



Carolina Power & Light Company

November 5, 1980

410: 38

FILE: NG-3513 (R)

SERIAL: NO-80-1633

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, GA 30303

RECEIVED
SERVICES UNIT

1980 NOV 17 PM 2 18

RECEIVED DISTRIBUTION
SERVICES UNIT

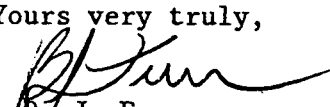
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
LICENSE NO. DPR-23
DOCKET NO. 50-261
RESPONSE TO IE BULLETIN 80-11 (180-DAY RESPONSE)

Dear Mr. O'Reilly:

Enclosed you will find Carolina Power & Light Company's response to IE Bulletin 80-11 concerning Masonry Wall Design. This response addresses Item 2b of the subject bulletin as required by Item 4.

This completes Carolina Power & Light Company's response to the subject bulletin. Should you have questions regarding our response, please contact my staff.

Yours very truly,


B. J. Furr
Vice President
Nuclear Operations

DCS:kbb*
Enclosures

cc: Mr. Norman C. Moseley

Sworn to and subscribed before me this 5th day of November, 1980.

Margaret R. Sparks
Notary Public

My Commission Expires June 5, 1984.

(2)

I - SUMMARY

In accordance with the requirements of The United States Nuclear Regulatory Commission's I.E. Bulletin 80-11, the concrete masonry walls which are in the proximity of safety related systems or equipment in the Reactor Building, Reactor Auxiliary Building and the Fuel Handling Building have been analyzed and reinforced as necessary with structural steel supports to ensure that these walls will not collapse due to the hypothetical earthquake.

The walls discussed in this report are given the same identifying numbers as those contained in Carolina Power and Light Company's first response to I.E. Bulletin 80-11, namely walls number 1, 2, 3a, 3b, 4 and 6.

The design of the Structural Supports is in accordance with the original H. B. Robinson - Unit No. 2 design criteria for Class 1 structures and the Final Facility Description and Safety Analysis Report.

II - DISCUSSION

1. GENERAL

The concrete masonry walls shown on sketches CAR 2762-SK 401, 402, 403, 404, 405 and 406 contained in Appendix B of this report are radiation shields of multi-wythe solid block and were not intended to function as load bearing elements.

The six walls which have previously been identified as being in proximity to safety related systems or equipment have been analysed for seismic loading and structural supports designed for them.

2. DESIGN CRITERIA

The following criteria were used to analyse the concrete masonry walls and proposed supports.

a. Material Specifications

- (1) Concrete block is Class B ($f'_c = 3,000$ psi)
- (2) Mortar - Class S, ($f'_c 1,800$ psi)
- (3) Structural steel and plate is ASTM A36
- (4) Concrete anchors are Phillips Wedge Anchors as manufactured by the Phillips Drilling Company
- (5) Welding electrodes conform to AWS A5.1 low hydrogen Class E70XX for Manual Shielded Metal - Arc Welding or AWS A5.17 F7X for Submerged Arc Welding.

b. Design Codes

- (1) American Concrete Institute (ACI) 67-23, Concrete Masonry Structures - Design and Construction

- (2) ACI Standard, "Building Code Requirements for Concrete Masonry Structures", (ACI 531-79).
- (3) American Institute of Steel Construction, (AISC) - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings - Sixth Edition, Revised 1963.
- (4) American Welding Society (AWS) D1.1.76 - Structural Welding Code.
- (5) Phillips Catalog F-1000 dated May 1, 1973.

c. Design Loads

- (1) Dead Load (D)
 - (a) Concrete Masonry = 143 pcf
 - (b) Structural Steel = 490 pcf
- (2) Seismic Loads
 - (a) Hypothetical Earthquake (E) 0.2g base horizontal ground acceleration and 0.134g base vertical acceleration acting simultaneously.
 - (b) Acceleration coefficients were obtained from the appropriate acceleration curves which are contained in Appendix A.

d. Load Combinations and Allowable Stresses

- (1) For concrete masonry
 - (D) + (E) using allowable stresses as per ACI 67-23
- (2) For structural steel
 - (D) + (E) using normal AISC working stresses

