



MIDDLE SOUTH
UTILITIES SYSTEM

LOUISIANA
POWER & LIGHT

142 DELARONDE STREET • P.O. BOX 8008
NEW ORLEANS, LOUISIANA 70174-8008 • (504) 388-2345

October 12, 1984

W3P84-2862
3-A1.01.04

Director of Nuclear Reactor Regulation
Attention: Mr. G. W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Knighton:

Subject: Waterford 3 SES
Docket No. 50-382
MASONRY BLOCK WALLS

- References: 1) NRC Inspection & Enforcement Bulletin No. 80-11, dated 5/8/80
- 2) LPL 14934 from D.L. Aswell (LP&L) to A. Schwencer (NRC), dated 8/22/80
- 3) LP&L letter W3K84-0842 from R.S. Leddick to R.C. DeYoung (NRC), dated 4/11/84
- 4) NRC Inspection & Enforcement Report No. 80-07 (Waterford 3), dated 5/14/84

By Reference 1, the NRC requested that LP&L review the design bases for masonry walls.

In Reference 2, LP&L addressed IEB 80-11 and stated that no seismic Category I equipment was attached to masonry block walls at Waterford 3.

In Reference 3, LP&L committed to a program designed to review design adequacy and as-built conditions for the Waterford 3 masonry block walls.

In Reference 4, the findings of the NRC Construction Appraisal Team (CAT) indicated that further review of documentation for the masonry block walls would be required.

On September 25-27, 1984, the NRC experts (Dr. P. T. Kuo and Mr. F. Rinaldi) visited the Waterford 3 site and reviewed documentation pertinent to design and construction of the masonry walls. During their visit, the inspectors determined that the material available for review was insufficient and requested that LP&L provide some additional information.

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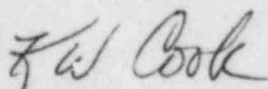
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Mr. G. W. Knighton, Chief
W3P84-2862
Page 2

Enclosed is the additional information requested by the NRC reviewers. It is provided in the format of responses to the sixteen confirmatory items identified during the site visit. Once the material is given NRC review, LP&L is prepared to visit and discuss any further information or details on the Waterford 3 masonry walls construction.

If you have any questions, please contact C. E. Wuller at (504) 464-3499.

Very truly yours,

A handwritten signature in cursive script, appearing to read "K.W. Cook".

K.W. Cook
Nuclear Support & Licensing Manager

KWC:GEW:sms

cc: E.L. Blake (w/o enclosure), W.M. Stevenson (w/o enclosure), J. Wilson,
G.L. Constable, P.T. Kuo, F. Rinaldi

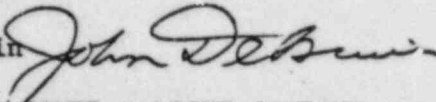
MEMORANDUM

September 28, 1984
ES-10106-84

TO: M. Yates/J. Houghtaling

FROM:

J. DeBruin



SUBJECT: LOUISIANA POWER & LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
1984 - 1165 MW INSTALLATION - UNIT NO. 3
FOLLOWUP ACTION PLAN FOR CLOSURE OF MASONRY
BLOCK WALLS CAT ITEM 6.2/6.3

Attached is the list of confirmatory items emanating from the NRR audit of the Masonry Block Wall design and installation. Four (4) of the sixteen (16) items have been resolved. Closure of the remaining items will be accomplished as follows:

- 1) Analysis is required to close the remaining items. Responsibilities has been delegated as noted below:
 - a) W.T. Teng shall resolve Item No. 3 in conjunction with the Civil SAG Group in New York.
 - b) All other open items requiring analysis will be performed at site under the direction of Gabe Aliberti.
- 2) Gabe Aliberti will coordinate with Bob Bagnetto of LP&L Project Engineering to expedite LP&L validation activities.
- 3) John DeBruin will prepare the draft letter to NRC for LP&L's use in transmitting the final documentation package to NRC. The Plan is submit the package by 10/8/84.
- 4) Gabe Aliberti will provide photographic documentation of the core drill results. This will be submitted as part of the package.
- 5) A followup meeting with NRC is to be held in mid October in Bethesda, MD in order to close the remaining open items.

JD/cl

cc: B. Grant
E. Kowalski
J. Tompeck
J. Costello
R. Buriski - LP&L
J. Hart
G. Aliberti
ESSE File P.83

CAT/REG11

LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES - UNIT NO. 3

9/28/84
3:30 PM

SUMMARY OF CONFIRMATORY
ITEMS STEMMING FROM
NRR EVALUATION OF
MASONRY BLOCK WALLS
NRC CAT ITEM NO. 6.2 & 6.3

ITEM NO.	NRC REVIEW STATUS	QUESTION	RESPONSE
1.	Open	Verify structural adequacy of concrete curb used to support Hollow Block Walls. Consider shear and bending loads in analysis. Verify adequacy of lap splice detail. Verify adequacy of FCR-CH-891.	Verification of curb structural adequacy is provided in Calc. Pkg. No. 1. Package No. 1 also provides verification of lap splice details and the embedded plate detail shown in FCR-CH-891.
2.	Open	Verify structural adequacy of vertical support for removable solid block wall under bearing, bending and shear loads, at diaphragm locations. Are test reports available?	Calculation Package No. 2 provides verification of vertical support for solid block wall. Structural adequacy has been verified by analysis. No tests were deemed necessary.
3.	Open	Clarify how the seismic acceleration value of .3g was selected for use in calculations. Confirm weight calculation. Confirm height limits used in analysis with as-built conditions. Provide frequency analysis for both solid block and or hollow block walls. Provide frequency analysis for Wall S1 and S21.	A final report will be submitted by 10/8/84. Refer to the attached Memo No. ES-10131-84 for status.
4.	Resolved	Verify that yield stress of rebar is still within .9fy when multiplier is 2.	Verification is provided in Calc. Package No. 4

ITEM NO.	NRC REVIEW STATUS	QUESTION	RESPONSE
5.	Open	Verify the structural adequacy of Masonry Walls when miscellaneous non-seismic loads are considered. Select Walls S1, H2, H13, and W29 for this analysis.	Calculation Package No. 5 provides verification of wall S1. Verification of walls H2, H13 & W29 will be provided by 10/8/84.
6.	Resolved	Confirm impact loads are low due to adjacent cable tray support material motion during a seismic event. Wall S2 typical.	Confirmation is provided in Calculation Pkg. No. 6
7.	Open	Provide connection details between perpendicular block walls and block wall to reinforced concrete wall, and L-shaped wall connections to diaphragm. (Example S6)	Connection details & specifications are provided in Package No. 7.
8.	Open	Confirm that block placement on wall H6/H7 is the exception. In this case blocks are staggered in lieu of vertical stacking as is typical for other hollow block walls. Verify structural adequacy of detail DN which is not presently covered in CAT Response.	Confirmation of acceptable block placement is provided in attached Memo No. ES-10130-84. Structural adequacy of detail DN is verified as noted in the attached Calc. Package No. 8.
9.	Open	Verify structural adequacy of walls 78, 79 & 80 (Stair well no. 7) due to slab loads.	Verification is provided in Calc. Package No. 9.
10.	Open	Identify mechanism of load transfer between multiwythe walls. Verify as-built details used at diaphragm interface and structural adequacy of the as-built condition. Based on inspection observations during audit, justify the adequacy as-built spacing between wythe for solid block walls. Provide documentation of inspection results.	Documentation and verification will be provided by 10/8/84.

ITEM NO.	NRC REVIEW STATUS	QUESTION	RESPONSE
11.	Open	Provide status of unfinished block wall in CCW Heat Exchanger Room A.	Refer to the attached LP&L draft memo on plans for wall repairs. A formal letter will be submitted.
12.	Open	Provide a summary of block wall versus boundary conditions.	Summary data will be provided by 10/8/84.
13.	Resolved	Provide calculation for dur-o-wall using corrected yield stress value.	Refer to Calc. Pkg. No. 13 for verification.
14.	Open	Verify allowable stress table used in calculations.	Corrected table will be furnished. Calculation results are not expected to be affected, & this will be verified. Data to be provided by 10/8/84.
15.	Resolved	Clarify the modulus used in wall analysis.	Modulus of Elasticity is used in analysis.
16.	Open	Verify that code minimum reinforcement requirements are met for vertical and horizontal reinforcement.	Data will be submitted by 10/8/84. This will be done & calculations will be furnished.

BY A. LEON DATE 10/6/84CHKD. BY K. Phib DATE 10/6/84CLIENT LP & LSHEET 1 OF 1

OFS NO. _____

DEPT. NO. 653PROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - CONC. CURBITEM # 1

1. ACCORDING TO CALCULATIONS DONE ON 3/15/84 FOR CONC. BLOCK WALLS REVIEW, SH S & 6 OF 11, COPY ATTACHED); AT BOTT. OF CONC. CURB :
 $M = 12.15 \text{ k-ft} \quad \& \quad V = 2.03 \text{ k}$ FOR $b = 16"$, $W = .36 \text{ k/ft}$
2. THE REINFORCEMENT PROVIDED IS #6 @ 12 OR 2#6 ON 16" WHICH IS CONSERVATIVE.
3. ACI 318-63 ALLOWS THE USE OF WORKING-STRESS OR ULTIMATE STRENGTH. THEREFORE TO SIMPLIFY CALCULATIONS, WORKING-STRESS IS USED, IN SAFETY.
 FOR $f'_c = 4.0 \text{ ksi}$, $f_s = .40 f_y = .40 \times 60 = 24.0 \text{ ksi}$, $\phi = .88$
 $A_s \text{ REQ'D} = 12.15 \times 12 / 24.0 \times .88 \times 9 = .77 \text{ in}^2 < .83 \text{ OK!}$
4. FOR $f'_c = 4.0 \text{ ksi}$, $f_s = 24 \text{ ksi}$, $K = 295 \text{ psi}$, $k = .38$, $\phi = .88$, $b = 16"$ (CONSERV.)
 $M = K b d^2 \therefore \underline{d \text{ REQ'D}} = (12.15 \times 12 / 295 \times 16)^{1/2} = \underline{5.6"} < \underline{9"} \text{ OK!}$
5. SHEAR :
 $\underline{V} = 2030 / 16 \times 9 = \underline{14.1 \text{ psi}} < \underline{1.1 \sqrt{f'_c} = 70} \text{ (ACI 318-63) OK!}$
6. CONC. CURB UNDER BENDING & AXIAL LOAD (COMPRESSION), ;
 AXIAL LOAD $= .36 \times 30 \times (1.0 + .30) = 14.0 \text{ k}$, $\alpha = 3"$, $(.5h - d) = 3"$
 MOMENT @ ϕ OF REINF. $= 12.15 \times 12 + 14.0 \times 3 = 188 \text{ k-in}$
 $\underline{A_s \text{ TOT}} = 188 / 24.0 \times .88 \times 9 - 14.0 / 24.0 = 1.02 - .58 = \underline{.44 \text{ in}^2} < \underline{.88} \text{ OK!}$
 $\underline{f_c} = 2 \times 188 / .38 \times .88 \times 16 \times 9^2 = .868 \text{ ksi} = \underline{868 \text{ psi}} < \underline{.45 f'_c = 1800} \text{ (ACI 318-63) OK!}$

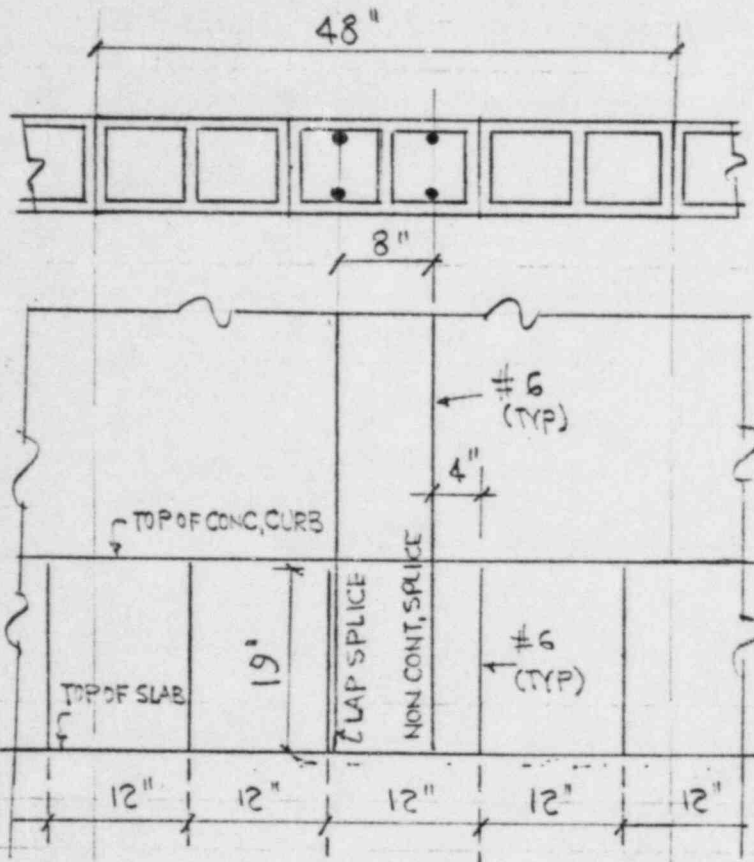
BY A. LEON DATE 10/4/84
 CHKD. BY 10/1/84 DATE 10/1/84
 CLIENT LP&L

SHEET 1 OF 3

DEPT. NO. 653

PROJECT WATERFORD #3

SUBJECT CONC. BLOCK WALLS - LAP SPLICE FOR REBARS - ITEM #1



1. REFERENCES :

- 1.1 DWG. G-765 502
- 1.2 CONC. BLOCK WALLS-REVIEW, CALCULATIONS DONE ON 3/15/84
- 1.3 ACI 318-71 CODE
- 1.4 FCR-CH-891 (COPY ATTACH'D)

2.1 LAP SPLICE :

- 2.2. FOR EA. 48" OF BLOCK WALL THERE ARE 2 #6 AND BOTH ARE SPLICED, THEREFORE THE SPLICE IS ON 100% OF BARS.

- 2.3, ACCORDING TO ACI 318-71, SECT, 7.6.3.2, § 7.6.3.7.2, WHEN $f_s = 24 \text{ KSI} < 1.5 f_y = 30 \text{ KSI}$ AND MORE THAN 75% OF BARS ARE SPLICED, THE SPLICE IS CLASS B 1.3 $1d$.

- 2.4, ACCORDING TO ACI 318-71, SECT, 12.5, d, WHEN REBARS SPACING IS AT LEAST 6", $1d$ CAN BE REDUCED 20%

EBASCO SERVICES INCORPORATED

SH 3 OF 5

BY A. LEON DATE 10/4/84
 CHKD. BY R. Hink DATE 10/4/84
 CLIENT LP & L

SHEET 2 OF 3
 DEPT. NO. 653

OFS NO. _____

PROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - LAP SPLICE FOR REBARSITEM #1

2.5 THEREFORE :

LENGTH OF SPLICED REQUIRED = $1.3 \times 8 l_d = 1.04 l_d$ 2.6. FOR #6 @ $F_y = 60 \text{ ksi}$, PER ACI 318-71, $l_d = 18"$ (TABLE ATTACHED),
THEREFORE :LENGTH OF SPLICED REQUIRED = $1.04 \times 18 = 18.72" < 19"$ OK ✓SPLICE PROVIDED = 19"2.7 ACCORDING TO ACI 318-71, SECT. 7.5.4, FOR NONCONTACT
SPLICES, BARS CANNOT BE SPACED LARGER THAN
THE REQ'D SPLICE/5 :

REQ'D SPLICE = 18.72"

SPACE = $18.72 / 5 = 4.68" > 4"$ (SPACING PROVIDED) OK ✓2.8 BASED ON THESE CALCULATIONS, THE LAP SPLICE OF 19"
PROVIDED IS ADEQUATE.

EBASCO SERVICES INCORPORATED

SH 4 OF 5

BY A. LEON DATE 10/3/84SHEET 3 OF 3CHKD. BY K. Shih DATE 10/2/84

OFS NO. _____

DEPT. NO. 653CLIENT LP&LPROJECT WATERFORD # 3SUBJECT CONC. BLOCK WALLS - FCR-CH-891:DETAIL (C).ITEM # 1

1. LENGTH OF $1'-7"$ FOR #6 DWLS IS ADEQUATE TO PROVIDE THE REQUIRED SPLICE LENGTH FOR CONC. BLOCK WALL REBARS, ACCORDING TO SH 3 OF 5 OF ITEM #1.
2. THE EMBEDMENT LENGTH OF $1'-6"$ INTO THE CONCRETE FLOOR IS ADEQUATE ACCORDING TO ACI 318-71 SECT 12.3.1 & 12.3.5.1 WHICH FOR #6 BARS IS $1'-6"$. SEE TABLE FOR l_d , ATTACHED.

FOR REFERENCE ONLY

ITEM #1

3.8.3.2 Applicable Codes Standards and Specifications

3.8.3.2.1 General Codes and Standards

a) Concrete Internal Structures

All concrete internal structures are designed in accordance with applicable portion of ACI 318-63, Ultimate Strength Design Part IV B, with the exception that ACI 318-71 is used for design of reinforcing steel splices. A listing of other standard codes or standards is as follows:

- 1) ACI-214-65 - Recommended Practice for Evaluation of Compression Test Results of Field Concrete
- 2) ACI-301-66 - Specification for Structural Concrete for Buildings (Exceptions noted in Subsection 3.8.3.6.1.2)
- 3) ACI-315-65 - Manual of Standard Practice for Detailing Reinforced Concrete
- 4) ACI-347-68 - Recommended Practice for Concrete Formwork
- 5) ACI-211.1-70 (Formerly ACI-613-54) - Recommended Practice for Selecting Proportions for Normal Weight Concrete
- 6) ACI-304-73 (Formerly ACI-614-59) - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete
- 7) ACI (1967) - Manual of Concrete Inspection
- 8) CRSI-65 - Recommended Practice for Placing Reinforcing Bars (20th Edition)
- 9) ANSI N45.2.5 - 1974 - Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants.

ACI-349, "Proposed Code Requirements for Nuclear Safety Related Concrete Structures" was not used in Waterford-3 design.

b) Steel Internal Structures

The design, fabrication, erection and inspection and testing of the steel internal structures comply with the applicable requirements of the documents listed below. Specific sections of these documents which have been followed are indicated in the following:

- 1) American Society of Mechanical Engineers (ASME) "Boiler and Pressure Vessel Code," 1971,

FOR REFERENCE ONLY

ITEM #1

Table 401. Allowable Stresses in Concrete for Working-stress Design of Buildings*†

Description		Allowable stresses					
		For any strength of concrete in accordance with Sec. 502 of ACI 318-63	For strength of concrete shown below				
			$f'_c = 2,500$ psi	$f'_c = 3,000$ psi	$f'_c = 4,000$ psi	$f'_c = 5,000$ psi	
Modulus of elasticity ratio n :		$29,000,000$ $w \leq 133 \sqrt{f'_c}$ $90 < w < 155$ $n \geq 6$					
For concrete weighing 145 lb per cu ft (see Sec. 1102 of ACI 318-63)		n	10	9	8	7	
Flexural f_c :							
Extreme fiber stress in compression		f_c	$0.45f'_c$	1,125	1,350	1,800	2,250
Extreme fiber stress in tension in plain concrete footings and walls		f_c	$1.6 \sqrt{f'_c}$	80	88	102	113
Shear v (as a measure of diagonal tension at a distance d from the face of the support):							
Beams with no web reinforcement†		v_c	$1.1 \sqrt{f'_c}$	55†	60†	70†	78†
Joists with no web reinforcement		v_c	$1.2 \sqrt{f'_c}$	61	66	77	86
Members with vertical or inclined web reinforcement or properly combined bent bars and vertical stirrups		v	$5 \sqrt{f'_c}$	250	274	316	354
Slabs and footings (peripheral shear, Sec. 1207 of ACI 318-63)†		v_c	$2 \sqrt{f'_c}$	100†	110†	126†	141†
Bearing f_c :							
On full area			$0.25f'_c$	625	750	1,000	1,250
On one-third area or less‡			$0.375f'_c$	938	1,125	1,500	1,875

* ACI Standard Building Code Requirements for Reinforced Concrete, ACI 318-63.

† Members subject to stresses produced by wind or earthquake forces combined with other loads may be proportioned for stresses one-third greater than those specified if the section thus required is not less than that needed for the combination of dead and live load. For shear values for lightweight aggregate concrete see Sec. 1208 of ACI 318-63.

‡ This increase shall be permitted only when the least distance between the edges of the loaded and unloaded areas is a minimum of one-fourth of the parallel side dimension of the loaded area. The allowable bearing stress on a reasonably concentric area greater than one-third but less than the full area shall be interpolated between the values given.

Reinforcement 20.2—Minimum splice lengths

FOR REFERENCE ONLY

ITEM #1

MINIMUM SPLICE LENGTHS $f'_c = 4,000 \text{ psi}$												
		TENSION BARS								COMPRESSION BARS		
		REGULAR BARS				TOP BARS						
		CLASS				CLASS				OPEN	ENCLOSED	
		A	B	C	D	A	B	C	D		TIES	SPIRALS
FOOTNOTE REFERENCES		1 5a	2 5a	3 5a	4 5a	1 5b	2 5b	3 5b	4 5b	6	6 7	6 8
BAR SIZE	f_y ksi	l_d	$1.3l_d$	$1.7l_d$	$2.0l_d$	l_{dt}	$1.3l_{dt}$	$1.7l_{dt}$	$2.0l_{dt}$	l_{dc}	$0.83l_{dc}$	$0.75l_{dc}$
3	40	12	12	12	12	12	12	14	17	12	12	12
	50	12	12	13	15	12	14	18	21	12	12	12
	60	12	12	15	18	13	16	21	25	12	12	12
	80	15	20	26	30	21	27	36	42	18	15	14
4	40	12	12	14	16	12	15	19	22	12	12	12
	50	12	13	17	20	14	18	24	28	13	12	12
	60	12	16	20	24	17	22	29	34	15	13	12
	80	20	26	34	40	28	36	48	56	24	20	18
5	40	12	13	17	20	14	18	24	28	13	12	12
	50	13	16	21	25	18	23	30	35	16	13	12
	60	15	20	26	30	21	27	36	42	19	16	14
	80	25	33	43	50	35	46	60	70	30	25	23
6	40	12	16	20	24	17	22	29	34	15	13	12
	50	15	20	26	30	21	27	36	42	19	16	14
	60	18	23	31	36	25	33	43	50	23	19	17
	80	30	39	51	60	42	55	71	84	34	30	27
7	40	15	20	26	30	21	28	36	43	18	15	13
	50	19	25	32	38	27	35	45	53	22	18	16
	60	23	30	39	46	32	41	54	64	26	22	20
	80	38	49	65	76	53	69	90	106	42	35	32
8	40	20	26	34	40	28	36	48	56	28	17	15
	50	25	33	43	50	35	46	60	70	35	21	19
	60	30	39	51	60	42	55	71	84	42	25	23
	80	50	65	85	100	70	91	119	140	70	40	36
9	40	25	33	43	51	35	46	60	71	35	19	17
	50	32	41	54	63	44	58	75	89	44	23	21
	60	38	49	65	76	53	69	90	106	53	28	25
	80	63	82	108	127	89	115	151	177	89	45	41
10	40	32	42	55	64	45	59	77	90	45	21	19
	50	40	52	68	80	56	73	96	113	56	26	24
	60	48	63	82	96	68	88	115	135	68	32	29
	80	80	104	137	161	113	146	191	225	113	51	46
11	40	40	51	67	79	55	72	94	111	55	23	21
	50	49	64	84	99	69	90	117	138	69	29	26
	60	59	77	101	118	83	108	141	166	83	35	32
	80	99	128	168	197	138	180	235	276	138	56	51

All Table Values are in inches
For "Footnote and References," see Reinforcement 20.5
Table Value Multipliers for Various Conditions:
Bars Spaced 6" or More (Splice Length): 0.8
3 Bar Bundles: 1.20
4 Bar Bundles: 1.33
Sand Lightweight Concrete: 1.18
All Lightweight Concrete: 1.33
 $f'_c < 3,000 \text{ psi}$: 1.33

Code Ref.
12.5 (a)
7.5.3, 12.7
12.5.1 (i)
12.5.1 (c)
7.7.1.1

DESIGN
HANDBOOK
ACI 318-71

BY COK DATE 3-15-84 FOR INFORMATION
CHKD. BY M. P. [signature] DATE 3-22-84 ONLY
CLIENT LP&L

SHEET 4 OF 11
OFS NO. 4294.385 DEPT. NO. 653

PROJECT WATERFORD #3
SUBJECT CONC. BLOCK WALLS

ITEM #1

FOR HOLLOW MASONRY WITH NO INSPECTION THE MATERIAL PROPERTIES AND DESIGN PARAMETERS TO BE USED ARE:

$$E_s = 29 \times 10^6 \text{ psi}$$
$$E_m = 675000 \text{ psi}$$

$$f_s = 24000 \text{ psi [GRADE 60]}$$
$$f_m = 225 \text{ psi} \times 2.5 = 562.5 \text{ psi}$$

$$n = \frac{E_s}{E_m} = \frac{29 \times 10^6}{675000} = 43 \quad \rho = \frac{f_s}{f_m} = \frac{24000}{562.5} = 42.67$$

$$k = \frac{n}{n + \rho} = \frac{43}{43 + 42.67} = 0.502$$

$$j = 1 - \frac{k}{3} = 1 - \frac{0.502}{3} = 0.832$$

$$K = \frac{1}{2} f_m j k = \frac{1}{2} (562.5) (0.832) (0.502) = 117.5$$

$$M = K b d^2 \quad \text{OR} \quad M = A_s \cdot f_s \cdot j \cdot d$$

1) 12" CONC. BLOCK WALL REINFORCED AS SHOWN ON PAGE 3.

$$b = 16", \quad d = 9", \quad d' = 2\frac{5}{8}, \quad j = 0.832, \quad k = 0.502,$$

$$A_s = A'_s = 0.88 \text{ in}^2 \text{ (2-#6 EA. FACE)} \quad f_m = 562.5 \text{ psi}$$

ALLOWABLE MOMENT:

MASONRY COMP.
CONTROLS

$$M = \frac{f_m}{2} k j b d^2$$

$$M = \frac{0.5625}{2} (0.502) (0.832) (16) (9)^2 = 152.2 \text{ K.in}$$
$$= \boxed{12.68 \text{ K.FT}}$$

REINF. STEEL
TENSION CONTROL

$$M = A_s \cdot f_s \cdot j \cdot d$$

$$M = 0.88 \times 24 \times 0.832 \times 9 = 158 \text{ K.in} = 13.18 \text{ K.FT}$$

USE

DATE 3-15-84

SHEET 1 OF 11

DATE 3-22-84

DEPT. NO. 4294 385

DEPT. NO. 653

L.P.E.L.

WATERFORD #3

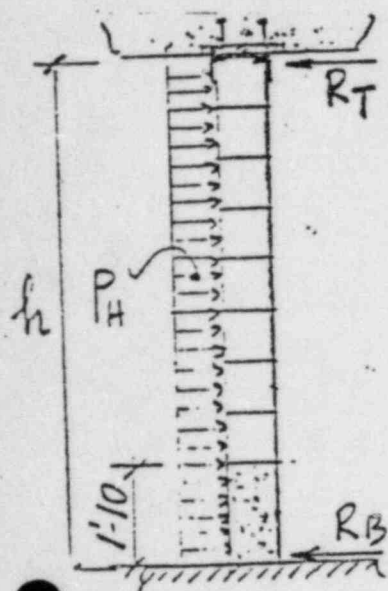
FOR REFERENCE

CONC. BLOCK WALLS

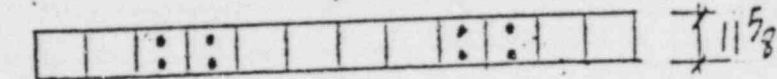
ONLY

ITEM # 1

INVESTIGATE REINF. SECTION AS A BEAM :

ASSUME BOTTOM FIXED SUPPORT AND
TOP SIMPLE SUPPORT.

48"



16" 16" 16"

REINF. CONC. BLOCK WEIGHT = 150 #/FT^3
 HOLLOW, " " = 60 #/FT^3

$$w_1 = 1.33 (0.150) = 0.20 \text{ K/FT}$$

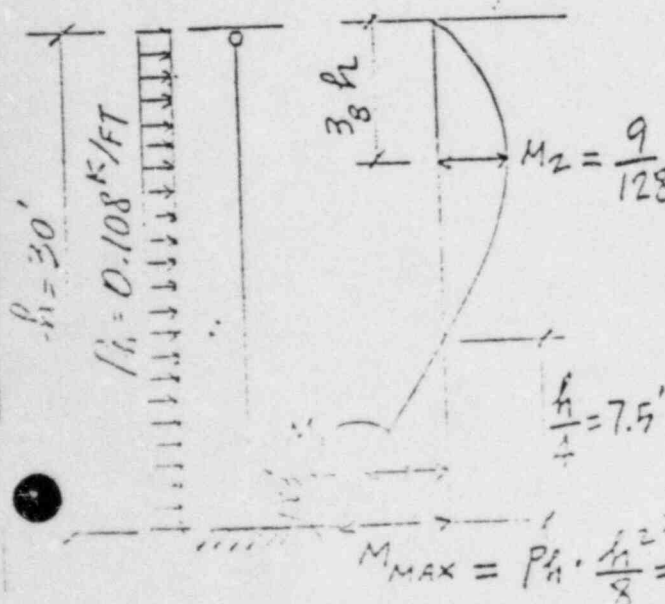
$$w_2 = 2.67 (0.060) = 0.16 \text{ K/FT}$$

$$w = 0.36 \text{ K/FT}$$

FOR HORIZ. EQ. FACTOR = 0.3

$$P_h = 0.36 \text{ K/FT} \times 0.3 = 0.108 \text{ K/FT OF BEAM}$$

CHECK MASONRY WALL STRESSES FOR 30' HIGH WALL :



$$M_2 = \frac{9}{128} P_h h^2 = \frac{9}{128} \times 0.108 \times 30^2 = 6.83 \text{ K·FT}$$

$$M_{\text{MAX}} = P_h \cdot \frac{h^2}{8} = 0.108 \times \frac{30^2}{8} = 12.15 \text{ K·FT}$$

DATE 3-15-84

SHEET 6 OF 11

DATE 3-22-84

CFS NO. 4294.285 DEPT. NO. 653

L P & L

WATERFORD #3

FOR REFERENCE

CONC. BLOCK WALLS

ONLY

ITEM #1

FIND REACTIONS:

$$R_B = \frac{5}{8} P_h \cdot h = \frac{5}{8} \times 0.108 \times 30 = 2.025^k$$

$$R_T = \frac{3}{8} P_h \cdot h = \frac{3}{8} \times 0.108 \times 30 = 1.215^k$$

FIND M_1 = MOMENT AT TOP OF CURB LEVEL:

$$M_1 \approx \left(\frac{5.67}{7.5} \right) 12.15 = 9.19 \text{ K.FT} < 12.68 \text{ K.FT} \quad \underline{\underline{OK}}$$

CHECK SHEAR AT THE TOP OF CURB LEVEL:

$$V = 2.025^k - 1.83(0.108) = 1.827^k$$

$$v = \frac{V}{b \cdot j \cdot d} = \frac{1827}{16 \times 0.832 \times 9} = 15.2 \text{ psi} < 25 \times 1.3 = 32.5 \text{ psi} \quad \underline{\underline{OK}}$$

CONCLUSION: 12' THICK CONCRETE BLOCK WALLS AS HIGH AS 30' ARE ACCEPTABLE AS CONSTRUCTED AND REINFORCED.

BY Y. MENG DATE 11-13-76

NEW YORK

SHEET 1 OF

CHKD. BY W. CHENG DATE 11-19-76

OFFS NO. 2796.130

DEPT. NO.

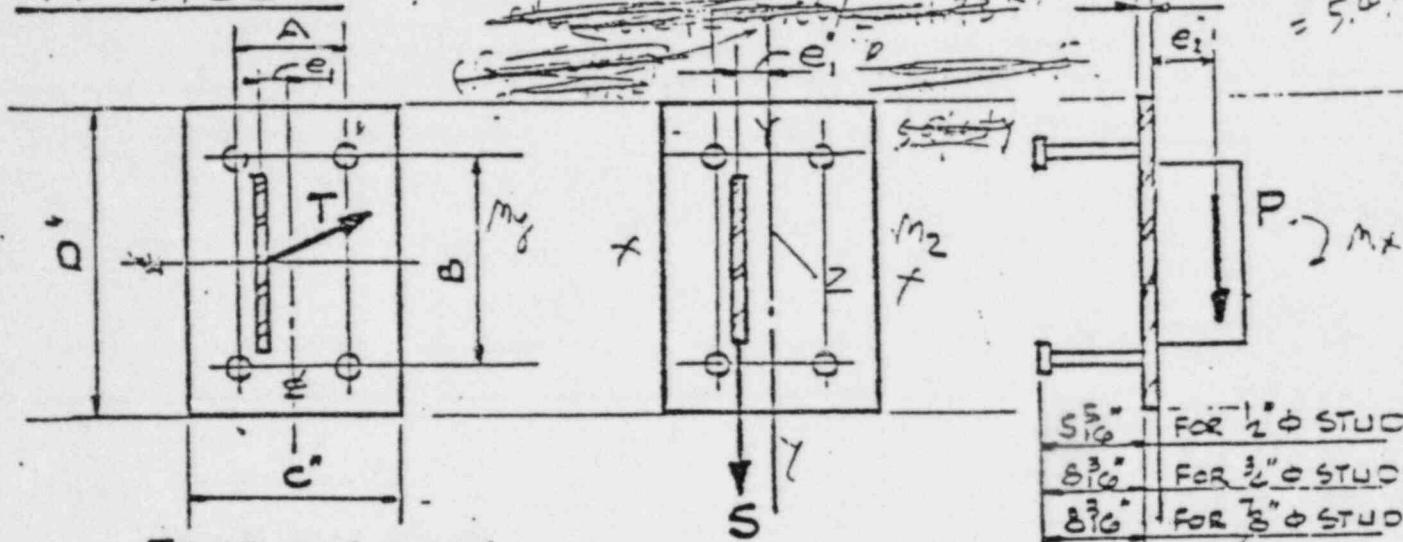
CLIENT LOUISIANA POWER & LIGHT COMPANY

PROJECT WATERFORD UNIT #3

SUBJECT EMBEDDED P.L. FOR REFERENCE ONLY

ITEM #1

(4) - STUDS



TENSION ONLY

SHEAR ONLY MOMENT & SHEAR

STUDS	STUDS			EMB. P.			ECC.		ALLOWABLE LOAD		
	DIA.	"A"	"B"	"t"	"c"	"d"	e ₁	e ₂	"T"	"S"	"P"
P-15 ₄	1/2" Ø	6"	6"	3/4"	8"	8"	2"	2 1/4"	12.7 ^K	15.2 ^K	10.6
P-17 ₆	3/4" Ø	6"	6"	1"	10"	10"	2"	2 1/4"	21.6 ^K	34.2 ^K	23.8
P-20 ₄	3/4" Ø	6"	1'-0"	1"	10"	1'-4"	2"	2 1/4"	28.6 ^K	40.0 ^K	33.6
P-21 ₄	3/4" Ø	6"	1'-0"	1 1/2"	10"	1'-4"	2"	2 1/4"	28.6 ^K	40.0 ^K	33.6
P-22 ₄	7/8" Ø	6"	1'-0"	1"	12"	1'-4"	2"	2 1/4"	38.9 ^K	54.5 ^K	45.7
P-23 ₄	7/8" Ø	6"	1'-0"	1 1/2"	12"	1'-4"	2"	2 1/4"	38.9 ^K	54.5 ^K	45.7
P-36 _{1/4}	1 1/8" Ø	6"	1'-0"	3/4"	8"	1'-6"	2"	2 1/4"	12.7 ^K	17.7 ^K	14.9
P-41 ₄	1/2" Ø	4"	4"	3/4"	6"	6"	2"	2 1/4"	8.0 ^K	13.0 ^K	7.
P-16.1/2	3/4" Ø	0	6"	3/4"	16"	12"	2	2 1/4"	10.8	17.1	11.9

EBASCO SERVICES INCORPORATED
FIELD CHANGE REQUEST

Section 1 thru 4 to be filled out by Construction
Section 5 to be filled out by Engineering

FOR REFERENCE ONLY,

ITEM # 1

~~OF~~ - IMMINENT

PROJECT WATERFORD #3		SFS NO.	FIELD CHANGE NO. FCR-CH-891
To G.E. BRUNDAGE <small>(PER PROCEDURE E-371)</small>	Dept ESSE-CIVIL (C-4)	Location ENBERAB	Date 12-9-77
Re: <input checked="" type="checkbox"/> Drawing No. G-765502	Title _____		
<input type="checkbox"/> Spec No G-555503	Title _____		
<input type="checkbox"/> Other G-557503, 559503, 561501, G-590			

1. DESCRIPTION (Items involved, submit sketch if applicable)

A 1'-10" HIGH CONCRETE CURB IS REQUIRED FOR ALL PERMANENT CONCRETE BLOCKWALLS. DOWELS FOR THESE CURBS WERE TO BE INSTALLED IN THE CONCRETE SLAB PRIOR TO PLACEMENT OF CONCRETE. IN ORDER TO AVOID DAMAGE TO THESE DOWELS EMBEDDED PLATES (HAVING RESTEEL WELDED TO THEM @ A LATER DATE) HAD BEEN DESIGNED AND INSTALLED IN THE SLAB. HOWEVER, DUE TO DESIGN ERROR, NEITHER
(SEE ATTACH SHEET)

2. REASONS FOR CHANGE (If from disposition of nonconformance report, list report number)

TO ENSURE PROPER CONSTRUCTION OF CONCRETE CURB AND CONCRETE BLOCKWALLS

RECOMMENDED DISPOSITION (Submit sketch if applicable)

☒ Minor Change

☐ Major Change

CONSTRUCT CONCRETE CURB AND BLOCKWALLS AS STATED BELOW AND ON ATTACHED SHEET

WHERE FOR CONCRETE CURBS, EMBEDDED PLATES HAD BEEN INSTALLED IN THE SLAB, CAD WELL A #6 BAR 1'-7" LONG (EF) @ 12" (+/-) IN CONTACT WITH EDGE OF EMBEDDED PLATE MOVE RESTEEL TO AVOID PLATE AND PAUL CONCRETE) TO THE PLATE. SEE SKETCH 1 A & B FOR DETAILS AND LOCATIONS

SR RESIDENT ENGINEER (Signature) 4.121 [Signature]	DATE 12-13-77	PROJECT Supt CONCURRENCE (Signature) J-O. Booth	DATE 12-14-77
--	-------------------------	---	-------------------------

5. DISPOSITION

EBASCO SERVICES, INC.

RECEIVED

<input type="checkbox"/> Not Approved (give reason) _____	<p>DEC 14 1977</p> <p>11:30</p> <p>DOCUMENT CONTROL DEPT.</p> <p>WATERFORD 3 FIELD</p>
<input checked="" type="checkbox"/> Considered Minor Change - Approved per Recommended Disposition - Design Documents will not be formally revised; field to maintain as-built records.	
<input type="checkbox"/> Considered Major Change - Action will be taken as prescribed in _____	

SR DISCIPLINE/ESSE DESIGNER (Signature) C. Liu / HB	DATE 12/14/77	SUPERVISING ENGINEER/ESSE DESIGNER (Signature) [Signature]	DATE 12/14/77
---	-------------------------	--	-------------------------

Supervising Engineer signs and returns to LDE for transmittal to Sr Resident Engineer with copies to:

Project Engineer	Esse PE	Others as Required
Project Manager	Coordinator	ACCOUNTABLE
		FILE
		RECEIVED

301

BY GL DATE 12-12-77

NEW YORK

SHEET 1 OF 4CHKD. BY CH DATE 12-12-77

FCR-CH-891

OFS NO. _____

DEPT.
NO. _____CLIENT LP&LPROJECT WSES, UNIT #3

SUBJECT _____

1) DESCRIPTION

EMBEDDED PLATES NOR DOWELS HAVE BEEN INSTALLED @ SEVERAL LOCATIONS THROUGHOUT THE BUILDING. ALSO DRAWING G 776 CALLS FOR A $1" \times \frac{3}{4}"$ SLOT IN CONCRETE WALLS TO BE USED FOR DOVETAILS. SINCE THIS SLOT HAD NOT BEEN REFERENCED ON THE C&H DRAWINGS AND THE UNAVAILABILITY OF MATERIAL @ TIME OF CONCRETE PLACEMENT, THE SLOT FOR THE DOVETAILS HAD NOT BEEN INSTALLED.

3) RECOMMENDED DISPOSITION

- ② WHERE THERE ARE NEITHER EMBEDDED PLATES OR DOWELS IN THE SLAB, DRILL A $1\frac{1}{4}" \times 1'-6"$ HOLE, COAT IT ^{WITH} SIKADUR HY-200 EPOXY, INSTALL A #6 BAR 3'-1" LONG, HAVING A 1'-7" PROJECTION AND THEN GROUT WITH CLASS F TYPE MORTAR SEE SKETCH 1 B & C FOR DETAILS.
- ③ WHERE CONCRETE BLOCK WALLS ARE TO HAVE A VERTICAL CONNECTION WITH A CONCRETE WALL AND THE SLOT FOR THE DOVETAILS HAS NOT BEEN INSTALLED, DRILL A $\frac{3}{8}" \times 1\frac{1}{8}"$ HEX NUT SLEEVE ANCHOR RED HEAD @ 24" VERTICALLY AND ATTACH A 6 GA CORR. GAL STRAP TO IT. SEE SKETCH 1 D. IN CASES WHERE REGLETS HAVE BEEN INSTALLED, ADJUST THE DOVETAILS TO FIT INSIDE THE SLOT.
- ④ FOR VERTICAL REINFORCEMENT OF CONCRETE BLOCK WALLS INSTALL 4-#6 BARS @ 48" O.C MAX. FOR INSTALLATION DETAILS OF THIS RESTEEL SEE SKETCHES 2 & 3.

BY GIL DATE 12-12-77

NEW YORK

SHEET 2 OF 4

CHKD. BY CH DATE 12-12-77 FOR-CH-891

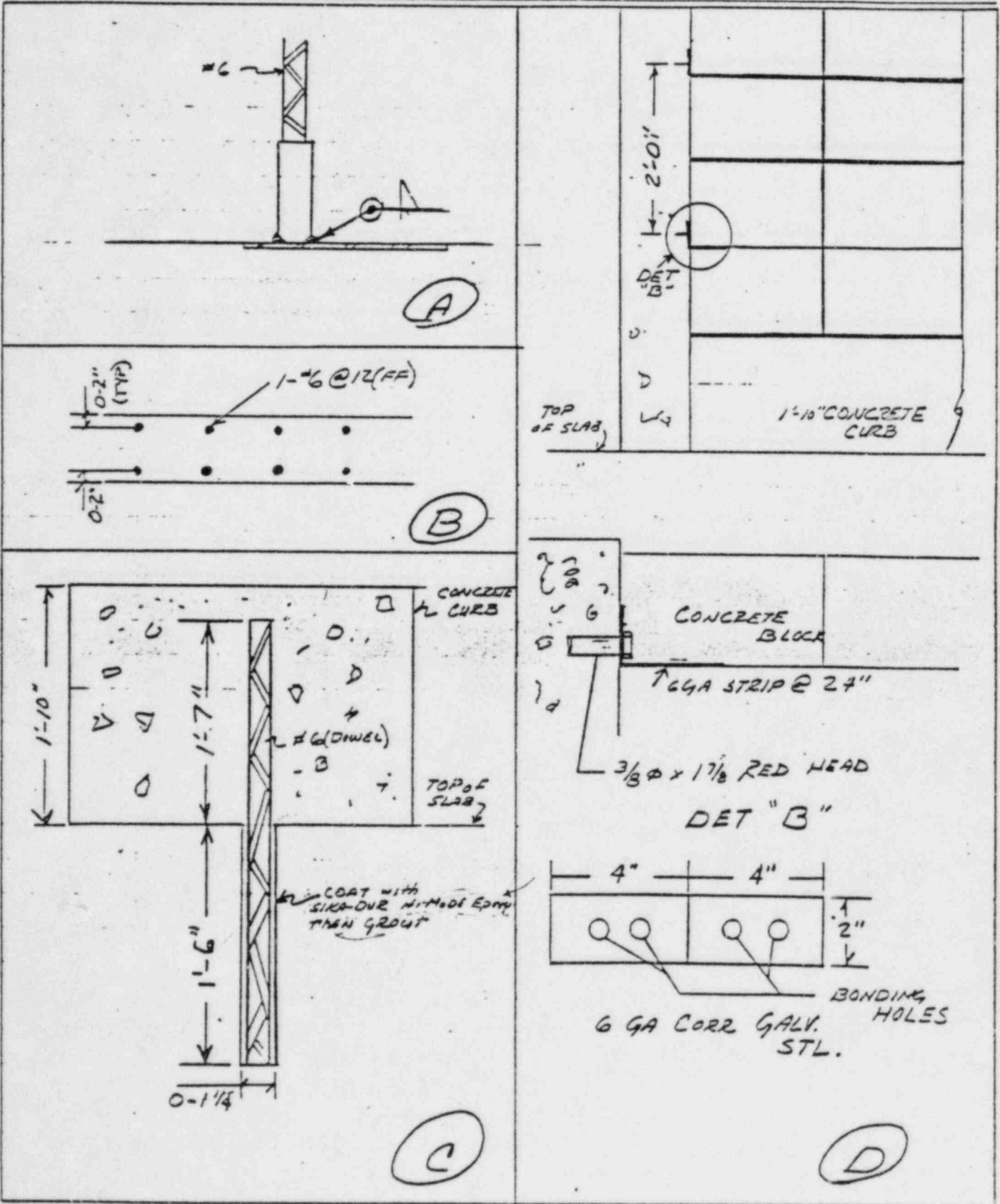
OFS NO.

DEPT.
NO.

CLIENT WSES

PROJECT Unit #3

SUBJECT SKETCH 1



EBASCO SERVICES INCORPORATED

BY GU DATE 12-12-77

NEW YORK

SHEET 3 OF 4

CHKD. BY CH DATE 12-12-77

FCR-CH-891

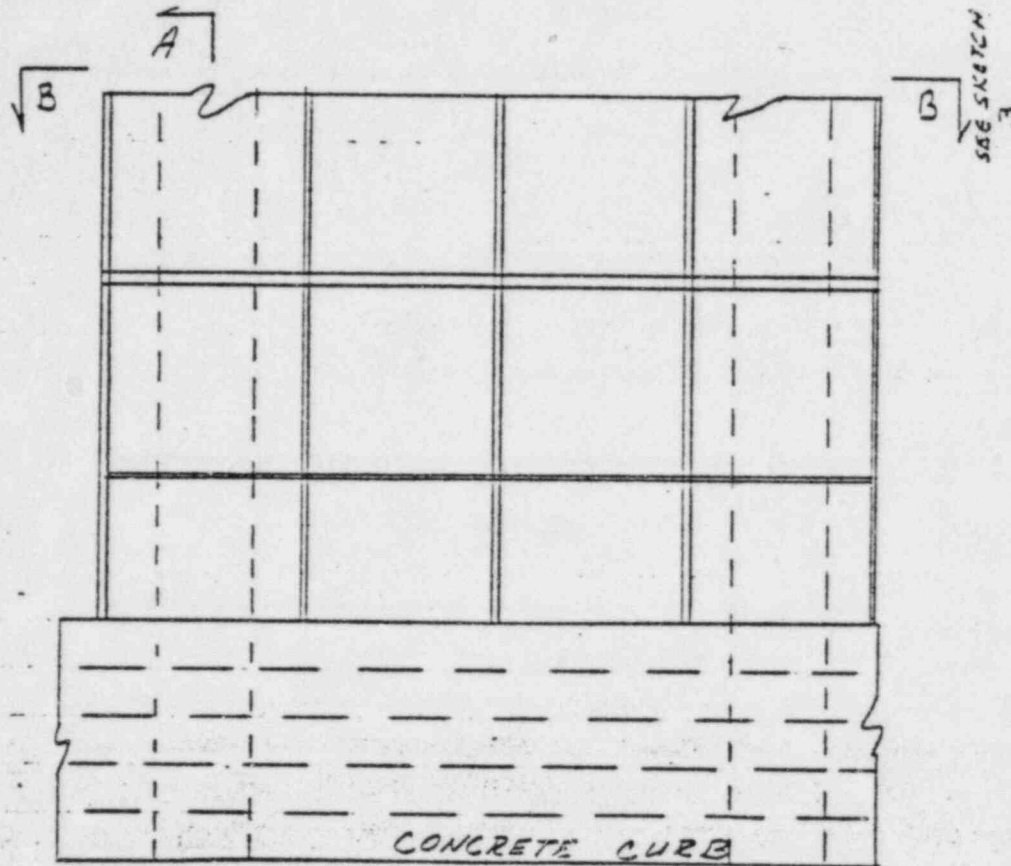
OFS NO. _____

DEPT.
NO. _____

CLIENT LP&I

PROJECT WSES, UNIT #3

SUBJECT SKETCH 2



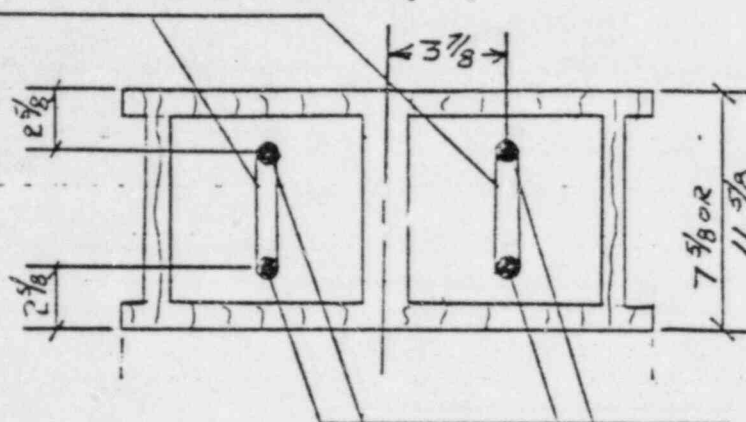
A
SEE SKETCH 3

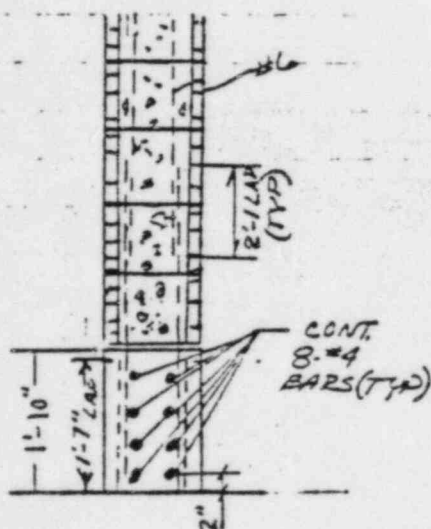
ELEVATION

BY YH DATE 12-12-77 NEW YORK
 CHKD. BY CR DATE 12-12-77 FOR-CH-891

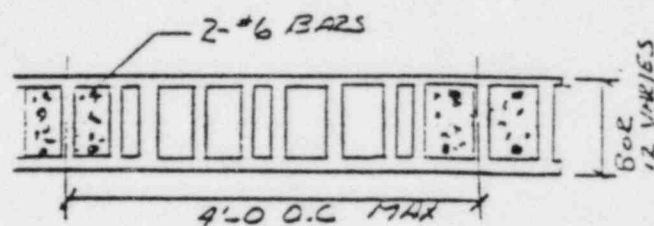
 SHEET 4 OF 4
 DEPT. NO. _____
 OFS NO. _____
CLIENT LPLPROJECT WSES UNIT #3SUBJECT SKETCH 3

#2 TIES IN ALTERNATE COURSES (TYP)


 4-#6 BARS AT 48 O.C MAX.
 FILL CORES WITH CONC.

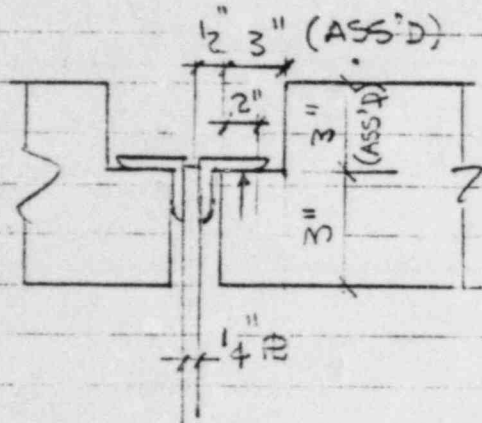
 TYPICAL REINFG
 FOR 8" & 12" CONC BLK


SECT A-A


 TYP. PERMANENT CONC BLOCK
 WALL (STACKED BONDED)
 SECT B-B

BY A. LEON DATE 9/25/81SHEET 1 OF 1CHKD. BY EDW DATE 1/25/82OFS NO. _____ DEPT. NO. 552CLIENT LP & LPROJECT WATER POND # 2SUBJECT CONC. BLOCK WALLS - LATERAL SUPPORT

CONC. BLOCK WALL - SIDE SUPPORT - 10' C/C.



WALL THICKNESS = 4.5' (6-ROWS)

1. LOADS: $w = 140 \text{ \#/cf}$.

$$R = .140 \times 4.5' \times 5' \times 8''/12'' = 2.1 \text{ K (FOR 8" COURSE)}$$

2. EARTHQUAKE FACTOR = .30

3. HOR. LOAD = $2.1 \times .3 = .63 \text{ K/1}$

4. SHEAR AT THE REDUCED SECTION:

$$U = 630/8 \times 3 = 23.625 \text{ psi} \approx 20 \times 1.3 = 26 \text{ (NRC-SRP)}$$

5. BEARING.

ASSUMED AREA FOR BEARING: (MASONRY)

$$2'' \times 8'' = 16 \text{ in}^2$$

$$630 \text{ \#/16} = 39.4 \text{ psi} < 170 \quad \text{OK} \checkmark$$

6. REQ'D THICKNESS OF L:

$$M = .63 \times 1.5 = .95 \text{ K-in} \quad F_c = 27 \text{ KSI}$$

$$S = .95/27 = .04 = \frac{1}{6} \times 8 \times t^2 \therefore$$

$$t = .16'' < .25'' \text{ OK} \checkmark$$

TO J. DeBruin DATE 9/27/84 FILE REF ES-10131-84
OFFICE LOCATION

FROM B. Grant *BG* OFFICE LOCATION

SUBJECT LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES - UNIT NO. 3
MASONRY WALLS SEISMIC ANALYSIS

The basis for the 0.3G aseismic design of the hollow block masonry walls was a frequency analysis of plate models of walls with various boundary conditions, and enveloping dimensions which was compared with acceleration values in the Floor Response Spectra for the DBE for 2% damping.

During the NRC Audit of CAT Item 6.2/6.3 we were requested to justify the use of the 0.3G acceleration. We were also requested to consider dynamic models more representative of the walls' internal structural action than the homogeneous plate model, specifically a beam model.

Our preliminary calculations show that frequency analysis of a beam model with one end fixed and the other simply supported, when compared with the 2% damping spectrum, can justify the 0.3G acceleration value used in the design except for the 30ft. high stair towers at Floor Elevation -35 ft.

For the 30 ft. stair towers we must refine our analysis in order to justify the design. There are two items to be performed by SAG-NY to accomplish this:

- (1) The damping value allowed for masonry construction is 7%. This will yield considerably lower accelerations in the frequency range of interest, than seen at 2% damping perhaps about 30% - 40% lower. We have never generated 7% damping Floor Response Spectra and will therefore develop appropriate correction factors for the 2% spectra.
- (2) The structural action of the wall will be more accurately represented by a beam-column model so that the vertical boundary conditions can be appreciated.

These two tasks will take about a week to perform. Accordingly we should have a report ready to send to the NRC by October 8, which will provide the requested justifications for aseismic design of all walls.

BG/tw

cc: J. Houghtaling, E. Kowalski, R. Alexandru, Z.T. Shi, W.T. Teng, G. Aliberti,
G. Wu, L. Biller, B. Grant, R. Esnes, A. Bishara, ESSE File P. 83

EBASCO

Interoffice Correspondence

SH 20715
SH 10711
ITEM #3

TO B. GRANT

DATE October 3, 1984 FILE REF. 8Q-A-10d

TO J DeBruin

OFFICE LOCATION 80/2WTC

FROM Z T Shi/W T Teng

OFFICE LOCATION 80/2WTC

SUBJECT LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES. UNIT NO. 3
MASONRY BLOCK WALL SEISMIC ANALYSIS

Refs: 1) ES-10131-84 (B Grant to J DeBruin) dated 9/27/84
2) ES-10106-84 (J DeBruin to M Yates/J Houghtaling)
dated 9/28/84

As a result of NRC-SEB audit on the subject masonry block walls, we have committed to perform a seismic analysis to justify the use of the 0.3g acceleration using beam model. This memorandum, in response to the two references, is to provide the required analysis and to indicate that the 0.3g is adequate to be used in the masonry block wall design.

Attachment 1 shows a table of benchmark seismic analysis results for five types which may envelop all masonry block walls in this project. The table is self-explanatory with five notes describing the wall types, wall height conservatism, stiffness conservatism, as well as the derivation of design "g" values.

Attachments 2-1 and 2-2 are the floor response spectra curves established for 5% damping at Elevation (-35') and (-4') respectively. Computer printouts are also attached for ready pick-up of the "g" values.

Attachment 3 shows the weight calculations used in the seismic analysis.

As-built wall heights are given in the table prepared for NRC Audit item: #12.

Based on the above analysis, we conclude that the use of 0.3g in the design of the masonry block wall is justifiable.

ZTS;WTT:mr

Attachments 1, 2-1, 2-2 & 3

cc: J Houghtaling
B Grant
L Biller
G Aliberti
J Costello
J Tompeck
J Hart

E S Kowalski
R Alexandru
Z T Shi
W T Teng
Project Record File

Concrete Masonry Block WallsBenchmark Seismic Analysis Results

	Wall Thickness (In)	Boundary Condition (Note 1)	Wall Height (Ft) (Note 3)	Frequency (HZ) (Note 4)	Acceleration (G) (Note 5)
1					
2					
11ow	12	A	30	5.46	0.25
11ow	12	B	16	4.70	0.27
11ow	8	A	15	13.99	0.20
11ow	8	B	12	4.94	0.26
11d.	6	C	10 (Note 2)	22.20	0.20

(1) Boundary Condition

- A - top pin, bottom fix, sides free.
 B - top free, bottom fix, sides free.
 C - simply supported at 2 ends.

(2) Span horizontally

- (3) Wall heights include 1'-10" high of reinforced concrete start wall. However, the 3-D model for frequency analysis, except wall (2), this 1'-10" reinforced concrete wall was treated as a masonry block wall, therefore, the actual frequency of the concrete masonry wall will be larger than those listed in the table.

- (4) The 3-D model for the frequency analysis is based beam - column concept, and the stiffness was derived from Reinforced Concrete and Masonry Block Wall only. The stiffness contributed from Dur-o-wall was not considered, therefore, the actual rigidity of the Masonry Block Wall is more rigid than the frequency resulted from analysis.

- (5) The seismic required design "g" values were obtained from the 5% damping DBE response spectra curves, which were generated at EL-35'.00 and EL-4'.0. The use of 5% damping DBE response spectra curves is in accordance with the requirement specified in Waterford FSAR Table 3.7-1.

I H CHOU DATE 10/5/84

SHEET 1 OF 1

SH30F11

D. BY Z T SHI DATE 10/5/84

OFFS NO. 2864.055 DEPT. 549

ITEM # 3

INT L P # 1

JECT WATERFORD NO. 3

POT CONCRETE BLOCK WALLS

WEIGHT COMPUTATION

1) 12" THICK CONC HOLLOW BLOCK WALL

(4'-0 STRIP, 2 HOLLOW BLOCKS & 1 REINFORCED BLOCK)

LINEAR WEIGHT OF HOLLOW BLOCKS (2)

$$= 60 \frac{\#}{\text{LF}} \times \frac{16}{12} \times 2 = 160 \frac{\#}{\text{FT}}$$

LINEAR WEIGHT OF REINFORCED BLOCK (1)

$$= 150 \times \frac{16}{12} \times 1 = 200 \frac{\#}{\text{FT}}$$

THEREFORE UNIT WT OF BLOCK WALL

$$= 160 + 200 = 360 \frac{\#}{\text{FT VERTICALLY}}$$

2) 8" THICK CONC HOLLOW BLOCK WALL

(4'-0 STRIP)

UNIT WT OF BLOCK WALL

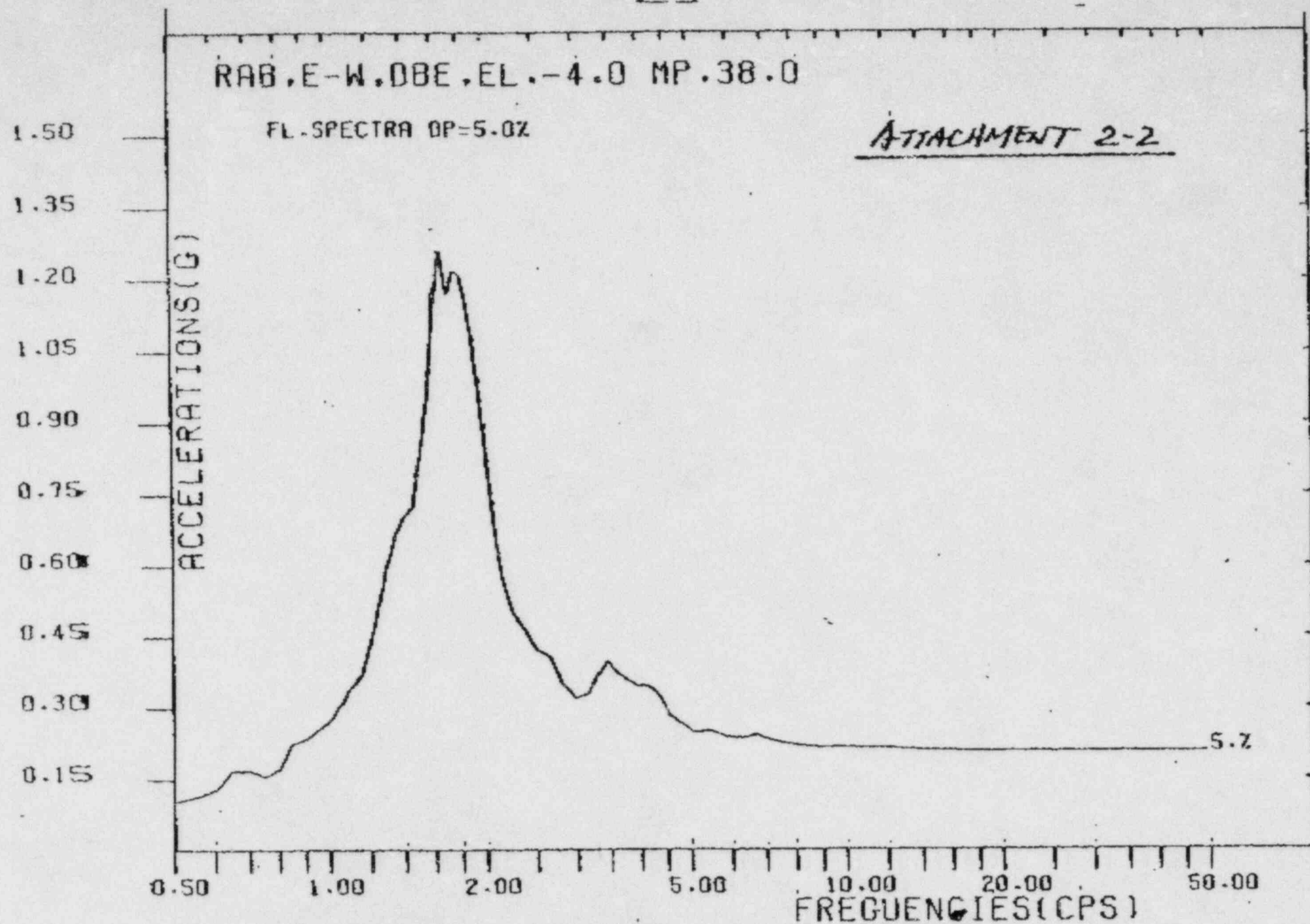
$$= 40 \times \frac{16}{12} \times 2 + 150 \times \frac{8}{12} \times \frac{16}{12} \times 1 = 240 \frac{\#}{\text{FT VERTICALLY}}$$

3) 6" THICK SLID BLOCK WALL

(8" STRIP)

$$\text{UNIT WT.} = \frac{6 \times 8}{144} \times 150 = 50 \frac{\#}{\text{FT HORIZONTALLY}}$$

SH 4 OF 11
ITEM #3



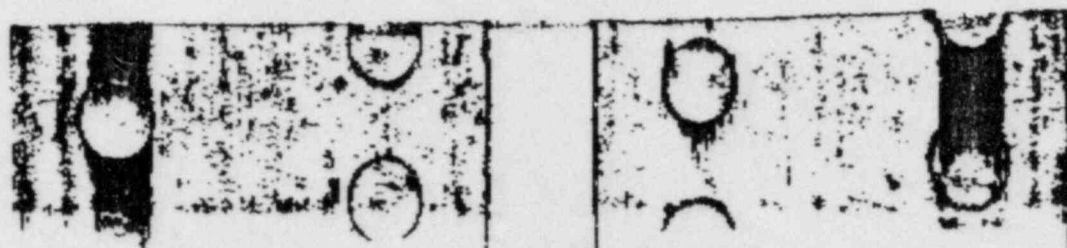
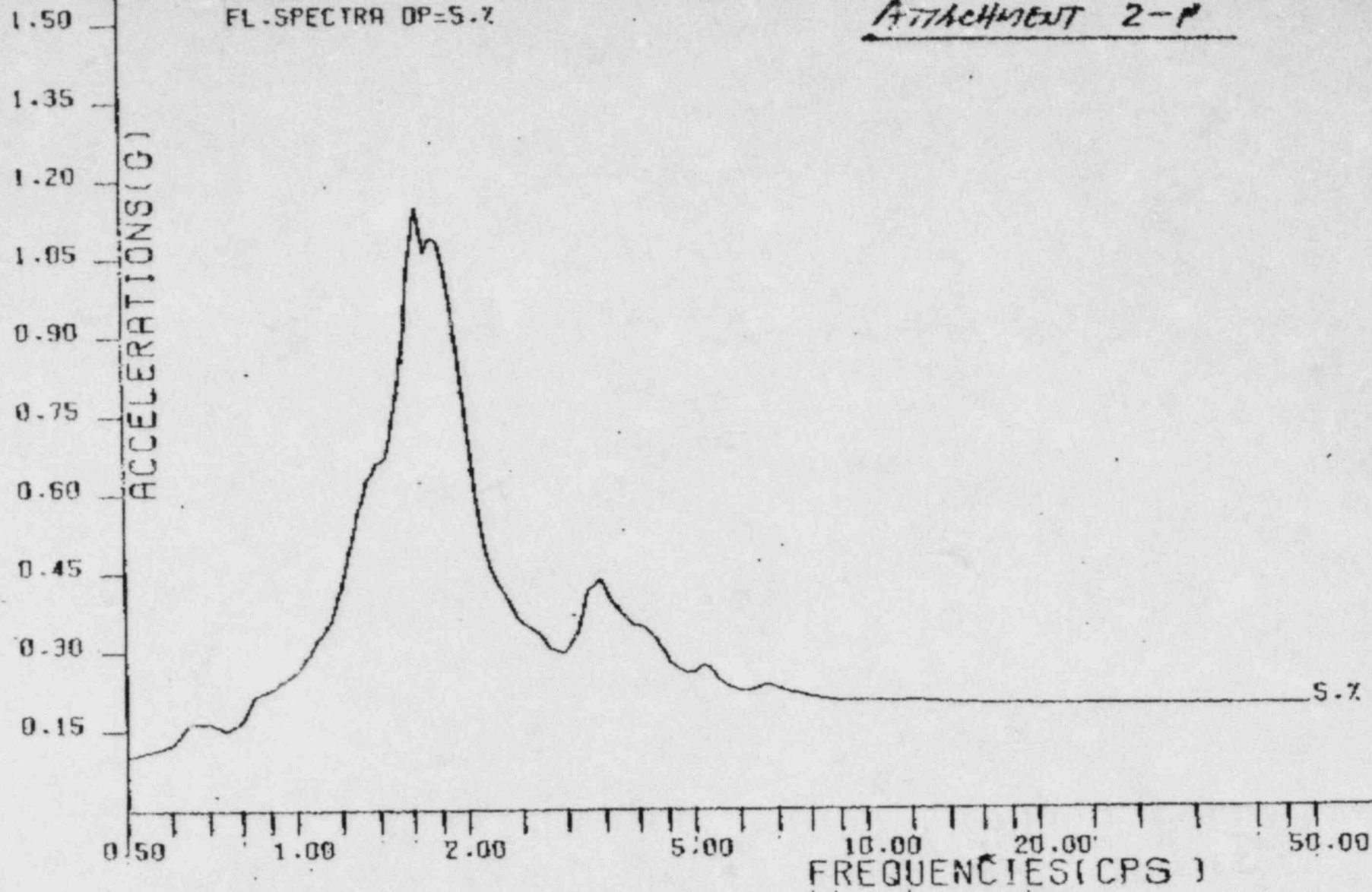
SH50711
ITEM #3

FON MAT DBE EL.-35.0

FL-SPECTRA DP=5.7

TO: BGA BNT 6.92.247

ATTACHMENT 2-P



FLOOD ACCELERATION SPECTRA FOR NAHE POINT NO. 39

(TRANSLATIONAL ACCELERATION)

MAT FDN

FREQ	PERIOD	DAMPING FACTOR	TIME	FREQ	PERIOD	DAMPING FACTOR	TIME
1	0.500	0.020	4.12	1	0.500	0.070	4.09
2	0.550	0.106530	13.43	2	0.550	0.107587	4.06
3	0.600	0.124719	6.63	3	0.600	0.115258	6.01
4	0.650	0.146717	6.54	4	0.650	0.149274	6.53
5	0.700	0.168881	12.95	5	0.700	0.154463	6.50
6	0.750	0.200287	7.67	6	0.750	0.146748	6.48
7	0.800	0.163707	8.15	7	0.800	0.157076	6.92
8	0.850	0.191940	8.06	8	0.850	0.187944	6.88
9	0.900	0.225057	13.53	9	0.900	0.199496	6.85
10	0.950	0.321099	8.50	10	0.950	0.217751	6.38
11	1.000	0.290240	9.44	11	1.000	0.235538	8.34
12	1.050	0.315686	13.50	12	1.050	0.250386	8.31
13	1.100	0.457758	13.88	13	1.100	0.288199	6.82
14	1.150	0.485290	7.24	14	1.150	0.327251	6.81
15	1.200	0.592256	7.22	15	1.200	0.380423	7.18
16	1.250	0.475281	7.19	16	1.250	0.442525	7.16
17	1.300	0.604824	7.16	17	1.300	0.501372	7.13
18	1.350	0.726698	7.12	18	1.350	0.544860	7.10
19	1.400	0.814764	7.08	19	1.400	0.568977	7.06
20	1.450	0.835234	13.41	20	1.450	0.578673	7.03
21	1.500	0.851304	8.00	21	1.500	0.645709	13.73
22	1.550	1.178789	14.96	22	1.550	0.737720	13.70
23	1.600	1.250152	14.87	23	1.600	0.840720	13.67
24	1.650	1.942490	13.64	24	1.650	0.867954	13.64
25	1.700	2.013121	13.60	25	1.700	0.847710	4.88
26	1.750	1.802571	4.84	26	1.750	0.894159	4.86
27	1.800	1.699231	4.83	27	1.800	0.899650	4.85
28	1.850	1.493841	4.81	28	1.850	0.869511	4.81
29	1.900	1.363435	4.79	29	1.900	0.814982	4.79
30	1.950	1.207467	4.76	30	1.950	0.747786	4.78
31	2.000	1.047450	4.74	31	2.000	0.674843	4.74
32	2.050	0.888067	13.21	32	2.050	0.604846	4.76
33	2.100	0.839813	12.41	33	2.100	0.543457	4.75
34	2.150	0.763591	12.62	34	2.150	0.493525	4.75
35	2.200	0.668345	12.59	35	2.200	0.457684	4.76
36	2.250	0.545445	10.45	36	2.250	0.432043	4.76
37	2.300	0.444444	10.42	37	2.300	0.411443	4.76
38	2.350	0.634783	4.15	38	2.350	0.392272	4.76
39	2.400	0.425532	4.92	39	2.400	0.385680	4.73
40	2.450	0.416467	4.72	40	2.450	0.363995	4.73
41	2.500	0.408163	4.64	41	2.500	0.354308	4.63
42	2.550	0.400000	4.61	42	2.550	0.336274	4.19
43	2.600	0.376364	4.18	43	2.600	0.304314	4.18
44	2.650	0.355366	10.43	44	2.650	0.297640	4.76
45	2.700	0.297816	4.77	45	2.700	0.418574	4.76
46	2.750	0.349215	4.74	46	2.750	0.437451	4.74
47	2.800	0.369215	14.65	47	2.800	0.393593	4.73
48	2.850	0.387991	4.72	48	2.850	0.371547	4.72
49	2.900	0.387991	4.77	49	2.900	0.352986	4.72
50	2.950	0.339089	4.74	50	2.950	0.335329	4.76
51	3.000	0.552138	4.76	51	3.000	0.379199	4.75
52	3.050	0.435045	4.74	52	3.050	0.396536	4.74
53	3.100	0.410583	4.72	53	3.100	0.376515	4.73
54	3.150	0.410583	4.72	54	3.150	0.352986	4.72

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SH80F15
SH70F11
ITEM #3

55	4.698000	0.212857	0.267429	4.70	0.266431	6.70	0.268595	4.70
56	4.855000	0.205973	0.266286	4.59	0.258769	4.70	0.262001	4.70
57	5.012000	0.199521	0.268589	4.15	0.261729	4.70	0.261699	4.70
58	5.169000	0.193461	0.318416	4.71	0.273130	4.70	0.262999	4.70
59	5.326000	0.187758	0.376120	4.68	0.267745	4.69	0.258244	4.69
60	5.483000	0.182382	0.273844	4.67	0.257827	6.68	0.267517	4.69
61	5.640000	0.177305	0.260838	4.69	0.237392	4.69	0.238570	4.49
62	5.797000	0.172503	0.231473	4.67	0.229523	4.69	0.232067	4.69
63	5.954000	0.167954	0.210456	4.71	0.224364	4.69	0.227951	4.49
64	6.111000	0.163639	0.234716	4.70	0.225080	4.70	0.226435	4.70
65	6.268000	0.159541	0.216749	4.93	0.224321	4.70	0.226447	4.70
66	6.425000	0.155642	0.236917	4.72	0.228240	4.70	0.228560	4.70
67	6.582000	0.151930	0.259721	4.70	0.235568	4.70	0.238329	4.70
68	6.739000	0.148390	0.255322	4.69	0.235568	4.69	0.230637	4.69
69	6.896000	0.145012	0.234885	4.69	0.231593	4.69	0.228710	4.69
70	7.053000	0.141784	0.224270	4.69	0.227211	4.69	0.225862	4.69
71	7.210000	0.138696	0.227517	4.69	0.223894	4.69	0.225123	4.69
72	7.367000	0.135740	0.217593	4.69	0.220994	4.69	0.220704	4.69
73	7.524000	0.132908	0.221679	4.69	0.219233	4.69	0.218645	4.69
74	7.681000	0.130191	0.222391	4.68	0.217420	4.69	0.216434	4.69
75	7.840000	0.127559	0.218586	4.68	0.215126	4.68	0.214612	4.69
76	8.000000	0.125000	0.214459	4.68	0.212158	4.68	0.212181	4.69
77	8.160000	0.117861	0.212182	4.68	0.207349	4.69	0.207726	4.69
78	8.320000	0.111458	0.201774	4.71	0.203722	4.69	0.203128	4.69
79	8.480000	0.105731	0.204965	4.69	0.203102	4.69	0.203268	4.69
80	8.640000	0.100563	0.206259	4.69	0.205245	4.69	0.205096	4.69
81	8.800000	0.095877	0.205094	2.35	0.204755	2.35	0.204639	2.35
82	8.960000	0.091609	0.203027	2.35	0.203739	2.35	0.203874	2.35
83	9.120000	0.087704	0.203495	2.35	0.203637	2.35	0.203608	2.35
84	9.280000	0.084118	0.206054	2.35	0.204276	2.35	0.203654	2.35
85	9.440000	0.080615	0.206298	2.35	0.206001	2.35	0.203303	2.35
86	9.600000	0.077760	0.202287	2.35	0.202458	2.35	0.202248	2.35
87	9.760000	0.074920	0.201592	2.35	0.201399	2.35	0.201257	2.35
88	9.920000	0.072294	0.200361	2.35	0.200302	2.35	0.200318	2.35
89	10.080000	0.069842	0.199118	2.35	0.199354	2.35	0.199520	2.35
90	10.240000	0.067549	0.197580	2.35	0.198213	2.35	0.199002	2.35
91	10.400000	0.065402	0.196779	2.34	0.198770	2.35	0.198697	2.35
92	10.560000	0.063347	0.196029	2.35	0.198323	2.35	0.198297	2.35
93	10.720000	0.061493	0.194748	2.35	0.197723	2.35	0.197834	2.35
94	10.880000	0.059769	0.194736	2.35	0.197225	2.35	0.197445	2.35
95	11.040000	0.058205	0.195900	2.35	0.196908	2.35	0.197224	2.35
96	11.200000	0.056433	0.197799	2.35	0.197553	2.35	0.197309	2.35
97	11.360000	0.054927	0.199648	2.35	0.197714	2.35	0.197402	2.35
98	11.520000	0.053499	0.198897	2.35	0.197416	2.35	0.197296	2.35
99	11.680000	0.052143	0.197562	2.35	0.196878	2.35	0.196928	2.35
100	11.840000	0.050854	0.195698	2.35	0.196319	2.35	0.196535	2.35
101	12.000000	0.049628	0.195257	1.57	0.196107	1.57	0.196404	1.57
102	12.160000	0.048459	0.194414	1.57	0.196300	1.57	0.196438	1.57
103	12.320000	0.047344	0.197166	1.57	0.196543	1.57	0.194522	1.57
104	12.480000	0.046279	0.196932	1.57	0.196812	1.57	0.196374	1.57
105	12.640000	0.045201	0.196301	1.57	0.196586	1.57	0.196578	1.57
106	12.800000	0.044287	0.196644	1.57	0.196395	1.57	0.196371	1.57
107	12.960000	0.043354	0.196919	1.57	0.196615	1.57	0.196553	1.57
108	13.120000	0.042459	0.196375	1.57	0.196557	1.57	0.196504	1.57
109	13.280000	0.041601	0.196231	1.57	0.196435	1.57	0.196440	1.57
110	13.440000	0.040750	0.196156	1.57	0.196363	1.57	0.196385	1.57
111	13.600000	0.039905	0.196315	1.57	0.196263	1.57	0.196356	1.57
112	13.760000	0.039065	0.196502	1.57	0.196310	1.57	0.196253	1.57

SH 8 OF 11
ITEM #3

114	1.250000	0.032000	0.195814	1.18	0.195801	1.18
117	32.500000	0.030749	0.195765	1.18	0.195769	1.18
118	33.750000	0.029430	0.195752	1.18	0.195753	1.18
119	35.000000	0.028571	0.195728	1.18	0.195690	1.18
120	36.250000	0.027586	0.195594	1.18	0.195650	1.18
121	37.500000	0.026667	0.195409	1.18	0.195625	1.18
122	38.750000	0.025806	0.195384	1.18	0.195607	1.18
123	40.000000	0.025000	0.195424	1.18	0.195578	1.18
124	41.250000	0.024242	0.195546	0.94	0.195572	0.94
125	42.500000	0.023529	0.195550	0.94	0.195544	0.94
126	43.750000	0.022857	0.195491	0.94	0.195521	0.94
127	45.000000	0.022222	0.195495	0.94	0.195504	0.94
128	46.250000	0.021622	0.195502	0.94	0.195494	0.94
129	47.500000	0.021053	0.195498	0.94	0.195482	0.94
130	48.800000	0.020492	0.195480	0.94	0.195470	0.94

MAXIMUM ACCEL. 2.013125 1.147360 0.189658

FLOR ACCELERATION SPECTRA FOR MASS POINT NO. 38

(TRANSLATIONAL ACCELERATIONS)

WAVELENGTH	PERIOD	DAMPING FACTOR	TIME	DAMPING FACTOR	TIME	DAMPING FACTOR	TIME
1	2.00000	0.107837	6.13	0.102744	6.11	0.099131	6.10
2	1.81818	0.126292	13.43	0.114138	6.88	0.108947	6.06
3	1.66667	0.148033	6.43	0.128101	6.59	0.118138	6.57
4	1.53846	0.201534	6.56	0.168879	6.54	0.153399	6.53
5	1.42857	0.213621	12.85	0.169570	6.58	0.159103	6.50
6	1.33333	0.167280	7.58	0.156725	6.49	0.153786	6.48
7	1.25000	0.199189	9.13	0.173140	6.93	0.162691	6.91
8	1.17647	0.294624	9.07	0.224924	9.04	0.195844	6.88
9	1.11811	0.333250	13.53	0.234466	7.99	0.209308	6.85
10	1.05263	0.301831	9.39	0.255455	8.38	0.227535	8.37
11	1.00000	0.331828	9.56	0.273032	6.35	0.248848	8.34
12	0.95238	0.479661	13.58	0.308905	13.47	0.262793	8.31
13	0.90909	0.507034	13.48	0.343668	13.61	0.303513	6.82
14	0.86956	0.409372	7.24	0.368236	7.22	0.347573	6.81
15	0.83333	0.497755	7.22	0.436201	7.20	0.400586	6.80
16	0.80000	0.635967	7.19	0.523245	7.17	0.465446	7.16
17	0.76923	0.768107	7.16	0.607850	7.14	0.530311	7.13
18	0.74074	0.865912	7.12	0.672034	7.10	0.580526	7.09
19	0.71428	0.894336	7.08	0.705902	7.07	0.610592	7.04
20	0.68965	0.920766	13.51	0.723886	7.04	0.624613	7.03
21	0.66667	1.279132	15.03	0.826904	14.06	0.700915	13.73
22	0.64516	1.340258	9.84	0.942651	14.97	0.803676	13.70
23	0.62500	2.132210	14.96	1.151486	14.00	0.919768	13.67
24	0.60606	2.216495	14.97	1.261469	13.66	0.975865	13.64
25	0.58235	1.992921	13.59	1.172224	13.60	0.965806	4.88
26	0.57142	1.896409	11.42	1.217942	4.86	1.000521	4.86
27	0.55354	1.673361	4.53	1.264399	4.84	1.006399	4.83
28	0.54054	1.535045	4.31	1.152089	4.81	0.974534	4.81
29	0.52631	1.363231	4.78	1.063721	4.79	0.915000	4.79
30	0.51282	1.187935	4.76	0.952114	4.77	0.842479	4.78
31	0.50000	1.032525	4.75	0.865135	4.74	0.761983	4.77
32	0.48760	0.964589	13.21	0.736851	4.75	0.683849	4.74
33	0.47619	0.892272	12.91	0.641537	4.74	0.616967	4.73
34	0.46511	0.785893	12.62	0.526322	12.63	0.559222	4.73
35	0.45454	0.741214	12.60	0.537298	12.61	0.520160	4.74
36	0.44444	0.615710	10.64	0.502570	4.74	0.495262	4.74
37	0.43478	0.528284	10.62	0.486348	4.74	0.472404	4.74
38	0.42532	0.564537	6.59	0.472004	4.73	0.453741	4.73
39	0.41667	0.567034	8.12	0.456311	6.73	0.435600	6.73
40	0.40816	0.494806	4.72	0.433552	4.72	0.414534	4.72
41	0.40000	0.484033	4.71	0.422602	4.63	0.398590	4.64
42	0.37636	0.478848	4.62	0.406293	4.62	0.376381	4.62
43	0.35364	0.353535	4.60	0.347872	4.19	0.342441	4.19
44	0.33687	0.326098	4.60	0.321340	4.19	0.322762	4.19
45	0.31969	0.356152	10.42	0.329284	4.18	0.324514	4.19
46	0.30441	0.452752	4.78	0.370509	4.78	0.346292	4.78
47	0.29052	0.486029	4.76	0.396631	4.73	0.366188	4.74
48	0.27785	0.393991	14.46	0.371496	4.73	0.357304	4.73
49	0.26624	0.395246	4.73	0.358670	4.73	0.346822	4.73
50	0.25555	0.382075	4.73	0.345610	4.72	0.337270	4.73

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SH 90F11
ITEM # 3

SH-1100-15
SH-100-11
ITEM # 3

55	4.683000	0.208857	0.277876	10.10	0.270896	6.70	0.271094	6.70
56	4.855000	0.208973	0.276000	6.68	0.269208	6.70	0.261335	6.70
57	5.012000	0.199521	0.243662	3.91	0.248322	6.70	0.252953	6.70
58	5.169000	0.198461	0.244333	4.18	0.248609	6.70	0.250182	6.70
59	5.326000	0.187758	0.270628	4.70	0.252094	6.70	0.249704	6.70
60	5.483000	0.187382	0.245306	4.70	0.248599	6.70	0.257028	6.70
61	5.640000	0.187305	0.246978	4.70	0.243723	6.70	0.245523	6.70
62	5.797000	0.177503	0.235983	4.69	0.239336	6.70	0.240297	6.70
63	5.954000	0.177954	0.232010	4.71	0.236918	6.70	0.238156	6.70
64	6.111000	0.176659	0.243034	4.70	0.236599	6.70	0.237105	6.70
65	6.268000	0.176541	0.251269	4.15	0.235663	6.71	0.236708	6.70
66	6.425000	0.176642	0.245490	4.72	0.236709	6.71	0.237515	6.70
67	6.582000	0.176930	0.258530	4.71	0.248937	6.70	0.238298	6.70
68	6.739000	0.176590	0.252760	4.69	0.240395	6.70	0.237147	6.70
69	6.896000	0.176012	0.237747	4.69	0.236086	6.70	0.234546	6.70
70	7.053000	0.176764	0.252010	4.69	0.232348	6.70	0.231687	6.70
71	7.210000	0.176696	0.234361	4.69	0.229735	6.70	0.229084	6.70
72	7.367000	0.176740	0.226785	4.69	0.226890	6.69	0.226778	6.70
73	7.524000	0.176908	0.223811	4.70	0.224769	6.69	0.224909	6.70
74	7.681000	0.176191	0.225216	4.69	0.223393	6.69	0.223374	6.70
75	7.838000	0.176551	0.223613	4.69	0.221748	6.69	0.221847	6.70
76	8.000000	0.176500	0.218795	4.69	0.219723	6.69	0.220487	6.70
77	8.160000	0.176643	0.219786	4.69	0.217333	6.70	0.217757	6.70
78	8.320000	0.176548	0.215603	4.71	0.215629	6.70	0.216382	6.70
79	8.480000	0.176531	0.214655	4.70	0.216697	6.70	0.216566	6.70
80	8.640000	0.176543	0.214772	4.70	0.216392	6.70	0.216159	6.70
81	8.800000	0.176587	0.216094	2.35	0.215345	2.35	0.215421	2.35
82	8.960000	0.176609	0.215963	2.35	0.214630	2.35	0.214706	2.35
83	9.120000	0.176704	0.215237	2.36	0.214025	2.35	0.214633	2.35
84	9.280000	0.176818	0.217680	2.35	0.214863	2.35	0.214178	2.35
85	9.440000	0.176815	0.215268	2.35	0.213777	2.35	0.213236	2.35
86	9.600000	0.176760	0.212193	2.35	0.212195	2.35	0.212091	2.35
87	9.760000	0.176929	0.214733	2.35	0.211175	2.35	0.211107	2.35
88	9.920000	0.176842	0.209249	2.35	0.210057	2.35	0.210194	2.35
89	10.080000	0.176949	0.204474	2.35	0.209222	2.35	0.209525	2.35
90	10.240000	0.176749	0.208369	2.36	0.208226	2.35	0.209397	2.35
91	10.400000	0.176502	0.211473	2.35	0.209663	2.35	0.209589	2.35
92	10.560000	0.176387	0.210000	2.35	0.209185	2.35	0.209050	2.35
93	10.720000	0.176493	0.208200	2.35	0.208538	2.35	0.208599	2.35
94	10.880000	0.176709	0.208263	2.35	0.208111	2.35	0.208249	2.35
95	11.040000	0.176825	0.207497	2.35	0.207816	2.35	0.207997	2.35
96	11.200000	0.176833	0.207268	2.36	0.207709	2.35	0.207860	2.35
97	11.360000	0.176927	0.208062	2.35	0.207742	2.35	0.207790	2.35
98	11.520000	0.176999	0.207491	2.35	0.207638	2.35	0.207698	2.35
99	11.680000	0.176213	0.206992	2.35	0.207463	2.35	0.207595	2.35
100	11.840000	0.176834	0.207324	2.36	0.207408	2.36	0.207535	2.35
101	12.000000	0.176928	0.207646	1.57	0.207682	1.57	0.207686	1.57
102	12.160000	0.176859	0.208232	1.57	0.207813	1.57	0.207731	1.57
103	12.320000	0.176744	0.208134	1.57	0.207806	1.57	0.207719	1.57
104	12.480000	0.176279	0.207692	1.57	0.207704	1.57	0.207662	1.57
105	12.640000	0.176261	0.207595	1.57	0.207627	1.57	0.207598	1.57
106	12.800000	0.176287	0.207577	1.57	0.207577	1.57	0.207532	1.57
107	12.960000	0.176334	0.207796	1.57	0.207498	1.57	0.207453	1.57
108	13.120000	0.176259	0.207342	1.57	0.207378	1.57	0.207375	1.57
109	13.280000	0.176160	0.207621	1.57	0.207278	1.57	0.207304	1.57
110	13.440000	0.1760750	0.207354	1.57	0.207267	1.57	0.207256	1.57
111	13.600000	0.176060	0.207269	1.57	0.207252	1.57	0.207217	1.57

114	31.250000	0.032000	0.206918	1.18	0.204904	1.18	0.204896	1.18
117	32.500000	0.030700	0.204843	1.18	0.204852	1.18	0.204841	1.18
118	33.750000	0.029430	0.204776	1.18	0.204794	1.18	0.204790	1.18
119	35.000000	0.028271	0.204708	1.18	0.204741	1.18	0.204742	1.18
120	36.250000	0.027186	0.204639	1.18	0.204698	1.18	0.204707	1.18
121	37.500000	0.026067	0.204570	1.18	0.204716	1.18	0.204691	1.18
122	38.750000	0.025006	0.204504	1.18	0.204675	1.18	0.204653	1.18
123	40.000000	0.024000	0.204439	1.18	0.204593	1.18	0.204601	1.18
124	41.250000	0.023042	0.204374	0.94	0.204554	0.94	0.204567	0.94
125	42.500000	0.022029	0.204316	0.94	0.204537	0.94	0.204543	0.94
126	43.750000	0.021057	0.204256	0.94	0.204537	0.94	0.204534	0.94
127	45.000000	0.020022	0.204199	0.94	0.204550	0.94	0.204523	0.94
128	46.250000	0.019022	0.204142	0.94	0.204528	0.94	0.204500	0.94
129	47.500000	0.018053	0.204088	0.94	0.204469	0.94	0.204454	0.94
130	48.800000	0.017092	0.204037	0.94	0.204398	0.94	0.204394	0.94

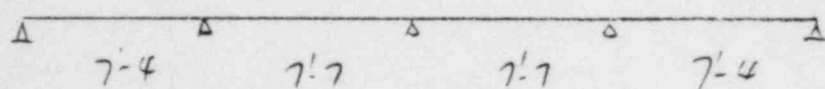
MAXIMUM ACCEL. 2.216455 1.241660 1.006399

4	39	1	1	0.020	2.0131
5	39	1	1	0.030	1.1474
6	39	1	1	0.070	0.8997

BY G.W.J. DATE 9/17/84
 CHKD. BY K. Shih DATE 10-1-84
 CLIENT LP & L
 PROJECT WATERFORD S.E.S. #3
 SUBJECT CONCRETE MASONRY BLOCK WALLS ITEM # 3

SHEET 1 OF 3
 DEPT. 653
 NO. 653
 OFS NO. _____

CONSIDER THE WALL AS A BEAM SUPPORTED
 BY THE EMBEDDED STEEL PLATE, SPANNING HORIZONTALLY
 FREQUENCY ANALYSIS OF THE BEAM



ASSUME THE SPANS ARE EQUAL IN LENGTH, SAY 7'-7"
 TAKE A 12" STRIP

FROM TABLE 8-3d (BLEVINS: FORMULAS.)

$$f_i = \frac{\chi_i^2}{2\pi l^2} \left[\frac{EIg}{W} \right]^{1/2}$$

FOR NUMBER OF SPAN = 4

$$\chi_1 = 3.142$$

$$E = 675,000 \text{ psi}$$

$$I = \frac{1}{12} (12)(6)^3 = 216 \text{ in}^4$$

$$W = 140 \times .5 \times 1 = 70 \text{ lb/ft} = 5.83 \text{ lb/in}$$

$$l = 7'-7" = 91"$$

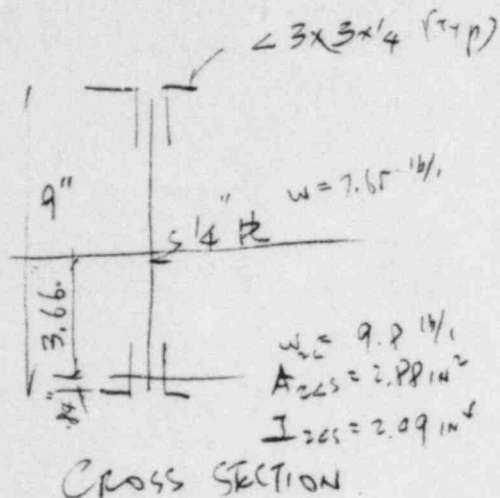
$$f_1 = \frac{(3.142)^2}{2\pi (91)^2} \left[\frac{675,000 \times 216 \times 386.4}{5.83} \right]^{1/2}$$

$$= \underline{\underline{18.7 \text{ Hz}}}$$

USING "g" VALUE = 0.3 IS JUSTIFIED.

