JUN 25 1985

Docket No.: 50-443
50-444

Distribution
Docket File
Local PDR
PRC System
NSIC
LB#3 Reading
OELD Attorney
GWKnighton
VNerses
JLee

APPLICANT: Public Service Company of New Hampshire

FACILITY: Seabrook Station, Unit 1 and 2

SUBJECT: MEETING SUMMARY

On May 24, 1985, NRC and applicant representatives met in Bethesda, Maryland to discuss the cable tray support re-evaluation program. Enclosure 1 provides the list of attendees to this meeting. Enclosure 2 provides the agenda and the applicant's presentation.

The applicant stated that the reason for undertaking the program was to evaluate existing cable tray problems and to apply current cable tray technology to resolve these problems.

As a result of the evaluation, the applicant decided to implement the Bethcel Raceway Program to the Seabrook Project.

The applicant confirmed in this meeting that the cable trays used at Seabrook Station was of the same material and configuration as those used in the test program and that no fireproofing spray is used, which is consistent with the test conditions. The applicant stated that an evaluation of the Seabrook cable tray and support system had been performed and compared with existing test data, and the evaluation results showed that the use of up to 20% damping would be appropriate for Seabrook. The staff discussed the information presented by the applicant and found that the applicant's approach was acceptable. The staff indicated that we would approve the up to 20% damping for Seabrook if the applicant can provide and document the evaluation results.

The applicant has agreed to revise Sections 3.7 and 3.10 of the FSAR to provide the appropriate information which was presented in this meeting. The staff will review the revised FSAR to confirm the analysis presented in this meeting and the staff's review will be documented in an SER supplement.

/s/

Victor Nerses, Project Manager
Licensing Branch No. 3
Division of Licensing

Enclosures:
As stated

cc: See next page

*Previously concurred:

LB#3/DL	LB#3/DL
*VNerses:dh	*GKnighton
06/17/85	06/ /85

Mr. Robert J. Harrison
President and Chief Executive Officer
Public Service Company of New Hampshire
Post Office Box 330
Manchester, New Hampshire 03105

Thomas Dignan, Esq.
John A. Ritscher, Esq.
Ropes and Gray
225 Franklin Street
Boston, Massachusetts 02110

Mr. Bruce B. Reckley, Project Manager
Public Service Company of New Hampshire
Post Office Box 330
Manchester, New Hampshire 03105

Dr. Mauray Tye, President
Sun Valley Association
209 Summer Street
Haverhill, Massachusetts 01839

Robert A. Backus, Esq.
O'Neil, Backus and Spielman
116 Lowell Street
Manchester, New Hampshire 03105

Ms. Beverly A. Hollingworth
7 A Street
Hampton Beach, New Hampshire 03842

William S. Jordan, III
Diane Curran
Harmon, Weiss & Jordan
20001 S Street, NW
Suite 430
Washington, DC 20009

Jo Ann Shotwell, Esq.
Office of the Assistant Attorney General
Environmental Protection Division
One Ashburton Place
Boston, Massachusetts 02108

D. Pierre G. Cameron, Jr., Esq.
General Counsel
Public Service Company of New Hampshire
Post Office Box 330
Manchester, New Hampshire 03105

Regional Administrator - Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

E. Tupper Kinder, Esq.
G. Dana Bisbee, Esq.
Assistant Attorney General
Office of Attorney General
208 State Hosue Annex
Concord, New Hampshire 03301

Resident Inspector
Seabrook Nuclear Power Station
c/o US Nuclear Regulatory Commission
Post Office Box 700
Seabrook, New Hampshire 03874

Mr. John DeVincentis, Director
Engineering and Licensing
Yankee Atomic Electric Company
1671 Worchester Road
Framingham, Massachusetts 01701

Mr. A. M. Ebner, Project Manager
United Engineers & Constructors
30 South 17th Street
Post Office Box 8223
Philadelphia, Pennsylvania 19101

Mr. Philip Ahrens, Esq.
Assistant Attorney General
State House, Station #6
Augusta, Maine 04333

Mr. Warren Hall
Public Service Company of
New Hampshire
Post Office Box 330
Manchester, New Hampshire 03105

Seacoast Anti-Pollution League
Ms. Jane Doughty
5 Market Street
Portsmouth, New Hampshire 03801

Mr. Diana P. Randall
70 Collins Street
Seabrook, New Hampshire 03874

Mr. Calvin A. Canney, City Manager
City Hall
126 Daniel Street
Portsmouth, New Hampshire 03801

Ms. Letty Hett
Town of Brentwood
RFD Dalton Road
Brentwood, New Hampshire 03833

Ms. Roberta C. Pevear
Town of Hampton Falls, New Hampshire
Drinkwater Road
Hampton Falls, New Hampshire 03844

Ms. Sandra Gavutis
Town of Kensington, New Hampshire
RDF 1
East Kingston, New Hampshire 03827

Chairman, Board of Selectmen
Town Hall
South Hampton, New Hampshire 03827

Mr. Angie Machiros, Chairman
Board of Selectmen for the Town of Newbury
Newbury, Massachusetts 01950

Ms. Rosemary Cashman, Chairman
Board of Selectmen
Town of Amesbury
Town Hall
Amesbury, Massachusetts 01913

Honorable Richard E. Sullivan
Mayor, City of Newburyport
Office of the Mayor
City Hall
Newburyport, Massachusetts 01950

Mr. Donald E. Chick, Town Manager
Town of Exeter
10 Front Street
Exeter, New Hampshire 03823

Mr. William B. Derrickson
Senior Vice President
Public Service Company of
New Hampshire
Post Office Box 700, Route 1
Seabrook, New Hampshire 03874

Mr. Alfred V. Sargent,
Chairman
Board of Selectmen
Town of Salisbury, MA 01950

Senator Gordon J. Humphrey
U. S. Senate
Washington, DC 20510
(Attn: Tom Burack)