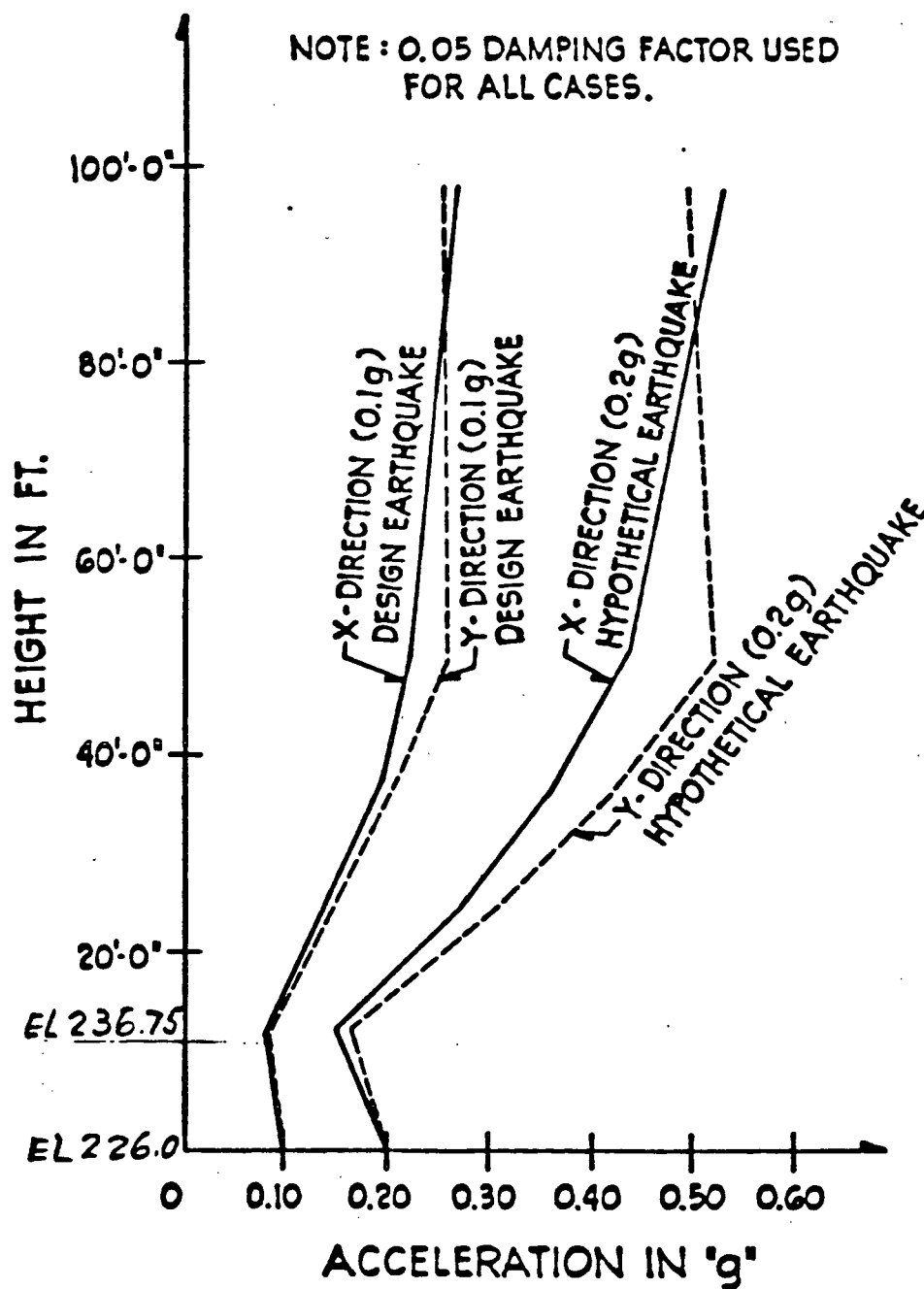
3. ANALYSIS AND RESULTS

The block walls in question were first analyzed assuming normal ACI 531 allowable stresses in the mortar in horizontal joints as well as between wythes (collar joints) and between vertical edge of the block wall and the reinforced concrete wall or the floor to which it is joined. Based on these assumptions, walls were found to be satisfactory as they now stand with no collar stress exceeding 2.5 psi as opposed to 8 psi generally allowable. Other mortar stresses were within the allowables of ACI 531.

