
 7840 SF = 16' to 14'
 10-12-07 BK
 524
 341

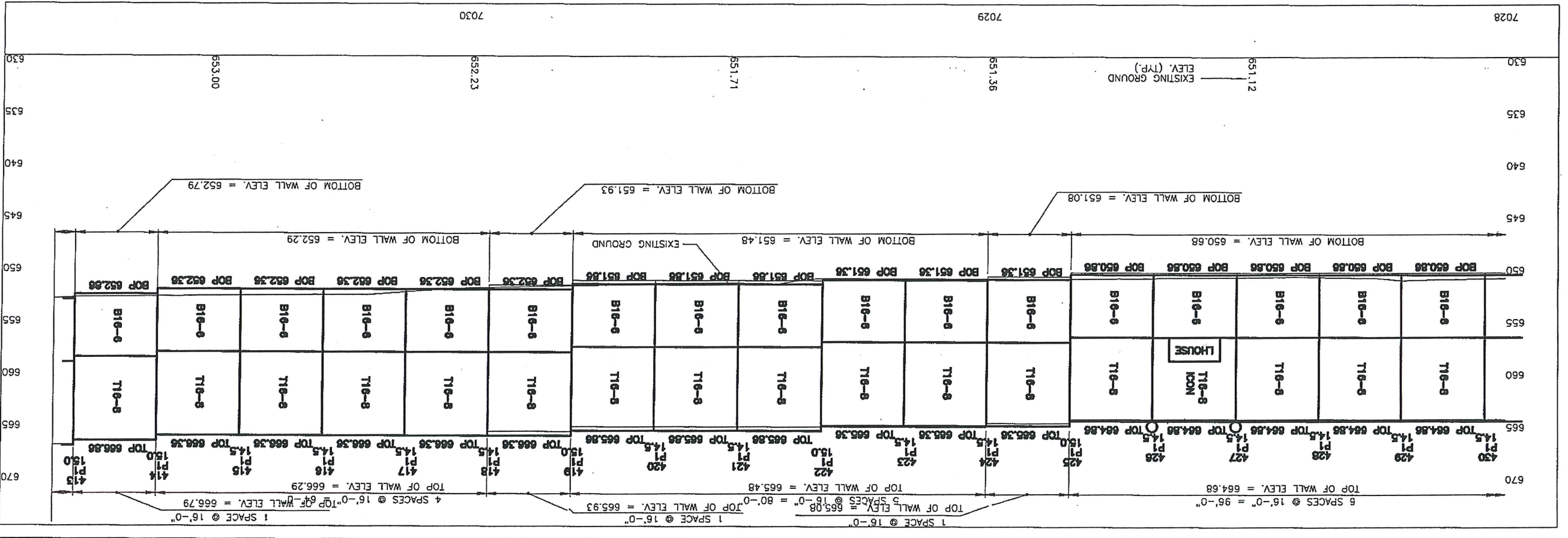
LAK-2-0.00

NOISE BARRIER 7 PROFILE
 STA. 7022+40.00 TO STA. 7028+00.00

DATE
 ETB
 CHECKED
 SGT



5768sf = 10' to 14'
1 @ 12' W x 14' H - 168
25 @ 16' W x 14' H - 5600
Wall #7

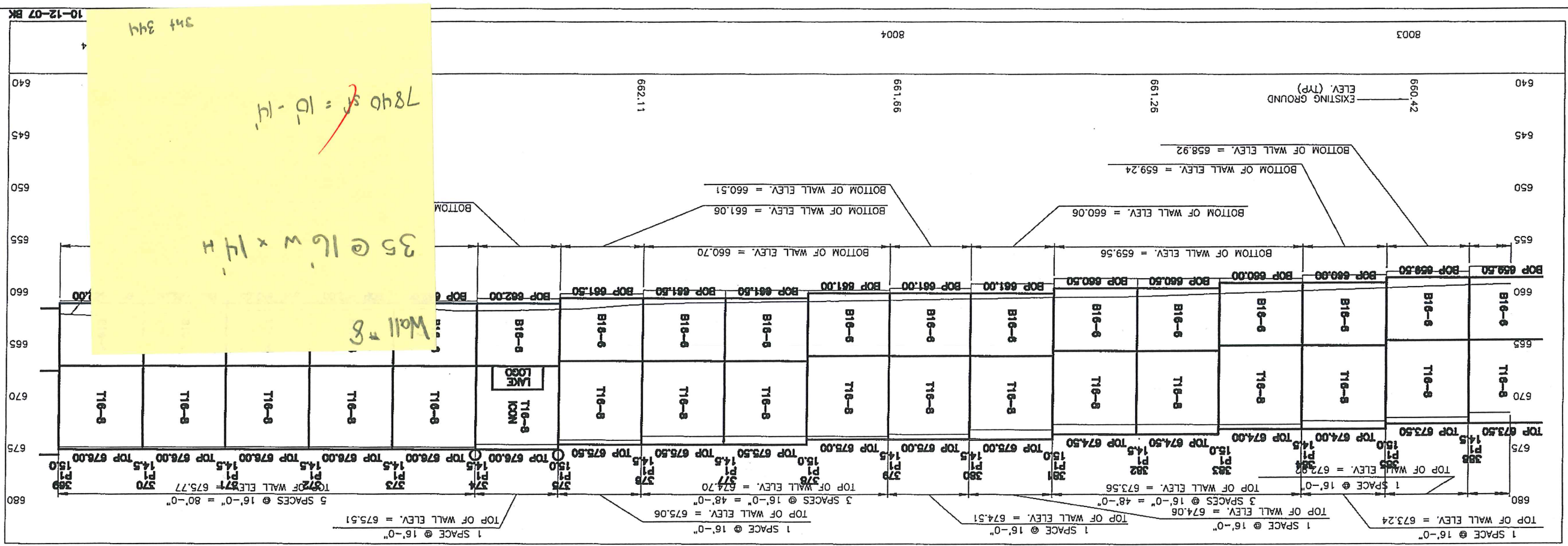
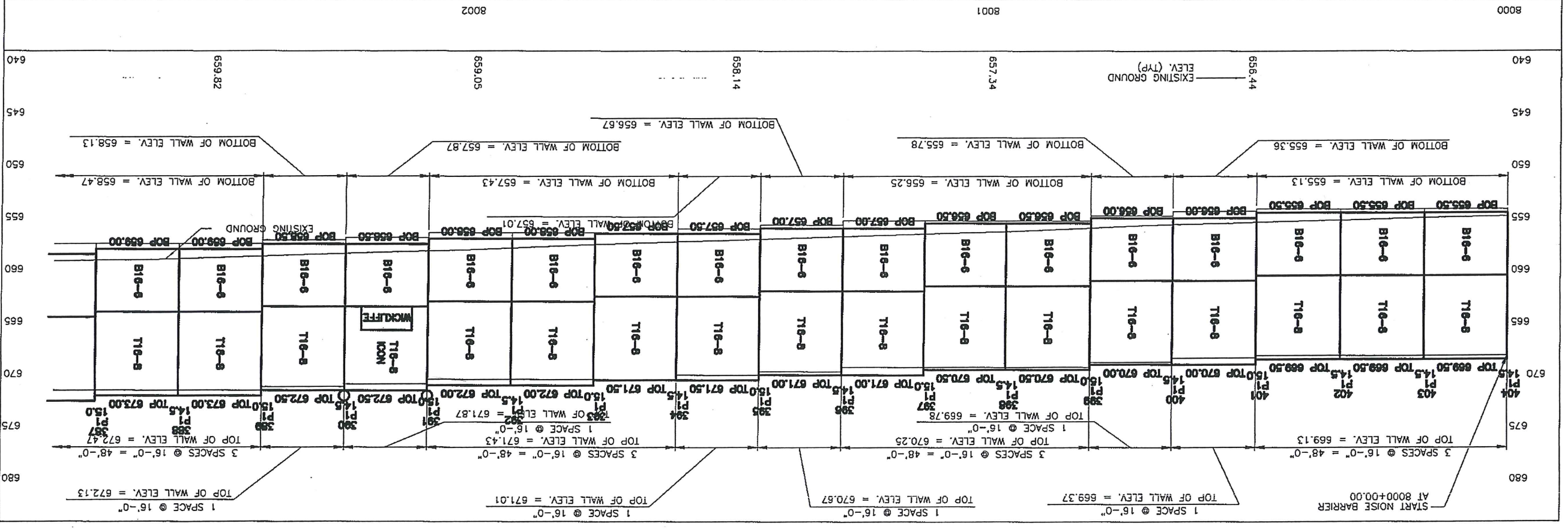