Senator Gordan J. Humphrey
1 Pillsbury Street
Concord, New Hampshire 03301
(Attn: Herb Boynton)

Mr. Owen B. Durgin, Chairman
Durham Board of Selectmen
Town of Durham
Durham, New Hampshire 03824

Charles Cross, Esq.
Shaines, Mardrigan and
McEaschern
25 Maplewood Avenue
Post Office Box 366
Portsmouth, NH 03801

Mr. Guy Chichester, Chaiman
Rye Nuclear Intervention
Committee
c/o Rye Town Hall
10 Central Road
Rye, New Hampshire 03870

Jane Spector
Federal Energy Regulatory
Commission
825 North Capital Street, NE
Room 8105
Washington, D. C. 20426

Mr. R. Sweeney
New Hampshire Yankee Division
Public Service of New Hampshire
Company
7910 Woodmont Avenue
Bethesda, Maryland 20814

ENCLOSURE 1

MEETING MAY 24, 1985

A. Dufault	UEC
R. Sweeney	EBASCO
P. McMahon	BECHTEL
R. Linderman	BECHTEL
K. Lee	BECHTEL
R. White	YANKEE ATOMIC
V. Nerses	NRC/NRR/DE/SGEB
J. Ma	NRC/NRR/DE/SGEB
S. Chan	NRC/NRR/DE/SGEB
G. Rigamonti	UE&C
R. Tucker	YAEC

ENCLOSURE 2

SEABROOK CABLE TRAY DAMPING
MEETING AGENDA

- INTRODUCTION (R. TUCKER / YAEC)
- CABLE TRAY TEST PROGRAM (B. LINDERMAN / BECHTEL)
- CABLE TRAY TEST MOVIE (OPTIONAL)
- OVERVIEW OF TEST PROGRAM RESULTS (B. LINDERMAN / BECHTEL)
- SEABROOK REVIEW (P. McMAHON / BECHTEL)
- DESIGN IMPLEMENTATION (A. DUFAULT / UE&C)
- CONCLUSIONS (R. TUCKER / YAEC)
- DISCUSSION

INTRODUCTION

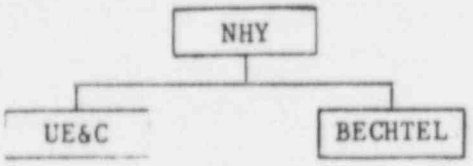
- CURRENT CONSTRUCTION STATUS
  - OVERALL PLANT CONSTRUCTION IS 86% COMPLETE
  - 98% OF THE CABLE TRAY AND VERTICAL TRAY SUPPORT SYSTEM IS COMPLETE
  - LATERAL BRACING IS 75% COMPLETE
  - AXIAL BRACING IS 5% COMPLETE

- PURPOSE OF THE CABLE TRAY STUDY

- RESULTS OF THE STUDY
  - IMPLEMENTATION OF THE BECHTEL RACEWAY PROGRAM

- BENEFITS OF ADOPTING THE PROGRAM
  - REDUCE CHANGEOUT OF CONNECTION HARDWARE
  - REDUCE INSTALLATION PROBLEMS
  - REDUCE COMPLEXITY OF ANTICIPATED MODIFICATIONS FROM 100% QA REINSPECTION
  - IMPROVE CONSTRUCTION SCHEDULE

- ORGANIZATION



RACEWAY TEST PROGRAM

PURPOSE

- TO UNDERSTAND THE DYNAMIC BEHAVIOR OF RACEWAY SYSTEMS AND ESTABLISH REALISTIC DAMPING CHARACTERISTICS, FREQUENCY RESPONSES, AND THE ACTUAL ELASTIC AND INELASTIC BEHAVIOR OF THE SYSTEMS.
- FURNISH DATA FOR DEFINING BETTER METHODS OF ANALYSIS FOR BOTH PRESENT AND FUTURE FACILITIES.
- DEMONSTRATE CIRCUITS REMAIN FUNCTIONAL EVEN WITH PLASTIC DEFORMATION OF RACEWAY SYSTEMS.
- DETERMINE CAPABILITIES OF INSTALLED SYSTEMS IN EXISTING FACILITIES TO RESIST EARTHQUAKE MOTIONS.

RACEWAY TEST PROGRAM (CONT)

METHOD

- STARTING WITH THE SIMPLEST DESIGN SUCH AS ONE USED FOR A FOSSIL POWER PLANT, TO UPGRADE THE SYSTEMS BY TESTING, UNTIL AN ACCEPTABLE AND STABLE LEVEL OF BEHAVIOR OF THE SYSTEM IS ACHIEVED.
- TO EXTENSIVELY TEST THESE SELECTED SYSTEMS TO GENERATE STATISTICAL DATA BASES.
- USE DATA BASES TO ESTABLISH ADEQUATELY CONSERVATIVE DESIGN CRITERIA AND PROCEDURES.