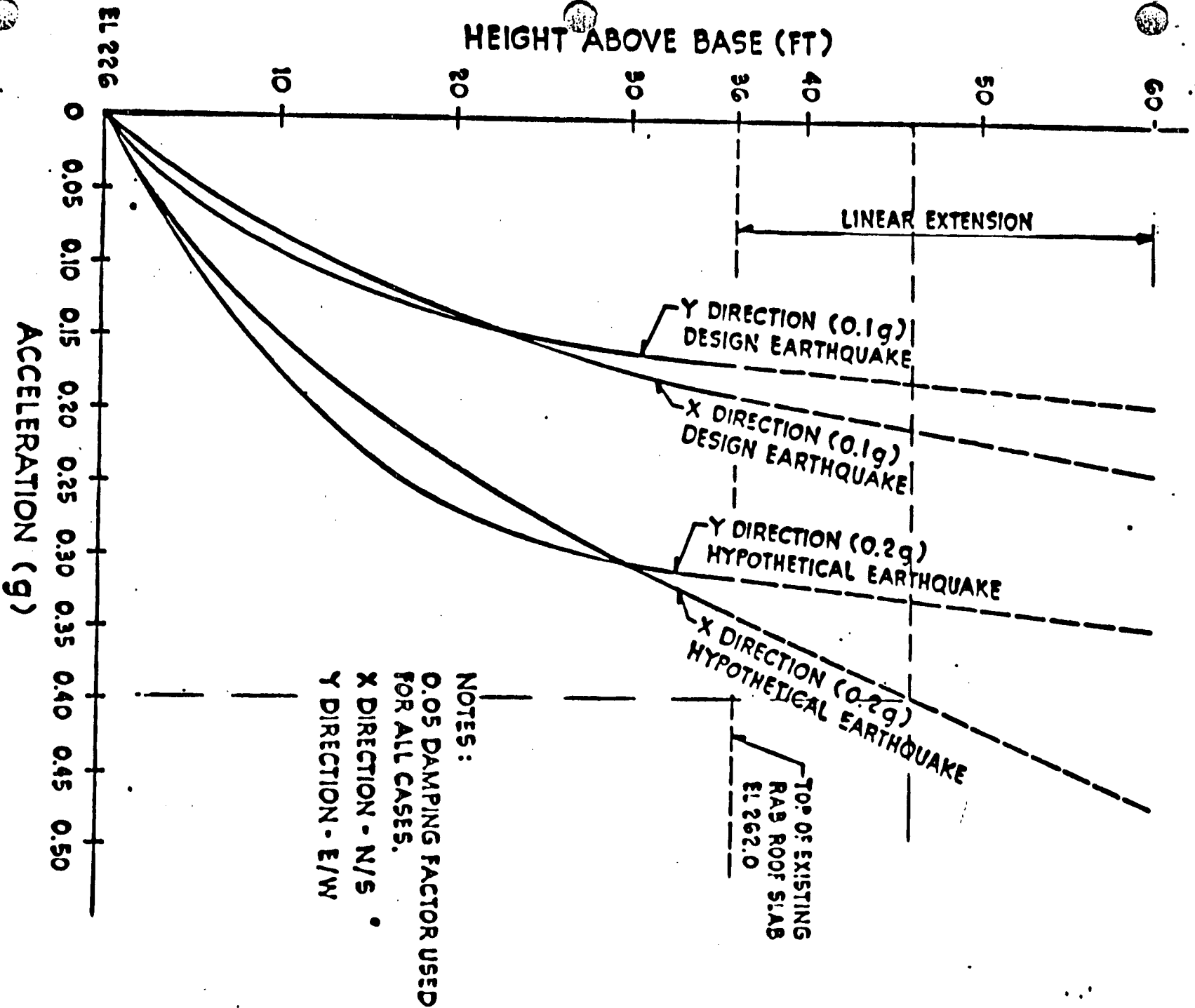
In addition the walls were analyzed assuming only the allowable stress in the horizontal joints between blocks. No bond or friction was assumed between wythes nor between the edge of the block wall and its adjoining reinforced concrete wall. Under these assumptions additional supports as shown in Appendix B are required to ensure the walls will retain their function during and after the hypothetical earthquake.

The walls in their present configuration are adequate when compared to ACI 531-79. However, due to a lack of consistent data verifying the quality of the wall mortar joints, and to eliminate all possible concern about these walls, CP&L commits to upgrade each of the walls as indicated in Appendix B of this report.