LAK-2-0.00

NOISE BARRIER 7 PROFILE
STA. 7028+00.00 TO STA. 7032+00.00

342
524

CALCULATED
ETB
CHECKED
SCT



344 344
 7840 sq ft = 16' x 14'
 35 @ 16' w x 14' h
 Wall # 8

LAK-2-0.00

NOISE BARRIER 8 PROFILE
 STA. 8000+00.00 TO STA. 8005+60.00

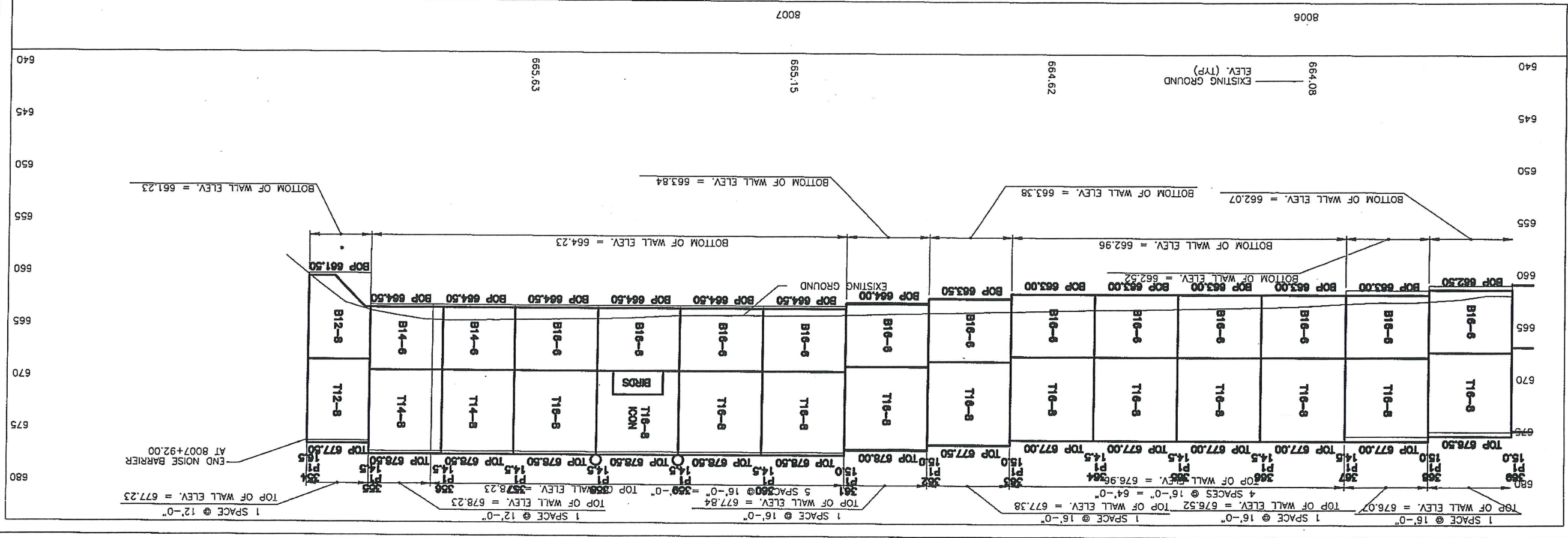
CALCULATED BY: ETB
 CHECKED BY: SCT

Wall #8
 13 @ 16" w x 14" h - 2912'
 1 @ 12" w x 14" h - 168'
 1 @ 12" w x 16" h - 192'
 3080 SF = 10' x 14'
 SH 345