TEST PROGRAM TASKS

TASK A - FIXTURE DESIGN AND CONSTRUCTION

TASK B INITIAL - PRELIMINARY TESTING

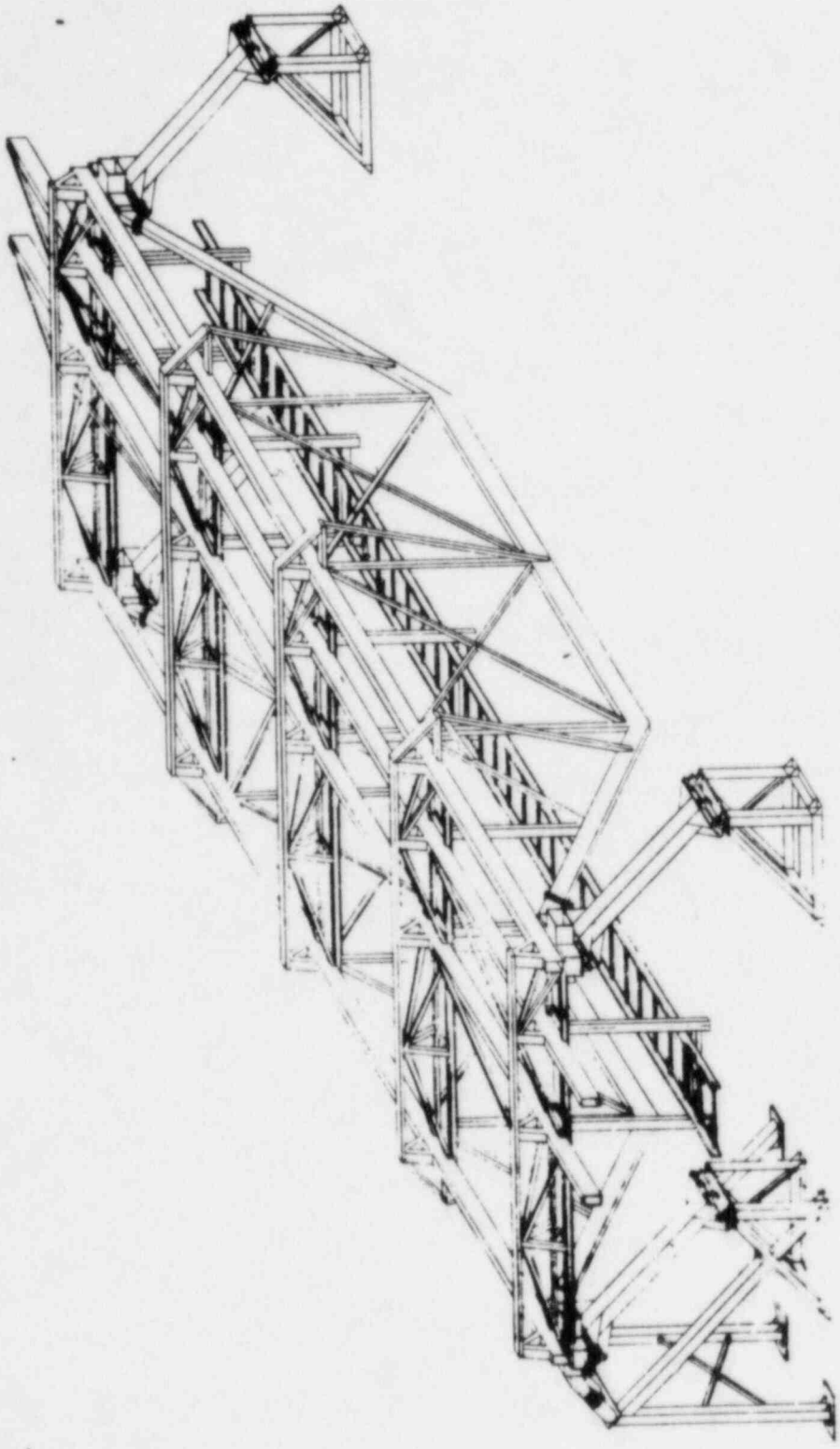
TASK B - CABLE TRAY RACEWAY SYSTEMS

TASK C - CONDUIT RACEWAY SYSTEMS

TASK D - COMBINED RACEWAY SYSTEMS

TASK E - FATIGUE LIFE OF CONNECTIONS

TASK F - CAPACITY OF CLAMPS



TASK B
CABLE TRAY RACEWAY SYSTEMS

PHASE I - TEST VARIOUS TRAY TYPES ON RIGID SUPPORTS

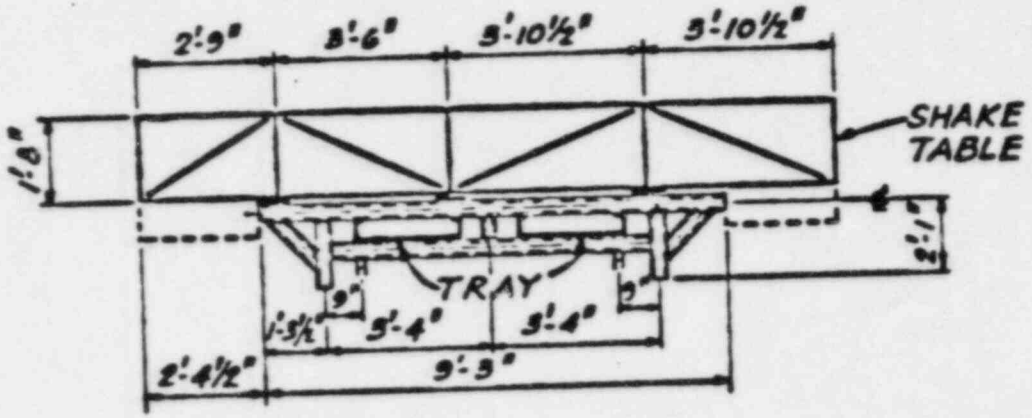