BY G WU DATE 7/1/84SHEET 2 OF 3CHKD. BY K. Glavin DATE 10-1-84OFS NO. _____ DEPT. 653
NO. _____CLIENT LP & LPROJECT WATERFORD S.E.S. #2SUBJECT CONCRETE MASONRY BLOCK WALL SI ITEM # 3

FREQUENCY OF THE SUPPORTING STEEL C.



STEEL C IS SUPPORTED BY TWO ANGLES AT EACH SIDE, AND WELDED ON THE TENSILE SIDE AT CEILING & FLOOR.

$$I = 2.49 \times 2 + 2.88 \times 3.66^2 \times 2 + \frac{1}{12} (1/4)(9)^3 = 92.81 \text{ in}^4$$

$$\text{SPAN } l = 29.5' = 354''$$

$$E = 29,000,000 \text{ psi}$$

$$W = 7.65 + 2 \times 9.8 = 27.2 \text{ lb/ft} = 2.27 \text{ lb/in}$$

$$g = 386.4$$

FROM TABLE P-1, (BLEVINS: FORMULAS)

$$f_i = \frac{\lambda_i^2}{2\pi l^2} \left(\frac{EI}{W} \right)^{1/2}$$

$$f_1 = \frac{(4.73)^2}{2\pi (354)^2} \left(\frac{29,000,000 \times 92.81}{2.27} \right)^{1/2}$$

$$= \underline{\underline{18.9}} \text{ Hz}$$

EBASCO SERVICES INCORPORATED

BY G. WU DATE 10/3/84SHEET 3 OF 3CHKD. BY K. L. L. DATE 10/3/84OFS NO. 100 4294.385 DEPT. 653CLIENT LP & LPROJECT WATERFORD S.E.S. #3SUBJECT CONCRETE MASONRY BLOCK WALL - WALL S21 ITEM # 3

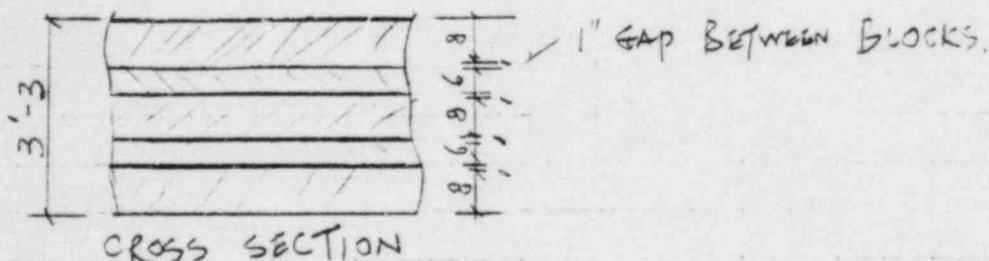
WALL DIMENSIONS

REF. 765 S01

L x H x THICK

10' x 21' x 3'-3

WALL HAS DUR-O-WALL P. EVERY COURSE.
WALL IS DESIGNED TO SPAN HORIZONTALLY.



TAKE ONE COURSE OF WALL 8" HIGH, 10' IN SPAN
ASSUME SIMPLY SUPPORTED AT BOTH ENDS AND ALSO
ASSUME WALLS ARE ACTING INDEPENDENTLY, FOR 6" THK WALL
FREQUENCY : FROM TABLE 8-1 (BLEVING FORMULAS)

$$f = \frac{\lambda_1^2}{2\pi L^2} \left[\frac{EIg}{W} \right]^{1/2}$$

$$E = 675,000 \text{ psi}$$

$$g = 386.4 \text{ in/sec}^2$$

$$I = \frac{1}{12} (8) (6)^3 = 144 \text{ in}^4$$

$$W = 6 \times 8 \times 150 \times \frac{1}{128} = 4.17 \text{ in}$$

$$\lambda_1 = \pi$$

$$f = \frac{\pi^2}{2\pi L^2} \left[\frac{EIg}{W} \right]^{1/2}$$

$$= \frac{\pi}{2 \times (10 \times 12)^2} \left[\frac{675000 \times 144 \times 386.4}{4.17} \right]^{1/2} = 10.4 \text{ Hz}$$

$$f = \sqrt{\left(\frac{39}{6}\right)^2} \times 10.4 = 67.6 \text{ Hz. FOR A 39" WALL ACTS AS ONE UNIT DUE TO Z STRAPS.}$$

BY W.T. DATE 9/27/84SHEET 1 OF 2CHKD. BY K.S.H. DATE 10-3-84OFS NO. _____ DEPT. NO. 653CLIENT CH2LPROJECT WATERBURY JCC UNIT NO. 3SUBJECT CONCRETE BLOCK WALLSITEM 4

NRC, APPENDIX 'A' TO SRP, SECT 3.3.4,
paragraph 3(a) permits the
allowable working stress for reinforcement to be
multiplied by a factor of 2.

$$\text{Allowable } F_s = 2 \times f_s = 2 \times 24,000 = 48,000 \text{ psi}$$

(ASTM A-615 Grade 60)

$$0.9 F_y = 0.9 \times 60,000 = 54,000 \text{ psi}$$

$$\therefore \underline{F_s < 0.9 F_y}$$

EBASCO SERVICES INCORPORATED

SH 2 OF 2

BY G. A. [illegible] DATE 9-26-84SHEET 2 OF 2CHKD. BY [illegible] DATE 9-27-84OFS NO. 2335.193 DEPT. NO. 623CLIENT LT 3 LPROJECT WATERFORD C.B.C. #2SUBJECT CONCRETE BLOCK WALLS

ITEM #4

SEE EBASCO CALCS OF 3.15.84
PAGE 7

STRESS USED = $0.40 F_y = 24 \text{ ksi}$

FACTOR OF $\phi = \underline{0.80 F_y}$ $\underline{0.9 F_y}$
 $\therefore \underline{0 \text{ K.}}$

BY A. LEON DATE 9/26/84SHEET 1 OF 15CHKD. BY LP & L DATE 9/26/84OFS NO. DEPT. NO. 653CLIENT LP & LPROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - WALL S1ITEM #3

1. CRITERIA:

- 1.1 DUROWALL IS EVALUATED FOR 7'-7" SPANS WITH THE MOST CRITICAL LOADS BASED ON SH 2 & 3 OF CALCULATIONS.
- 1.2 LOADS OF SH 2 & 3 OF CALCULATIONS WERE BASED ON SKETCHES FROM MECH. & ELECT. DISCIPLINES.
- 1.3 LOADS FOR ELECT. FIXTURES (LESS THAN 10#) ARE NOT SHOWN.
- 1.4 THE WALL THICKNESS IS 12" TOTAL CONSISTING OF TWO-6" WALLS WHICH ARE TREATED INDEPENDENTLY, SOUTH SIDE WALL WILL CARRY ALL THE SOUTH SIDE LOADS & NORTH SIDE WALL, ALL THE NORTH SIDE LOADS.
- 1.5 FOR THE DUROWALL, THE MOST CRITICAL LOADS ARE F_z & M_y FOR MECH. LOADS; F_y FOR ELECT. & DEAD LOAD OF WALL.
- 1.6 FOR 7'-7 BAYS, THE CRITICAL CONDITIONS ARE:
SOUTH SIDE WALL: EL. -10'-6", BAY BET. ③ & ④
NORTH SIDE WALL: EL. -15', BAY BET. ③ & ②
- 1.7 FOR 7'-4 BAYS, THE LOADS ARE SMALLER THAN FOR 7'-7 BAY THEREFORE NO CALCULATIONS REQ'D.
- 1.8 FOR THE LATERAL SUPPORTS THE CRITICAL LOADS ARE F_z , M_x & M_y FOR MECH. LOADS. F_y FOR ELECT. & DEAD LOAD OF WALL.

2. REFERENCES:

- 2.1 DWG. G-765 S02
- 2.2 CALCULATIONS FOR CONC. BLOCK WALL REVIEW DONE ON 3/15/84
- 2.3 FIELD SKETCHES FOR MECH. & ELECT. ATTACHMENTS.
SH. 13, 14 & 15 OF 15 OF THIS CALCULATIONS.

BY A. LEON DATE 2/26/81

CHKD. BY LP/L DATE 1-1-81

OFS NO. 653

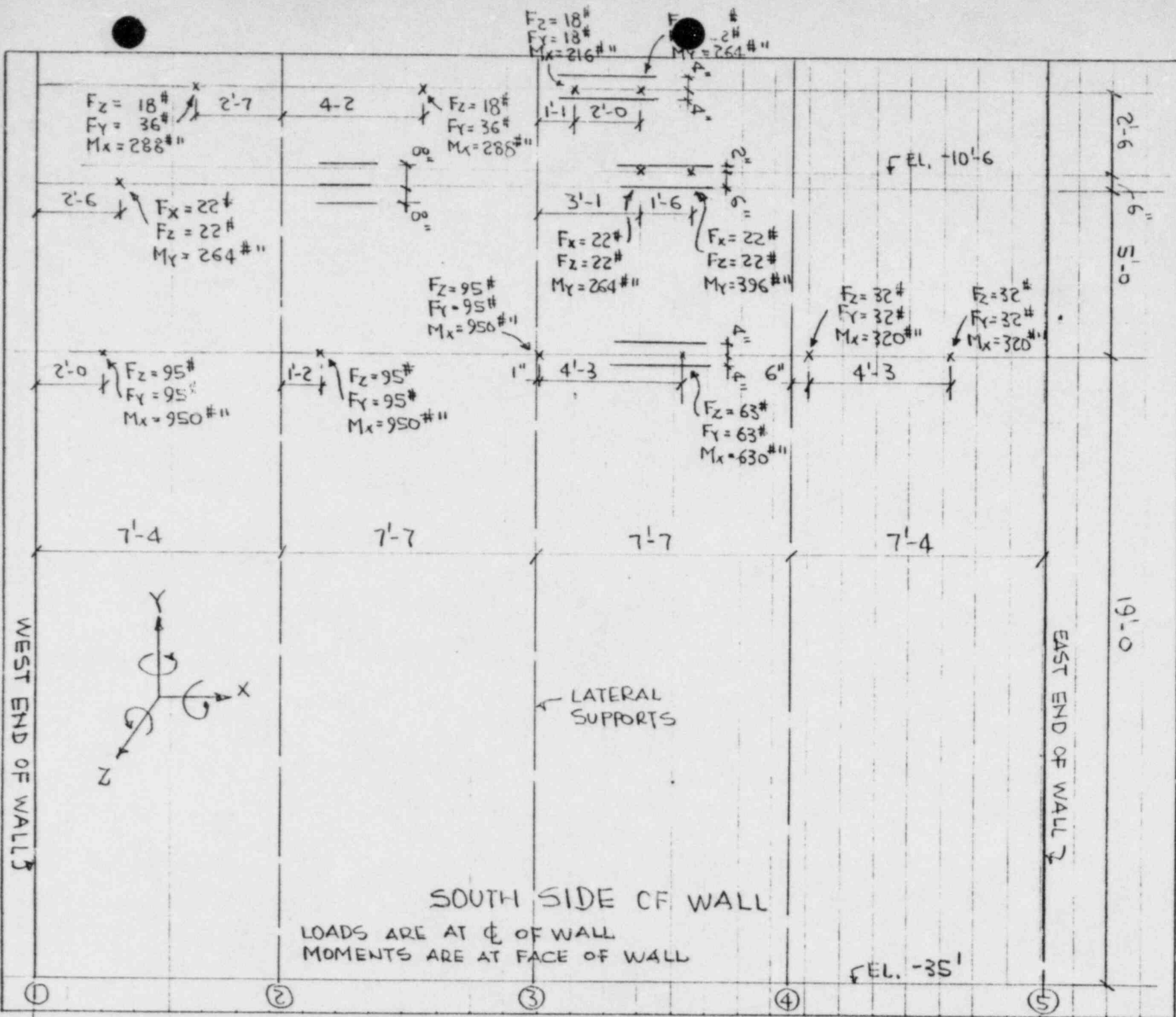
CLIENT LP/L

PROJECT WATERFORD #3

SUBJECT

CONC. BLOCK WALLS - WALL S1

ITEM # 15

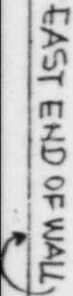


SHEET 3 OF 15

DEPT. NO. 653
OFFS NO. _____

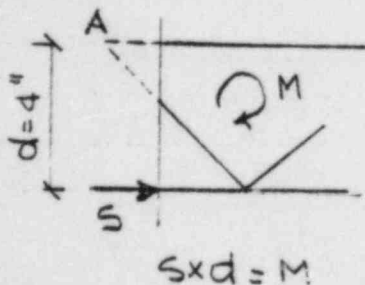
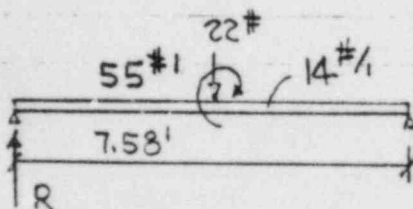
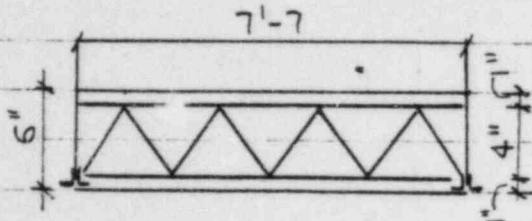
100

1143#5



BY A. LEON DATE 9/26/84SHEET 4 OF 15CHKD. BY _____ DATE 10-3-84OFS NO. _____ DEPT. NO. 653CLIENT LP & LPROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - WALL S1ITEM # 5

I- SOUTH SIDE WALL - BAY BET. ③ & ④ - EL. - 10.5'



1. LOADS :

1.1 WALL : $w = 140 \text{ \#/cft.}$

1.2 NO ELECT. LOADS.

1.3 MECH. LOADS :

BECAUSE LOADS ARE AT $\frac{1}{2}$ OF WALL, FOR ONE 6" WALL IS HALF THE LOAD, $F_z = 22 \times 1.5 = 11\#$ AT TWO LOCATIONS. $M_y = 264\#1 = 22\#1$ $M_y = 396\#1 = 33\#1$

1.3.1 TO SIMPLIFY CALCULATIONS, ASSUME

 $F_z = 11 \times 2 = 22\#$ AT HALF SPAN $M_y = 22 + 33 = 55\#1$ AT HALF SPAN.

1.4 VERTICAL LOADS :

1.4.1 $w = 140 \times \frac{6}{12} \times \frac{8}{12} = 46.7\#$ (FOR 6" WYTHE & 8" COURSE).

1.5 HORIZONTAL LOADS :

1.5.1 EARTHQUAKE FACTOR = .39

1.5.2 $H_w = 46.7 \times .3 = 14\#1$ 1.5.3 $F_z = 22\#$

1.6 MOMENTS :

1.6.1 $M_y = 55\#1$

2. FORCES & MOMENTS FOR DUROWALL :

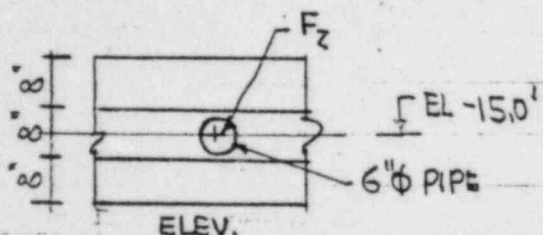
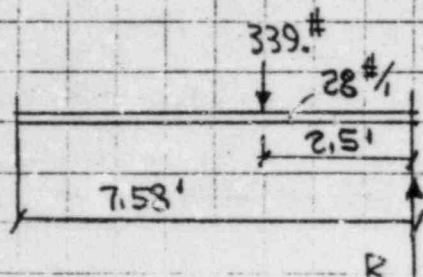
2.1 $R = 14 \times 7.58 \times 1.5 + 22 \times 1.5 + 55/7.58 = 53.1 + 11.0 + 7.3 = 71.4\#$ 2.2 $M = .125 \times 14 \times 7.58^2 + .25 \times 22 \times 7.58 + 55 \times 1.5 = 109.5 + 41.7 + 27.5 = 169.7\#$ 2.3 $S = M/d = 169.7 \times 12/4 = 509.1\#$ 3. STRESSES AT DUROWALL : $F_y = 65 \text{ KSI}$, $F_t = .6 F_y = 39.0 \text{ KSI}$ 3.1 AREA OF $\frac{3}{16}\phi$ WIRE = $\pi \times .19^2/4 = .028 \text{ in}^2$ 3.2 $f_t = 509.1 / .028 = 18182 \text{ psi} \approx 18.2 \text{ KSI} < 39.0$ OK. ✓3.3 SHEAR ON CONC. BLOCK WALL : $b = 8$, $v = 71.4 / 6 \times 8 = 1.5 \text{ psi} < 20 \times 1.2 = 26$ OK. ✓

BY A. LEON DATE 9/26/84SHEET 5 OF 15CHKD. BY P. Hunt DATE 10-2-84

OFS NO. _____

DEPT. NO. 653CLIENT LP&LPROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - WALL 51ITEM # 5

II - NORTH SIDE WALL - BAY BET. ③ & ② - EL. -15.0'



F_z IS DISTRIBUTED ON
2 TRUSSES (CONSERV. ASSUMP.)

4. LOADS:

4.1 WALL: $W = 140 \text{ \#/ft.}$ (REF 1.1)

4.2 NO ELECT. LOADS

4.3 MECH. LOADS:

LOADS ARE AT ϕ OF WALL, FOR ONE
6" WALL IS HALF THE LOAD.

$$F_z = 678 \times .5 = 339 \text{ \# (SH 3)}$$

4.4 VERTICAL LOADS:

4.4.1 $W = 140 \text{ \#/ft}$

4.5 HORIZ. LOADS:

4.5.1 $H_w = 14 \text{ \#} \times 2 = 28 \text{ \#/ft}$ (2 COURSES, 2 TRUSSES)
(CONSERV. ASSUMP.)4.5.2 $F_z = 339 \text{ \#}$ (REF. 4.3)

5. FORCES & MOMENTS FOR DUROWALL:

$$5.1 \quad R = 28 \times 7.58 \times .5 + 339 \times (7.58 - 2.50) / 7.58 = 106.1 + 227.2 = 333.3 \text{ \#}$$

$$5.2 \quad M = 333.3 \times 2.50 - .5 \times 28 \times 2.50^2 = 833.2 - 87.5 = 745.7 \text{ \#-ft}$$

$$5.3 \quad S = 745.7 \times 12 / 4 = 2237.1 \text{ \#}$$

$$S = 2237.1 / 2 = 1118.6 \text{ \#/PER TRUSS}$$

6. STRESS AT DUROWALL:

$$6.1 \quad f_t = 1118.6 / 0.28 = 39950 \text{ psi} = 40.0 \text{ KSI} < .9 F_y = .9 \times 65 = 58.5 \text{ OK}$$

6.2 SHEAR ON CONC. BLOCK WALL:

$$v = 333.3 / 6 \times 16 = 3.5 \text{ psi} < 20 \times 1.3 = 26 \text{ OK}$$

SHEET 6 OF 15

QFS NO. _____ DEPT. NO. 653

PROJECT WATERFORD #3

ITEM #5

2'-6" 6" 5'-0" 19'-0"

EAST END OF WALL 3.

SOUTH	SIDE OF WALL
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

WEST END OF WALL

581/9-91

BY A. LEON DATE 9/26/84

SHEET 7 OF 15

CHKD. BY R. Shih DATE 10-1-84

OFS NO. _____ DEPT. NO. 653

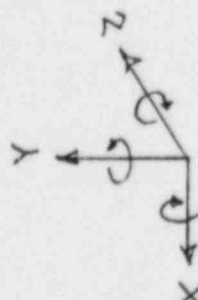
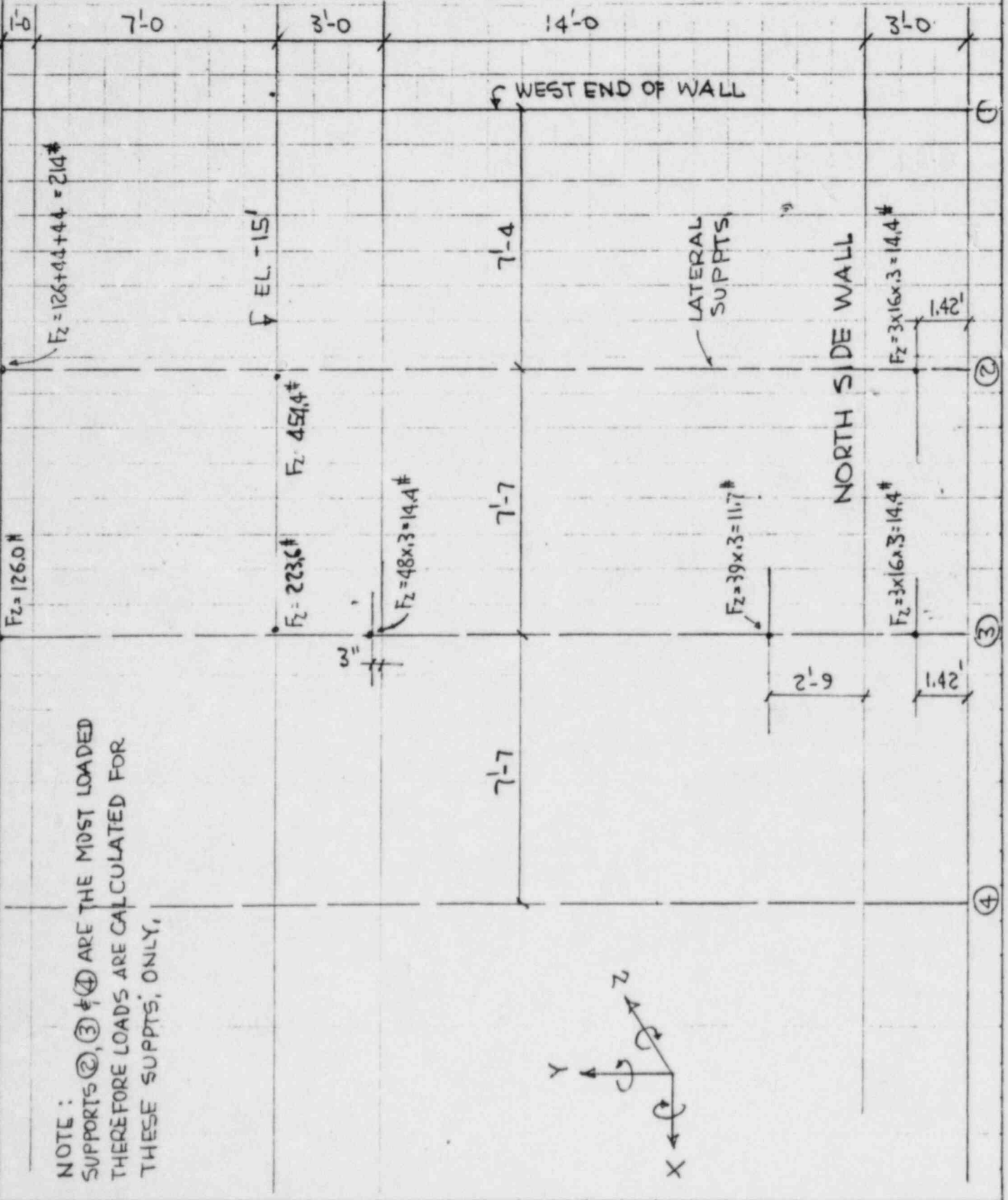
CLIENT LP & L

PROJECT WATERFORD #3

SUBJECT CONC. BLOCK WALLS - WALL S1

ITEM # 5

LOADS ON LATERAL SUPPTS. BASED ON SH 3.



BY A. LEON DATE 9/26/84

SHEET 8 OF 15

CHKD. BY [Signature] DATE 10-2-84

DEPT. NO. 653

CLIENT LP & L

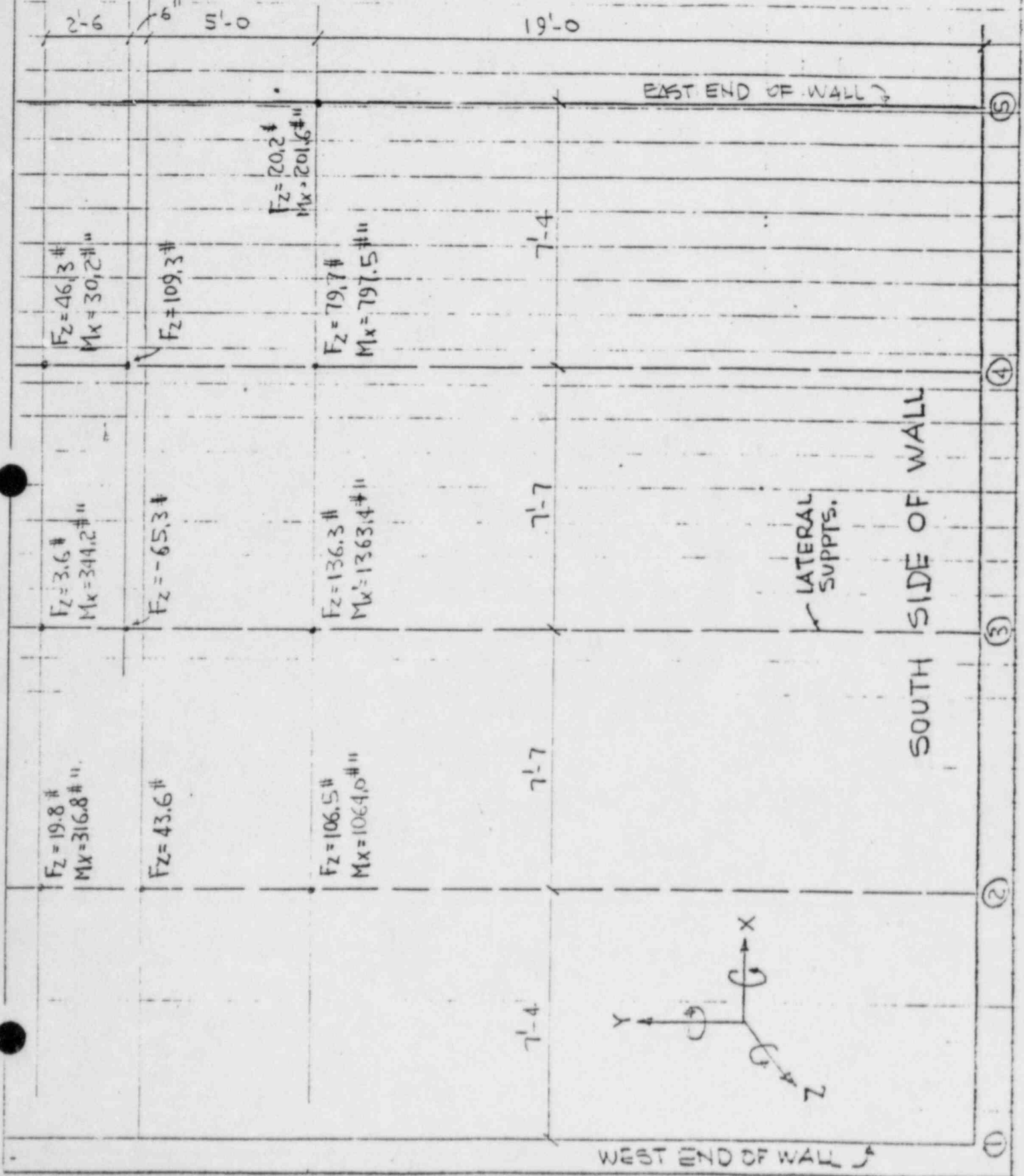
PROJECT WATERFORD #3

SUBJECT CONC. BLOCK WALLS.

WALL S1

ITEM # 5

LOADS BASED ON SH 6



BY A. LEON DATE 9/26/84

SHEET 9 OF 15

CHKD. BY Y. Shih DATE 10-2-84

OFS NO. _____

DEPT. NO. 653

CLIENT LP&L

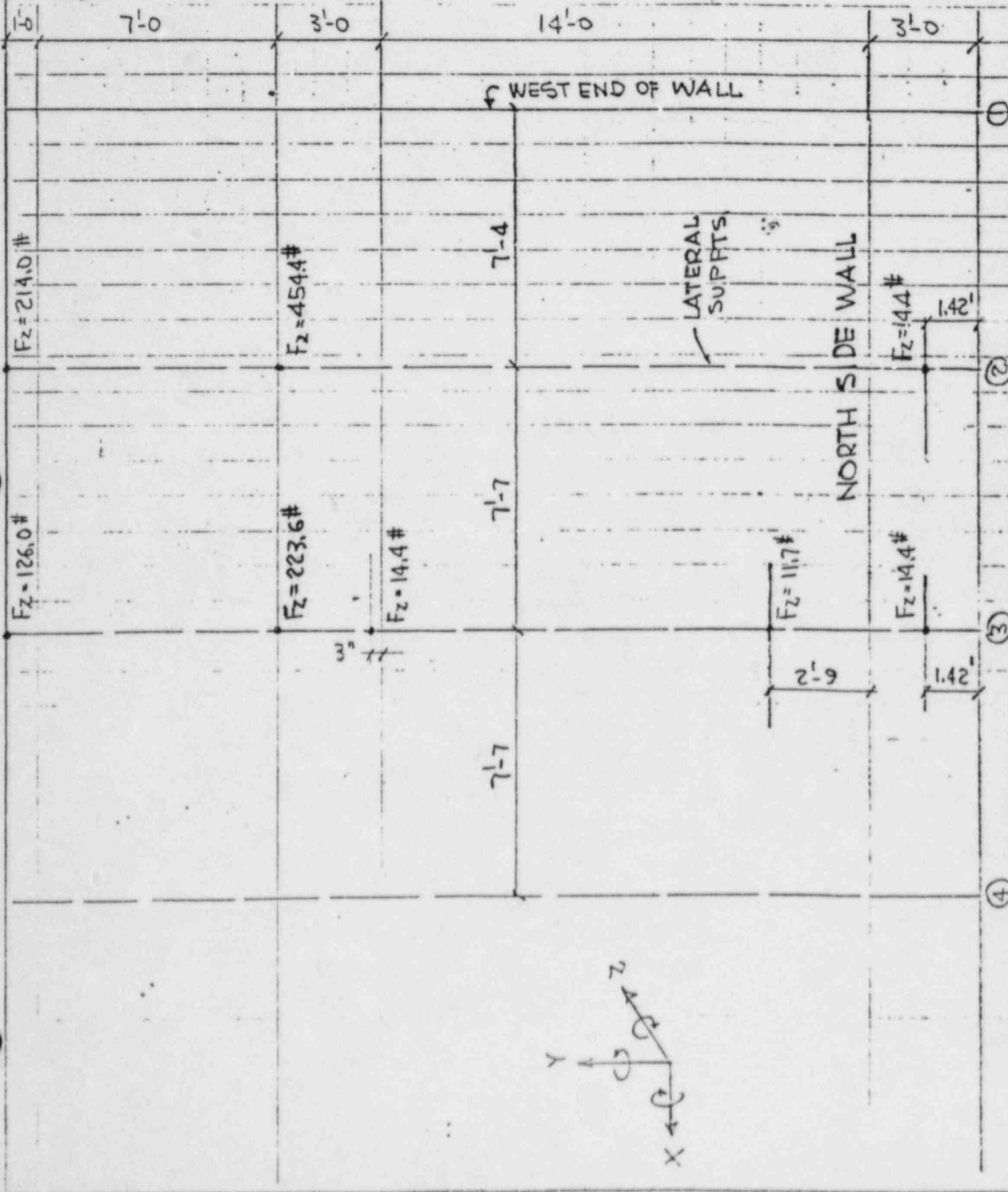
PROJECT WATERFORD #3

SUBJECT CONC. BLOCK WALLS

WALL S1

ITEM #5

LOADS BASED ON SH 7

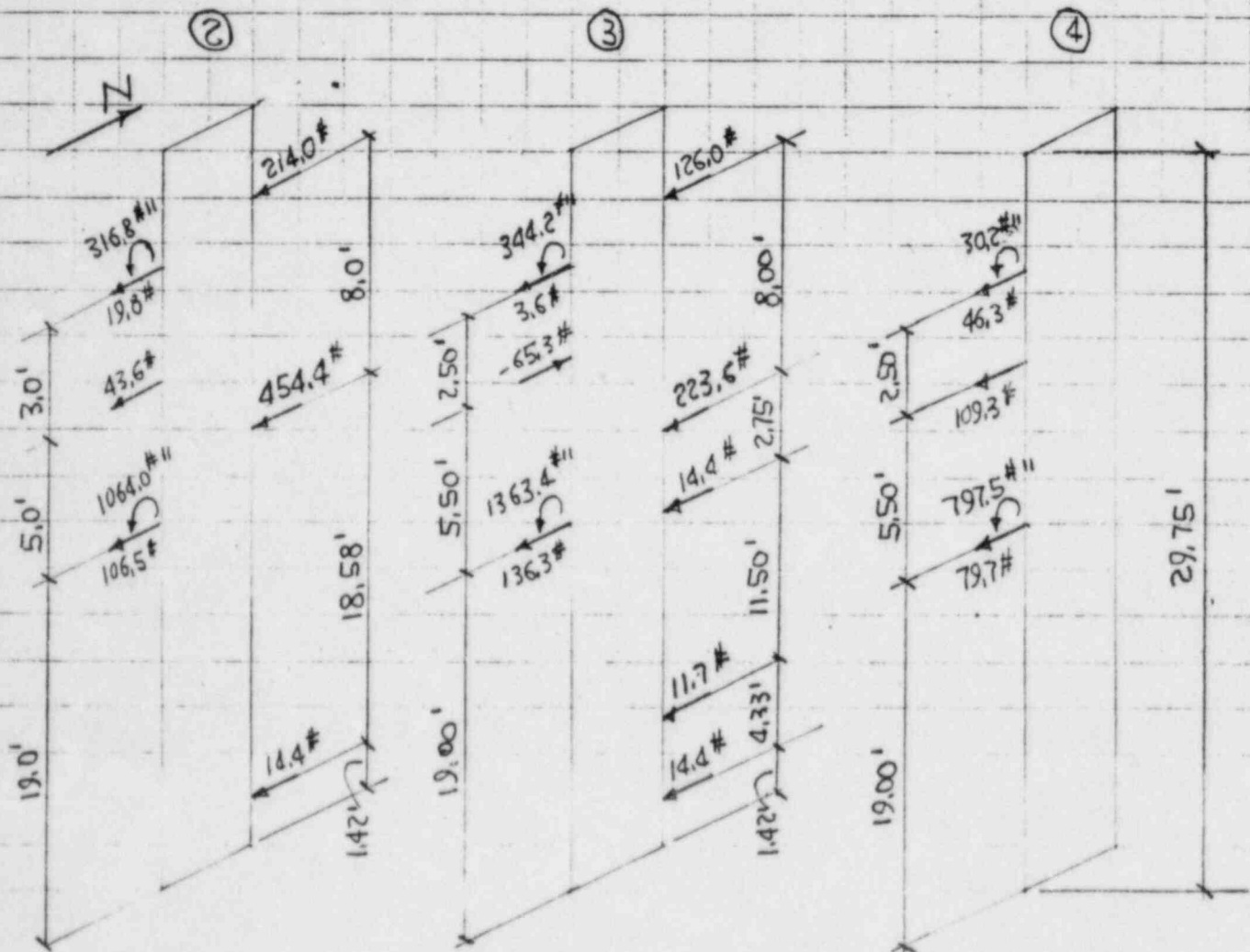


BY A. LEONDATE 9/26/84SHEET 10 OF 15CHKD. BY K. K. K.DATE 10-28-84

OFS NO. _____

DEPT. NO. 653CLIENT LP & LPROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS -WALL S1ITEM #5

LOADS BASED ON SH 8 & 9.

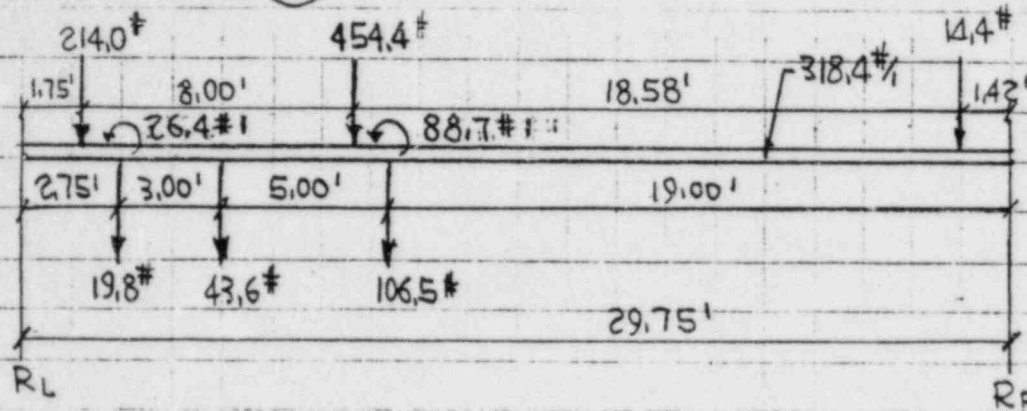


NOTE: LATERAL SUPPORTS ② & ③ ARE THE MOST LOADED. A CLOSE INSPECTION OF THE LOADS SHOW THAT SUPPORT ② IS THE CRITICAL ONE THEREFORE THIS SUPPT. IS ANALYSED.

BY A. LEON DATE 9/27/84SHEET 11 OF 15CHKD. BY A. Leon DATE 10-2-84OFS NO. _____ DEPT. NO. 653CLIENT LP&LPROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - WALL S1

ITEM #5

LATERAL SUPPORT (2):



1. LOADS DUE TO WALL:

$$W = 140 \times 7.58' = 1061.2 \text{ \#/ft}$$

$$\text{HORIZ. LOAD, } H_w = 1061.2 \times 3 = 318.4 \text{ \#/ft}$$

$$2. M_{x_1} = 316.8 \text{ \#-ft} = 26.4 \text{ \#-ft}$$

$$M_{x_2} = 1064.0 \text{ \#-ft} = 88.7 \text{ \#-ft}$$

$$3. R_L = .5 \times 318.4 \times 29.75 + 214.0 \times \left(\frac{28.00^{.94}}{29.75} \right) + 454.4 \times \left(\frac{20.00^{.67}}{29.75} \right) \\ + 14.4 \times \left(\frac{1.42^{.85}}{29.75} \right) + 19.8 \times \left(\frac{27.00^{.91}}{29.75} \right) + 43.6 \times \left(\frac{24.00^{.81}}{29.75} \right) \\ + 106.5 \times \left(\frac{19.00^{.64}}{29.75} \right) + 26.4/29.75 + 88.7/29.75 \\ = 4736.2 + 201.2 + 304.4 + .7 + 18.0 + 35.3 + 68.2 + .9 + 3.0 \\ = 5367.9 \text{ \#} \approx 5.4 \text{ K}$$

$$R_R = 318.4 \times 29.75 + 214.0 + 454.4 + 14.4 + 19.8 + 43.6 + 106.5 - 5367.9 \\ = 9472.4 + 852.7 - 5367.9 \\ = 4957.2 \text{ \#} \approx 5.0 \text{ K}$$

$$4. M_{\text{MAX @ } 15.52'} = 4957.2 \times 15.52 - 14.4 \times 14.10 - .5 \times 318.4 \times 15.52^2 \\ = 76935.7 - 203.0 - 38346.6 \\ = 38386.1 \text{ \#-ft} \approx 38.4 \text{ K-ft}$$

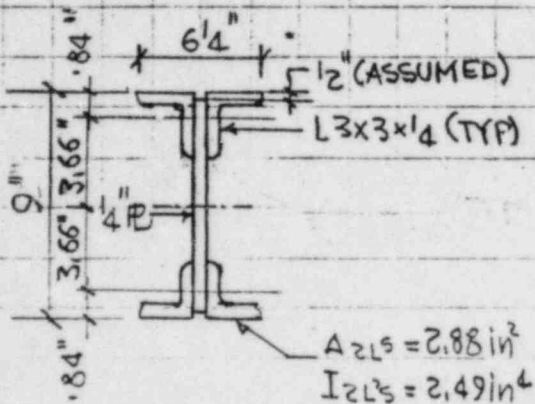
BY A. LEON DATE 9/27/84
 CHKD. BY H. Smith DATE 10.2.84
 CLIENT LP&L

SHEET 12 OF 15
 DEPT. NO. 653

OFS NO. _____

PROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - WALL S1ITEM # 5

5. - STRESSES ON BUILT UP BEAM :



5.1 LOADS :

$$R = 5.4 \text{ K}$$

$$M = 38.4 \text{ K} \times 12 = 460.8 \text{ K}''$$

5.2 PROPERTIES OF SECTION :

$$5.2.1 \text{ AREA} = 2.88 \times 2 + 8 \times \frac{2.00}{25} = 7.76 \text{ in}^2$$

$$5.2.2 \text{ I} = 2.49 \times 2 + 2.88 \times 2 \times 3.66^2 + .25 \times 8^3 / 12$$

$$= 4.98 + 77.16 + 10.67$$

$$= 92.81 \text{ in}^4$$

$$5.2.3 \text{ S} = 92.81 / 4.50 = 20.62 \text{ in}^3$$

5.3 STRESSES : $F_b = 24 \text{ KSI}$, $F_u = 14.5 \text{ KSI}$

$$f_b = 460.8 / 20.62 = 22.35 \text{ KSI} < 24 \text{ OK}$$

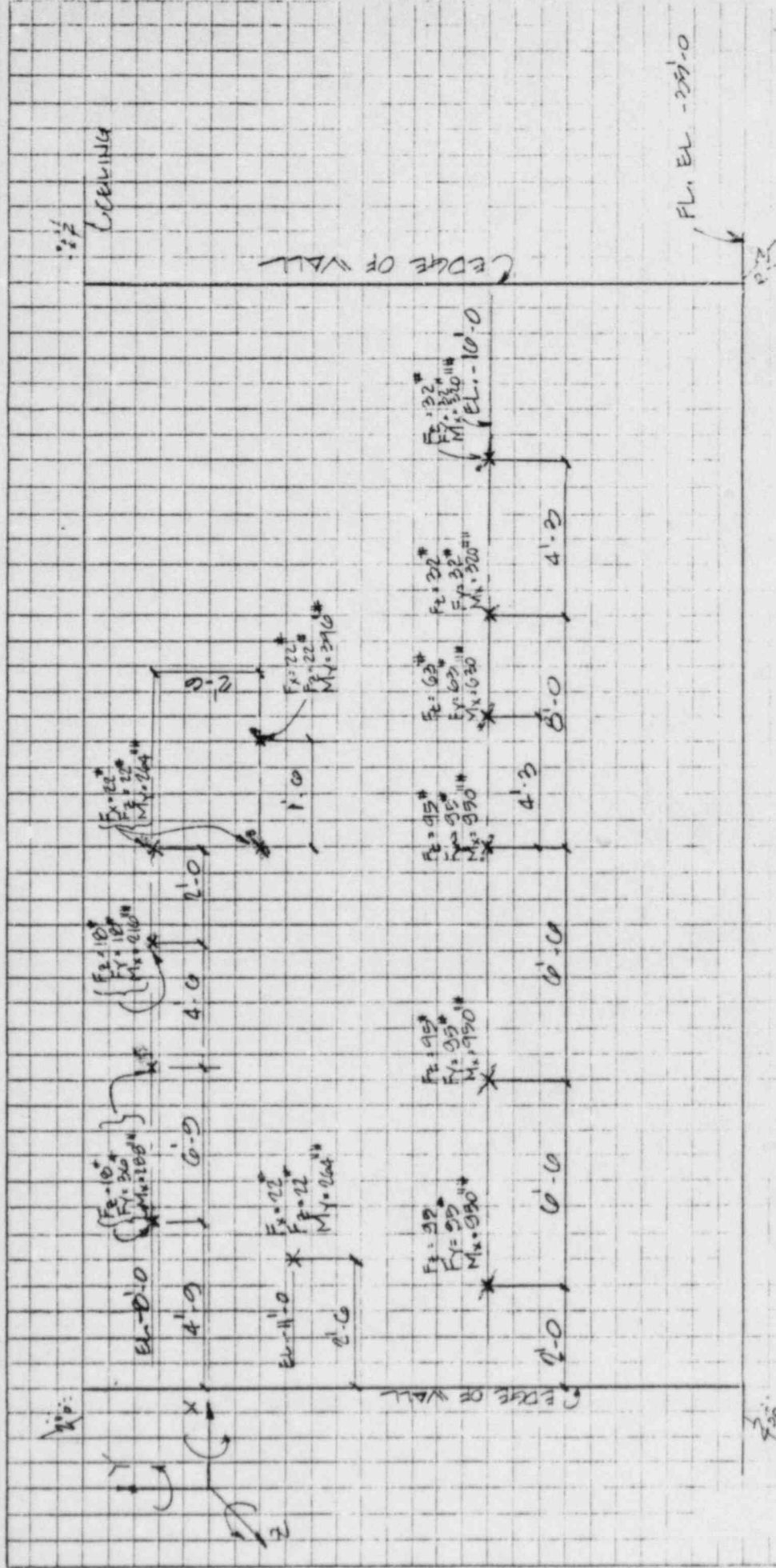
$$f_u = 5.4 / 2.00 = 2.70 \text{ KSI} < 14.5 \text{ OK}$$

6. - BASED ON THESE CALCULATIONS, WALL S1 IS STRUCTURALLY ADEQUATE AS BUILT.

ITEM #5

OPS. NO. LAB-1564
 DEPT. NO. ESSE
 BY PM DATE 9.25.84
 CHECKED BY _____ DATE _____

CLIENT LP & L
 PROJECT WATERFORD #3
 SUBJECT PIPE SUPPORT LADS AT WALL S1



EL. LKG NORTH (N.T.S.)

MOMENTS ARE AT FACE OF WALL

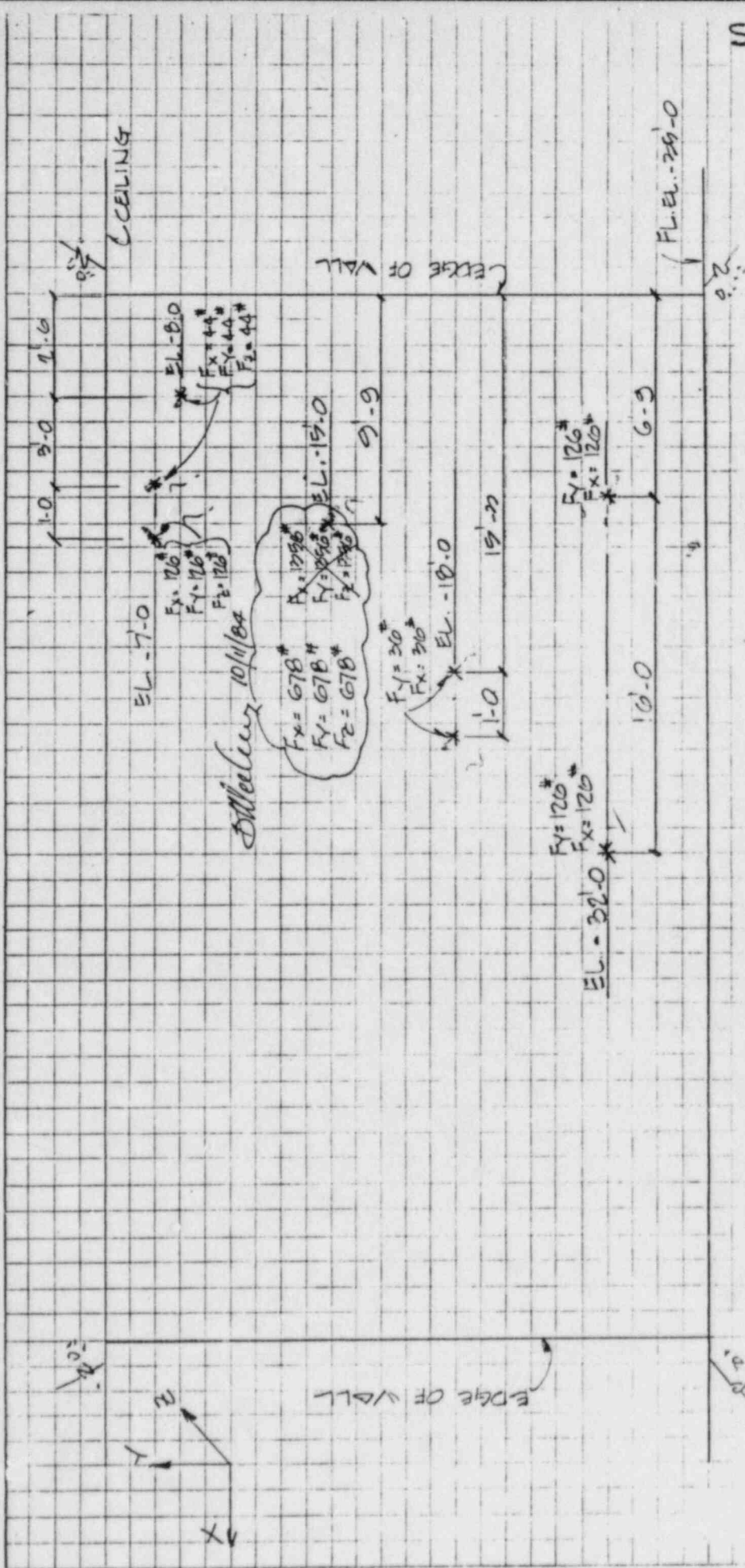
SH 13 OF 42
 ITEM #5
 13 OF 15

ITEM #5

CLIENT: UP #1
 PROJECT: WATERFORD #3
 SUBJECT: PIPE SUPPORT LOADS ON WALL

OPS. NO. 100-15104
 BY: DM
 CHECKED BY: THS

DEPT. NO. ESSE
 DATE 9-25-84
 DATE 9-25-84



ELEV. LKG. SOUTH (N.T.S)

FORCES ARE AT 4 WALL

SH 140F42
 ITEM #5
 14 OF 15

SH150F42

SHEET 15 OF 15

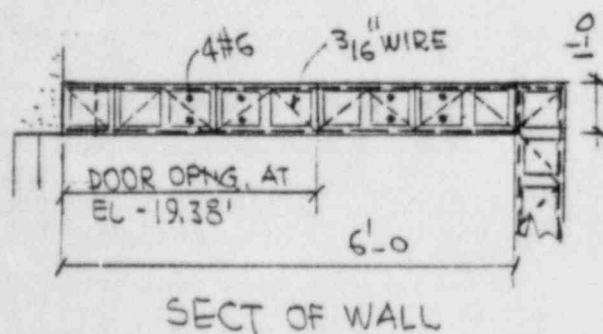
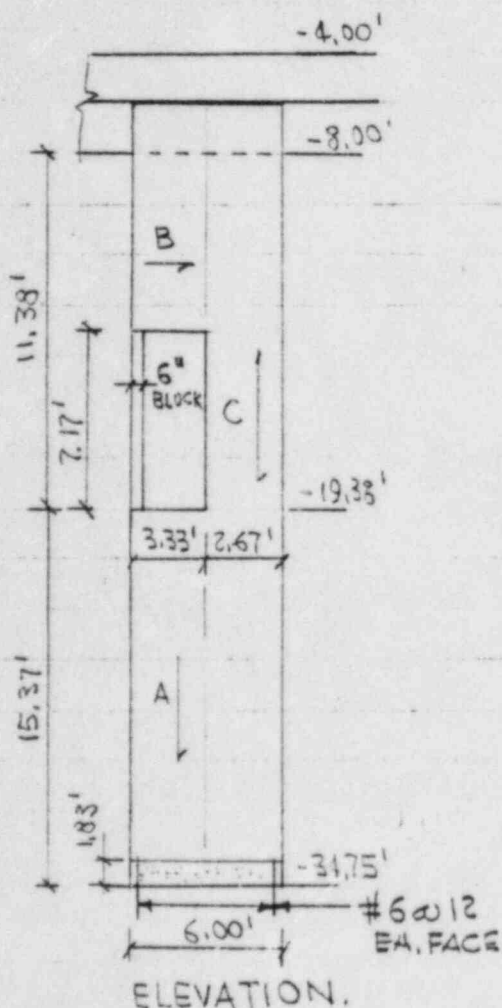
OFFS NO. _____ NO. _____

PROJECT

ITEM #5

SUBJECT



BY A. LEON DATE 9/29/84SHEET 1 OF 12CHKD. BY [Signature] DATE 10-7-84OFS NO. _____ DEPT. NO. 653CLIENT LP&LPROJECT WATERFORD # 3SUBJECT CONC. BLOCK WALLS - WALL H-2.ITEM = 3

1. REFERENCES:

1.1 DWG. G-760 S02

1.2 FIELD SKETCHES FROM MECH. 9/26/84

ELECT. 9/26-9/28/84

1.3 CALCULATIONS DONE ON 3/15/84

2. CRITERIA:

2.1 WALL H-2 IS EVALUATED IN 3-SECT. SECT. 'A' IS CONSIDERED AS CANTILEVER FROM EL. -34.75' TO EL. -19.38'

SECT. 'B' IS CONSIDERED AS CANTILEVER HORIZONTALLY THRU THE DUROBLOCK TRANSFERRING THE LOADS TO SECT. 'C' WHICH IS CONSIDERED FIXED AT EL. -34.75' AND SIMPLE SUPPORTED AT EL. -8.00'.

2.2 SECT. 'A' & SECT. 'C' HAVE 2 CELLS FILLED WITH CONC. & 4#6 VERT. CONTINUOUS.

2.3. LOADS OF SH2 OF CALC. ARE BASED ON SKETCHES FROM MECH. & ELECT. DISCIPLINES.

2.4. THE CRITICAL LOADS FOR SECT. 'A' ARE F_z & M_x FOR MECH. & F_y FOR ELECT. & OWN WEIGHT.2.5 THE CRITICAL LOADS FOR SECT. 'B' ARE F_z & M_y FOR MECH. & F_y FOR ELECT. & OWN WEIGHT.2.6 THE CRITICAL LOADS FOR SECT. 'C' ARE F_z & M_x FOR MECH. & F_y FOR ELECT. & OWN WEIGHT.

BY A. LEON DATE 9/27/84

SHEET 2 OF 12

CHKD. BY K. [Signature] DATE 10-2-84

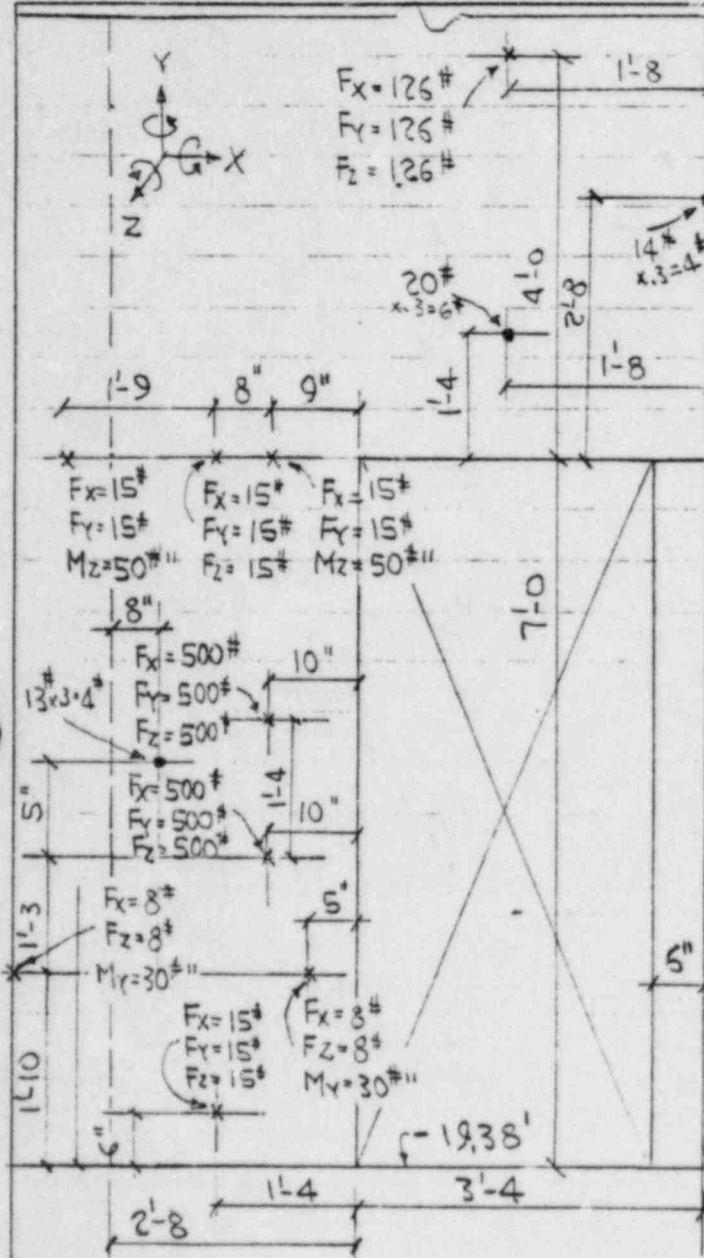
OFS NO. _____ DEPT. NO. 653

CLIENT LPFL

PROJECT WATERFORD #3

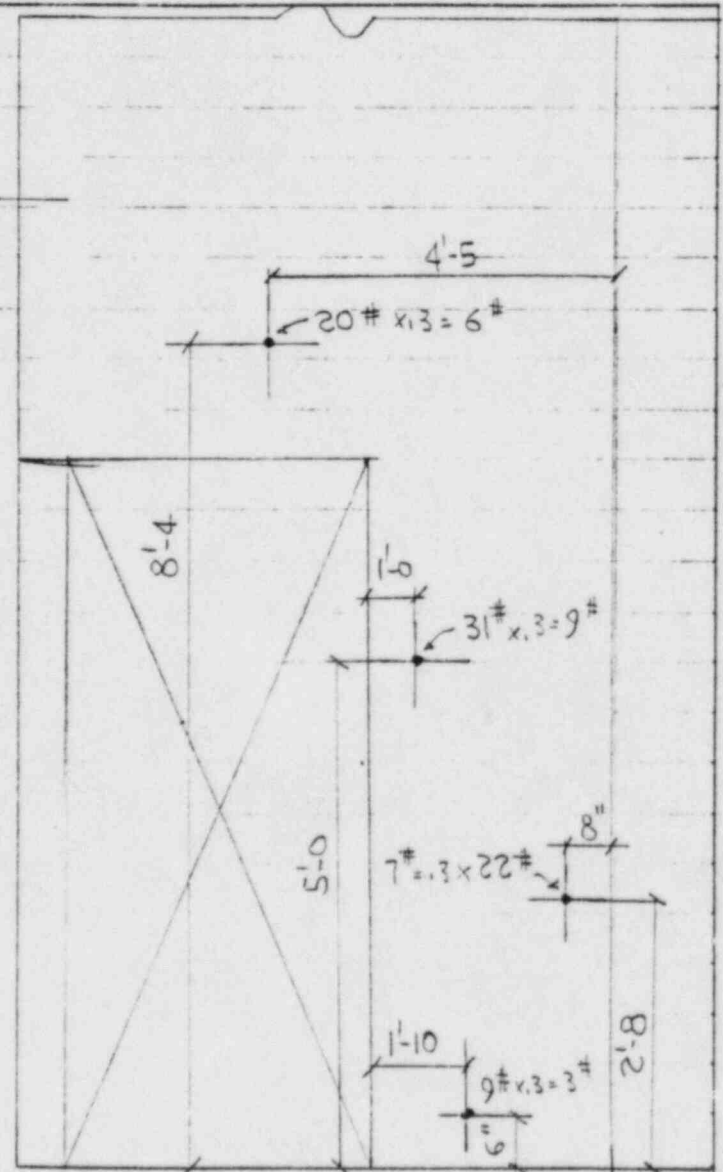
SUBJECT CONC. BLOCK WALLS - WALL H-2

17-1-3



- x MECH. ATTACHMENTS (EAST SIDE ONLY)
- ELECT. ATTACHMENTS (WESTSIDE ONLY)

EAST SIDE OF WALL



WEST SIDE OF WALL

NOTE: FOR MECH. AND ELECT. LOADS IT IS ASSUMED 30% OF WALL WGT. FROM EL -34.75' TO EL-19.38' FOR SECT. 'C'.

BY A. LEON DATE 9/29/91

SHEET 3 OF 12

CHK'D BY K. J. J. DATE 12-1-91

OFS NO. _____ DEPT. NO. 653

CLIENT LP&L

PROJECT WATERFORD #3

SUBJECT CONC. BLOCK WALLS - WALL H-2.

ITEM # 3

OWN WEIGHT : SECT. 'A' : $1.33 \times 150 + 2.00 \times 60 = 320 \#$

$H_w = 320 \times .3 = 96 \# / 1$ (VERT)

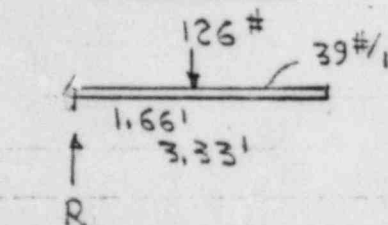
SECT. 'B' : (SAME AS SECT. 'A')

$H_w = 96 \# / 1$ (VERT) = $96 / 3.33' = 29 \# / 1$ (HORIZ.)

SECT. 'C' : $1.33 \times 150 + 1.33 \times 60 = 279 \#$

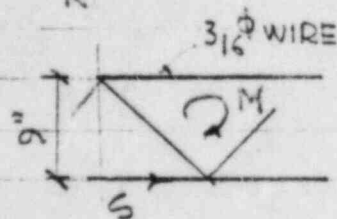
$H_w = 279 \times .3 = 84 \# / 1$ (VERT)

SECT. 'B' : $b = 16"$, $H_w = 29 \times 1.33' = 39 \# / 1$ (HORIZ.)



$$R = 39 \times 3.33 + 126.0 = 129.9 + 126.0 = 255.9 \#$$

$$M = 129.9 \times 3.33 / 2 + 126.0 \times 1.66 = 216.3 + 209.2 = 425.5 \#'$$



STRESSES ON DUROBLOCK :

$$S = 425.5 \times 12 / 9 = 567.7 \#$$

$$A = \pi \times .19^2 / 4 = .028 \text{ in}^2$$

$$F_y = 65 \text{ KSI}, F_t = .6 F_y = 39 \text{ KSI}$$

$$f_t = 567.7 / .028 = 20275 \text{ psi} \approx 20.2 \text{ KSI} < 39, \text{ OK}$$

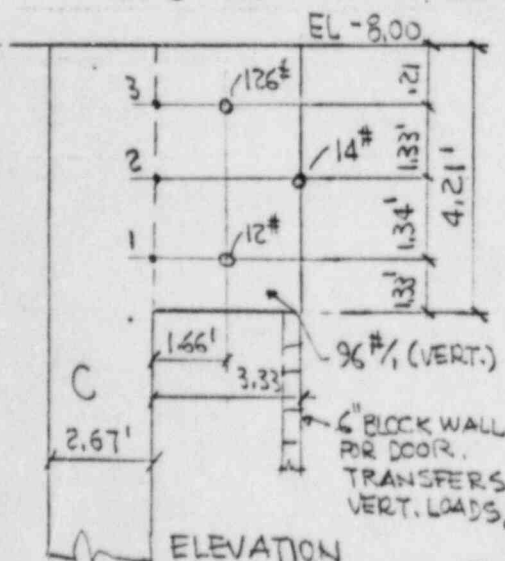
SHEAR ON CONC. WALL :

$$b = 16, j = .85, d = 1.25" (\text{SHELL THICKNESS})$$

$$V = 255.9 / 1.25 \times 16 \times .85 = 15.1 \text{ PSI} < 25, \text{ OK}$$

* Since there is a 6" block wall for door Duct-O-Wall takes Horiz Loads

LOADS TRANSFERRED FROM SECT. 'B' TO SECT. 'C' :



$$F_{z1} = 12 \# \quad M_{y1} = 12 \times 1.66 \approx 20 \#'$$

$$F_{z2} = 4 \# \quad M_{y2} = 4 \times 3.33 \approx 14 \#'$$

$$F_{z3} = 126 \# \quad M_{y3} = 126 \times 1.66 \approx 209 \#'$$

DISTRIBUTED LOAD :

$$W = 96 \# / 1$$

$$M_{yW} = 96 \times 1.67 \approx 160 \#'$$

CONCENTRATED LOADS ARE SO CLOSE

THAT THEY OVERLAP, TO SIMPLIFY

CALCULATIONS USE :

$$W_F = (12 + 4 + 126) / 4.21 = 34 \# / 1$$

$$M_{yF} = (20 + 14 + 209) / 4.21 = 58 \#'$$

$$\text{BEARING ON 6\"/>$$

BY A. LEON DATE 9/29/84SHEET 4 OF 12CHKD. BY 1/2/84 DATE 10-2-84

OFS NO. _____

DEPT. NO. 533CLIENT LP&LPROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - WALL H-2ITEM # 5

$$W_{TOT} = 96 + 34 = 130 \#/\text{ft} \quad M_{Y_{WT}} = 160 + 58 = 218 \#/\text{ft}$$

$M_{Y_{WT}}$ IS REDISTRIBUTED THRU THE DUROWALL TO THE SOUTH WALL.

STRESSES ON DUROWALL:

$$M = 218 + 132 \times 2.67 = 218 + 352 = 570 \#/\text{ft}$$

$$b = 16"$$

$$M = 570 \times 1.33 = 758 \#/\text{ft}$$

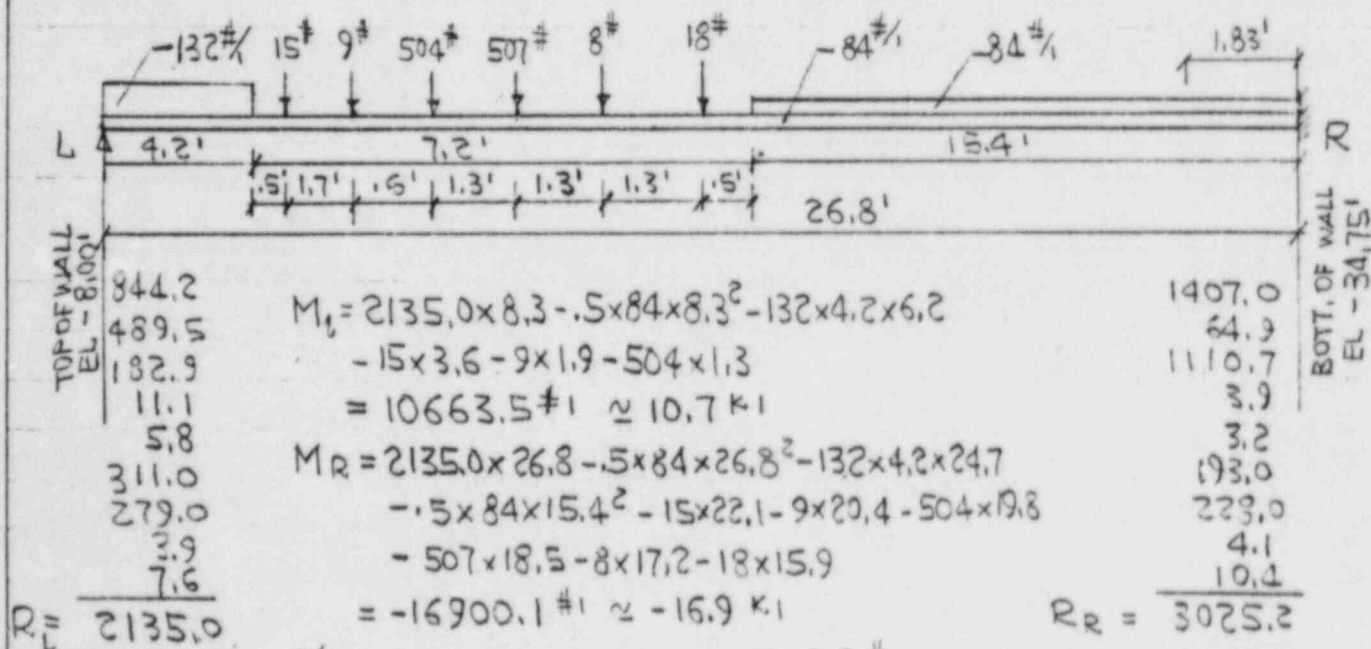
$$S = 758 \times 12/9 = 1011 \#$$

$$f_t = 1011 / 1028 = 36.1 \text{ KSI} < 39.0 \quad \text{OK} \checkmark$$

THEREFORE THE LOADS TRANSFERRED FROM SECT. 'B' TO SECT. 'C' ARE $W' = 130 \#/\text{ft}$ ON THE TOP 4.21'.

SECT. 'C':

LOADS FOR MECH & ELECT. ATTACHMENTS = $84 \#/\text{ft}$ ($\approx 31.6 \#/\text{ft}$)



$$V_{1.83'} = 3025.2 - 168 \times 1.83 = 2717.8 \#$$

$$M_{1.83'} = 3025.2 \times 1.83 - .5 \times 168 \times 1.83^2 - 16900.1 = -11645.3 \#/\text{ft} \approx -11.6 \text{ K} \quad \text{OK} \checkmark$$

WHICH IS LESS THAN 12.68 K' ACCORDING TO SH 4 OF 11 OF CALCULATIONS DONE ON 3/15/84, (COPY ATTACHED). THEREFORE CONC. BLOCK WALL IS OK.

BY A. LEON DATE 9/29/84
 CHKD. BY LP=L DATE 10-2-84
 CLIENT LP=L
 PROJECT WATERFORD #3
 SUBJECT CONC. BLOCK WALLS - WALL H-2.

SHEET 5 OF 12
 DEPT. 653
 OFS NO. _____

$$\underline{U} = 2713 / 16 \times .85 \times 9 = \underline{22.7} < 25 \text{ psi}$$

OK ✓

CONC. CURB : $M = 16.9 \text{ k}$, $V = 3.1 \text{ k}$ $b = 2.67'$ $d = 10''$ $j = .85$
 A_s PROVIDED IS #6 @ 12", FOR $b = 2.67'$ THERE IS AT
 LEAST $3\#6 = 1.32 \text{ in}^2$

$$\underline{A_s} = 16.9 \times 12 / 24 \times 10 \times .85 = .99 \text{ in}^2 < 1.32$$

OK ✓

RESISTING MOMENT FOR THE CONC. SECTION :

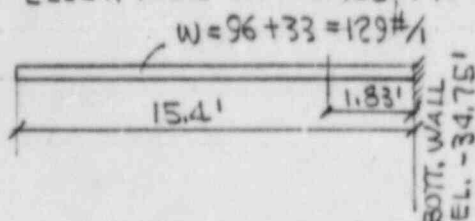
FOR $f'_c = 4 \text{ KSI}$, $f_y = 60 \text{ KSI}$, $f_c = 1.8 \text{ KSI}$, $f_s = 24 \text{ KSI}$, $n = 8$, $K = 295 \text{ psi}$

$$\underline{M_{RES.}} = K b d^2 = 295 \times (2.67 \times 12) \times 10^2 / 12 = \underline{78.8 \text{ k}}$$

THEREFORE THE CONC. CURB IS OK.

SECT 'A'

LOADS FOR MECH. & ELECT. ATTACHMENTS: ACCORDING TO MECH. & ELECT. FIELD SKETCHES, THE LOADS DUE TO ATTACH. ARE VERY SMALL. CONSERVATIVELY



ASSUME $10\#/\text{ft}$. $W = 10 \times 3.33 = 33 \text{ #/ft}$ (VERT.)

$$R = 129 \times 15.4 = 1986.6 \text{ #}$$

$$M = .5 \times 129 \times 15.4^2 = 15296.8 \text{ #'} \approx 15.3 \text{ k}$$

$$V_{1.83} = 1986.6 - 129 \times 1.83 = 1750.5 \text{ #} \approx 1.8 \text{ k}$$

$$M_{1.83} = 1986.6 \times 1.83 - .5 \times 129 \times 1.83^2 = 15296.8 - 11877.3 \text{ #'} \approx 11.9 \text{ k}$$

WHICH IS LESS THAN 12.7 k ACCORDING TO SH 4 OF 11 OF CALCULATIONS DONE ON 3/15/84 (COPY ATTACHED). THEREFORE CONC. BLOCK WALL IS OK.

$$\underline{U} = 1751 / 16 \times .85 \times 9 = \underline{14.3 \text{ psi}} < 25 \text{ psi}$$

OK ✓

CONC. CURB DOES NOT REQUIRED TO BE CHECKED BECAUSE MOMENT AND SHEAR ARE LESS THAN THE ONES USED TO CHECK CONC. CURB FOR SECT. 'C'.