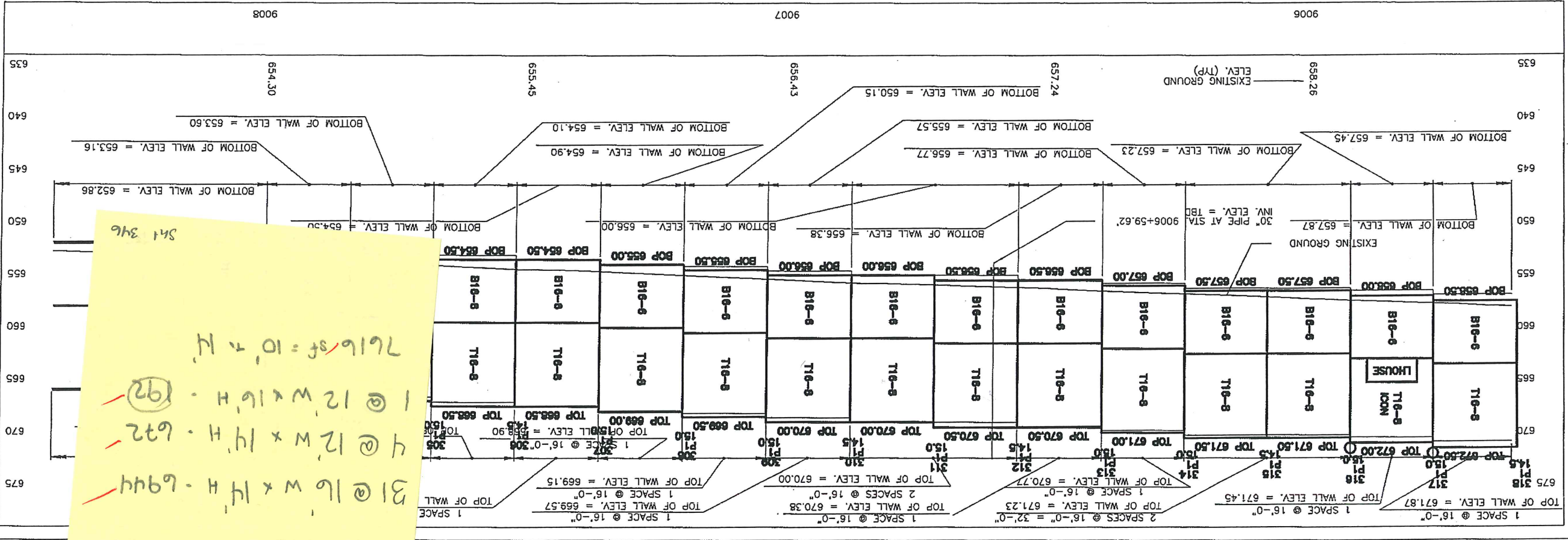
345
524

LAK-2-0.00

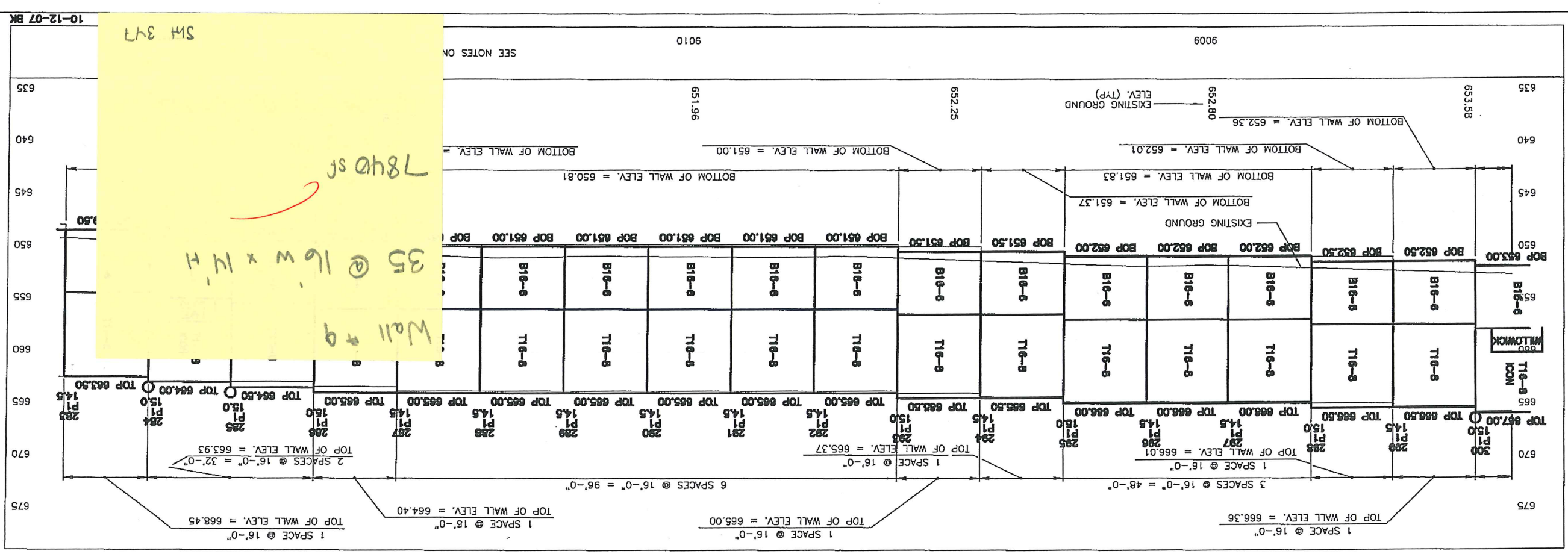
NOISE BARRIER 8 PROFILE
8005+60.00 TO STA. 8007+92.00



CALCULATOR
 ETB
 DATED
 SCT



Wall #9
 31 @ 16' W x 14' H - 6944
 4 @ 12' W x 14' H - 672
 1 @ 12' W x 16' H - 672
 7616 sf = 10' x 14'



Wall #9
 35 @ 16' W x 14' H
 7840 sf

PREPARED
 ETB
 CHECKED
 SCT

NOISE BARRIER 9 PROFILE
 STA. 9005+60.00 TO STA. 9011+20.00

LAK-2-0.00

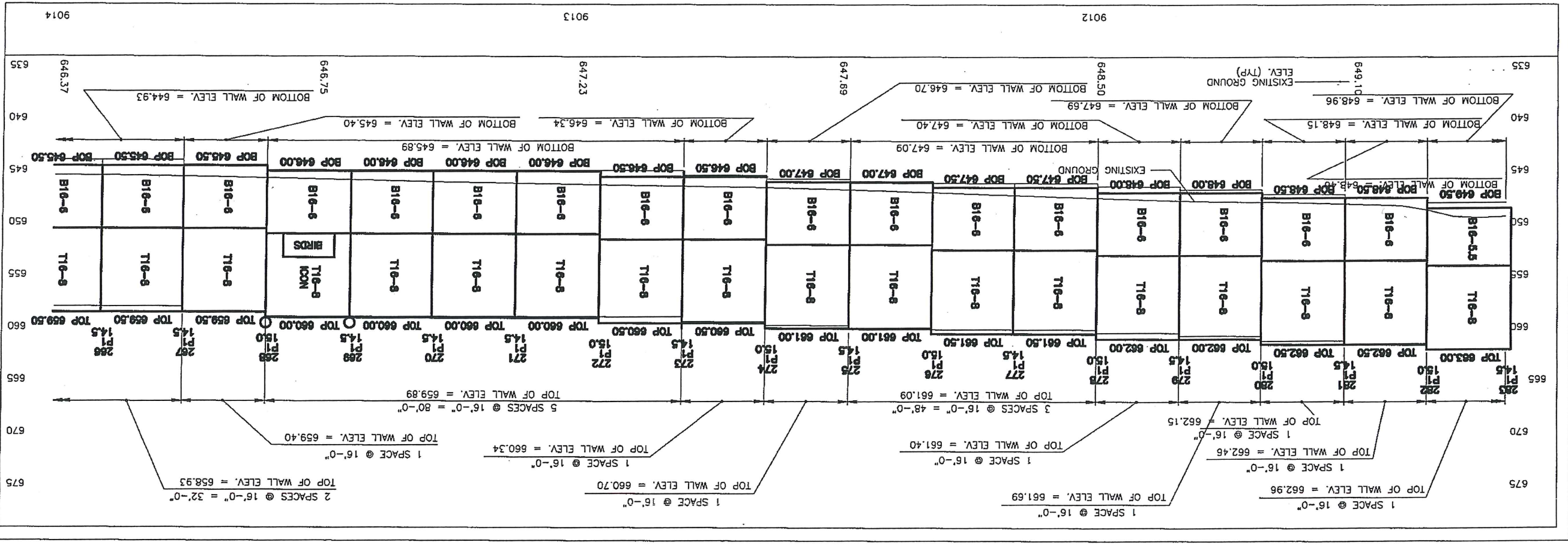
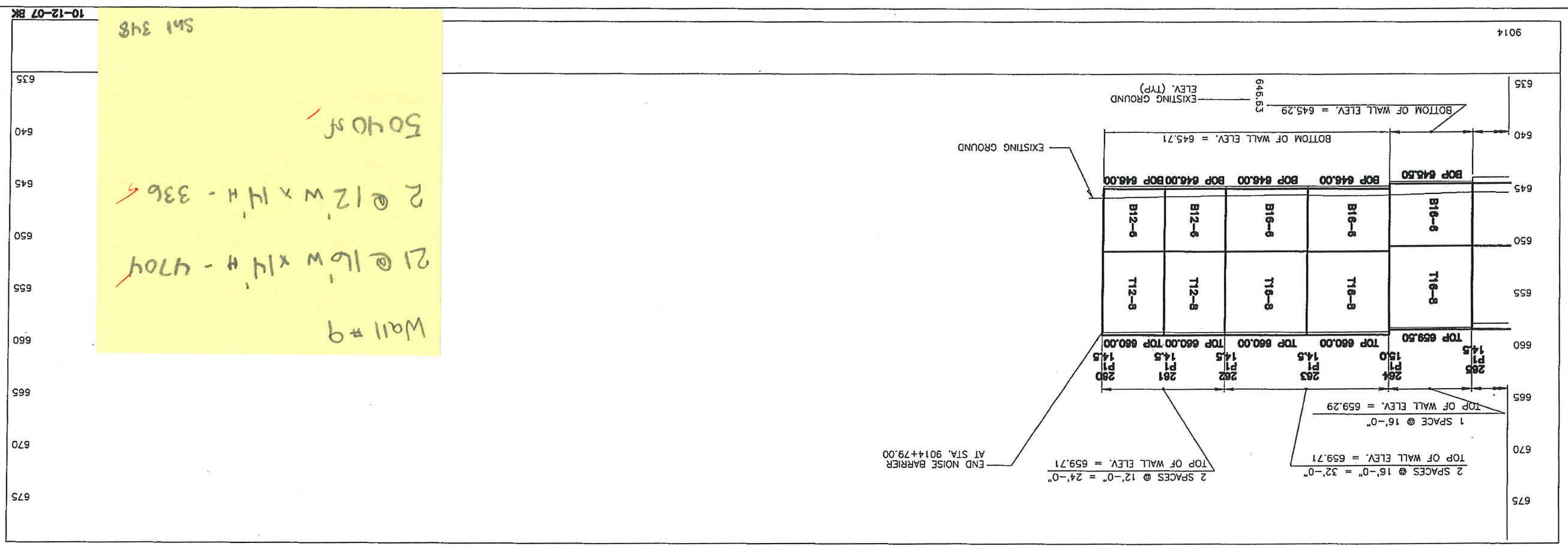
347
 524