PHASE II - NON-DESTRUCTIVE TESTING OF VARIOUS UNBRACED TRAY SYSTEMS

PHASE III - TEST EFFECTS OF TRAY TYPE AND MANUFACTURER ON A SELECTED UNBRACED TRAY SYSTEM

PHASE IV - TEST EFFECTS OF STRUT CONNECTIONS ON A SELECTED UNBRACED TRAY SYSTEM

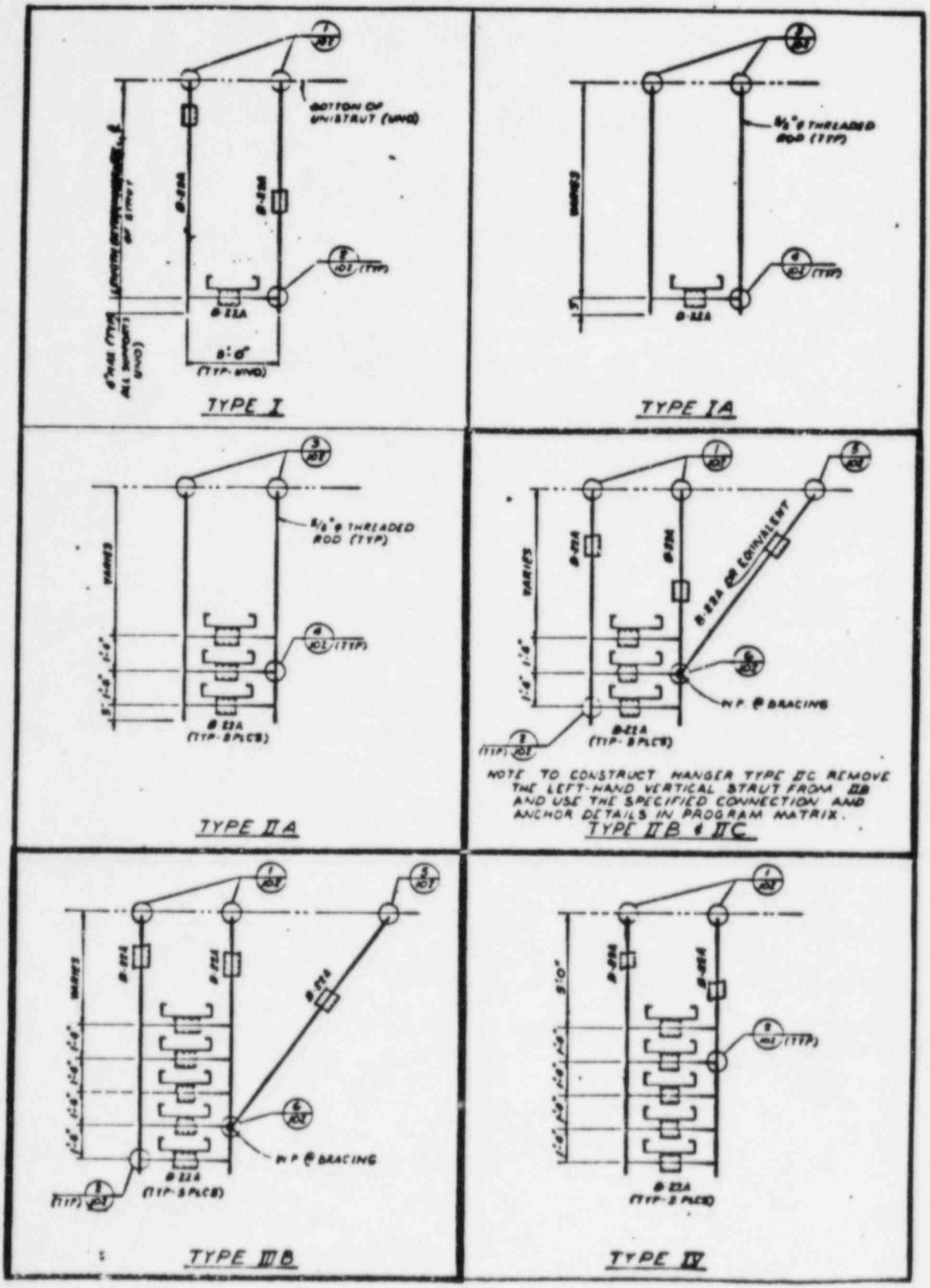
PHASE V - DESTRUCTIVE TESTING ON SELECTED UNBRACED AND BRACED TRAY SYSTEMS

PHASE VI - DESTRUCTIVE TESTING ON OPTIMIZED UNBRACED AND BRACED SYSTEMS

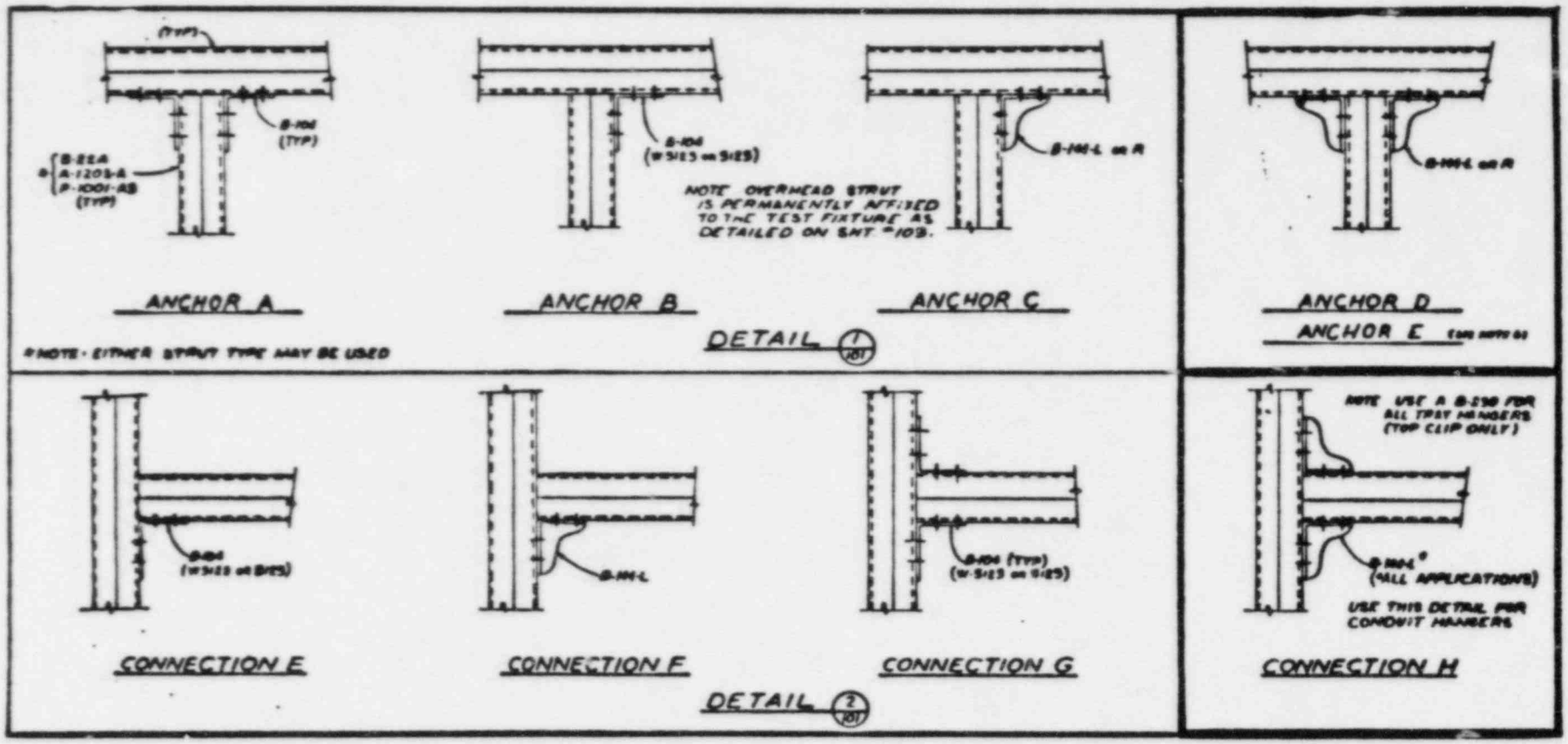