APPENDIX A

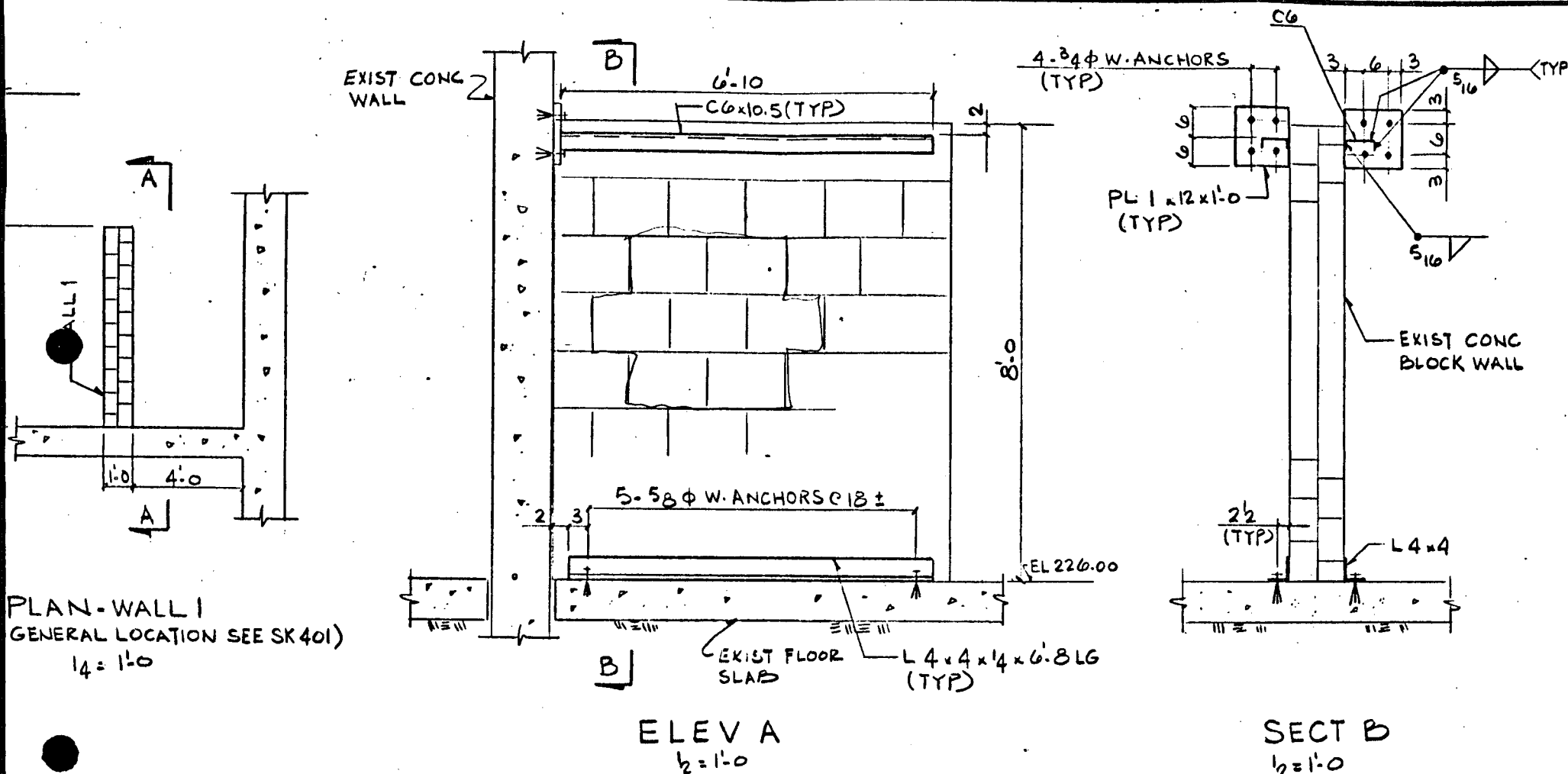
H B ROBINSON STEAM ELECTRIC PLANT
UNIT NO. 2

ACCELERATION CURVE FOR FUEL HANDLING BUILDING



ACCELERATION CURVE FOR REACTOR AUXILIARY BUILDING
(DUPLICATE OF ORIGINAL SEISMIC RESPONSE CURVE)

APPENDIX B



STRUCTURAL STEEL & PLATE SHALL CONFORM
A-36.

EXPANSION BOLTS SHALL BE PHILLIPS
ANCHORS IN ACCORDANCE WITH MFR
INSTRUCTIONS.

WELDING ELECTRODES SHALL CONFORM
A5.1 LOW HYDROGEN CLASS E70XX
ELECTRODES.

VERIFY ALL DIMENSIONS &
SPACINGS BEFORE FABRICATION.

ENSURE THAT ALL CONTACT
POINTS BETWEEN STRUCTURAL STEEL
WALLS TO BE FULL CONTACT

6- ALL STEEL & WEDGE ANCHORS AS
SHOWN ARE NEW.

7- FOR CLEANING & PAINTING STRUCTURAL
STEEL SEE EBASCO SPECIFICATION
CAR-HBR-C-4.