348
524

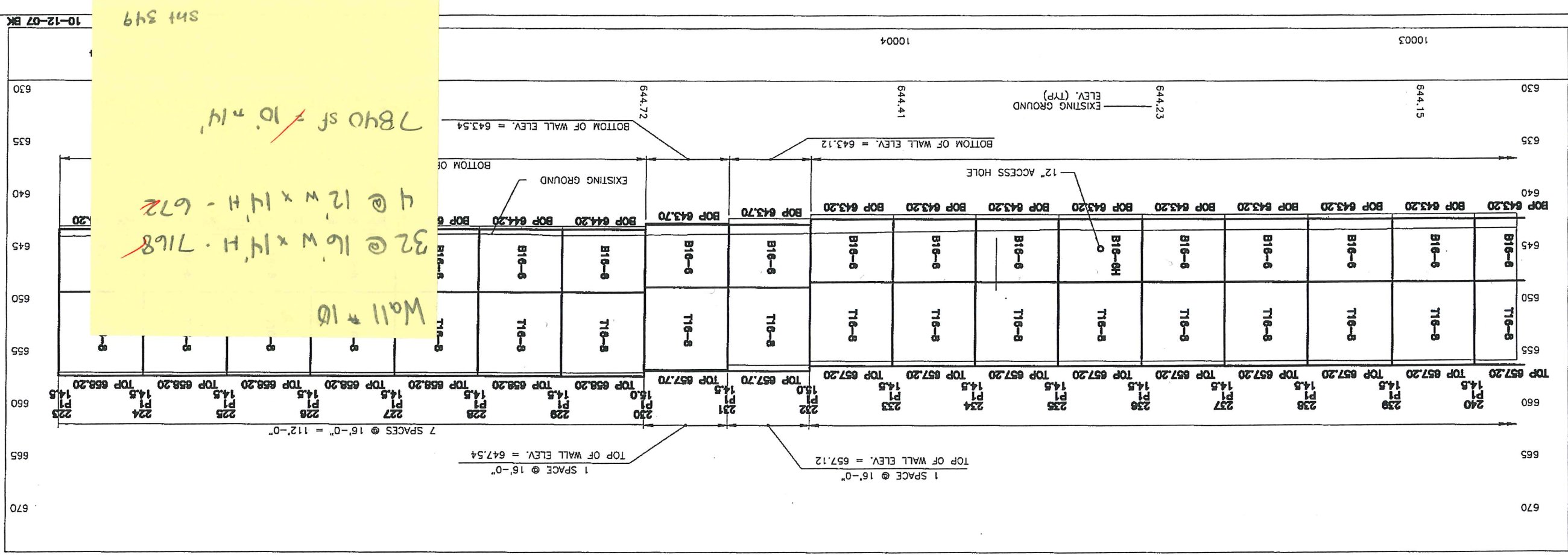
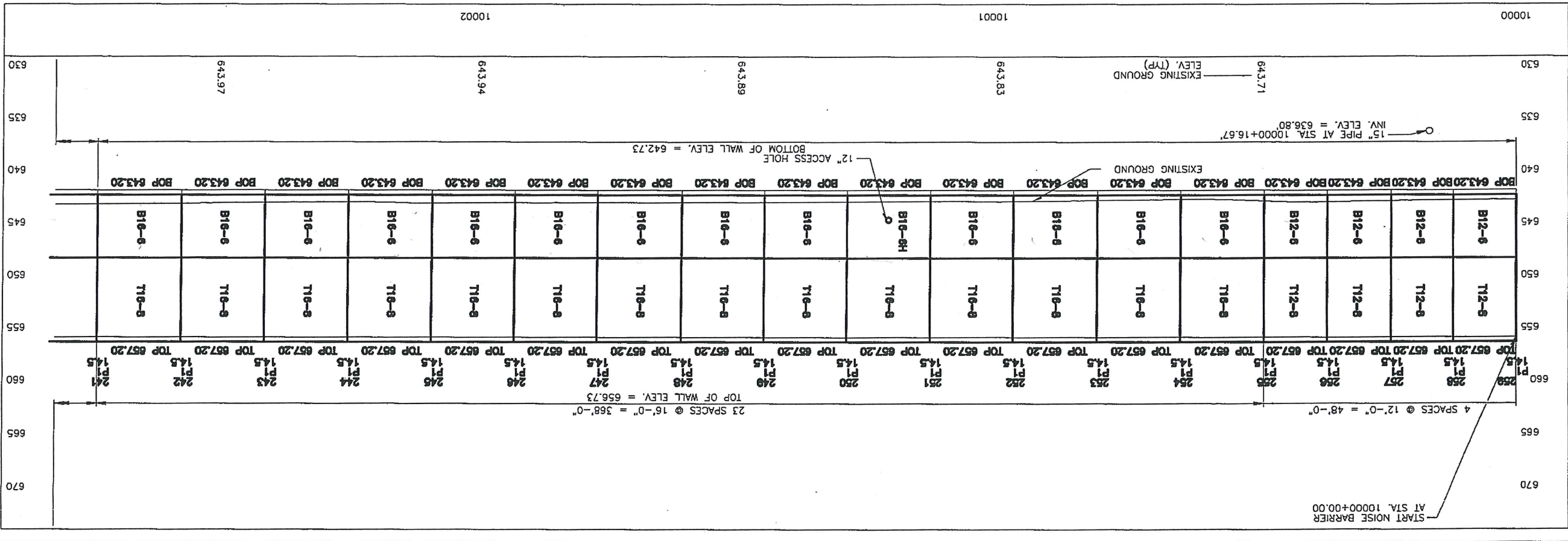
LAK-2-0.00