BY SURKMANIAN DATE 9-26-84

SHEET 6 OF 12

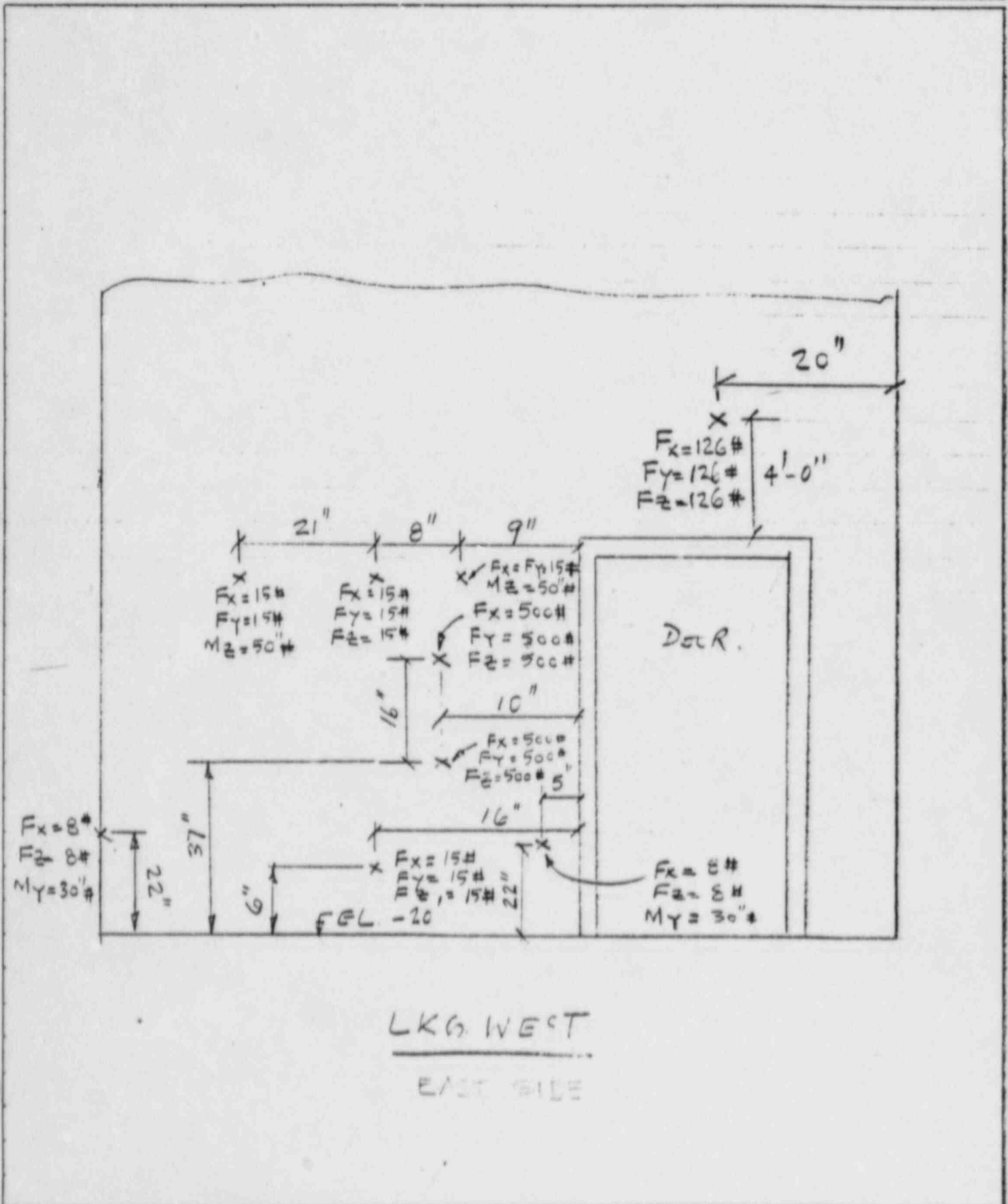
CHKD. BY _____ DATE _____

DEPT. ESS
OFS NO. LCU-1564 NO. _____

CLIENT L.P. & L

PROJECT WATERFORD SES UNIT 3

SUBJECT S/K LOADS ON BLACKWALL (H.2)



LKG WEST

EAST SIDE

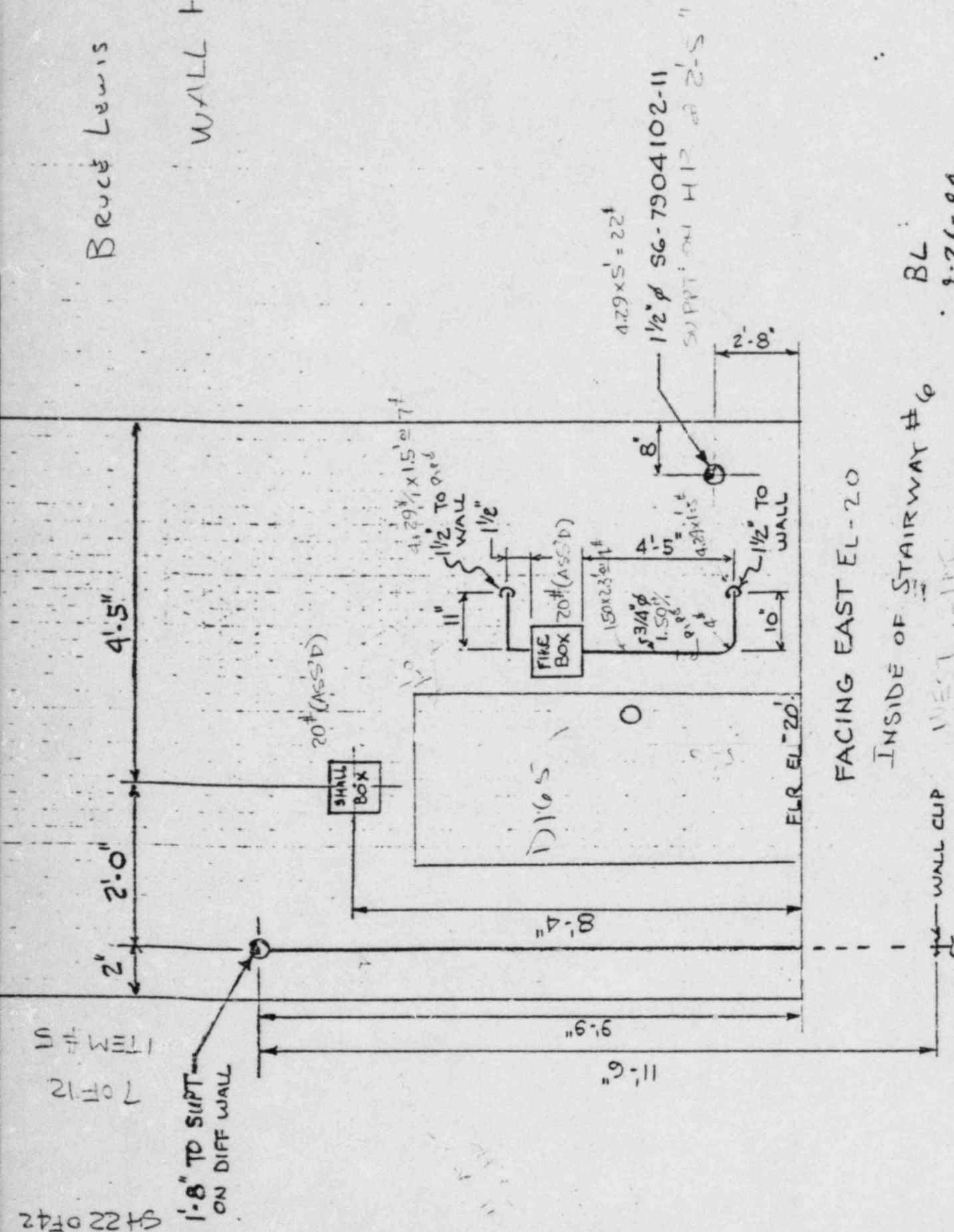
WALL HZ

BL
9-26-89

FACING EAST EL-20

INSIDE OF STAIRWAY #6

the wall clip



ITEM # 5
8 OF 12

4.29 x 2 = 13' #

8" (ASST)

2'-8" (ASST)

6" (6" LG)

B22

2'-10"

3/4" FLEX

2'-6"

3/4" FLEX

2'-10"

2'-8" (ASST)

2'-0"

1.50 x 9' - 14" #

3/4" LRG (WD N/S) (5'-6 TO SUPP)

20" (ASST)

Exit

2 PRESS SWIS MTC ON PIPING LINE

8'-4" (ASST)

E1-20

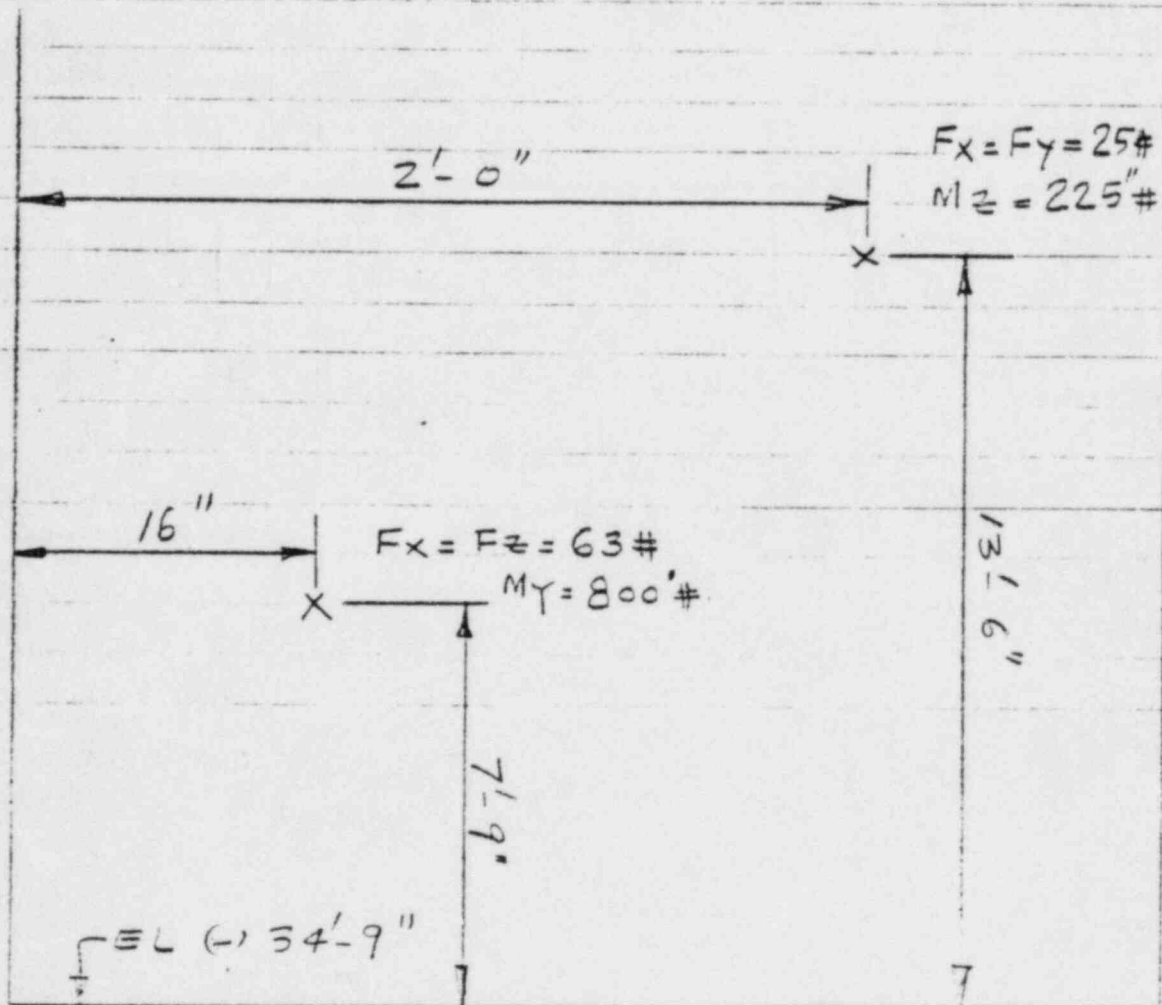
H2 Wall Looking West

BY TH DATE 10-1-84
 CHKD. BY DM DATE 10-1-84

SHEET 9 OF 12
 OFS NO. L00-1564 DEPT. ESSE
 NO. ESSE

CLIENT L. P. & L

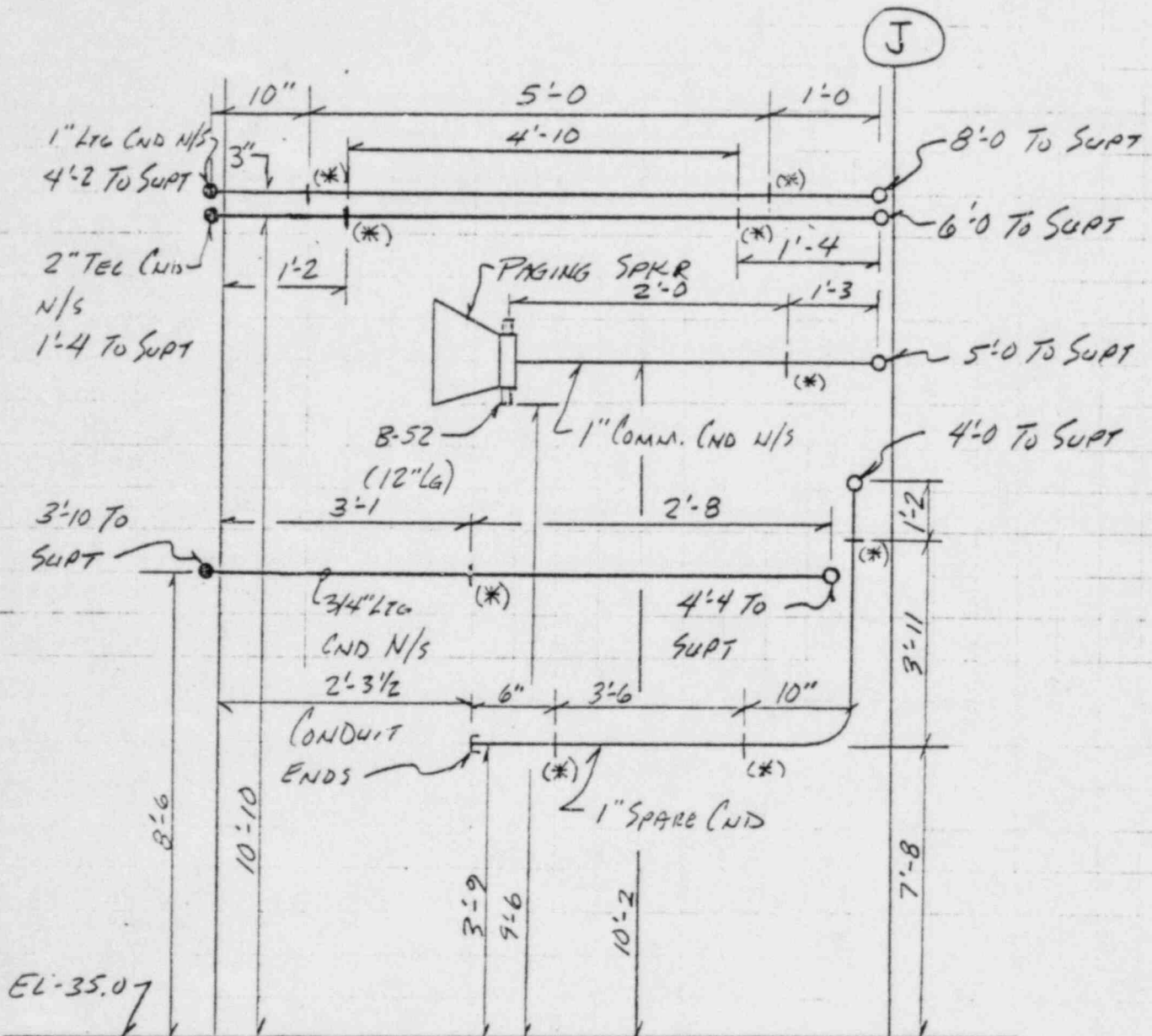
PROJECT WATERFORD SES UNIT 3 ITEM # 5
 SUBJECT BLOCK WALL (H-2) (PIPE SUPPORT) LEADS



ELE. LKG WEST

BY TL ROBINSON DATE 10-1-84SHEET 10 OF 12

CHKD. BY _____ DATE _____

OFS NO. _____ DEPT. EE NO. 10005CLIENT CP&CPROJECT WATERFORD SES #3SUBJECT CONC. BLOCK WALL (H2 WALL @ EL-35.0)ITEM 5H2 WALL @ EL-35.0 LOOKING WEST

* = CONDUIT STRAP B-288 SH 20

BY TL ROBINSON DATE 10/2/04

SHEET 11 OF 12

CHKD. BY _____ DATE _____

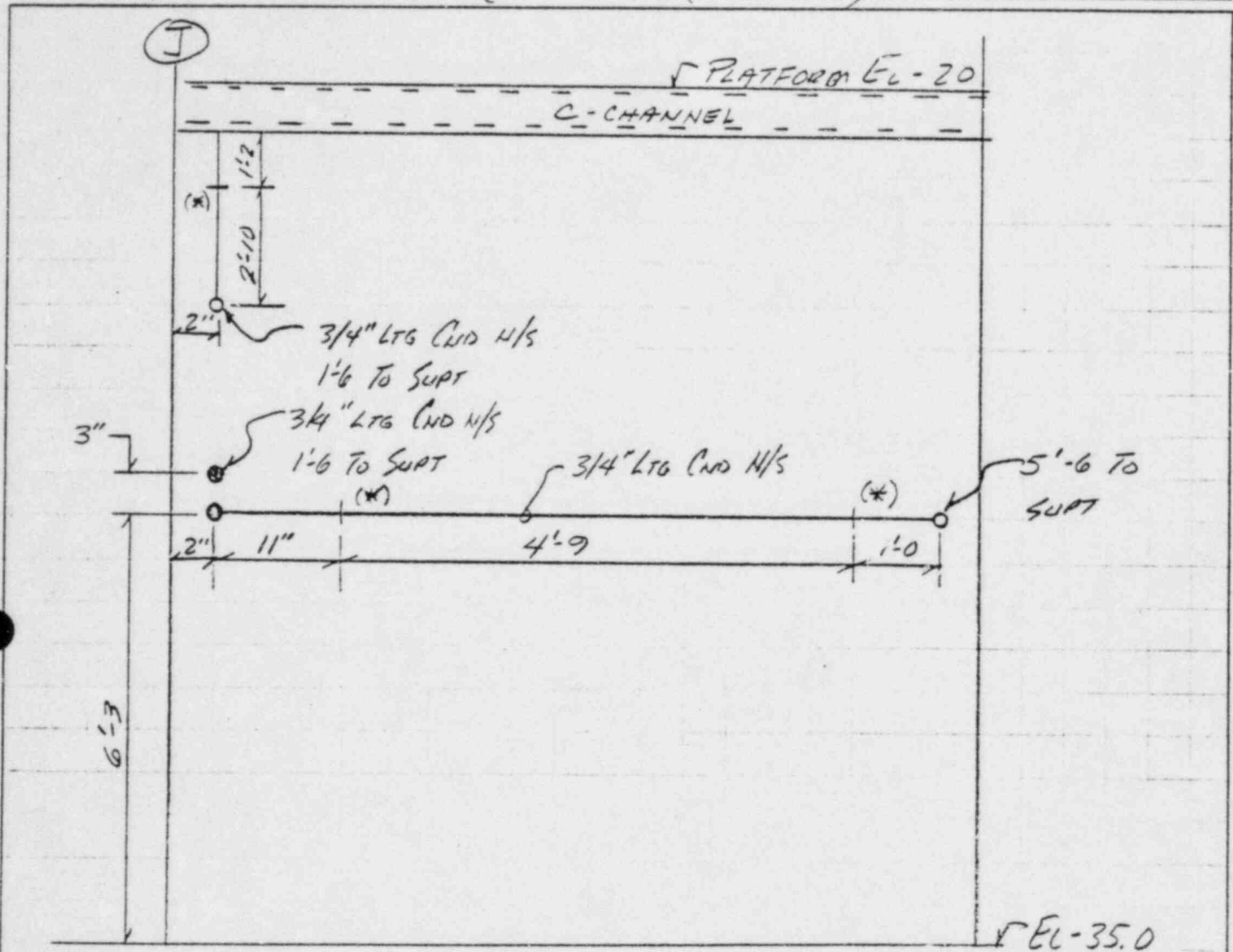
OFS NO. _____ NO. 105

CLIENT CPSC

PROJECT WATERFORD SEC 2

SUBJECT DRUG BLOCK WARE (H2 WARE @ 62-35)

ITEM #5



H2 Wall @ EL-35.0 Looking East

EBASCO SERVICES INCORPORATED

SH 270F42

BY B. LEWIS DATE 10-1-84SHEET 12 OF 12

CHKD. BY _____ DATE _____

OFS NO. _____ DEPT. NO. 8888CLIENT LP&LPROJECT WATERFORD #3SUBJECT I & C ATTACHMENTSWALL H-2ITEM #5

THERE ARE NO I & C INST.'S, INST LINES, OR SUPPORTS
ATTACHED TO WALL H-2, ELEV -34.75' TO -13.38'

BY G WU DATE 9/27/84

SHEET 1 OF 7

CHKD. BY K. K. K. DATE 9/29/84

DEPT. 653

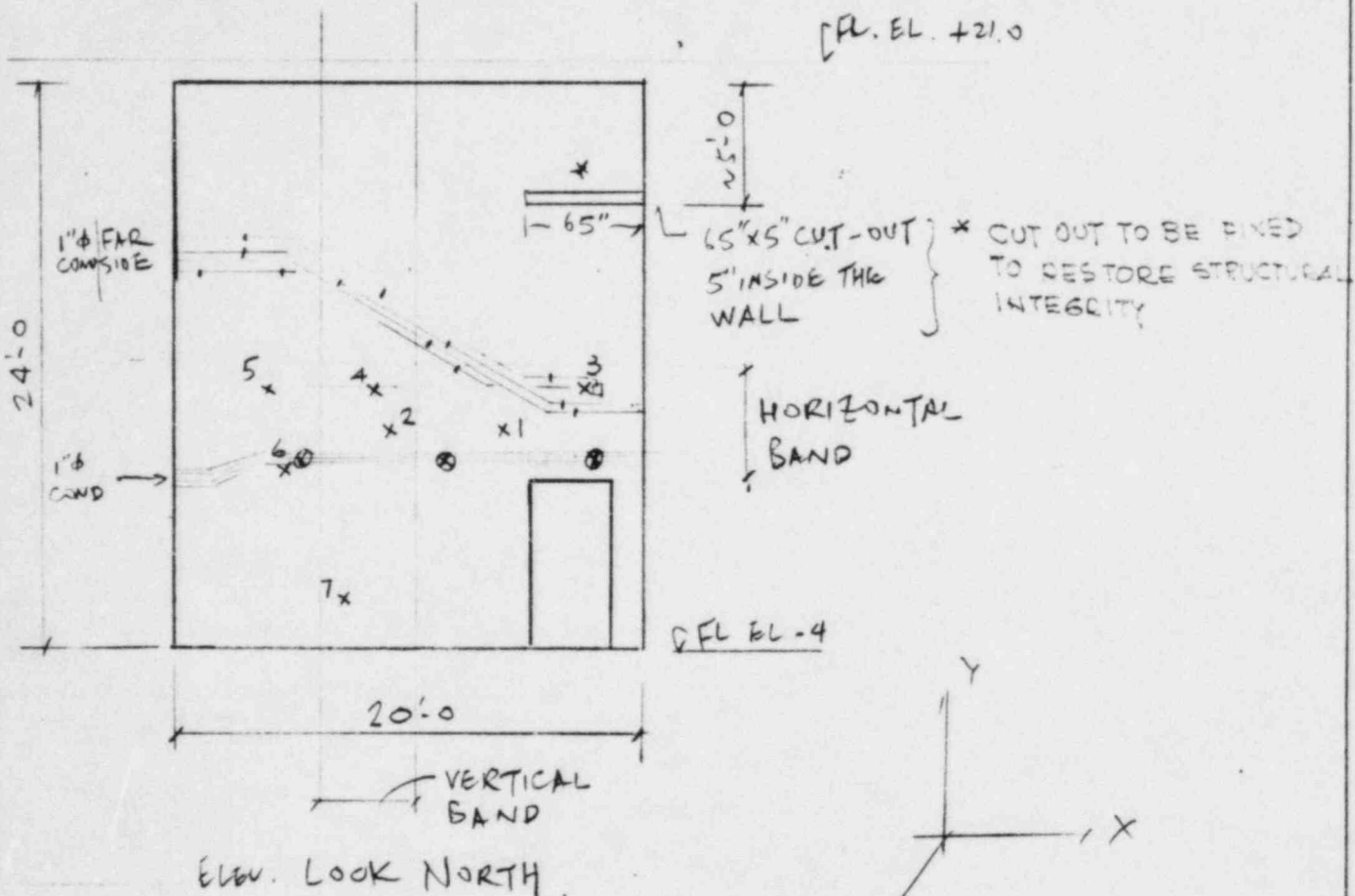
CLIENT LP & L

PROJECT WATERFORD S.E.S. #3

SUBJECT CONCRETE MASONRY WALL H 13

ITEM # 5

REF: DWG. G760502



FOR MECH. & ELECT. LOADS, SEE SH5, 6 & 7 OF 7.

THE PIPING AND ELECTRICAL COND LOADS ARE CONCENTRATED IN THE TWO BANDS OF WALL.

THE CONDUITS SUPPORTED BY THE WALL ARE GENERALLY 1" φ CONDUIT WEIGHS 2.33 LB/FT ITS EFFECT ON THE WALL IS MINIMUM.

P 2. $F_y = 75^{\#}$, $M_x = 2400^{\#}$

P 4. $F_y = 18^{\#} = F_z$, $M_x = 324^{\#}$

P 7. $F_x = F_y = F_z = 126^{\#}$

P 1. $F_y = 100^{\#}$, $M_x = 3200^{\#}$

P 3. $F_y = F_z = 18^{\#}$, $M_x = 324^{\#}$

P 5. $F_y = F_z = 18^{\#}$, $M_x = 324^{\#}$

P 6. $F_y = 63^{\#}$, $M_x = 2000^{\#}$

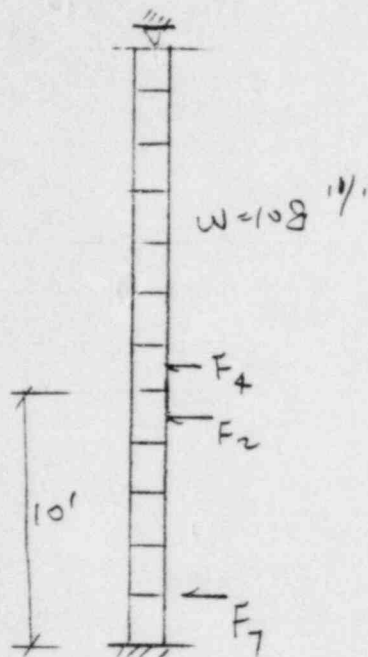
BY G.W.J. DATE 9/27/84
 CHKD. BY W.J. DATE 9/29/84
 CLIENT LP & L

 SHEET 2 OF 7
 DEPT. 653
 OFS NO. _____

 PROJECT WATERFORD S.E.S. #3
 SUBJECT CONCRETE BLOCK WALL H13

ITEM #5

① CHECK WALL AS A 48" WIDE VERTICAL STRIP.



$$D.L. \quad W = \frac{2 \times 60 + 150}{3} = 90 \text{ lb/ft}$$

$$\frac{\times 4}{360} \text{ lb/ft}$$

$$\text{SEISMIC LOAD } W = .3 \times 360 = 108 \text{ lb/ft}$$

F_7 IS SO CLOSE TO THE FIXED END ITS EFFECT ON THE BEAM IS NEGLECTIBLE.

CONSIDER F_2 & F_4 ACT ON THE SAME POINT WITH A FORCE $= F_2 + F_4$

$$M_{2,4} = M_{x2} + M_{x4} = 2400 + 324 = 2724 \text{ ft-lb}$$

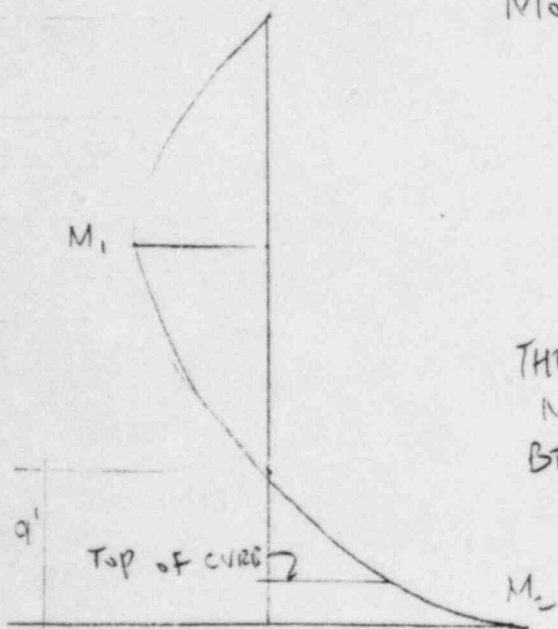
MOMENT DUE TO D.L.

$$M_1 = \frac{q}{128} w l^2 = \frac{q}{128} (108)(24)^2 = 4374 \text{ ft-lb}$$

$$= 52,488 \text{ in-lb}$$

$$M_2 = \frac{w l^2}{8} = \frac{1}{8} (108)(24)^2 = 7776 \text{ ft-lb}$$

$$= 93,312 \text{ in-lb}$$


 M-DIAG
 V.L.

THE PIPING LOAD ACTS NEAR THE ZERO MOMENT ZONE ON THE BEAM WILL BE ADDED TO THE END.

$$M = \frac{M_{1,4}}{2} \left(\frac{3 \times 14^2}{24^2} - 1 \right) = 0.01 \quad M_{1,4} = 27.24 \text{ ft-lb}$$

HOWEVER @ M_1 , THE MOMENT DUE TO $M_{2,4}$ IS ABOUT $\frac{1}{4} (2724) = 680 \text{ ft-lb}$

BY E. Wu DATE 9/27/84SHEET 3 OF 7CHKD. BY [Signature] DATE 9-28-84OFS NO. _____ DEPT. NO. 653CLIENT LP & LPROJECT WATERFORD S.E.S. #2SUBJECT CONCRETE BLOCK WALL H13ITEM # 5

$$M_1 = 52,488 + 6P_0 = 53,680 \text{ "H}$$

$$\text{SAY } M_1 = 53,700 \text{ "H}$$

$$\underline{\underline{A_s}} = \frac{M}{f_y j d} = \frac{53700}{24000 \times 9} = 0.28 \text{ "H} < 0.88 \text{ "H}$$

(2 #6) O.K.

$$M_2 = 93,312 \text{ "H}$$

$$\text{SAY } M_2 = 94,000 \text{ "H}$$

$$\underline{\underline{A_s}} = \frac{M}{f_y j d} = \frac{94000}{24000 \times 9} = 0.49 \text{ "H} < 0.88 \text{ "H}$$

O.K.

REACTION AT BOTTOM

$$R = \frac{5}{8} w l = \frac{5}{8} (108)(24) = 1620 \text{ lb}$$

CHECK SHEAR SAY $R = 2000 \text{ #}$

$$\underline{\underline{v}} = \frac{R}{b d} = \frac{2000}{48 \times 9} = \underline{\underline{4.6 \text{ psi}}} < 28 \text{ psi}$$

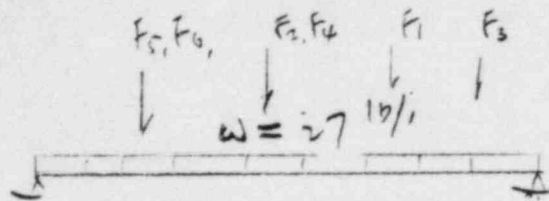
O.K.

BY G. Wu DATE 9/27/84SHEET 4 OF 7CHKD. BY LP & L DATE 9/27/84OFS NO. DEPT. 653CLIENT LP & LPROJECT WATERFORD S.E.S. #2SUBJECT CONCRETE MASONRY WALL H13ITEM # 5

⊖ CHECK WALL WITH A HORIZONTAL STRIP CONSISTS OF 4 COURSES. WIDTH = $4 \times 8 = 32"$ AND ASSUME IT IS SIMPLY-SUPPORTED AT ENDS

$$D.L. W = 90 \text{ lb/ft}$$

$$W = 0.3 \times 90 = 27 \text{ lb/ft}$$



LOADING FROM F_1 THRU F_6 ARE F_2 'S

F_y & M_x ARE NOT IN EFFECT.

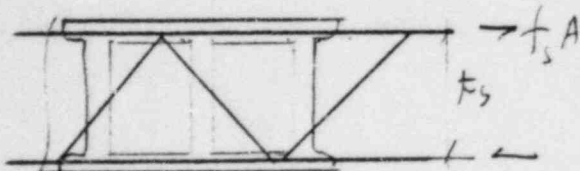
THE ONLY F_2 'S ARE $F_{23} = F_{25} = 18^{\#}$, VERY SMALL.

MOMENT DUE TO D.L.

$$M_+ = \frac{1}{8} W L^2 = \frac{1}{8} (27)(19)^2 = 1218^{\#} = 74,620 \text{ " }^{\#}$$

$$\text{SAY } M_+ = 15,000 \text{ " }^{\#}$$

THIS MOMENT WILL BE RESISTED BY THE DUR-O-WALL TRUSS. $\phi = 3/16"$, $A = \frac{\pi}{4} (\phi)^2 = .028 \text{ " }^2$



STRESS ON 2 DUR-O-WALL OVER 4 COURSES

$$f = \frac{M}{2 A t_c} = \frac{15,000 \text{ " }^{\#}}{2 \times 10 \times 2} = 26,800 \text{ psi}$$

$$< .6 F_y = .6 \times 65 = 39 \text{ KSI} \quad \checkmark$$

OK.

BY SUFK DATE 9-26-84

SHEET 5 OF 7

CHKD. BY _____ DATE _____

OFS NO. L.C.U.-1564 DEPT. NO. ESSE

CLIENT _____

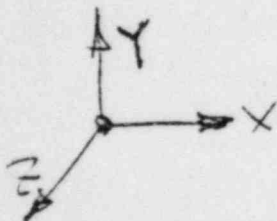
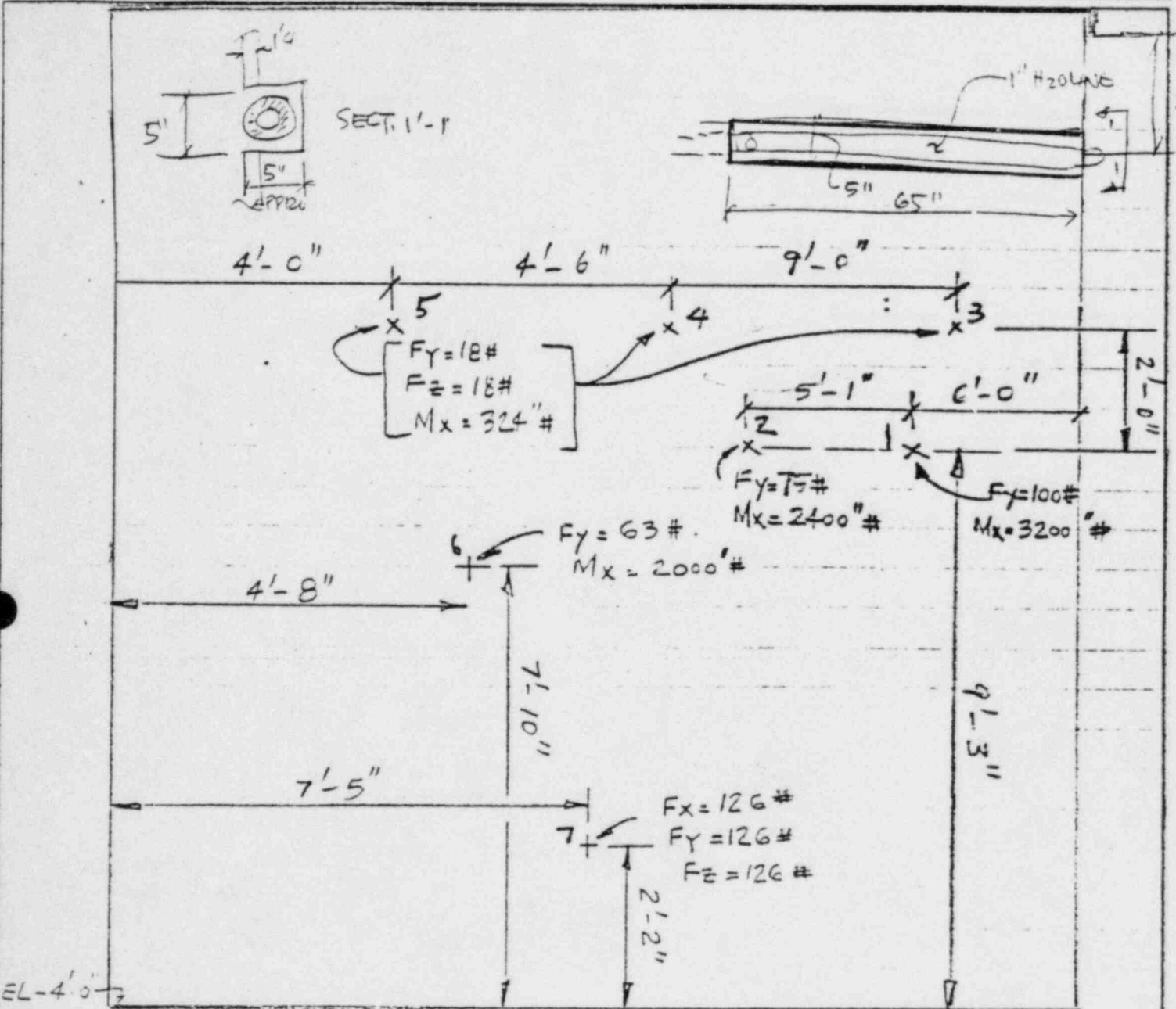
L.P. & L.

PROJECT _____

WATERFORD SES UNIT 3

SUBJECT _____

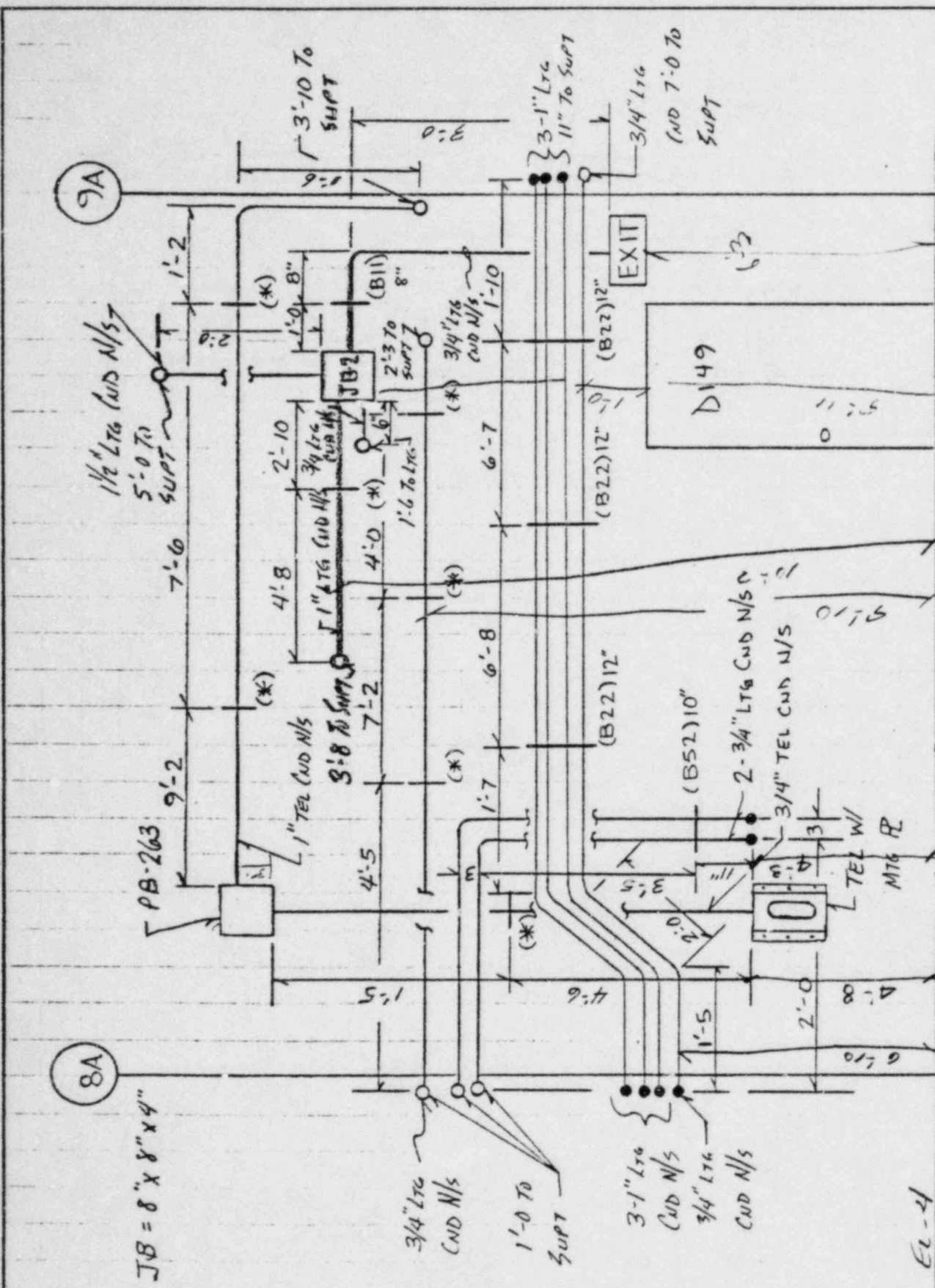
S/R LOADS ON BLOCK WALL (H-13) ITEM#5



ELE. LKG NORTH

Wall H13 View Looking North

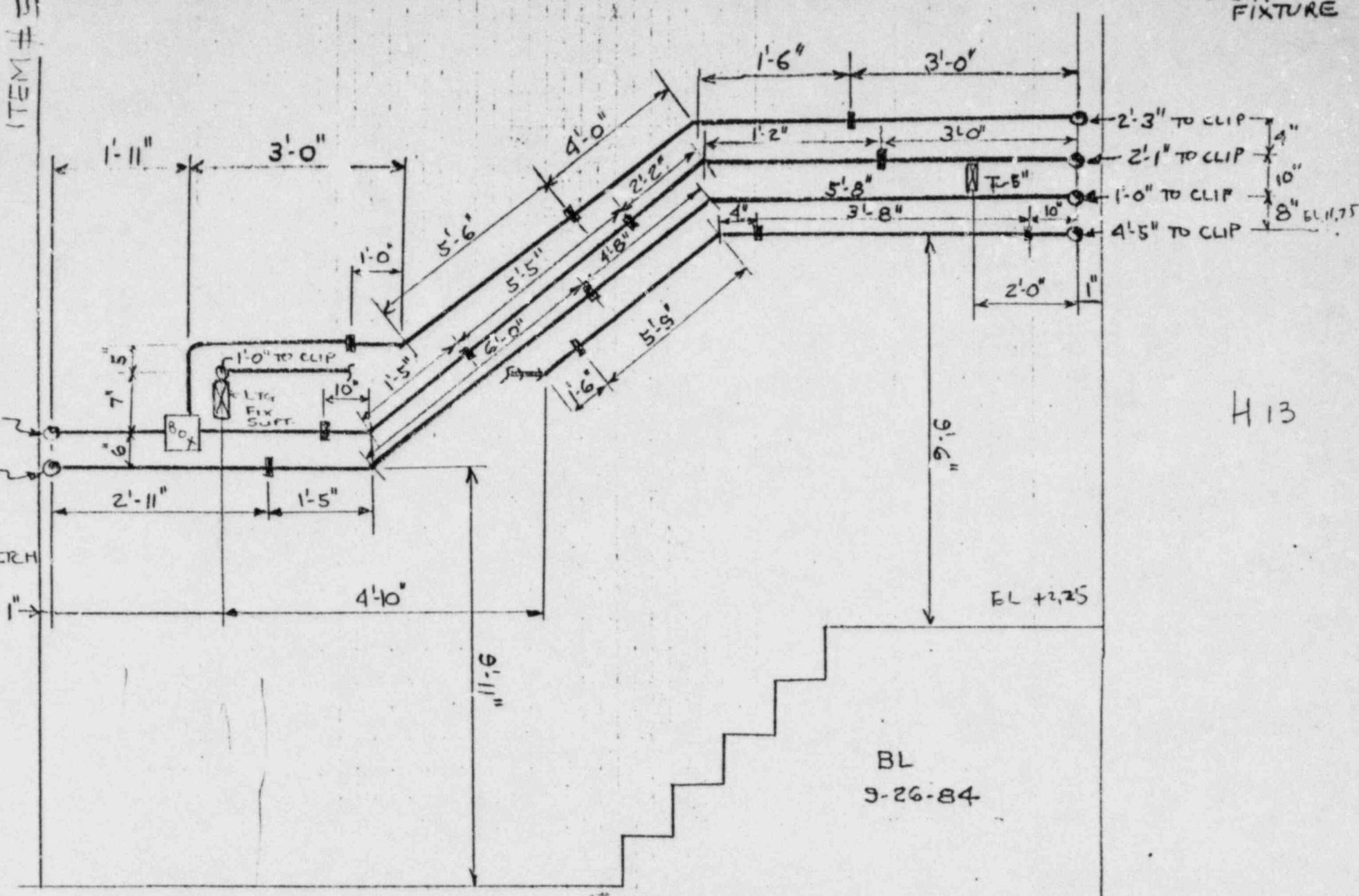
* 3/4" CONDUIT CLAMP
W/ SPACER



⊞ = SUPT FOR LIGHT FIXTURE

SH 340F42
7 OF 7
ITEM # 5

CONT ON OTHER SKETCH



H13

BL
9-26-84

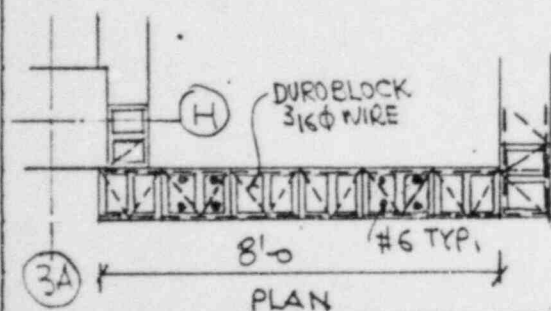
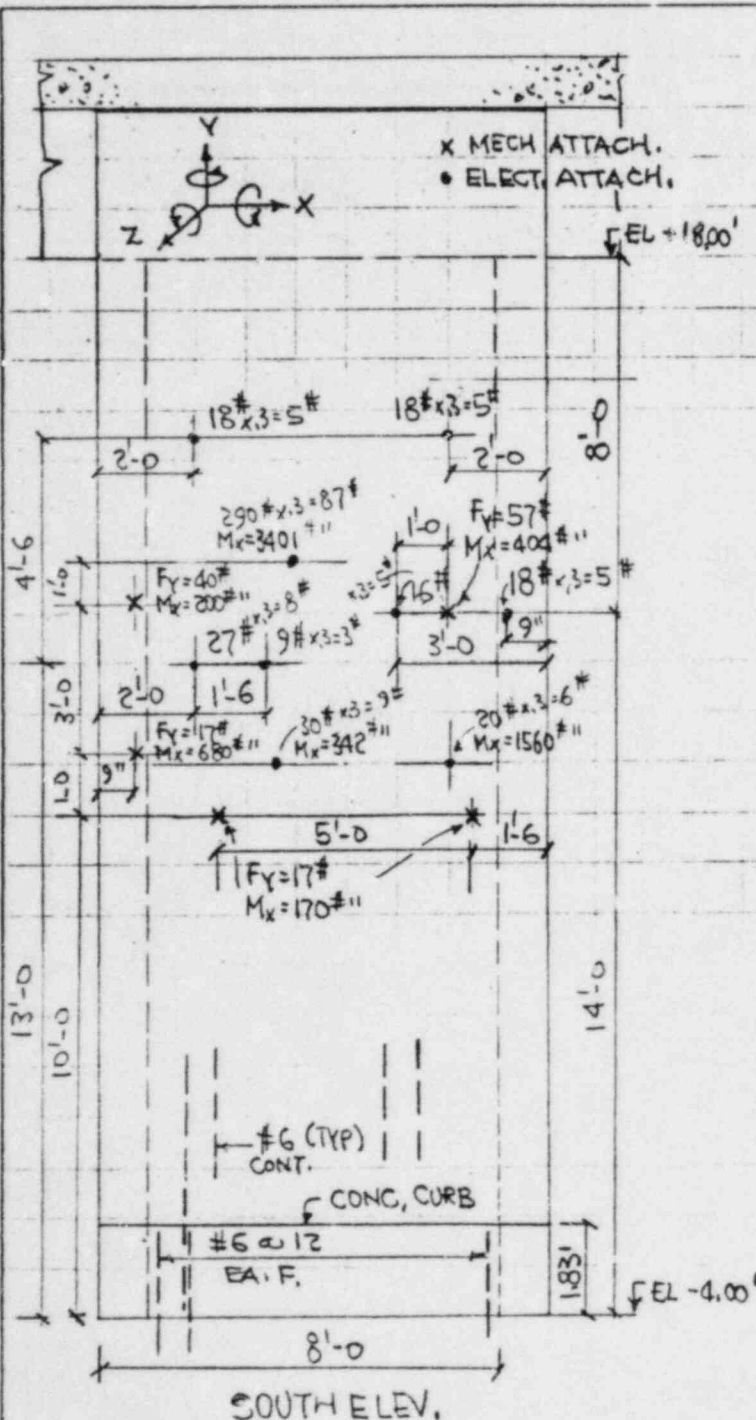
FLR ELEV. (-) 4'-0" FACING So.
INSIDE STAIRWELL

BY A. LEON DATE 9/30/84
 CHKD. BY K. Shee DATE 10-4-84
 CLIENT LP & L
 PROJECT WATERFORD #3
 SUBJECT CONC. BLOCK WALLS - W29

SHEET 1 OF 8
 DEPT. 653
 NO. 653

OFS NO. _____

ITEM #5



1. REFERENCES:

1.1 DWG. G-760502

1.2 FIELD SKETCHES FROM MECH, 9/26/84
ELECT. 9/28/84

1.3 CALCULATIONS DONE ON 3/15/84

CASE A - CHECK REINF.
 WITHOUT AXIAL LOAD.
 CASE B - CHECK COMP.
 STRESS OF MASONRY WITH
 AXIAL LOAD.

2. CRITERIA:

2.1 WALL W29 IS EVALUATED AS
FIXED AT EL -4.00' & SIMPLE
SUPPORTED AT EL +18.00'2.2 THE CRITICAL LOADS ARE F_z & M_x
FOR MECH. LOADS AND F_y & M_x
FOR ELECT. & OWN WGT LOADS.2.3 THE DUREBLOCK (TRUSS) REDISTRIBUTES
THE LOADS ON THE WHOLE WIDTH OF
THE WALL.2.4 IF WALL IS NOT STRUCT. ABQ, VERIFY WITH
PLATE ACTION OF WALL

3. LOADS:

3.1 OWN WGT: $b = 48"$

$$W = 1.33' \times 150 + 2.67' \times 60 = 360 \#/\text{VERT.}$$

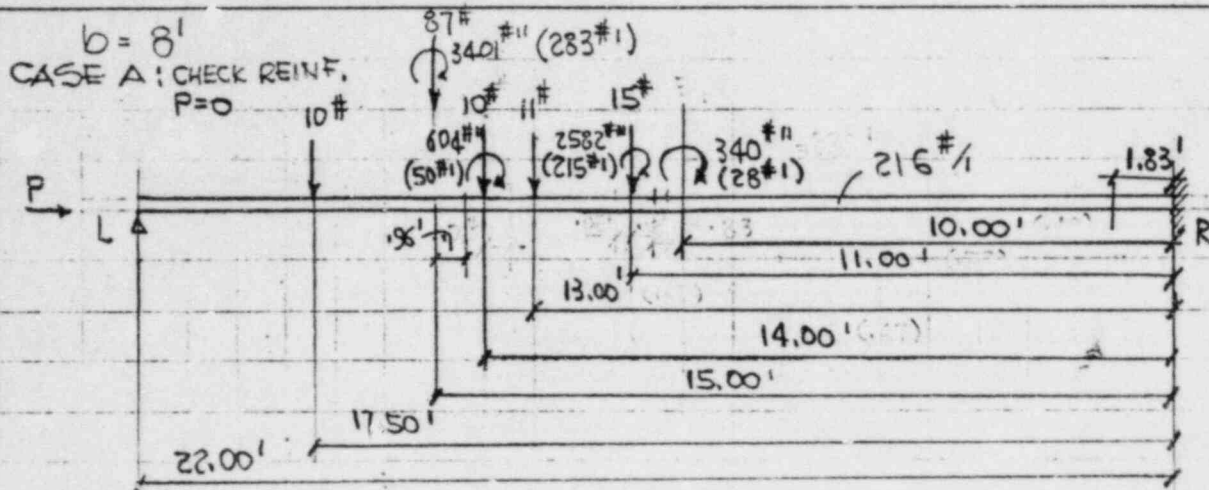
$$\text{HORIZ. COMP} = 360 \times .3 = 108 \#/\text{VERT.}$$

3.2 MECH & ELECT: FROM FIELD SKETCH
ELECT. LOADS WHEN ATTACHED WITH
ANCHOR BARS GENERATES FIXITY AT THE
WALL AND THEREFORE IS A MOMENT
THAT FOR EARTHQUAKE WILL BE
AFFECTED BY 1.3g.

3.3. EARTHQUAKE FACTOR = 1.3g.

BY A. LEON DATE 10/1/84SHEET 2 OF 8CHKD. BY K. Shih DATE 10-1-84

OFS NO. _____

DEPT. NO. 653CLIENT LP&LPROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS - W29ITEM # 5

1782.0	$M_R = 1817.3 \times 22.0 - .5 \times 216 \times 22^2$	2970.0
7.0	$- 10 \times 17.50 - 87 \times 15.0 - 10 \times 14.0$	3.0
46.9	$- 11 \times 13 - 15 \times 11 + 283$	40.1
4.8	$+ 50 + 215 + 28$	5.2
4.6	$= -13643.4 \#1 \approx -13.6 \text{ K}$	6.4
4.7		10.3
- 17.4		+ 17.4
- 3.0	$M_{1.83} = 1817.3 \times 7.96 - .5 \times 216 \times 7.96^2$	+ 3.0
- 11.0	$- 10 \times 3.46 - 87 \times 3.96 + 283$	+ 11.0
- 1.3	$= 7787.5 \#1 \approx 7.8 \text{ K}$	+ 1.3
$R = 1817.3 \approx 1.8 \text{ K}$		$3067.7 \approx 3.1$

$$M_{1.83} = 3067.7 \times 1.83 - .5 \times 216 \times 1.83^2 - 13643.4$$

$$= -8391.2 \#1 \approx -8.4 \text{ K}$$

$$V_{1.83} = 3067.7 - 216 \times 1.83$$

$$= 2672.4 \# \approx 2.7 \text{ K}$$

THEREFORE MAX. MOM. FOR THE BLOCK WALL = -8.4 K FOR $b = 96''$
 ACCORDING TO SH 4 OF 11 OF CALCULATIONS DONE ON 3/15/84,
 (COPY ATTACHED), THE ALLOW. MOMENT FOR $48''$ IS 12.7 K
 AND FOR $96''$ IS $12.7 \times 2 = 25.4 \text{ K}$ WHICH IS LARGER THAN
 THE ACTUAL MOMENT THEREFORE CONC. BLOCK WALL IS OK. ✓

$$u = 2672.4 / 16 \times 2 \times 9 = 9.3 \text{ psi} < 20 \times 1.3 = 26 \text{ OK} \checkmark$$

CONC. CURB

$$M = 13.6 \text{ K} \quad V = 3.1 \text{ K} \quad b = 96'' \quad d = 10'' \quad j = .85 \quad A_s = \#6 @ 12 = 3.52 \text{ in}^2$$

$$A_s = 13.6 \times 12 / 24 \times 10 \times .85 = 1.80 \text{ in}^2 < 3.52 \text{ OK} \checkmark$$

BY A. LEON DATE 10/6/84
 CHKD. BY R. Shil DATE 10/6-84
 CLIENT LP&L
 PROJECT WATERFORD #3
 SUBJECT CONC. BLOCK WALLS - WALL W29 -

SHEET 3 OF 8
 DEPT. 653
 OFS NO. _____

ITEM #5

CASE B: CHECK MASONRY STRESS WITH P (AXIAL FORCE);

CHECKING OF WALL UNDER COMBINED BENDING & AXIAL LOAD:

1. VERTICAL FORCES ON FACE OF WALL (ELECT. ATTACHMENTS.)

$$F_y = 18 + 18 + 290 + 16 + 18 + 27 + 9 + 30 + 20 = 446 \#$$

$$F_{y \text{ SEISMIC}} = 446 \times (1 + .30) = 580 \# = .6 \text{ K}$$

2. VERTICAL FORCES @ ϕ OF WALL (MECH. ATTCH MTS.)

$$F_y = 40 + 57 + 17 + 17 + 17 = 148 \#$$

3. WGT OF WALL = $360 \# \times 2 \times (22.0' - 1.83') = 14522 \#$

$$F_{y \text{ SEISM}} = 14522 \times (1 + .30) = 18879 \#$$

$$\text{TOTAL } F_y @ \phi \text{ WALL} = 18879 + 148 = 19027 \# \approx 19.2 \text{ K}$$

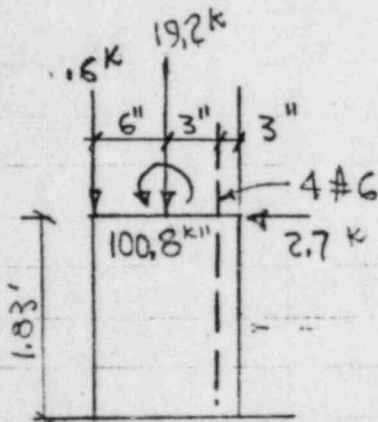
$$\text{FROM SH 2 OF 3, } M = 8.4 \text{ K'}, V = 2.7 \text{ K}$$

$$M = 8.4 \times 12 = 100.8 \text{ K''}$$

TAKING MOMENTS ABOUT ϕ OF REINFORCEMENT:

$$M_{\text{TOT.}} = 100.8 + .6 \times 9 + 18.1 \times 3 = 160.5 \text{ K''}$$

$$j = .83, F_s = 24 \text{ KSI, } d = 9, b = 32''$$

AREA OF $b = 96''$ SECTION:

$$A_{4 \text{ HOLLOW BLOCKS}} = 4 \times 12 \times 16 - [(16 - 1.25 \times 3) \times (12 - 1.25 \times 2)] = 302 \text{ in}^2$$

$$A_{2 \text{ SOLID BLOCKS}} = 2 \times 12 \times 16 = 384 \text{ in}^2$$

$$A_{\text{TOT.}} = 686 \text{ in}^2$$

$$f_{mP} = [(19.2 + .6) / 686] \times 1000 = 29 \text{ psi}; f_{mM} = (2 \times 160.5 / .502 \times .832 \times 32 \times 9^2) \times 1000 = 297 \text{ psi}$$

$$f_{m \text{ TOT.}} = 29 + 297 = 326 \text{ psi} < 223 \times 2.5 = 558 \text{ OK.}$$

FOR PROPERTIES & DESIGN PARAMETERS, SEE CALCULATIONS DONE ON 3/15/84 FOR CONC. BLOCK WALLS. (SH 4 OF 11, COPY ATTACHED).

CONCRETE CURB: $b = 96''$, $d = 9$, $j = .85$, $f'_c = 4 \text{ KSI}$, $f_s = 24 \text{ KSI}$

$$F_y @ \phi \text{ WALL} = 19.2 + .150 \times 1.83' \times 8' \times 1.0' = 21.4 \text{ K}$$

$$F_y @ \text{FACE} = .6 \text{ K}$$

$$M_{\text{TOT. @ BOTT. WALL}} = 100.8 + 2.7 \times 1.83 \times 12 = 160.1 \text{ K''}$$

$$M @ \text{REINF.} = 160.1 + .6 \times 9 + 21.4 \times 3 = 229.7 \text{ K''}$$

$$f_{cM} = (2 \times 229.7 / .375 \times .875 \times 96 \times 9^2) \times 1000 = 180 \text{ psi.}$$

$$f_{cP} = [(21.4 + .6) / 96 \times 12] \times 1000 = 19$$

$$f_{c \text{ TOT.}} = 19 + 180 = 199 \text{ psi} < .45 f'_c = 1800 \text{ OK.}$$

BY TL. ROBINSON DATE 9-28-84

SHEET 4 OF 8

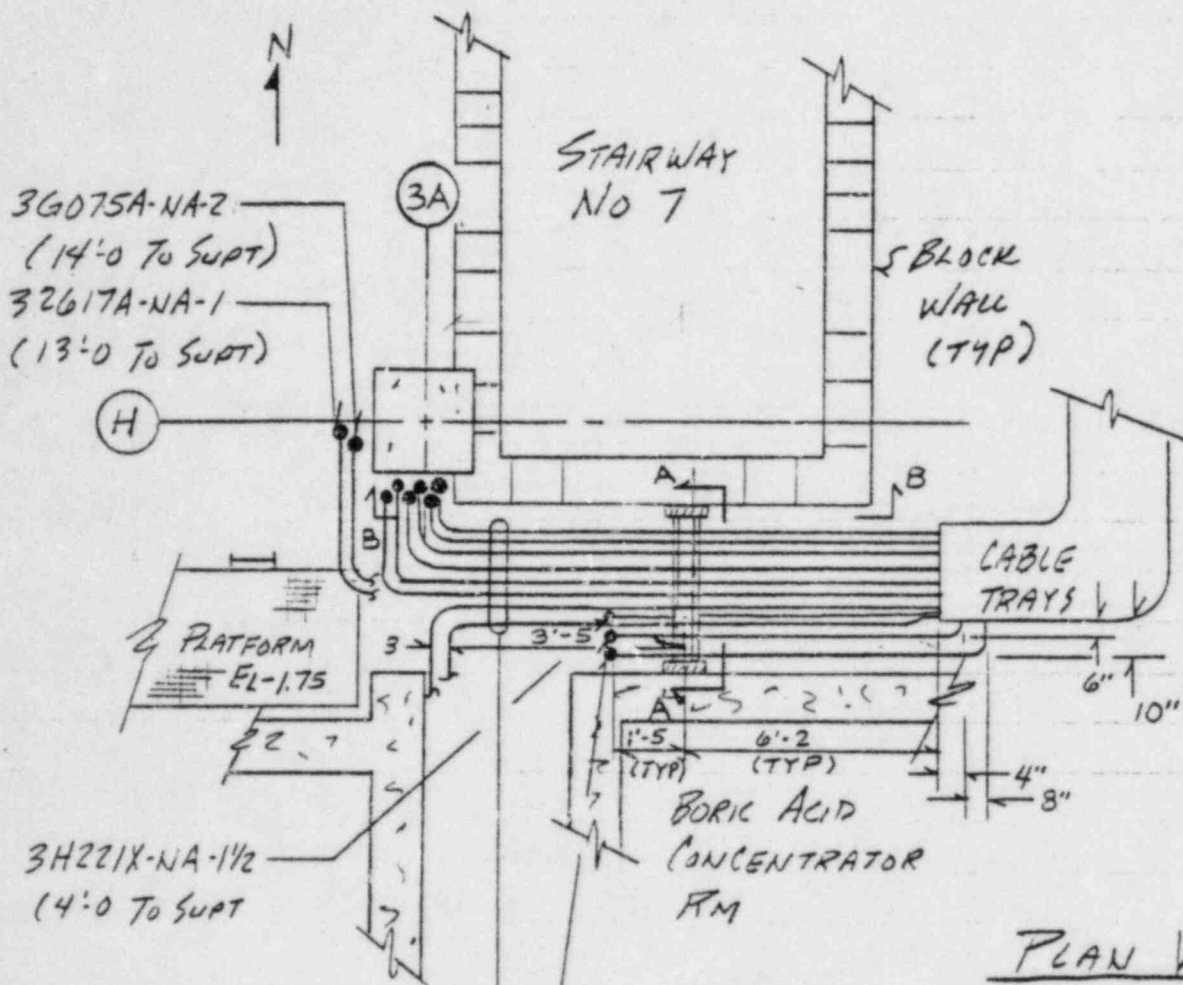
CHKD. BY _____ DATE _____

OFS NO. _____ DEPT. ENR NO. _____

CLIENT LP&L

PROJECT WATERFORD SES #3

SUBJECT CONDUITS ATTACHED TO BLOCK WALLS (W29) WALL W29 ITS #3



PLAN VIEW

TOP TO BOTTOM (N TO S)

- 30448C-NB-2 (3'-6" TO SUPT) @ LEFT HAND SIDE
- 30460C-NB-2 (3'-8" TO SUPT)
- 30448A-NA-2 (4'-0" TO SUPT)
- 30460A-NA-2 (4'-6" TO SUPT)
- 35168-NA-2 (5'-0" TO SUPT)
- 30317A-NA-2 (5'-6" TO SUPT)
- 30447V-NB-3 (7'-2" TO SUPT)
- 30446V-NB-3 (6'-5" TO SUPT)

TOP TO BOTTOM

- 30452Q-NA-1 (9'-0" TO SUPT)
- 30452P-NA-1 (8'-0" TO SUPT)

SH 39 OF 42

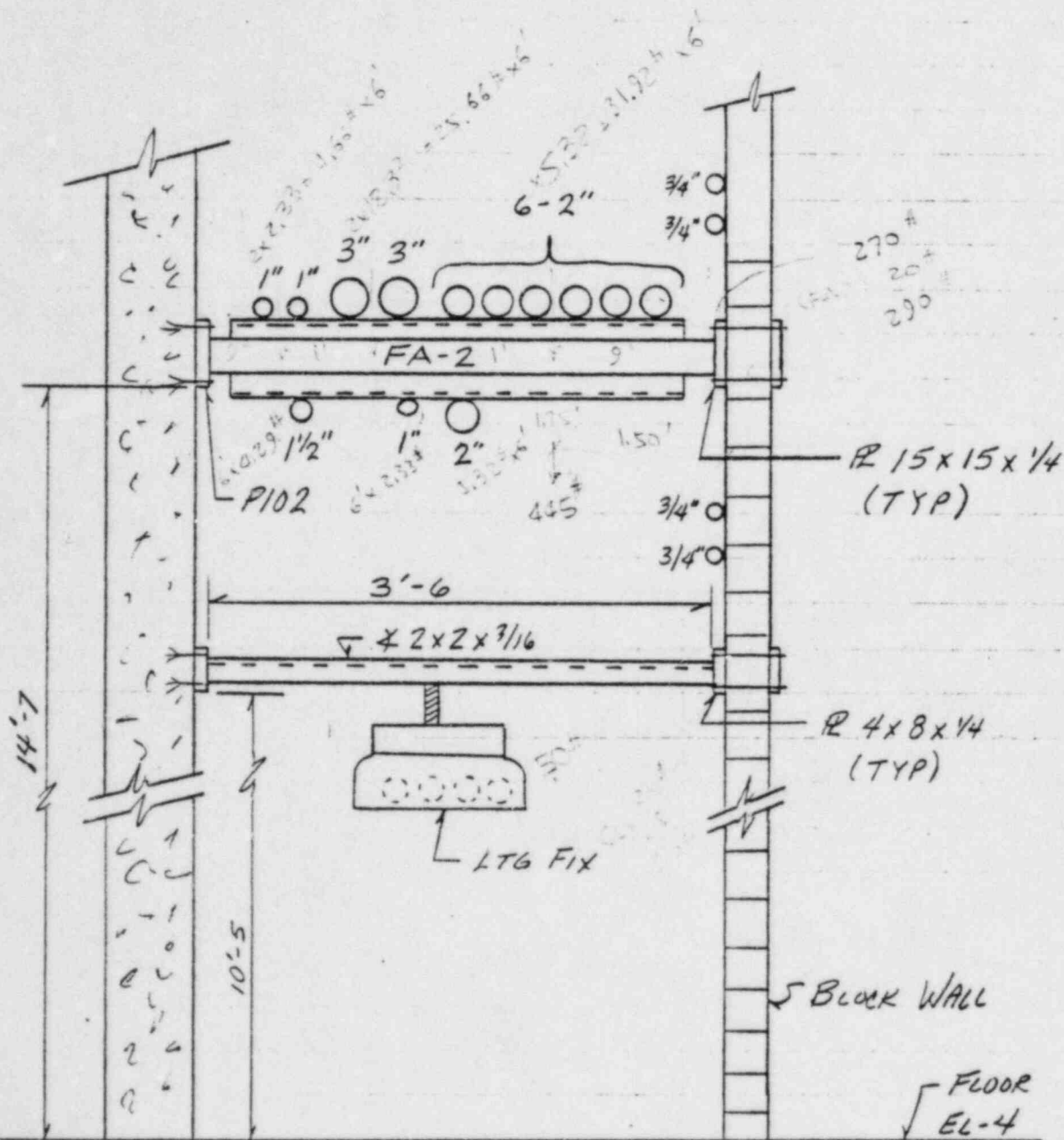
SHEET 5 OF 8

OFS NO. _____ NO. _____

SUBJECT CONDUITS ATTACHED TO BLOCK WALLS

WALL W30

72-5



SECTION "A-A"

BY T.L. ROBINSON DATE 9-28-84

SHEET 6 OF 8

CHKD. BY _____ DATE _____

OFS NO. _____ DEPT. NO. _____

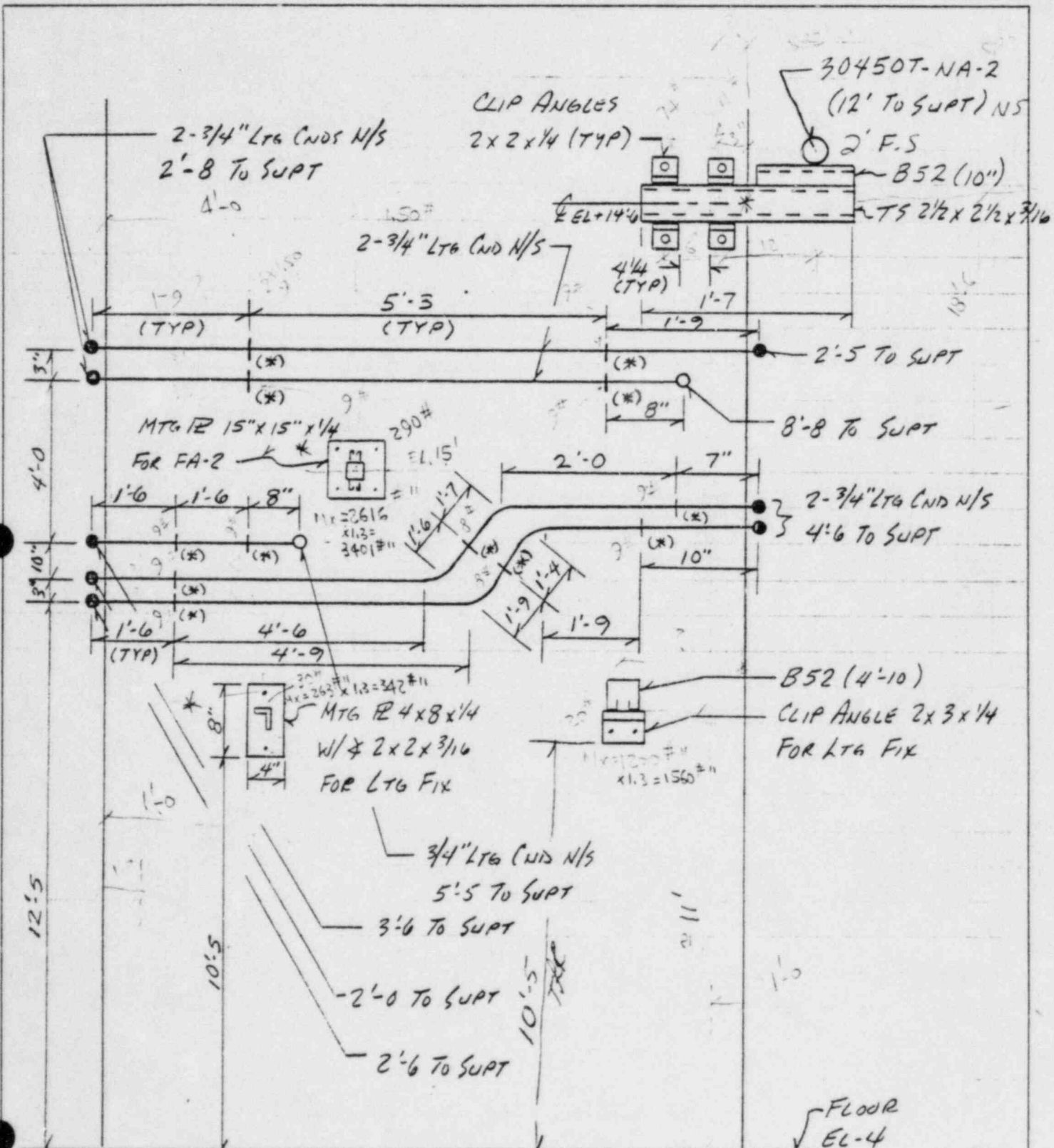
CLIENT CP&L

PROJECT WATERFORD SES #3

SUBJECT CONDUITS ATTACHED TO BLOCK WALLS

WALL W29

1'-11" #3



SECTION "B-B"

BY T.L. ROBINSON DATE 9-28-84SHEET 7 OF 8

CHKD. BY _____ DATE _____

OFS NO. _____ DEPT. NO. 1000CLIENT CP&LPROJECT WATERFORD SES #3SUBJECT CONDUITS ATTACHED TO BLOCK WALLSWALL W29ITEM # 330450T-NA-2
(12' TO SUPT)CLIP ANGLES
2x2x1/4 (TYP)2-3/4" LTR CND N/S
2'-8" TO SUPT

2-3/4" LTR CND N/S

EEL+14'6"

B52 (10")

TS 2 1/2 x 2 1/2 x 3/16

5'-3"
(TYP)

(TYP)

MTG PL 15" x 15" x 1/4

FOR FA-2

2'-5" TO SUPT

8'-8" TO SUPT

2-3/4" LTR CND N/S
4'-6" TO SUPT

B52 (4'-10")

CLIP ANGLE 2x3x1/4
FOR LTR FIXMTG PL 4x8x1/4
W/ 2x2x3/16
FOR LTR FIX3/4" LTR CND N/S
5'-5" TO SUPT

3'-6" TO SUPT

2'-0" TO SUPT

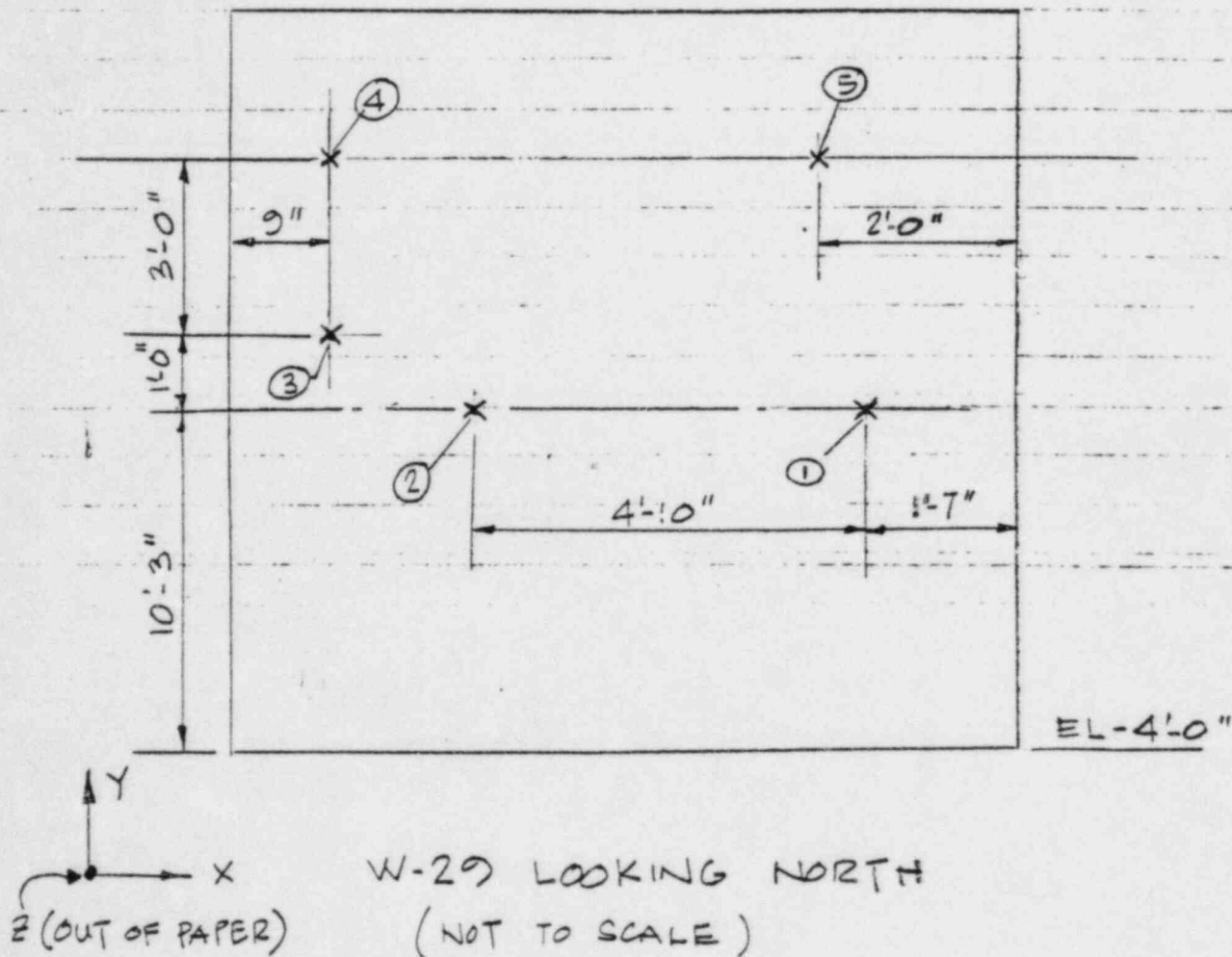
2'-6" TO SUPT

FLOOR
EL-4

SECTION "B-B"

BY GNN DATE 9-26-84SHEET 8 OF 8

CHKD. BY _____ DATE _____

OFS NO. LOU-1564 DEPT. NO. ESSECLIENT LP&LPROJECT WATERFORD #3SUBJECT PIPE SUPPORT LOADS. ON BLOCK WALL W-29ITEM #5

FORCES & MOMENTS ACTING ON THE FACE OF THE WALL

- ① $FY = 17 \#$ $MX = 170 \text{ IN-}\#$
- ② $FY = 17 \#$ $MX = 170 \text{ IN-}\#$
- ③ $FY = 17 \#$ $MX = 680 \text{ IN-}\#$
- ④ $FY = 40 \#$ $MX = 200 \text{ IN-}\#$
- ⑤ $FY = 57 \#$ $MX = 404 \text{ IN-}\#$

FOR HOLLOW MASONRY WITH NO INSPECTION THE MATERIAL PROPERTIES AND DESIGN PARAMETERS TO BE USED ARE:

$$E_s = 29 \times 10^6 \text{ psi}$$

$$f_s = 24000 \text{ psi [GRADE 60]}$$

$$E_m = 675000 \text{ psi}$$

$$f_m = 225 \text{ psi} \times 2.5 = 562.5 \text{ psi}$$

$$n = \frac{E_s}{E_m} = \frac{29 \times 10^6}{675000} = 43 \quad r = \frac{f_s}{f_m} = \frac{24000}{562.5} = 42.67$$

$$k = \frac{n}{n+r} = \frac{43}{43+42.67} = 0.502$$

$$j = 1 - \frac{k}{3} = 1 - \frac{0.502}{3} = 0.832$$

$$K = \frac{1}{2} f_m j k = \frac{1}{2} (562.5) (0.832) (0.502) = 117.5$$

$$M = K b d^2 \quad \text{OR} \quad M = A_s \cdot f_s \cdot j \cdot d$$

1) 12" CONC. BLOCK WALL REINFORCED AS SHOWN ON PAGE 3.

$$b = 16", \quad d = 9", \quad d' = 2\frac{5}{8}, \quad j = 0.832, \quad k = 0.502,$$

$$A_s = A'_s = 0.88 \text{ in}^2 \text{ (2-#6 EA. FACE)} \quad f_m = 562.5 \text{ psi}$$

ALLOWABLE MOMENT:

MASONRY COMP. CONTROLS

$$M = \frac{f_m}{2} k j b d^2$$

$$M = \frac{0.5625}{2} (0.502) (0.832) (16) (9)^2 = 152.2 \text{ K.in}$$

$$= 12.68 \text{ K.FT}$$

REINF. STEEL TENSION CONTROL

$$M = A_s \cdot f_s \cdot j \cdot d$$

$$M = 0.88 \times 24 \times 0.832 \times 9 = 158 \text{ K.in} = 13.18 \text{ K.FT}$$

USE

EBASCO SERVICES INCORPORATED

BY D. MERLINSKY DATE 10-8-84 FOR REFERENCESHEET 1 OF 2CHKD. BY SUBRAMANIAM DATE 10-8-84 ONLYOFS NO. LOW. 1564 DEPT. NO. ESSE

CLIENT _____

PROJECT _____

SUBJECT _____

LP & L
WATERFORD #3ITEM #5FPL'S DUE TO PIPE SUPPORTS ON CONCRETE BLOCK WALLS.

FOOTPRINT LOADS ON CONCRETE BLOCK WALLS WERE COMPUTED USING FOLLOWING CONSIDERATIONS AND ASSUMPTIONS:

- 1). ALL PIPES WERE ASSUMED TO BE SCHEDULE 80 FILLED WITH WATER.
- 2). MAXIMUM SPANS AS RECOMMENDED BY THE CODE WERE ASSUMED
- 3). LATERAL LOADS, WHERE APPLICABLE, WERE ASSUMED TO BE OF THE SAME MAGNITUDE AS DEAD WEIGHT LOAD. (UNLESS OTHERWISE NOTED)
- 4). WHERE PIPE WAS EMBEDDED INTO THE WALL, MOMENTS INDUCED ON EITHER SIDE OF THE WALL WERE ASSUMED TO CANCEL OUT.
- 5). WHERE PIPE WAS PASSING THROUGH A PIPE SLEEVE AND WAS SUPPORTED VERTICALLY AND Laterally ON EITHER BOTH SIDES OF THE WALL, RESULTANT MOMENT AT WALL & MASS WAS ASSUMED TO BE ZERO.
- 6). LOADS FOR CANTILEVER TYPE SUPPORTS ARE GIVEN AT THE FACE OF THE WALL

EXAMPLES ON SMT. 2 ILLUSTRATE THE METHOD OF FPL COMPUTATIONS.

EBASCO SERVICES INCORPORATED

BY D. MERLINSKY DATE 10-8-84 FOR REFERENCE

CHKD. BY SUBRAMANIAN DATE 10-8-84

ONLY
LP & L

SHEET 2 OF 2

OFS NO. LOU. 1564 DEPT. NO. ESSE

CLIENT

PROJECT

WATERFORD #3

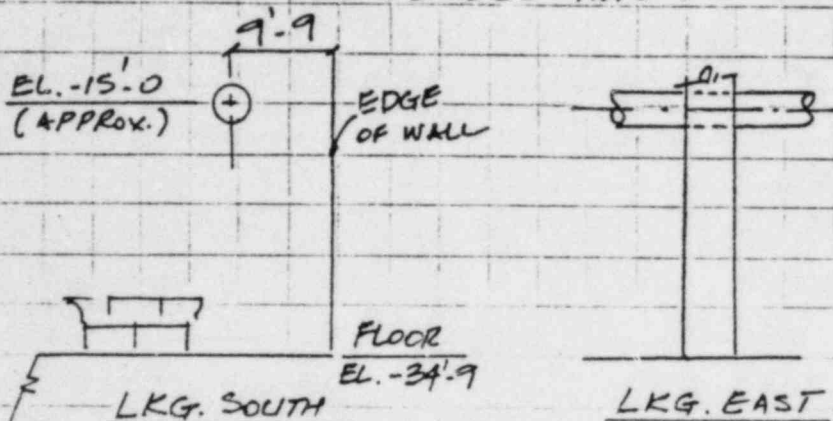
ITEM #5

SUBJECT

FPL'S DUE TO PIPE SUPPORTS ON CONCRETE BLOCK WALLS.

EXAMPLE #1

6" ϕ DRAINAGE LINE PASSING THROUGH AND EMBEDDED INTO THE WALL.



MAX. SPAN = 17 FEET ; WEIGHT PER FOOT = 39.9 #/FT
WEIGHT OF SPAN = 17 x 39.9 = 678 #

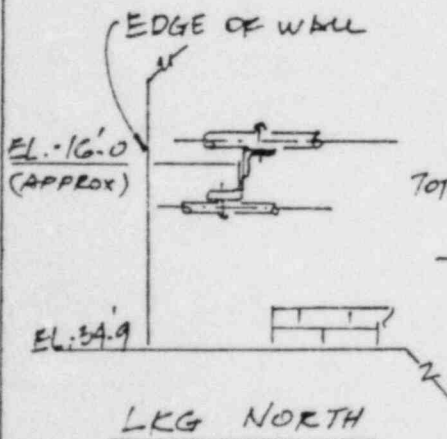
$$F_x = F_y = F_z = \frac{2 \times 678}{2} = 678 \# \quad M_x = M_y = M_z = 0$$

$$g = .5$$

SEE ASSUMPTION #4 SHT. 1

EXAMPLE #2

CANTILEVER TYPE SUPPORT SIMULTANEOUSLY PROVIDING RESTRAINT FOR 1" ϕ (INSULATED) & 2" ϕ LINES 10" FROM THE WALL FACE.



MAX. SPAN 1" ϕ - 7'
2" ϕ - 10'

TOTAL WEIGHT OF 1" ϕ (2" INSUL) = 7(2.17 + .31 + 1.9) = 30.66
2" ϕ = 10(5.02 + 1.28) = 63.00

$$\text{TOTAL } F_y = F_z = 93.66 \approx 95 \#$$

$$M_x = 95 \times 10 = 950 \#$$

NOTE: DUE TO THE USE OF ASSUMPTIONS STATED ON SHT. 1, LOADS CALCULATED ABOVE ARE CONSERVATIVE.

BY Y. LIU DATE 9/26/84SHEET 1 OF 1CHKD. BY T. S. L. DATE 10-1-84OFS NO. 2865.046 DEPT. NO. 653CLIENT L. P. & LPROJECT WATERFORD #3SUBJECT SEISMIC SUPPORT C313 REVIEWITEM # 6

RAB EL. - 410 a VALUE

$JBE = 0.38 \quad 0.33$
 $DSE = 0.53 \quad 0.52$

SEE ATTACHED 'g' VALUE

FOR ACTUAL GAP SEE ATTACH'D SH A-2 & A-3

SINCE THIS SEISMIC

SUPPORT HAS A NATURAL

FREQUENCY OF $38.3 H_z > 33 H_z$

FOR MIN. FREQUENCY ALLOWED SEE ATT. A-5

THIS SUPPORT IS IN THE

RIGID SUPPORT RANGE

WE CAN USE ITS SUPPORT

WT TIMES ACCELERATION

COEFFICIENT AS STATIC

LOAD ON SUPPORT

1. FOR JOINTS SEISMIC LOAD.

ASSUME ALL CABLES

+ TRAYS + MISC LOAD (SEE ATTACHED SH A-1)

ARE ACTING EQUALLY ON JOINTS 6, 7, 8 & 9

$$W = \frac{1}{4} (903 + 869) = 0.12 K$$

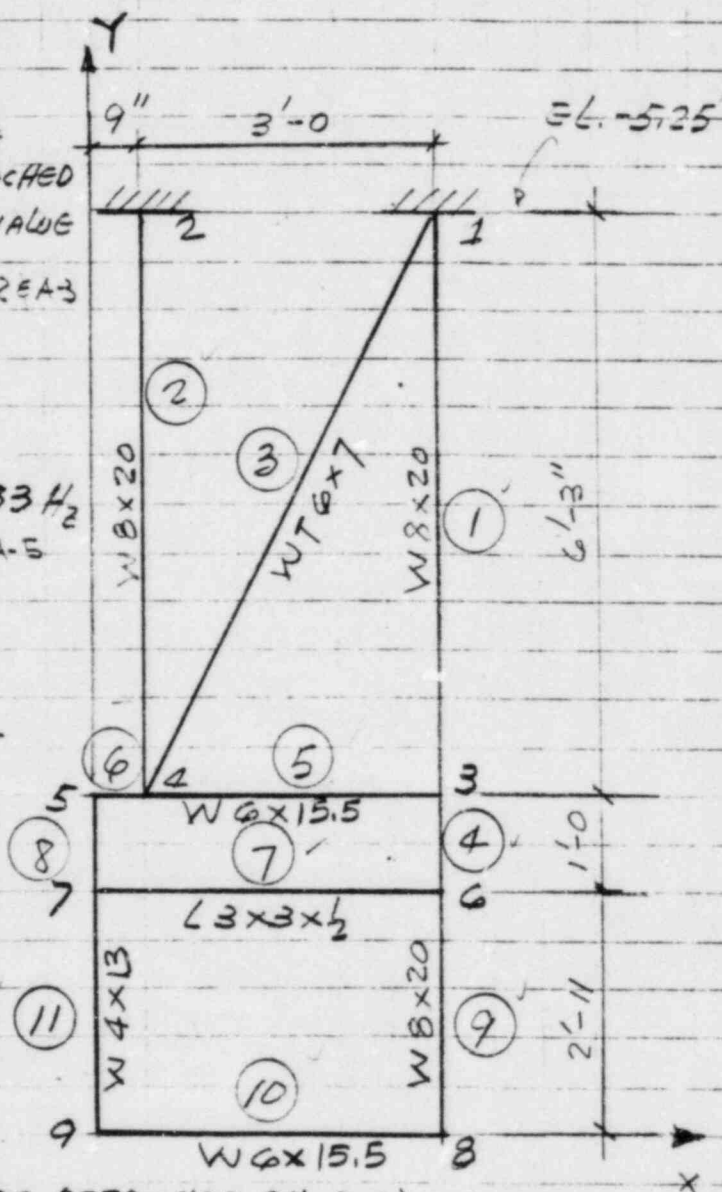
SEISMIC FORCE @ JOINTS 6, 7, 8 & 9 WILL BE

$$F = 0.44 \times 0.53 = 0.23 K$$

2. FOR MEMBER SEISMIC FORCE USE

$$F = 0.565 K \times 0.53 = 0.3 K$$

ACTING ON JOINT 3 & 5



ITEM# 6

PAGE 2

NUMBER INCIDENTS

30 2 9 9 5 7 7 0 0 0

[illegible]

2019 4 12 N 00 00 00

PAGE 6

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		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EBASCO SERVICES INCORPORATED

SH 6 OF 13

BY T. Lio DATE 7-26-84SHEET 9 OF CHKD. BY K. G. L. DATE 10-1-84OFS NO. 4294.381 DEPT. 653CLIENT LP & LPROJECT WATERFORD SES UNIT NO. 3SUBJECT BEAM & GIRDER EVALUATION : STRUDL INPUTITEM # 6~~LOADING COMBINATION 101 COMB 1 1.0 2 1.0~~

\$

LOADING LIST ALL

STIFFNESS ANALYSIS

OUTPUT DEC 2

OUTPUT BY MEMBER END

LIST REACTIONS FORCE

LIST MAX STRESS ALL SEC FRA NS 3 0.0 0.5 1.0

SECT FR NS 3 0.0 0.5 1.0

~~LOADING LIST 101~~

LIST DISP

PARAMETERS

~~UNLCE 5.0 MEM TO (this is only for BRACED BEAMS)~~~~CODE SP69~~

CHECK CODE MEM

QTIME

FINISH

FROM OUTPUT RESULTS - (SEE ATTACHED A-2)

JT. No. JT HORIZONTAL DISPL.