REF DWG :
G. 190420

EBASCO SERVICES INCORPORATED

DIV. CIVIL DR. FARAJ

SCALE AS SHOWN

DATE 10/1/00

APPROVED

2/1/01

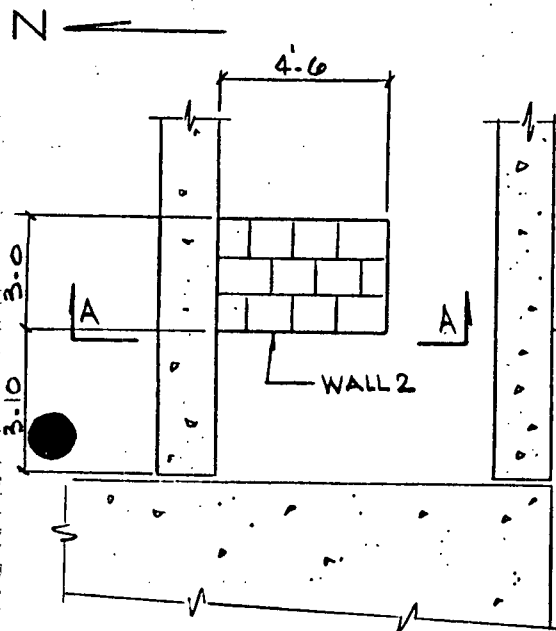
2/1/01

CAROLINA POWER & LIGHT CO.
H. B. ROBINSON - UNIT 2

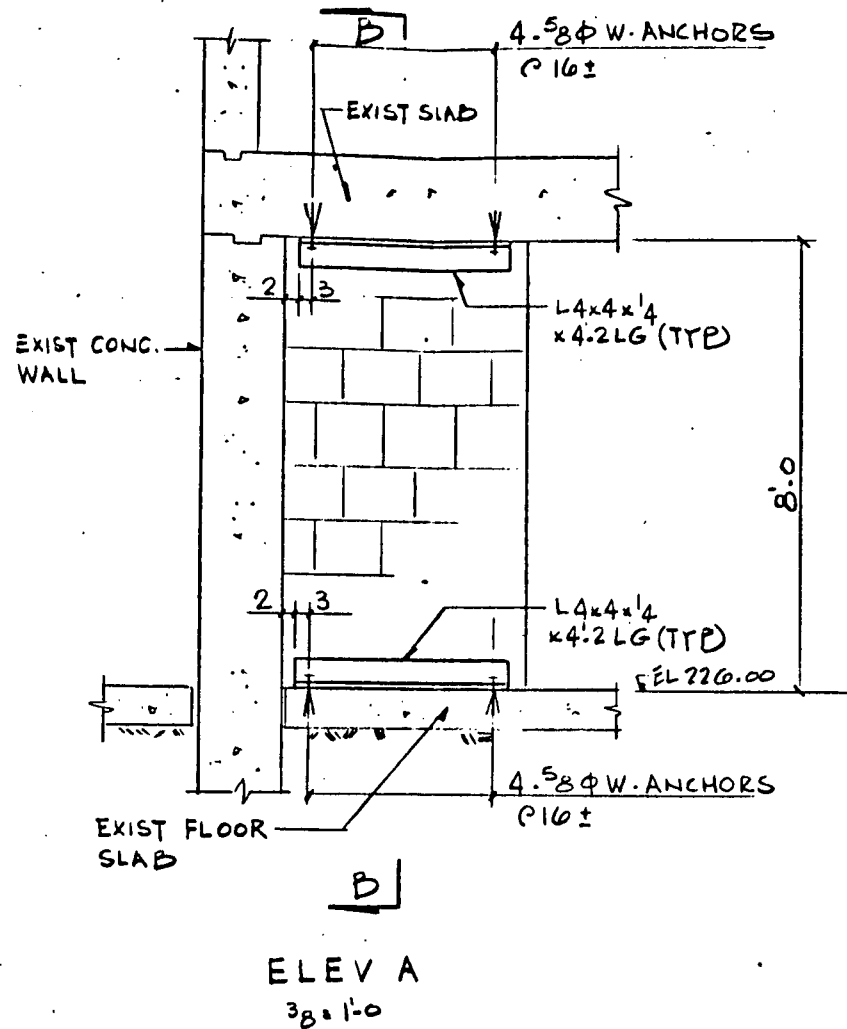
WALL I - SUPPORT DETAIL &
GENERAL NOTES

CAR 2

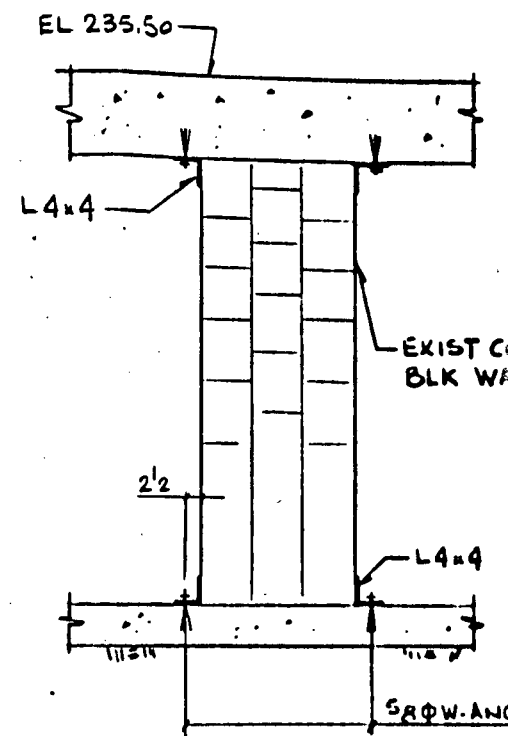
SK 4



PLAN- WALL 2
(FOR GENERAL LOCATION SEE SK 401)
1/4" = 1'-0"



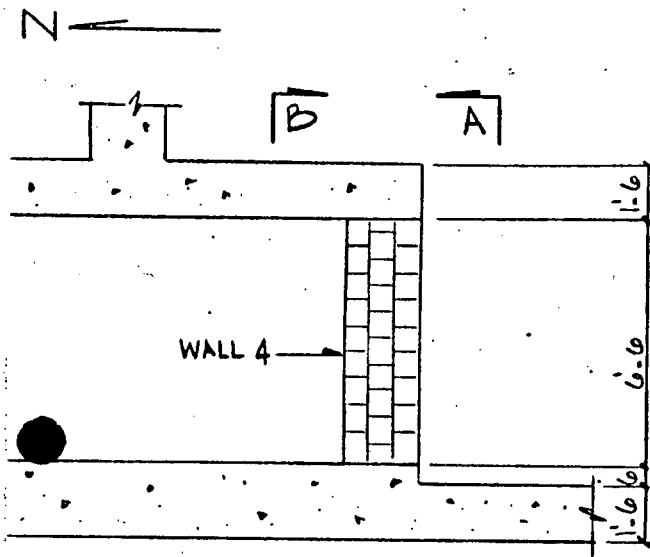
ELEV A
3/8" = 1'-0"