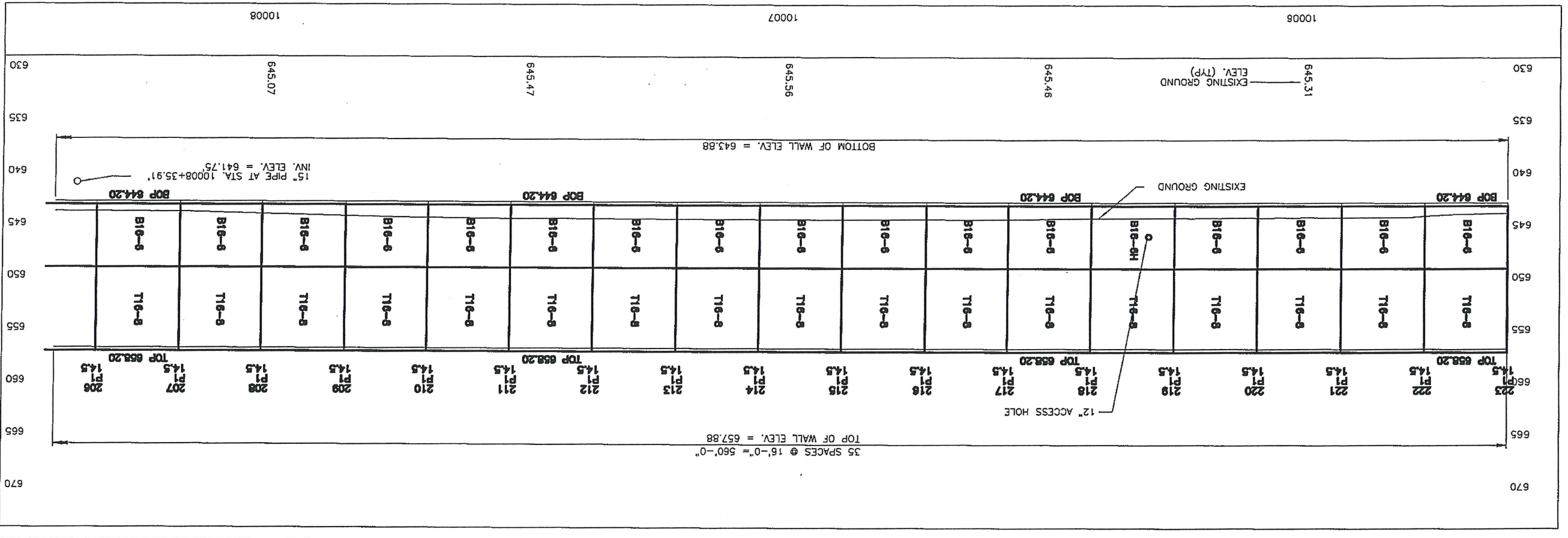
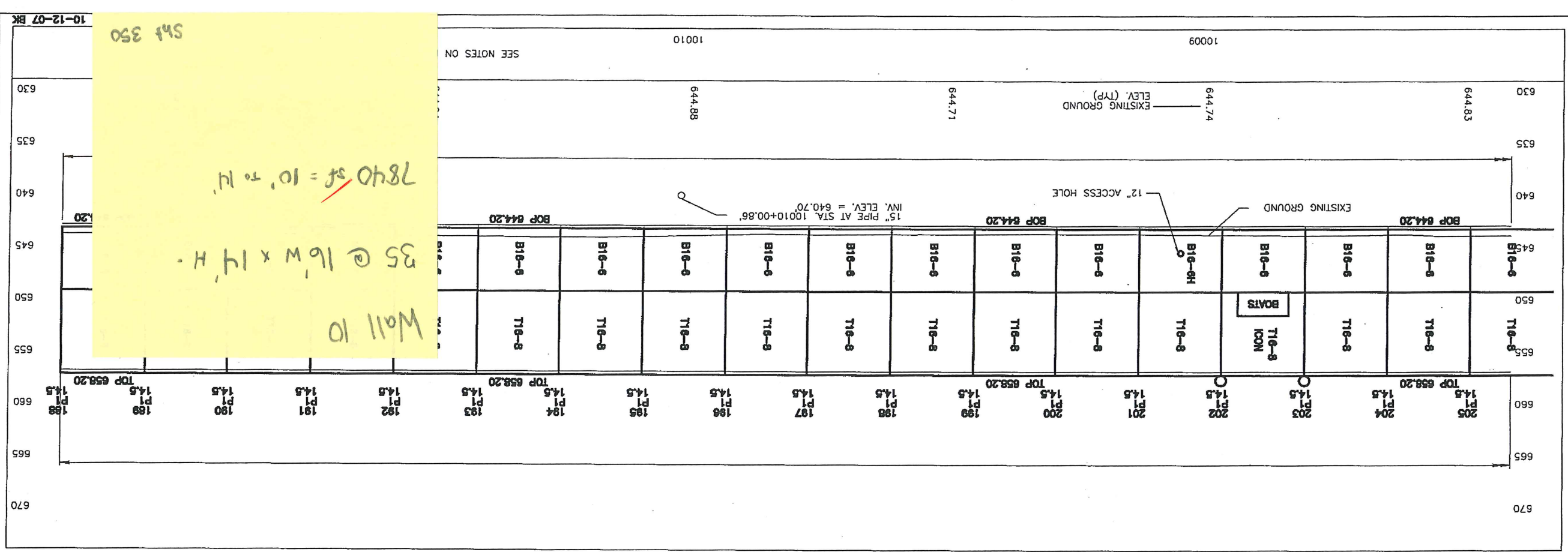
NOISE BARRIER 9 PROFILE
STA. 9011+20.00 TO STA. 9014+79.00