TEST SET-UP FOR RIGIDLY SUPPORTED TRAYS

(PHASE I)



TRAY SUPPORT TYPES TESTED



TRAY SUPPORT CONNECTIONS

TASK C
CONDUIT RACEWAY SYSTEMS

PHASE VII - TEST VARIOUS SIZED RIGID CONDUITS ON RIGID SUPPORTS

PHASE VIII - NON-DESTRUCTIVE TESTING OF RIGID CONDUITS SUPPORTED ON VARIOUS UNBRACED SUPPORT SYSTEMS

PHASE IX - DELETED

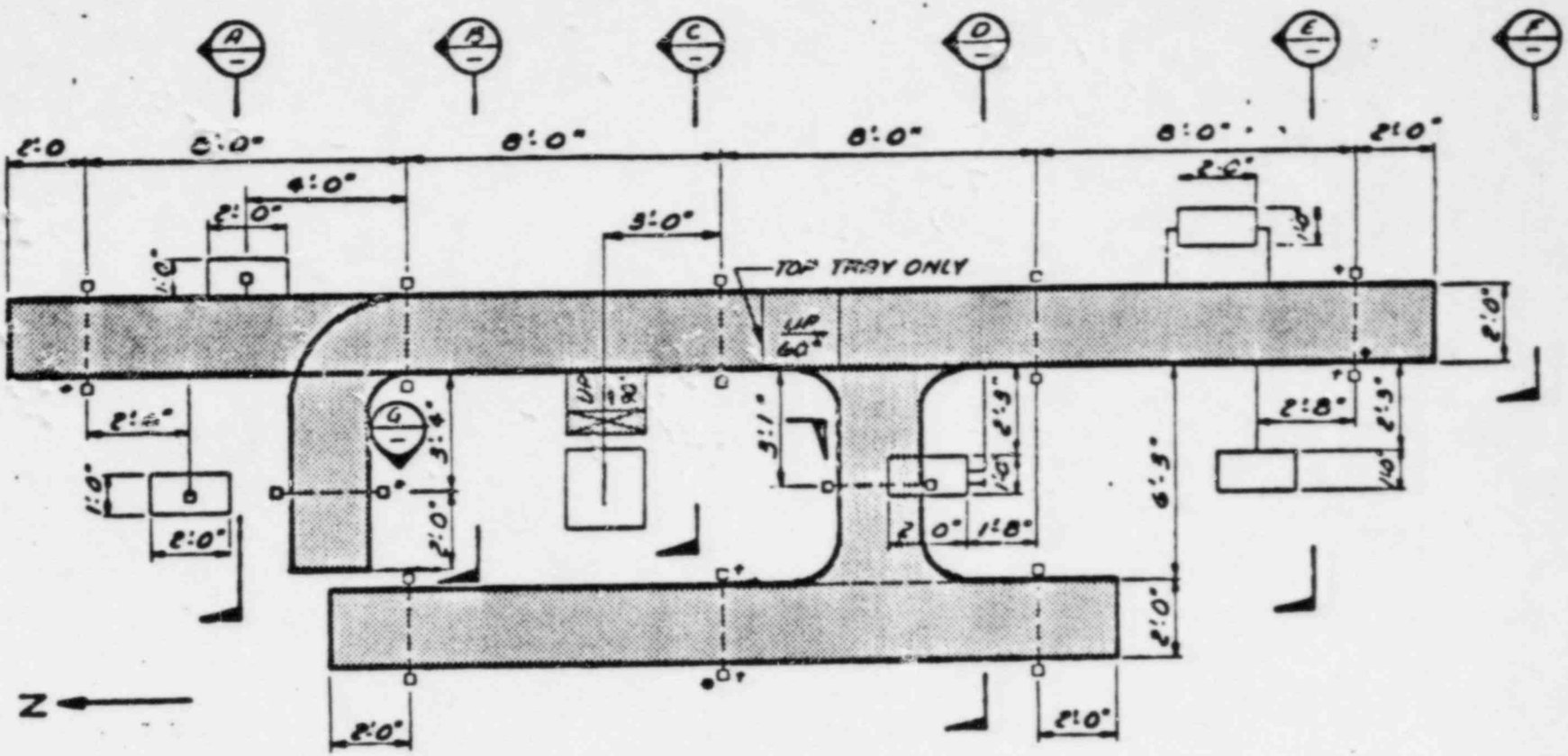
PHASE X - DESTRUCTIVE TESTS ON RIGID CONDUIT SUPPORT SYSTEMS WITH VARIOUS TYPES OF STRUT CONNECTIONS