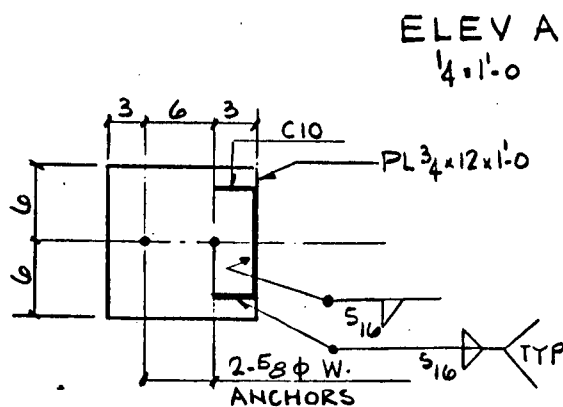
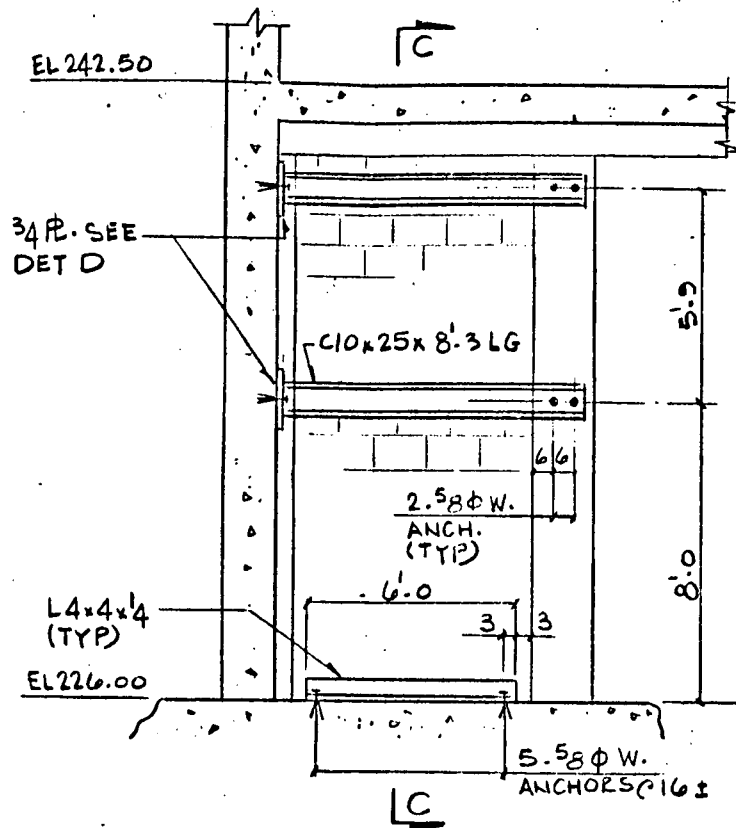
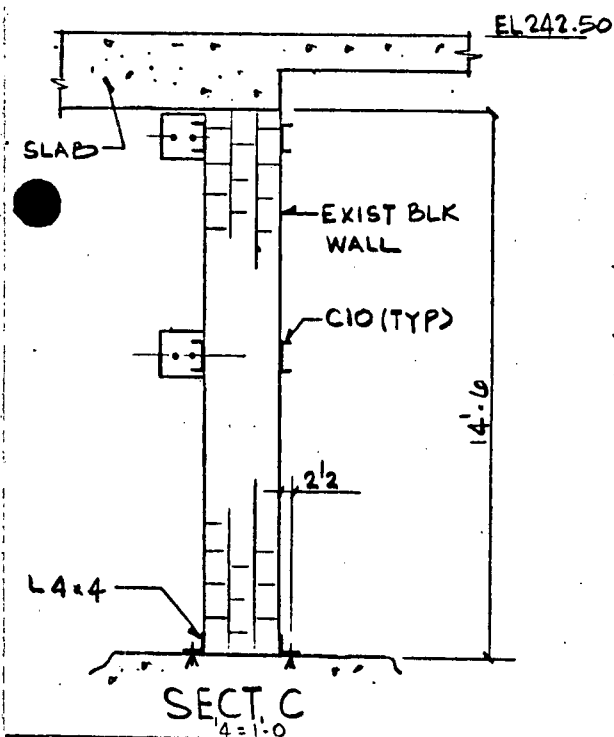
SECT B
3/8" = 1'-0"