DESIGNED
ETB
CHECKED
SCT



Wall #9
 21 @ 16' W x 14' H - 4704
 2 @ 12' W x 14' H - 336
 5040 sq ft





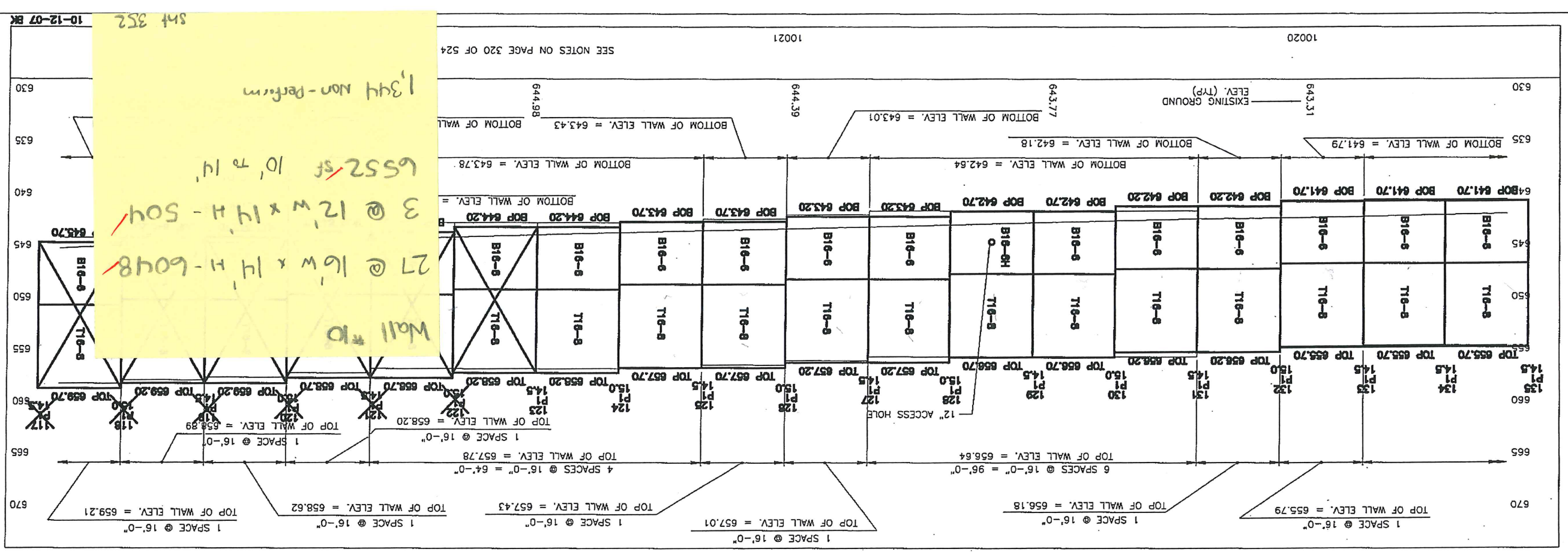
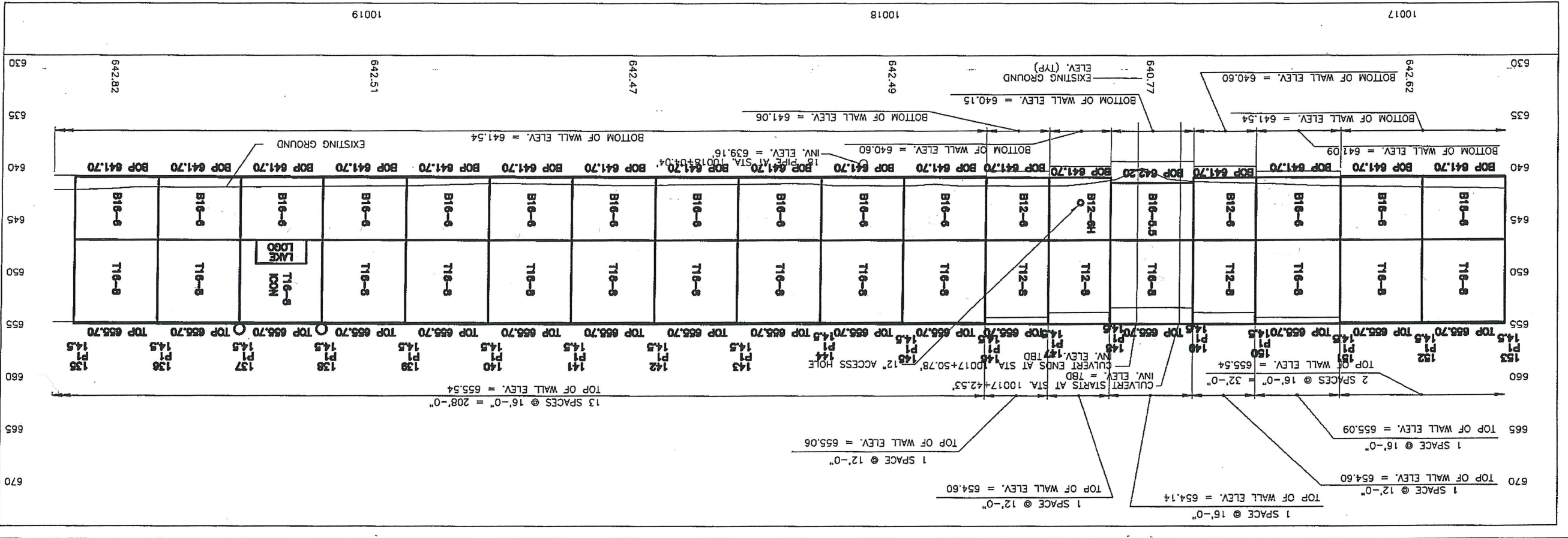
541 350
 Wall 10
 35 @ 16' W x 10' H
 7840 sf = 10' to 14'