PHASE XI - DELETED

TASK D
COMBINED RACEWAY SYSTEMS

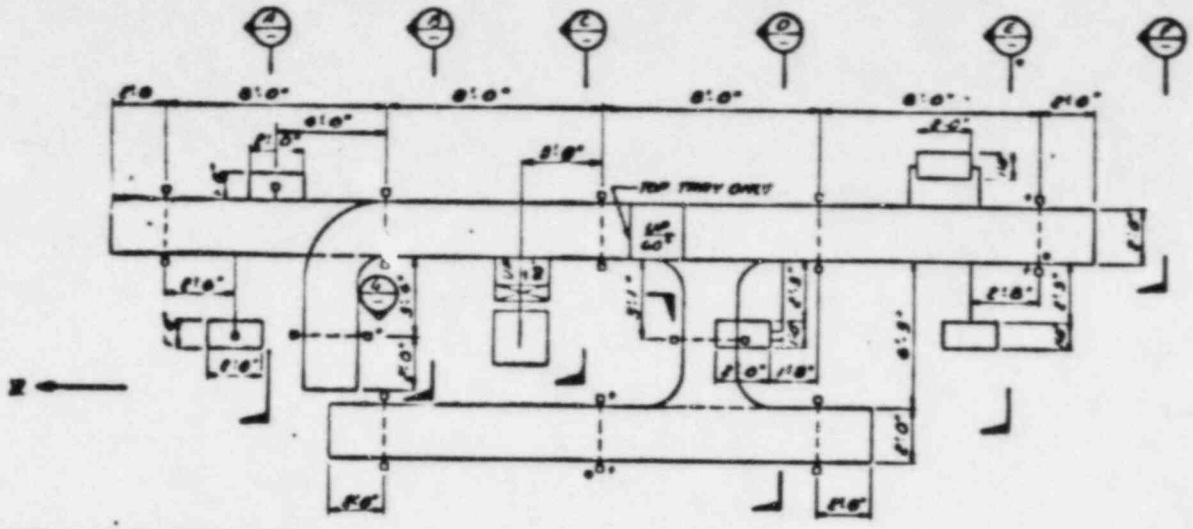
PHASE XII - COMBINED TRAY-CONDUIT RACEWAY SYSTEMS WITH STRUT-TYPE HANGERS

PHASE XIII - DELETED

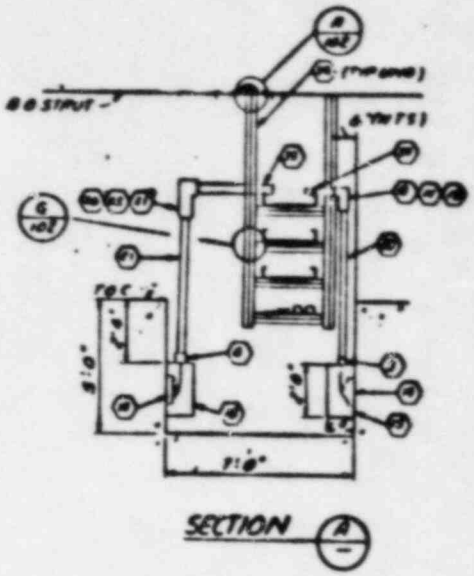


* LOCATION OF TRANSVERSE BRACE
† LOCATION OF LONGITUDINAL BRACE

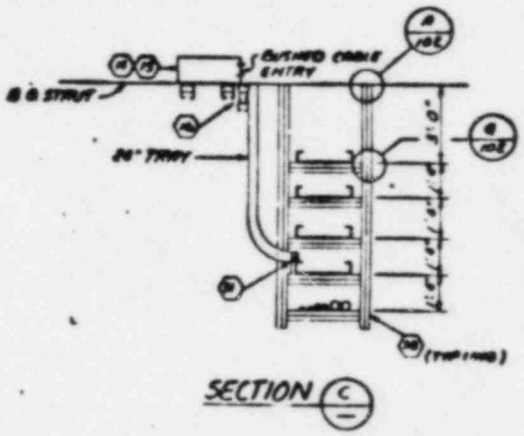
TESTED COMPOSITE RACEWAY LAYOUT — PLAN
(PHASE XII)