NOTES
FOR NOTES SEE SK 402

REF DWG :
G. 190420



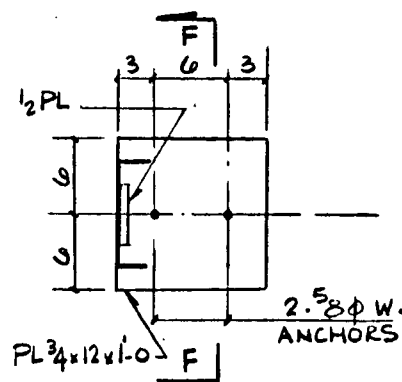
PLAN - WALL 4
(FOR GENERAL LOCATION SEE SK 401)
1/4" = 1'-0"



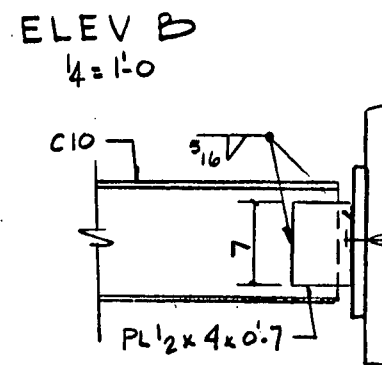
DET D
(4 REQD)
1" = 1'-0"

NOTES:
SEE SK 402

REF DWG:
G. 190400



DET E
(2 REQD)
1" = 1'-0"

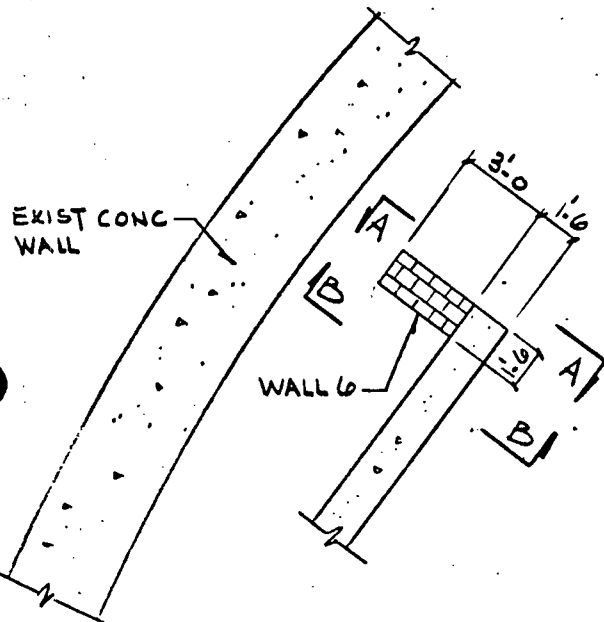


SECT F
1" = 1'-0"

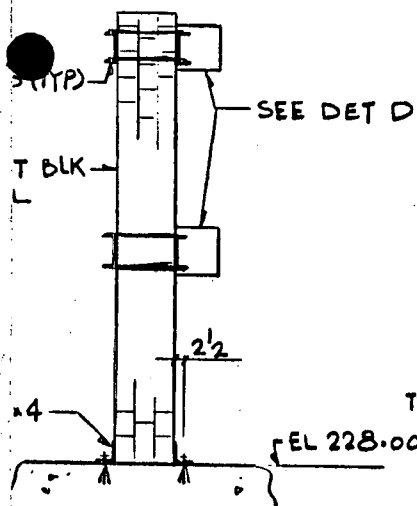
EBASCO SERVICES INCORPORATED	
DIV. CIVIL	W. FARAW
SCALE AS SHOWN	APPROVED
DATE NOTED 10-20-01	<i>[Signature]</i>
	R. C. M.