524
350

LAK-2-0.00

NOISE BARRIER 10 PROFILE
 STA. 10005+60.00 TO STA. 1011+20.00

CALCULATED
 ETB
 CHECKED
 SCT



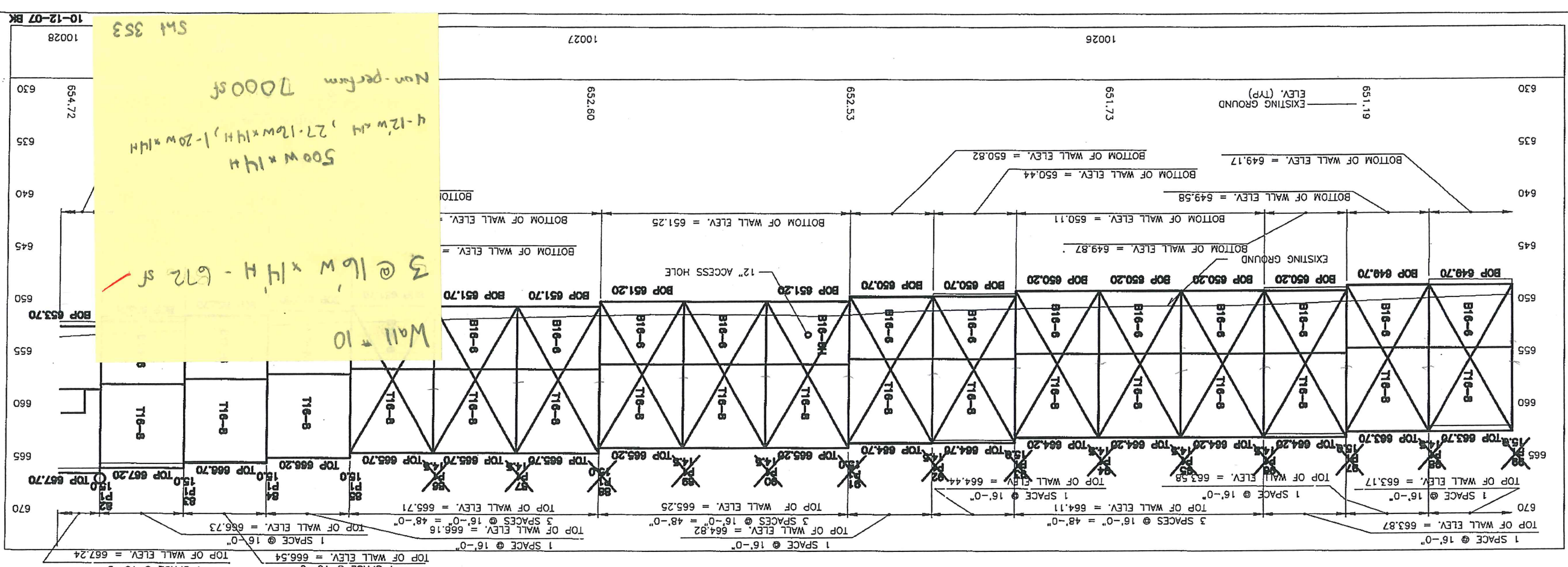
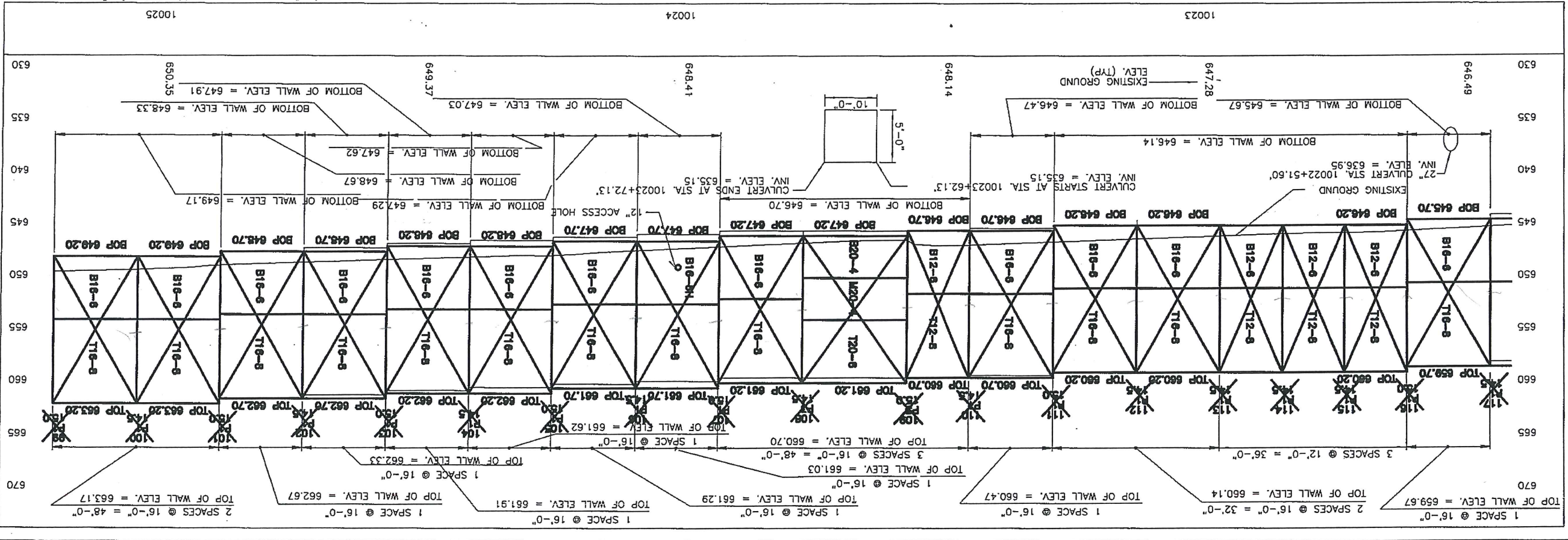
DESIGNED
SCT

CALCULATED
ETB

NOISE BARRIER 10 PROFILE
STA. 10016+80.00 TO STA. 10022+40.00

LAK-2-0.00

352
524



500W x 14H
 4-12' x 27'-12\"/>

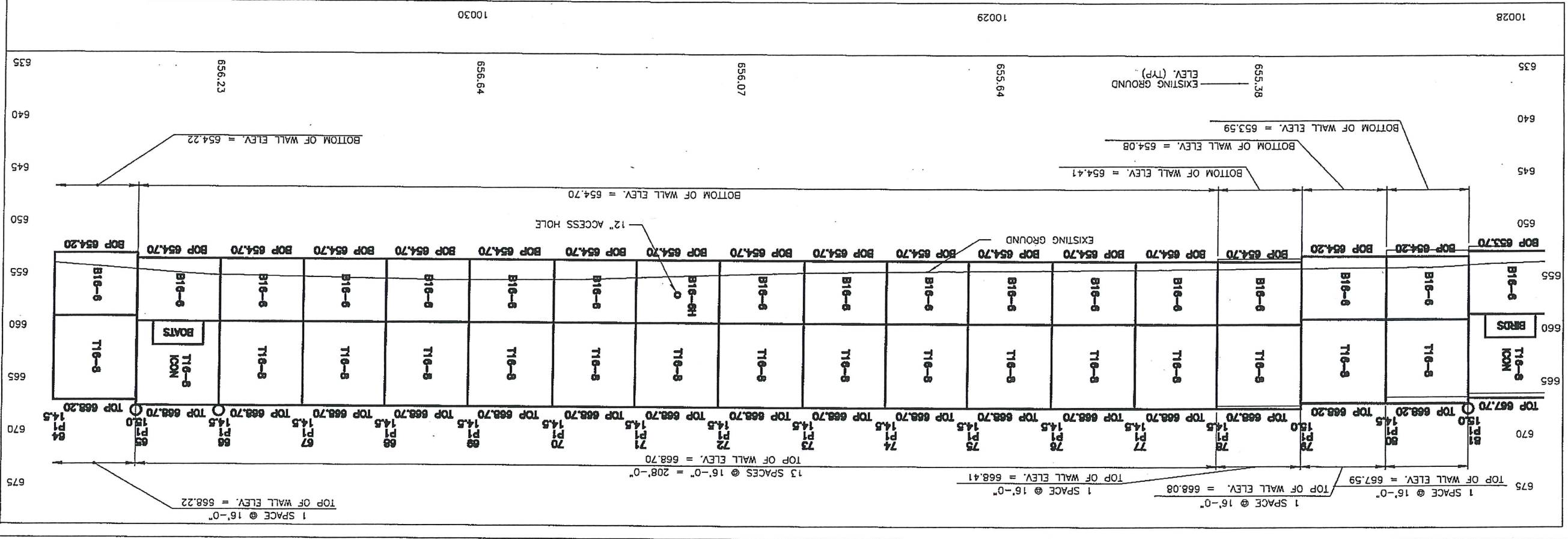
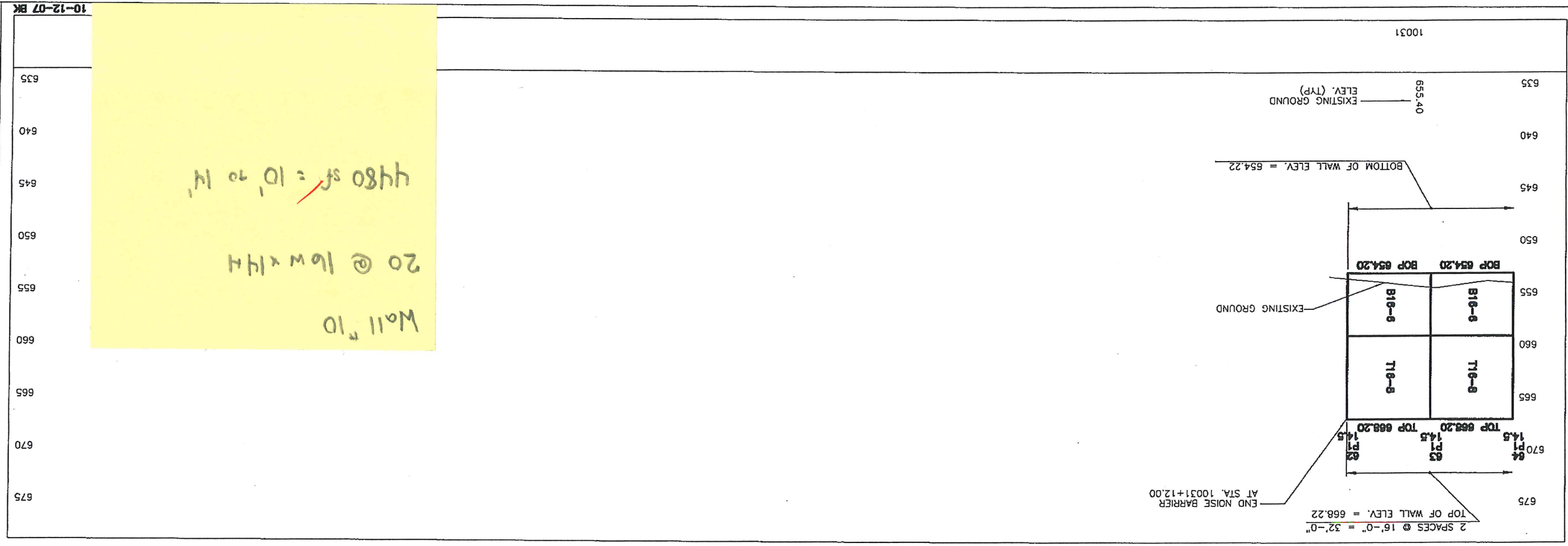
LAK-2-0.00