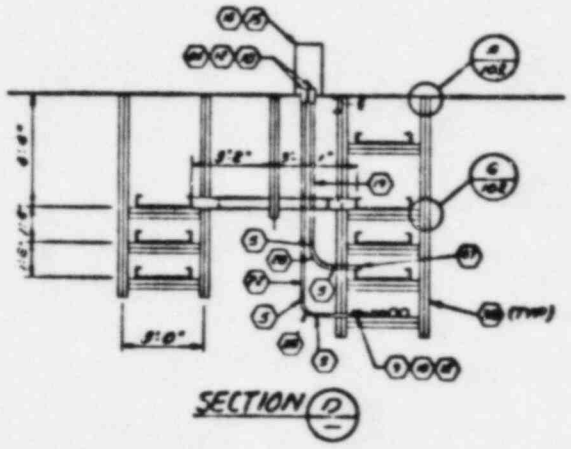
COMPOSITE RACEWAY SYSTEM



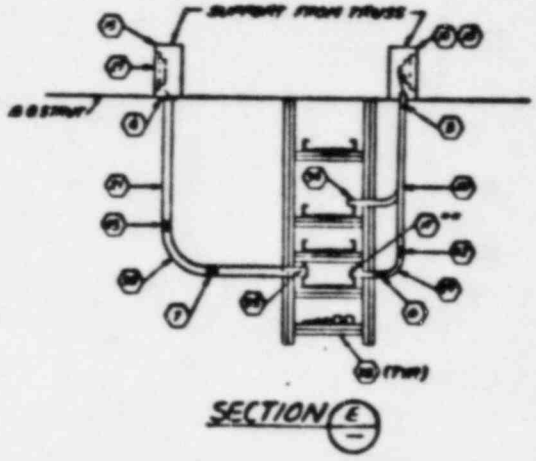
SECTION A



SECTION C



SECTION D



SECTION E

TESTED COMPOSITE RACEWAY LAYOUT — SECTIONS (PHASE XII)

TEST VARIABLES

- TRAY AND CONDUIT TYPES
- TRAY AND CONDUIT LOADING
- HANGER TYPES
- HANGER LENGTH
- HANGER CONNECTIONS
- NUMBER OF TRAYS
- NUMBER OF CONDUITS
- CONDUIT SIZES
- CONDUIT CLAMPS
- FITTINGS
- BRACING
- INPUT MOTION DIRECTION

CABLE TRAY

FIVE DIFFERENT TYPES OF CABLE TRAYS WERE SELECTED TO BE TESTED:

- LADDER TYPE MANUFACTURED BY B-LINE SYSTEMS INC.
- LADDER TYPE MANUFACTURED BY METAL PRODUCTS CORPORATION.
- PUNCH BOTTOM TYPE MANUFACTURED BY B-LINE SYSTEMS INC.
- TROUGH TYPE MANUFACTURED BY HUSKY-BURNDY
- ALUMINUM LADDER TYPE MANUFACTURED BY P-W INDUSTRIES

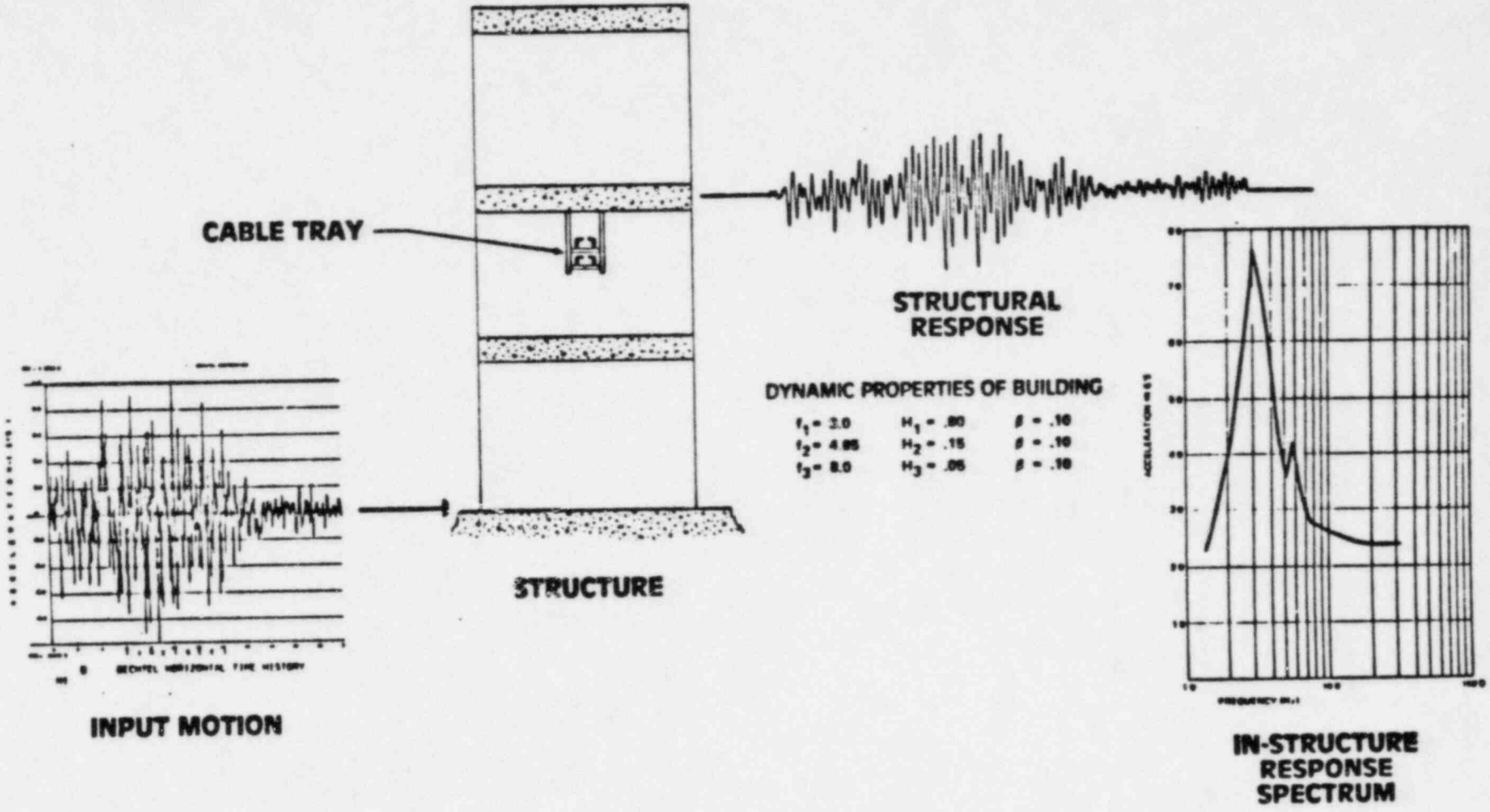
ALUMINUM GUTTER WIREWAY WITH COVER MANUFACTURED BY SUN METAL PRODUCT WAS ALSO TESTED.