5

0.01"

7

0.01"

9

0.02"

} $< \frac{1}{32}$ " (0.03") OK

RYLTU 16:41 SEP 26 84

CYBER	EBAS0772	2155	JESJCL	16.42.19	26 SEP 84	YL
CYBER	EBAS0772	2155	JESMSG	16.42.19	26 SEP 84	YL
CYBER	EBAS0772	2155	SYMSG	16.42.20	26 SEP 84	YL
CYBER	EBAS0772	2155	GO.FT06F001	16.42.21	26 SEP 84	YL

```
*****
*
*
*      MCAUTO ICES EXECUTIVE SYSTEM
*
*      RELEASE 4.2 - 06 JUN 1984
*
*      TIME- 16:41:13      DATE- SEP 26, 1984
*
*      MODEL 81      VS2 REL 3.8
*
*
*****
```

PAGE -

STRUOL 'YLIU'

```
*****
*
*      MCAUTO STRUOL      RELEASE 4.11A JUL 1984
*      MCAUTO STRUOL INTERACTIVE GRAPHICS      RELEASE 3.11
*      MCAUTO STRUOL BATCH GRAPHICS      RELEASE 1.11
*      MCAUTO STRUOL DYNAL      RELEASE 6.11
*      MCAUTO STRUOL DESIGN GROUP      RELEASE 1.11
*      MCAUTO STRUOL RECON      RELEASE 1.11
*      MCAUTO STRUOL NONLINEAR      RELEASE 1.11
*      MCAUTO STRUOL TOWER      RELEASE 1.11
*      MCAUTO STRUOL DANOS      RELEASE 2.11
*
*
*      TIME 16.41.21, 9/26/84
*
*      DATA POOL SIZE 30640 BYTES
*
*****
```

TYPE SPACE FRAME
SCAN CONDITION ON
UNIT KIP INCH DEG
JOINT COORDINATES

1	45.	122.	0.	S
2	9.	122.	0.	S
3	45.	47.	0.	
4	9.	47.	0.	
5	0.	47.	0.	
6	45.	35.	0.	
7	0.	35.	0.	
8	45.	0.	0.	
9	0.	0.	0.	

STRUOL output of C313

A-2

ITEM #6

S47 OF 13

MEMBER INCIDENCES

1 1 3
2 2 4
3 1 4
4 3 6
5 3 4
6 4 5
7 6 7
8 5 7
9 6 8
10 8 9
11 7 9

CONSTANTS

E 29000. ALL
POISON 0.3 ALL
DENSITY 0.283 ALL
BETA 90. 3
BETA 180. 7

MEMBER PROPERTIES

1 4 9 TABLE 'STEELW' 'W8X20'
2 TABLE 'STEELW' 'W8X20'
8 11 TABLE 'STEELW' 'W4X13'
5 & 10 TABLE 'STEELW' 'W6X15'
3 TABLE 'STEELWT' 'WT6X7'
7 TABLE 'STEELL' 'L30308'

LOADING 2

JOINT LOAD

3 FOR Y -.283 FOR X -.15
4 FOR Y -.283 FOR X -.15
6 FOR Y -0.46 FOR X -0.24
7 FOR Y -0.46 FOR X -0.24
8 FOR Y -0.46 FOR X -0.24
9 FOR Y -0.46 FOR X -0.24

5

LOADING LIST ALL

STIFFNESS ANALYSIS

**** STRUDL MESSAGE - BANDWIDTH STATISTICS ARE AS FOLLOWS :

THE MAXIMUM BANDWIDTH IS 3 AND OCCURS AT JOINT 6
THE AVERAGE BANDWIDTH IS 1.57
THE STANDARD DEVIATION IS 0.90

OUTPUT DEC 2

OUTPUT BY MEMBER END
LIST REACTIONS FORCE

PAGE - 4

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ITEM#6

SH80F13

PROBLEM - YLIU TITLE - NONE GIVEN

ACTIVE UNITS INCH KIPS DEG. FAHR SEC LBM

MEMBER FORCES

MEMBER	LOADING	JOINT		FORCES				MOMENTS	
				AXIAL	SHEAR Y	SHEAR Z	TORSION	MOMENT Y	MOMENT Z
1			START						
1	2	1	END	-1.94	0.12	0.00	-0.00	0.01	8.52
2	2	3	START	1.94	-0.12	-0.00	0.00	-0.01	0.14
2	2	2	END	1.43	0.23	0.00	-0.00	-0.01	11.05
3	2	4	START	-1.43	-0.23	-0.00	0.00	-0.00	6.35
3	2	1	END	-2.10	0.00	0.00	0.00	-0.15	0.00
4	2	4	START	2.10	-0.00	-0.00	-0.00	-0.08	0.01
4	2	3	END	-1.22	0.55	0.00	-0.02	0.01	9.38
5	2	6	START	1.22	-0.55	-0.00	0.02	-0.02	-2.74
5	2	3	END	0.59	0.44	0.00	0.00	-0.02	9.52
6	2	4	START	-0.59	-0.44	-0.00	-0.00	-0.01	6.20
6	2	4	END	-0.31	0.62	0.00	0.01	0.01	0.23
7	2	5	START	0.41	-0.62	-0.00	-0.01	-0.02	5.33
	2	6		0.01	-0.04	0.00	-0.02	-0.02	-0.88

PAGE - 6

MEMBER FORCES

MEMBER	LOADING	JOINT		FORCES				MOMENTS	
				AXIAL	SHEAR Y	SHEAR Z	TORSION	MOMENT Y	MOMENT Z
			END						
	2	7	START	-0.01	0.04	-0.00	0.02	-0.02	-0.13
	2	5	END	-0.62	0.41	-0.00	-0.02	-0.01	5.11
	2	7	START	0.62	-0.41	0.00	0.02	0.01	-0.13

ITEM #6

SA90F13

6	END	-0.72	0.32	-0.00	0.00	-0.00	
8		0.72	-0.32	0.00	0.00	0.00	
10	START						
8	END	-0.08	0.26	0.00	0.00	-0.00	
9		0.08	-0.26	-0.00	-0.00	-0.00	
11	START						
7	END	-0.20	0.16	0.00	0.00	0.00	
9		0.20	-0.16	-0.00	-0.00	-0.00	4.1

SUPPORT JOINT REACTION LOADS

JOINT	LOADING	FORCES			MOMENTS			
		X FORCE	Y FORCE	Z FORCE	X MOMENT	Y MOMENT	Z MOMENT	
1	GLOBAL							
2	GLOBAL	2	1.03	3.84	-0.00	0.01	-0.01	8.66
		2	0.23	-1.43	0.00	-0.01	0.00	11.05

PAGE - 7

LIST MAX STRESS ALL SEC FRA NS 3 0.0 0.5 1.0

PAGE - 8

RESULTS OF LATEST ANALYSES

PROBLEM - YLTU TITLE - NONE GIVEN

ACTIVE UNITS INCH KIPS DEG. FAHR SEC LBM

INTERNAL MEMBER RESULTS

MEMBER MAXIMUM STRESS

MEMBER	STRESS				STRESS			
	MAX NORMAL	AT SECTION	LOAD		MIN NORMAL	AT SECTION	LOAD	
1	0.83	0.0 FR 2			-0.17	0.0 FR 2		
2	0.41	0.0 FR 2			-0.89	0.0 FR 2		
3	1.28	0.0 FR 2			0.77	0.0 FR 2		

ITEM #6

SHIO OF 13

4	0.76	0.0	FR	2	-0.0	FR	2
5	0.83	0.0	FR	2	-1.0	FR	2
6	0.63	1.000	FR	2	-0.45	1.000	FR
7	0.89	1.000	FR	2	-0.89	1.000	FR
8	1.15	0.0	FR	2	-0.82	0.0	FR
9	0.57	1.000	FR	2	-0.33	1.000	FR
10	0.78	0.0	FR	2	-0.74	0.0	FR
11	0.82	1.000	FR	2	-0.72	1.000	FR

PAGE - 9

SECT FR NS 3 0.0 0.5 1.0
LIST DISP

PAGE - 10

RESULTS OF LATEST ANALYSES

PROBLEM - YLIU TITLE - NONE GIVEN

ACTIVE UNITS INCH KIPS DEG. FAHR SEC LBM

JOINT DISPLACEMENTS - SUPPORTS

JOINT	LOADING	DISPLACEMENTS			ROTATIONS		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
1	GLOBAL						
	2	0.0	0.0	0.0	0.0	0.0	0.0
2	GLOBAL						
	2	0.0	0.0	0.0	0.0	0.0	0.0

JOINT DISPLACEMENTS - FREE JOINTS

JOINT	LOADING	DISPLACEMENTS			ROTATIONS		
		X DISP	Y DISP	Z DISP	X ROT	Y ROT	Z ROT
3	GLOBAL						
	2	-0.01	-0.00	0.00	-0.00	-0.00	-0.01
4	GLOBAL						
	2	-0.01	0.00	-0.00	0.00	-0.00	-0.01
5	GLOBAL						
	2	-0.01	0.00	-0.00	0.00	-0.00	-0.01
6	GLOBAL						
	2	-0.01	-0.00	0.00	-0.00	-0.01	-0.01

ITEM #6

SH11CF13

	LOCAL						
7							
8	GLOBAL	-0.01	0.00	-0.00	0.00	0.01	-0.01
9	GLOBAL	-0.02	-0.00	0.00	-0.00	-0.01	-0.01
		-0.02	0.00	-0.00	0.00	-0.01	-0.00

Page - 11

OTIME
 TOTAL CPU TIME 0 MINUTES, 2.400 SECONDS
 TOTAL I/O TIME 0 MINUTES, 21.420 SECONDS
 FINISH

Page - 12

```

*****
*                                     *
*                               WARNING *
*                                     *
* IBM REPORT NUMBER USERS, NOTE THAT BEGINNING 14 OCTOBER 1984 THIS *
* IS NO LONGER AVAILABLE IN THE FORM: *
* // *REPORT NUMBER=XXXXX.XXX *
* CONTACT A MCAUTO CONSULTANT FOR AN ALTERNATE FORMAT. *
*****
  
```

***** FOLLOWING IS A SUMMARY OF MAJOR STRUDL BUGS - SEPTEMBER 1984

- 4.9-621 INCORRECT RESULTS WERE OBTAINED FOR ANY LOADING CONDITIONS CONSISTING OF CENTRIFUGAL LOADS.
- 4.10-720 INCORRECT STRESS RESULTANTS NY AND NXY WERE PRINTED BY LIST NODAL COMMAND FOR THE CSIG, PSR, PSRCSH, LST, LSR, IPLQ, IPLOC SH, IPQQ, AND IPCQ ELEMENTS. THIS PROBLEM HAS BEEN CORRECTED ON PRODUCTION WITH RELEASE 4.10A.
- 4.10-769 INCORRECT MAX AND MIN STRESS RESULTANTS NY AND NXY ARE BEING PRINTED BY LIST NODAL WITH ENVELOPE COMMAND FOR THE PLANE STRESS/PLANE STRAIN ELEMENTS. THIS PROBLEM HAS BEEN CORRECTED ON PRODUCTION WITH RELEASE 4.11.
- 4.10-786 LIST SECTION DISPLACEMENT COMMAND GIVES INCONSISTENT RESULTS FOR MEMBERS HAVING MEMBER END JOINT SIZE. THE PROGRAM HAS BEEN MODIFIED WITH RELEASE 4.11A SO THAT MEMBER SECTION DISPLACEMENTS WILL NOT BE LISTED FOR MEMBERS DEFINED WITH END JOINT SIZE.
- 4.10-800 INCORRECT MEMBER LOADS MAY BE GENERATED BY THE SPECIAL PROCESSOR PROGRAM DOORELOA FOR PLANE FRAME AND SPACE FRAME MEMBERS. THIS PROBLEM HAS BEEN CORRECTED ON PRODUCTION WITH RELEASE 4.11A.

SH12 OF 13
 ITEM #6

**** JING IS A SUMMARY OF NEW STRUDL ENHANCEMENTS

FOR INFORMATION/DOCUMENTATION ON ANY NEW ENHANCEMENT LISTED, CALL THE
MICRUTO STRUDL USER SUPPORT GROUP, OUTSIDE MISSOURI. THE TOLL

Page - 13

FREE NUMBER IS 1-800-622-0070. INSIDE MISSOURI, CALL COLLECT AT
(314) 252-5555.

1. FINITE ELEMENT OUTPUT HAS BEEN MODIFIED. ADDED WITH RELEASE
4.9A.
2. MULTIPLE JOINT RESTRAINT CAPABILITY. LINEAR CONSTRAINT
EQUATIONS OF MULTIPLE JOINTS, RIGID LINKS, AND COUPLED
DISPLACEMENT CONDITIONS MAY BE SPECIFIED. ADDED WITH RELEASE
4.10A.
3. AN OPTION FOR AUTOMATIC SELECTION OF DYNAMIC DEGREES OF FREEDOM
FOR KINEMATIC CONDENSATION. ADDED WITH RELEASE 4.10A.

CYBER EBAS0772 2155 GO,FT10F001 16.42.24 26 SEP 84 YL YL

STRUDL SURCHARGE REPORT

JOB ID: VLIU TITLE: NONE GIVEN

DATE: 9/25/84

TASKS	DESCRIPTIVE NOTES			FEE UNITS
STIFFNESS ANALYSIS	NO. JOINTS: 9	NO. MEMBERS AND ELEMENTS: 11	NO. LOADINGS: 1	10

ITEM #
SH130413

ERP

DATE 9-22-77

AKD. BY ALG/STAN DATE 9-13-80

OFS NO.

FOR REFERENCE ONLY

CLIENT

PROJECT

SUBJECT.

ITEM #6

STRUCTURE :- AUX. BLDG..

STRUCTURE :- AUX. BLDG.
"g" VALUES AT DIFFERENT ELEV. FOR PERIOD - 0.2 SEC, 0.5% dc

[illegible]

FOR REFERENCE ONLY

EBASCO SERVICES INCORPORATED

BY KS Lee DATE 4/19/84
 CHKD. BY SW DATE 05/03/84

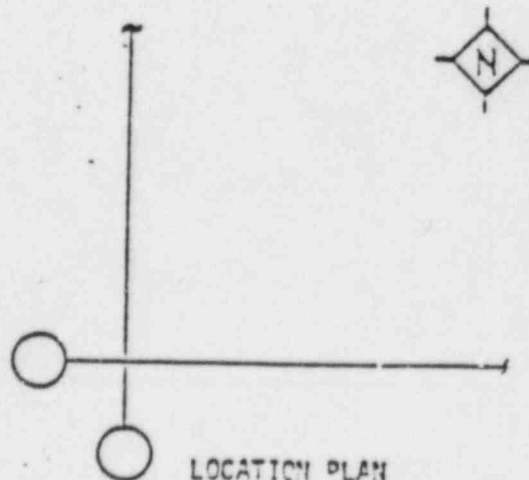
A-1
 SHEET 4294.611 OF 653
 DEPT. NO. 2865.055

CLIENT LP&L
 PROJECT WATERFORD UNIT # 3

SUBJECT HVAC/ELECT SEISMIC SUPPORT EVALUATION ITEM #6

CALC. NO	:		1) Original Design Loads:	SUPP. NO:	E170
SUPT. NO (HV/EL):		<u>C313</u>	Support D.L.		<u>565</u> Lb
HV/EL. DWG. NO	:	<u>G37755</u>	Cable Trays Loaded (500N+ 400N)		<u>900</u> Lb
CIVIL DWG. NO	:	<u>G69554</u>	W = Total Design Load		<u>1465</u> Lb
LINE NO	:		2) Extg. Loads		
P. SUPP. NO	:		Support D.L.		<u>565</u> Lb
			Cables + Trays (A+(M+N)10#)L		<u>900</u> Lb
			Misc. Loads		<u>869</u> Lb
			Pipe Support		<u> </u> Lb
			W _I = Total Extg. Load =		<u>2334</u> Lb
			ORIGINAL FREQUENCY	=	<u>38.3</u> Hz = f
			ORIGINAL STRESS	=	<u>0.12</u> ksi = f'

ELEVATION



LOCATION PLAN

EBASCO SERVICES INCORPORATED

BY K. SHIH DATE 10-7-84

SHEET A-2 OF

CHKD. BY DATE

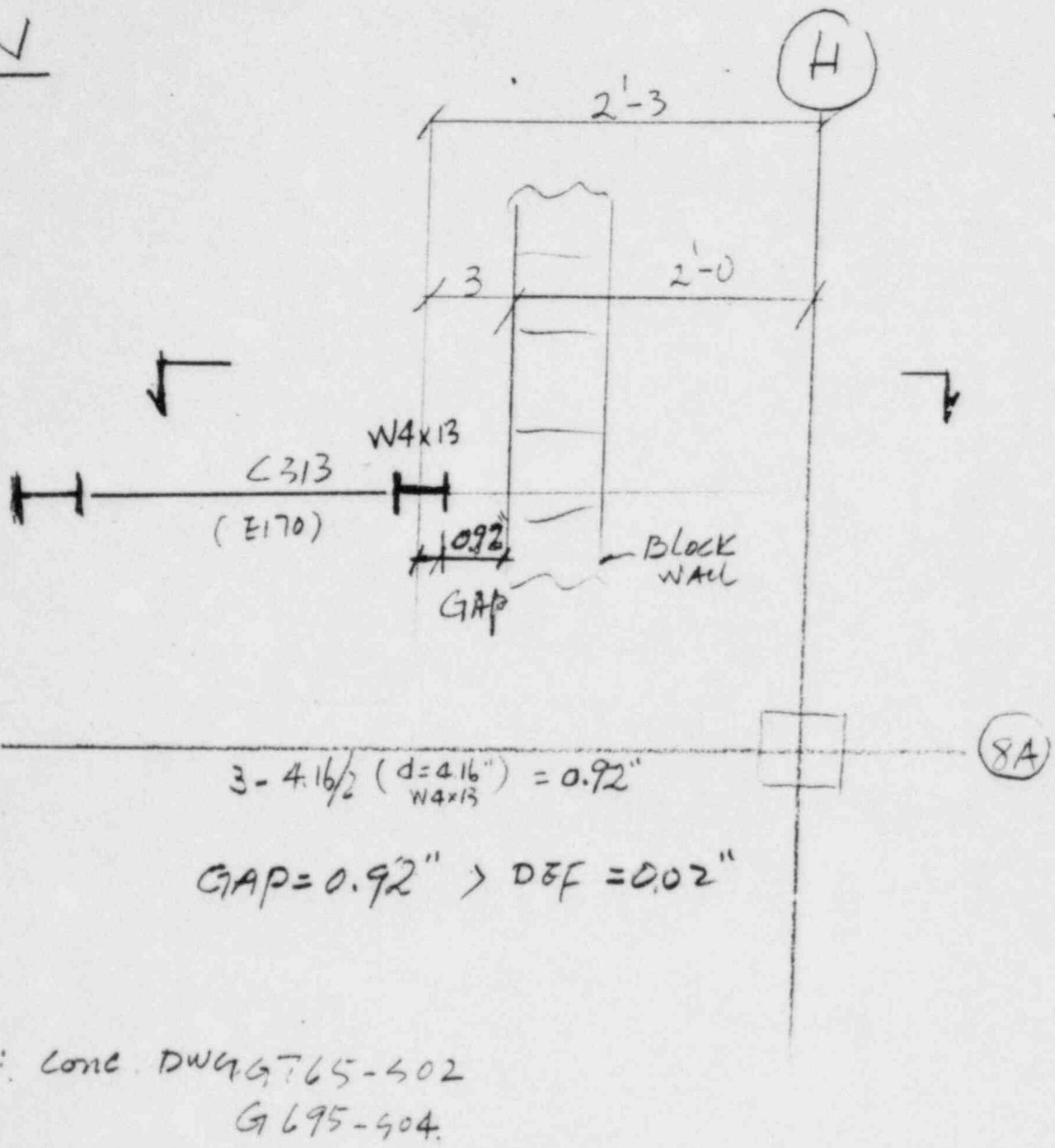
OFS NO. DEPT. NO. 653

CLIENT LP & L

PROJECT WATERFORD S.E.S. #3

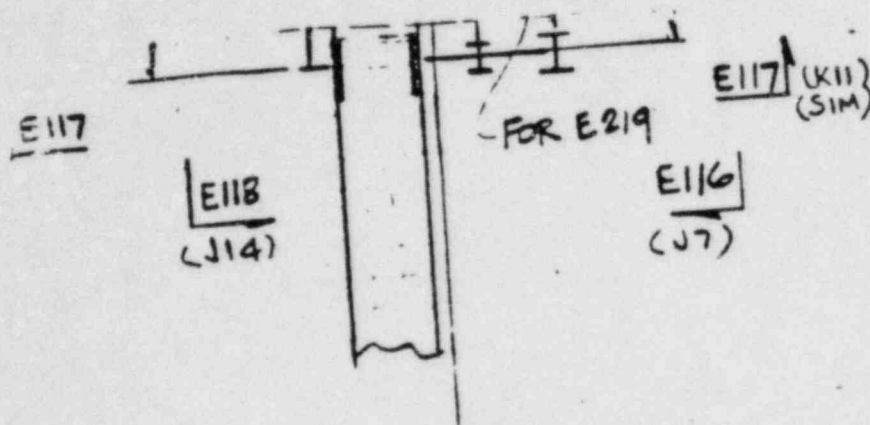
SUBJECT WALL Location & Gap Item 6

N



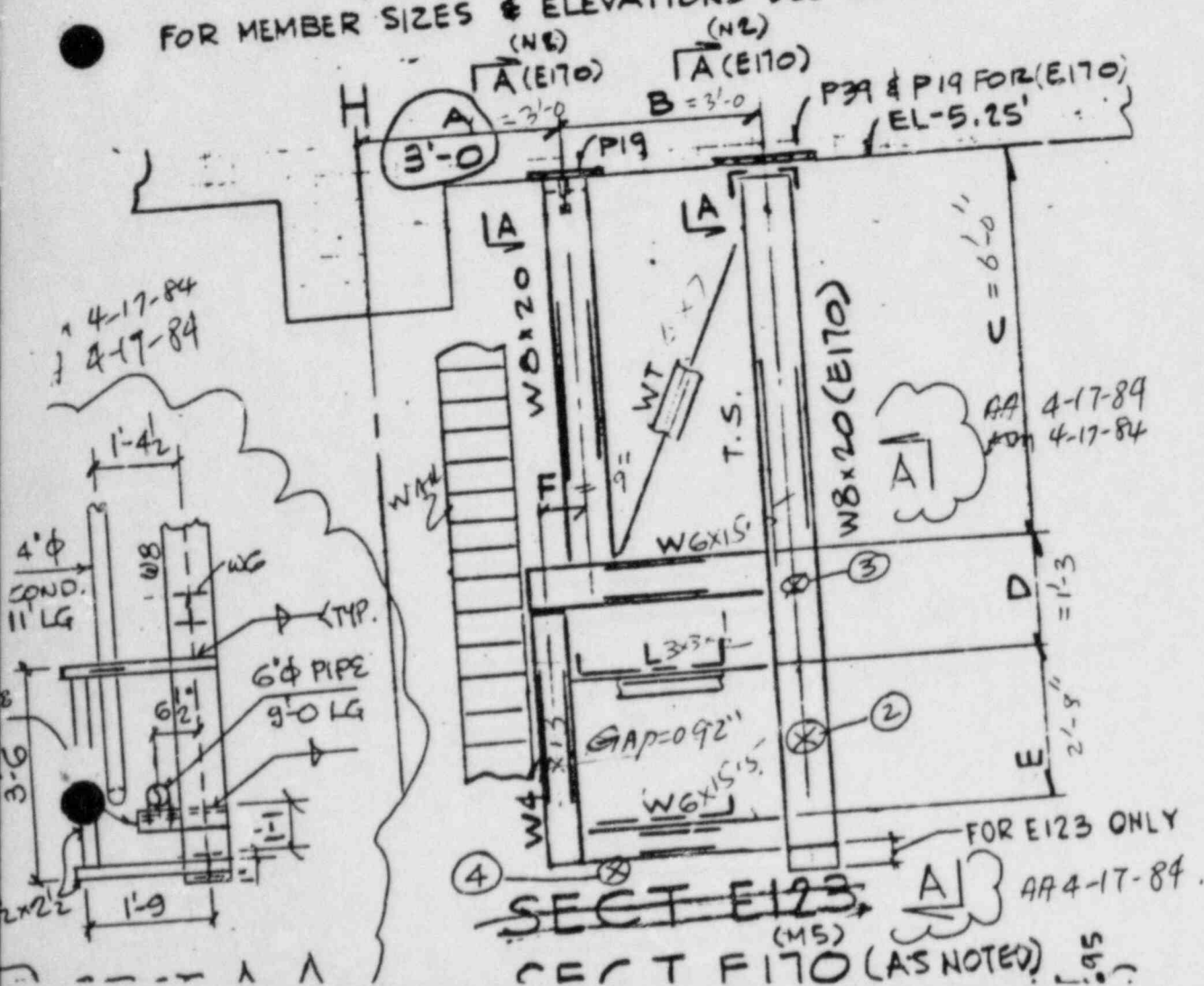
PARTIAL PLAN

ITEM # 6



PART PLAN

PART PLAN
 FOR MEMBER SIZES & ELEVATIONS SEE SECTS
 (N2) (N2)



EBASCO SERVICES INCORPORATED

A-4

DATE 2/19/84
DATE 05/03/84

SHEET 1a OF
DEPT. NO. 653

OFS NO. 2865.055

LP & L

INT

JECT WATERFORD UNIT #3

IBJECT HVAC/ELEC SEISMIC SUPPORT EVALUATION

ITEM # 6

SUPP. NO: C-313

a. FREQUENCY CHECK :

1. Original Frequency : 38.3
2. Allowable loads per Table 3 : > 5.0^k
3. Actual added loads : 0.869^k

☒ Support O K, actual load is less than allowable loads.

☐ Need further analysis, see following pages.

b. STRESS CHECK ON VERTICAL MEMBER :

1. Type of support from tables : 1B
2. Allowable loads from tables : 3^k
3. Actual added loads : 0.869^k

☒ Support O K, actual loads less than allowable loads.

☐ Need further analysis see following pages

Need platform steel check

c. STRESS CHECK ON HORIZONTAL MEMBER :

☒ Member OK. No further analysis required

☐ Member needs further analysis. see attached pages

Ebasco Definition of Criteria for Cable Tray Supports

A5
ITEM #6

On the basis of the NRC guides, SRP's and codes, referred to in the previous section, Ebasco has prepared several guides which may also be applicable for the analysis and design of trays, conduits and their supports. These are

- a. "Seismic Considerations for Seismic Category I Equipment and Equipment Supports," Ebasco Specification 7-75 Ta, 1975.
- b. "Guidelines for the Design of Conduit Systems in Seismic Category I Buildings of Nuclear Power Plants," Electrical Engineering Guides and Data-G16-10, April, 1976.
- c. "Procedure for Establishing the Maximum Exposed Conduit Spans in Seismic Category I Buildings of Nuclear Power Plants," Electrical Engineering Guides and Data -G16-9, June, 1976, and December, 1976.
- d. "Cable Tray Design and Installation Practices for Power and Control Cables in Nonnuclear Installations," Electrical Engineering Guides and Data, G38am-1.

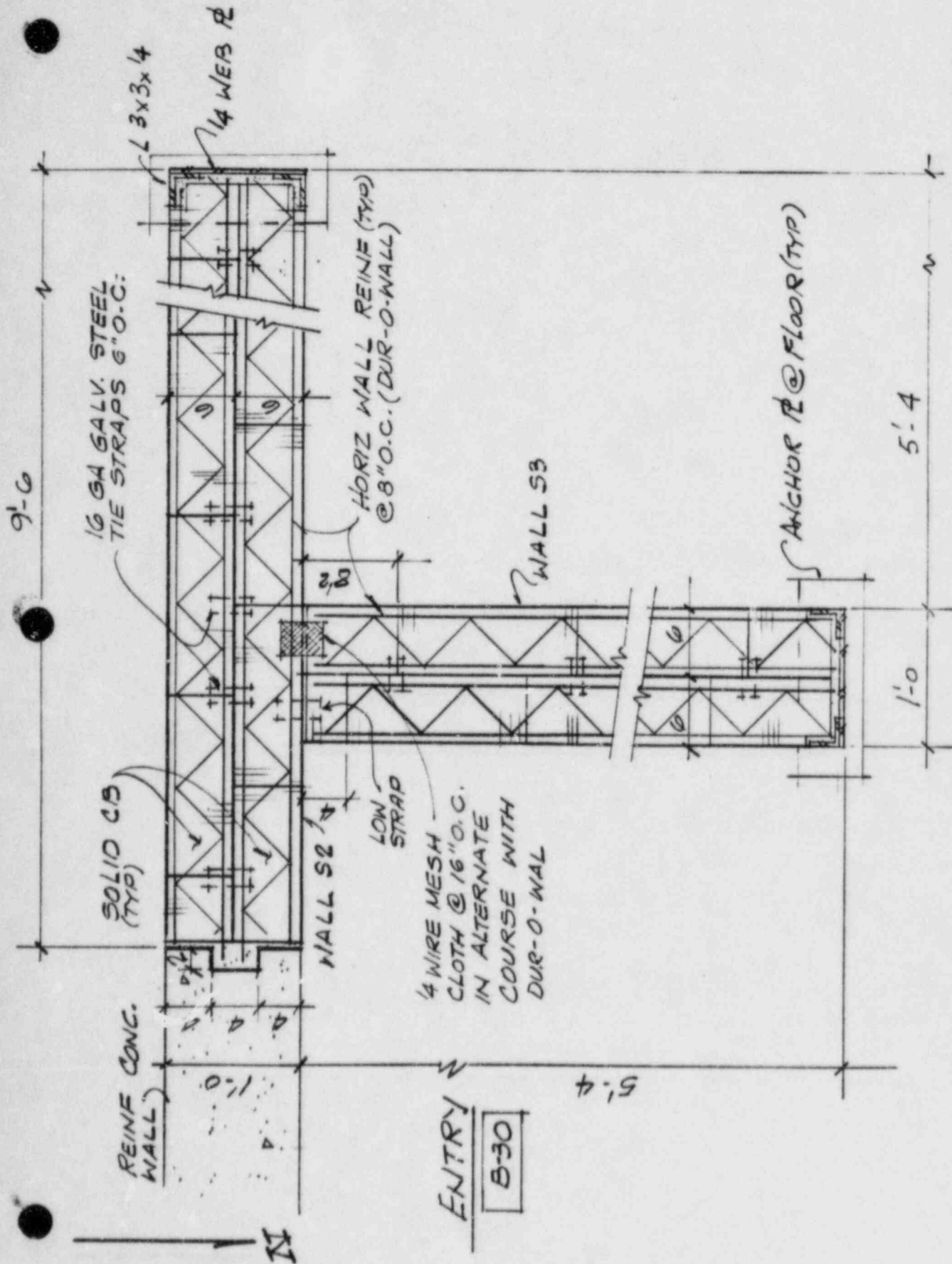
The above documents have the purpose of providing some guidance for the analysis, design, procurement and installation of cable tray/conduit subsystems. Originally, in the past, the standard practice was to furnish restraints of rigid design, i.e. fundamental frequency equal to or greater than 33 Hz. This was done, to allow the usage of the floor response spectra for the qualification of the tray/conduit and in accordance with the state of the art and the NRC requirements, in lieu of complete analyses of the subsystems. The trays/conduits were qualified based on the assumption that the restraints provide a nonyielding simple support. These rigid restraints were provided to suit the tray/conduit layout. The layouts were generally made with no advance considerations given to easy and effective supporting system. Generally all supports were built up of steel members with I, C and L sections. Unistruts or equivalent elements were not used, due to insufficient documen-

tation to satisfy the QA requirements. Due to randomness of tray/conduit layouts the resulting support systems were of many different configurations to suit these layouts. Generally shelf to vertical connections as well as vertical member to ceiling connections were treated as hinged.

Recently on St. Lucie #2 and Waterford projects, the supports were treated not as "rigid". This resulted in some savings in the weight and configuration of supports. In this application since the response spectra exhibit essentially flat variation of the acceleration with respect to frequency over a large range of frequencies, attempt was made to limit the support frequencies at approximately 16 Hz. Studies were performed on complete 3D model of a system consisting of various numbers of spans, and also with approximate model of the same system. This was done to establish the amplification factors due to flexibility of supports, multispan coupling effects and multimode effects. This approach resulted in realistic treatment of the problem and in appreciable reduction in support weight.

BY: J. SANTOSPIRITO/10-3-84
 CHECKED BY: K. SHIH 10-8-84

SH. 1 OF 3
 ITEM #7



PART PLAN EL -34.75' 1'-0" SOLID CB WALL (EAST COL LINE 84/4)

1" = 1'-0"

6-765502

1'-0 CONG BLOCK
REINF. (STACK BOND
SEISMIC DESIGN)

VERT. WALL REINF
(HOLLOW BLOCK)

4'-0 O.C. MAX

ENCLOSED AREA OR SHAFT

PRE-FAB CORNER ASSEM
(3/6 TO 28" MAX)
HORIZ WALL REINF.

#2 TIES @
ALTER. CS.

4-#6 BARS
(AT 4'-0 O.C. MAX)

HORIZ-WALL
REINF EVERY
2ND COURSE
(TYP)

1/4 WIRE
MESH CLOTH
EVERY ALTER
CS (16" OC)

1'-4
TYP STRECHER

4'-0 O.C. MAX

FILL CELLS
W/MORTAR
MINIMUM
COMPRESSIVE
STRENGTH
2,500 PSI (TYP)

VERTICAL WALL REINF
(HOLLOW BLOCK)

TYP PLAN @ CORNER
HOLLOW CONCRETE BLOCKS

BY: J. SANTOS/RTD/10-3-84
CHKD BY: K. SAKA
10-6-84

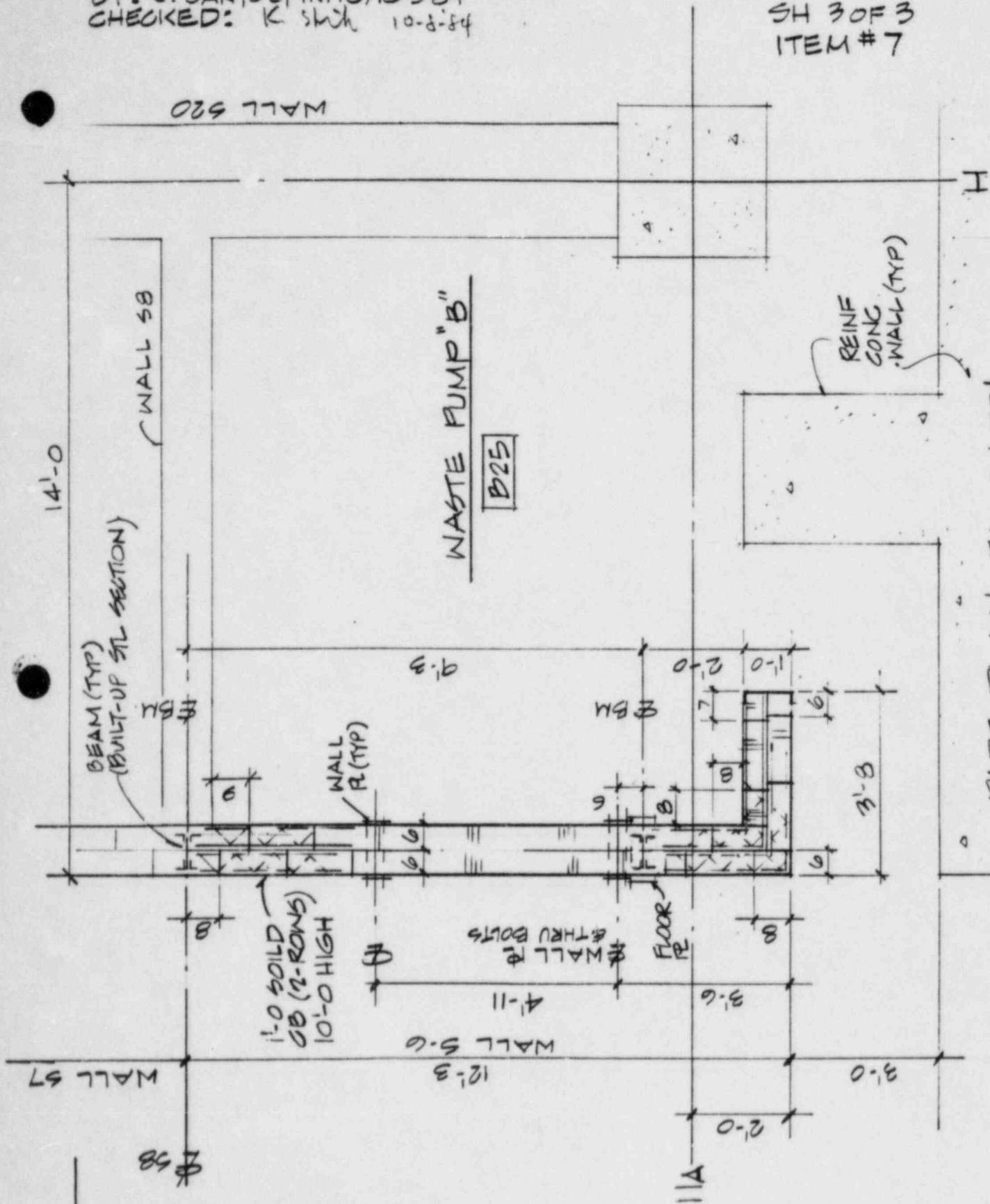
SH 2 OF 3
ITEM # 7

BY: J. SANTOSPIRITO/10-3-84
CHECKED: K Shih 10-8-84

SH 3 OF 3
ITEM # 7

G-765502

PART PLAN EL-34.75' (WALL 56)

$$38 = 1 - 0$$


ITEM #7

FOR REFERENCE
ONLY.

Project Identification

No. LOU-1564.738

Order No. _____

EBASCO SERVICES, INC.

RECEIVED

DEC 09 1977

ENGINEERING
DOCUMENT DEPT.
WATERFORD 3 FIELD
R3

NOTICE

SEE FIELD CHANGE REQUEST

NO. (S) AS-672, AS-809, AS-1179
FOR APPROVED CHANGES
TO THIS DOCUMENT.

EBASCO SERVICES INCORPORATED

SPECIFICATION EBASCO

MASONRY

NON-NUCLEAR SAFETY CLASS

WITH SEISMIC CONSIDERATIONS

PURCHASER: EBASCO SERVICES INCORPORATED, AGENTOWNER: LOUISIANA POWER & LIGHT COMPANYOPERATING COMPANY: LOUISIANA POWER & LIGHT COMPANYPROJECT: WATERFORD STEAM ELECTRIC STATIONUNIT NO.: 3 NETHERL K1 1165 MWLOCATION: ST CHARLES PARISH, LOUISIANA

SELLER: _____



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Revisions	Date	Prepared By:	Reviewed By:	Pages Affected
Original	10/31/72	J Ihnat	D E Houghton	All
R1	1/31/73	J Ihnat	D E Houghton	2,3,4,5,6

FIELD CHANGE
REQUEST

LPL Consent - LPL Letter No 5177, dated May 13, 1973

CH-1215

DATE: 9/14/82

Project Identification

No. LOU 1564.738

ITEM # 7

REV. NO.	DATE	PAGES AFFECTED	PREPARED BY	QA REVIEWED BY	REVIEWED BY
R2	2/26/76	All	K Ilachinski <i>K.I.</i>		D Houghton <i>D.H.</i>
R3	12/23/77	1, 3, 5, 6, 7, 8, 9	K Ilachinski <i>K.I.</i>		D E Houghton

EBASCO SERVICES INCORPORATED

ITEM # 7

EBASCO SPECIFICATION

MASONRY

CONTENTS

	<u>Paragraph</u>	<u>Page</u>
Scope	1	1
Standards and Codes	2	1
Delivery of Materials	3	2
Storage of Materials	4	2
Materials	5	2
Mortar Mixing	6	5
Workmanship and Installation	7	5
Standard Concrete Block	8	5
Horizontal Wall Reinforcement	9	6
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Seismically Designed Masonry Considerations	16	9

Project Identification
No. LOU 1564.738

ITEM # 7

1. SCOPE

This specification covers materials and installation of concrete block masonry, shielding block and accessory materials in accordance with the drawings and as specified herein.

R2

2. STANDARDS AND CODES

.1 The materials herein specified shall comply with the latest revision in effect at the date of the purchase order, or as mutually agreed to subsequent to date of the order by Purchaser and Seller, of all currently approved applicable regulations, safety codes, specifications and standards including applicable technical definitions as acknowledged and accepted in the industry as listed in the various sections below, but not limited thereto. The documents so listed set forth the minimum requirements. They may be exceeded by the Seller if, in his judgement, superior or more economical designs or materials are available, subject to Purchaser's approval.

R2

.2 All services, designs, equipment and material sold or otherwise provided to Purchaser by Seller shall comply with all Federal, State and local laws, regulations, codes and all applicable specifications and standards including but not limited to those specified herein in each case as in effect at the date of order placement.

R2

.3 All material and services hereunder shall comply with the Occupational Safety and Health Act of 1970 (OSHA) including all the latest revisions thereto and all applicable standards thereunder.

R2

.4 Specifications

R2

American Society for Testing and Materials ASTM

ASTM C-90	Hollow Load Bearing Concrete Masonry Units
ASTM C-145	Solid Load Bearing Concrete Masonry Units
ASTM C-150	Portland Cement
ASTM C-270	Mortar for Unit Masonry
ASTM C-476	Mortar and Grout for Reinforced Masonry
ASTM C-404	Aggregates for Masonry Grout
ASTM C-207	Hydrated Lime for Masonry Purposes
ASTM C-33	Concrete Aggregates
ASTM C-144	Aggregate for Masonry Mortar
ASTM E-119	Fire Tests of Building Construction and Materials
ASTM A-615	Deformed and Plain Eillet-Steel Bars for Concrete Reinforcement
ASTM D-1055	Sponge and Expanded Cellular Rubber Products
ASTM C-637	Aggregate for Radiation Shielding Concrete

American National Standards Institute ANSI

N101.6	Concrete Radiation Shields
N45.2.2	Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants (During the Construction Phase)

Emaco Specification
Masonry

Project Identification
No. LOU 1564.728

ITEM #7

3. DELIVERY OF MATERIALS

All masonry materials shall be so shipped, delivered, handled and stored as to prevent the intrusion of foreign matter and the damage of materials by water, breakage, chipping or staining. Cement, lime and other manufactured materials shall be delivered in unbroken containers plainly marked with Manufacturer's name and brand and shall be stored in their original containers in a manner that will permit identification until ready for use.

4. STORAGE OF MATERIALS

.1 Concrete blocks shall be stacked in piles clear of the earth and shall be protected on top against the weather with an approved cover. Blocks which are stored for a period of time shall be stacked on sides with block courses separated vertically with 1 x 2 in. wood strips.

.2 Sand shall be stored so as to be protected from dirt or foreign matter. Material subject to deterioration such as cement and lime shall be stored in weathertight sheds with floors elevated at least 12 in. above grade. All packages showing evidence of water or other damage shall be rejected, removed from the jobsite and replaced at no extra cost to the Purchaser.

5. MATERIALS

Masonry materials used in the erection of masonry walls shall conform to the following standards:

.1 Concrete Block

.01 Concrete block for exterior and interior (non-shielding) walls shall be hollow load bearing units, Grade N-1 and conforming to ASTM C-90. Block shall be of thickness shown on drawings with nominal face dimensions of 8" x 16" with 2 cells per block and plain ends. A vertical reinforcing two cell block with one end open may be used. Special starter block heights shall be furnished where shown on drawings.

.02 Concrete block units shall be composed of normal weight aggregate, conforming to ASTM C-33, except that cinders will not be acceptable. Units which are exposed to view or painted shall have uniform appearance.

.03 All units shall be steam cured with a moisture content expressed as a percentage of total absorption of not more than 40 percent at time of delivery.

.04 Should units exceed the moisture limitations prior to laying, drying shall be accomplished by approved means until they meet the above moisture requirements.

Ebasco Specification
Masonry

Project Identification
No. LOU 1564.738

ITEM #7

5. MATERIALS (Cont'd)

.1 Concrete Block (Cont'd)

.05 Test to determine moisture content at time of delivery shall be paid for by Supplier. R1

.06 The Supplier of the concrete blocks shall certify that the block units have a maximum shrinkage of not more than .03 percent from saturated to oven dry condition. R1

.07 Concrete block walls shall have fire-resistance ratings indicated on drawings. Fire rated concrete block shall bear U.L.I. Classification Marking. R1

.2 Shielding Concrete Block

.01 Shielding concrete block, used for filling openings in concrete shielding walls, and as elsewhere shown on drawings shall be steam cured, solid concrete block units with no voids, and a minimum uniform density of 138 pounds per cubic foot. Compressive strength shall be 4000 psi minimum. R3

.02 Concrete block shall conform to ASTM C-143, Grade N-1, manufactured from normal weight aggregates in compliance with ASTM C-33, and conforming to ANSI N 101.6 except that no fly ash or cinders shall be used. The moisture content shall not exceed 45 percent at the time of delivery. R1

.03 Blocks shall be formed true and square and shall have all surfaces finished smooth to form an effective nuclear shield when laid up dry with no mortar in the joints. R1

.04 Blocks shall be of thicknesses shown on drawings with nominal face dimensions of 8" x 16", with special starter block heights furnished, where shown on drawings and/or required, to permit staggering the horizontal joints of all layers. At least one block for each layer at each opening, shall be furnished with approved lifting devices, cast into the block, to permit starting removal of the block layer (wythe). R1

.3 Reinforcing Rods

Shall be deformed intermediate grade, new billet steel, conforming to ASTM A-615, Grade 60. R1

.4 Masonry Horizontal Reinforcing

For interior walls shall be extra heavyweight "Dur-O-Wal" truss type as manufactured by Dur-O-Wal Inc. or approved alternate, of "Brite" Steel finish. For exterior concrete block walls shall be extra heavyweight "Dur-O-Wal" truss type or approved alternate with galvanized steel side rods and R1

Ebasco Specification
Masonry

Project Identification
No. LOU 1564.738

ITEM #7

5. MATERIALS (Cont'd)

.4 Masonry Horizontal Reinforcing (Cont'd)

truss rods and shall conform to ASTM A-116, Class 3. All corner and tee assemblies shall be prefabricated.

.5 Rigid Steel Strap Anchors

Shall be 2" x 3/16" galvanized with ends turned down at least 2 inches. R2

.6 Ties

For partitions to walls or partitions to partitions shall be strips of metal lath or 1/4 inch mesh galvanized hardware cloth. R1

.7 Control Joint Material

Shall be "Weatherite R", conforming to ASTM D-1056, as manufactured by Williams Equipment & Supply Co. Inc. or approved alternate. R2

.8 Portland Cement

Shall conform to ASTM C-150, Type II. R2

.9 Hydrated Lime

Shall conform to ASTM C-207, Type S. R2

.10 Sand

Shall consist of clean, hard, sharp, durable particles and shall not contain a total of more than 5% by volume of loam, mica, clay or other deleterious substances, and shall conform to ASTM C-144, all passing a No. 8 sieve. R2

.11 Water

Shall be free from any injurious amounts of acid, alkali, salts, oil, sediment, or organic matter. R2

.12 Metal Lath

For wall ties or as a base for concrete fill in block cavities shall be 3/8" diamond mesh, 3.4 lbs per square yard. R2

.13 Grout

Shall be white Portland Cement Type, conforming to ASTM C-476. R2

Division Specification
Masonry

Project Identification
No. LOU 1564.738

ITEM #7

6. MORTAR MIXING

.1 Mortar shall comply with the property specification for Type S-mortar as set forth in ASTM Standard C-270 (for non-seismically designed). Mortar and grout for reinforced masonry (seismically designed) shall comply with ASTM C-476. R2

.2 Mortar shall be thoroughly mixed and only in quantity needed for immediate use. Any mortar or grout not used within 1½ hours after initial mixing shall be discarded. R2

.3 Mortars that have stiffened within this time interval because of evaporation of moisture may be retamped to restore workability by adding water. Harsh, nonplastic mortar should not be retamped or used.

.4 Only machine-mixing shall be used, except for small jobs when hand mixing is specifically authorized by the Engineer. At least five minutes of mixing time shall elapse after all of the material has been placed in the mixer before any mortar is discharged. Water shall be used in the quantity necessary to give proper workability. R1

.5 All mortar shall consist of the following proportions by volume: R2

a) non-seismically designed masonry walls:

1 part Portland Cement

½ part Hydrated Lime

4 parts Sand

b) for seismically designed masonry walls follow ASTM C-476 for minimum compressive strength of 2500 psi.

7. WORKMANSHIP AND INSTALLATION

.1 Masonry work shall not be erected when the ambient temperature (adjacent to the work area) is 40° F, and falling except by written permission of the Engineer. When masonry work is authorized during temperature below 40° F, provision shall be made for heating and drying of materials and protecting the completed work in a manner acceptable to Engineer. R2

.2 At the end of each day, or whenever the progress of erecting walls is interrupted, the top of walls shall be protected against rain entering vertical cells.

8. STANDARD CONCRETE BLOCK

.1 Laying of block shall be in accordance with the recommended Practices for Laying Concrete Block by the Portland Cement Association. R1

.2 When masonry must be laid in extremely hot weather, or drying wind conditions, or under daily hot sun exposure, appropriate measures must be taken to shelter the work and preserve the necessary moisture of the mortar. If curing in extremely hot weather is required, it shall be done by dampening the masonry surfaces with a light fog spray so that water does not run down the surfaces.

Project Identification
No. LOU 1564.731

ITEM #7

8. STANDARD CONCRETE BLOCK (Cont'd)

.3 Concrete block shall be laid plumb, straight and true to line and to dimensions shown on the drawings. Concrete block (non seismic design) shall be laid with vertical joints staggered (running bond) in all areas unless otherwise shown on drawings. Concrete block walls designed for seismic criteria shall be laid with both horizontal and vertical joints continuous (stack bond). All joints shall not exceed 3/8". All exposed edges of block shall be sharp and true. No blocks less than one-half nominal length will be permitted. Wherever blocks have to be cut, the cuts shall be made square using a carbondum saw. Where plaster occurs, joints shall be raked 1/4" to form key for plaster. All exposed interior concrete unit joints, both vertical and horizontal, shall be tooled to a neat and slightly concave surface. Units installed around door frames, windows and lower openings, control joints, built-in items and where units support brackets, anchors or similar support shall be filled in solid with mortar.

R2

R1

.4 Full mortar bedding shall be used for the first course on the foundation and where cells are filled in solidly with mortar. Otherwise, face shell bedding shall be used. Where vertical reinforcement occurs, the cells shall be filled with mortar.

R2

.5 Where fresh masonry joins masonry that is partially or totally set, the exposed surface of the masonry wall already in place shall be cleaned and dampened when necessary to obtain the best possible bond with the new work. All loose masonry units and mortar shall be removed.

.6 Partitions shall be full height and shall be anchored to construction above as shown on drawings, unless otherwise noted.

R2

.7 Control joint material, flashing, reinforcing, anchors, lintels, pipe sleeves etc, as shown on the drawings, and as required shall be installed as the work progresses. Control joints shall be kept free of mortar.

R2

.8 Where vinyl base occurs on exposed block walls, a skim coat of neat cement plaster 4" high and sufficient to completely cover the area behind the base shall be applied. The skim coat shall be trowelled smooth and even to provide sufficient base for cementing the base. The top of the skim coat shall be feathered back to the wall, just below the top of the base.

R2

9. HORIZONTAL WALL REINFORCEMENT

.1 Spacing for interior walls shall be at 16 in. on centers vertically, unless noted otherwise on the drawings. Reinforcement shall be placed in first and second bed joints above and below openings. Reinforcement in first bed joints immediately above and below openings shall be a minimum of 10 feet in either direction beyond the opening or from column to column, whichever is less; in second bed joint it shall exceed 2 ft 0 in. beyond each side of opening. Reinforcement shall be lapped a minimum of 6 in. to insure continuity. Pre-

R2

R2

Project Identification
No. LOU 1564.738

9. HORIZONTAL WALL REINFORCEMENT (Cont'd)

- .1 (Cont'd)
fabricated corner reinforcement shall be of unequal length returns, one return to be a minimum of 48 in., the other return a minimum of 40 in. and shall be staggered in alternate courses.
- .2 Courses receiving reinforcement shall first receive full mortar bedding prior to embedding reinforcement so as to obtain proper bonding, and covered with an additional spread of mortar if necessary to insure full embedment.
- .3 Horizontal reinforcement splices shall be staggered vertically so that no splices in two adjoining courses are less than 8 in. horizontally apart. R2
- .4 Ties for partitions abutting partitions or walls shall be strips of metal lath or 1/4 in. mesh galvanized hardware cloth placed across the joints between the two walls. Ties shall be placed every 16 in. o.c. vertically in alternate courses with the Dur-O-Wal horizontal reinforcement in partitions. R2
- .5 Wall reinforcement shall not pass through control joints but shall be cut back 4 in. from edge of joints.

10. VERTICAL WALL REINFORCEMENT

- .1 Vertical wall reinforcement shall consist of steel reinforcing rods of the sizes detailed on the drawings. Bars shall be accurately placed and securely held in position at top and bottom before mortar is placed. R2
- .2 Splices in vertical reinforcing bars shall be made only at such points and in such manner that the structural strength of the member will not be reduced.
- .3 All vertical reinforcing bars shall be completely embedded in mortar and shall have a minimum of masonry cover of 1 1/2 inches, and mortar shall conform to ASTM C-476. R2
- .4 All block cores containing vertical reinforcement shall be filled with mortar (no filler block shall be used). Blocks shall be laid up so as to preserve the unobstructed vertical continuity of the cores to be filled. Mortar fins protruding from joints shall be removed before filling the cores. In filling vertical cores, the mortar placement shall not exceed four feet in height. During placement, the mortar fill shall be rodded or puddled to insure complete filling of the core. If the core filling is discontinued for one hour or more, the mortar shall be terminated 1 1/2 inches below the top of the block. R2

Project Identification
No. LOU 1564.738

11. SHIELDING BLOCK

.1 Shielding block shall be laid as shown on drawings, with at least one block per layer (wythe) containing a cast-in lifting device to permit removal. Blocks are to be laid in running bond. Each layer (wythe) is to be laid so that both horizontal and vertical joints are staggered with the joints of all other layers. Staggering of the horizontal joints in each layer may be achieved by having each first course of a different height.

R2

.2 Cutting of shielding block shall be done carefully with a masonry saw to avoid chipping or cracking of block. Any blocks that are not cut true and square shall be rejected.

R2

.3 The jamps, bottom and heads of all shielding block openings shall be filled solid with mortar conforming to ASTM C-476, except that heavy-weight aggregate conforming to ASTM C-637 be used. Each layer shall have these joints filled before installing the next layer.

R2

R3

12. CONTROL JOINT CAULKING

.1 Control joint surfaces shall be prepared for caulking in strict accordance with the Manufacturer's instructions. Surfaces shall be clean, dry and free of loose particles and laitance. Refer to caulking Specification No. LOU 1564.741G for additional information.

R2

13. CLEANING AND REMOVAL

.1 Care must be exercised during erection to protect the faces of masonry from being smeared or splattered with mortar, grout or splashing from activities performed on scaffolds; should faces be smeared or splattered, they shall be immediately cleaned before the mortar or grout has set.

R2

.2 At the completion of the masonry work, all masonry work shall be cleaned down and scaffolding and equipment removed. Debris, refuse and surplus material shall be cleaned up and removed from the premises.

14. CERTIFICATES

.1 Supplier shall furnish a certificate from an independent laboratory, stating compliance of the shielding block with these specifications, particularly with regard to aggregates, density and uniformity thereof and squareness of the block.

R2

.2 Supplier shall submit a certificate stating compliance of block with fire resisting rating.

15. SAMPLES

.1 Samples of all masonry shall be submitted for approval of finish and surface texture.

Ebasco Specification
Masonry

ITEM #7

Project Identification
No. LOU 1564.738

16. SEISMICALLY DESIGNED MASONRY CONSIDERATIONS

R3

.1 This revision to Specification LOU 1564.738 shall apply to masonry with seismically designed considerations. Materials shall be furnished in accordance with this addendum, Specification Ebasco LOU 1564.738, the purchase order and designated Ebasco design drawings. Should there be any conflict between this addendum and Specification Ebasco LOU 1564.738, the provisions of this addendum shall govern.

.2 Seller shall submit all test strength documentation along with material certification prior to shipping for the purchasers review and acceptance for the concrete block, horizontal wall reinforcement (Dur-o-wall) and the vertical wall rebars.

R3

.3 Tests of mortar and grout for reinforced masonry shall comply with ASTM C-476, shall be documented, and shall be available for the purchasers review and acceptance.

R3

.4 Seller shall be responsible for conformance to this specification. Any material found not to conform to specification Ebasco LOU 1564.738 or this addendum, whether upon delivery or after installation shall be rejected.

R3

.5 The Vendor shall specify the requirements to ensure that components to be furnished herein will be protected from any deterioration due to long term storage. Vendor is to submit requirements to Purchaser for review.

R3

These components shall be stored at level D as defined by ANSI N45.2.2.

FOR REFERENCE ONLY
SYSTEM STATUS SHEET

ITEM #7

Date 8-30-82

FCR or BEN No. CH-1315

Start-Up System 99C DD

1a) System Release Cut-Off
has occurred _____

1b) Complete work before
System Release:

N/A
Yes 1 No
(Asst. Supt. Start-Up Initial;
If "NO" Complete Item 3)

1c) Priority No. N/A

2) System was released on
N/A
(Complete Item 3)

3) Post System Release
Work Authorization No.
N/A
(Obtain from LP&L Start-Up)

4) Work Assignment
a) Affected By/Contractor
GEO Letter
6752-C-2141 EBASCO

b) Code _____ Non-Code _____

c) Work Assigned To:

- 1) Ebasco Force Account... ☒
2) Contractor..... ☐

1) System Release Cut-Off
has not occurred ✓

* Below review not required if
this block checked.

Review By:

B. J. Farrell 11/8/82
Asst. Supt. Start-Up

Senior Resident Engineer

Project Superintendent

N/A
Assistant Construction Superintendent

App. R	CCB
Env. Reg.	CIWA
IE Bull.	FJO
Lic. Comm.	N/A
NRC Quest.	TMI

DOCUMENTATION CHANGE ONLY
BY 11/8/82

SEP 20

ENTRY

EBASCO Civil
EBASCO SERVICES INCORPORATED
FIELD CHANGE REQUEST



ITEM #7

Section 1 thru 5 to be filled out by Construction. Section 6 to be filled out by Engineering.

PROJECT Waterford SES Unit 3 OPS NO. FCR-CH-1315

To J. DeBruin Dept E.S.S.E. Location Site Date 8-30-82

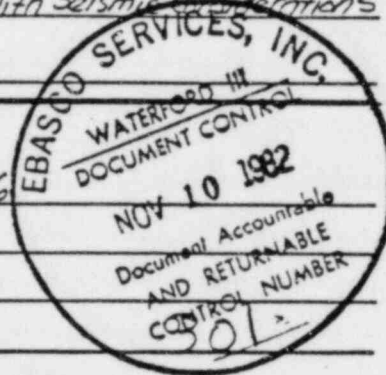
Re: ☐ Drawing No. _____ Title _____

☒ Spec No. 1564.738 R3 Title Masonry Non-Nuclear Safety Class with Seismic Considerations

☐ Other _____

1. DESCRIPTION (Items involved, submit sketch if applicable)

Mortar mix for seismic block walls per ASTM-C 476
CONSIDERED



2. AREA OF CHANGE

Technical
Cost
Schedule

☐ Major
☐ Major (> \$100,000)
☐ Major (Critical Path)

☒ Minor
☒ Minor (< \$100,000)
☒ Minor (Noncrit Path)

3. REASONS FOR CHANGE (If from disposition of nonconformance report, list report number)

ASTM-C476-80 does not address mortars, it only addresses grouts.

4. RECOMMENDED DISPOSITION (Submit sketch if applicable) ☒ Minor Change

☐ Major Change

All references in 1564.738 to ASTM-C 476 shall be changed
to ASTM-C 270. Refer to sections 6.1, 6.5b, 10.3, 11.3 and 16.3
of 1564.738.

Craig A. McBride

Sr Resident Engineer (Signature) [Signature] DATE 9/3/82 PROJECT Supt. CONCURRENCE (Signature) [Signature] DATE 9/14/82

6. DISPOSITION

☐ Not Approved (give reason)

☒ Considered Minor Change - Approved per Recommended Disposition - Design Documents will not be formally revised; field to maintain as-built records.

☐ Considered Major Change - Action will be taken as prescribed on DCN--

☐ Generic Impact - For feedback consideration. Copy to Mgr of Feedback Program (Engrg) - NY Office).

EBASCO SERVICES, INC.
RECEIVED

NOV 8 1982

ENGINEERING
DOCUMENT DEPT.
WATERFORD 3 FIELD

LEAD DISCIPLINE OR ESSE DESIGNER (Signature) [Signature] DATE 9.10.82 SUPERVISING ENGR OR ESSE DESIGNER (Signature) [Signature] DATE 9/14/82

Supervising Engineer signs and returns to LDE for transmittal to Sr Resident Engineer with copies to:

Project Engineer

Project Manager

Project Supt

PO&B (NOT)

ESSE RE

Coordinator

Proj Cost/Sched Engr

CONSTR CTRL Supt

Others as Required

H. L. HUGH

H. M. HUGH

P. C. LIU

J. P. CAGE

631/11-76



EBASCO SERVICES INCORPORATED

FIELD CHANGE REQUEST

FOR REFERENCE ONLY



IMMINENT ITEM #7

Sections 1 thru 4 to be filled out by Construction
Section 5 to be filled out by Engineering

PROJECT WATERFORD 3 OPS NO. FCR-45-1179

To W. HUBRICH Dept ESSE Location SITE Date 1/17/79

Re: ☐ Drawing No. Title

☒ Spec No. LOU 1564.738 Title MASONRY

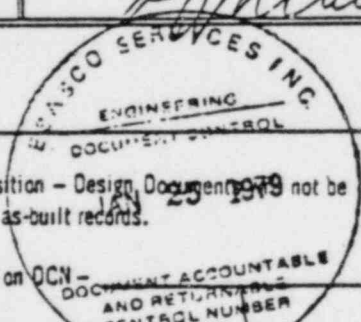
☐ Other

1. DESCRIPTION (Items involved, submit sketch if applicable)
PARA. 11.3 OF SUBJECT SPEC CALLS FOR USE OF HEAVY-WEIGHT
AGGREGATE IN MORTAR FILL AROUND SHIELDING WALLS.
AGGREGATE TO CONFORM TO ASTM C-637.

2. REASONS FOR CHANGE (If from disposition of nonconformance report, list report number)
AGGREGATE IS COSTLY, DIFFICULT TO OBTAIN AND APPARENTLY
NOT NECESSARY.

3. RECOMMENDED DISPOSITION (Submit sketch if applicable) ☒ Minor Change ☐ Major Change
DELETE REQUIREMENTS OF PARA 11.3 AND USE MORTAR
WITH NORMAL WEIGHT AGGREGATE.

4. SR RESIDENT ENGINEER (Signature) [Signature] DATE 1/19/79 PROJECT SUPV. CONCURRENCE (Signature) [Signature] DATE 1/19/79

5. DISPOSITION
☐ Not Approved (give reason)
☒ Considered Minor Change - Approved per Recommended Disposition - Design Document 158-25-1979 not be formally revised; field to maintain as-built records.
☐ Considered Major Change - Action will be taken as prescribed on OCN-


EBASCO SERVICES, INC.
RECEIVED
JAN 25 1979
ENGINEERING
DOCUMENT DEPT.
WATERFORD 3

LEAD DISCIPLINE/ESSE DESIGNEE (Signature) [Signature] DATE 1/24/79 SUPERVISING ENGINEER/ESSE DESIGNEE (Signature) [Signature] DATE 1-25-79

Supervising Engineer signs and returns to LDE for transmittal to Sr Resident Engineer with copies to:
Project Engineer Esse PE Others as Required K. ELACHINSKI
Project Manager Coordinator A. G. GAST
Project Supr C. L. GUTS G. NELSON

FIELD CHANGE REQUEST

FOR REFERENCE ONLY

ITEM #7

Section 1 thru 4 to be filled out by Construction

Section 5 to be filled out by Engineering

NON IMMINENT

PROJECT <u>WATERFORD-3</u>	OPS NO.	FIELD CHANGE NO. <u>FCR-AS-809</u>
To <u>G. BRUNDAGE</u> <small>(PER PROCEDURE E-37)</small>	Dept <u>ESSE</u>	Location <u>SITE</u> Date <u>6/20/78</u>
Re: <input type="checkbox"/> Drawing No. _____	Title _____	
<input checked="" type="checkbox"/> Spec No. <u>LOU 1564.738</u>	Title <u>MASONRY</u>	
<input type="checkbox"/> Other _____		

1. DESCRIPTION (Items involved, submit sketch if applicable)

SECTION 9.1 OF REFERENCED SPEC. CALLS FOR PREFABRICATED CORNER REINFORCEMENT WITH UNEQUAL LENGTH RETURNS OF A MIN. OF 28" & 40".

2. REASONS FOR CHANGE (If from disposition of nonconformance report, list report number)

THE ABOVE IS A NON-STANDARD SIZE & WILL RESULT IN INCREASED COST.

3. RECOMMENDED DISPOSITION (Submit sketch if applicable) ☒ Minor Change ☐ Major Change

CHANGE REQUIREMENTS OF PREFABRICATED CORNER REINFORCEMENT TO HAVE UNEQUAL LENGTH RETURNS OF 36" & 28"

SR RESIDENT ENGINEER (Signature) <u>W.C. Luggs</u>	DATE <u>6-20-78</u>	PROJECT SPT CONCURRENCE (Signature) <u>[Signature]</u>	DATE <u>6-20-78</u>
--	---------------------	--	---------------------

5. DISPOSITION

EBASCO SERVICES, INC.

RECEIVED

- ☐ Not Approved (give reason) _____
- ☒ Considered Minor Change - Approved per Recommended Disposition - Design Documents will not be formally revised but will contain as-built records.
- ☐ Considered Major Change - Action will be taken as prescribed on DCN - _____

JUN 29 1978

8.00

ENGINEERING

DOCUMENT DEPT.

WATERFORD 3 FIELD

LEAD DISCIPLINE/ESSE DESIGNER (Signature) <u>[Signature]</u>	DATE <u>6-22-78</u>	SUPERVISING ENGINEER/ESSE DESIGNER (Signature) <u>G. Brundage</u>	DATE <u>6/22/78</u>
--	---------------------	---	---------------------

Supervising Engineer signs and returns to LDE for transmittal to Sr. Resident Engineer with copies to:

Project Engineer
Project Manager

ACCOUNTABLE
DOCUMENT
AND RETURNABLE
CONTROL NUMBER

A. GROSS
R. TEAL
C. LEUTE

EBASCO SERVICES INCORPORATED
FIELD CHANGE REQUESTITEM #7
IMMINENTSection 1 thru 4 to be filled out by Construction
Section 5 to be filled out by Engineering

FOR REFERENCE ONLY

PROJECT WATERFORD SES# 3 OPS NO. AS 612
FCR- AS 612To E BRUNDAGE Dept ESSE Location SITE Date 3-6-78
(PER PROCEDURE E-37)Re: ☐ Drawing No. _____ Title _____☒ Spec No. LOU 1564.738 Title MASONRY☐ Other _____

1. DESCRIPTION (Items involved, submit sketch if applicable)
- The last sentence of SECTION 5.07 of the above spec. states, "Fire rated concrete block shall bear U.L.I. Classification Marking."

2. REASONS FOR CHANGE (If from disposition of nonconformance report, list report number)

It is not practical to mark every concrete block - standard commercial practice is to furnish certification of ASTM compliance

3. RECOMMENDED DISPOSITION (Submit sketch if applicable)

☒ Minor Change☐ Major ChangeChange the last sentence to read, "Fire rated concrete block shall ~~meet~~ be certified to U.L.I. Classification Requirements."SR RESIDENT ENGINEER (Signature) SEM

DATE

W.C. Duggan for B.D. Fowler3-7-78

SUPPORT CONCURRENCE (Signature)

DATE

5. DISPOSITION

☐ Not Approved (give reason) _____☒ Considered Minor Change - Approved per Recommended Disposition - Design documents will not be formally revised; field to maintain as-is☐ Considered Major Change - Action will be taken as prescribed

EBASCO SERVICES, INC.

RECEIVED

MAR 8 1978

3:10

ENGINEERING
DOCUMENT DEPT.

WATERFORD 3 FIELD

LEAD DISCIPLINE/ESSE DESIGNEE (Signature)

DATE

Fredrick C. Kleban3-8-78

SUPERVISING ENGINEER/ESSE DESIGNEE (Signature)

DATE

E Brundage3/8/78

Supervising Engineer signs and returns to LDE for transmittal to Sr Resident Engineer with copies to:

Project Engineer

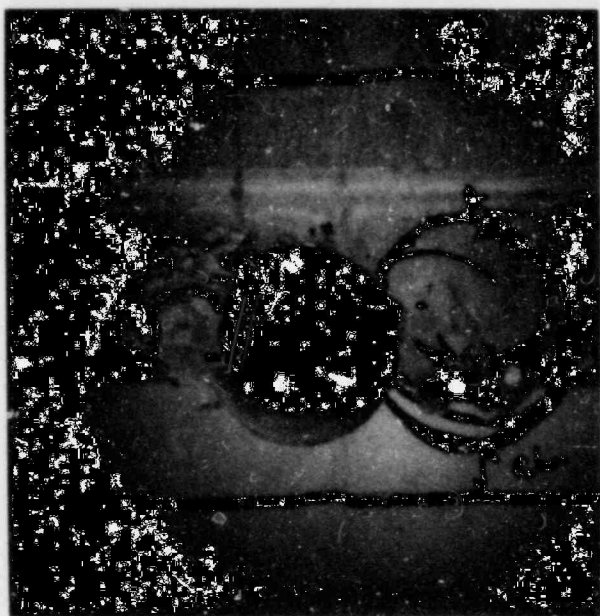
Esse PE

Others as Required

Project Manager

Coordinator

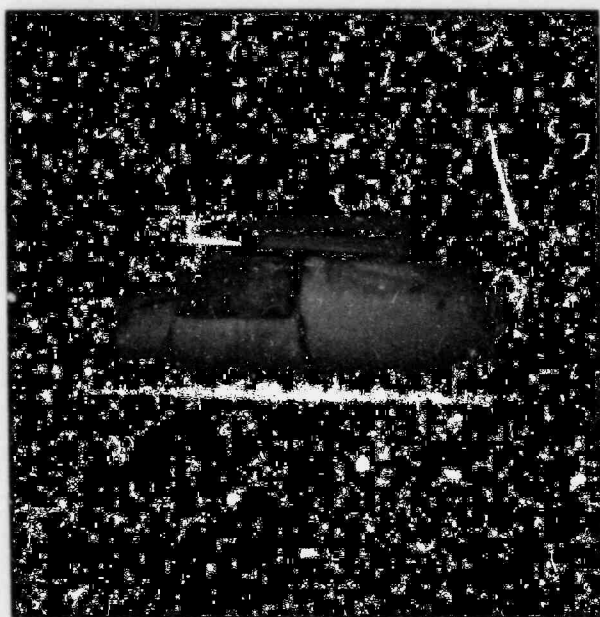
K. ILACHINSKIC. LEUTER. TEAL



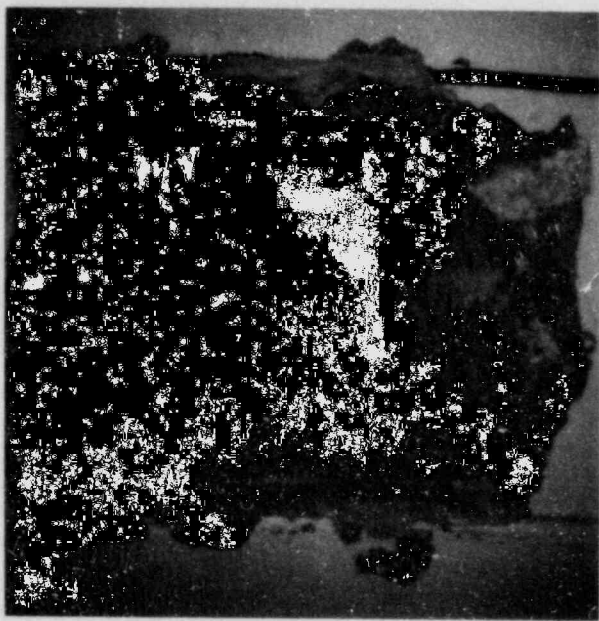
CORE HOLE S-1



CORE HOLE S-1



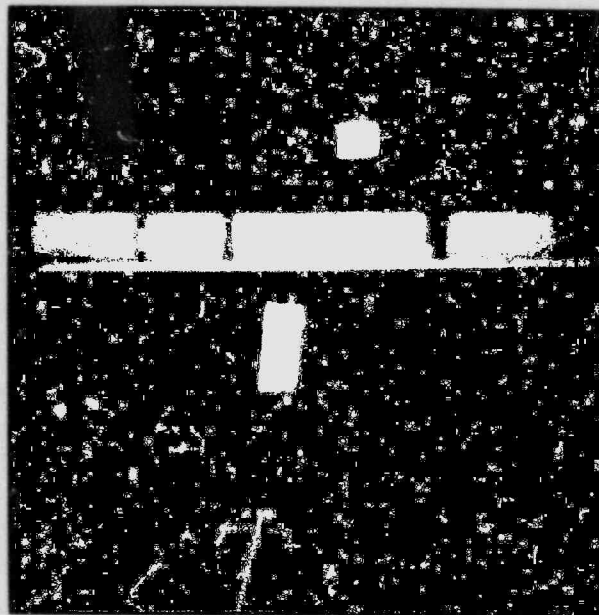
CORE HOLE S-1



- CORE HOLE S-21 -



- CORE HOLE S-21 -



- CORE HOLE S-21 -

DATE 9/27/84

FILE REF ES-10130-84

TO J. DeBruin

OFFICE LOCATION

FROM ^{BG} B. Grant/G. Aliberti ^{GA}

OFFICE LOCATION

SUBJECT LOUISIANA POWER & LIGHT COMPANY
WATERFORD SES - UNIT NO. 3
CONCRETE MASONRY BLOCK WALLS

The concrete masonry block wall H6 and H7 located at Elevator Machine Room EL.-34.75' are constructed with running bond pattern instead of stack bond. The walls are 8" concrete block above the 1'-10 concrete curb from EL. -32.67' to EL. -24.67 with a 6" slab over. They are reinforced with vertical reinforcement @ 48" o.c. in the block cells and with duro-wal every other courses. The structural analysis indicates that the walls are adequate for the applied loads.

Therefore the drawing can be revised to denote block pattern and to be accepted as-built. WALLS H7 & H6 ARE THE EXCEPTION AS THAT THE BLOCKS ARE OF RUNNING BOND INSTEAD OF STACK

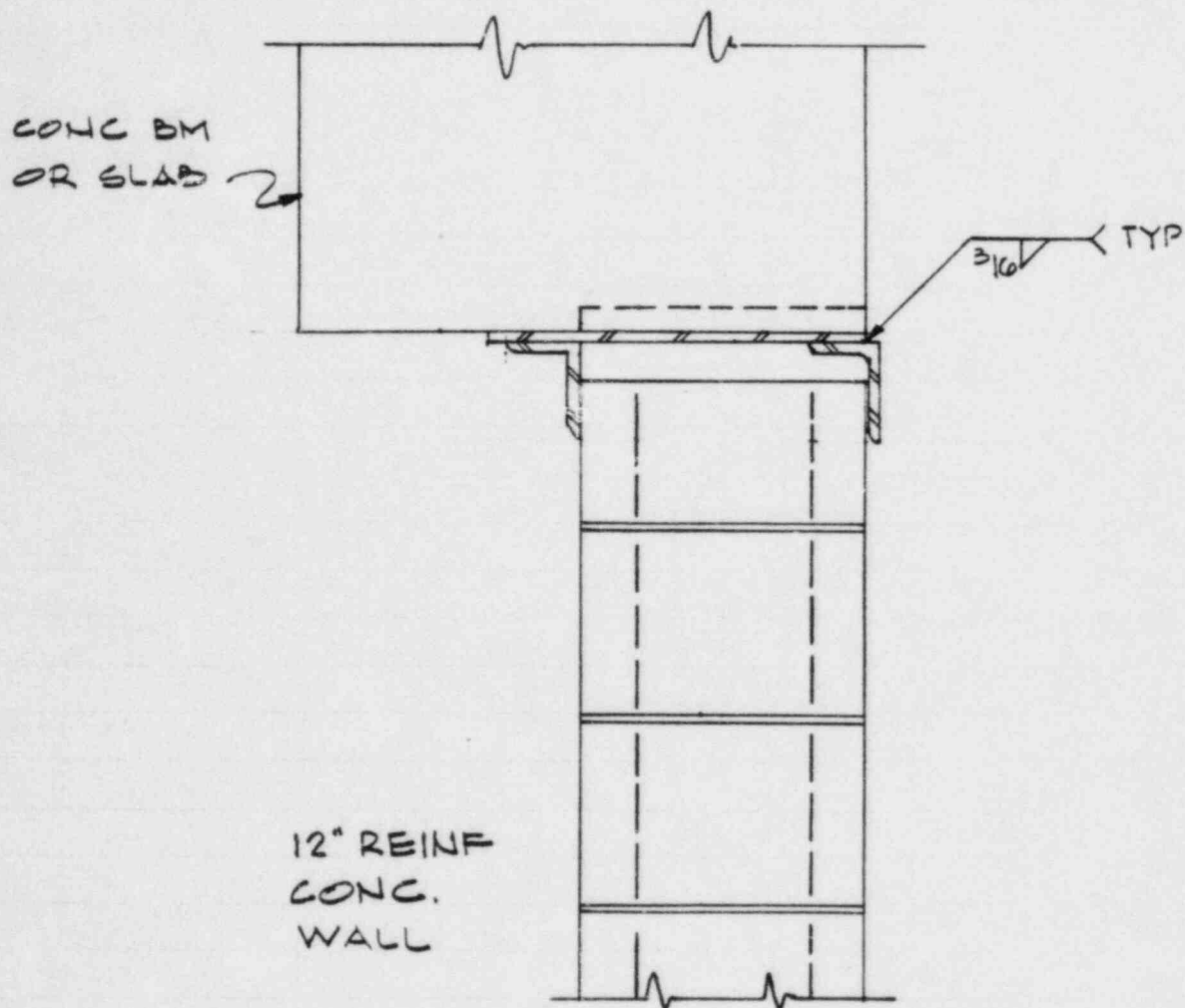
BG/GA/tw

BOND
GA 9-27-84cc: J. Houghtaling
E. Kowalski
B. Grant
G. Aliberti
A. Bishara
B. Esnes
L. Biller
ESSE File P. 83

BY G. Aliberti DATE 9-26-84SHEET 1 OF 1CHKD. BY K. Shul DATE 9-30-84OFS NO. _____ DEPT. NO. 653CLIENT LP & LPROJECT WATERFORD SES #3SUBJECT CONCRETE BLOCK WALLS

ITEM #3

PART DET DN
REF DWG G-700303



BY E. KRIVKOV DATE 9-27-84SHEET 1 OF 1CHKD. BY KSKH DATE 9-30-84OFS NO. _____ DEPT. NO. 653

CLIENT _____

LP & L

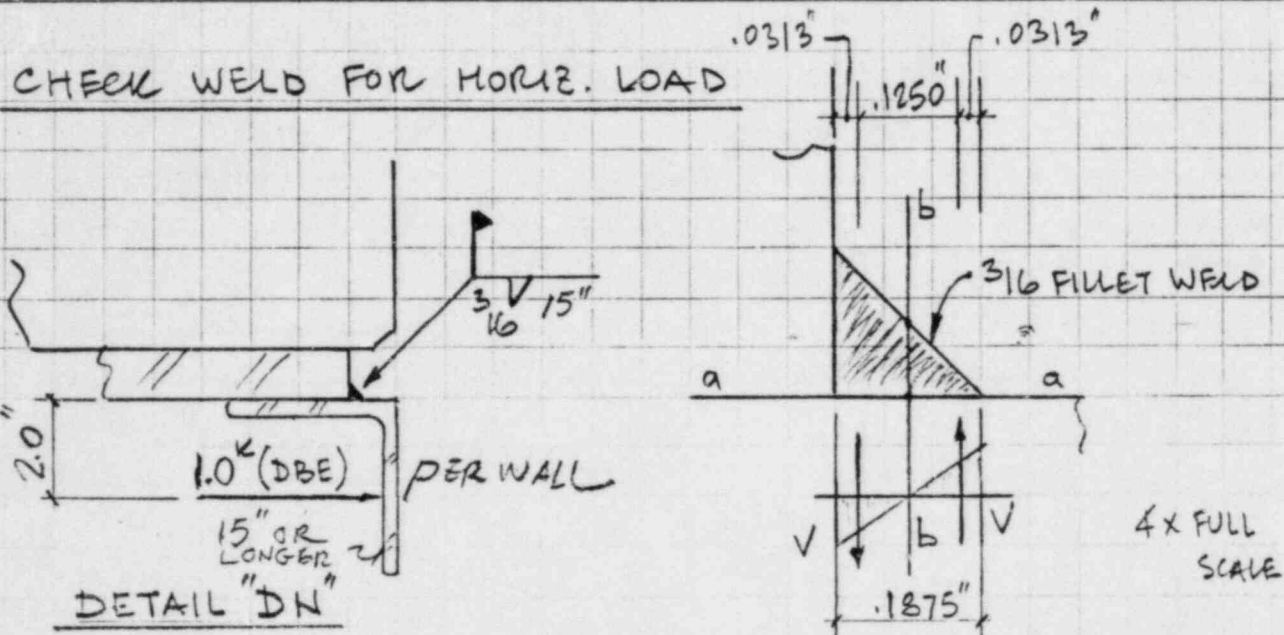
PROJECT _____

WATERFORD #3

SUBJECT _____

CONCRETE BLOCK WALLS.

ITEM #8



ASSUME THAT 3/16 FILLET WELD IS RESISTING (15" LG)

$$M = 1.0^k \times 2.0' = 2.0^k \cdot \text{in} \quad \& \quad H = 1.0^k \quad P_H = 1.0^k \div 15" = .07^k/\text{in}$$

$$S_{\text{WELD}} = 15" \times .1875^2 \div 6 = .0879 \text{ in}^3 \quad f_v = .07 \div (3/16) \times .707 = .53 \text{ ksi}$$

$$f_b = 2.0 \div .0879 = 22.76 \text{ ksi}$$

$$22.76 \div 21.0 = 1.08 \therefore 8\% \text{ OVER}$$

$$f_R = (22.76^2 + .53^2)^{1/2} = 22.77 \text{ ksi} < 21.0 \times 1.3 = 27.3 \text{ ksi} \quad \text{"DBE"}$$

CHECK WELD FOR MOMENT DUE TO V @ SECT b-b

$$V = 2.0 \div .1250 = 16.0^k \quad \text{OR} \quad V' = 16.0^k \div 15" = 1.07^k/\text{lin. in}$$

$$S_1 = 1.0 \times .0938^2 \div 6 = .0015 \text{ in}^3/\text{in}$$

$$M_{bb} = 1.07^k \times (.1250 \div 2 - .0313) = .0333^k \cdot \text{in}/\text{in}$$

$$f_{1b} = .0333 \div .0015 = 22.26 \text{ ksi} \quad 22.26 \div 21.0 = 1.06 \therefore 6\% \text{ OVER}$$

\therefore OK BECAUSE LOADING IS "DBE"

CONCLUSION:

WELD IS ACCEPTABLE AS BUILT.