NOISE BARRIER 10 PROFILE
 STA. 10022+40.00 TO STA. 10028+00.00

CALCULATED
 ETB
 CHECKED
 SCT

35
 524

10-12-07 BK

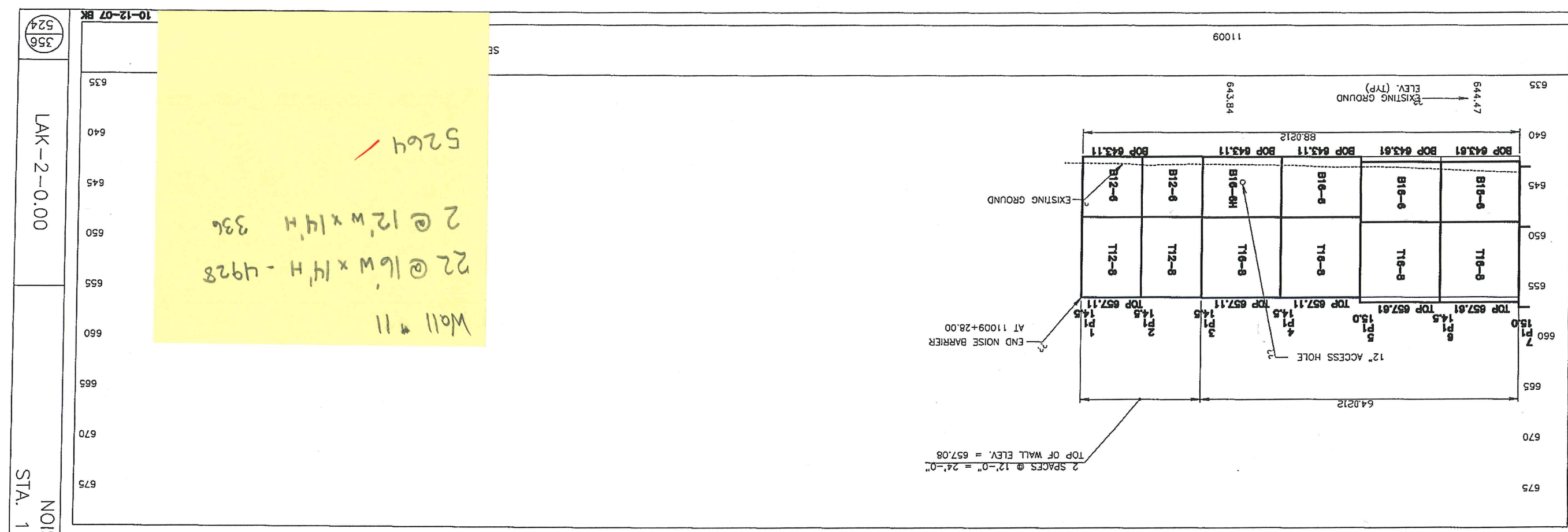
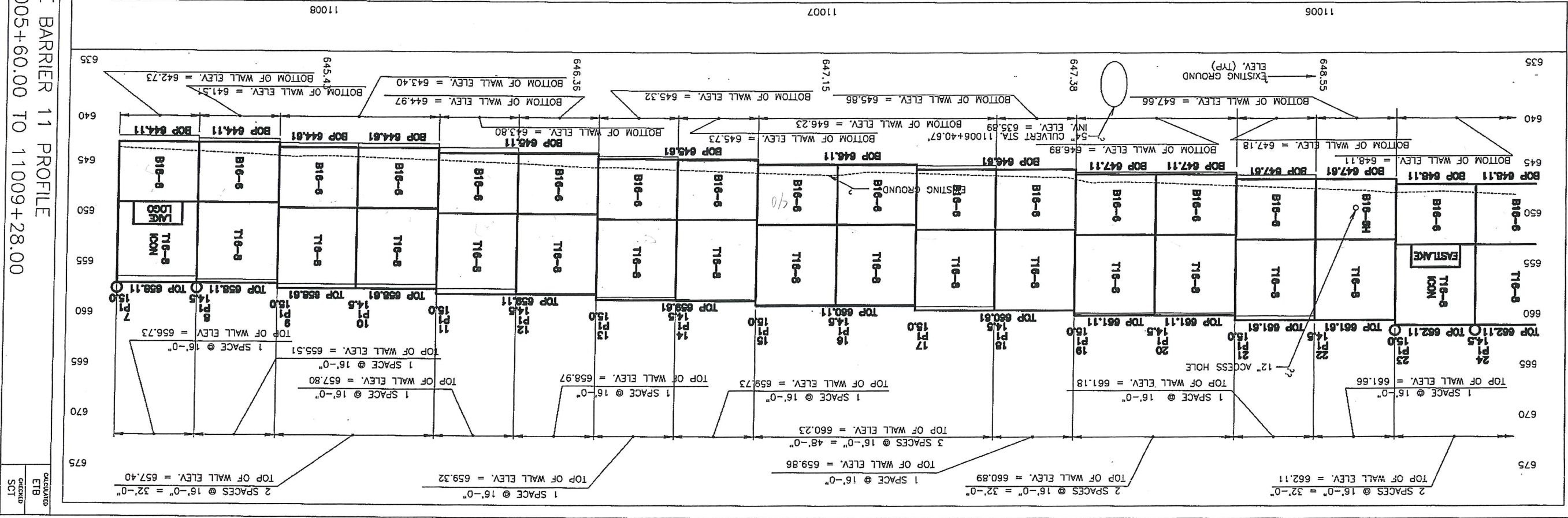


NOISE BARRIER 10 PROFILE

LAK-2-0.00

STA. 10028+00.00 TO STA. 10031+12.00

524
 354
 CALCULATED
 ETB
 CARGO
 SCT



Wall # 11
 22 @ 16' W x 14' H - 4928
 2 @ 12' W x 14' H - 336
 5264 ✓

NOISE BARRIER 11 PROFILE
 STA. 11005+60.00 TO 11009+28.00

356
 524

CALCULATED
 ETB
 CHECKED
 SCJ