CAROLINA POWER & LIGHT CO.
H. B. ROBINSON - UNIT 2
WALL 4 - SUPPORT DETAIL

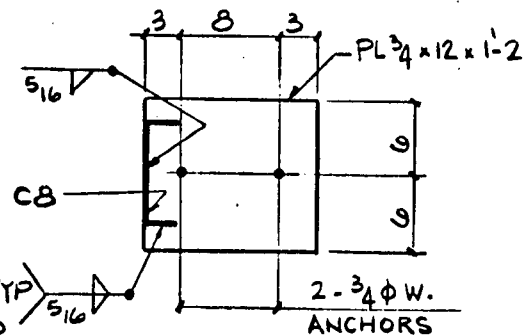
N



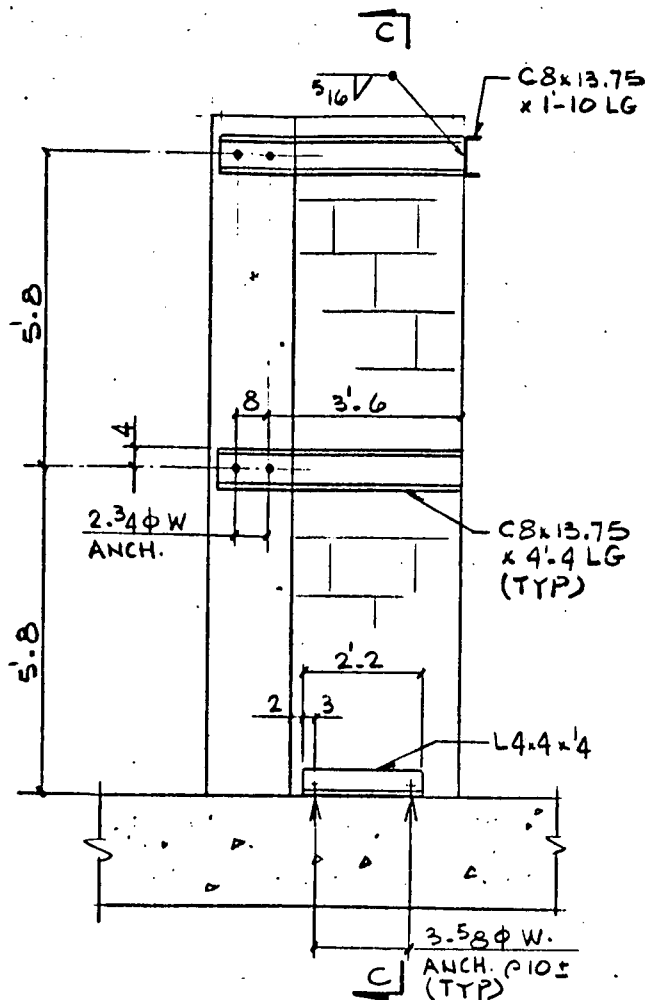
PLAN - WALL 6
(FOR GENERAL LOCATION SEE SK 401)
3'-0" = 1'-0"



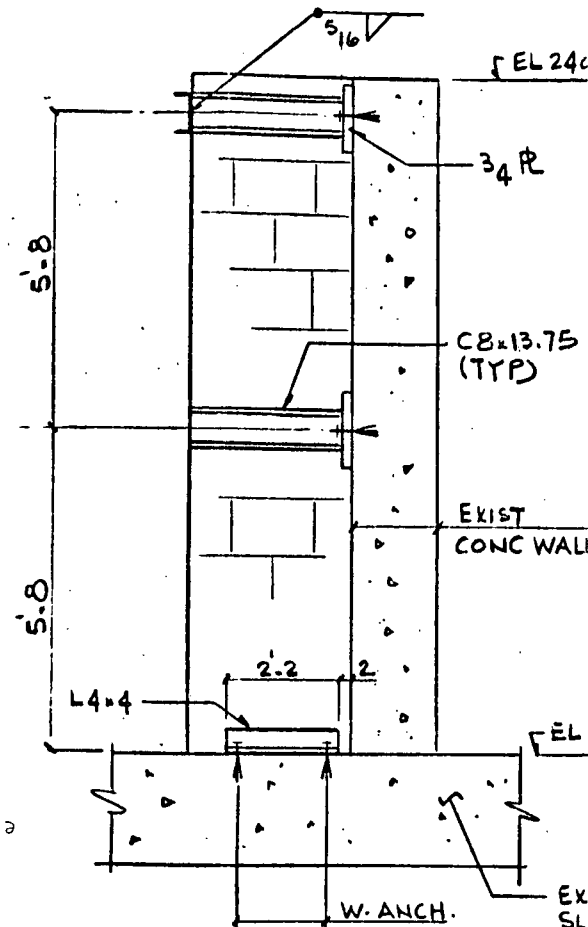
SECT C
1'-0"



DET D - BASE & DET
(2 REQD)



ELEV A
3'-0" x 1'-0"



ELEV B
3'-0" x 1'-0"

NOTES
FOR NOTES SEE
REF DWG :
G. 190367

EBASCO SERVICES INCORPORATED			
DIV. CIVIL	W. FARAJ	APPROVED	
SCALE AS NOTED	CH. 12		
DATE 12-22-77			RCM

CAROLINA POWER & LIGHT CO.
H.B. ROBINSON - UNIT 2
WALL 6 - SUPPORT DETAIL

REACTOR AUXILIARY
BUILDING

CHARGING PUMP
ROOM

WALL 3a
SEE SK404

WALL 3b
SEE SK404

PIPE ALLEY

WALL 4
SEE SK405

WALL 1 - SEE
SK-402

WALL 2 - SEE
SK403

FUEL HANDLING
BUILDING

WALL 7C

WALL 5a

WALL 5b

WALL 5c

REACTOR
BLDG

WALL 6 - SEE
SK406

REF DWG

G. 1901

G. 1901

GENERAL LOCATION PLAN
- BLOCK WALLS -

EBASCO SERVICES INCORPORATED

DIV. CIVIL DR. FARAJ

SCALE N.T.S. CH. 1111

DATE 10-20-52

APPROVED

[Signature]

11/11/52

CAROLINA POWER & LIGHT CO
H.B. ROBINSON - UNIT 2

BLOCK WALLS - LOCATION PLAN