BY G Wu DATE 9/26/84

SHEET 1 OF 4

CHKD. BY K Shih DATE 9-30-84

OFS NO. _____ DEPT. NO. 653

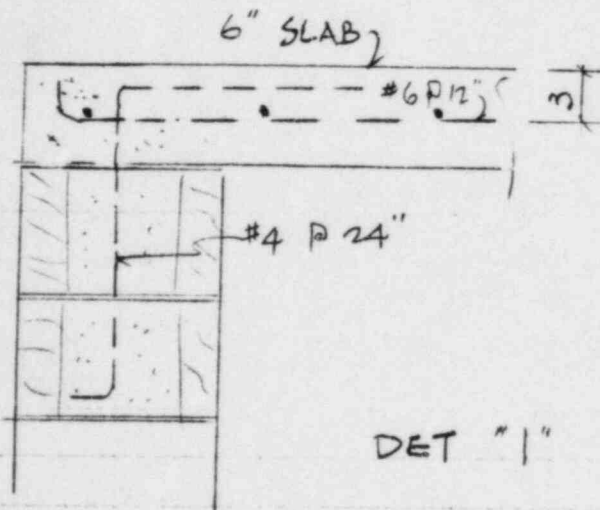
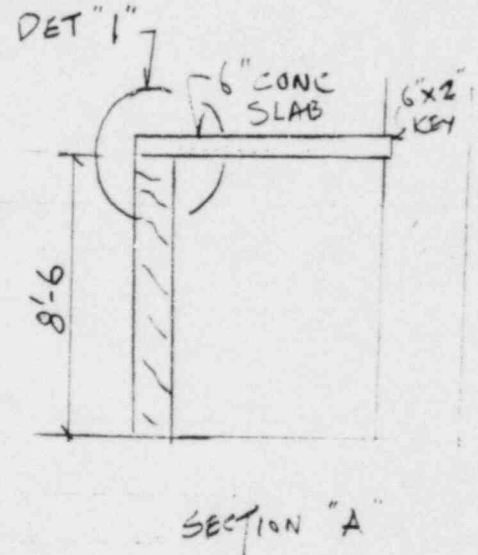
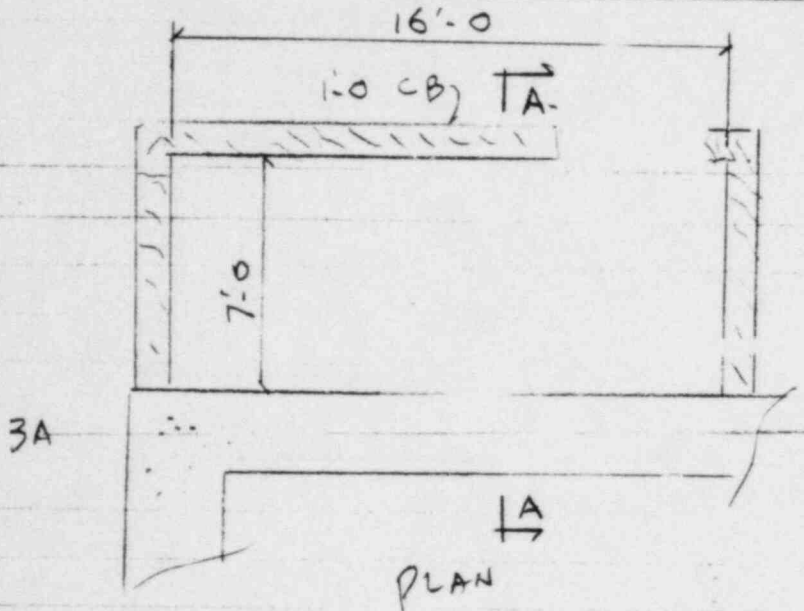
CLIENT LP & L

PROJECT WATERFORD III

SUBJECT CONCRETE MASONRY WALL

ITEM # 9

WALLS 18, 19 & 20 (STAIRWELL #7)



THE 6" CONCRETE SLAB
SUPPORTED THREE SIDES
ON BLOCK WALL IS
KEYED INTO THE CONC
REINF. WALL ON
COL LINE 3A

THE WIDTH TO LENGTH
RATIO = $\frac{8}{18} = .44$

THE SLAB SHALL BE
TREATED AS ONE WAY
SLAB

REF: G760 S02
G572 S01

BY G. WU DATE 9/26/84SHEET 2 OF 4CHKD. BY K. Smith DATE 9-30-84

OFS NO. _____

DEPT. NO. _____

CLIENT LP & LPROJECT WATERFORD IIISUBJECT CONCRETE MASONRY WALLITEM # 9QUESTION NO. 9

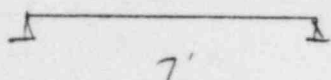
FOR 6" CONCRETE SLAB

$$W = 150 \times .5 = 75 \text{ lb/ft D.L.}$$

$$W = 30 \text{ lb/ft L.L.}$$

- ① TAKE 1' STRIP OF SLAB.

$$w = 105 \text{ lb/ft}$$



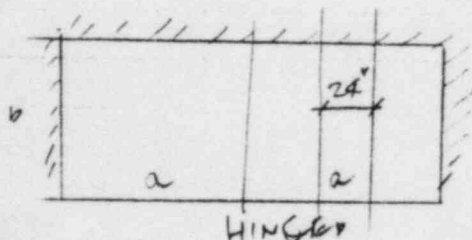
ASSUME SIMPLY-SUPPORTED

$$M_{\pm} = \frac{1}{8} w l^2 = \frac{1}{8} (105) (7)^2 = 643.1' \text{ } ^{\#}$$

$$= 7717.5' \text{ } ^{\#}$$

$$j = .73$$

$$d = 3'$$



$$A_s = \frac{M}{f_s j d} = \frac{7717.5}{24,000 \times .73 \times 3} = 0.120'$$

$$< .220' \text{ O.K.}$$

* #4 @ 24" REINF. HAS BEEN PROVIDED @ THE TOP OF THE BLOCK WALL.

- ② ASSUMED THE SLAB IS FIXED @ THE BLOCK WALL AND HINGED AT THE CONC WALL

$$M = 0.0664 p b^2 = 0.0664 \times 105 \times (7)^2 = 311.6' \text{ } ^{\#} = 4099.5' \text{ } ^{\#}$$

$$\left[\frac{a}{b} \approx 1. \text{ ENG'G MONOGRAPH NO. 27} \right]$$

FOR 24" OF SLAB

$$M = 2 \times 4099.5 = 8199' \text{ } ^{\#}$$

$$A_s (\text{REQ'D}) = \frac{M}{f_s j d} = \frac{8199}{24,000 \times .73 \times 3} = 0.13'$$

$$< .220' \text{ O.K.}$$

- ③ CONSIDER A BEAM 24" WIDE. FIXED AT ONE END & HINGED @ OTHER

$$M_{\text{MAX}} = \frac{1}{8} w l^2 = \frac{1}{8} (105) (7)^2 = 643.1' \text{ } ^{\#}$$

THIS IS SAME AS CASE ① & IS O.K.

BY G WU DATE 9/26/84

SHEET 3 OF 4

CHKD. BY K. Shultz DATE 9-30-84

OFS NO. _____ DEPT. NO. _____

CLIENT LP & L

PROJECT WATERFORD II

SUBJECT CONCRETE MASONRY WALL

ITEM # 9

③ ASSUME SLAB & WALL ACT AS A BAND OF 1' WIDTH

$$W = 105 \text{ lb/ft}$$

$$M_L = \frac{W L^2}{12} = \frac{105 \times 7.5^2}{12} = 492.2$$

A NO AXIAL LD

ASSUME "I" = $\frac{I}{6}$ ARE THE SAME FOR THE 6" SLAB AND THE 12" BLOCK WALL.

$$\begin{array}{r} +492.2 \\ -246.1 \\ \hline -246.1 \end{array}$$

B W/ AXIAL LD

$$\begin{aligned} 105 \times \frac{35}{2} &= 184 \text{ \#/ft (AVG)} \\ 8.5 \text{ WALL } 8.5 \times 9 &= 765 \text{ \#/ft} \\ \text{DESIGN } P &= 765 \times 1.3 = 995 \text{ \#/ft} \\ \frac{P}{A} &= \frac{995}{86} = 12 \text{ psi} \end{aligned}$$

$$M = 246.1 \text{ \#} = 2953.2 \text{ \#}^2$$

*A = 1 HOLLOW WALL
SEE SH. A-1

$$K = \frac{M}{f_m I} = \frac{2953.2}{12 (6)^4} = 6.8$$

$$f_m = \frac{2(K)}{R U} = \frac{2(6.8)}{0.5(0.8)} = 34 \text{ psi}$$

$$A_s = \frac{2953.2}{4000 \times 3 \times 6} = 1.023 \text{ \#}^2$$

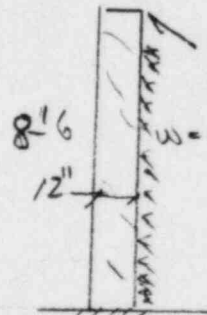
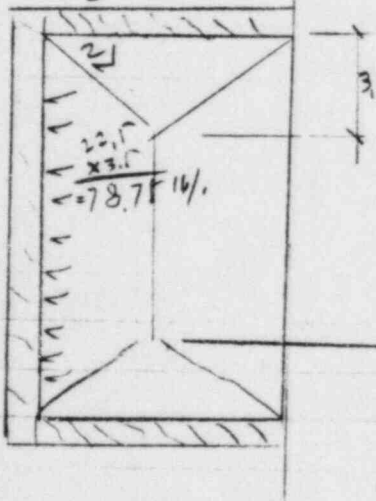
< 1 \text{ \#}^2 \text{ O.K.}

$$\text{TOTAL } f_m = 12 + 34 = 46 \text{ psi} < 169 \times 1.3 \text{ psi O.K.}$$

④ ASSUME UNDER EARTHQUAKE CONDITION, BLOCK WALLS TAKE ALL THE HORIZONTAL LOAD.

FROM THE 6" SLAB

$$W = .3 \times 150 \times .5 = 22.5 \text{ \#/ft}$$



$$I = \frac{1}{12} (12) (8.5 \times 12)^3$$

FOR BLOCK WALL

$$W = .3 \times 7 \times 90 = 189 \text{ \#/ft}$$

DEFLECTION @ TOP OF THE SHORT WALL (7')

$$\Delta = \frac{P L^3}{3 E I} + \frac{W L^4}{8 E I}$$

$$= \frac{L^3}{E I} \left[\frac{P}{3} + \frac{W L}{8} \right]$$

$$= \frac{(8.5 \times 12)^3}{675000 \times \frac{1}{12} (17 \times 12)^3} \left[\frac{275.6}{3} + \frac{189 \times 7}{8} \right]$$

$$= .00043 \text{ \#}$$

VERY SMALL

SINCE THE Δ IS SO SMALL, THE SLAB EARTHQUAKE LOAD HAS LITTLE EFFECT ON THE BLOCK WALL DESIGN.

BY G WU DATE 9/26/84
 CHKD. BY K SSK DATE 9-30-84
 CLIENT LP & L

SHEET 4 OF 4OFS NO. _____ DEPT. 653
NO. _____

CLIENT _____

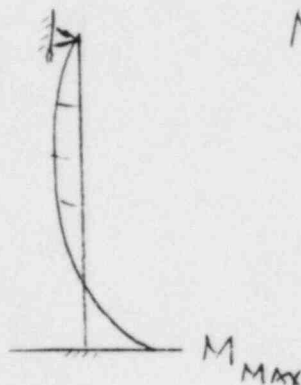
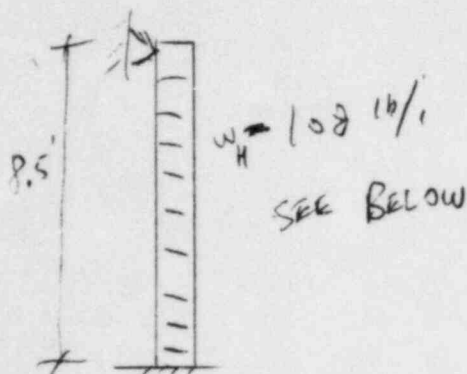
PROJECT _____

WATERFORD S.E.S. #3

SUBJECT _____

CONCRETE MASONRY WALLITEM #9

A) CHECK WALL UNDER HORIZONTAL LOAD



$$M_{\text{MAX}} = \frac{w_h^2}{8} = \frac{108 \times 8.5^2}{8}$$

$$= 975.4 \text{ ft} \cdot \text{lb}$$

$$= 1170.5 \text{ in} \cdot \text{lb}$$

$$A_s = \frac{M}{f_s j d} = \frac{1170.5}{24000 \times 0.87 \times 9}$$

$$= 0.06 \text{ in}^2$$

FOR 12" WALL, $w = \frac{2 \times 60 + 150}{3} = 90 \text{ lb/ft}$

FOR A STRIP OF 48", $w = 4 \times 90$
 $= 360 \text{ lb/ft}$

THE HORIZONTAL FORCE

$w = 0.3 \times 360$
 $= 108 \text{ lb/ft}$

SHEAR

$V = \int (108) \times 8.5$
 $= 570 \text{ lb}$

$\leq 88 \text{ lb/ft}$
 (2×6)
 O.K.

$\tau = \frac{570}{48 \times 0.87 \times 9} = 1.6 \text{ psi} < 2.0 \times 1.3$
 psi

CONCLUSION:

O.K.

THE 6" CONCRETE SLAB ON TOP OF THE BLOCK WALL CAN BE SAFELY SUPPORTED BY THE WALL.

BY G. WU DATE 9/26/84
 CHKD. BY K. Gill DATE 10-1-84
 L P & L

SHEET 1 OF 1
 DEPT. 653
 NO. 653

OFS NO. _____

CLIENT _____

WATERFORD S.E.S. #3

PROJECT _____

CONCRETE MASONRY WALL

ITEM #16

SUBJECT _____

HOLLOW BLOCK WALL - 12" THICK

VERTICAL REINF. BARS 4-#6 @ 48"
 HORIZONTAL DUR-O-WALL TRUSS WITH 3/16" ROD @
 EVERY OTHER COURSE

$$A_{S.V} = .44 \times 4 = 1.76 \text{ } ^\circ$$

NO. 9 GAGE DIAGONAL

$$A_{S.H} = \frac{\pi}{4} (3/16)^2 \times 2 + \frac{\pi}{4} (1.15)^2 \cos 51^\circ = .066 \text{ } ^\circ$$

* THE AVERAGE HORIZONTAL CROSS-SECTIONAL AREA FOR A HOLLOW BLOCK IS 114.4" ^{TWO COURSES}

$$A_{VERT} = \frac{114.4 \times 8}{16} = 57.2 \text{ } ^\circ \times 2 = 114.4 \text{ } ^\circ$$

$$\text{VERTICAL STEEL} = \frac{A_{S.V}}{A_H} = \frac{1.76}{114.4} = .015$$

$$\text{HORIZONTAL STEEL} = \frac{A_{S.H}}{A_V} = \frac{0.066}{114.4} = .00057$$

$$\text{HORIZONTAL + VERTICAL} = .015 + .00057 = .01557$$

By Code **
 11.3.2.2

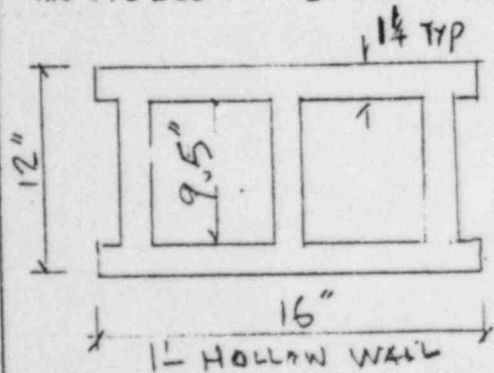
.0007

.0007

.002

* HOLLOW BLOCK AREA

** ACI 931



HOLLOW BLOCK

$$A_{HORIZ.} = 1.25 \times 16 \times 2 + 1.25 \times 9.5 \times 3 = 40 + 35.6 = 75.6 \text{ } ^\circ$$

SOLID BLOCK

$$A_{HORIZ.} = 16 \times 12 = 192 \text{ } ^\circ$$

$$\text{NET AREA} = 114.4 \times \frac{12}{16} = 86 \text{ } ^\circ$$

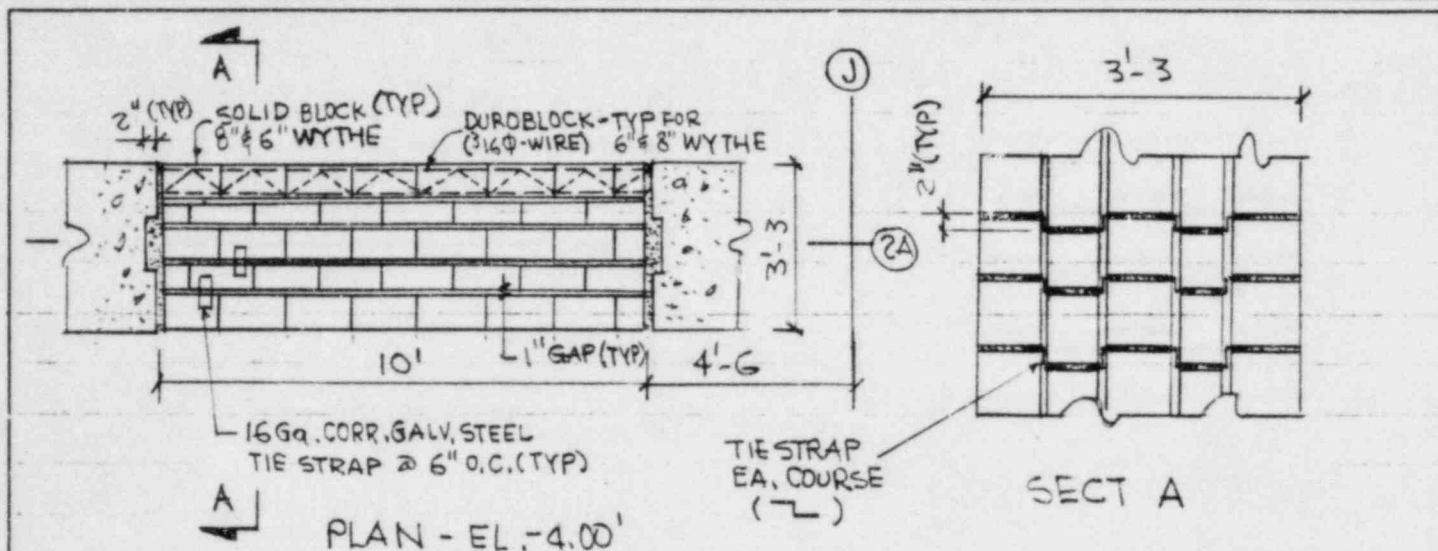
FOR A 48" WIDTH

$$\text{FOR A 48" WIDTH } A_H = \frac{2 \times 75.6 + 192}{3} = 114.4 \text{ } ^\circ$$

BY A. LEON DATE 10/2/84
 CHKD. BY keuh DATE 10-3-84
 CLIENT LP&L

SHEET 1 OF 2
 DEPT. 653
 OFS NO. _____

PROJECT WATERFORD #3 ITEM # 10
 SUBJECT CONC. BLOCK WALLS - WALL S21 - LOAD TRANSFER FOR MULTI-WYTHE WALL



1. REFERENCES:

1.1 DWGS. G-765501 & G-765502.

1.2 CALCULATIONS FOR CONC. BLOCK WALLS - REVIEW DONE ON 3/15/84.

2. CRITERIA:

2.1 EA. WYTHE IS EVALUATED AS STANDING BY ITSELF. THE CRITICAL ONES ARE 6" WYTHE

2.2 THE WALL IS CONSIDERED AS SPANNING HORIZONTALLY.

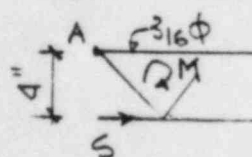
3. STRESSES ON DUROBLOCK:

$$W = 140 \text{ #/cf.}$$

$$\text{FOR } 6" \text{ WYTHE \& } 8" \text{ HEIGHT (1-COURSES), } W = 140 \times \frac{6}{12} \times .67 = 47 \text{ \#}$$

$$\text{FOR SEISMIC FACTOR OF } .39 \text{ THE HORIZ. LOAD} = .3 \times 47 = 14 \text{ \#}$$

$$M = .125 \times 14 \times 10^2 = 175 \text{ \#} \quad V = .5 \times 14 \times 10 = 70 \text{ \#}$$



$$S = 175 \times 12 / 4 = 525 \text{ \#} \quad \text{AREA WIRE} = \pi \times (.19)^2 / 4 = .028 \text{ in}^2$$

$$f_t = 525 / .028 = 18750 \text{ psi} = 18.7 \text{ KSI} < .60 \times 65 = 39 \text{ OK}$$

SHEAR ON GROUT:

$$v = 70 / 6 \times 8 \times .85 = 1.7 \text{ psi} < 20 \times .13 = 26 \text{ OK}$$

8" WYTHE IS NOT CRITICAL COMPARED WITH THE 6" WYTHE, THEREFORE IS OK.

DEFLECTION OF 6" WYTHE: $\Delta = 5 \times 14 \times 120^4 / 384 \times 675000 \times (8 \times 6^3 / 12) \approx 38" < 48"$

SPACE AMONG WYTHES IS 1" FROM FIELD INFORMATION.

BY A. LEON DATE 10/2/84
CHKD. BY R. Phil DATE 10-4-84
CLIENT LP&L

SHEET 2 OF 2
DEPT. NO. 653

OFS NO. _____

PROJECT WATERFORD # 3ITEM # 10SUBJECT CONC. BLOCK WALLS - WALL S21-LOAD TRANSFER FOR MULTI WYTHE WALLS

1. THEREFORE EA. WYTHE STANDS BY ITSELF BECAUSE THE SPACE AMONG WYTHES IS 1" AND THE DEFLECTION OF THE WYTHE IS 38". WYTHES DO NOT TOUCH. THE WYTHES ARE TIED TOGETHER WITH 16GA. CORRUGATED GALVANIZED STEEL TIE STRAPS AT 6" O.C.
2. THE WYTHES THRU THE DUROBLOCK ADEQUATELY TRANSPORT THE HORIZONTAL LOAD, GENERATED UNDER EARTH QUAKE CONDITIONS, TO THE CONC. WALLS THRU THE GROUT WHICH IS ADEQUATE TO TRANSFER THE LOAD.
3. BEARING ON GROUT:
 $W = 3.25' \times 140 \times 10' = 4550 \#$; $H = 4550 \times 3 = 1365 \#$
 $BEARING = 1365 / (2' \times 12' \times 2.5 (NRC-SRP)) = 23 \text{ psi} < 169 \text{ OK}$
4. BASED ON THE ABOVE, WALL S21 IS ADEQUATE 'AS BUILT'

BY A. LEON DATE 10/5/84
CHKD. BY R. Shih DATE 10-5-84
CLIENT LP&L

SHEET 1 OF 1
DEPT. NO. _____

OFS NO. _____

PROJECT WATERFORD #3

SUBJECT CONC. BLOCK WALLS - AS BUILT DETAILS ADEQUACY - ITEM #10

1. THE AS BUILT DETAILS USED AT DIAPHRAGM INTERFACE AND STRUCTURAL ADEQUACY OF THE AS BUILT CONDITION WAS EVALUATED ON ITEM #2, COPY ATTACHED.

BY A. LEON DATE 9/25/84

FOR REFERENCE

SHEET 1 OF 1CHKD. BY GWU DATE 9/25/84

ONLY

OFS NO. _____

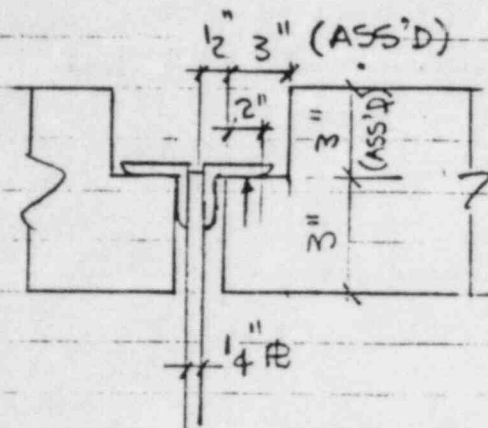
DEPT. NO. 653CLIENT LP & LPROJECT WATERFORD # 3

ITEM 10

SUBJECT CONC. BLOCK WALLS - LATERAL SUPPORTS

(ITEM # 2)

CONC. BLOCK WALL - SIDE SUPPORT, - 10' C/C.



WALL THICKNESS = 4.5' (6-ROWS)

1. LOADS: $w = 140 \text{ \#/cft}$.

$$R = .140 \times 4.5' \times 5' \times 8"/12" = 2.1 \text{ K (FOR 8" COURSE)}$$

2. EARTHQUAKE FACTOR = .30

3. HOR. LOAD = $2.1 \times .3 = .63 \text{ K/1}$

4. SHEAR AT THE REDUCED SECTION:

$$U = 630/8 \times 3 = 26.25 \text{ psi} \approx 20 \times 1.3 = 26. \text{ (NRC-SRI)}$$

5. BEARING:

ASSUMED AREA FOR BEARING: (MASONRY)

$$2" \times 8" = 16 \text{ in}^2$$

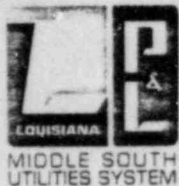
$$630 \text{ \#/16} = 39.4 \text{ psi} < 170 \quad \text{OK} \checkmark$$

6. REQ'D THICKNESS OF L:

$$M = .63 \times 1.5 = .95 \text{ K-in} \quad F_k = 27 \text{ psi}$$

$$S = .95/27 = .04 = \frac{1}{6} \times 8 \times t^2 \therefore$$

$$t = .16" < .25" \text{ OK} \checkmark$$



LOUISIANA

POWER & LIGHT / INTER-OFFICE CORRESPONDENCE

October 12, 1984

SCRATCH MEMORANDUM

TO: K.W. Cook

FROM: R.F. Burski

SUBJECT: WATERFORD SES UNIT NO. 3
STATUS OF MASONRY BLOCK WALL IN BETWEEN CCW
HEAT EXCHANGER A ROOM AND PIPE CHASE

As you are aware, the subject wall has not been completed, in order to allow access for LP&L Plant Staff monitoring and verification activities, related to piping and pipe support systems during post core hot functional testing. This wall is scheduled to be completed subsequent to these activities.

During the field surveillance on September 25, 1984, several discrepancies were noted in the construction of this wall, such as loose bolts, incomplete grouting and inordinate spacing between wythes. These conditions are attributed to the partially completed status of the wall as discussed above. Noted deviations from specified design details will be corrected during the completion process.

It should be also noted that at present, a design change is under consideration by LP&L involving the addition of permanent access into the pipe chase. The attached LP&L CIWA 840056 provides the background related to the proposed change.

R.F. Burski
R.F. Burski

RFB/st

cc: T.F. Gerrets, R.P. Barkhurst, N.S. Carns, D.E. Dobson, R.S. Leddick,
R.W. Prados, File

DESIGNED BY: Don Pruet CONDITION IDENTIFICATION WORK AUTHORIZATION LCIWA NO. 840056

ORIGINATOR: Don Pruet PE DEPT. 1/4/84 TIME 0800 4. SYSTEM NO AND TITLE 19-36-STRUCTURES 5. EQUIP-LCC-BLDC-ELEV. RAB+21

MOMENT NAME AND UNID NO. PIPE CHASE - RAB -4 To +21 7a. REFERENCE 1564 - G 554 SOI XX SH20F2

REF. 1564 - G 556 SOI 7b. REFERENCE 1564 - G 763 SOI ITEM # 11

DESCRIPTION OF PROBLEM:

PIPE CHASE ON NORTH SIDE OF WALL AT "L" LINE BETWEEN COLUMN LINES "3A" & "5A" SHOWN ON REFERENCED DRAWINGS IS DESIGNED TO BE SEALED USING CONCRETE BLOCKS PLACED IN THE CONSTRUCTION OPENINGS AT EL. -4 AND +21. THIS PIPE CHASE HAS APPROX. 80 HANGERS, SNIPPERS, OR SPRING CANS WHICH MUST BE INSPECTED THROUGHOUT THE LIFE OF THE PLANT AS PART OF THE INSERVICE INSPECTION PROGRAM. CLOSING THE EXISTING CONSTRUCTION OPENINGS WITH CONCRETE BLOCK WILL NOT PROVIDE THE NECESSARY ACCESS TO THIS CHASE.

SIGNATURE D. Pruet DATE 1-4-84 ☐ SEE ADDENDUM PAGE

PRIORITY	10. CONDITION CATEGORY	11. CONDITION STATUS	12. CA TYPE	13. LICENSEE EVENT REPORT	14. FAILURE MODE	15. FAILURE DETECTION	16. SYSTEM STATUS	17. EFFECT ON PLANT	18. EFFECT ON PLANT CONC.
1.9	NA	N/A	NS-CA	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	N/A	N/A	N/A	N/A	10

DISPOSITION: ORIGINAL ☐ INVALID REPORT ☐ CONTROLLED MAINT. ☒ QUESTION TO ESSE ☐ UNCONTROLLED MAINT.

21. ASSIGNED WORK GROUP: ESSE-Civil

ACTION DUE DATE: 1-13-84

2. CONTROLS REQUIRED	YES	NO	PROCEDURES
UNFINED SPACE ENTRY		<input checked="" type="checkbox"/>	
LODGE WORK PERMIT		<input checked="" type="checkbox"/>	OWGS. OR OTHER PER MIT.
LOGGING		<input checked="" type="checkbox"/>	OTHER:
EE/PMH APPROVAL REQ.		<input checked="" type="checkbox"/>	

INITIAL CORRECTIVE ACTION: WHERE POSSIBLE, IDENTIFY RETEST REQUIREMENTS

ESSE EVALUATE AND PROVIDE DESIGN WHICH WILL ALLOW EASY ACCESS TO THIS CHASE SUCH AS HOLLOW METAL DOORS AT +21.

PREPARED BY: D. Pruet DATE: 1-4-84 APPROVED BY: D. Pruet DATE: 1-4-84 ☐ SEE ADDENDUM PAGE

LCIWA SIGNATURE AND DATE: D. Pruet 1-4-84 YES ☐ NO ☐ NO ☐

CC SIGNATURE & DATE

Revision 6 Attachment 5,1 - Page 1 of 2

CIWA

CIWA
NO.

340056

ADDENDUM PAGE

DATE

5/2/84

SH 3 OF 3

EX NO.

TITLE:

ITEM #11

A hollow metal doors as access to pipe chase is not feasible. Pipe chase enclosure walls are design to withstand three hour fire rating & radiation dose rate level greater than 100.0 mr/hr. Existing are four through accesses which satisfy this criteria.

They are located, two at (EL. + 21) & two at (EL. -4) between column lines 3A & 5A. These accesses are sealed by removable concrete block wall panels. Each panel can be dismantle within approximately 20 manhours. This include disposal of contaminated mortar, removal and stacking of the blocks with durowalls which is reused. The duration to reinstalled panels are 16 manhours per panel.

If your inservice inspection programs will be more frequent that your refuel outage then the need for easier access will exist, also provision will have to be made for access within the pipe chase to the equipment being serviced. The pipe chase is 56'-0 high without intermediate floors which would make frequent servicing of instruments & equipment within the pipe chase time consuming.

The final inservice inspection procedures for this pipe chase need to be evaluated, if they are frequent enough to warrant the change in design. If this is so then there are several options to be selected from such as

- 1) Provide 2'-0 thick concrete motorized door on track at one of the existing panels. This would be the most easy access but by far the most expensive.
- 2) The blowdown heat exchanger room and pipe chase at FL EL -4'-0 both have radiation dose rate level greater than 100.0 mr/hr. The difference in radiation level maybe so minute that the access panel in this area can be replaced by a removable 3 hr/fire rating panel with a light weight free standing shielding in front of it. The difference in radiation level may cause the shielding to need a lifting device.
- 3) Provide 2'-0 thick concrete labyrinthine wall on the north side of the pipe chase with controlled access gate & 3 hr./fire rating removable panels at one of the existing panels.

All three schemes would have catwalks and ladders within the pipe chase.

cc: Dick Diener NW

J. Houghtaling

B. Grant

L. Biller

FOLLOW-UP ACTION

☒ NY

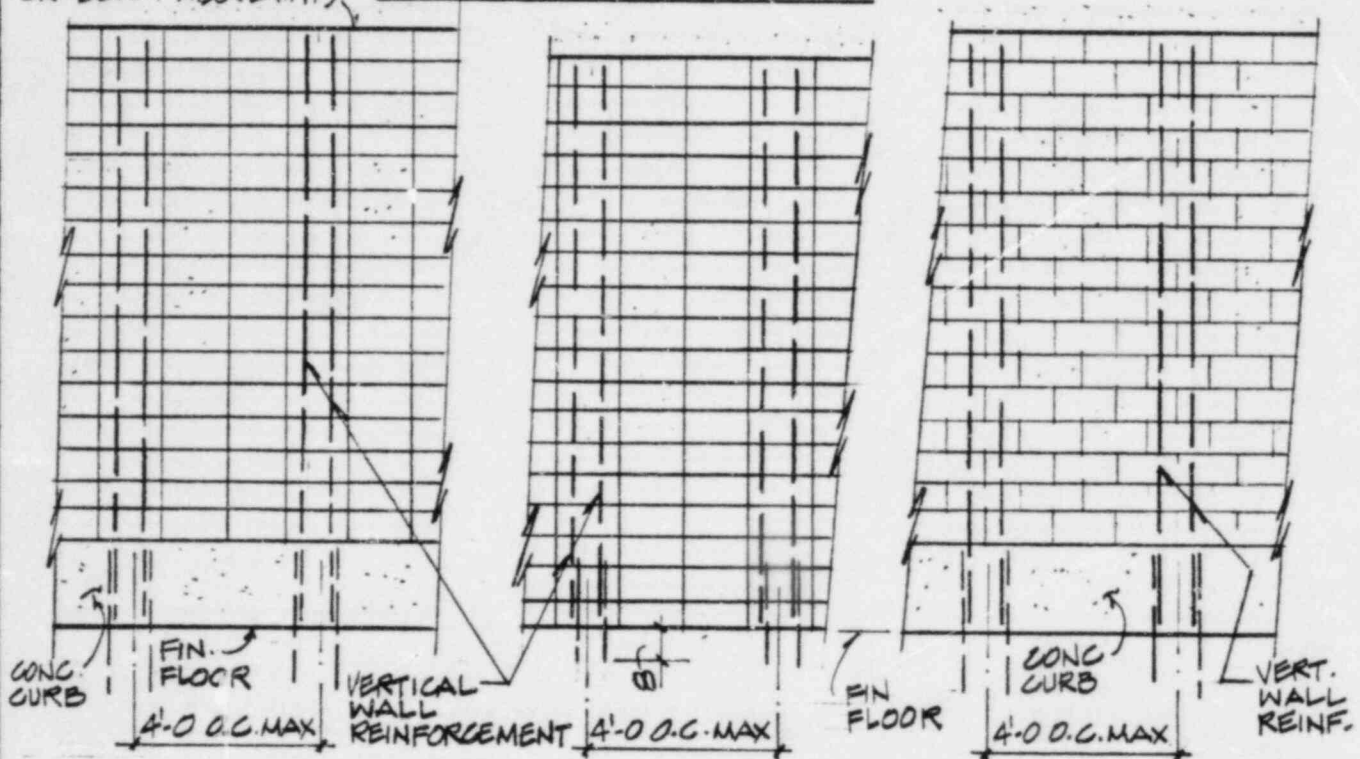
☐ ESSE

☐ OTHER

Bill Grant: 5/2/84
Clyde 5-2-84

REINFORCED MASONRY HOLLOW CONC. BLOCK WALL

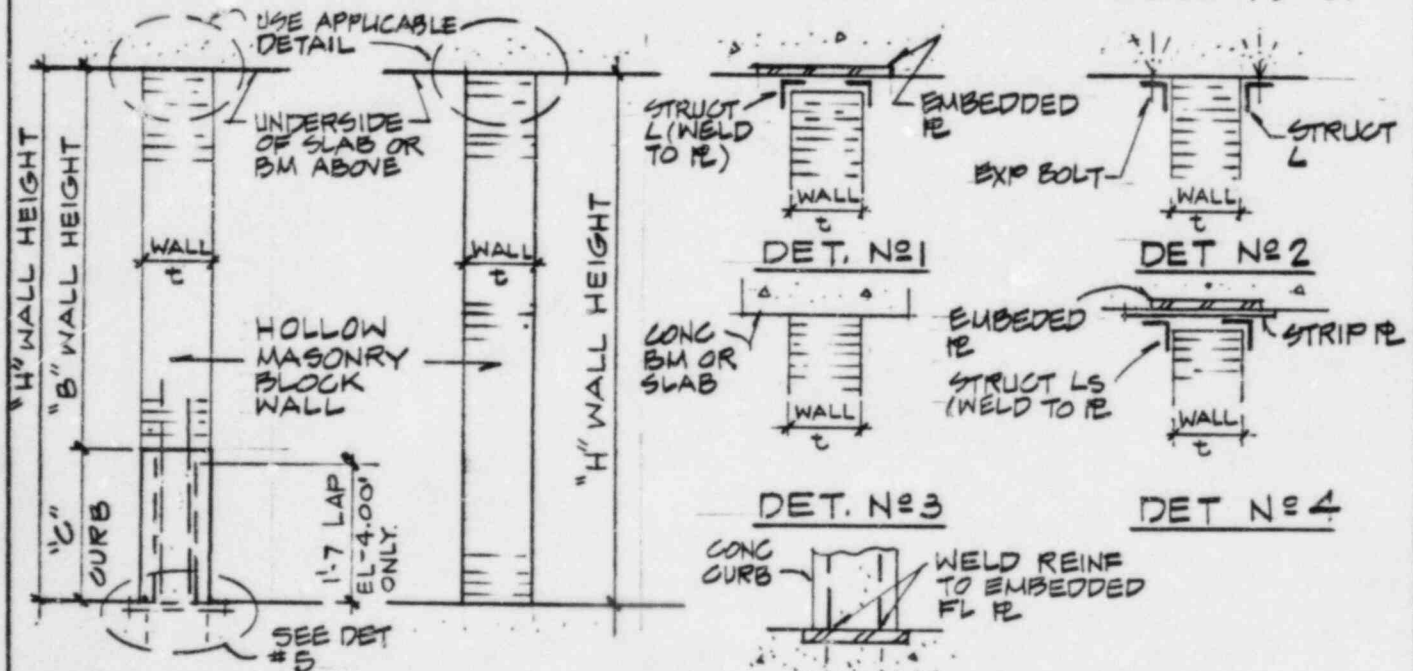
LINE OF SLAB OR BEAM ABOVE (TYP) TYPES & DETAILS



ELEVATION WALL #1
(STACK BOND)
HORIZ. WALL REINF. EVERY 2ND CS

ELEVATION WALL #2
(STACK BOND)
HORIZ. WALL REINF. EVERY 2ND CS

ELEVATION WALL #3
(RUNNING BOND)
HORIZ. WALL REINF. EVERY 2ND CS



WALL TYPE A
(WITH CONC CURB)

WALL TYPE B
(WITHOUT CONC CURB)

DET #5

"AT FL EL-4.00' ONLY"

BY: J. SANTOSPIRITO 10-4-84
CHECKED BY: GW 10-6-84

WALL DETAILS

NOTE:

WORK THIS SHEET
WITH DWGS
G-760501, G-760502,
G-760503 G-765502
& G-771505.

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-4-84

SHEET _____ OF _____

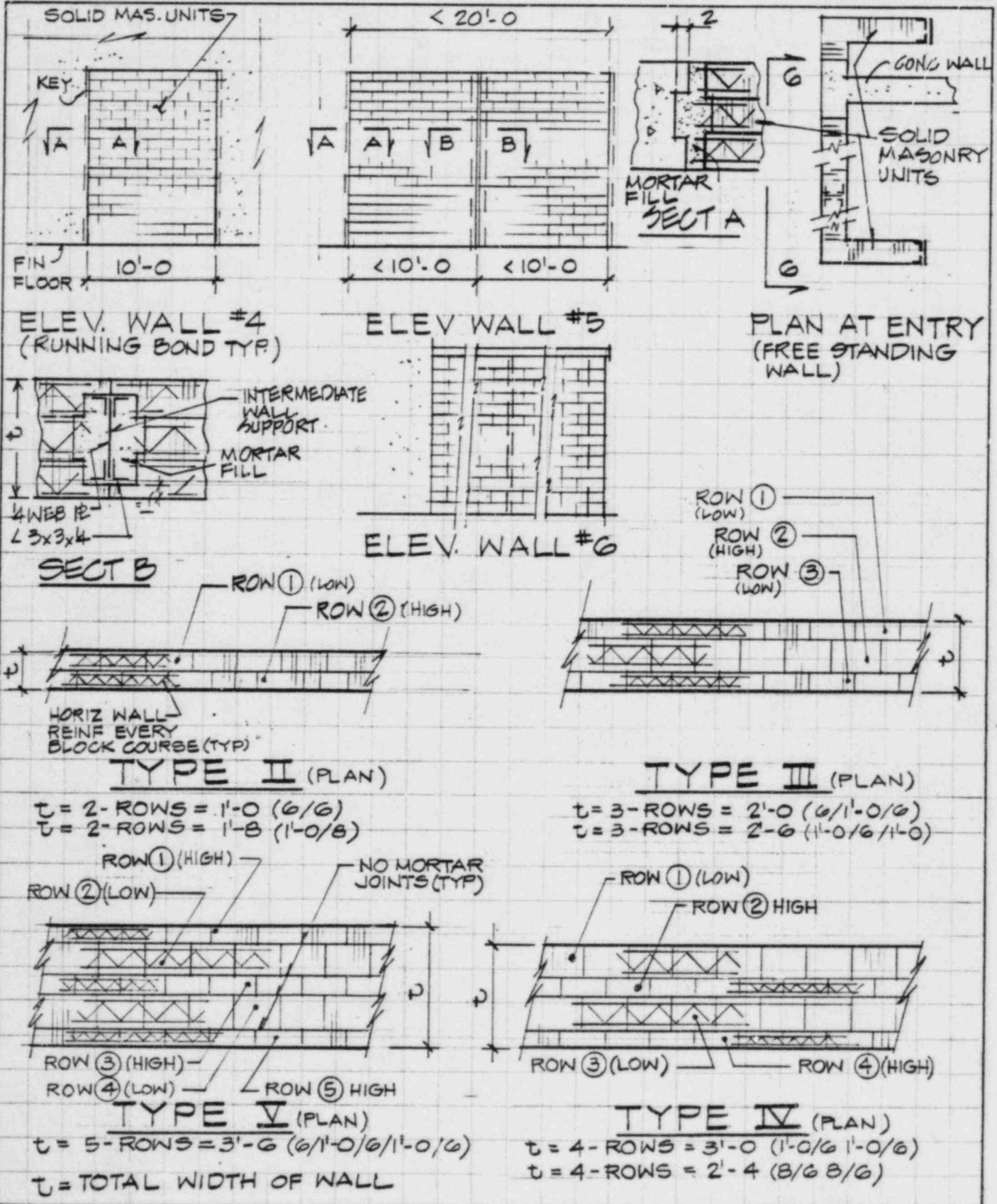
CHKD. BY G W DATE 10-8-84

OFS NO. _____ DEPT. NO. _____

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



EBASCO SERVICES INCORPORATED

BY J. SANTOSFRITO DATE 10-5-84

SHEET _____ OF _____

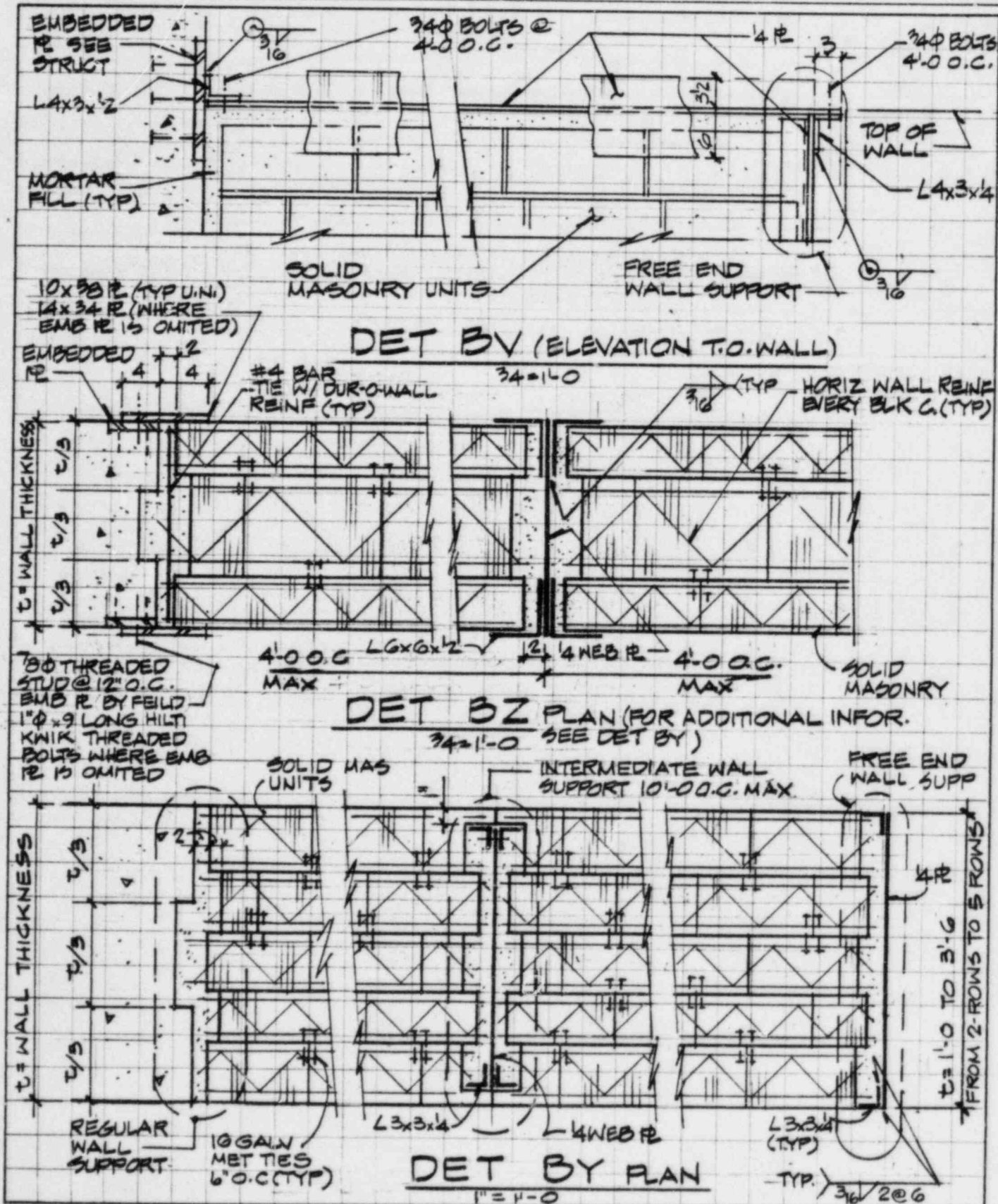
CHKD. BY G.W DATE 10-8-84

OFS NO. _____ DEPT. NO. _____

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

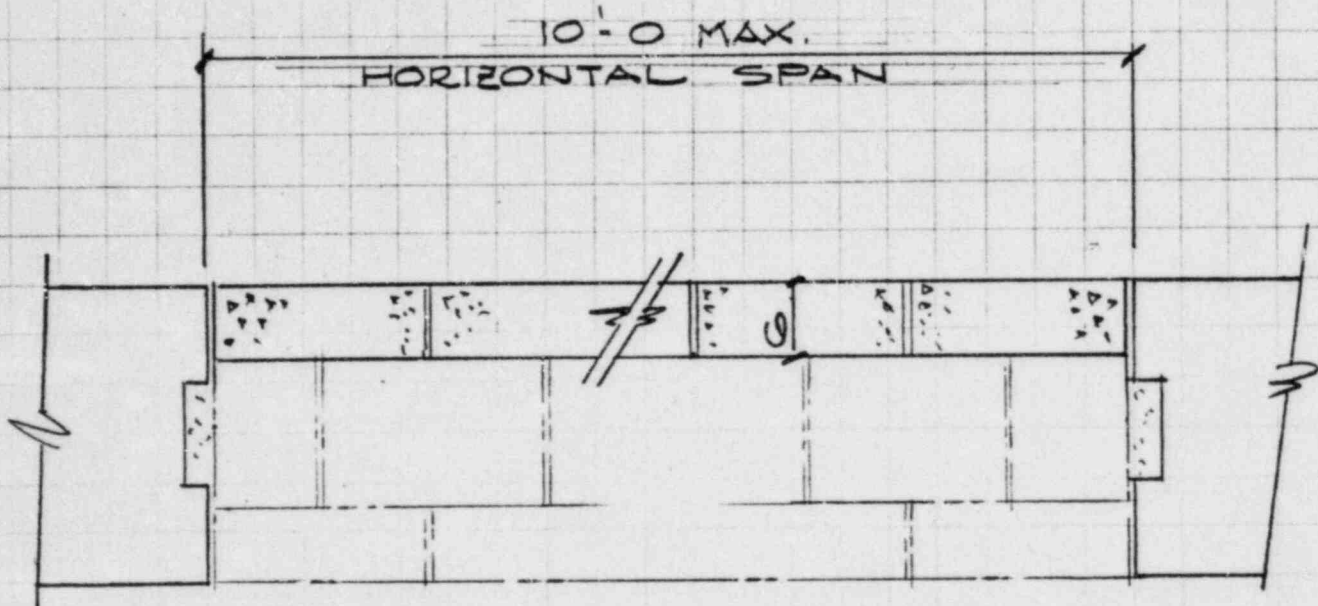
SUBJECT CONCRETE MASONRY BLOCK WALLS



EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-12-84 SHEET OF
 CHKD. BY AC DATE 10/12/84 OFS NO. 2865-058 DEPT. NO. 653
 CLIENT LOUISIANA POWER & LIGHT
 PROJECT WATERFORD #3
 SUBJECT CONCRETE MASONRY BLOCK WALLS

SOLID BLOCK



PLAN

FREQUENCY $f = 22.21 \text{ Hz}$

EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-12-84

SHEET OF

CHKD. BY α. DATE 10/12/84

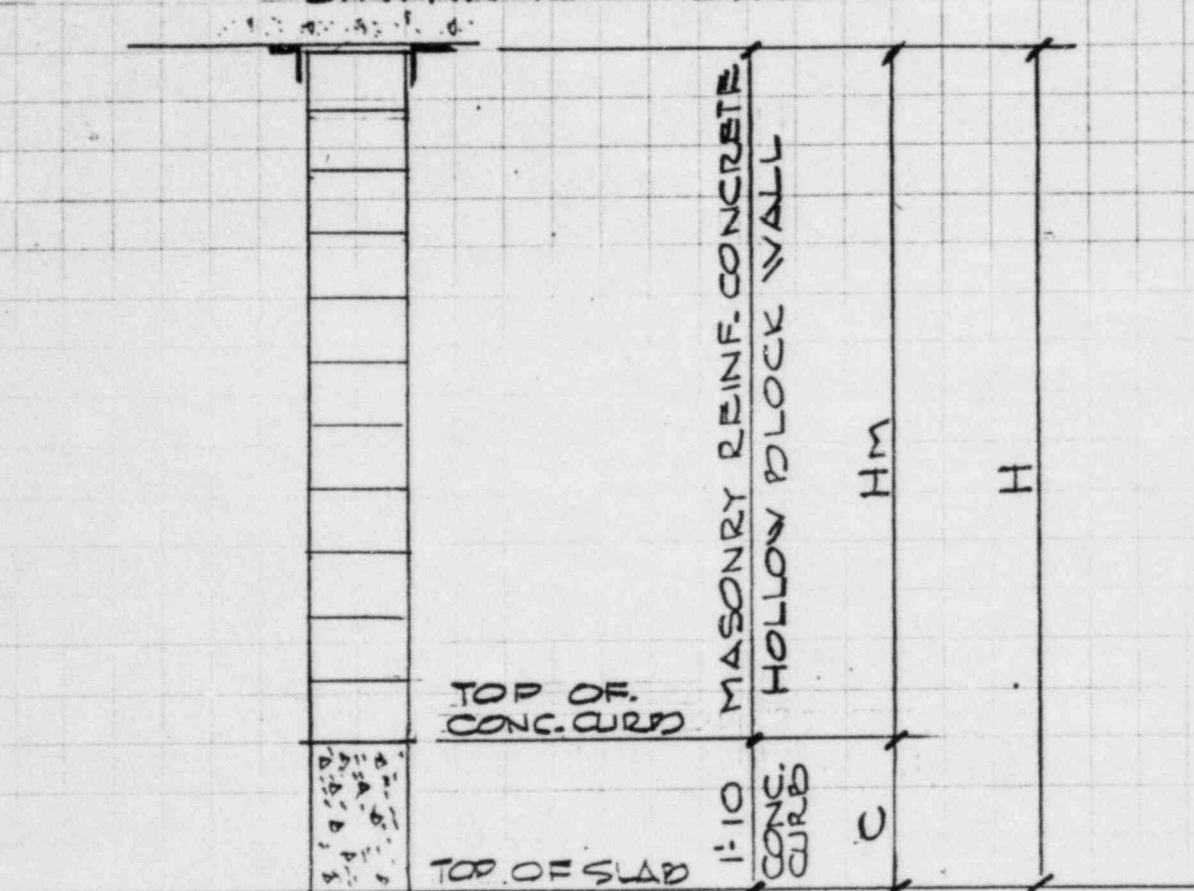
OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

CONC. MASONRY BLOCK WALL
LIMITING CONDITIONS



WALL THICKNESS "t" INCHES	MAX. HEIGHT "H" - FEET		FREQUENCY Hz		REMARKS
	HINGED	CANTI- LEVER	HINGED	CANTI- LEVER	
8	24'-0	12'-3	5.49	4.80	
12	30'-0	17'-0	5.46	4.15	

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

SHEET _____ OF _____

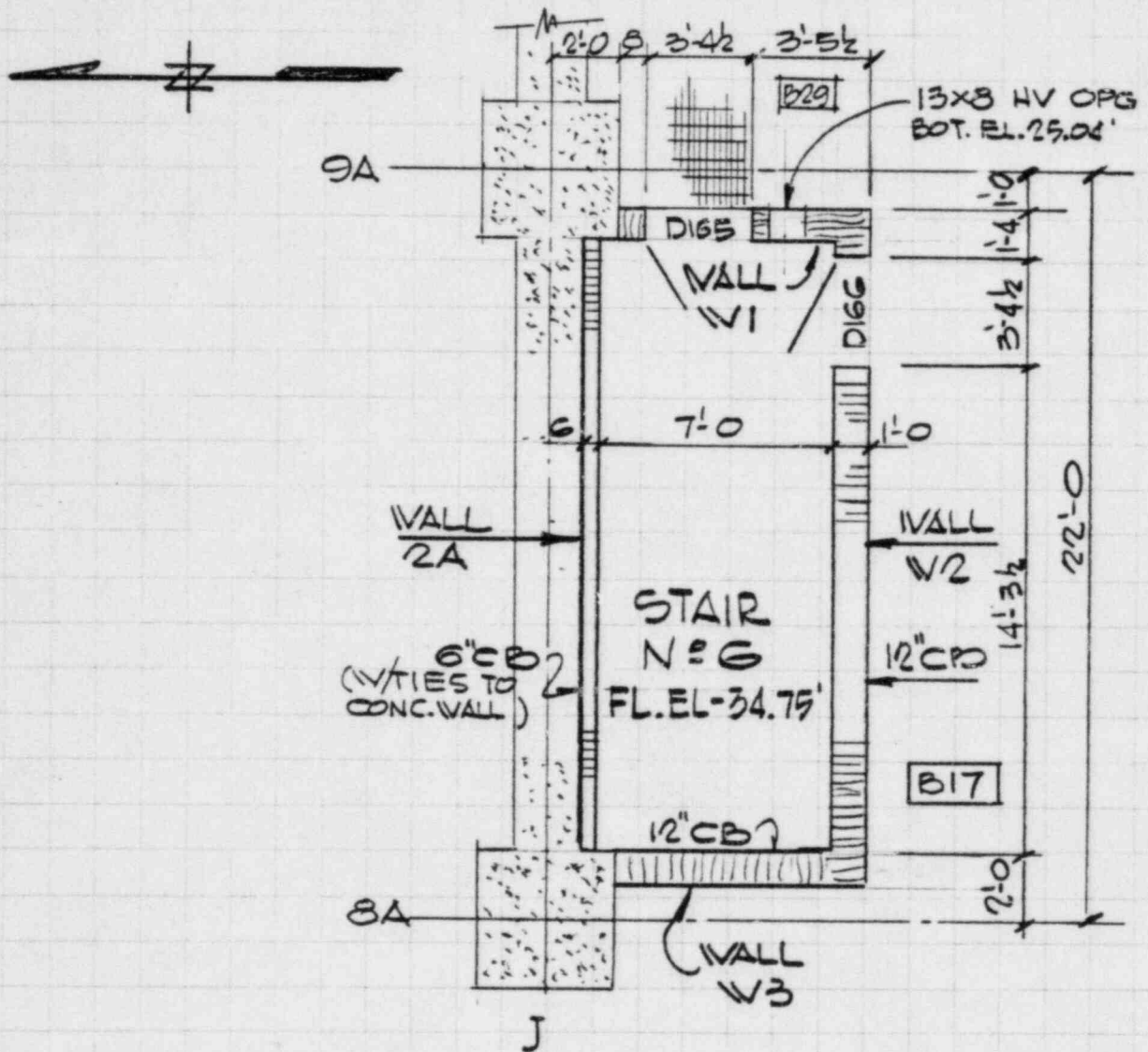
CHKD. BY J.S. DATE 10-8-84

OFS NO. 2365-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL. -34.75' ± -15.50'

SCALE 3/16" = 1'-0"

REF. DVG. G-765502

SHEET _____ OF _____

DEPT. NO. 653
OFFS NO. 2865-053

NO. 1000

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS: * WALL IS SELF-SUPPORTING DUE TO THE EMBEDDED TIE STRAPS ALONG THE LENGTH OF THE WALL

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

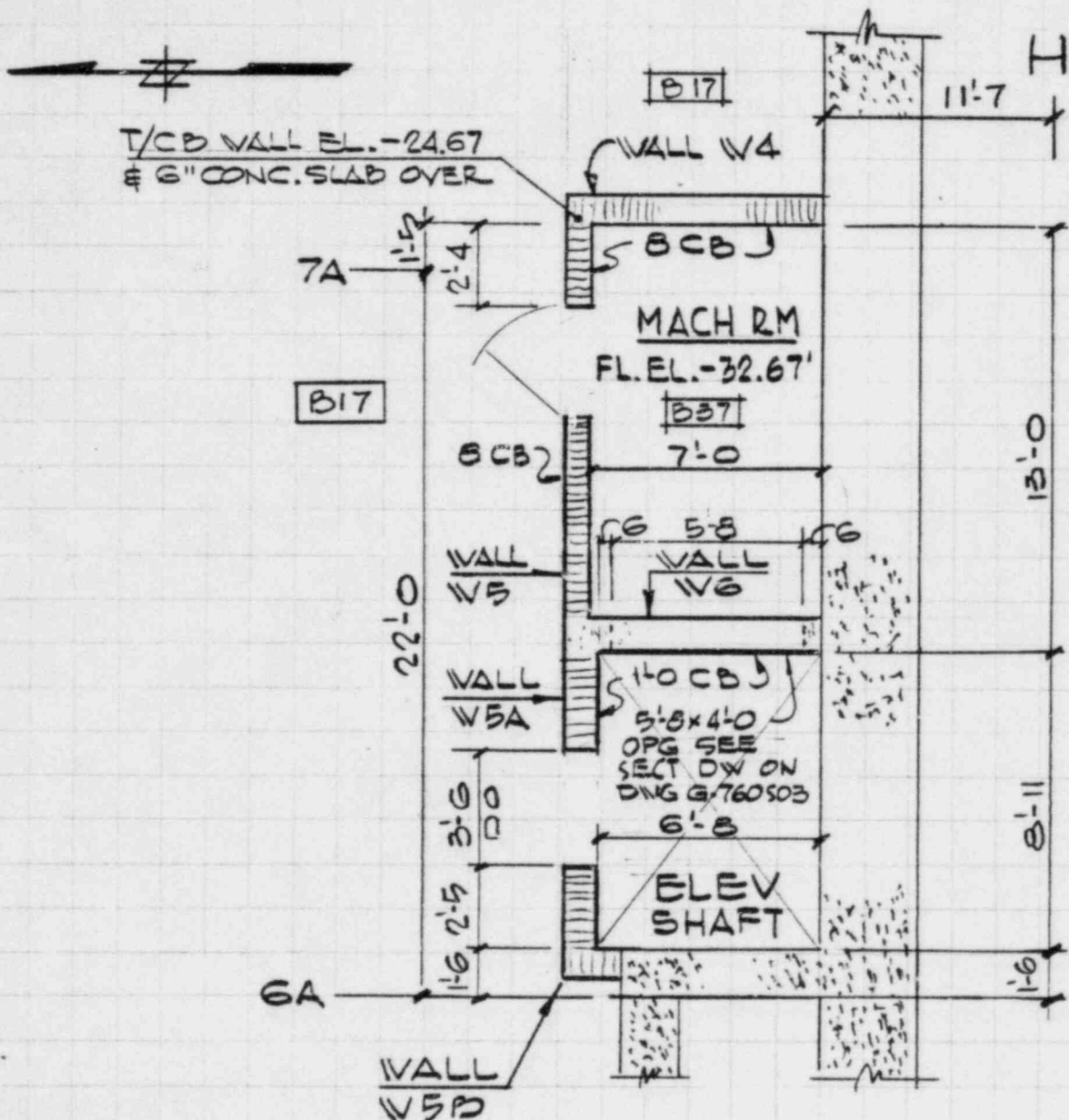
SHEET OF

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN AT EL.-32.67

SCALE $\frac{3}{8} = 1'-0$

REF. DWG. G-765502

EBASCO SERVICES INCORPORATED

BY G. W. V., DATE 10-8-84

CHKD. BY G. Ghosh DATE 10-9-84

CLIENT

LOUISIANA POWER & LIGHT CO.

PROJECT

WATERFORD #3

SUBJECT

CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

DEPT. 653
NO. 653

DATA - SEISMIC MASONRY

WALL NO			WALL DIMEN.			WALL TYPES & DETS			DESIGN PARAMETERS						
W	H	S	t = INCH.	W = FEET (FT.)	H = FT. H _g G _{HT}	TYPE	DETAIL	ELEV WALL NO	HOLLOW UNITS			SOLID UNITS			
									BOTT.	HINGED	TOP	FREE	EXIST.	HINGED	CANTILEVERED
4	H7		8	7'8	10'0	A	3	3	✓	✓					
5	H6		8	12'8	10'0	A	3	3	✓	✓					
5A			12	10'11	*	A	*	1	✓	✓					
5B			12	11'8	*	A		1	✓	✓					
6			12	7'0	**	**	**	**	**	**	**				
															</

REMARKS: * CANNOT BE VERIFIED DUE TO EQUIP. ABOVE
** INACCESSIBLE

EBASCO SERVICES INCORPORATED

BY G. FISCHION DATE 10-6-84

SHEET _____ OF _____

CHKD. BY J.S. DATE 10-8-84

OFS NO. 2869-053 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

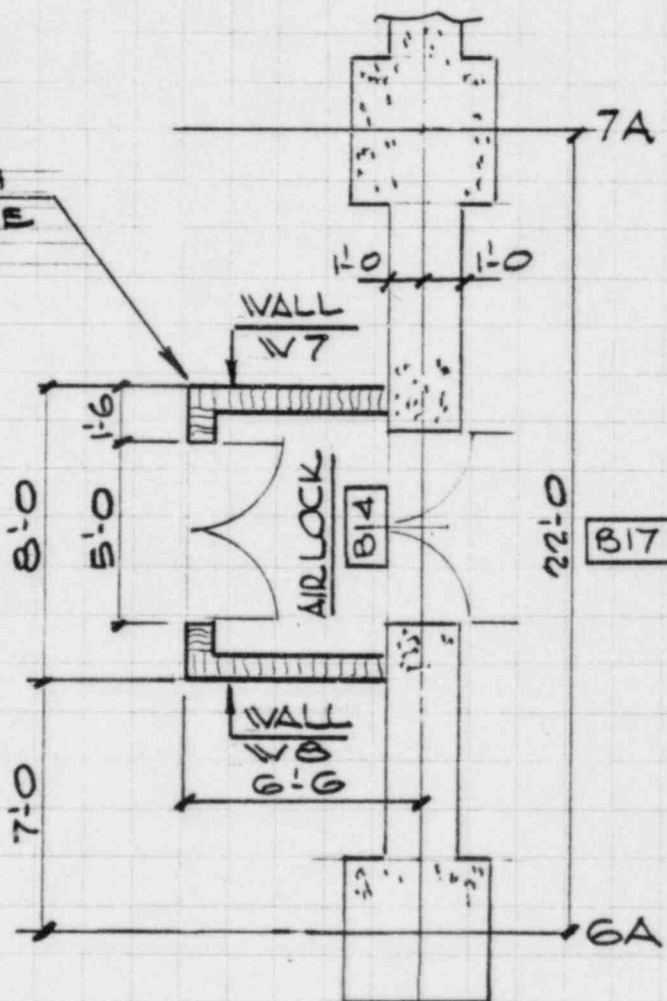
PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



SCP 7'-6" HIGH
W/6" SLAB ABOVE

B15



PLAN AT AIRLOCK EL-34.75'

3/16 = 1'-0

REF. DWG G-765502

DATE 10-8-84

DATE 10-9-80

LOUISIANA POWER & LIGHT CO.

OFFS NO. 1865-058 DEPT. NO. 653

WATERFORD #2

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

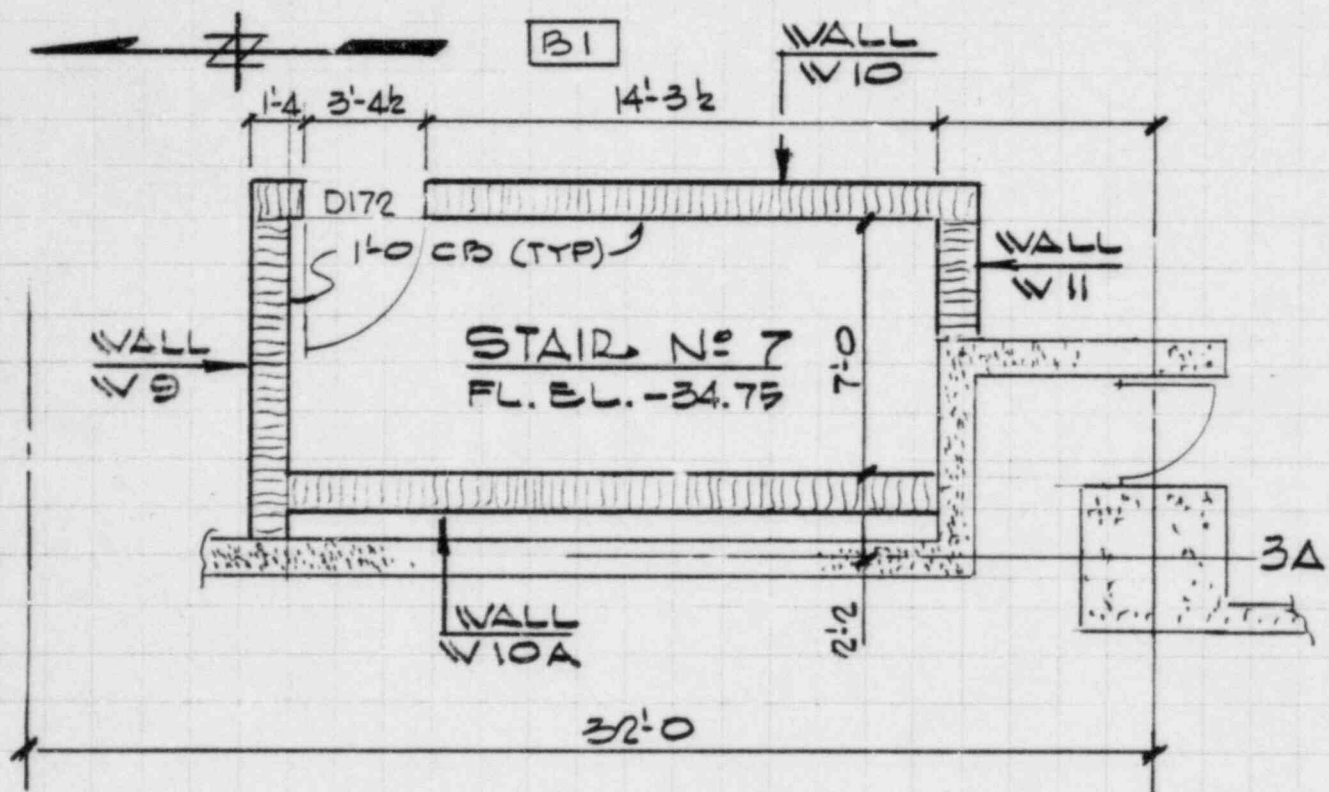
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN AT EL. -34.75'

$\frac{3}{8}" = 1'-0"$

REF. DWG G-765502

EBASCO SERVICES INCORPORATED

BY G. W. W. DATE 10-8-34

CHKD. BY G. Olikh DATE 10-9-94

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10.6.84

CHKD. BY J.S. DATE 10-8-84

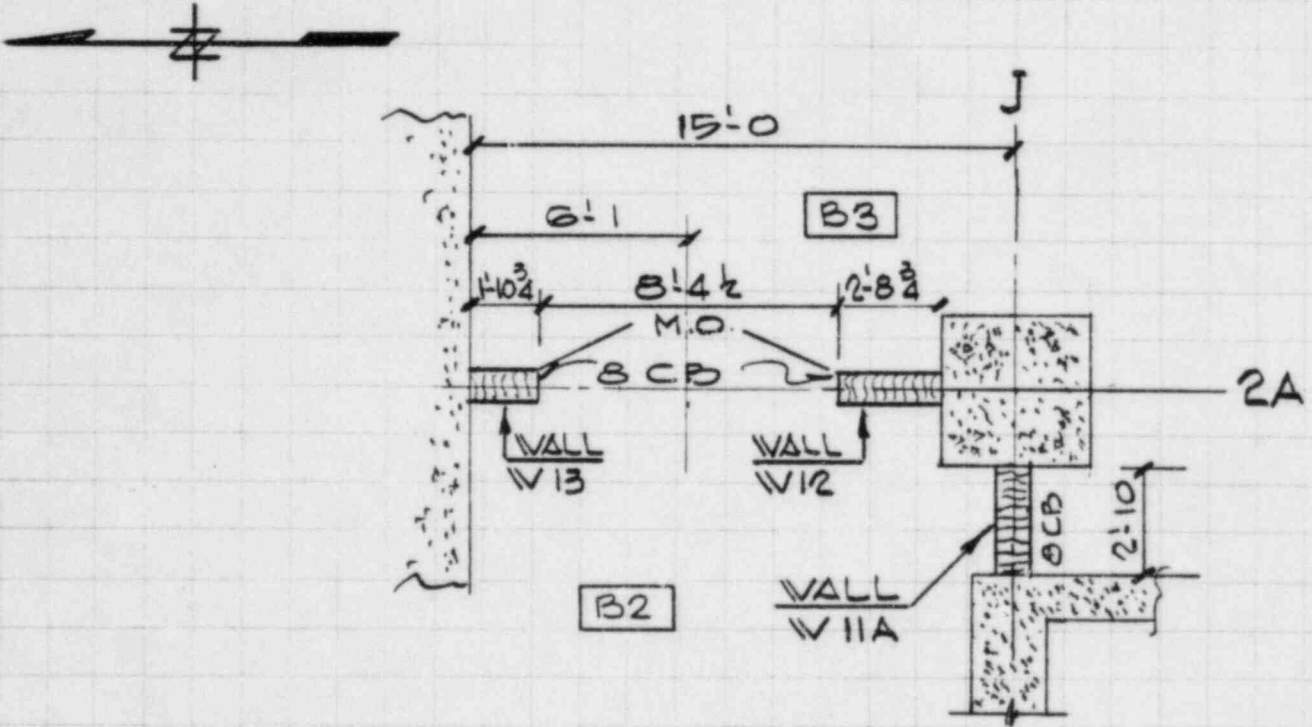
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD T.S.

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN
TOP/CONC. WALL
EL. -20.00

REF. DWG G-765502

DATA - SEISMIC MASONRY

[illegible]

REMARKS: * WALL SPANS HORIZONTALLY
‡ WALL STARTS ON TOP OF 10'-0" HIGH REINF. CONC WALL

EBASCO SERVICES INCORPORATED

BY G. FISIONI DATE 10-6-84

CHKD. BY JS. DATE 10-8-84

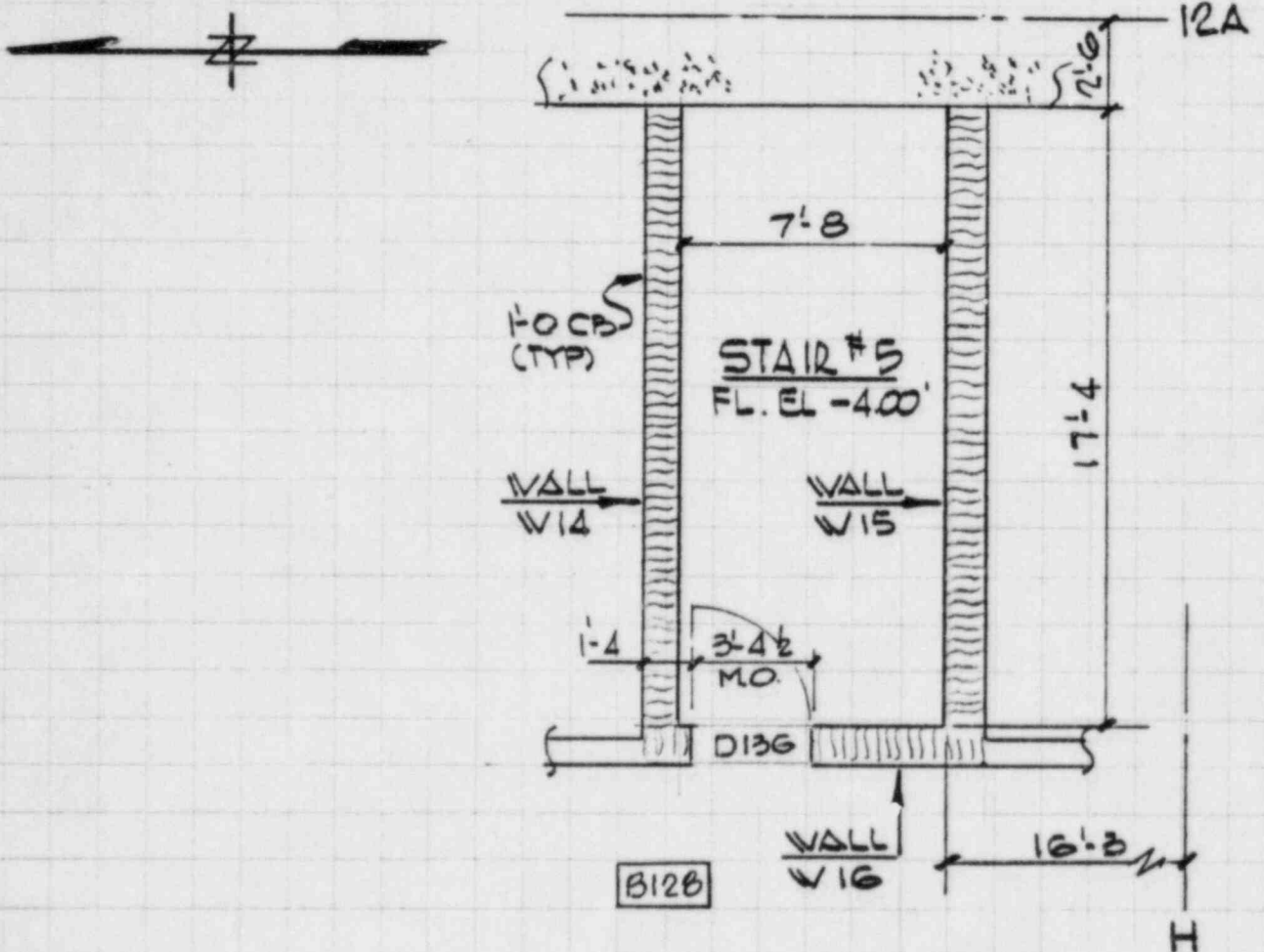
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL -4.00

3/16" = 1'-0"

REF. DWG. G-765501

SHEET _____ OF _____

OFFS NO.

DEPT. NO. 653
7865-058

No. 9076

WATERFORD #3

CONCRETE MASONRY WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G.F/SCHIONI DATE 10-6-84

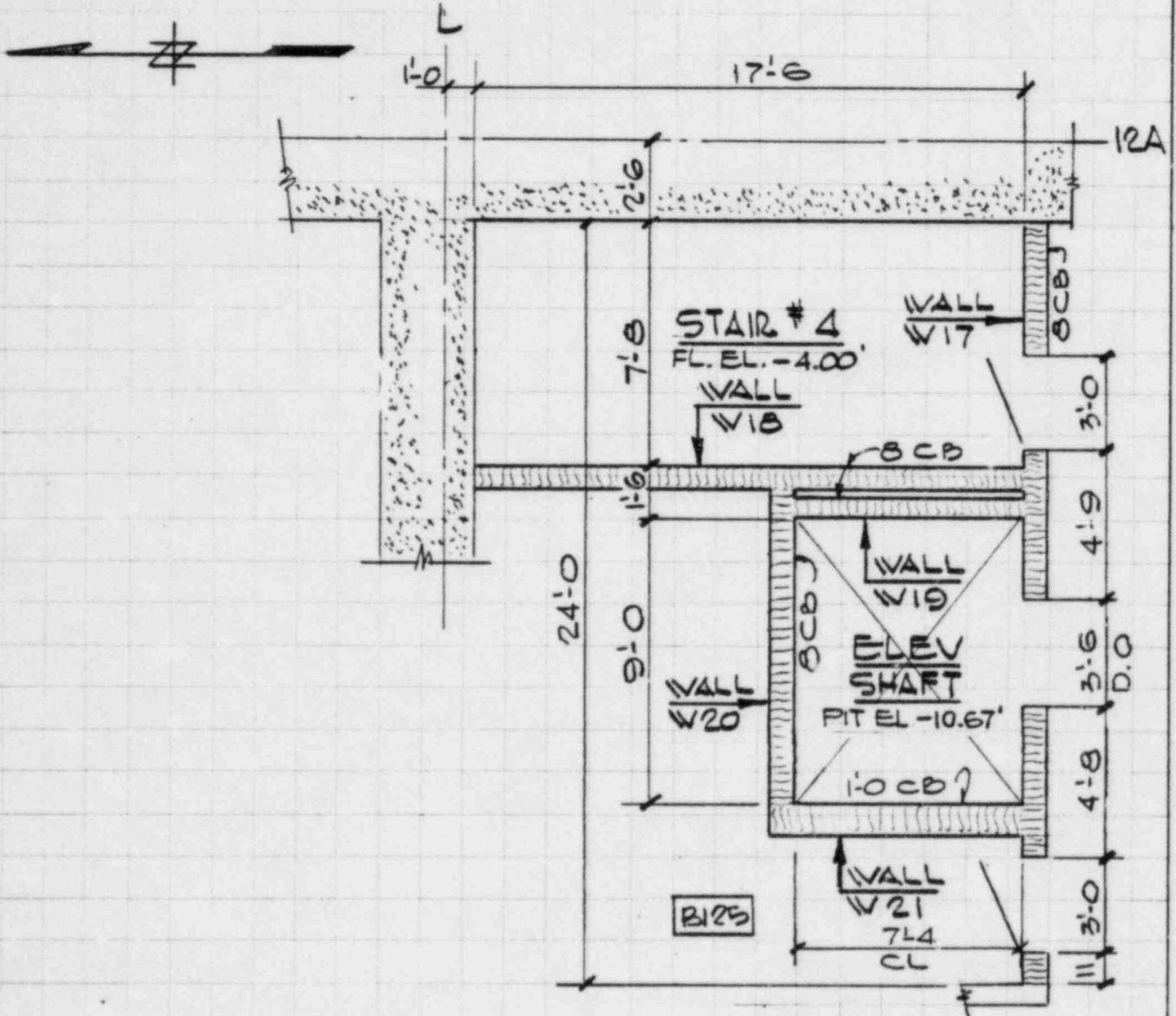
CHKD. BY J.S DATE 10-8-84

SHEET _____ OF _____
OFS NO. 2865-053 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN.

$$\frac{3}{16} = 180$$

REF. DWG G-775 502

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10.6.84

CHKD. BY J.S DATE 10-8-84

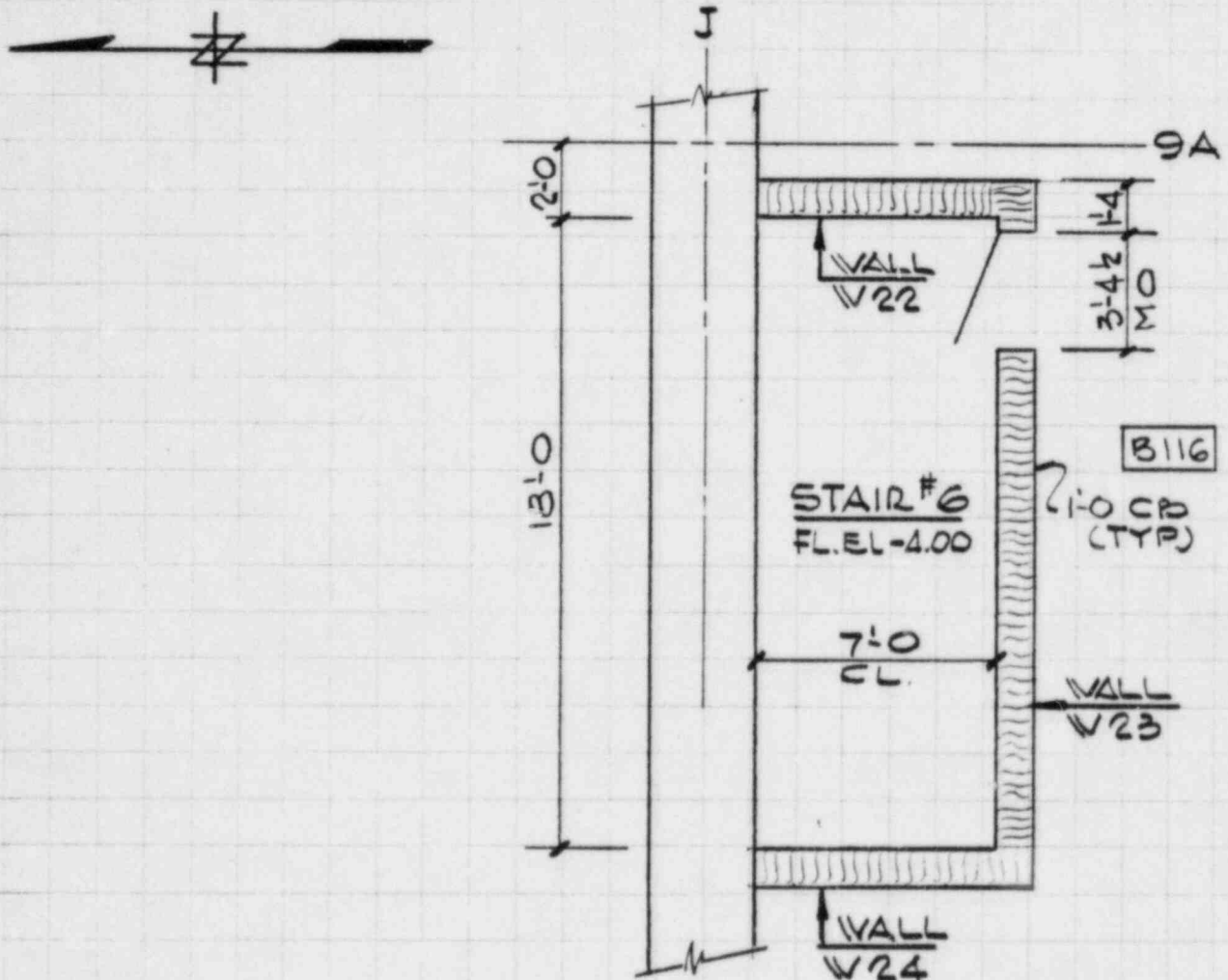
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL -4.00

$$\frac{3}{16}'' = 1'-0$$

REF. DWG G-765501

SHEET _____ OF _____

DEPT. NO. 653
OFFS NO. 2865-058

NO

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

SHEET _____ OF _____

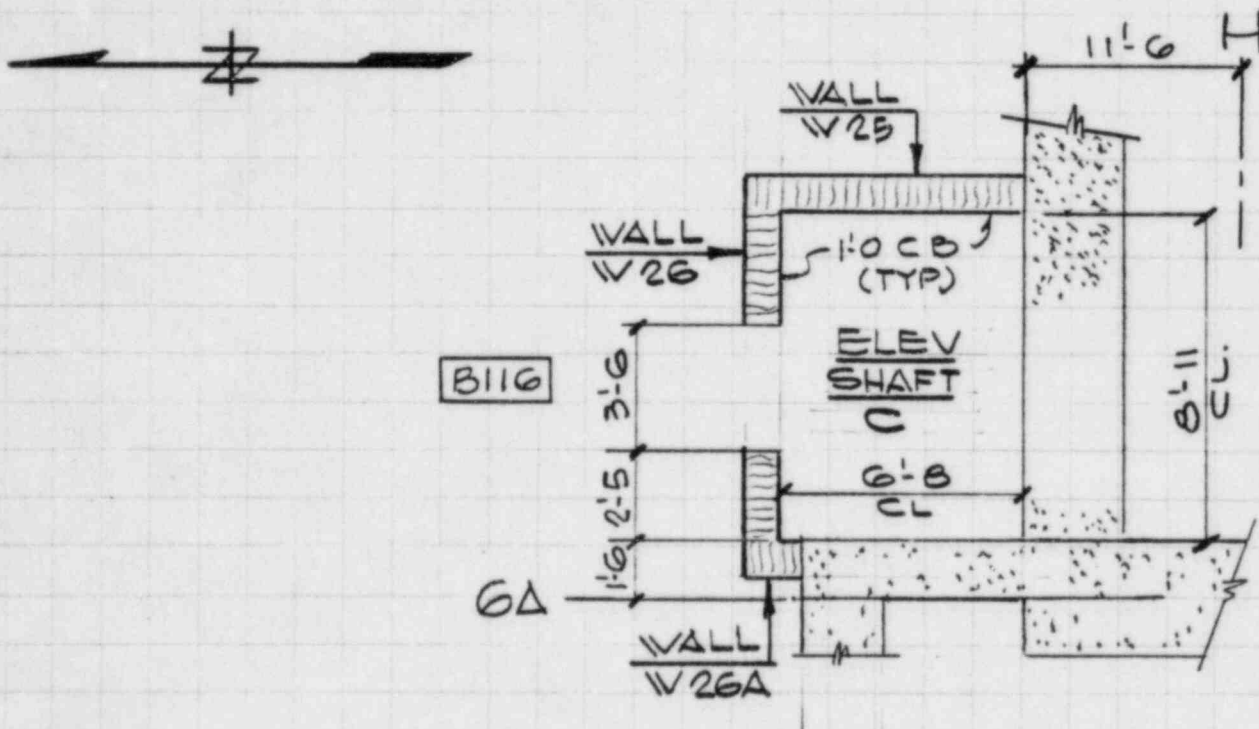
CHKD. BY J.S. DATE 10-8-84

OFS NO. 2565-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL-4.00

$\frac{3}{16} = 1'-0$

BY G. WU DATE 10-8-84

DATE 10-8-84

CHKD. BY S. Miller DATE 10-9-79

DATE 10-9-84

CLIENT COOPERATION

LOUISIAN

OFFS NO. 2005-050 P-L NO. 053

SHEET _____ OF _____

05

EXPT. NO. 053

Σ 7
Ο -

056

SUBJECT CONCRETE Masonry BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISHIONI DATE 10-6-84

SHEET _____ OF _____

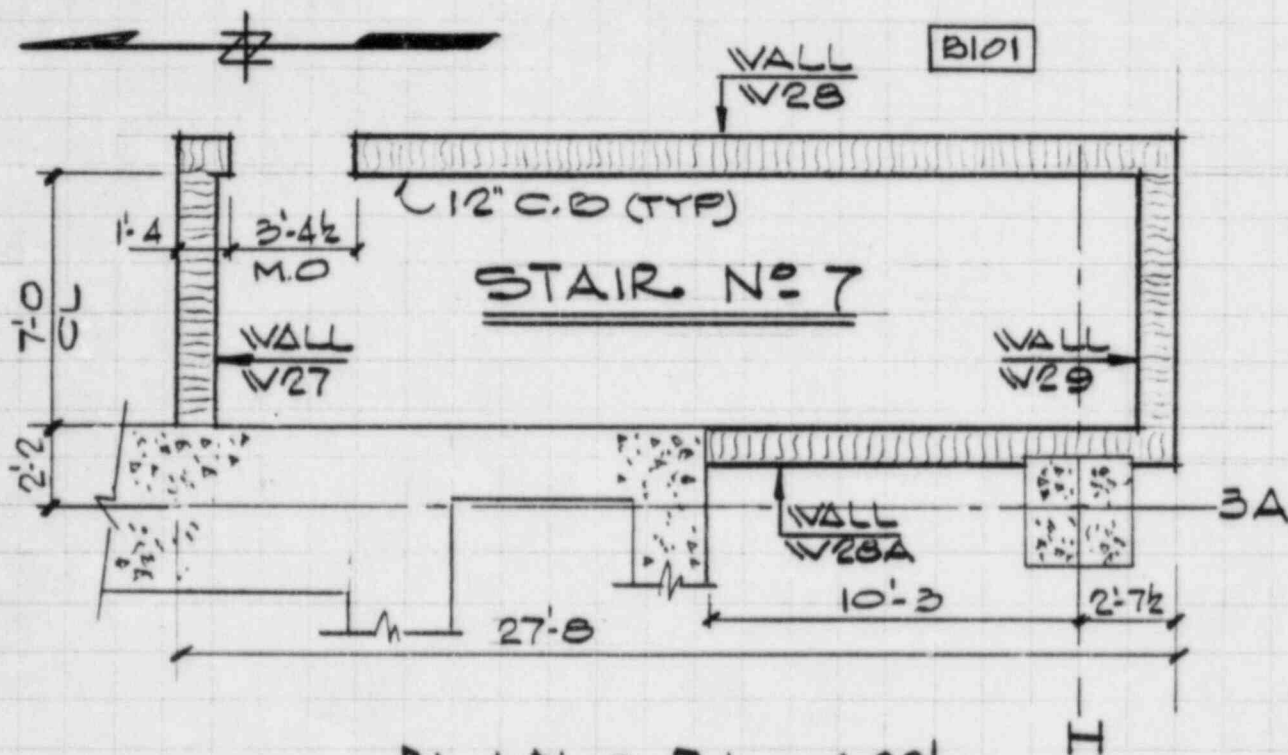
CHKD. BY J.S. DATE 10-8-84

OFS NO. 2865-053 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL. -4.00'

$\frac{3}{16} = 1'-0$

REF. DWG. G-765501

EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-8-84

CHKD. BY A. C. [Signature] DATE 10-9-84

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #5

SUBJECT CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFFS NO. 2865-058 DEPT. NO. 653

DEPT. 653
NO.

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

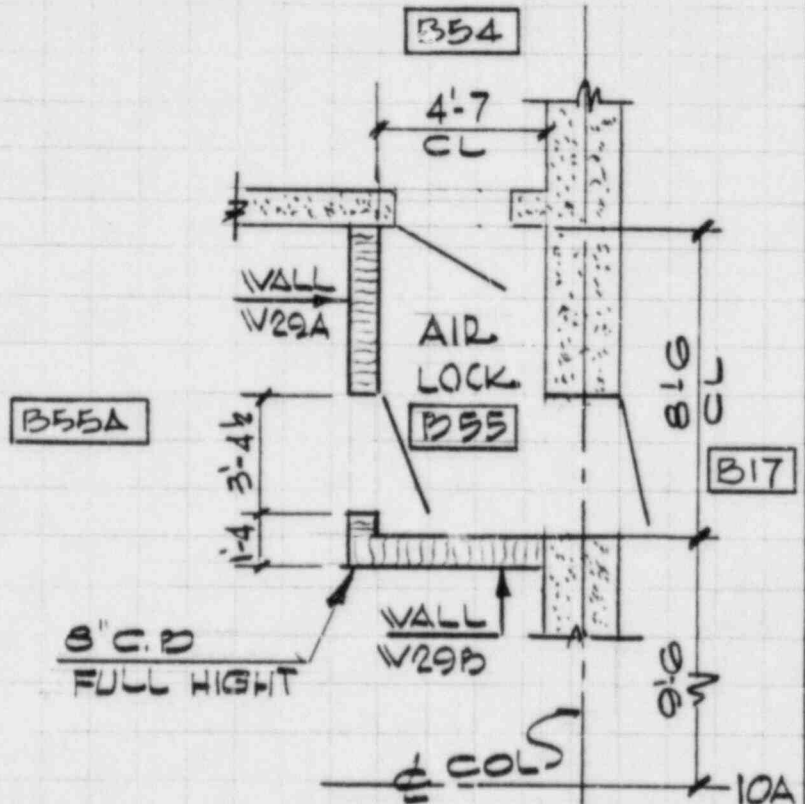
SHEET OF

OFS NO. 2565-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN AT EL-15.50'

$\frac{3}{16} = 110$

REF. DWG G-765501

EBASCO SERVICES INCORPORATED

BY G. WU, DATE 10-8-84

CHKD. BY G. Alibek DATE 10-9-94

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD # 2

SUBJECT CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

DEPT. NO. 653

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

SHEET _____ OF _____

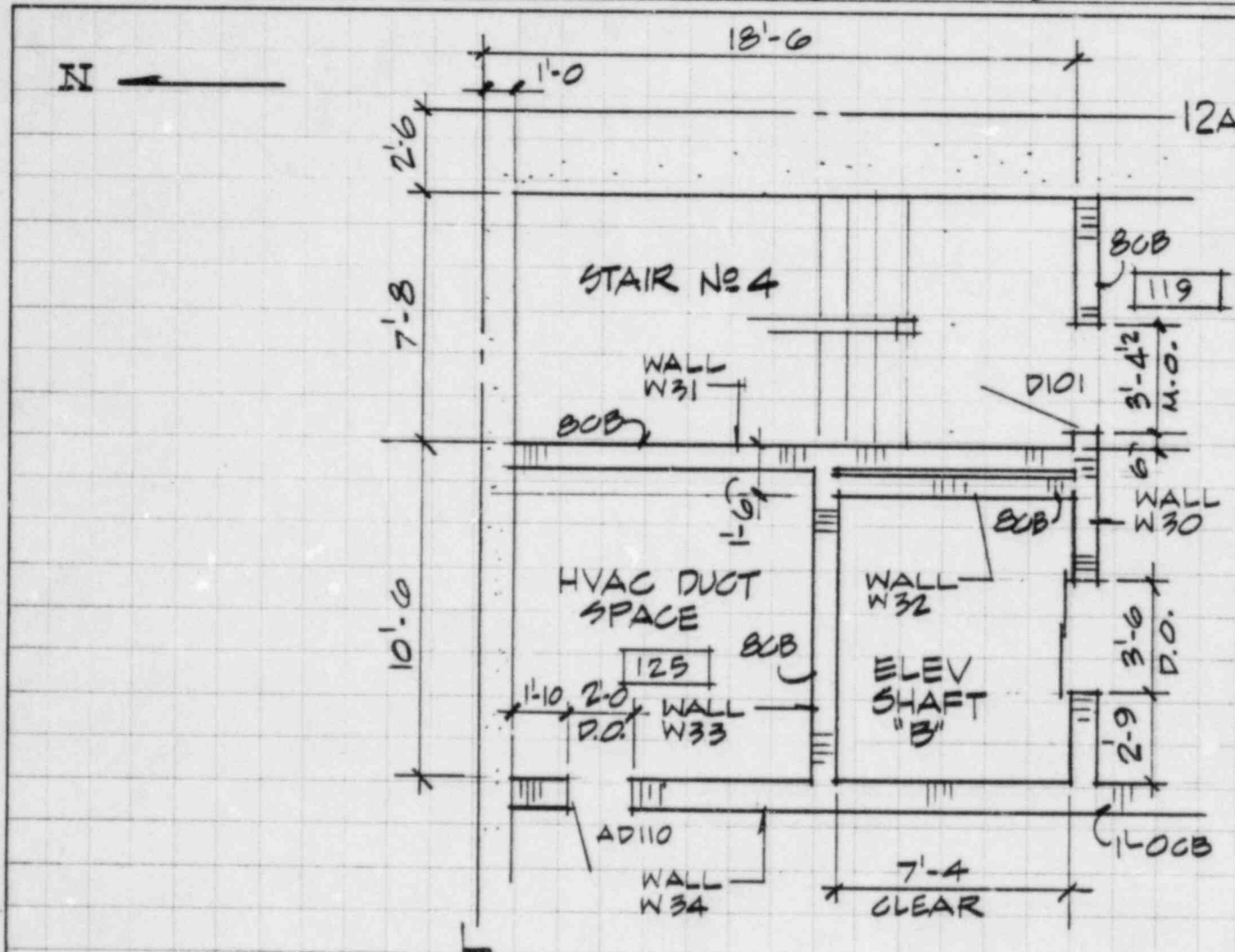
CHKD. BY G.F. DATE 10.8.84

OFFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL 7.00'

RAB

$$316 = 11 - 0$$

REFER DWG G.765
301

OFFS NO. 202700 NO. 000

11

REMARKS: * INACCESSIBLE

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

CHKD. BY GF DATE 10.8.84

LOUISIANA POWER & LIGHT CO.

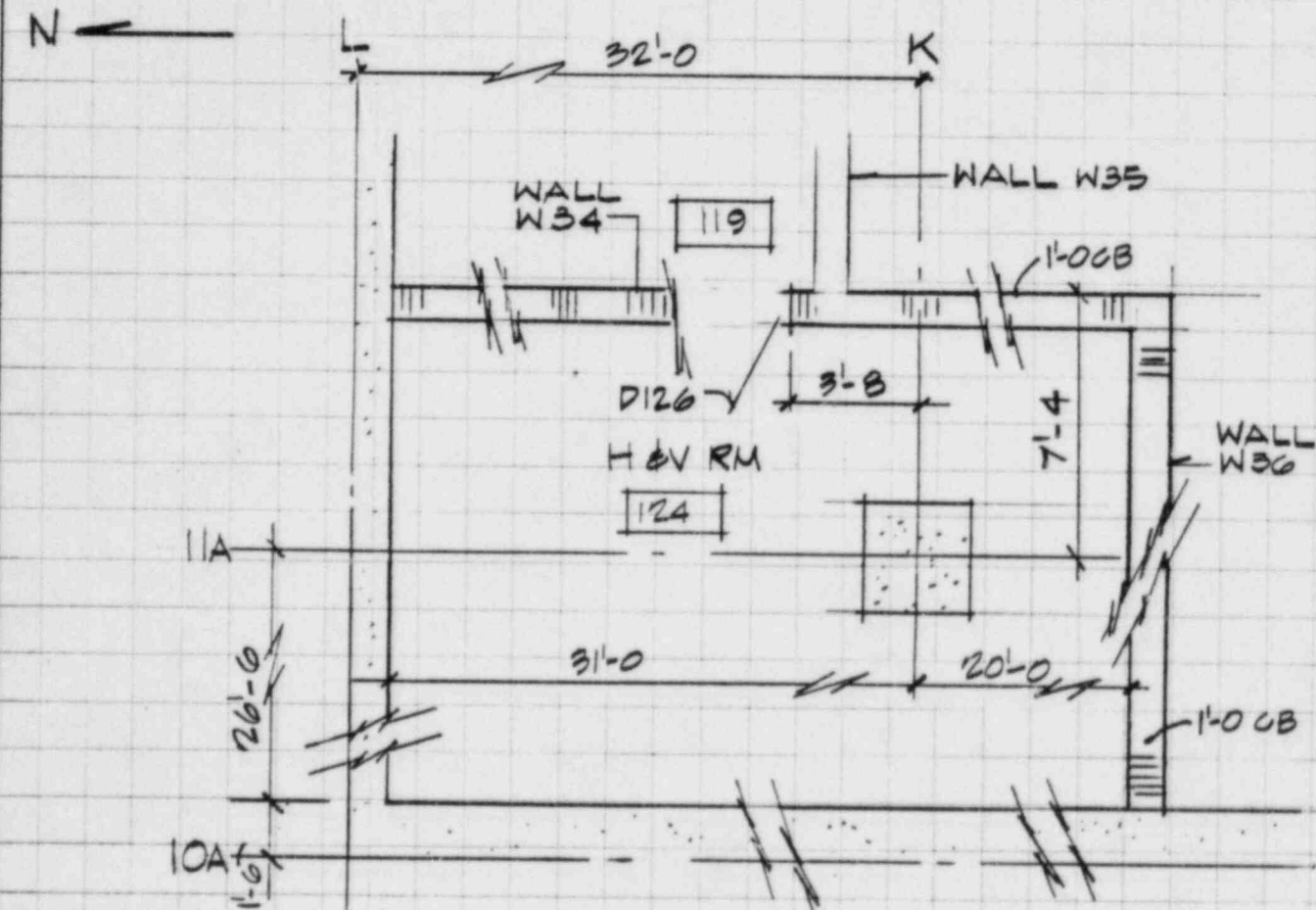
WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

DEPT. NO. 653



PART PLAN EL. 7.00'

KAB

31621-0
REFER DWG 6-765501

BY G. WU DATE 10-8-84

CHMD. BY E. O. Oakes DATE 10-9-82

OFFS NO. 1265-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT

WALSH-FORD #3

SUBJECT

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

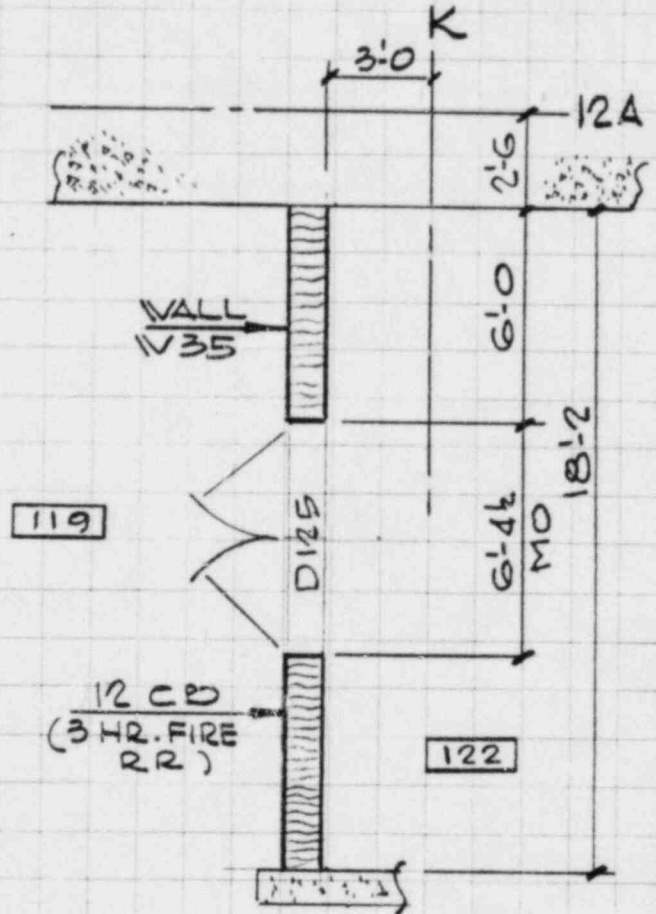
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL + 7.00'

3/6 = 1-0

REF DWG G-765501

DATE 10-8-84

DATE 10-9-84

LOUISIANA POWER & LIGHT CO

DEPT. NO. 653
OFS NO. 2865-058

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

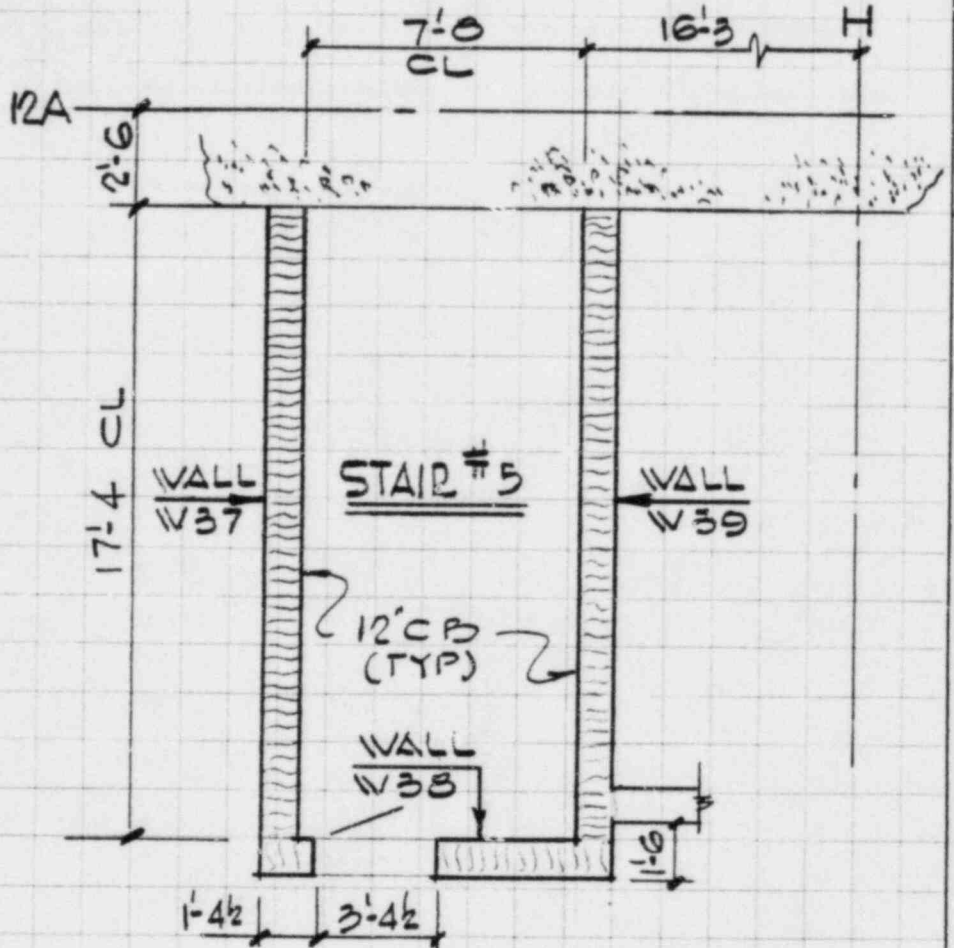
SHEET _____ OF _____

OFS NO. 65-055 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



122

PLAN @ EL +7.00'

$\bar{r}_e = 1'-0$

REF. DWG G-765501

DEPT. NO. 653
OFS NO. 2865-058

NO. 100

WATERFORD #3

CONCRETE MASONRY WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

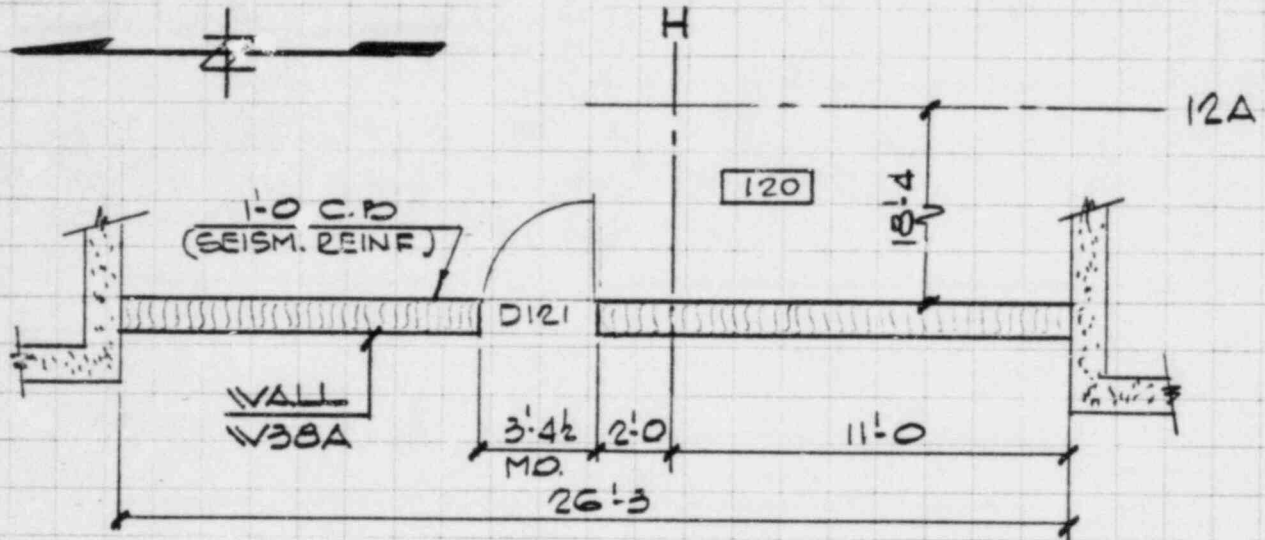
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL. +7.00'
 $\frac{3}{16} = 1'-0$

REF. DWG G-775502

EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-8-84

CHKD. BY C. Albert DATE 10.9.80

CLIENT

PROJECT

SUBJECT

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

DEPT. 653
NO.

DATE 10.9.88 OFS NO. 1000
LOUISIANA POWER & LIGHT CO

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONE DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

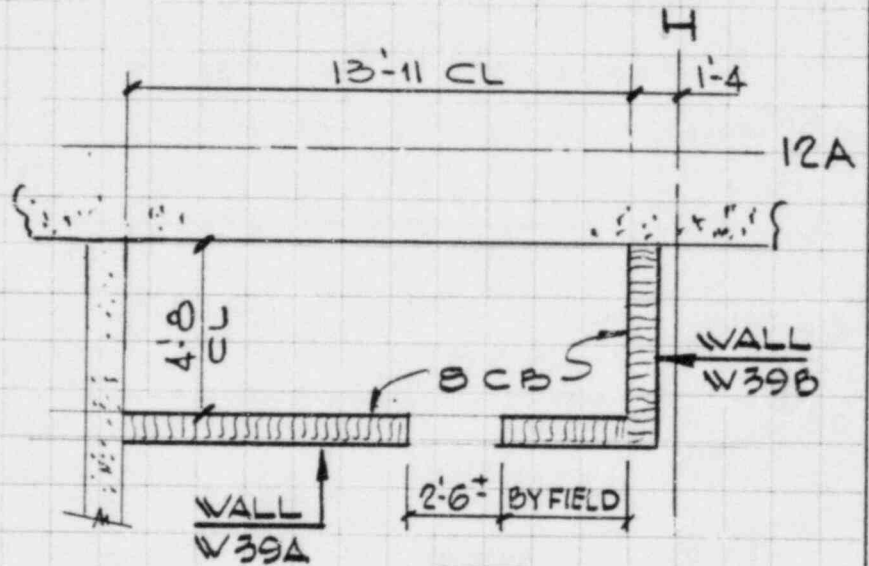
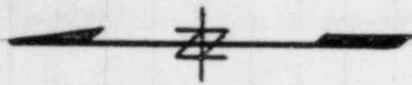
SHEET _____ OF _____

OFF. NO. 1365-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



120

PLAN @ EL +7.00'

$\frac{3}{16} = 1'-0$

REF DWG G-775502

5. WU

DATE 10-8-84

SHEET _____ OF _____

DATE 10-8-86

OFFS NO. 1065-028

[illegible]

LOUISIANA POWER & LIGHT CO.

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

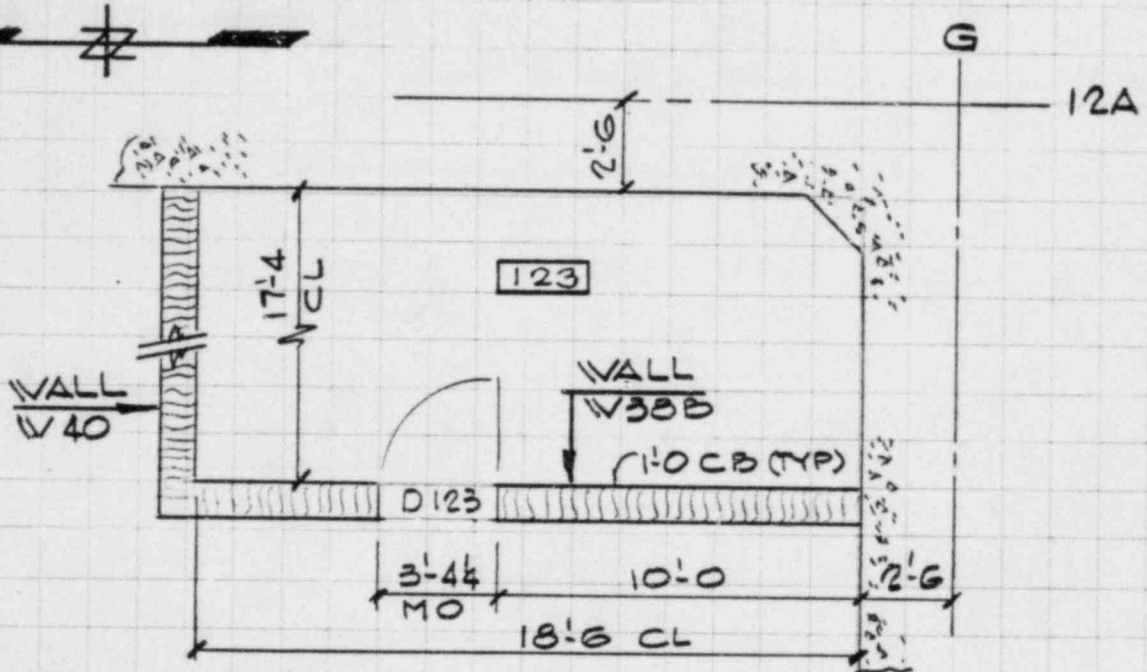
SHEET OF

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL + 7.00'

DATE 10-8-84

DATE 10-9-84

LOUISIANA

3

CONCRETE

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

WALLS: W41, W42, W42A
W42B, W43, W44, W45
W46, W47

BY BILAK DATE 10-6-84

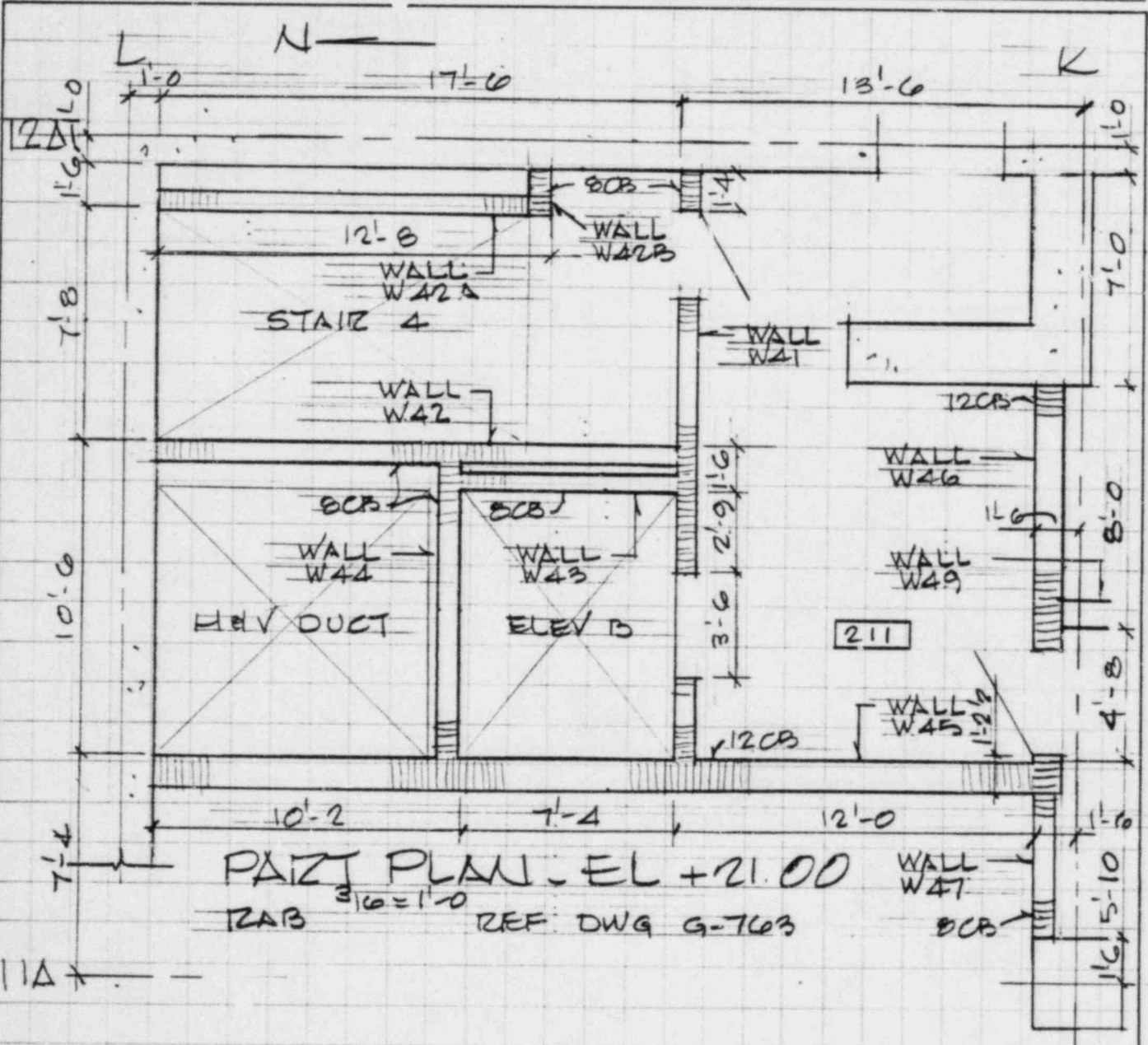
CHKD. BY GF. DATE 10-8-84

EET _____ OF _____
OFS NO. 2865-05B DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS: * INACCESSIBLE

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

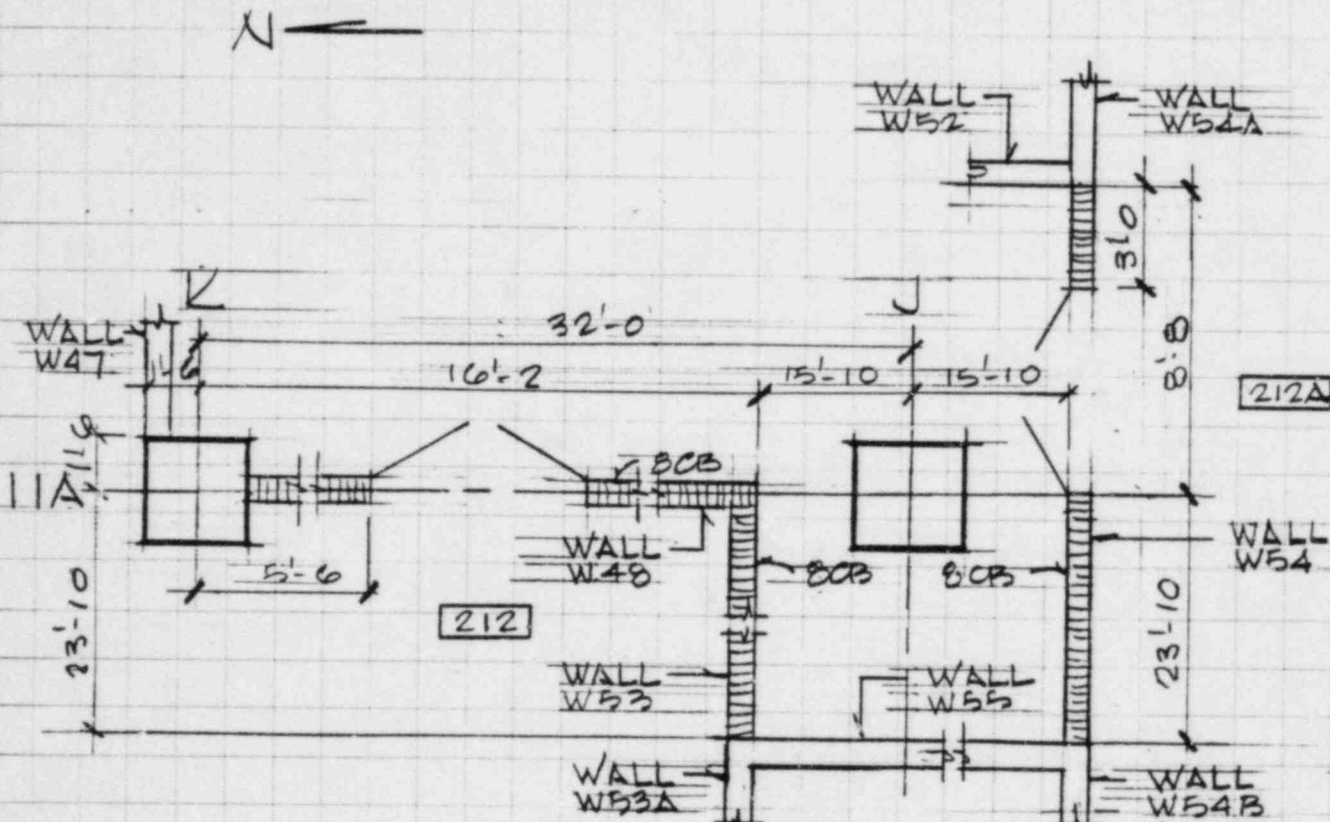
CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD # 3

SUBJECT CONCRETE MASONRY BLOCK WALLS

SHEET OF

OFS NO. 2865-058 DEPT. NO. 653



PART PLAN - EL+21.00
 ZAB 316 = 1'-0" REF DWG G763

EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-8-84

SHEET _____ OF _____

CHKD. BY [Signature] DATE 10-9-90

OFS NO. _____ NO. _____

DEPT. _____
NO. _____

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT _____ WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

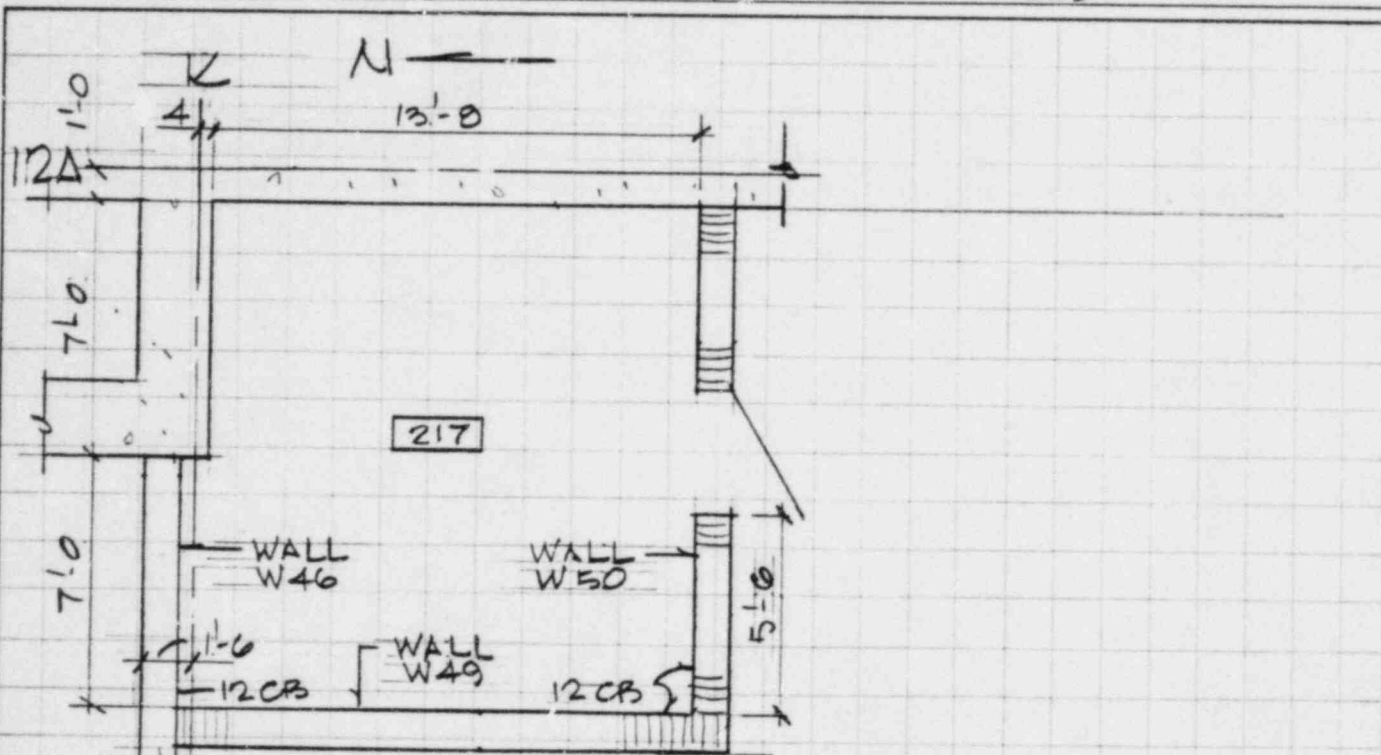
WALLS: W49, W50

SHEET _____ OF _____

OFS NO. 2865-05B DEPT. NO. 653

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN - EL +21.00

316 = 1-0
IZAB DEF DWG G-763

SHEET _____ OF _____

OFFS NO.

DEPT.
NO.

OFFS NO. 1547 CO

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

CLIENT LOUISIANA POWER & LIGHT CO.

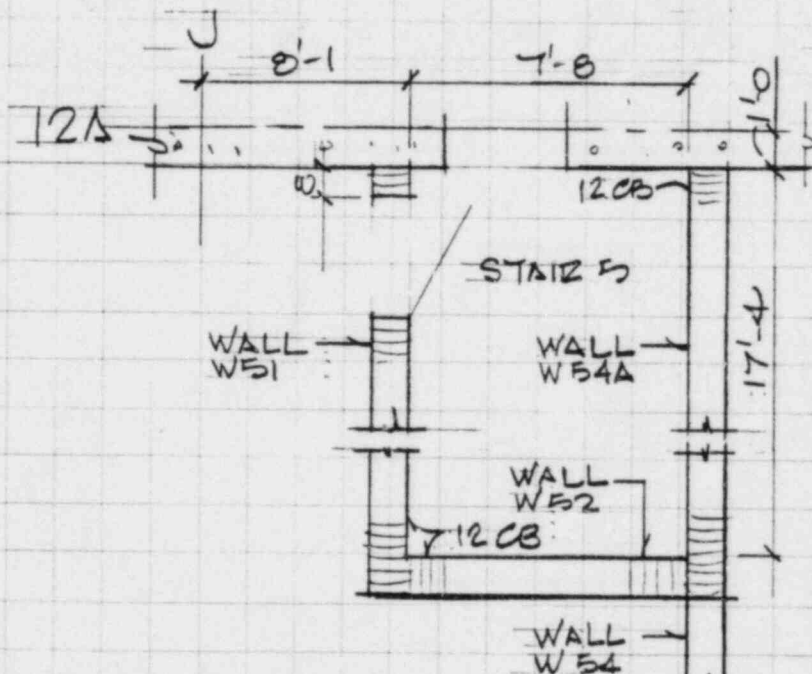
PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

SHEET OF

OFS NO. 2865-058 DEPT. NO. 653

N ———



PART PLAN - EL+21.00
 TAB ^{3/16} = 1-0 REF DWG G-763

DATE 10-8-84

DATE 10.9.86

LOUISIANA POWER & LIGHT CO

OFFS NO

DEPT
NO

SHEET _____ OF _____

PROJECT	WATERLOO
SUBJECT	CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

SHEET OF

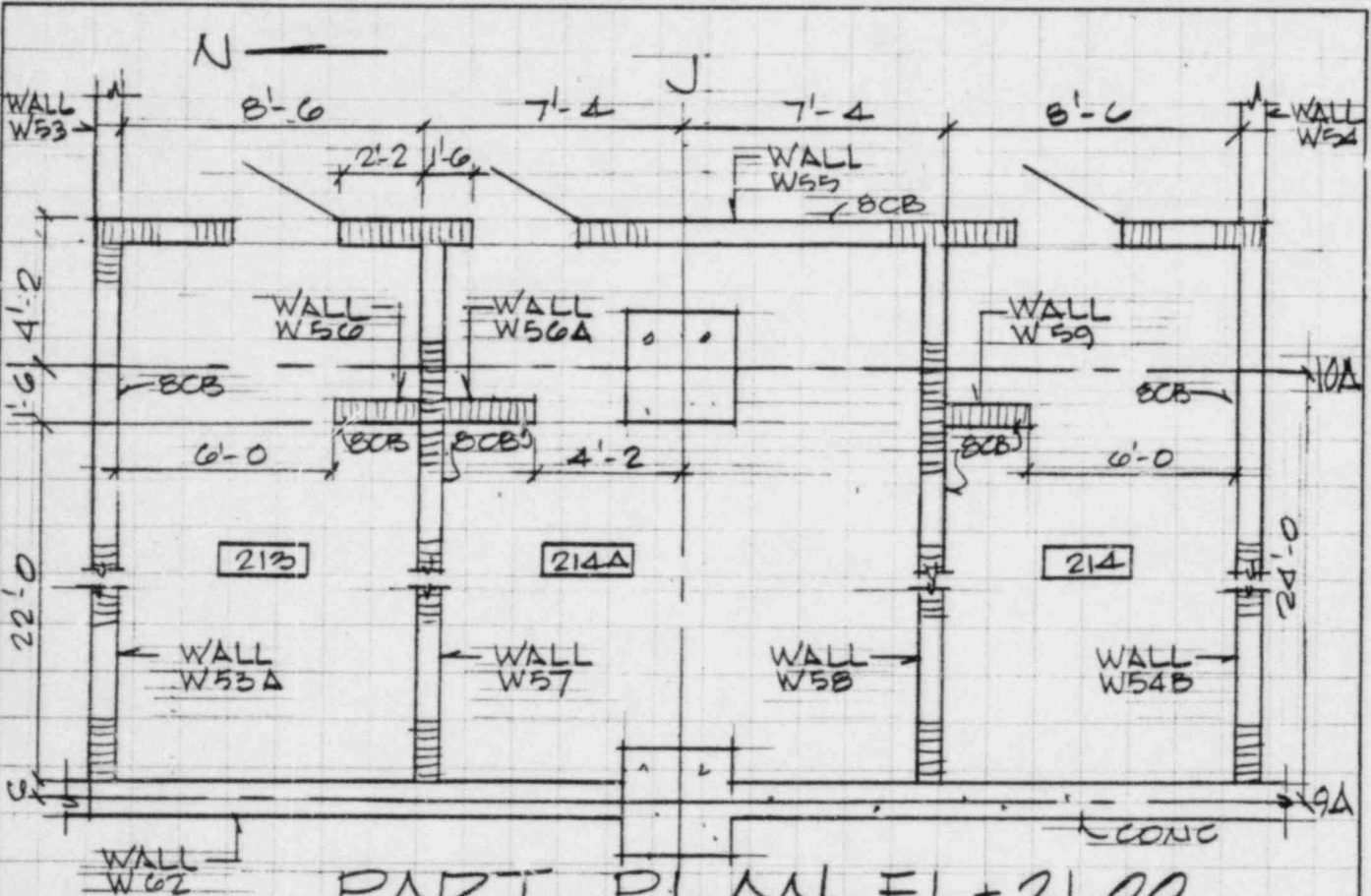
CHKD. BY G.F. DATE 10-8-84

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL+21.00

RAB 316 = 1'-0"

REF DWG G-703

DATE 10-8-84

DATE 10-9-86

LOUISIANA POWER & LIGHT CO

DEPT.
NO.

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

SHEET OF

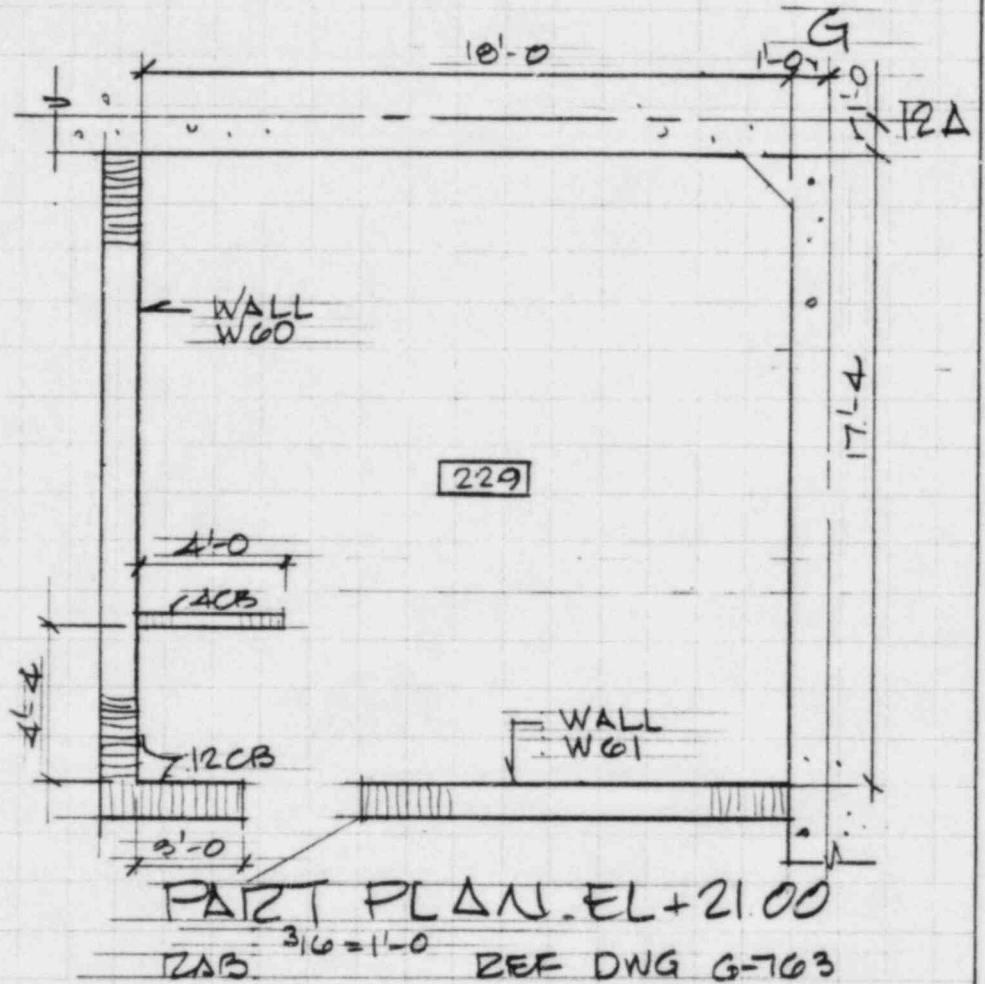
OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N ———



EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-8-84

SHEET _____ OF _____

CHKD. BY C. O. Liberti DATE 10-9-84

OFS NO. _____ NO. _____

DEPT. _____
NO. _____

CLIENT 1 LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD 2

SUBJECT CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

WALLS: W64, W65, W66
W66A, W67, W68

BY BILAK DATE 10-6-84

CHKD. BY G.F. DATE 10-8-84

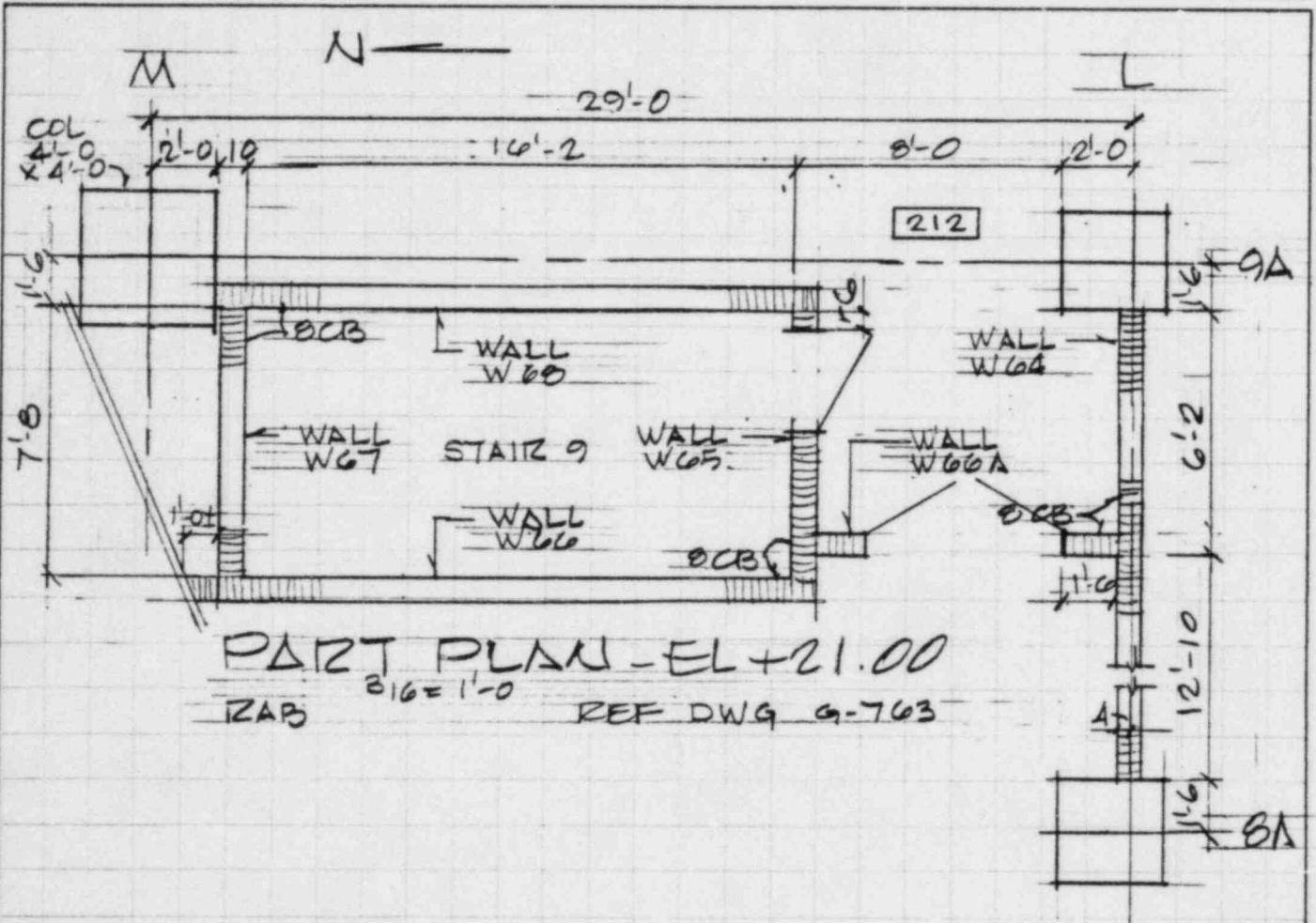
SHEET OF

OFS NO. 2865-058 DEPT. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY J.S DATE 10-8-84

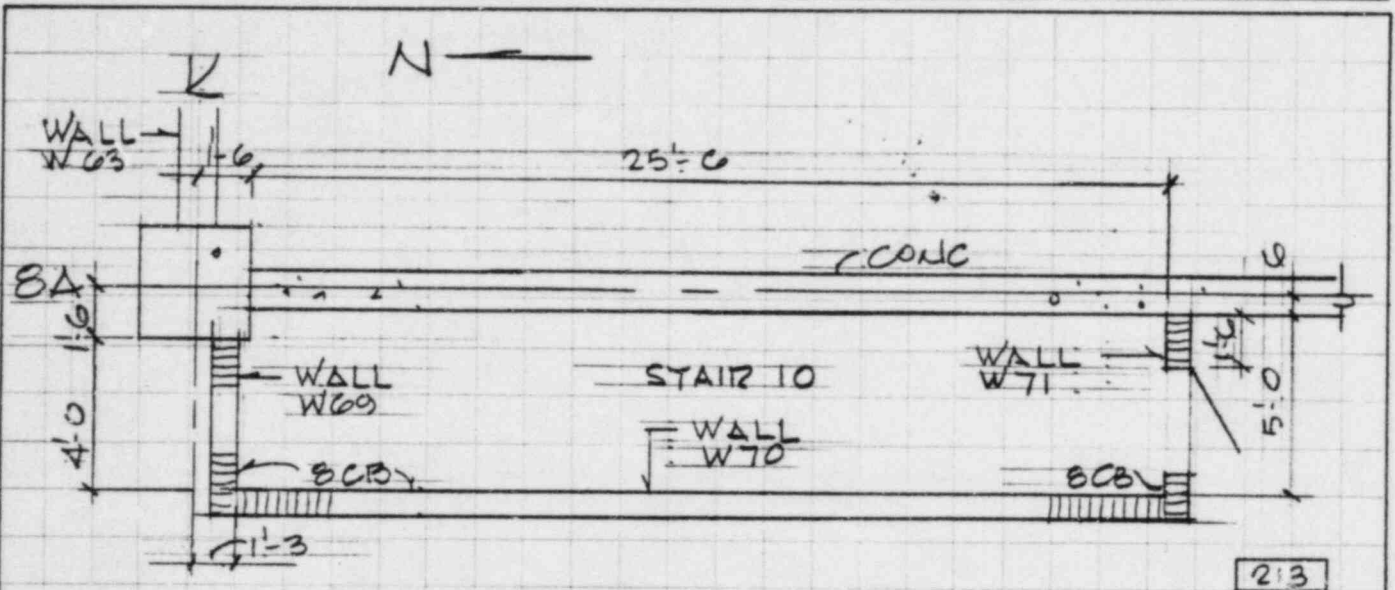
SHEET _____ OF _____

OFS NO. 2865-053 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL+21.00

RAB $316 = 140$ REF DWG G-763

DATE 10-8-84

DATE 10.9.88

LOUISIANA POWER & LIGHT CO

DEPT. _____
NO. _____

#3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY G.F. DATE 10-8-84

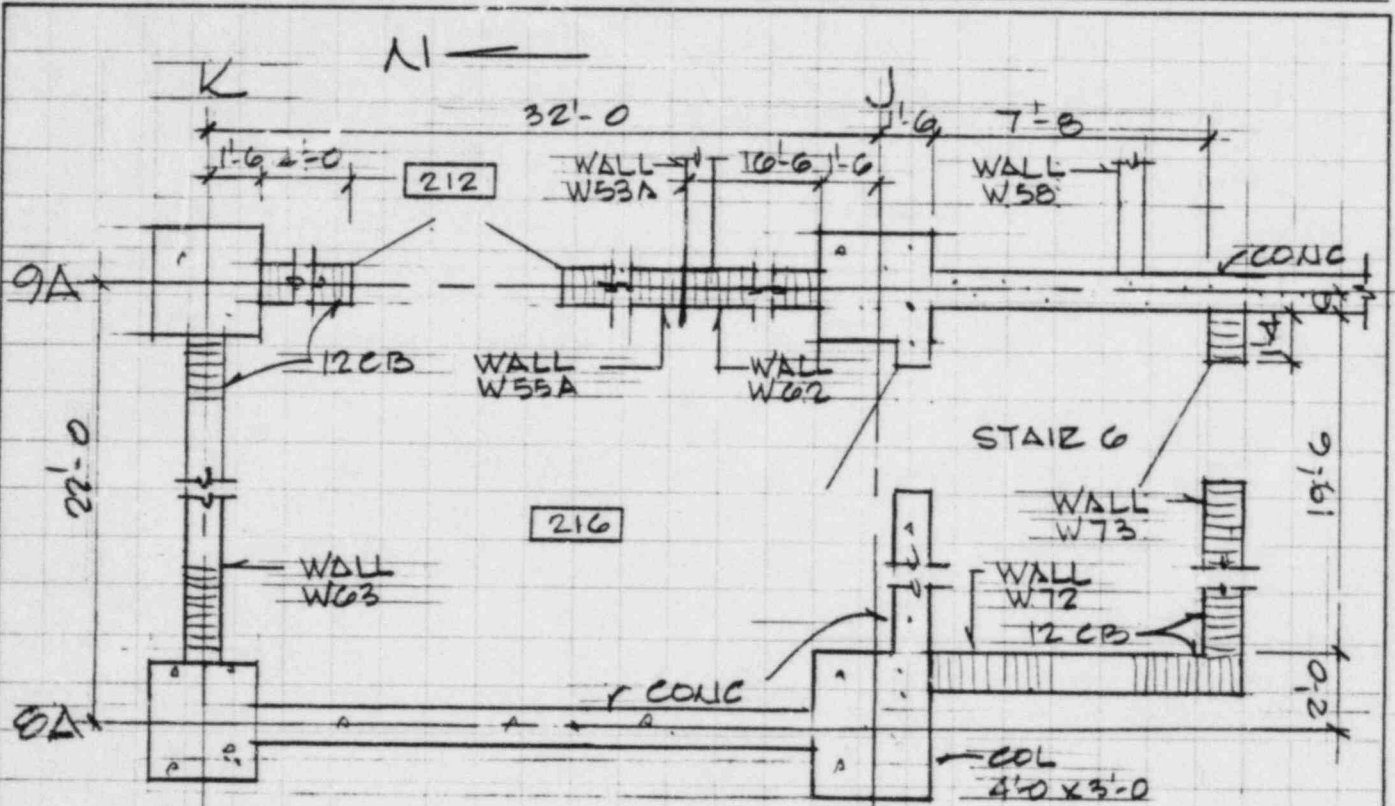
SHEET OF

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN - EL +21.00

2AB 316 = 1'-0 REF DWG G-763

BY G. W. V. DATE 10-8-84

CHKD. BY A. V. K. M. DATE 10.9.94

CLIENT 1 LOUISIANA POWER & LIGHT CO

DEPT. _____
OFS NO. _____ NO. _____

SHEET _____ OF _____

PROJECT

WATERFORD #3

SUBJECT

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPINO DATE 10-6-84

CHKD. BY G.F. DATE 10-8-84

SHEET _____ OF _____

OFS NO. 2865-008 DEPT. NO. 653

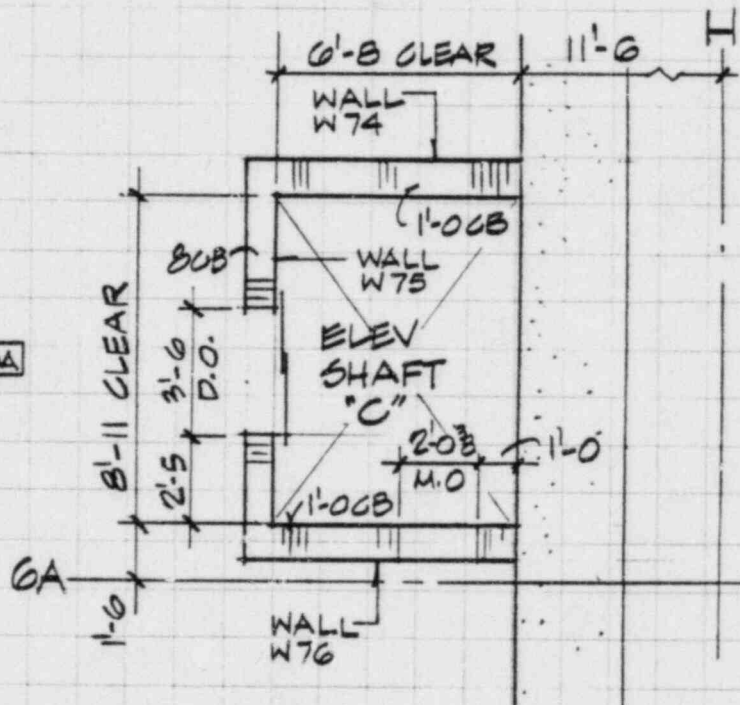
CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N —————

225A



PART PLAN EL. 21.00'
 RAB 316=1'-0" REFER DWG G-763

1

1

REMARKS:

[illegible]

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

CHKD. BY GF DATE 10-8-84

SHEET _____ OF _____

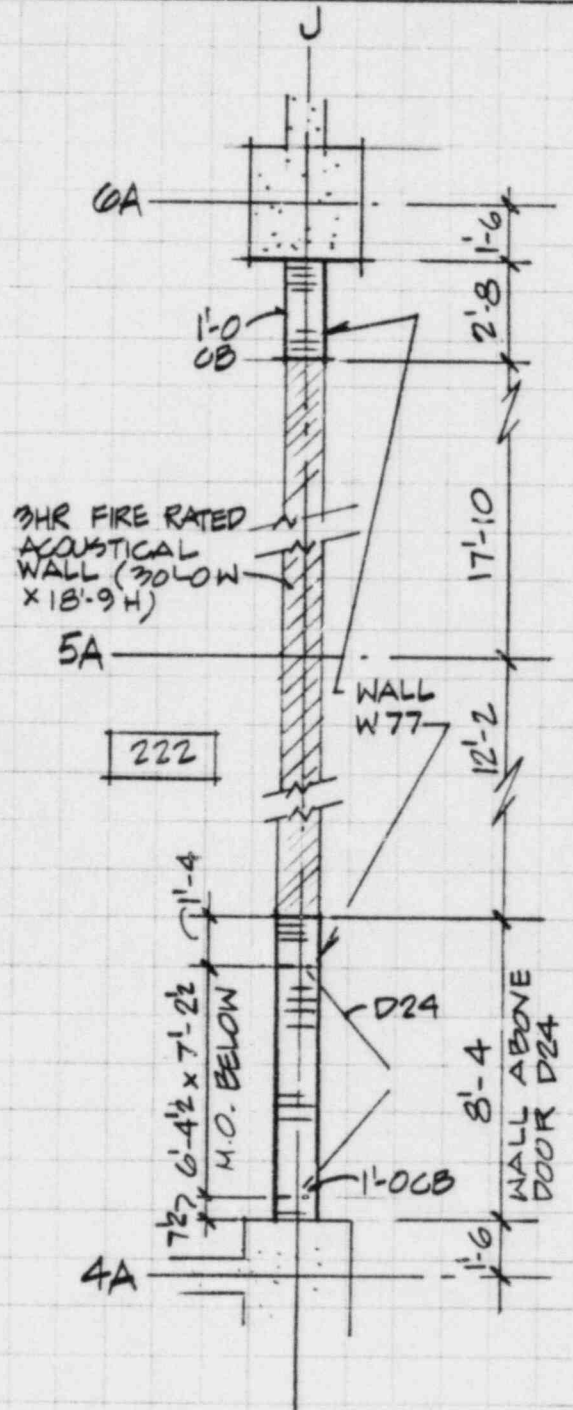
OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N 



PART PLAN EL. 21.00'
RAB 3/16=1'-0" REFER DNG 6763

DEPT.
NO.DEPT.
NO.

3

DATA - SEISMIC MASONRY

[illegible]

REMARKS: * WALL SPANS HORIZONTALLY

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIVITO DATE 10-6-84

CHKD. BY GF DATE 10-8-84

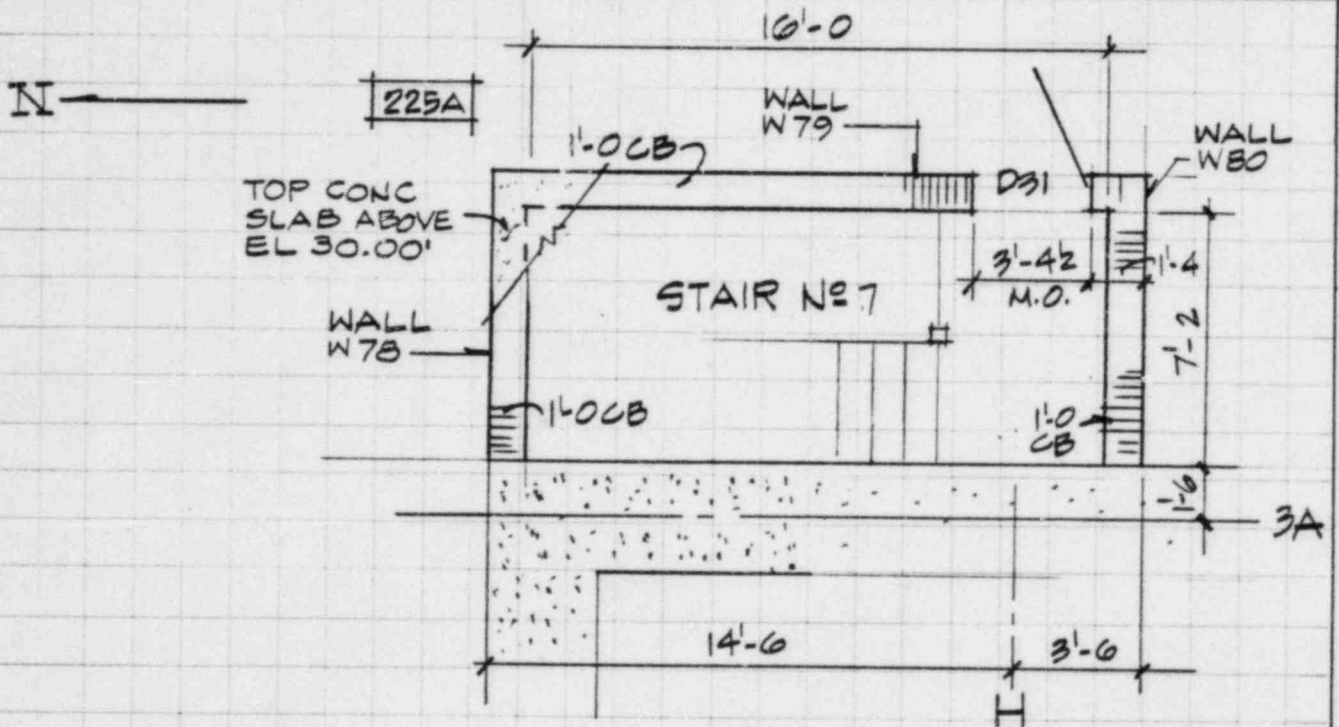
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD # 3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL 21.00'
RAB 3/16" = 1'-0" REFER DWG 6-763

DATE 10-8-84

DATE 10-9-84

OFFS NO

DEPT
NO.

LOUISIANA POWER & LIGHT CO

3 MATTHEW

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY G.F DATE 10-8-84

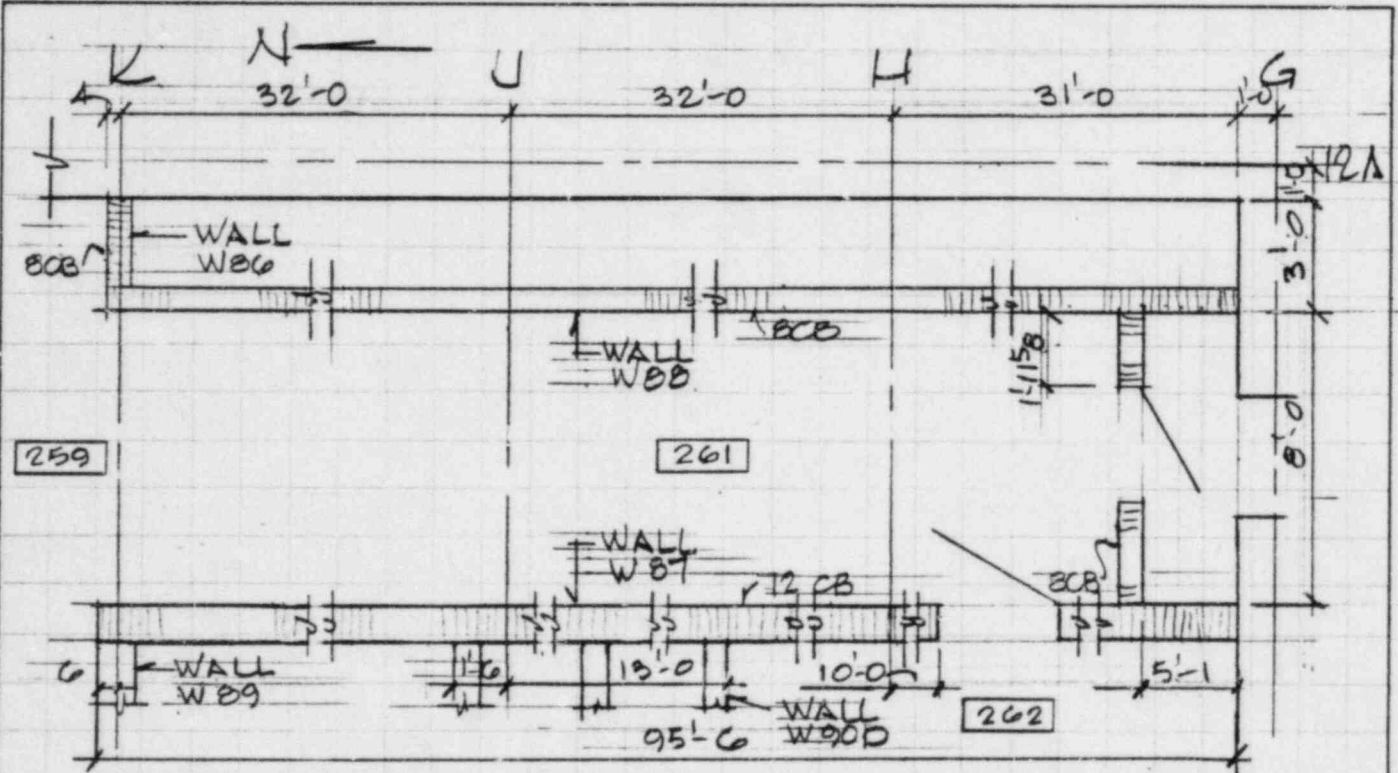
SHEET _____ OF _____

OFS NO. 2865-053 DEPT. NO. 653

CHRD. BY DATE OFS NO.
CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN - EL +35.00

TZAP

REF DWG G-765501

DATE 10-22-84

DATE 10-9-61

LOUISIANA

WATER

CONCRETE

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

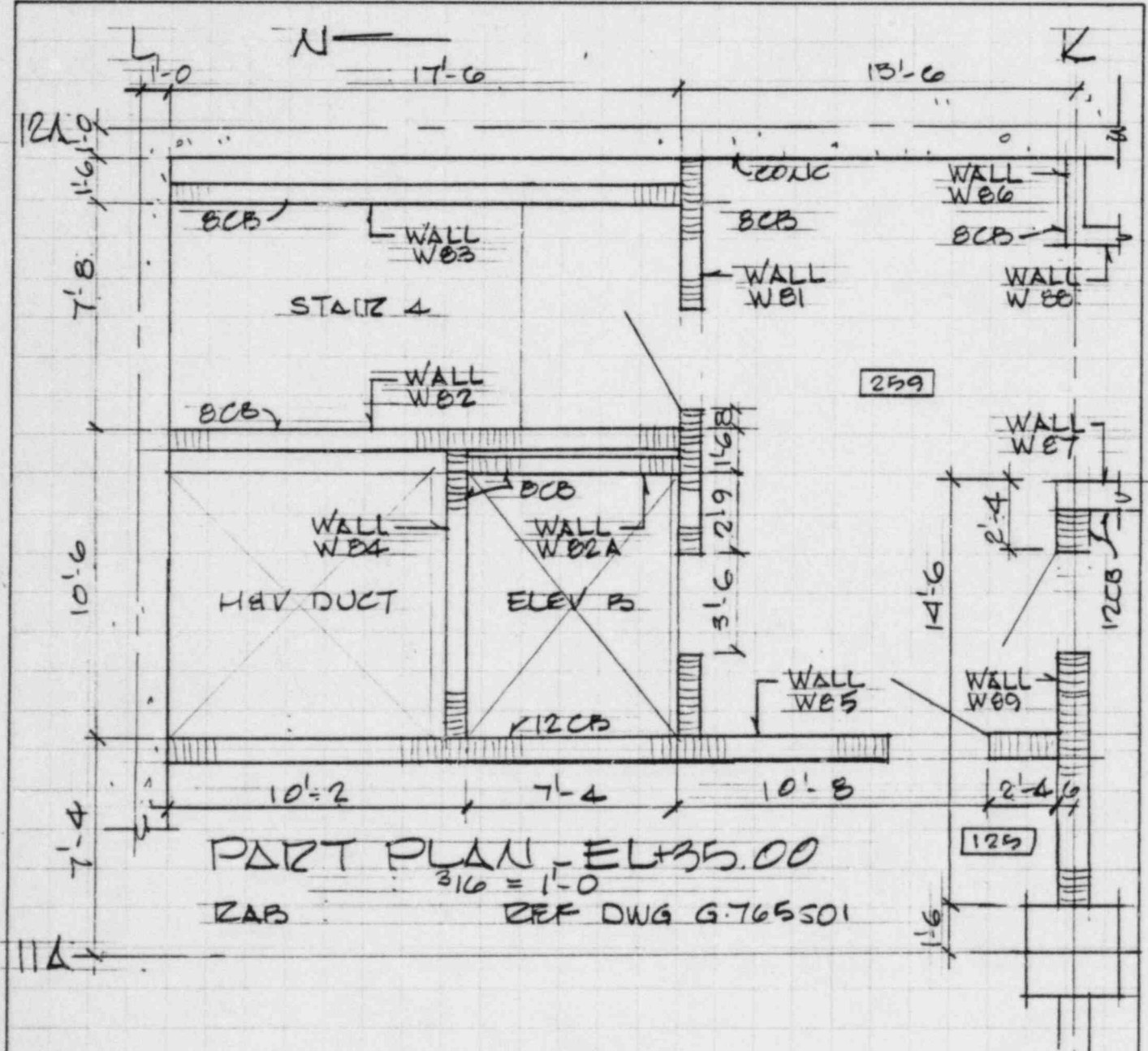
SHEET OF

OFS NO. 2865-055 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



EBASCO SERVICES INCORPORATED

BY FISCHER DATE 10-8-84

CHKD. BY G.W. DATE 10-8-84

SHEET _____ OF _____

OFS NO. 2865,058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS: * /ACCESSIBLE

EBASCO SERVICES INCORPORATED

BY BILAL DATE 10-6-84

SHEET OF

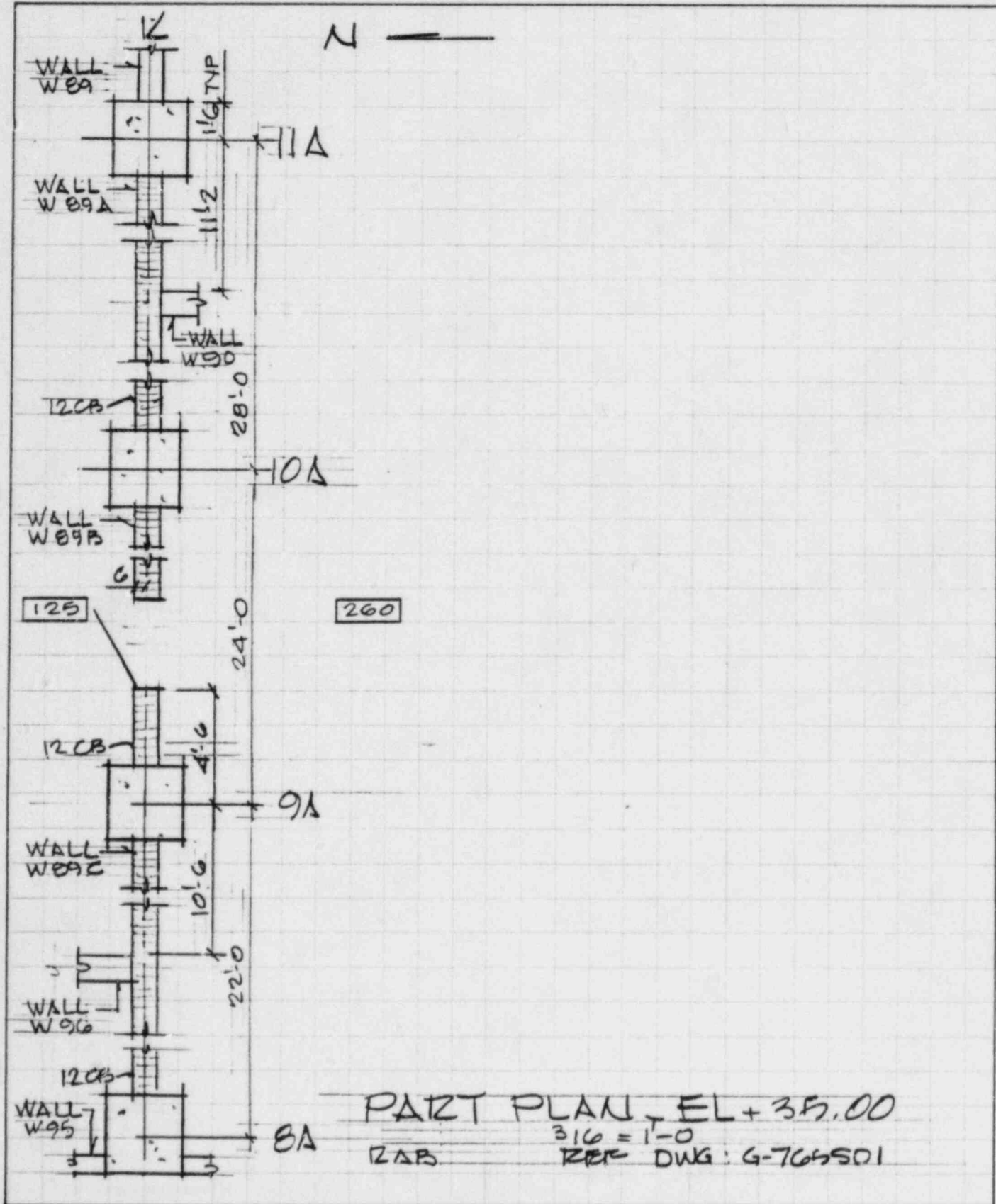
CHKD. BY J.S DATE 10-8-84

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN, EL + 35.00

ZAB

3/16 = 1'-0"

REF DWG: G-764501

SUBJECT 001010

SHEET _____ OF _____

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY G.F DATE 10-8-84

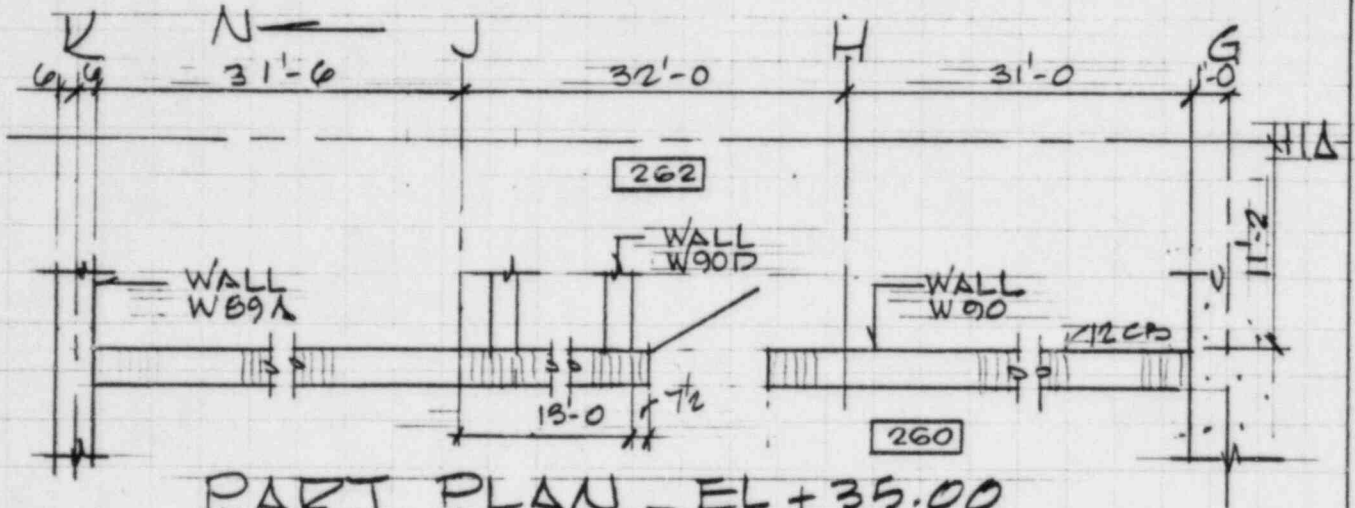
SHEET OF

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN - EL + 35.00

IZAB

316 = 1'-0"

REF DWG G-765 501

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY J.S DATE 10-8-84

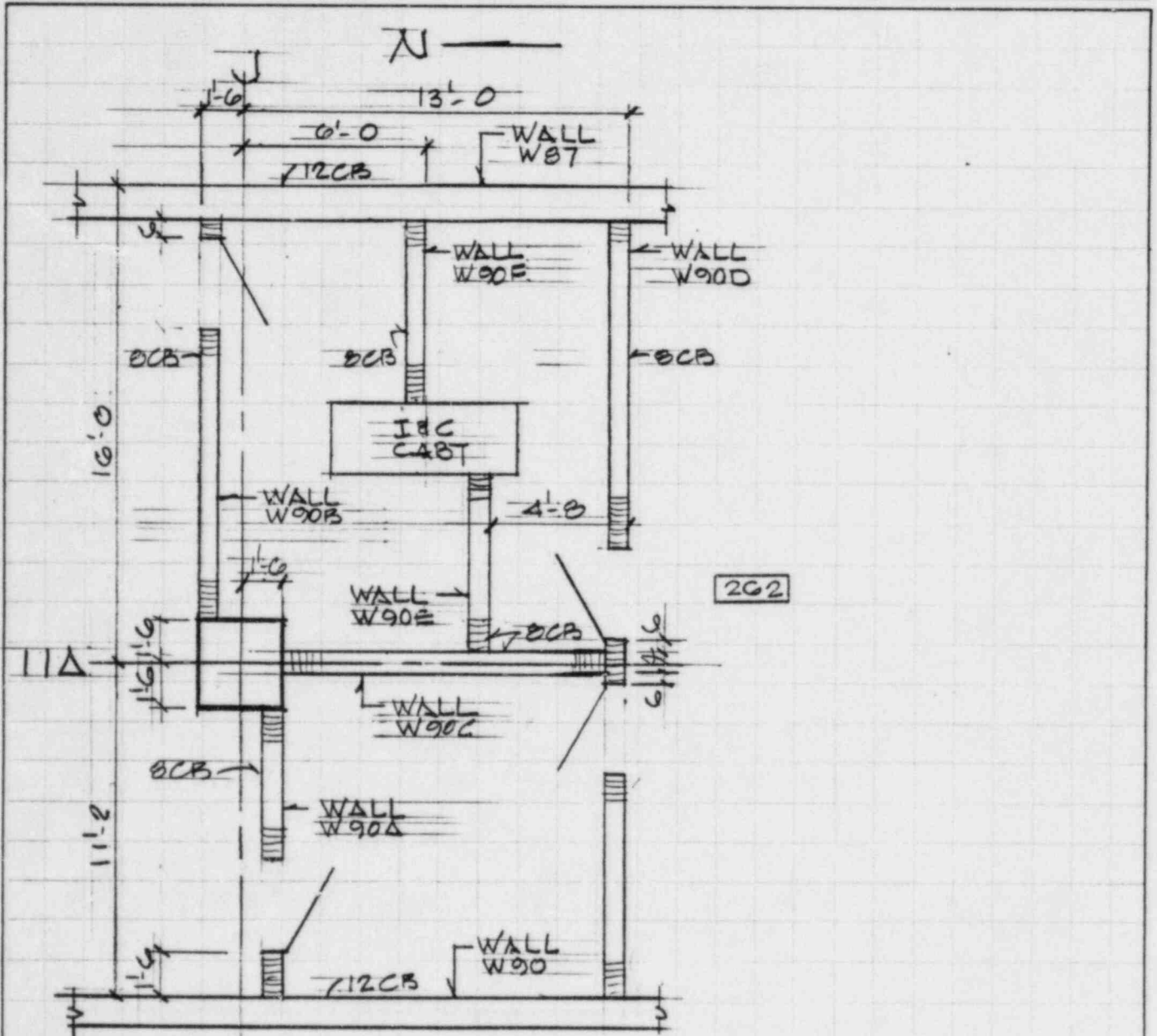
SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN - EL +35.00

12AB

316 = 150

REF DNG G-765501

SHEET _____ OF _____
OFS NO. 2865.058 DEPT. NO. 653

CLIENT

LOUISIANA POWER & LIGHT CO

PROJECT

WATERFORD #3

SUBJECT

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS: * FREE STANDING- NO CONN AT TOP

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

SHEET _____ OF _____

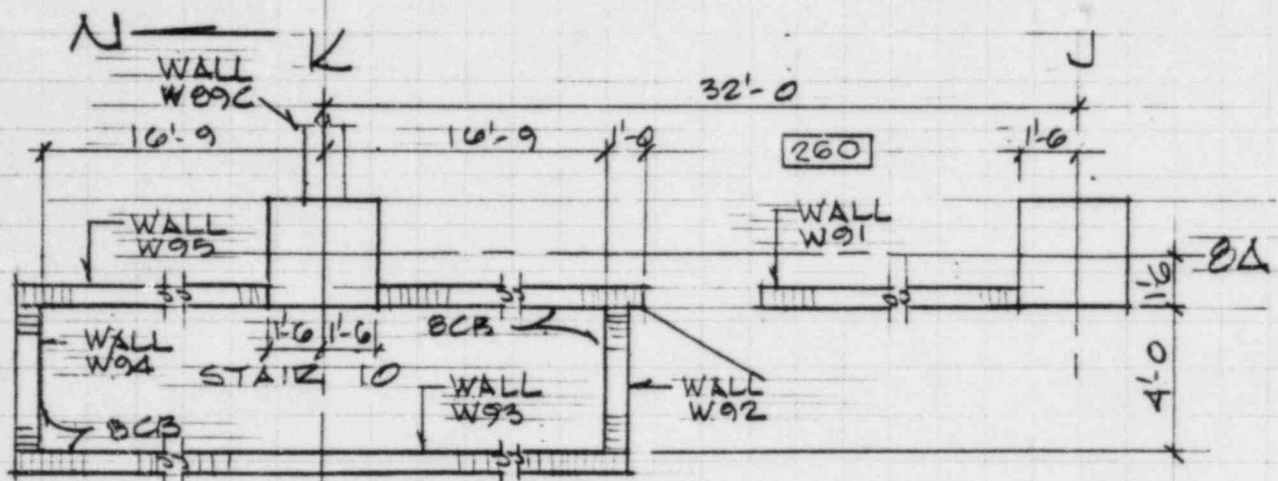
CHKD. BY G.F. DATE 10-8-84

OFS NO. 2865-023 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL + 35.00
 3/16" = 1'-0"
 REF DWG G-769501

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-6-84

CHKD. BY JS DATE 10.8.84

CLIENT

PROJECT

SUBJECT

SHEET _____ OF _____

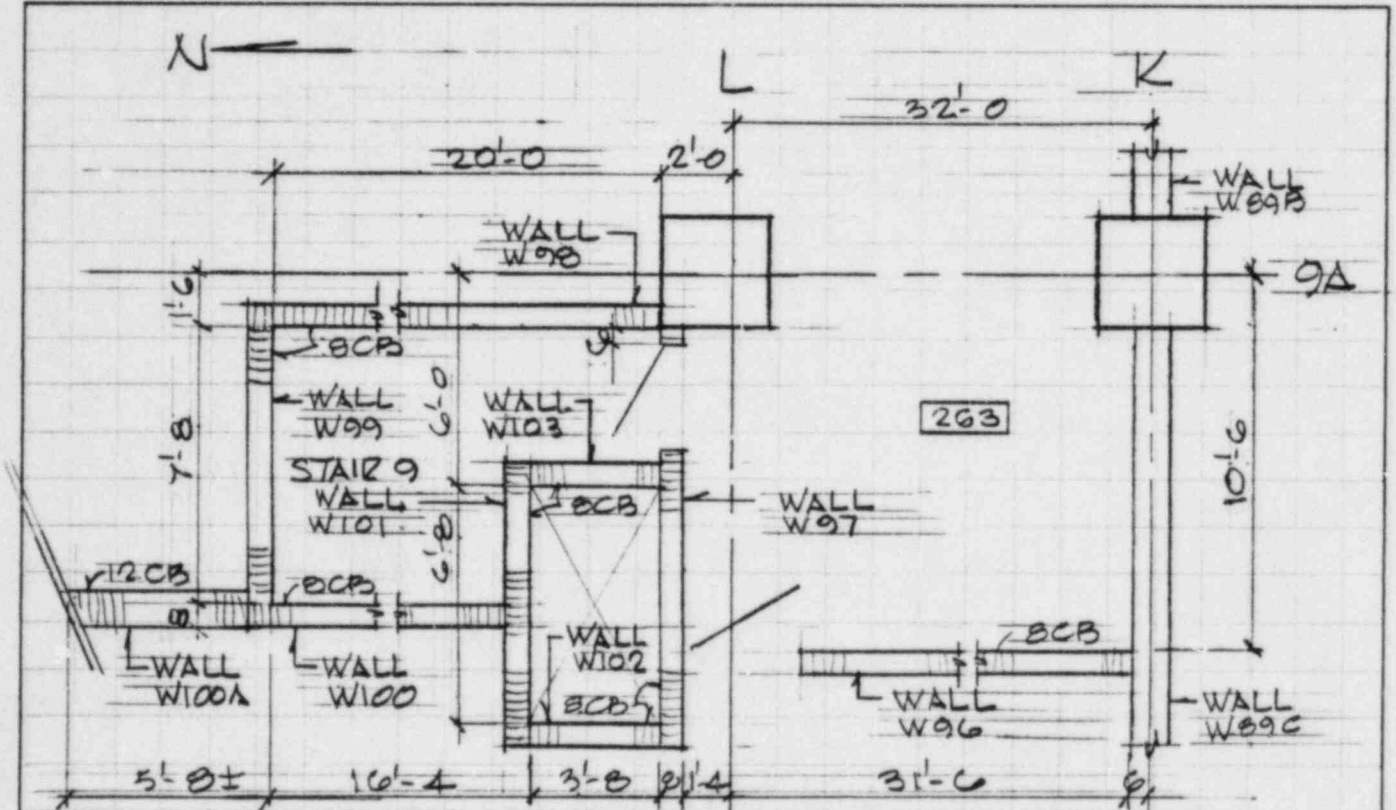
OFS NO. 2865-098 DEPT. NO. 653

DEPT. 653
NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD # 3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN - EL + 35.00

12A B5

ZEE DWG G-765 501

BY FISCHER DATE 10-8-84

CHKD. BY G.W. DATE 10-8-84

SHEET _____ OF _____

CHKD. BY G. W. DATE 10-8-84

DES NO _____ DEPT. NO _____

CLIENT LOUISIANA POWER & LIGHT CO.

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

DATA - SEISMIC MASONRY													
WALL N ^o		WALL DIMEN.			WALL TYPES & DETS			DESIGN PARAMETERS					
W	H S	T = INCH.	W = FEET (FT.)	H = FT. H _E 1/4	TYPE	DETAIL	ELEV WALL N ^o	HOLLOW UNITS			SOLID UNITS		
								FIXED	HINGED	TOP	EXIST.	HINGED	CANTILEVERED
96	H43	12	32'-10	9'-10	A	2	1	✓	✓				
97		8	8'-0	7'-2	A	3	1	✓		✓			
98	H42	8	20'-8	5'-2	A	4	1	✓	✓				
99	H41	8	9'-0	9'-2	A	2	1	✓	✓				
100	H40	8	16'-4	9'-2	A	2	1	✓	✓				
100A		12	5'-8	9'-10	A	2	1	✓	✓				
101		8	8'-0	9'-10	A	2	1	✓	✓				
102		8	5'-0	9'-10	A	2	1	✓	✓				
103		8	4'-4	9'-10	A	4	1	✓	✓				

REMARKS:

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

SHEET _____ OF _____

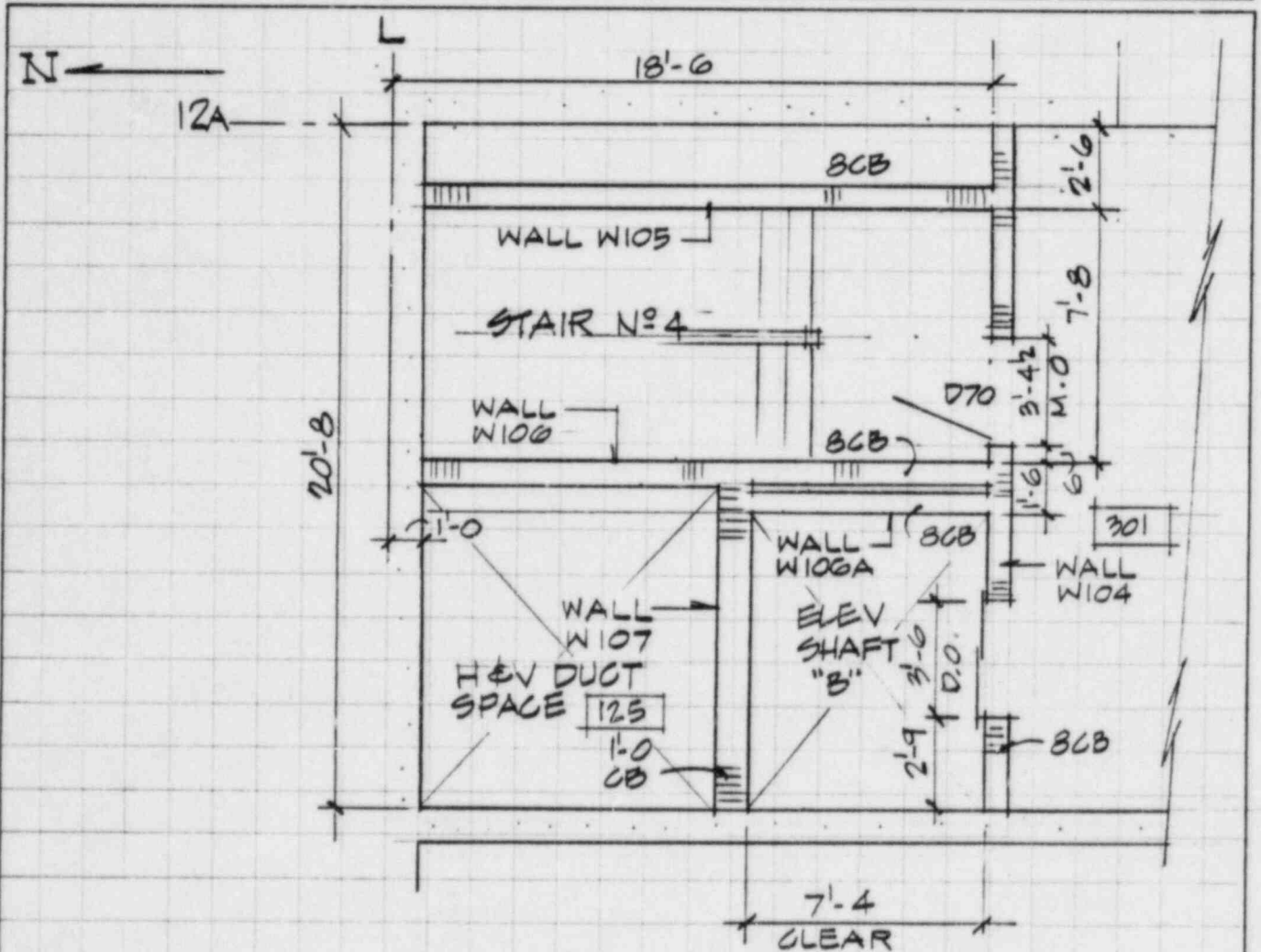
CHKD. BY GF DATE 10-8-84

OFS NO. 2865-053 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL 46.00'

RAB

310=1'-0"

REFER DWG G764

BY FISCHER DATE 10-8-84

DATE 10-8-84

CHKD. BY: GA.WU DATE 10-8-84

DATE 10-8-84

CLIENT COULDING POWER & LIGHT CO

LOUISIANA POWER & LIGHT CO

DEPT. NO. 653
OFS NO. 2865.058

EXPT. NO. 653

PROJECT WATERLOO #2

WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS: *INACCESSIBLE

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

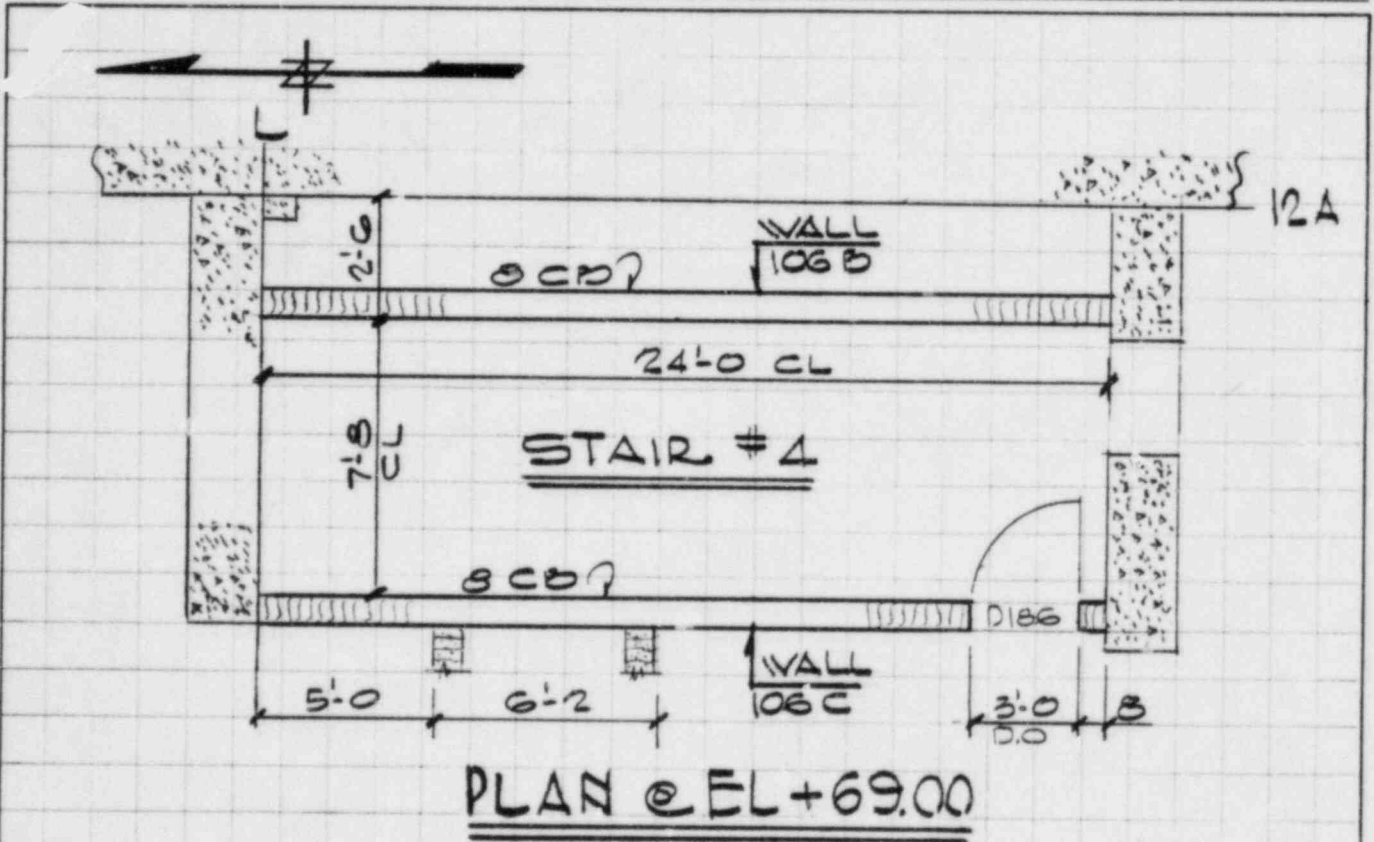
SHEET _____ OF _____

OFS NO. 2865-053 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



REF. DWG G-771503

DATE 10-8-84

DATE 10-8-84

DEPT. NO. 653

LOUISIANA POWER & LIGHT CO

WATERFORD #3

CONCRETE MASONRY BLOCK W/4LS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-6-84

CHKD. BY J.S. DATE 10-8-84

CLIENT

LOUISIANA POWER & LIGHT CO.

PROJECT

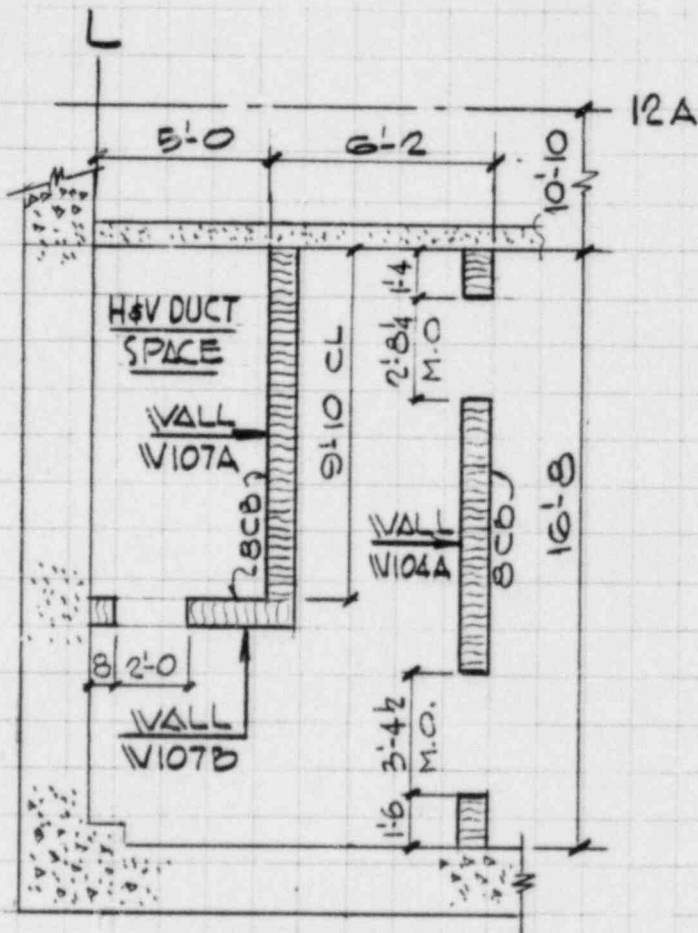
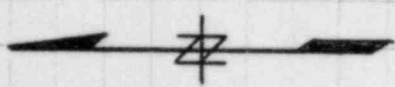
WATERFORD #3

SUBJECT

CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. 653



PLAN @ EL. +69.00'

REF. DWG G-771503

BY FISCHER DATE 10-8-84 SHEET _____ OF _____
CHKD. BY G.W. DATE 10-8-84 OFS NO. 2865.058 DEPT. NO. 653
CLIENT LOUISIANA POWER & LIGHT CO.
PROJECT WATERFORD #3
SUBJECT CONCRETE MASONRY BLOCK WALLS

501/0-01

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

SHEET _____ OF _____

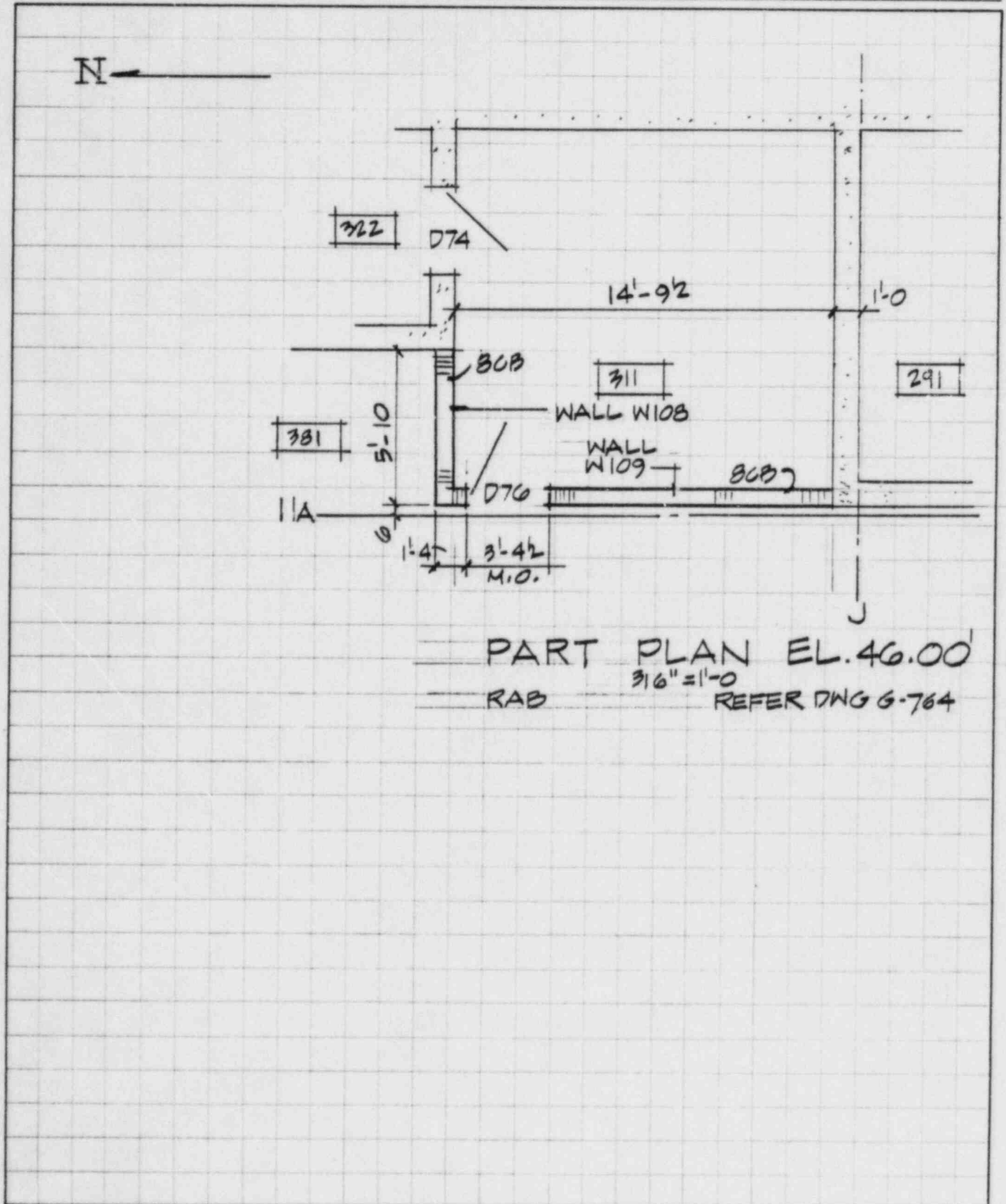
CHKD. BY G.F. DATE 10-8-84

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



OFFS NO. 2865, 058 DEPT. NO. 653

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS: * CERAMIC TILE FIN. NO VISUAL INSPEC. POSSIBLE

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

CHKD. BY G.F. DATE 10-8-84

CLIENT

LOUISIANA POWER & LIGHT CO.

PROJECT

WATERFORD #3

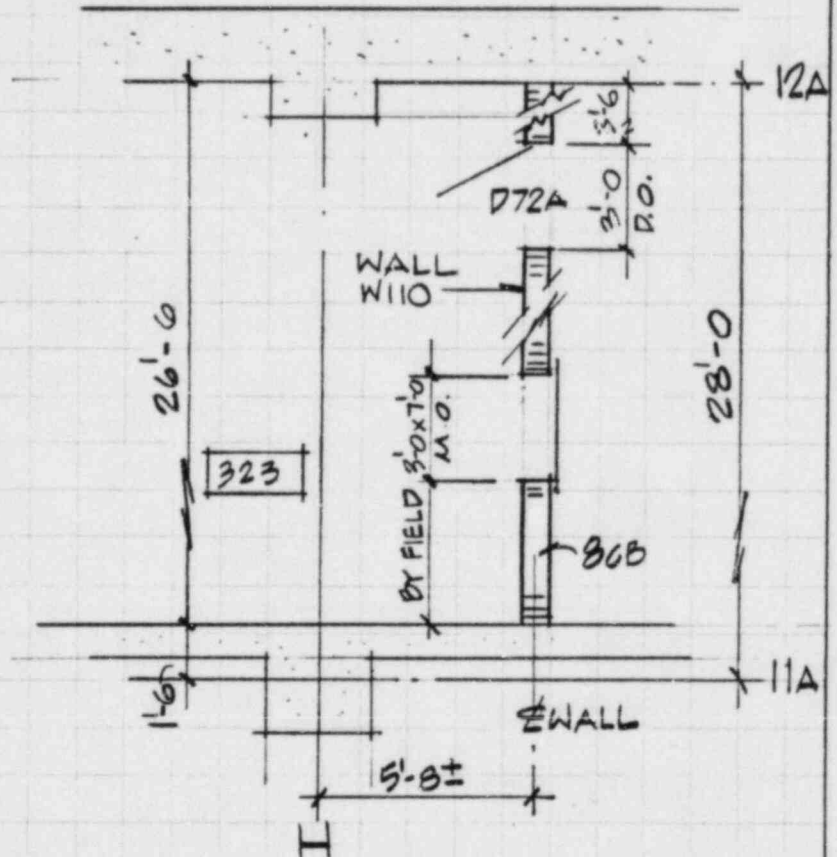
SUBJECT

CONCRETE MASONRY BLOCK WALLS

SHEET ____ OF ____

OFS NO. 2865-058 DEPT. 653

N



PART PLAN EL 46.00'
 3/16 = 1'-0"
 RAB REFER DWG G-764

BY W. SCHER DATE 10-8-84

CHKD. BY G.W. DATE 10-8-84

DATE 10-8-84

OFFS NO. 2865, 058 DEPT. NO. 653

OFFS NO. 2865, 058 DEPT. NO. 653

CLIENT

PROJECT

LOUISIANA POWER & LIGHT CO.
WATERFORD #3

SUBJECT

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOS PIV TO DATE 10-6-84

SHEET _____ OF _____

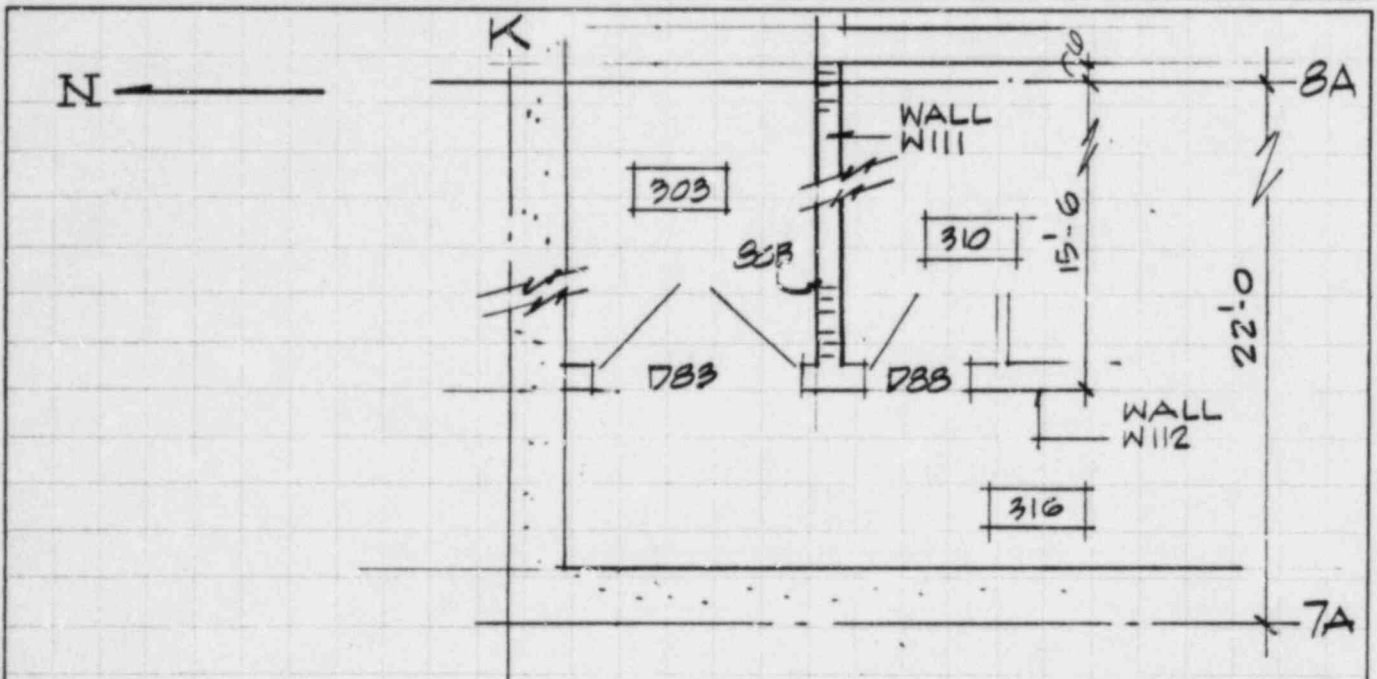
CHKD. BY G.F. DATE 10-8-84

OFS NO. 2365-053 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL 46.00'
RAB 316-1-0 REFER DWG G-764

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRO DATE 10-6-84

SHEET 1 OF 2

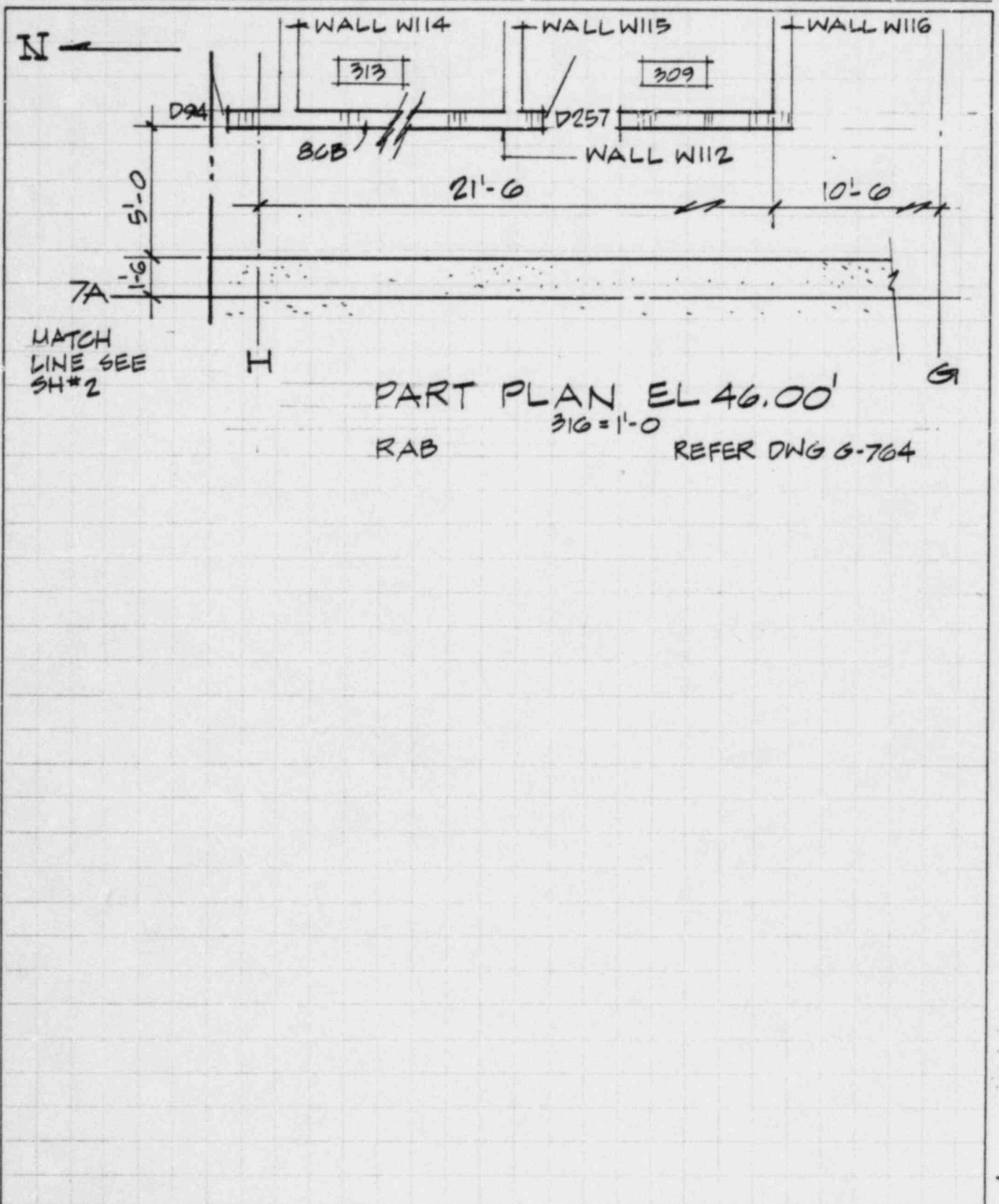
CHKD. BY GF DATE 10-8-84

OFS NO. 12665-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS SH#1



EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

SHEET 2 OF 2

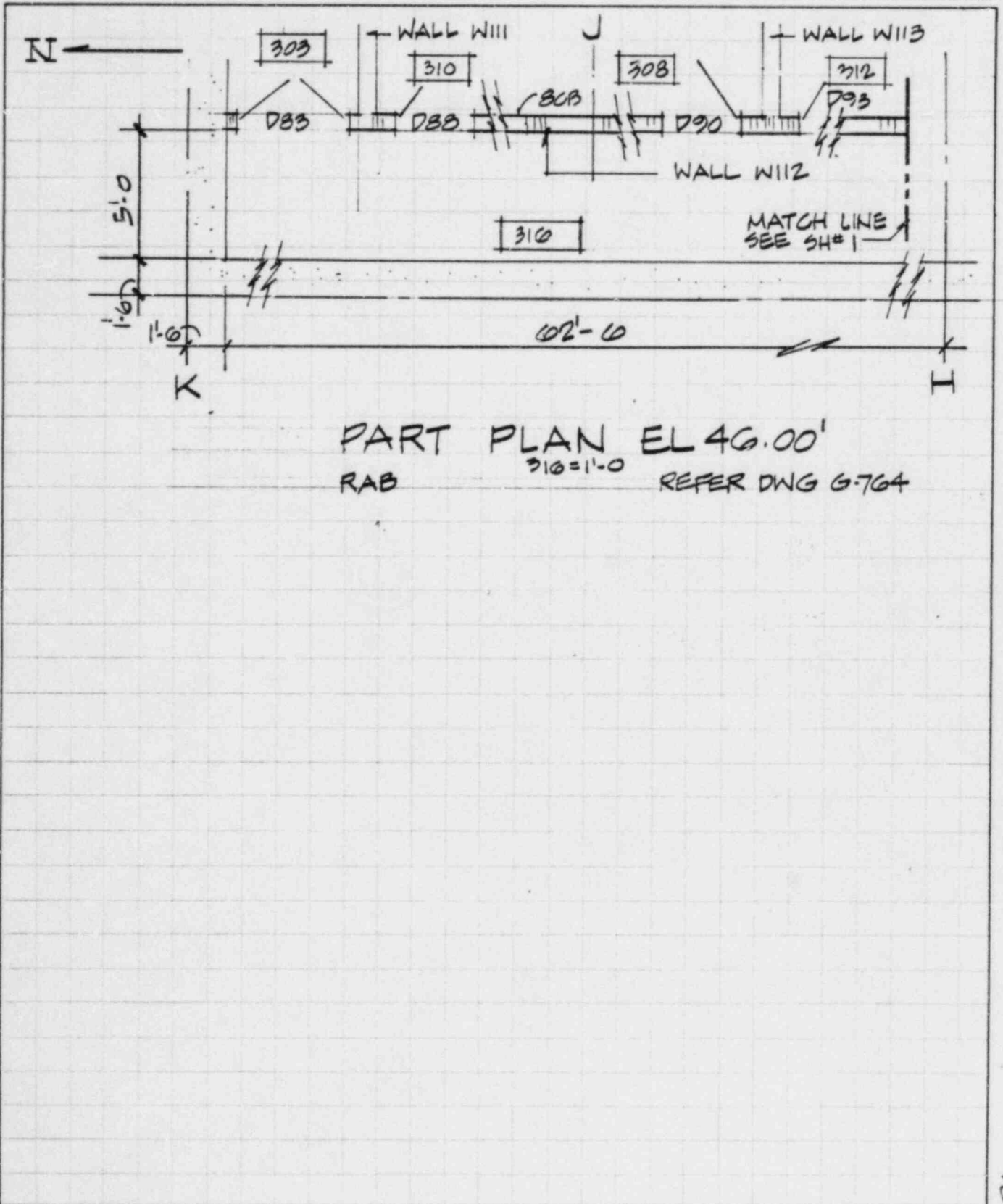
CHKD. BY G.F. DATE 10-8-84

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



DATE 10-8-84

DATE 10-8-84

LOUISIANA POWER & LIGHT CO

DEPT. NO. 653
OFS NO. 2865,058

WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

ALL TYPES & DETS

WALL №

WALL DIMEN.

WALL TYPES & DETS

DESIGN PARAMETERS

HOLLOW UNITS

SOLID UNITS

BOTT.

TOP

INTERMEDIATE DIAPHRAM

FIXED

HINGED

FREE

EXIST.

HINGED

CANTILEVERED

2 | H45

8

84'-8

15-4

A

2

1

✓

☒

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

CHKD. BY GF DATE 10-8-84

CLIENT

LOUISIANA POWER & LIGHT CO.

PROJECT

WATERFORD #3

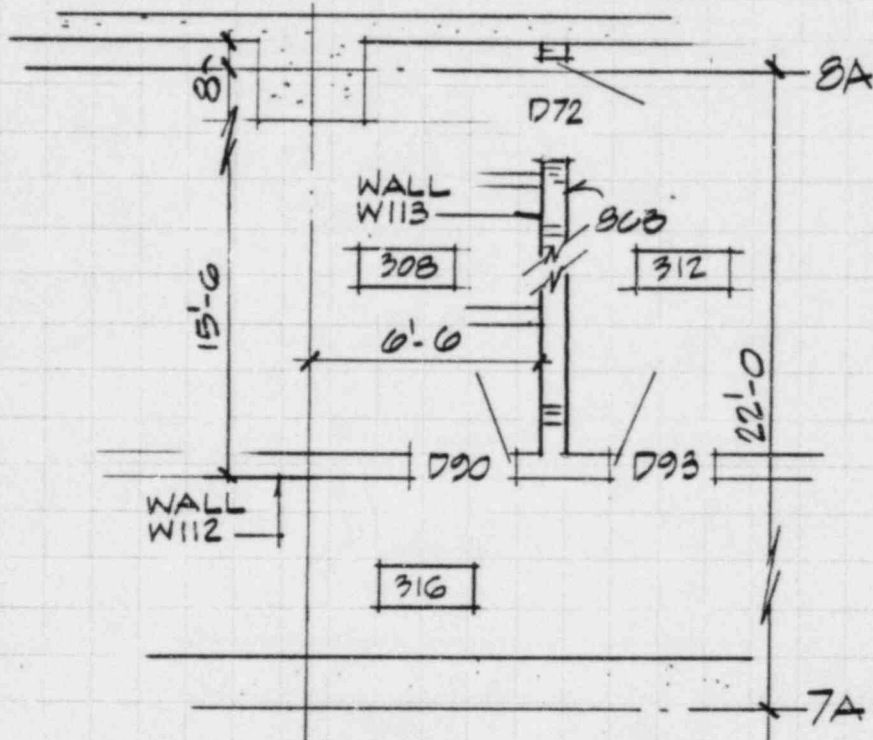
SUBJECT

CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

N —————



PART PLAN EL 46.00'

RAB

3/16" = 1'-0"

REFER DWG G-764

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

SHEET _____ OF _____

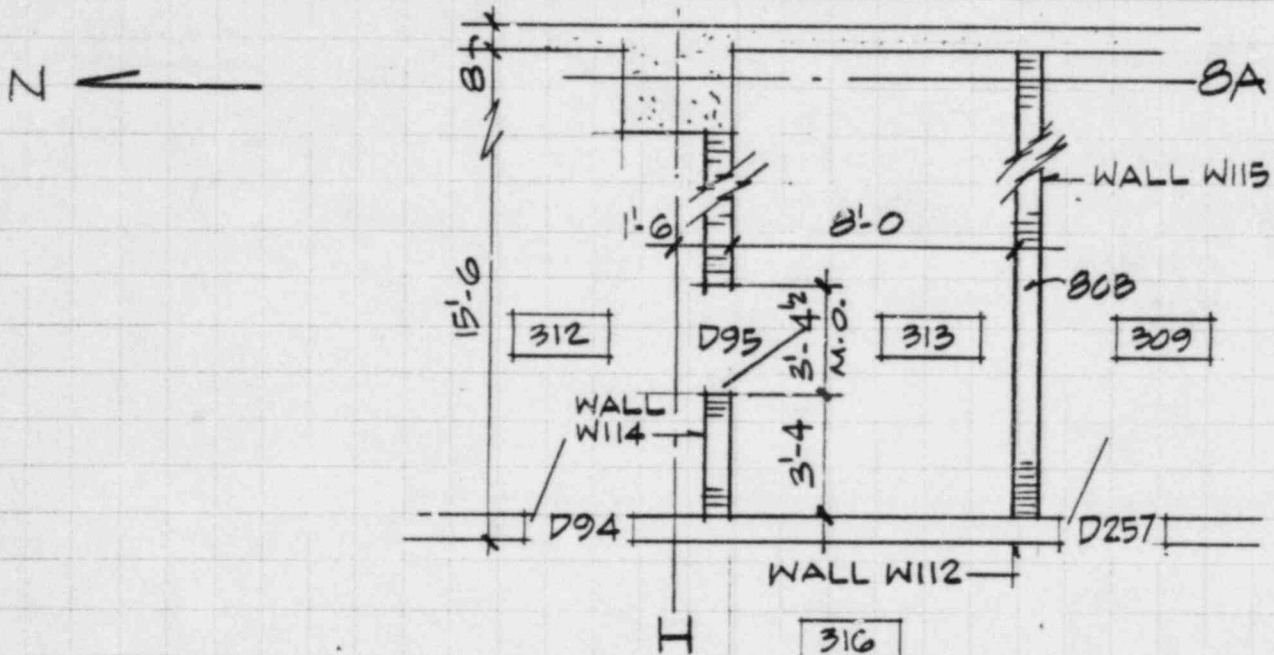
CHKD. BY GF DATE 10-8-84

GFS NO. 2365-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #5

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL 46.00'

RAB

$$316'' = 1'.0$$

REFER DWG G-704

DATE 10-8-84

DATE 10-8-84

OFS NO. 2865, 058 DEPT. NO. 653

LOUISIANA POWER & LIGHT CO

WATERFORD #3

CONCRETE MASONRY BLOCK W/4-L5

DATA - SEISMIC MASONRY

[illegible]

REMARKS: * INACCESSIBLE

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

CHKD. BY GF DATE 10-8-84

CLIENT

LOUISIANA POWER & LIGHT CO.

PROJECT

WATERFORD #3

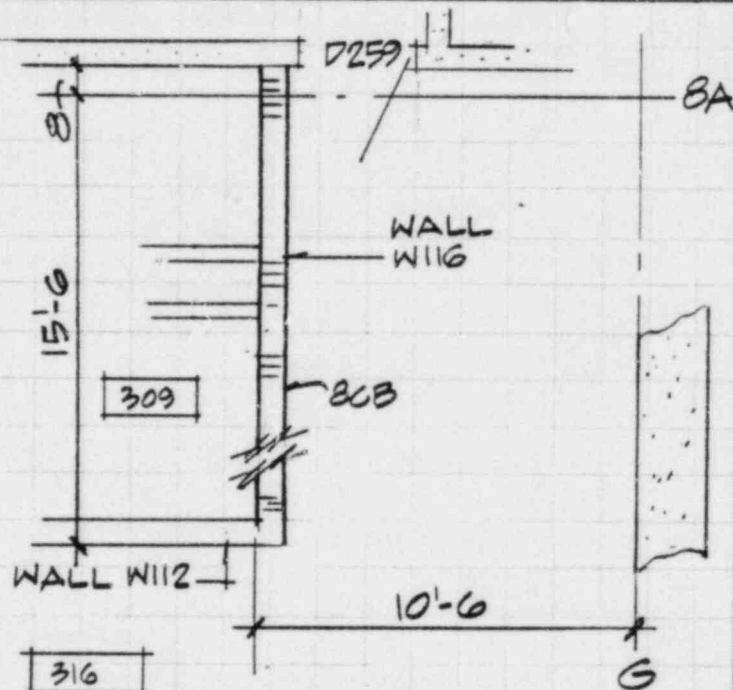
SUBJECT

CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865-058 DEPT. NO. 653

N ←



PART PLAN EL 46.00'

RAB

316 = 1'-0" REFER DWG G-764

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

SHEET _____ OF _____

CHKD. BY GF DATE 10-8-84

OFS NO. 2865-078 DEPT. NO. 653

CLIENT

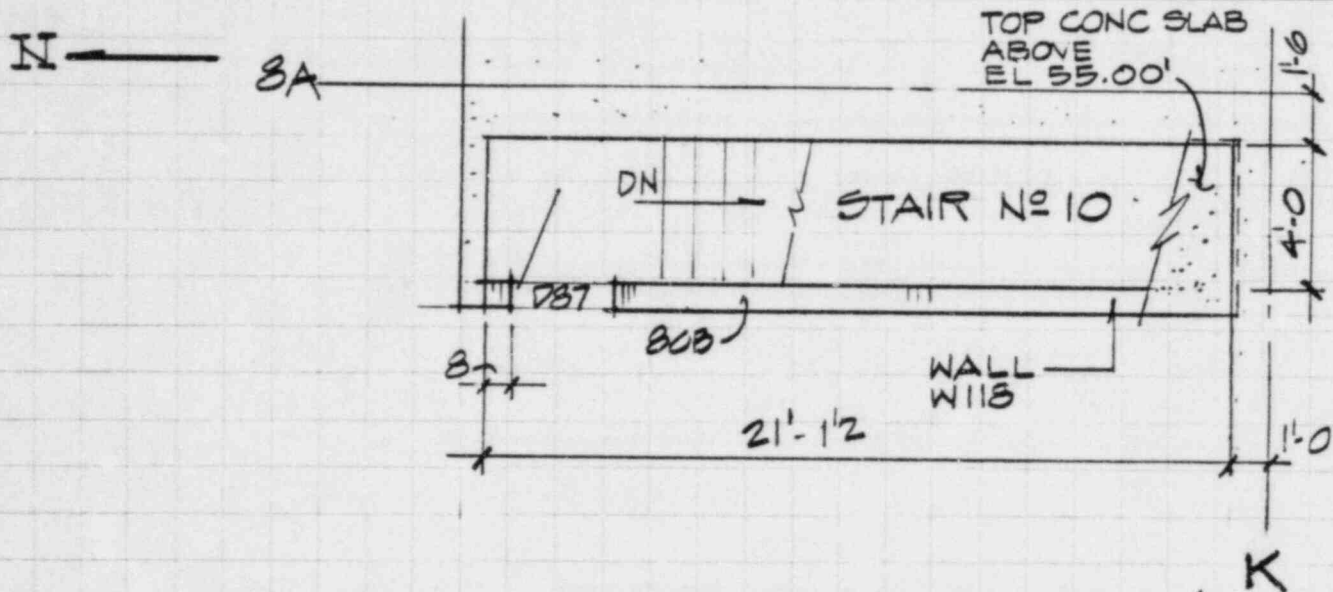
DATE 10-5-64 OFS NO. 2007-0
LOUISIANA POWER & LIGHT CO

PROJECT

WATERFORD # 3

SUBJECT

CONCRETE MASONRY BLOCK WALLS



PART PLAN EL 46.00'

RAB

$$316'' = 1'-0''$$

REFER DWG G.764

SHEET _____ OF _____

DEPT. NO. 653
OFFS NO. 2865, 058

8

44-5

WALL TYPES & DETS	DESIGN PARAMETERS
-------------------	-------------------

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-6-84

CHKD. BY GF DATE 10-8-84

SHEET _____ OF _____

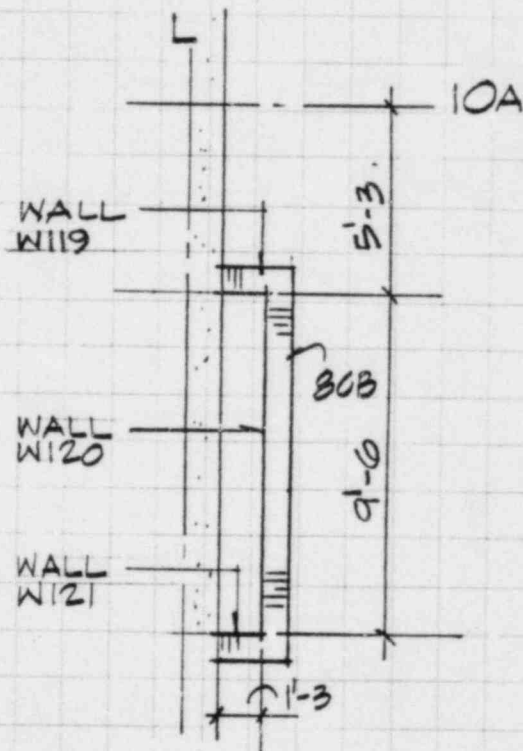
OFS NO. 2865-098 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N —————



PART PLAN EL 46.00'
RAB 316 = 1'-0" REFER DWG G-764

DEPT. NO. 653
OFS NO. 2865.058

LOUISIANA POWER & LIGHT CO
WATERFORD #3

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS: *FIRE BLANKET ON WALL. NO VISUAL INSPEC POSSIBLE.

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10.6.84

SHEET _____ OF _____

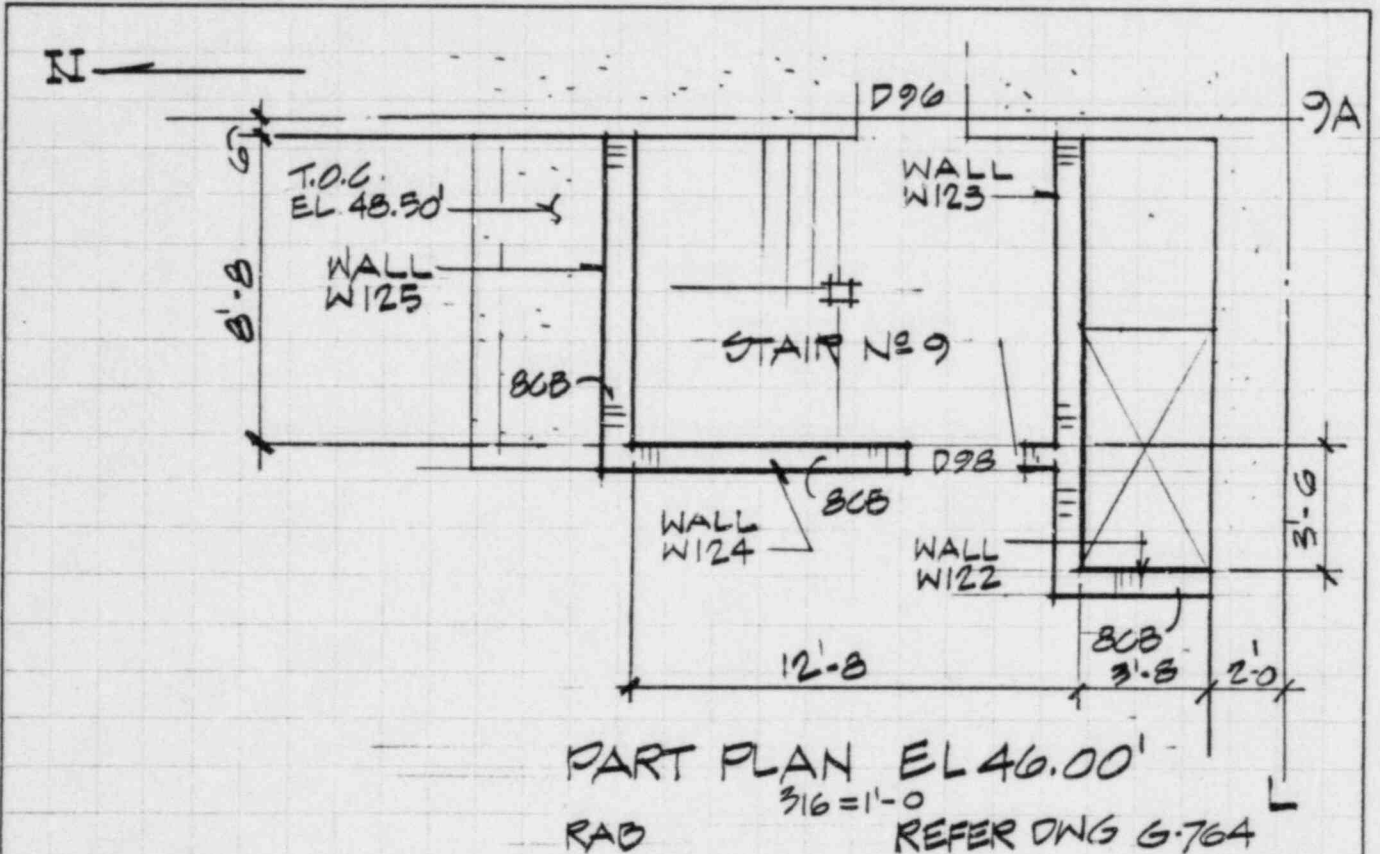
CHKD. BY G.F. DATE 10.8.84

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



BY **FISCHER**

DATE 10-8-84

SHEET _____ OF _____

CHKD. BY E. W.

DATE 10-8-84

DEPT. NO. 653
OFS NO. 2665,058

CLIENT

LOUISIANA POWER & LIGHT CO

PROJECT

WATERFORD #3

SUBJECT

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPRITO DATE 10-7-84

SHEET _____ OF _____

CHKD. BY GF DATE 10-8-84

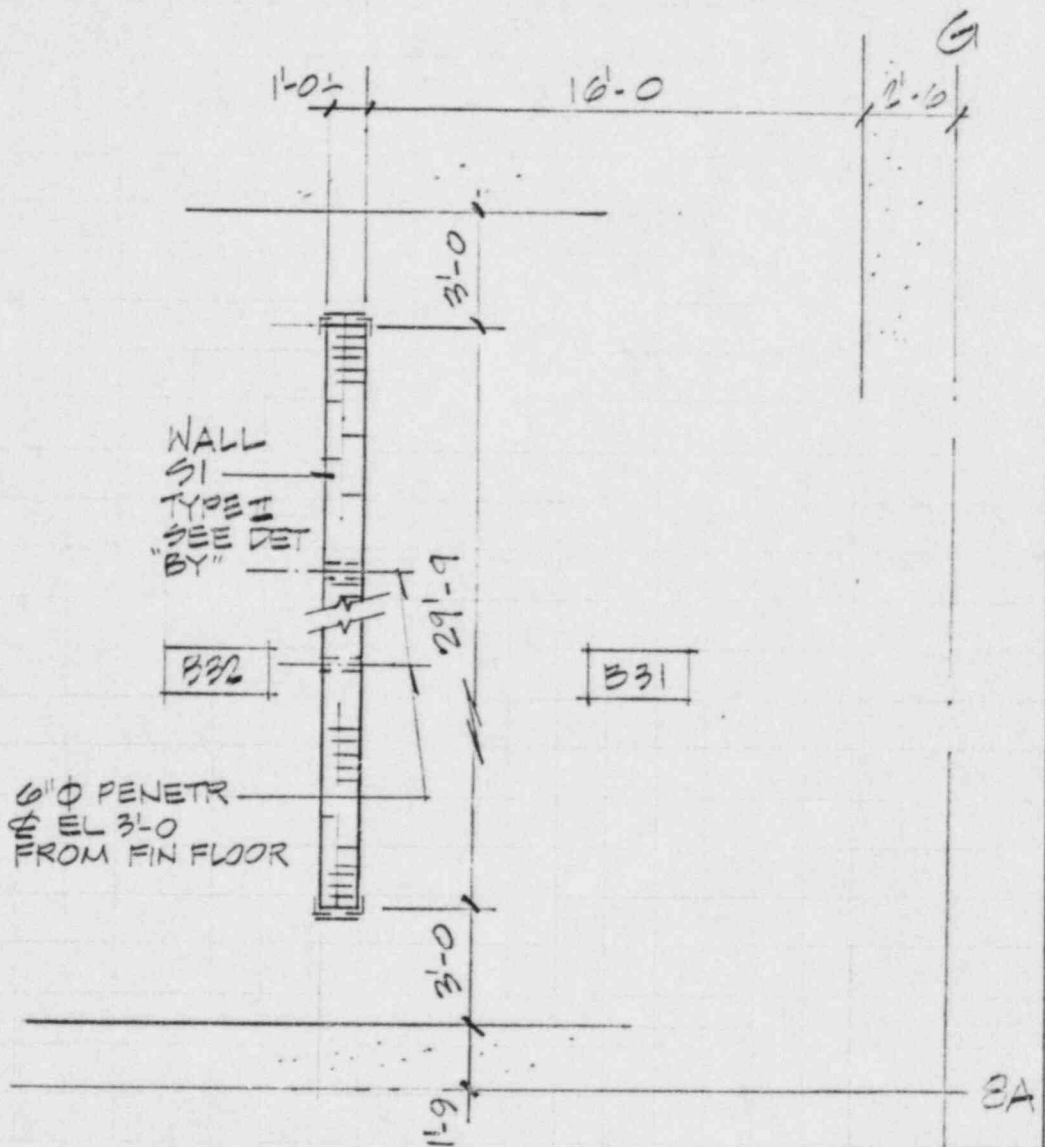
OFS NO. 6367-023 DEPT. G-53 NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD F3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N



PART PLAN EL-34.75

RAB

316=1'-0

REFER DWG G-765402

BY ET WU DATE 10-8-84

CHKD. BY WILLIAMS DATE 10-2-50

CLIENT	NAME	ADDRESS	CITY	STATE	ZIP	PHONE	FAX	E-MAIL	WEBSITE
	ABC	123	NEW	YORK	10001	212-555-1234		abc@xyz.com	www.abc.com
	DEF	456	LOS	ANGELES	90001	213-555-5678		def@xyz.com	www.def.com
	GHI	789	CHICAGO	ILL	60601	312-555-9012		ghi@xyz.com	www.ghi.com
	JKL	101	HONOLULU	HAWAII	96801	808-555-3456		jkl@xyz.com	www.jkl.com
	MNO	202	PHOENIX	ARIZONA	85001	602-555-7890		mno@xyz.com	www.mno.com
	PQR	303	DALLAS	TEXAS	75201	214-555-2345		pqr@xyz.com	www.pqr.com
	STU	404	ATLANTA	GEORGIA	30301	404-555-6789		stu@xyz.com	www.stu.com
	VWX	505	SEATTLE	WASHINGTON	98101	206-555-0123		vwx@xyz.com	www.vwx.com
	YZA	606	PORTLAND	OREGON	97201	503-555-4567		yma@xyz.com	www.yma.com

SHEET _____ OF _____
DEPT. _____
OFFS NO. 2865.053 NO. _____

PROJECT
SUBJECT

WATERFORD #3
CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-7-84

SHEET OF

CHKD. BY CT DATE 10-2-84

OFS NO. 2865-058 DEPT. NO. 633

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N —————

2" ϕ PENETR
@ EL. 24'-0"
ABOVE FIN FLOOR

53)

12 ON FLOOR

WALL
S2 TYPE I
SEE DET "BY"

530

532

8A

PART PLAN EL.-34.75'
RAB
3/8" = 1'-0"
REFER DWG G-765
502

SHEET _____ OF _____

CHKD. BY W. H. L. DATE 10-9-50

OFS NO. 2365.058 DEPT. NO.

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-7-84

SHEET _____ OF _____

CHKD. BY GF DATE 10-9-84

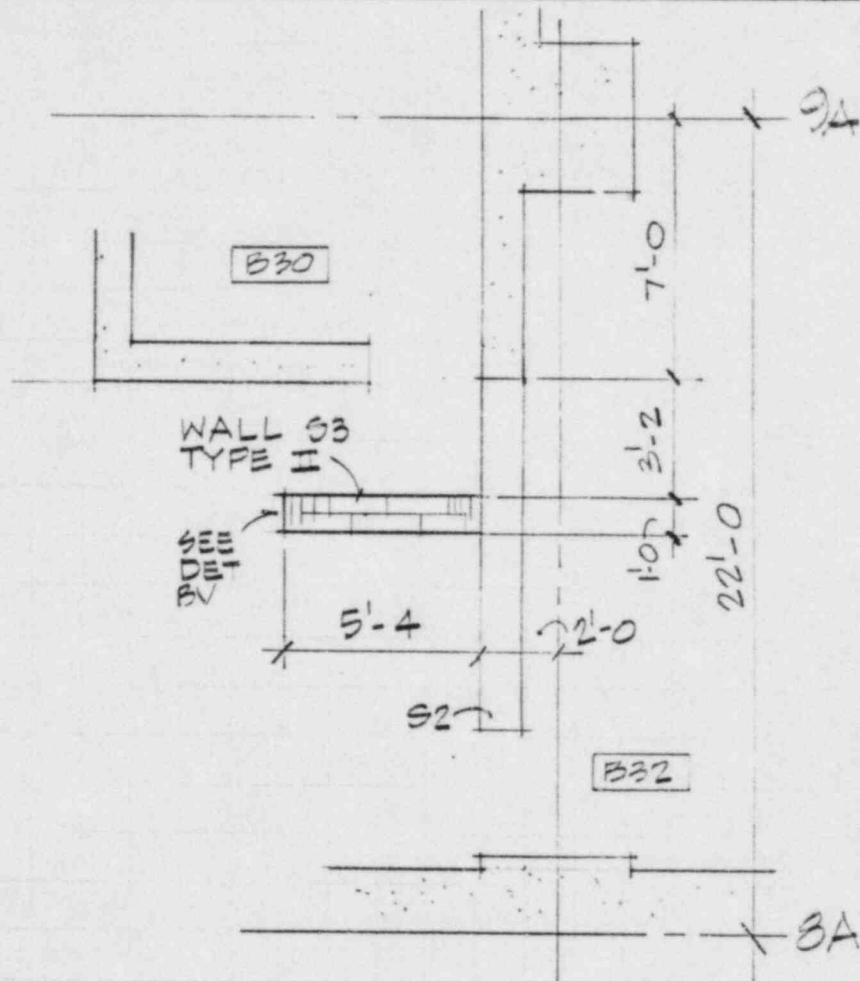
OFS NO. 2565-003 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N



PART PLAN EL-34.75'
 RAB
 REFER DNG G-703
 502

EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-8-84

CHKD. BY 10/1/94 DATE 10.2.94

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD - 5

SUBJECT CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFS NO. 2865.033 DEPT. NO. _____

NO

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOPRITO DATE 10-7-84

CHKD. BY GE DATE 10-3-84

SHEET _____ OF _____

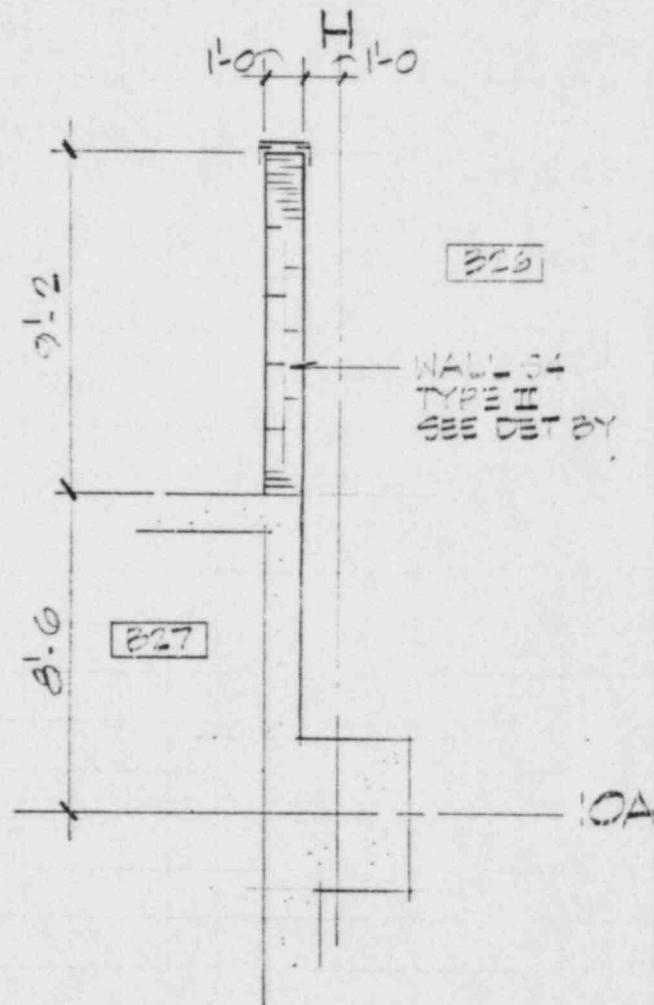
OFS NO. 1365-003 DEPT. 552 NO. 552

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N —————



PART PLAN EL-54.75
RAB
316-11-0
REFER DNG G-763
502

EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-8-34

CHKD. BY S. D. Miller DATE 10-9-94

SHEET _____ OF _____

OFS NO. 2863.038 DEPT. NO. _____

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-7-84

SHEET OF

CHKD. BY GE DATE 10-8-84

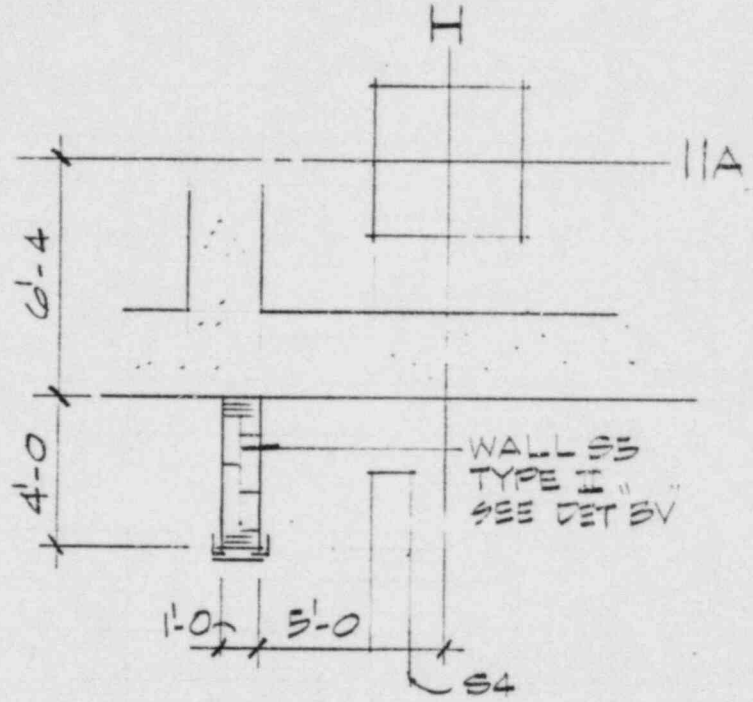
OFS NO. 1365-055 DEPT. NO. 655

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALL

N —————



PART PLAN EL-34.75'
 310=1'-0"
 RAB REFER DWG G-765
 302

EBASCO SERVICES INCORPORATED

BY G. Wu DATE 10.8.34

SHEET _____ OF _____

CHKD. BY W. J. H. D. DATE

OFFS NO. 2865.038 DEPT. NO. _____

CL'ENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-7-84

SHEET _____ OF _____

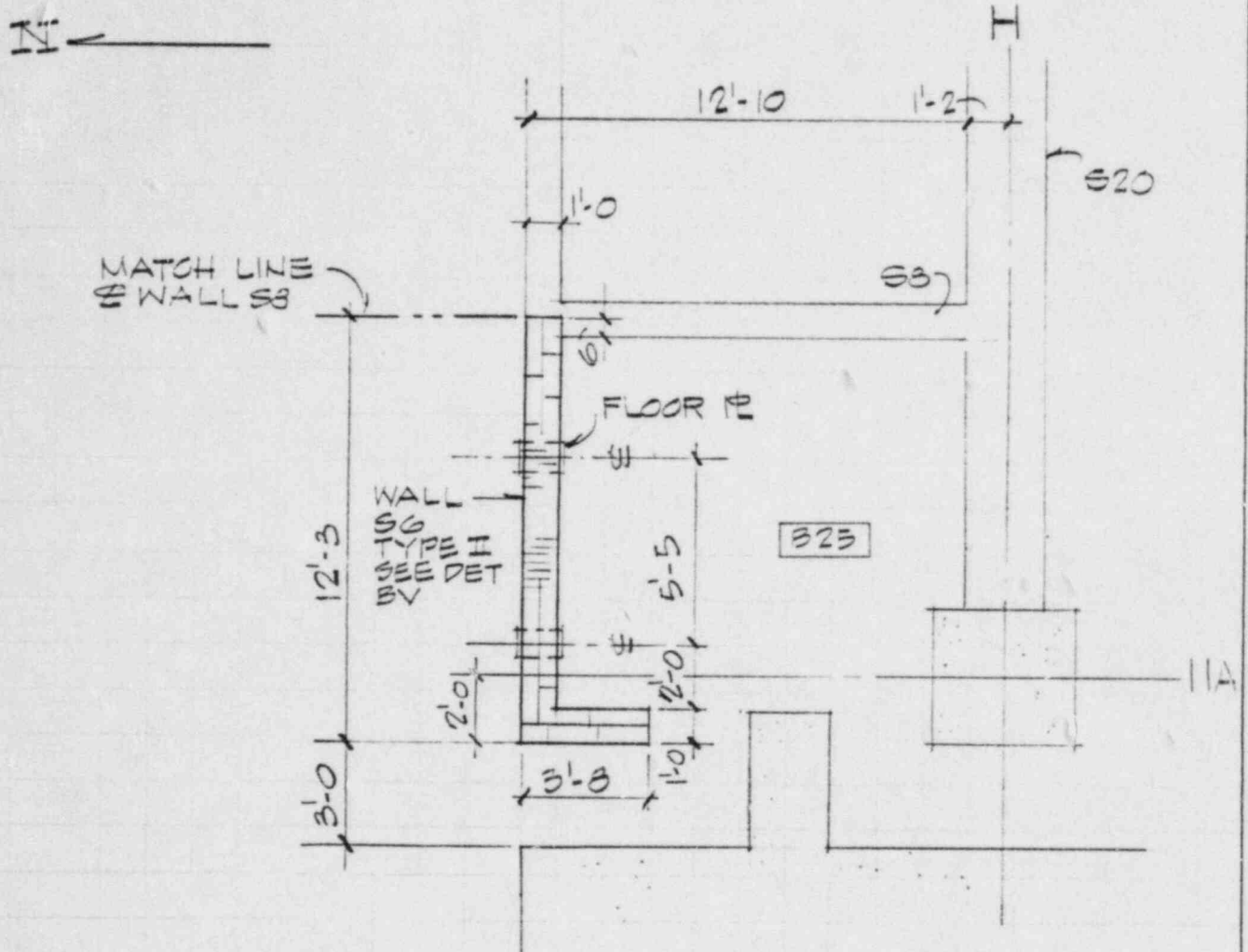
CHKD. BY G.F. DATE 10-3-84

OFS NO. 1265-125 DEPT. 553

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALL



PART PLAN EL-34.75'
 316=1'-0"
 RAB REFER DWG G-765
 502

BY G WU DATE 10-8-94

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

SHEET _____ OF _____

OFFS NO. 2865.053 DEPT. NO. _____

DESIGN PARAMETERS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-7-84

SHEET _____ OF _____

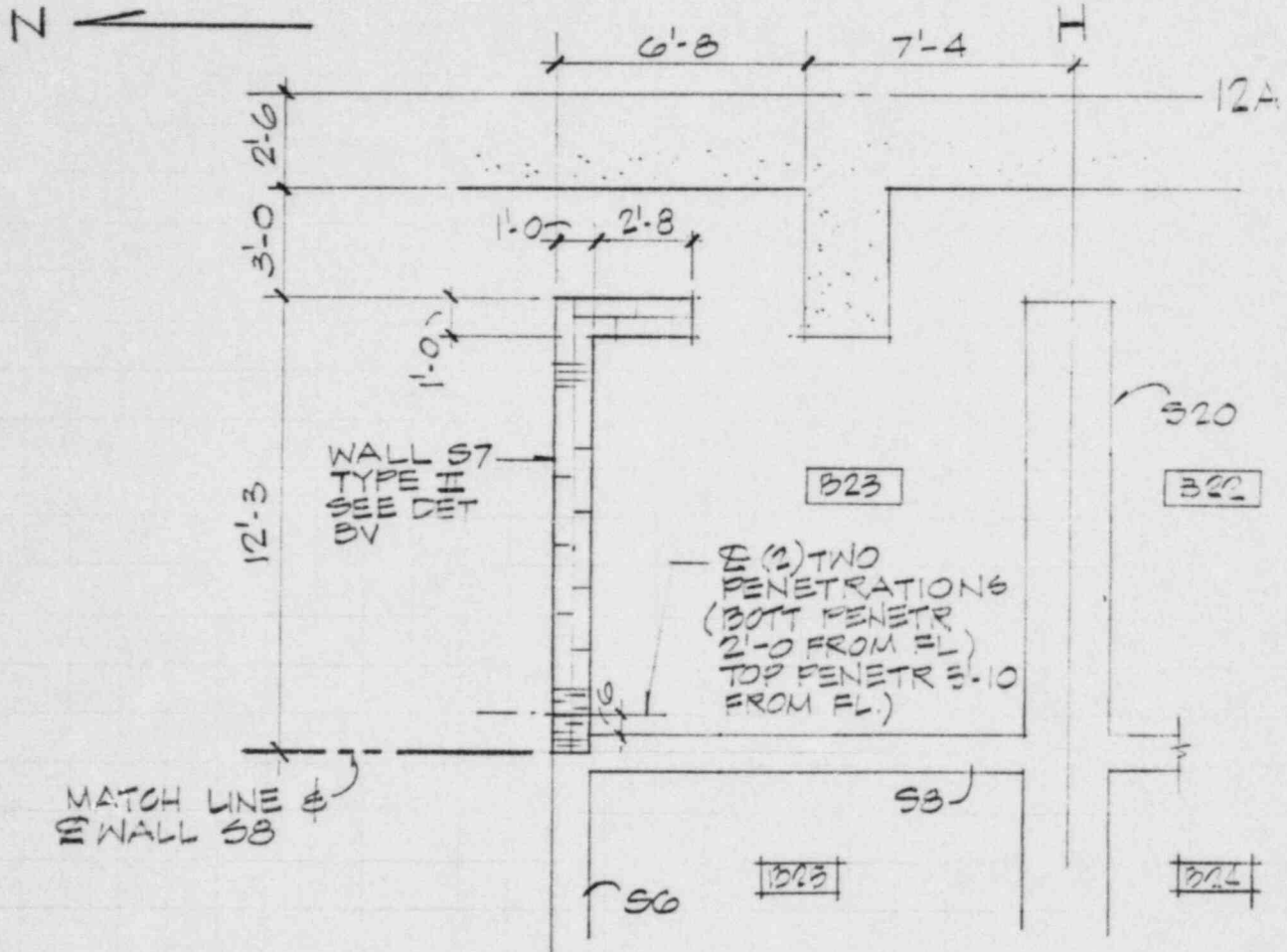
CHKD. BY _____ DATE 10-8-84

OFS NO. 1365-053 DEPT. NO. 652

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD F3

SUBJECT CONCRETE MASONRY BLOCK WALL



PART PLAN EL-34.75'

RAB

310=1'-0"

REFER DWG 6-705 S02

SHEET
OF

DEPT. NO. 2365.058 OFS NO. 2365.058

DEPT. NO. — 2865.058 OFS NO. —

MAITLAND ROAD 井

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY J. SANTOSPIRITO DATE 10-7-84

SHEET _____ OF _____

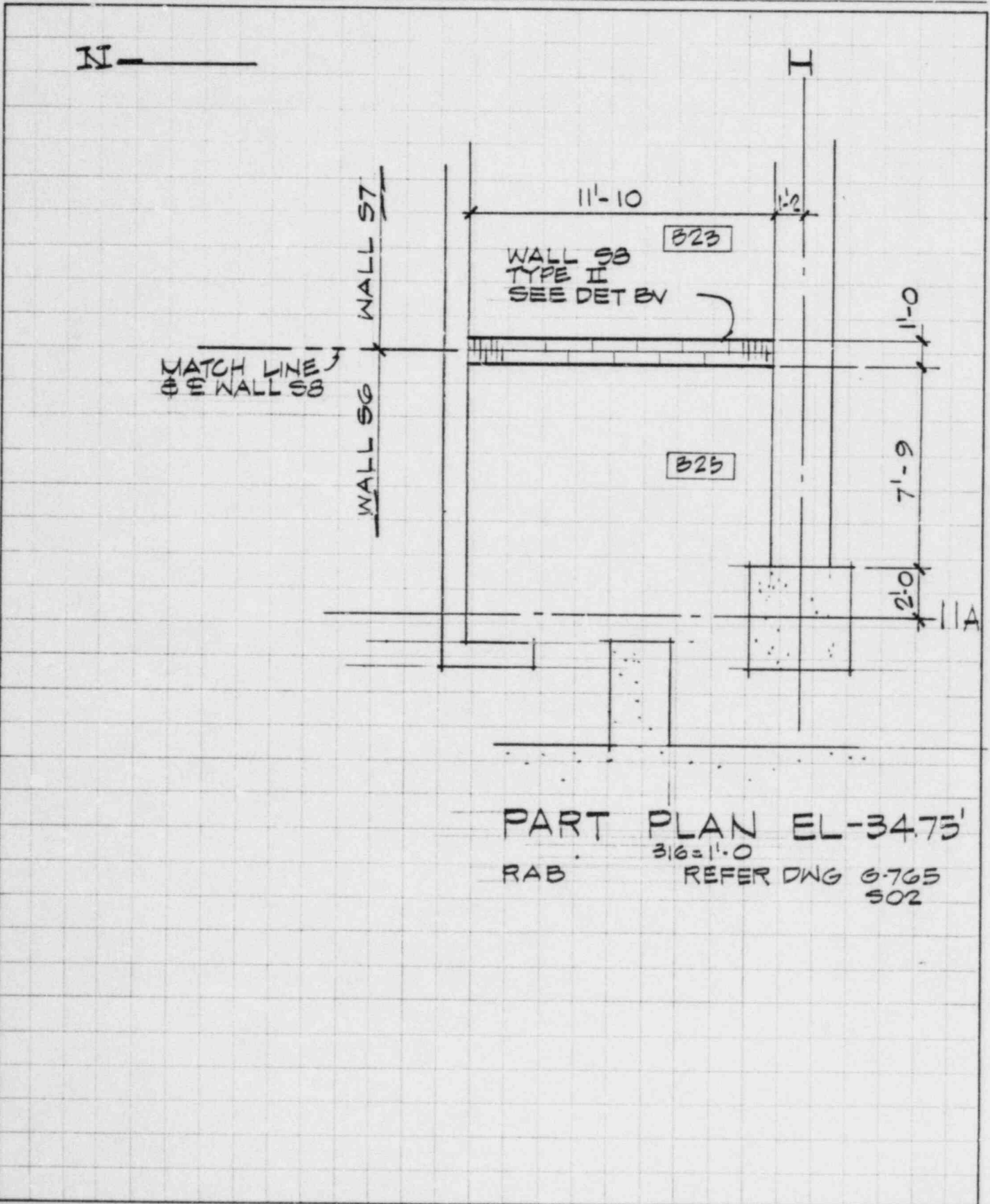
CHKD. BY GF DATE 10-8-84

OFS NO. 2865-098 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



SHEET _____ OF _____

DEPT. NO. 2865.058 OFS NO. _____

NO

WATERLOO # (U)

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

CHKD. BY J.S. DATE 10-8-84

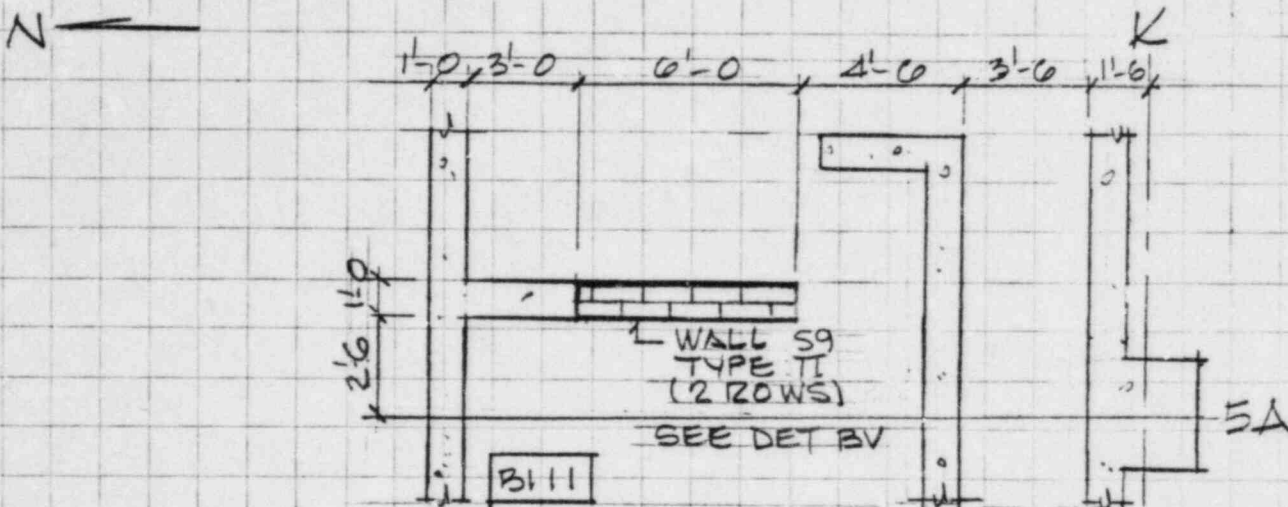
SHEET OF

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL-4.00

TRAB ³¹⁶ = 1'-0" REF DWG G-765501

DATE 10-8-84

DATE 10-9-84

DEPT. NO. 2865.058 OFS NO.

NO.

MATERIALS

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

BY BILAK DATE 10-7-84

CHKD. BY G.F. DATE 10-8-84

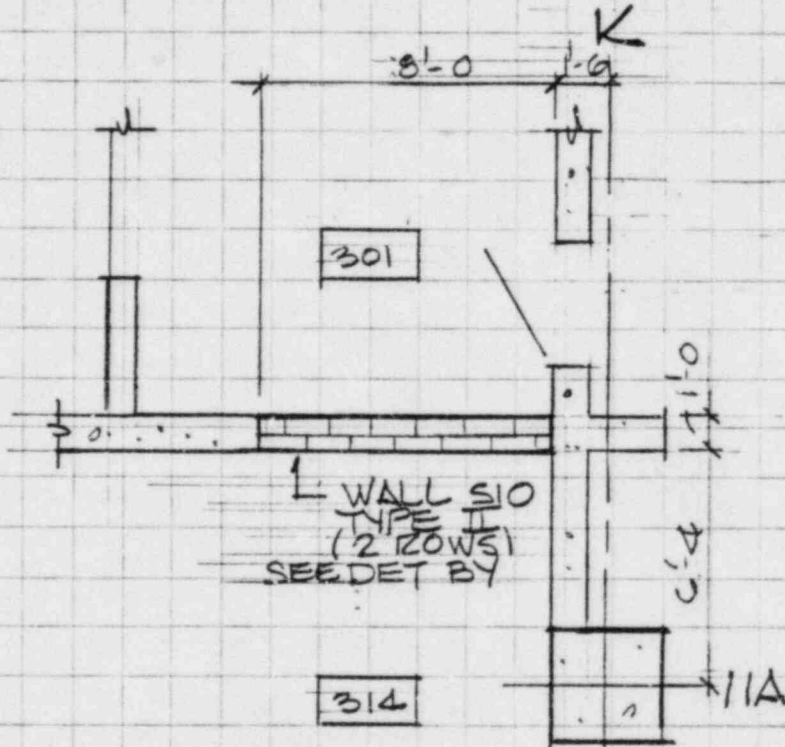
SHEET OF
OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

N 



PAINT PLAN EL+46.00
ZAB ³¹⁶⁼¹¹⁰ REF DWG G-760501

CHKD. BY G. M. M. A. N. DATE 10-9-84

DATE 10-9-84

OFS NO. 2865.058 DEPT. NO.

2865.050

DEPT.
NO.

PROJECT WALPSTOCK

SUBJECT

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

SHEET _____ OF _____

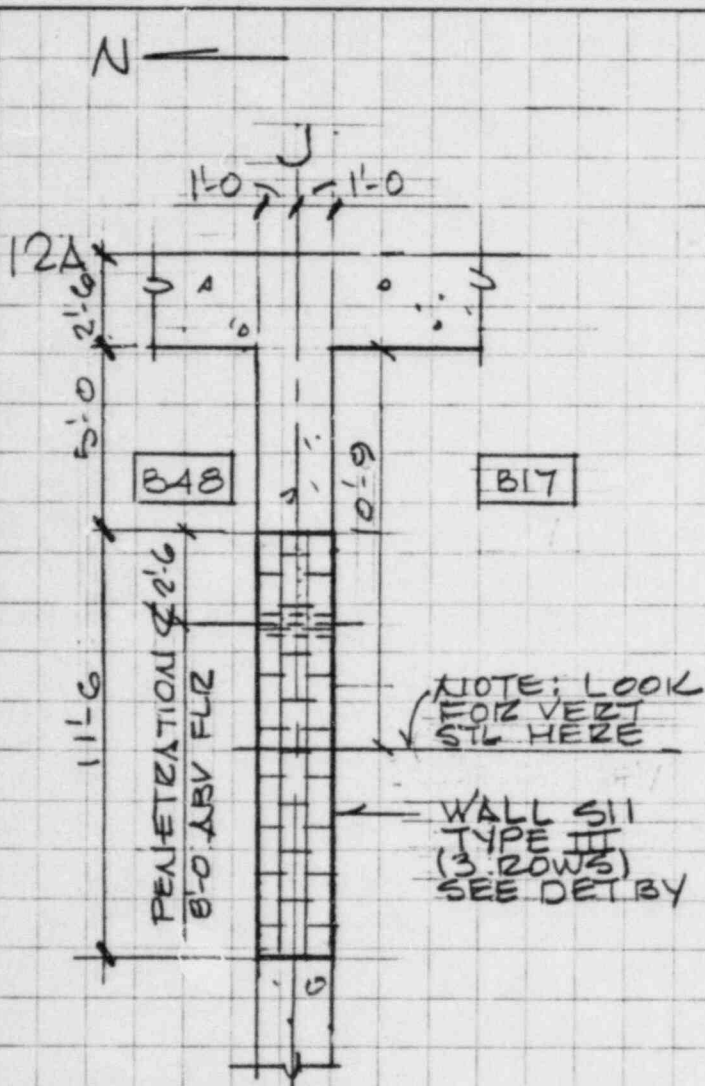
CHKD. BY J.S. DATE 10-8-84

OFFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN-EL-3475

ZAB ³¹⁶⁼¹⁴⁰ ZEF DWG G-765402

DATE 10-8-84

DATE 10-9-94

DEPT. NO. 2865.055

LOUISIANA POWER & LIGHT CO.

WATERLOO #3

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

SHEET _____ OF _____

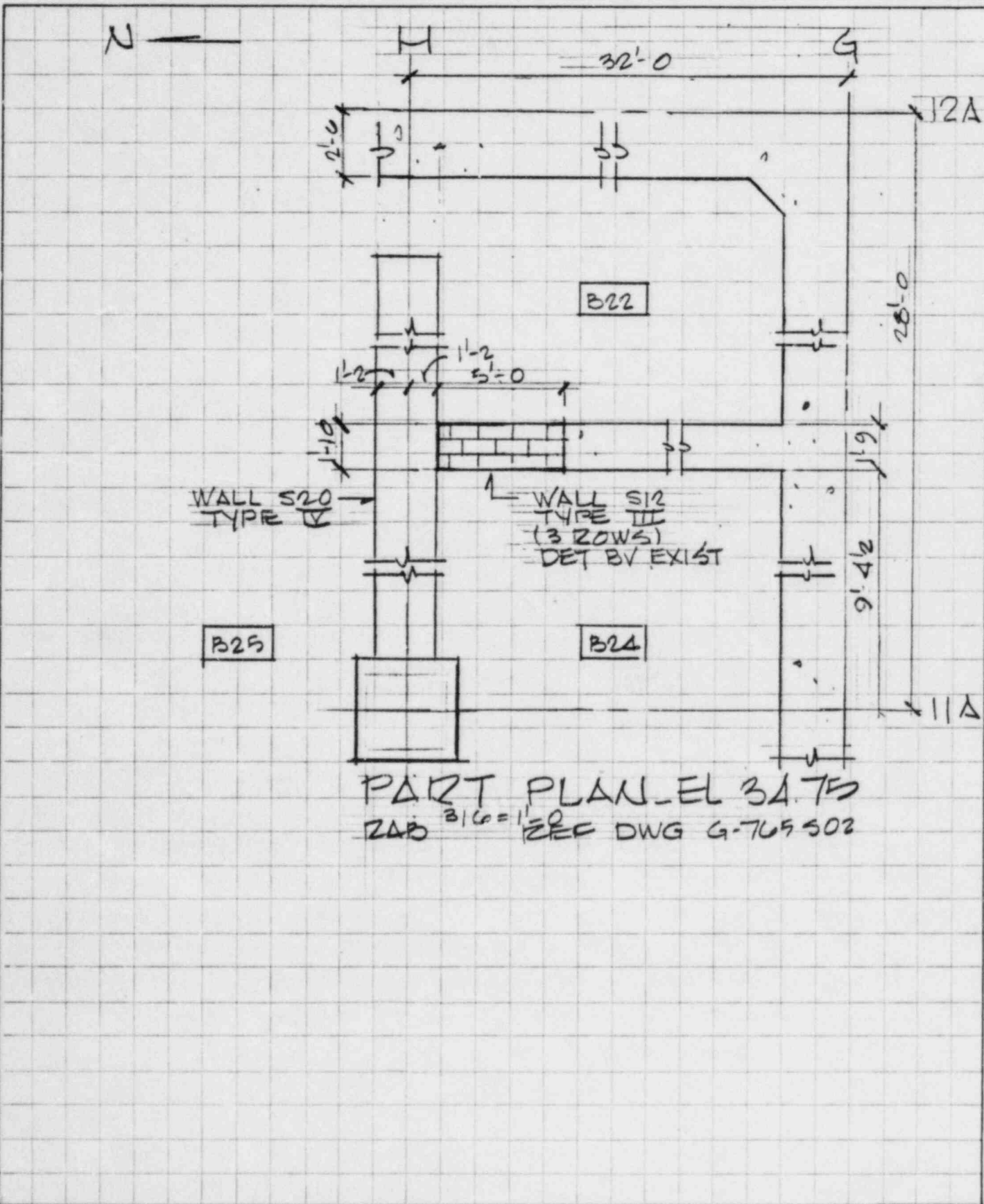
CHKD. BY G.F. DATE 10-8-84

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



CHKD. BY JM/MLN DATE 10.9.97

CMKD. BY 05/06/06 DATE 11-1-06

CLIENT FOODLICK

PROJECT WALTON

SUBJECT

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

SHEET _____ OF _____

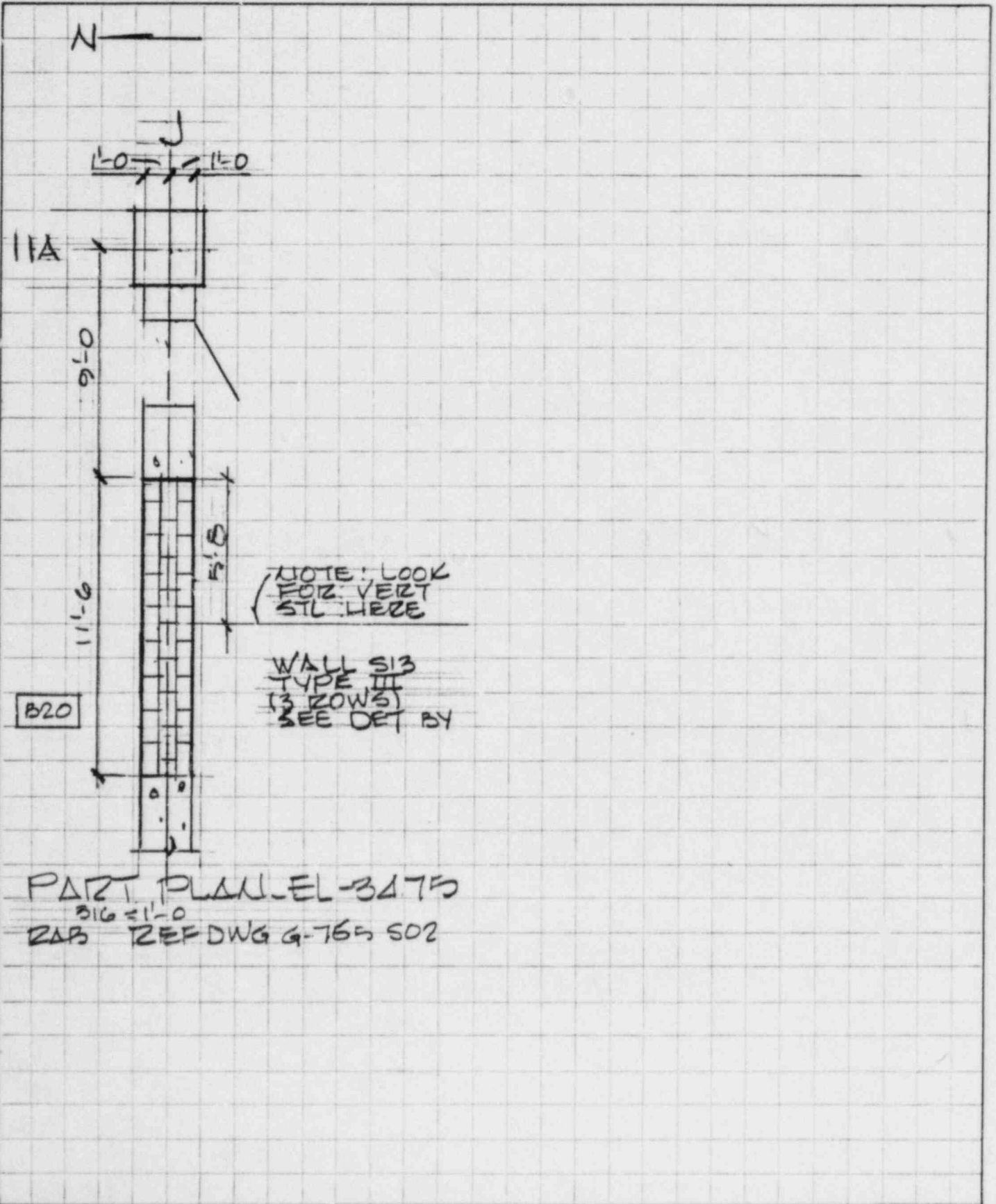
CHKD. BY J.S. DATE 10-8-84

OFS NO. 2865-058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



SHEET _____ OF _____

OFFS NO. 6007.000 NO.

NO.

WATFORD 井

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

SHEET _____ OF _____

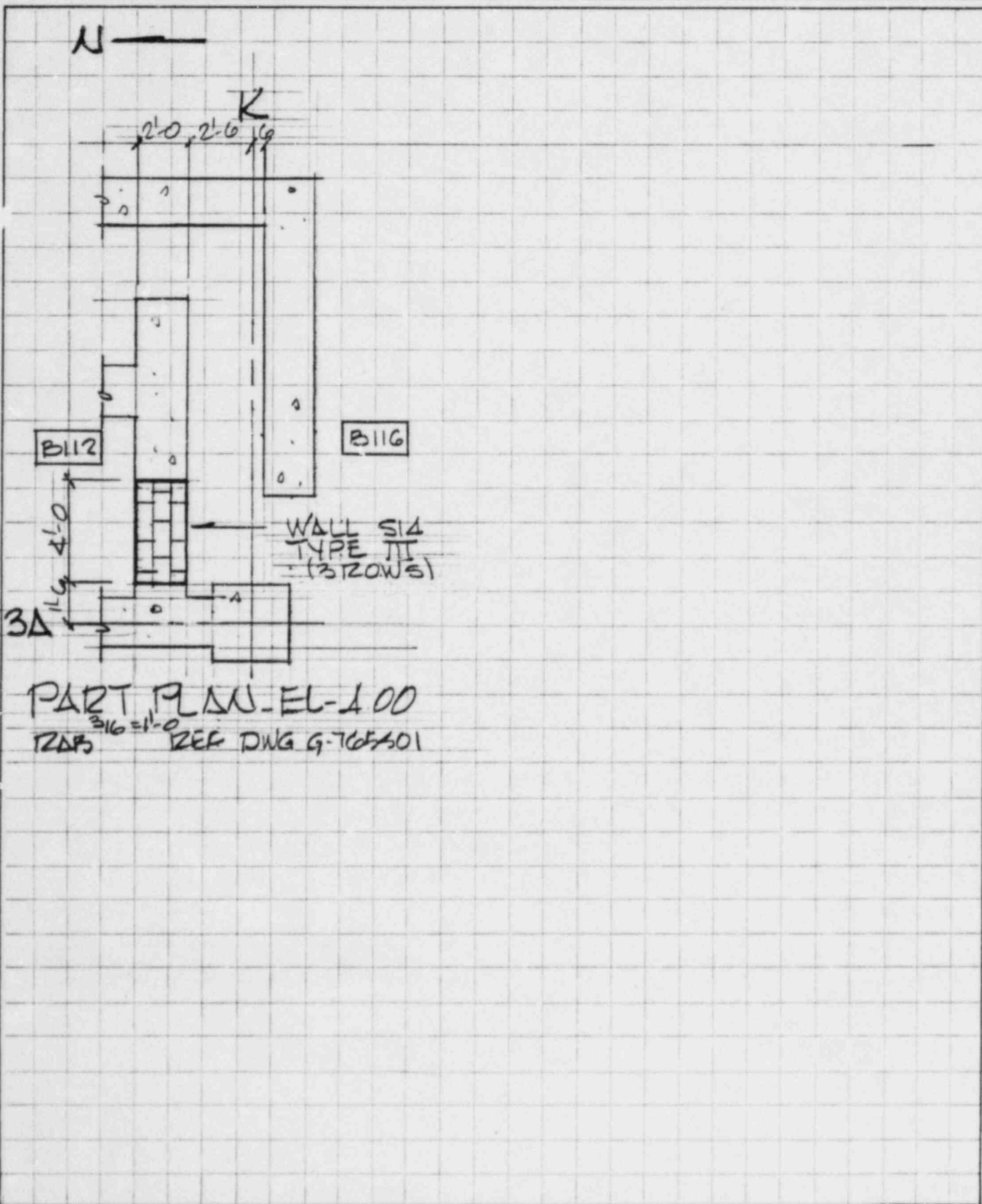
CHKD. BY G.F. DATE 10-8-84

OFS NO. LOU2865.058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



SHEET _____ OF _____

DEPT. NO. 2865.058 OFFS NO.

NO. —

WATERLOO # 10

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY PSILAK DATE 10-7-84

SHEET _____ OF _____

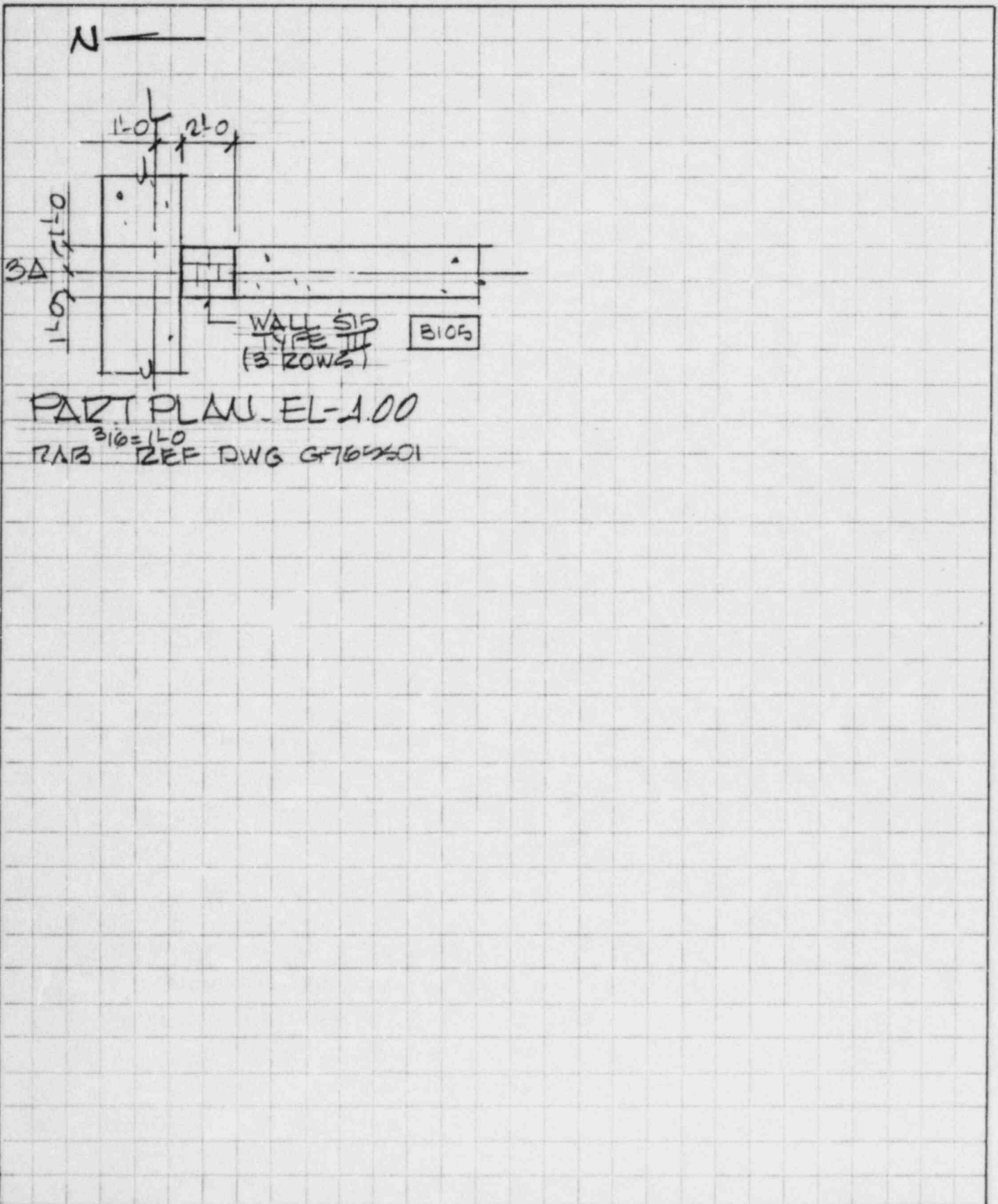
CHKD. BY J.S. DATE 10-8-84

OFS NO. LOU2865,058 DEPT. G53

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



BY A. W. U. DATE 10-8-84

DATE 10-8-84

CHKD. BY W. J. H. H. DATE 10-9-89

DATE 10-9-84

DEPT. NO. 2865.058 OFS NO. 2865.058

REPORT
NO.

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT	#
WATKINSON	3

SUBJECT CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS: * WALL AT EL +9.0' COVERED BY MORTAR

EBASCO SERVICES INCORPORATED

BY BILAL DATE 10-7-84

SHEET _____ OF _____

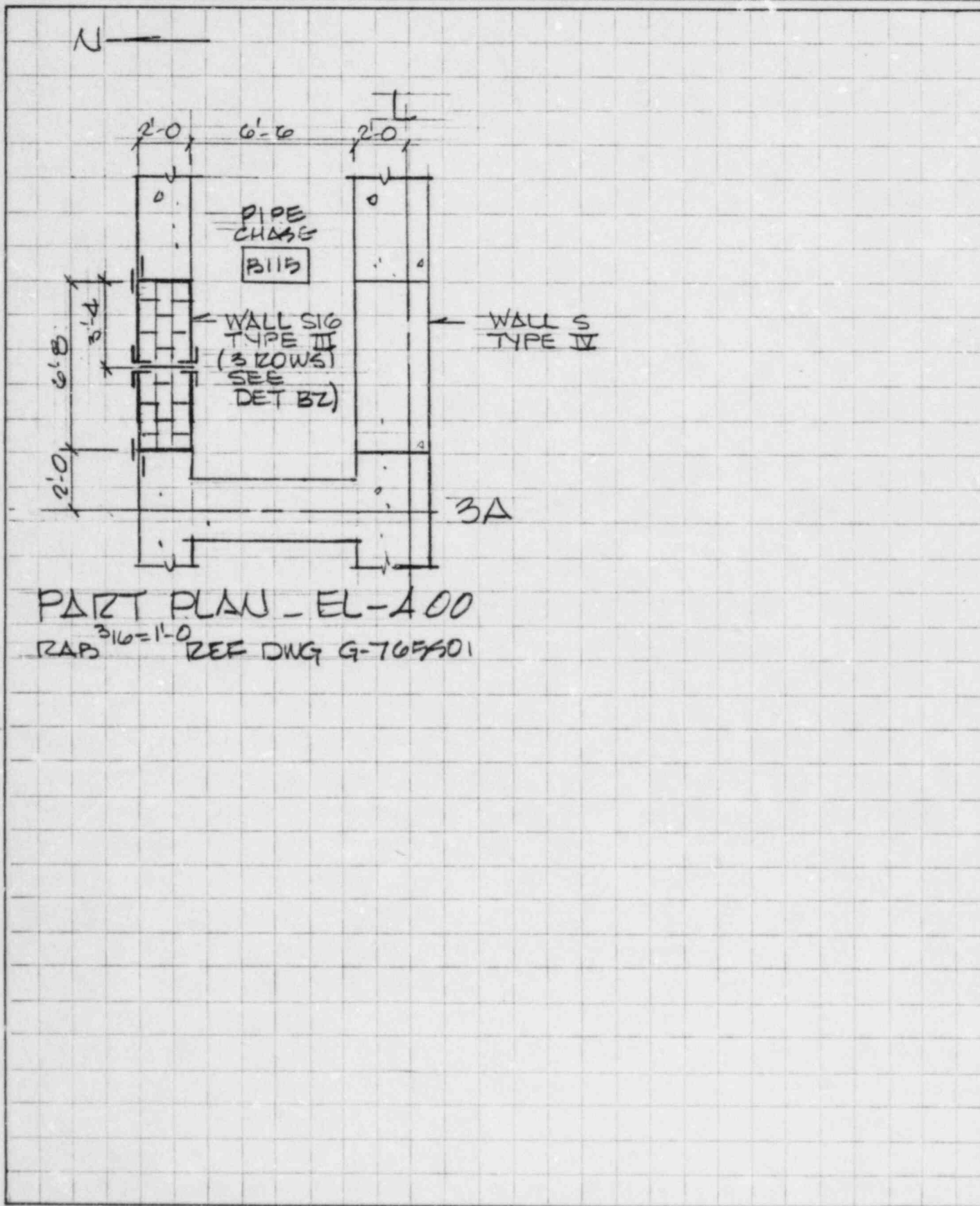
CHKD. BY G.F. DATE 10-8-84

OFS NO. LOU 2865.058 DEPT. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



EBASCO SERVICES INCORPORATED

BY G. WU DATE 10-8-84

CHKD. BY G. A. Jones DATE 10-9-84

SHEET _____ OF _____

OFFS NO. 2865.038 DEPT. NO. _____

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

SHEET _____ OF _____

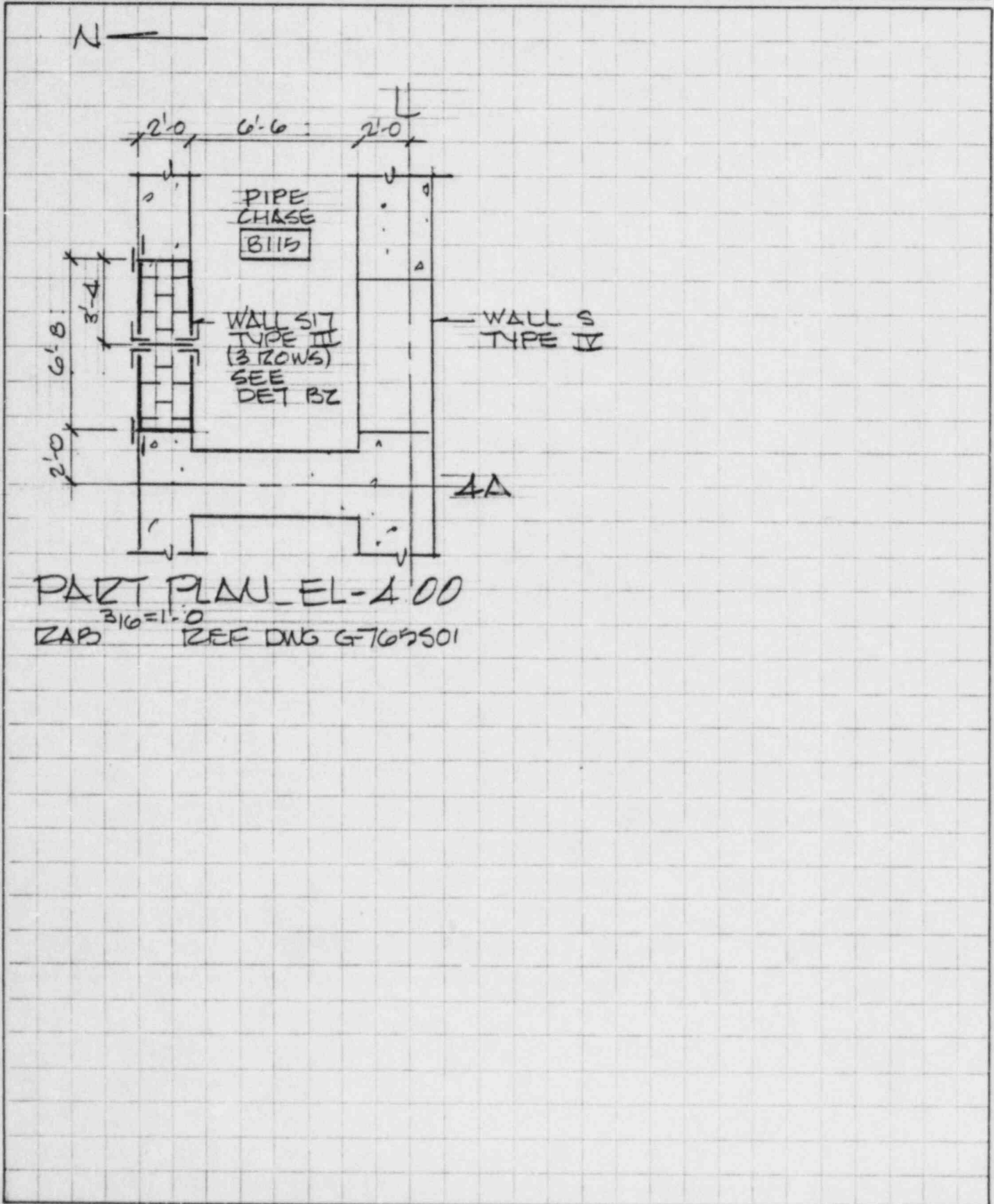
CHKD. BY J.S. DATE 10-8-84

OFS NO. LOU2865.058 DEPT. NO. 053

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



DATE 10-8-84

DATE 10-9-84

2005.05.05

LOUISIANA LIGHT CO. # POMEYANZ

WATKINS (W)

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

CHKD. BY GF. DATE 10-8-84

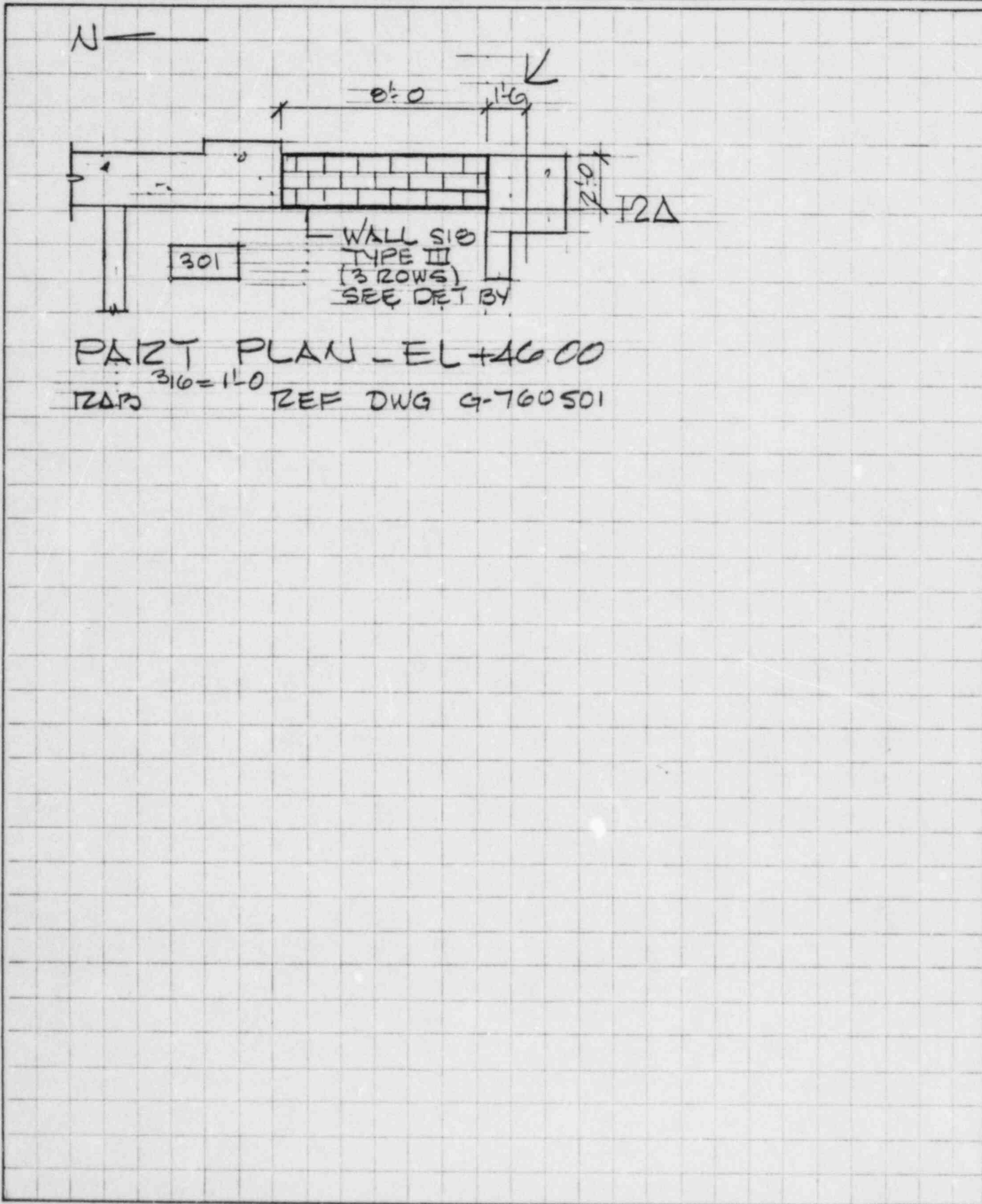
SHEET OF

OFS NO. LOU2865.058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



BY G. W. L. DATE 10-8-84

DATE 10-8-84

CHKD. BY W. L. L. L. DATE 10-9-77

DATE 10-9-89

CLIENT — **PODOLSKY LOWERY & LIGHT CO.**

OFFS NO. 2865.053 DEPT. NO.

PROJECT	WILLIAMS	UNIT

SUBJECT	CONCRETE BLOCK WALLS
---------	----------------------

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

CHKD. BY J.S. DATE 10-8-84

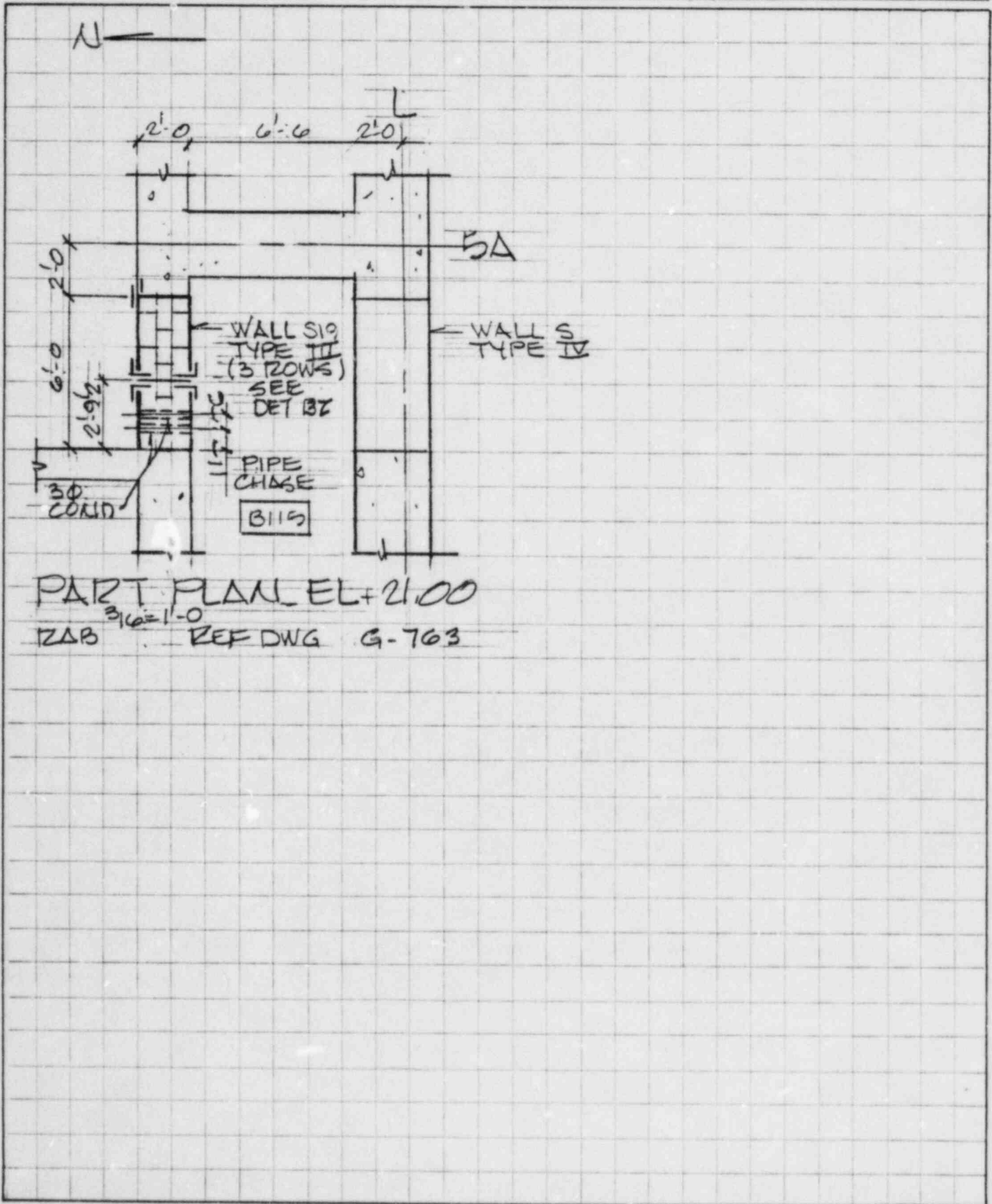
SHEET _____ OF _____

OFS NO. LOU2865.058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PART PLAN EL+21.00

12AB 3/16=1'-0" REF DWG G-763

SHEET _____ OF _____
OFFS NO. 2865.058 DEPT. NO. _____

PROJECT WATERFORD # 3
SUBJECT CONCRETE MASS

COZCRESH MASHONZWA BLOCK MALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY BILAK DATE 10-7-84

SHEET _____ OF _____

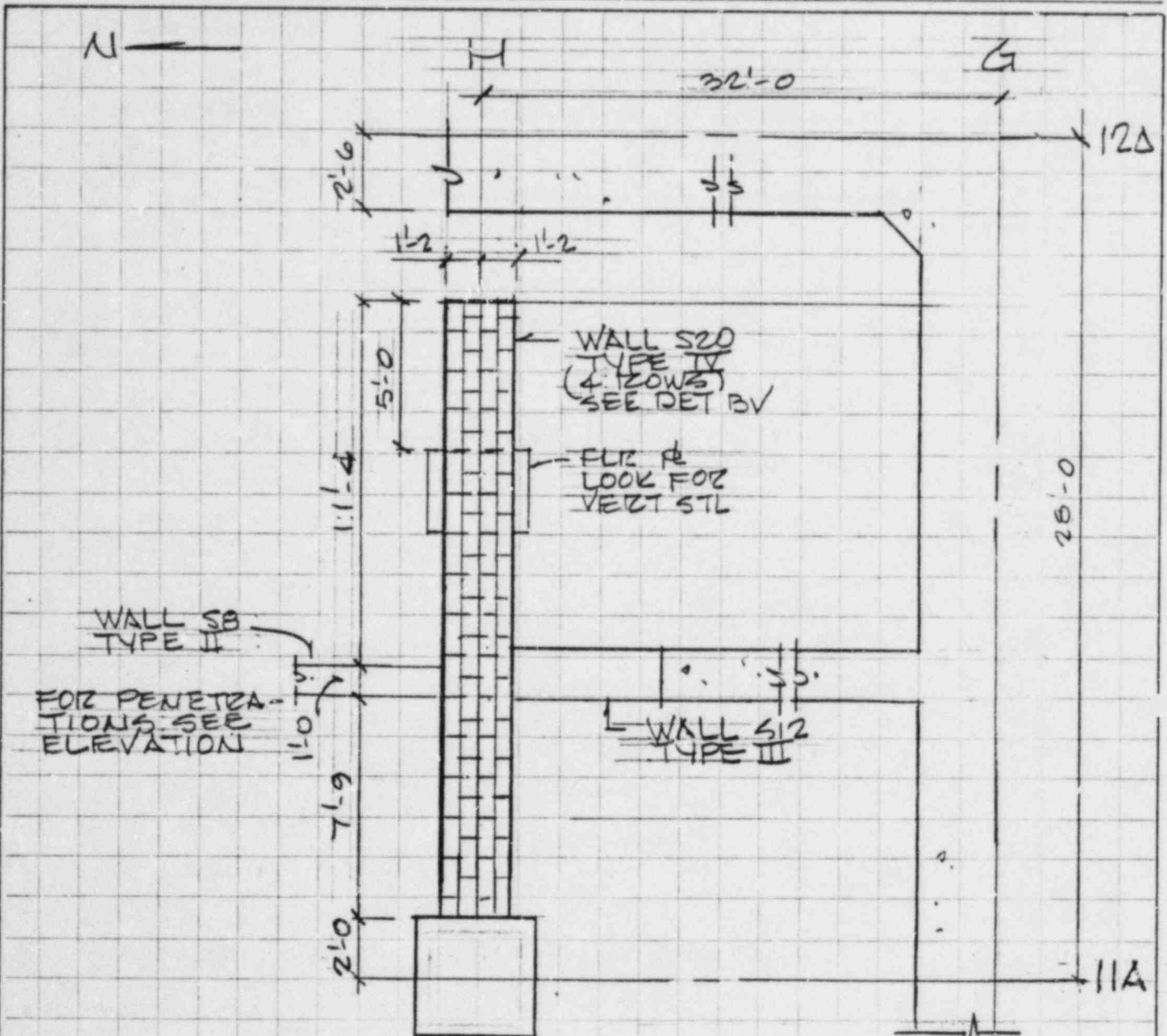
CHKD. BY GF DATE 10-8-84

OFS NO. _____ DEPT. NO. _____

CLIENT LOUISIANA POWER & LIGHT

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



CHEET

OFFS NO. 2865.058 DEPT. NO.

2865.058 DEPT.
NO...

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY E. FISCHIONI DATE 10-7-84

CHKD. BY J.S. DATE 10-8-84

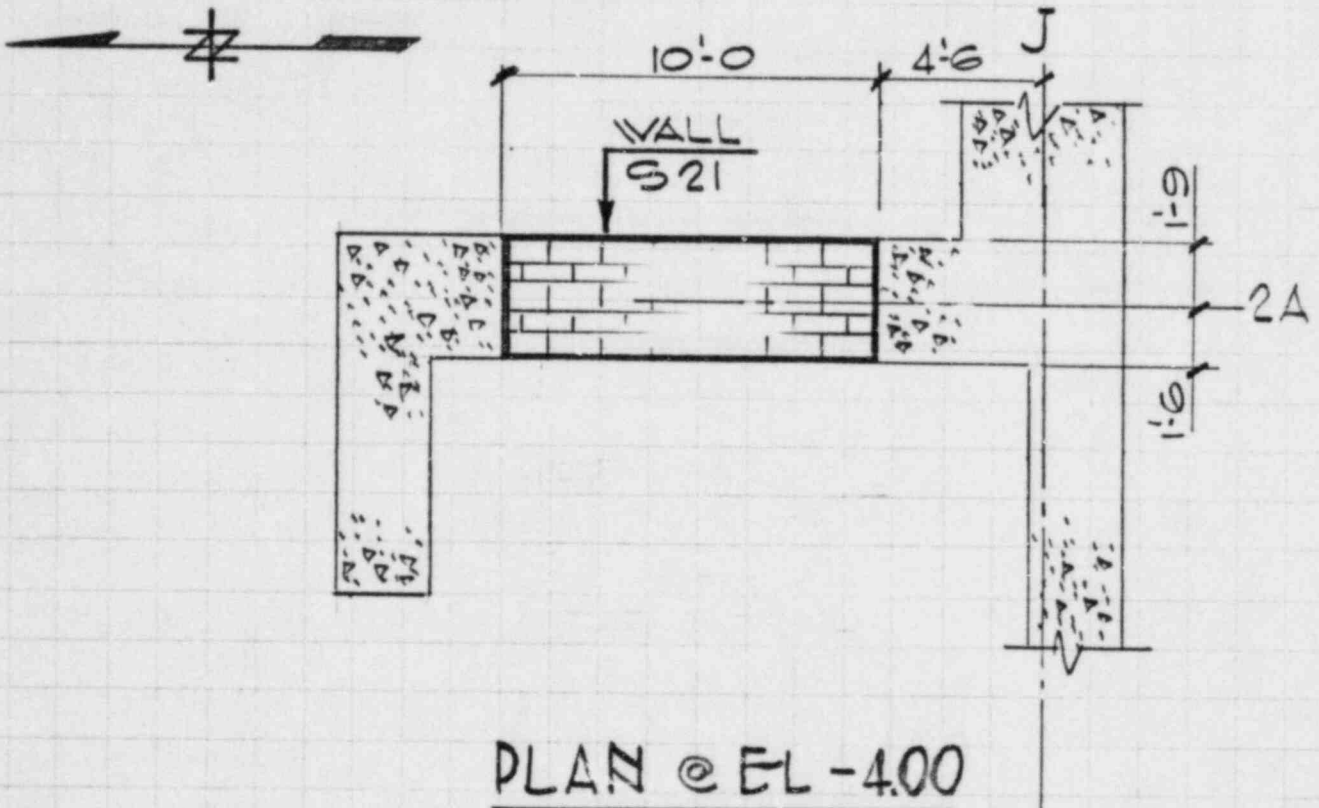
SHEET _____ OF _____

OFS NO. LOU2865.058 DEPT. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL - 4.00

$\frac{3}{16} = 1 \pm 0$

REF. DWG. G-763501
G-763502

DEPT. NO. 2865.058
OFS NO.

2865.053

SUBJECT CONCRETE MASONRY BLOCK WALLS

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10.7.84

SHEET _____ OF _____

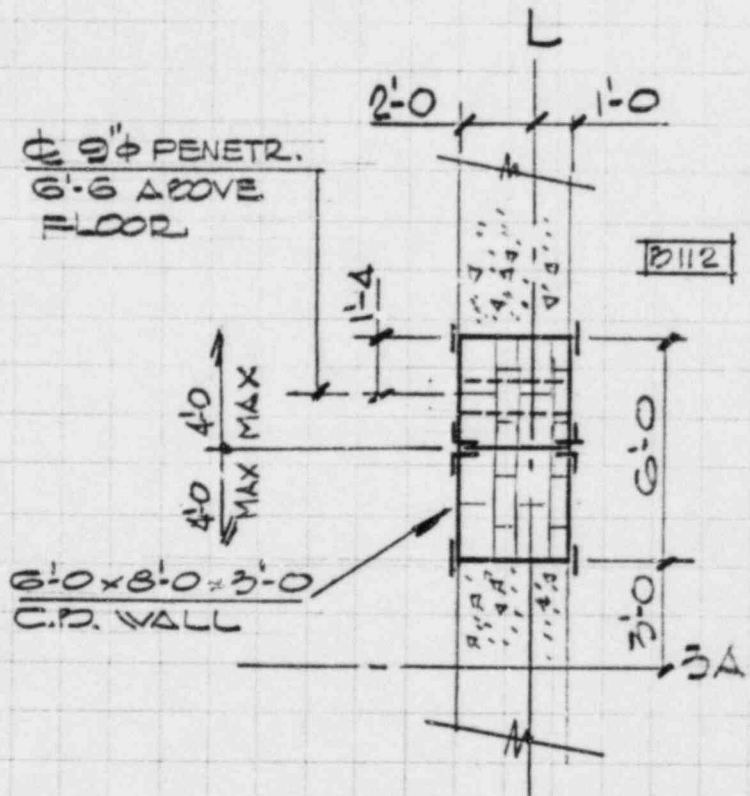
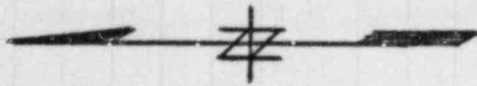
CHKD. BY J.S. DATE 10-8-84

OFS NO. 2865-098 DEPT. NO. G53

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL. -4.00'

$\frac{3}{16} = 1'-0"$

REF. DWG G-765501
DET DZ G-765502

DEPT. NO. 2865.058 OFS NO. 2865.058

DEPT.
NO.

WATERBURY

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISHION DATE 10-7-84

SHEET _____ OF _____

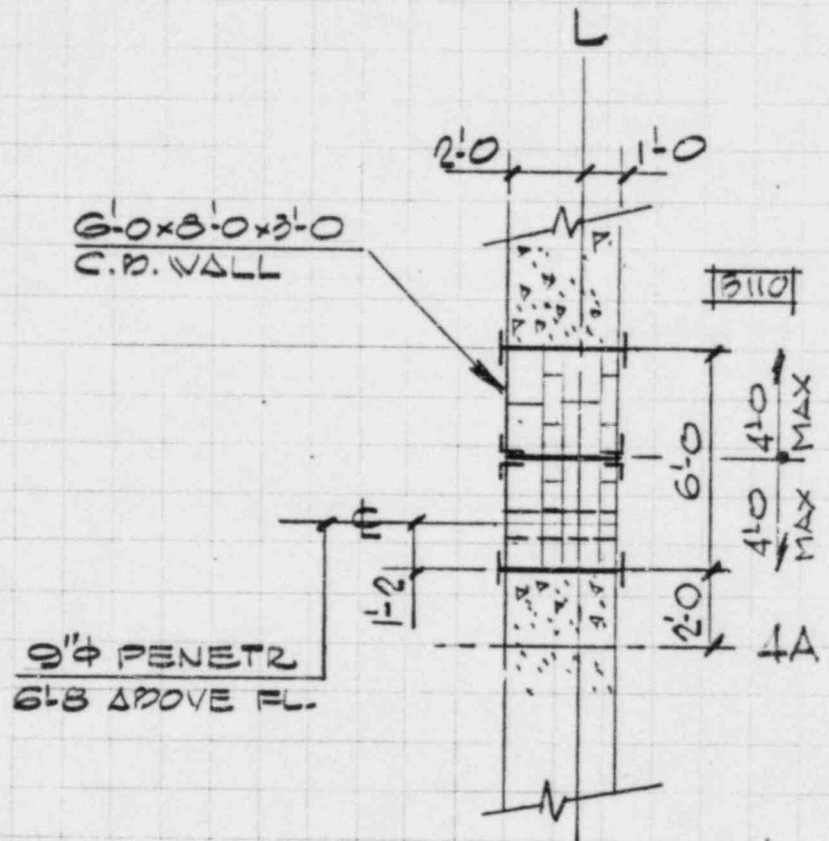
CHKD. BY J.S. DATE 10-8-84

OFS NO. LOU2865.058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL -4.00'

$3/16" = 1'-0"$

REF. DWG. G-765501
DET. DE G-765502

DEPT. NO. 2865.058 OFS NO. 2865.058

DOMESTIC LIGHT CO.

SUBJECT

CONCRETE MASONRY BLOCK WALLS

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISHION DATE 10-7-84

SHEET _____ OF _____

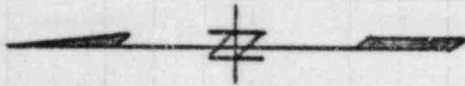
CHKD. BY J.S. DATE 10-8-84

OFS NO. LOU 2665.058 DEPT. NO. 653

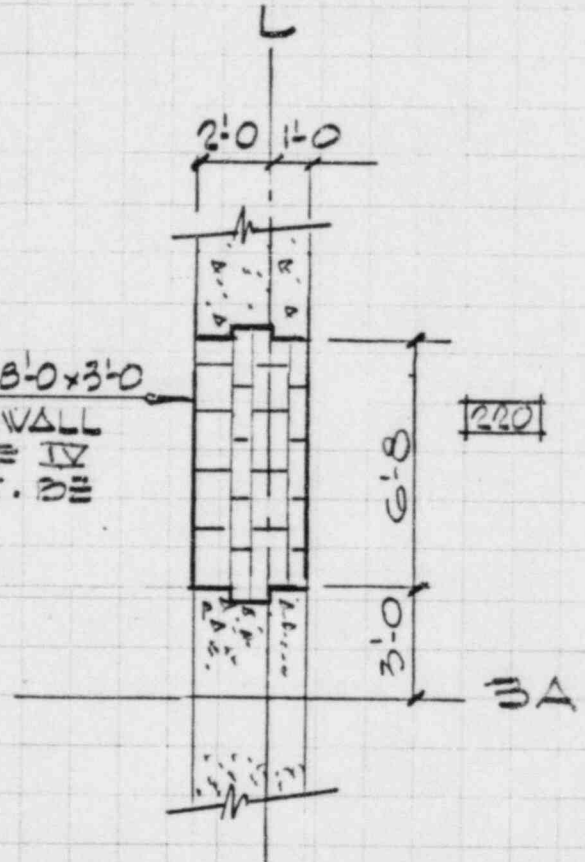
CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALL



6'8" x 8'0" x 3'0"
C.M. WALL
TYPE IV
DET. 2E



PLAN @ EL+21.00'

$\frac{3}{16} = 1'0"$

REF. DWG. G-763

SHEET _____ OF _____

OFFS NO. 2865.058 DEPT. NO.

REPORT ON

WATERLOO 井

CONCRETE BLOCK WALLS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-7-84

SHEET _____ OF _____

CHKD. BY J.S. DATE 10-8-84

OFS NO. LOU 2865.058 DEPT. NO. G53

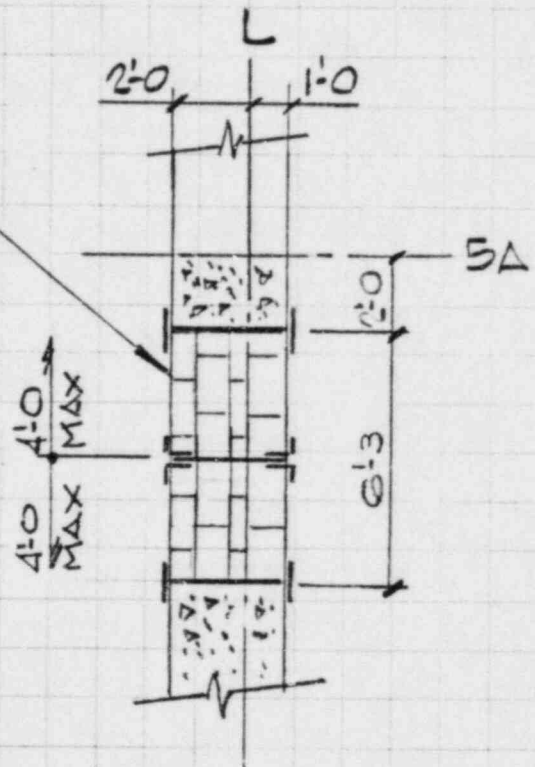
CLIENT LOUISIANA POWER & LIGHT

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



6'-8" x 8'-0" x 3'-0"
C/D WALL



PLAN @ EL. +21.00'

3' = 1'-0"

REF. DWG G-763

DET. DE G-765S02

SHEET _____ OF _____

OFFS NO. 40000000 NO.

NO.

MAITRORON 井

CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHONI DATE 10-7-84

SHEET _____ OF _____

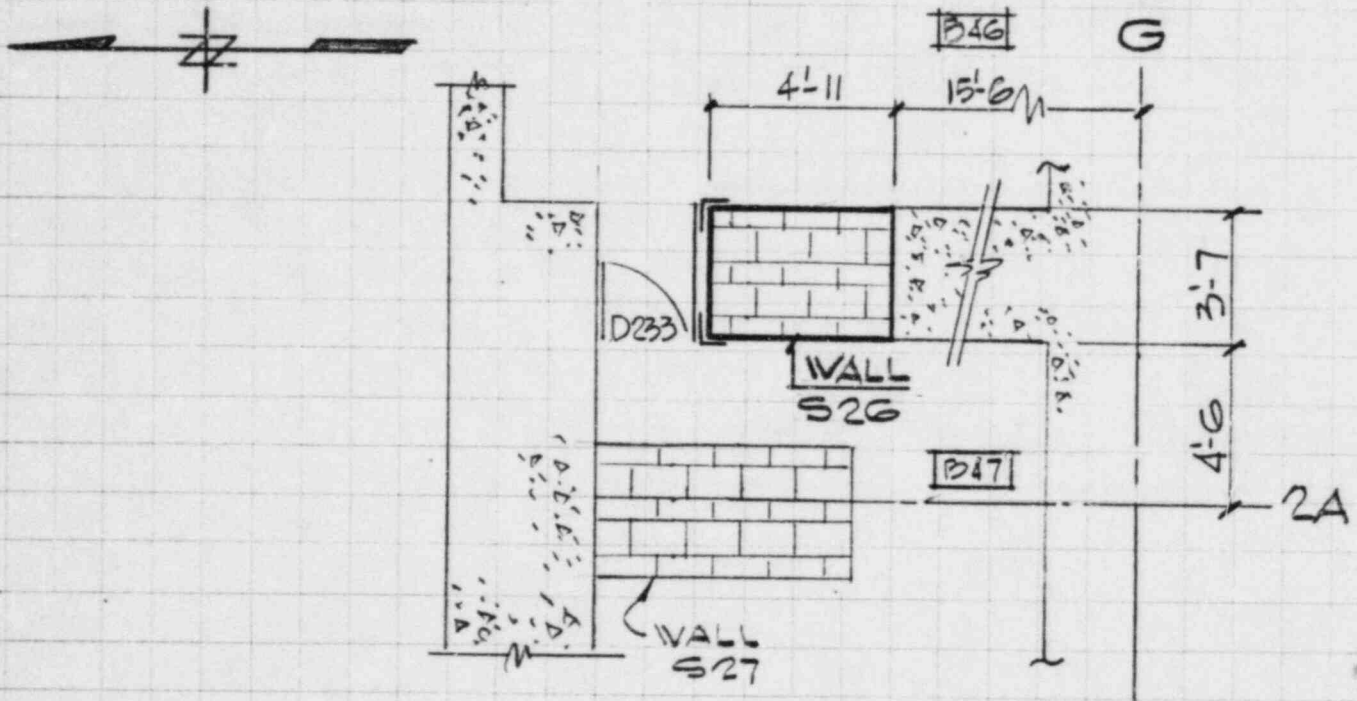
CHKD. BY J.S. DATE 10-8-84

OFS NO. LOU2865.058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL - 34.75'

3/8 = 1/0

REF. DWG G-765S02

DEPT. NO. 2865.058 OFFS NO. 2865.058

EXP. NO.

SUBJECT CONCRETE MASONRY BLOCK WALLS

100

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10.7.84

SHEET _____ OF _____

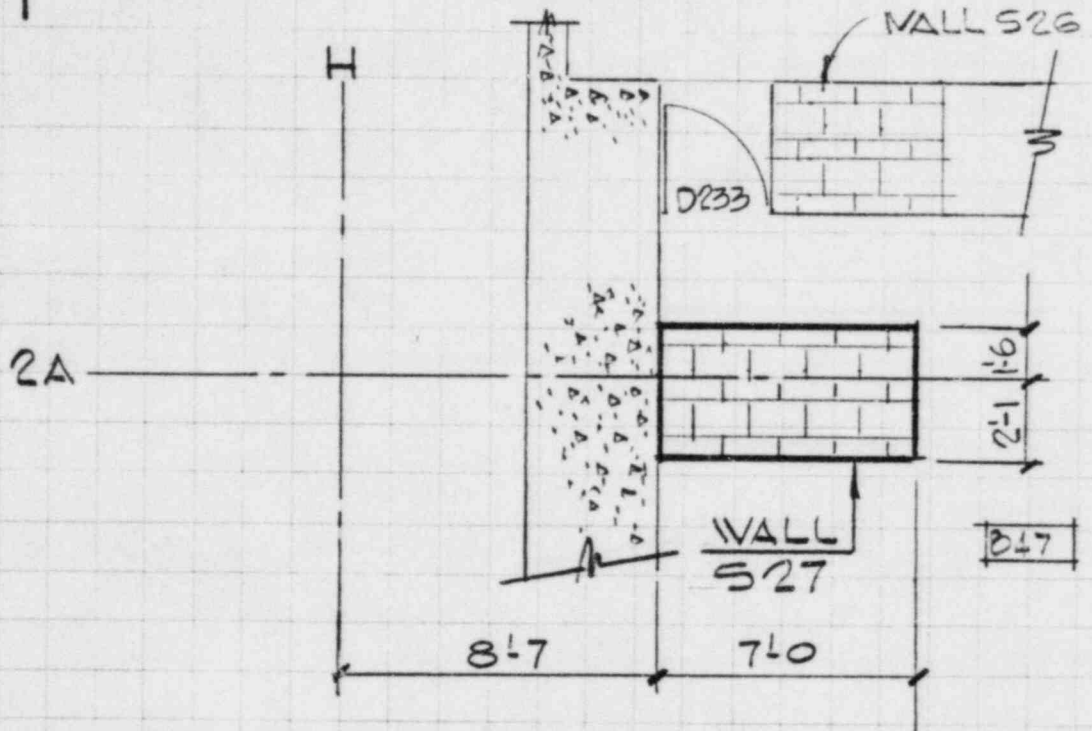
CHKD. BY J.S. DATE 10.8.84

OFS NO. LOU2865.058 DEPT. NO. G53

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL-34.75'

3/8" = 1'-0"

REF. DWG G-765502

SHEET _____ OF _____

DEPT. NO. 2865.058
OFS NO.

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三

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISHIONI DATE 10-7-84

SHEET _____ OF _____

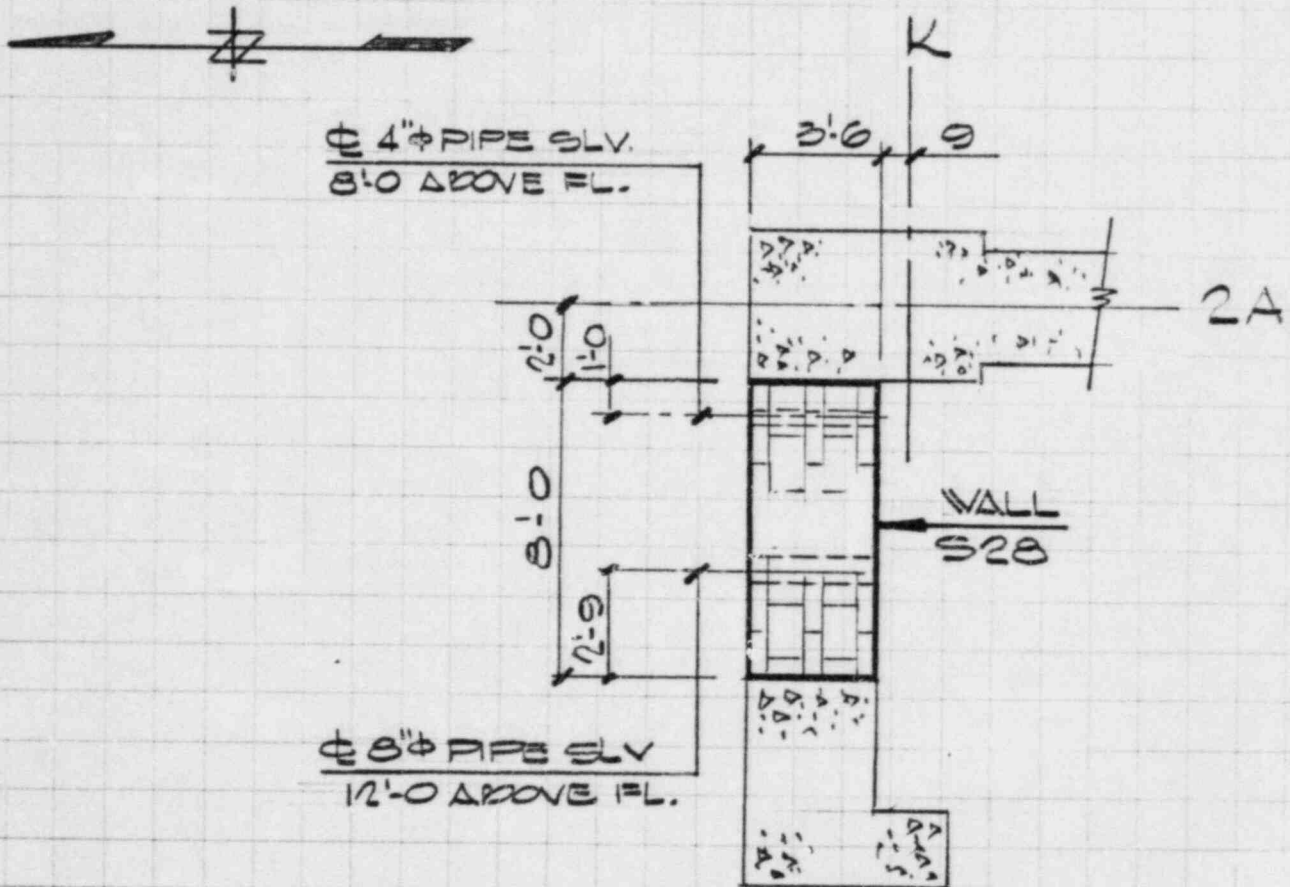
CHKD. BY J.S. DATE 10-8-84

OFS NO. LOW 2865.058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL - 34.75'

3/4\" = 1'-0

REF. DWG G-765502

CLIENT LOUISIANA POWER & LIGHT CO.

Project WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-7-84

SHEET _____ OF _____

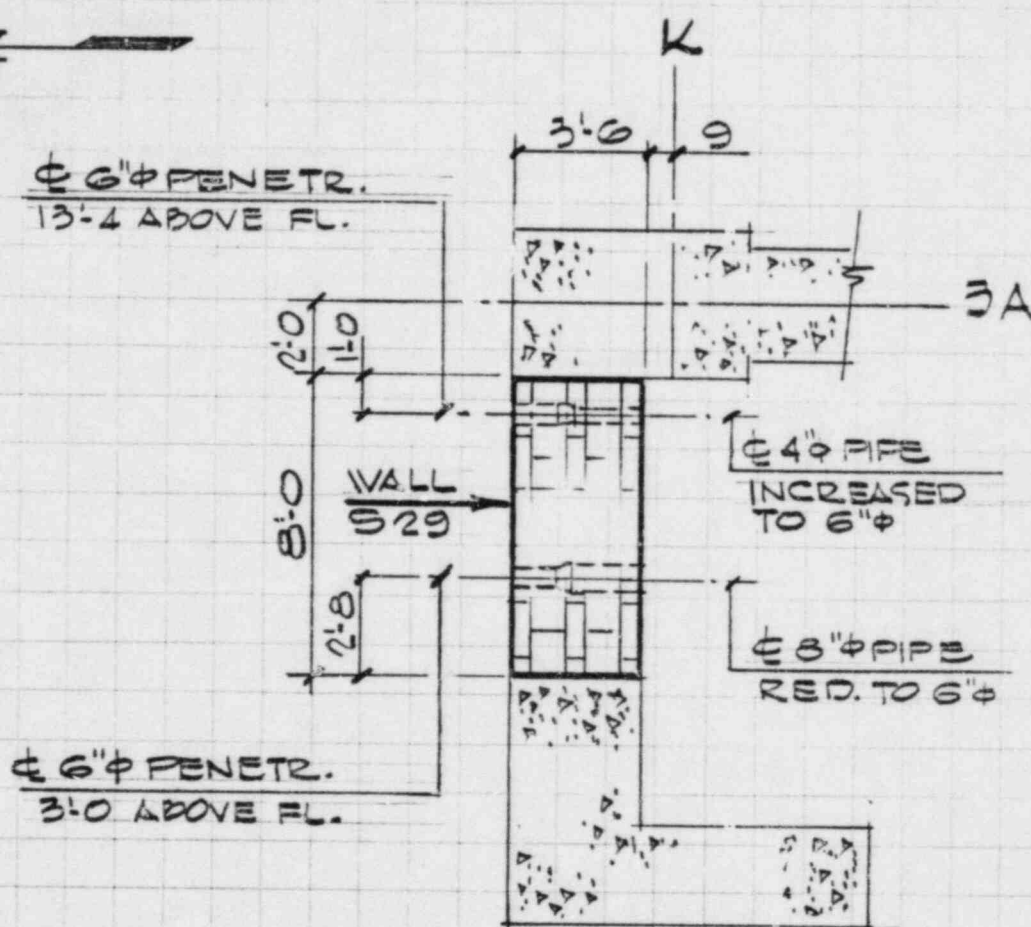
CHKD. BY J.S. DATE 10-8-84

OFS NO. LOU2865.058 DEPT. NO. 6.53

CLIENT LOUISIANA POWER & LIGHT CO

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL. -34.75'

$$\frac{3}{16} = 1' - 0$$

REF. DWG G-765 SO2
G-570 SO2

DATE 10-8-84

DEPT. NO. 2865.058 OFS NO. 2865.058

DEPT.
NO.DEPT.
NO.

WATERBURY # (b)

CONCRETE MASONRY BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10.7.84

SHEET _____ OF _____

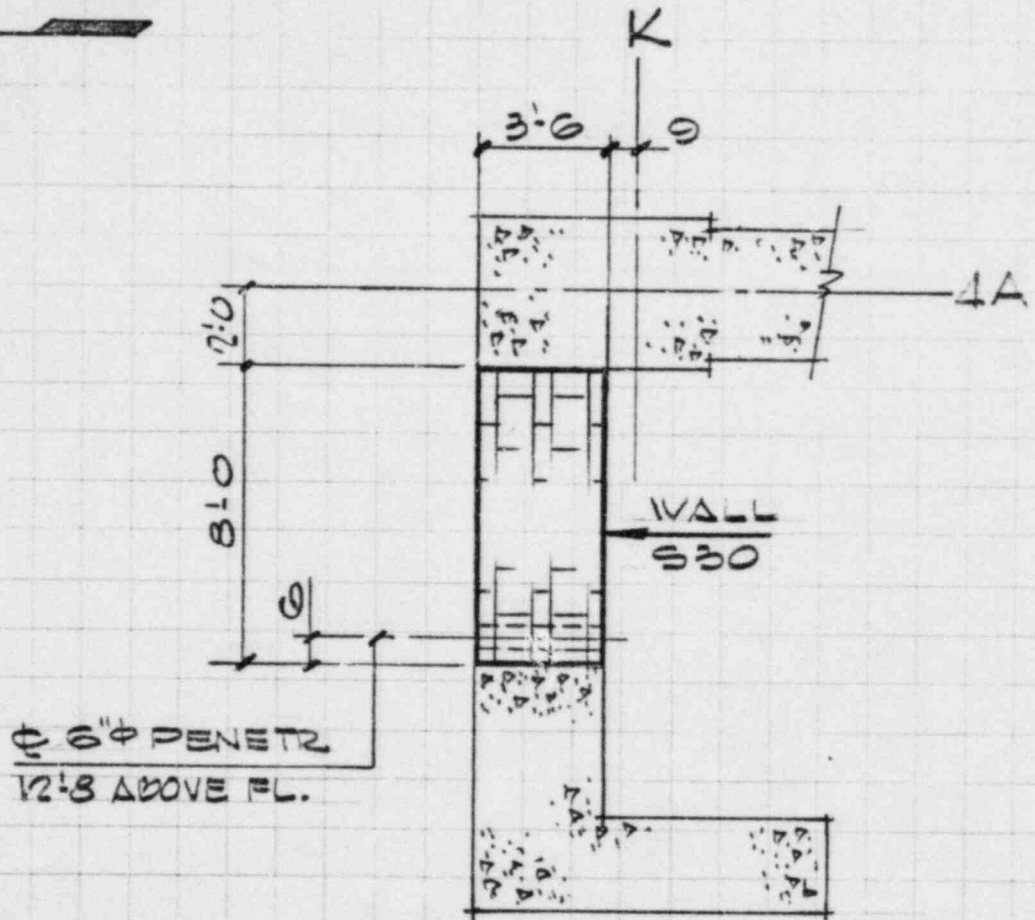
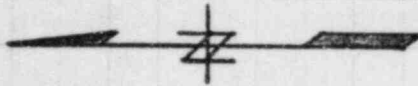
CHKD. BY J.S. DATE 10.8.84

OFS NO. LOU1865.058 DEPT. NO. 653

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL -34.75'

$\frac{3}{4}C = 1'-0"$

REF. DWG G-765502
G-570502

BY G. W. C. DATE 10-8-84

DATE 10-8-84

CHKD. BY [Signature] DATE 10-9-89

DATE 10-9-89

CLIENT LOUISIANA POWER & LIGHT CO.

OFFS NO. 2865.058 DEPT NO. 100

SHEET _____ OF _____

PROJECT WATERPROOFING
SUBJECT CONCRETE MASS

CONCRETE BLOCK WALLS

DATA - SEISMIC MASONRY

[illegible]

REMARKS:

EBASCO SERVICES INCORPORATED

BY G. FISCHIONI DATE 10-7-84

SHEET _____ OF _____

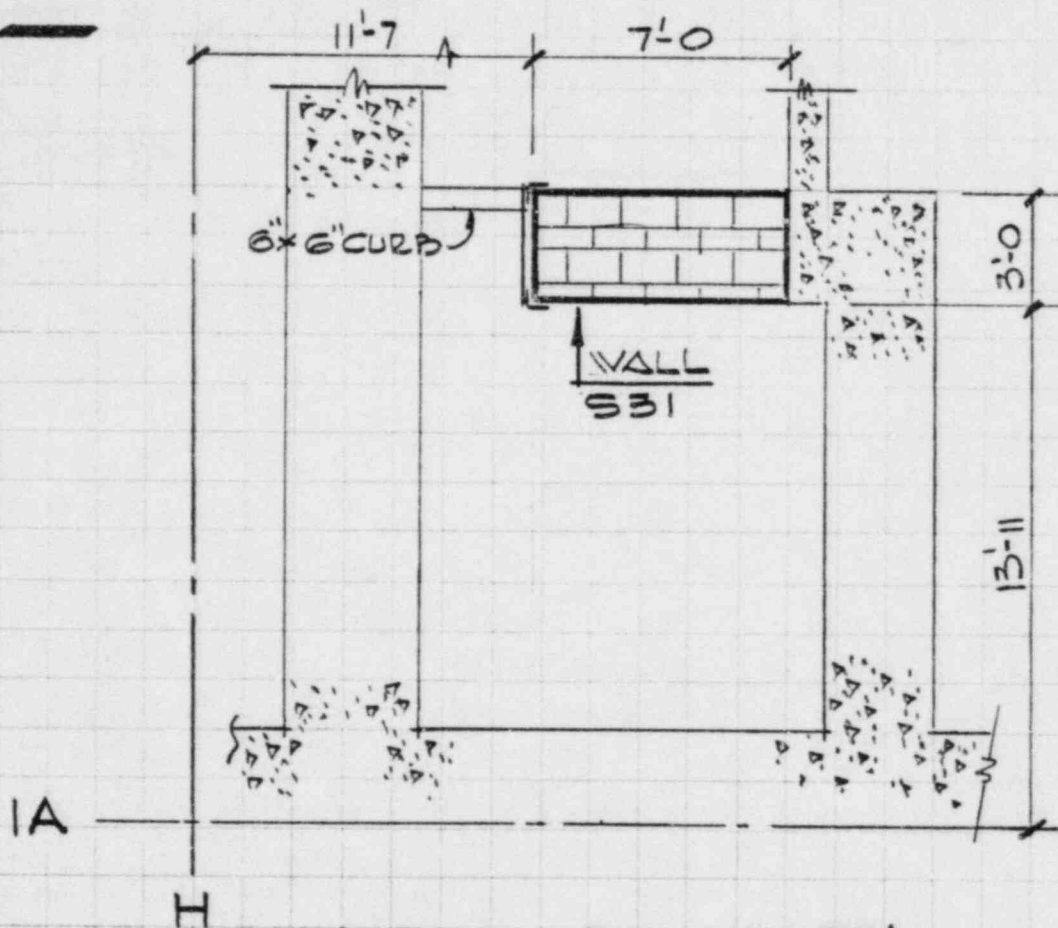
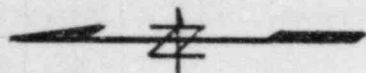
CHKD. BY J.S DATE 10-8-84

OFS NO. LOU2865.058 DEPT. NO. G53

CLIENT LOUISIANA POWER & LIGHT CO.

PROJECT WATERFORD #3

SUBJECT CONCRETE MASONRY BLOCK WALLS



PLAN @ EL - 34.75'

$\frac{3}{16} = 1'-0$

REF. DWG. G-765502

SHEET _____ OF _____

OK5NO

NO

COO WITH # DONOR ANZ FOUND

MYTHOLOGY # (5)

CONCRETE MASONRY BLOCK WALLS

6

REMARKS:

BY GJM DATE 3-15-84

REV. 1 GA 9-20-84

SHEET 1 OF 2

CHKD. BY JM DATE 3-16-84

LOUISIANA POWER & LIGHT CO.

OFS NO.

DEPT. NO.

CLIENT WATERFORD STEAM ELECTRIC STATION

1977 1165 MW INSTALLATION - UNIT 3

PROJECT

SUBJECT CONC BLOCK WALL DUR-O-WAL REINFORCEMENT ITEM # 13

FROM DUR-O-WAL MANUAL:

REF: G-765502

TRUSS DESIGN: SIDE RODS WORK TOGETHER. DIAGONAL CROSS RODS HELP RESIST LONGITUDINAL TENSILE STRESSES.

EFFECTIVE AREA INCLUDES SIDE RODS PLUS DIAGONAL CROSS ROD AREA TIMES COSINE OF ANGLE BET. CROSS ROD & SIDE ROD.

WIRE ASTM A82, $F_y = 70$ KSI

TRUSS: 2 - $\frac{3}{16}$ ϕ SIDE RODS + NO. 9 GA CROSS RODS. EFFECTIVE AREA

	d IN	EFF AREA IN ²	WT PER FT LBS
12" WALL	10	0.066	0.276
8" "	6	0.069	0.257

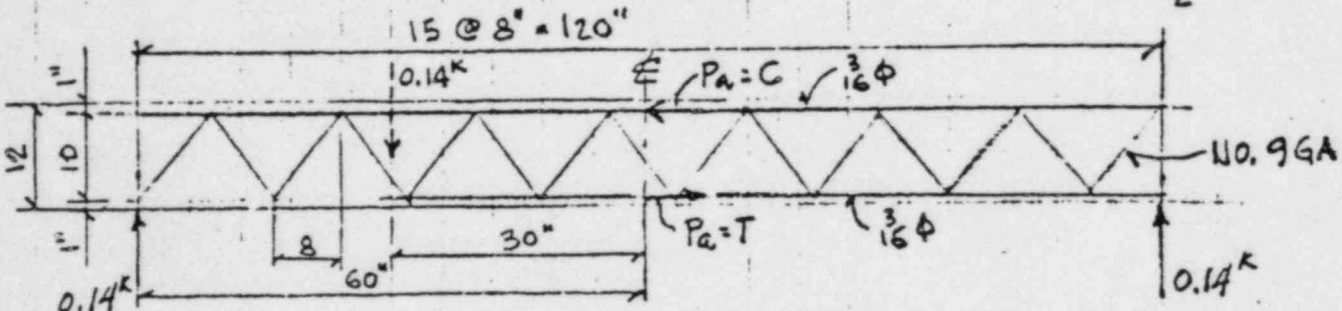
GIVEN: WALL WT = 140 $\frac{lb}{cu}$

SEISMIC FACTOR = 0.3 G

TRUSSES VERTICALLY @ 8" SPG, 10' LONG
CROSS ROD CONN @ 16" TO SIDE RODS

12" WALL UNIFORM LOAD TO TRUSS, $w = \frac{8}{12} \times 0.14 \times 0.3 = 0.028$ K/LIN FT

① IF SIMPLE TRUSS TAKING TENSION & COMPRESSION $R = 0.028 \times \frac{10'}{2} = 0.14$ K



DIAGONAL $H = 0.14 \times \frac{8}{10} = 0.112$ K

$C = (10^2 + 8^2)^{0.5} = 12.81$ $P_2 = 0.14 \times \frac{12.81}{10} = 0.18$ K

#9 GA BAR $A = \frac{\pi d^2}{4} = \frac{\pi}{4} \times \frac{0.1483^2}{4} = 0.01727$ IN²

DIAG. $f_a = \frac{0.18}{0.01727} = 10.42$ KSI < $70 \times 0.6 = 42$ KSI OK

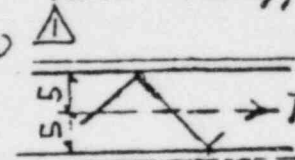
CHORD MAX $P_2 = 0.14 \times \frac{30}{10} = 0.42$ K $A = \left(\frac{3}{16}\right)^2 \times \frac{\pi}{4} = 0.0276$ IN²

$f_a = \frac{0.42}{0.0276} = 15.22$ KSI < 42 KSI OK SINCE CHORDS ARE CONT. LATERALLY SUPPORTED, NO REDUCTION HAS TO BE APPLIED.

② WITH EFFECTIVE STL AREA (STEEL TAKING TENSION ONLY, MORTAR & CONC. TAKES COMPRESSION)

MAX $T = 0.14 \times \frac{30}{5} = 0.84$ K

STEEL $f_a = \frac{0.84}{0.066} = 12.73$ KSI < 42 KSI OK



EBASCO SERVICES INCORPORATED

SH 20F2

BY A. J. A. DATE 3-15-84 REV 1 GA 9-26-84SHEET 2 OF 2CHKD. BY [Signature] DATE 3-16-84

OFS NO. _____ DEPT. NO. _____

CLIENT LOUISIANA POWER & LIGHT CO.
WATERFORD STEAM ELECTRIC STATIONPROJECT 1477 1165 MW INSTALLATION - UNIT 3SUBJECT CONC BLOCK WALL DUR-O-WAL REINFORCEMENTITEM # 138" WALL UNIFORM LOAD TO TRUSS, $W = \frac{8}{12} \times \frac{8}{12} \times 0.14 \times 0.3 = 0.0187^k/LIN FT$ ① IF SIMPLE TRUSS TAKING TENS. & COMPR., $R = 0.0187 \times \frac{10}{2} = 0.0935^k$ CHORD MAX $P_c = 0.0935 \times \frac{30}{6} = 0.468^k$

$$MAX f_a = \frac{0.468}{0.0276} = 16.94 ksi < \frac{42}{39.0} \underline{OK}$$

② WITH EFFECTIVE STEEL AREA:

$$MAX T = 0.0935 \times \frac{30}{3} = 0.935^k$$

$$STEEL f_a = \frac{0.935}{0.069} = 13.55 ksi < \frac{42}{39.0} \underline{OK}$$

1

EBASCO SERVICES INCORPORATED

SH10F1

BY A. LEON DATE 9/27/84SHEET 1 OF 1CHKD. BY 1-36-84 DATE 10-4-84OFS NO. _____ DEPT. NO. 653CLIENT LP&LPROJECT WATERFORD #3ITEM # 14SUBJECT MAX ALLOWABLE WORKING STRESSES FOR REINFORCED SOLIDAND HOLLOW UNIT MASONRY.TYPE OF STRESS AS PER
ACI-JURNAL AUGUST 1978-TABLE 10.1 (psi) $f'_m = 1350 \text{ psi}$ ENGINEERING OR ARCHITECTURAL
INSPECTION REQUIRED

YES

NO*

COMPRESSION-FLEXURAL ($.33 f'_m$); MAX=120

446

223

SHEAR :

a) NOSHEAR REINFORCEMENT

FLEXURAL ($1.1 \sqrt{f'_m}$); MAX=50

40

20

SHEAR WALLS

 $M/Vd \geq 1$ ($.9 \sqrt{f'_m}$); MAX=34

33

16

 $M/Vd < 1$ ($2.0 \sqrt{f'_m}$); MAX=40

40

20

b) REINFORCING TAKING ENTIRE SHEAR

FLEXURAL ($3.0 \sqrt{f'_m}$); MAX=150

110

55

SHEAR WALLS

 $M/Vd \geq 1$ ($1.5 \sqrt{f'_m}$); MAX=75

55

28

 $M/Vd < 1$ ($2.0 \sqrt{f'_m}$); MAX=45

45

23

MODULUS OF ELASTICITY ($1000 f'_m$)

1350000

675000

MODULUS OF RIGIDITY ($400 f'_m$)

540000

N.A.

BEARING ON FULL AREA ($.25 f'_m$); MAX=900

338

169

BEARING ON 1/3 OR LESS OF AREA ($.375 f'_m$)
(MAX=1200)

506

253

* AS PER 10.1.5 OF "BUILDING CODE REQUIREMENTS FOR CONCRETE
MASONRY STRUCTURES (PROPOSED AS ACI STANDARD).

N. NOT APPLY

EBASCO SERVICES INCORPORATED

BY A. LEON DATE 10/5/84
CHKD. BY K. Shih DATE 10-5-84
CLIENT LP&L

SHEET 1 OF 1OFS NO. _____ DEPT. NO. 653PROJECT WATERFORD #3SUBJECT CONC. BLOCK WALLS, - MODULUS USED.ITEM # 15

1. THE MODULUS USED IN WALL ANALYSIS IS THE MODULUS OF ELASTICITY. SEE ITEM # 14

BY G. WU DATE 9/26/84
 CHKD. BY K. G. H. DATE 10-1-84
 CLIENT LP & L
 PROJECT WATERFORD S.E.S. #3
 SUBJECT CONCRETE MASONRY WALL

SHEET 1 OF 1
 DEPT. 653
 NO. 653

OFS NO. _____

ITEM # 16

HOLLOW BLOCK WALL - 12" THICK

VERTICAL REINF. BARS 4-#6 @ 48"
 HORIZONTAL DUR-O-WALL TRUSS WITH 3/16" ROD. @
 EVERY OTHER COURSE

$$A_{SV} = .44 \times 4 = 1.76 \text{ "}$$

$$A_{SH} = \frac{\pi}{4} (3/16)^2 \times 2 + \frac{\pi}{4} (1.15)^2 \cos 51^\circ = .066 \text{ "}$$

* THE AVERAGE HORIZONTAL CROSS-SECTIONAL AREA FOR A HOLLOW BLOCK IS 114.4 "

$$A_{VER} = \frac{114.4 \times 8}{16} = 57.2 \text{ "}$$

$$\text{VERTICAL STEEL} = \frac{A_{SV}}{A_H} = \frac{1.76}{114.4} = .015$$

$$\text{HORIZONTAL STEEL} = \frac{A_{SH}}{A_V} = \frac{.066}{114.4} = .00057$$

$$\text{HORIZONTAL + VERTICAL} = .015 + .00057 = .01557$$

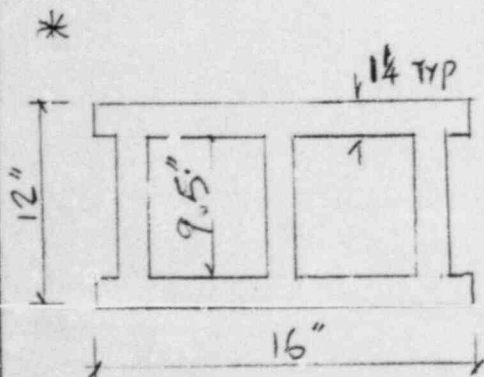
By Code **
 11.3.2.2

.0007

.0007

.0002

** ACI 531



HOLLOW BLOCK

$$A_{HORIZ.} = 1.25 \times 16 \times 2 + 1.25 \times 9.5 \times 3 = 40 + 35.6 = 75.6 \text{ "}$$

SOLID BLOCK

$$A_{HORIZ.} = 16 \times 12 = 192 \text{ "}$$

$$\text{For a 48" width, } A_H = \frac{2 \times 75.6 + 192}{3} = 114.4 \text{ "}$$

BY E. KRIVCOV DATE 9-27-84

SHEET 1 OF 1

CHKD. BY K. Shih DATE 10-6-84

OFS NO. _____ DEPT. NO. 653

CLIENT _____

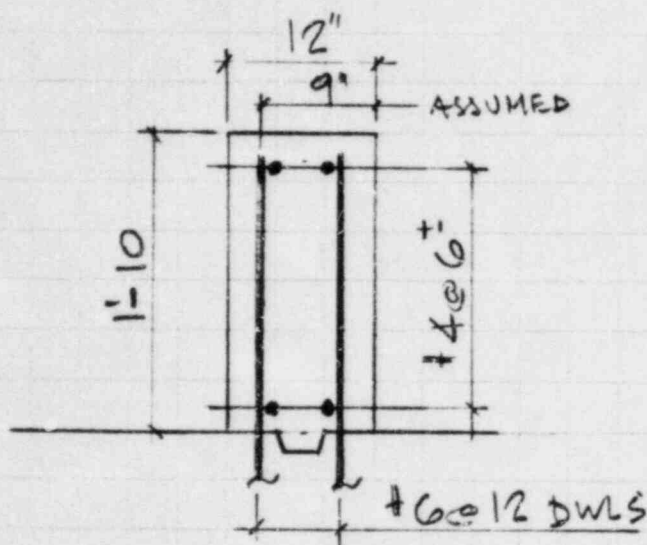
LP & L

PROJECT WATERFORD #3

SUBJECT MIN REINFG REQ'D. FOR 12" WIDE CURBS

ITEM # 16

REF. DWG. NO. G765302



$$A_s^{HORIZ} = .40 \text{ in}^2/\text{FT EF} (+4 @ 6 \text{ EF})$$

(PROVIDED)

$$A_s^{VERT} = .44 \text{ in}^2/\text{FT EF} (+6 @ 12 \text{ EF})$$

(PROVIDED)

REINFG. PROVIDED

"A" - CONSIDERING CURB AS A WALL

$$A_s^{VERT} \text{ PER FT} = 12 \times 12 \times .0015 = .22 \text{ in}^2/\text{FT BF OR } .11 \text{ in}^2/\text{FT EF} < .40$$

$$A_s^{HORIZ} \text{ PER FT} = 12 \times 12 \times .0025 = .36 \text{ in}^2/\text{FT BF OR } .18 \text{ in}^2/\text{FT EF} < .44$$

"B" - CONSIDERING CURB AS A FLEXURAL MEMBER

$$A_s^{VERT} = 12 \times 9 \times .0033 = .36 \text{ in}^2/\text{FT} < .44 \text{ in}^2/\text{FT}$$