TEST MOTION

SNAP BACK - FIXED SUPPORTS

HARMONIC MOTION

EARTHQUAKE MOTION


CABLE TRAY
STRUCTURAL RESPONSE
DYNAMIC PROPERTIES OF BUILDING
f_1 = 3.0 H_1 = .80 β = .10
f_2 = 4.95 H_2 = .15 β = .10
f_3 = 8.0 H_3 = .05 β = .10
STRUCTURE
INPUT MOTION
IN-STRUCTURE RESPONSE SPECTRUM

CABLE TRAY
TEST PROGRAM
MOVIE

SUMMARY OF CABLE TRAY TEST RESULTS

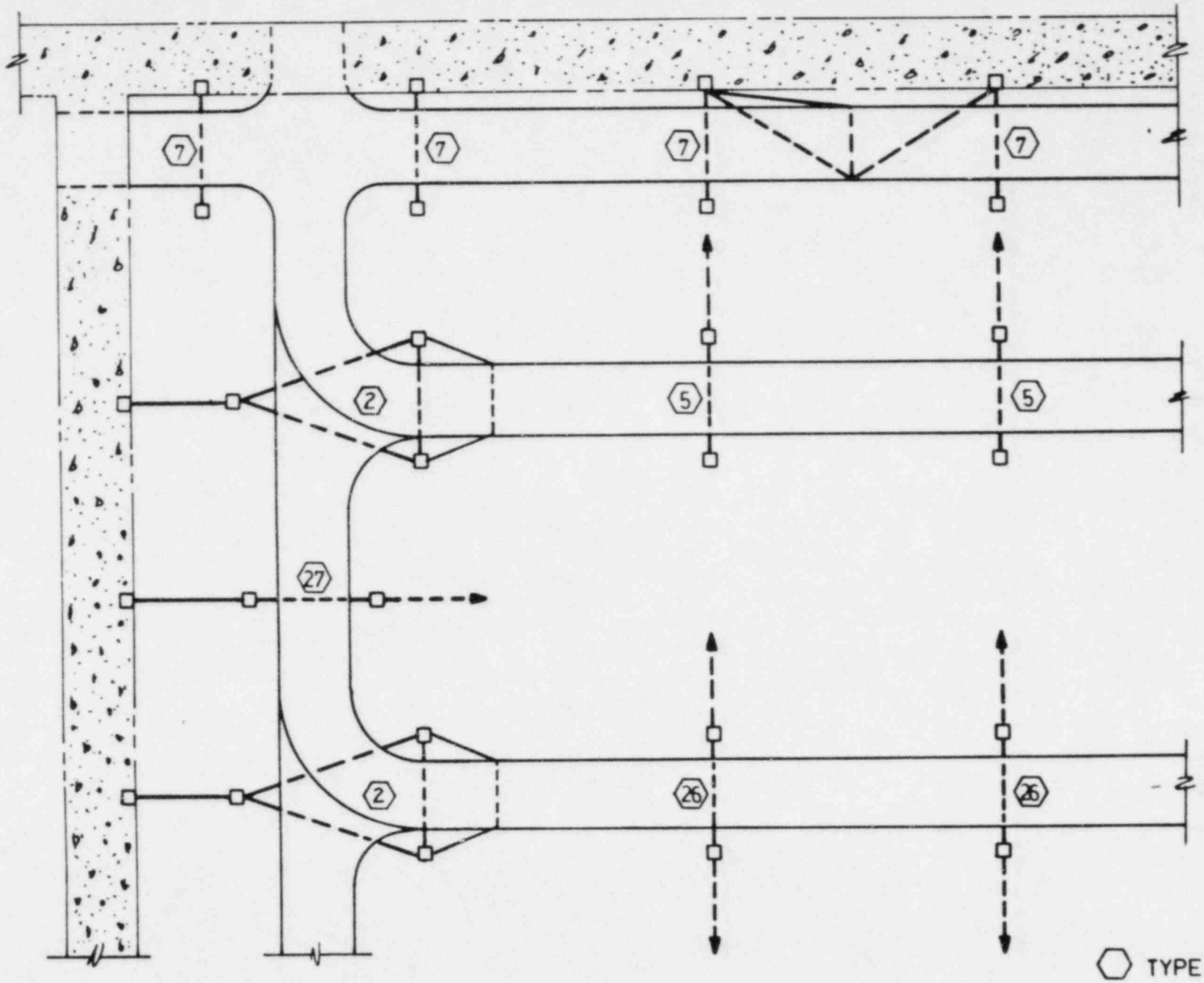
STRUT SUPPORTED TRAY SYSTEMS

- HIGH DAMPING WITH VALUES RANGING TO 50% OF CRITICAL FOR TRAYS WITH CABLE LOADING FROM 25 TO 50 LBS/FT. DAMPING REDUCES TO 7% OF CRITICAL WITH NO CABLE LOADING.
- DAMPING INCREASES WITH INCREASING FLOOR RESPONSE LEVEL.
- BRACING/RIGIDITY IS DESIRABLE BECAUSE IT INCREASES THE RESONANT FREQUENCY, DECREASES DEFLECTIONS AND INCREASES THE DAMPING IN THE SYSTEM.
- CABLES DO NOT APPEAR TO INFLUENCE OVERALL SYSTEM RESPONSE EXCEPT FOR DAMPING AND THEIR MASS.
- ALL STRUT SUPPORTED CABLE TRAYS TESTED SURVIVED WITHOUT DAMAGE. THESE SYSTEMS WERE TESTED AT INPUT LEVELS (ZPA VALUE) OF 1 TO 3 G'S TO THE SHAKE TABLE.

SEABROOK REVIEW:

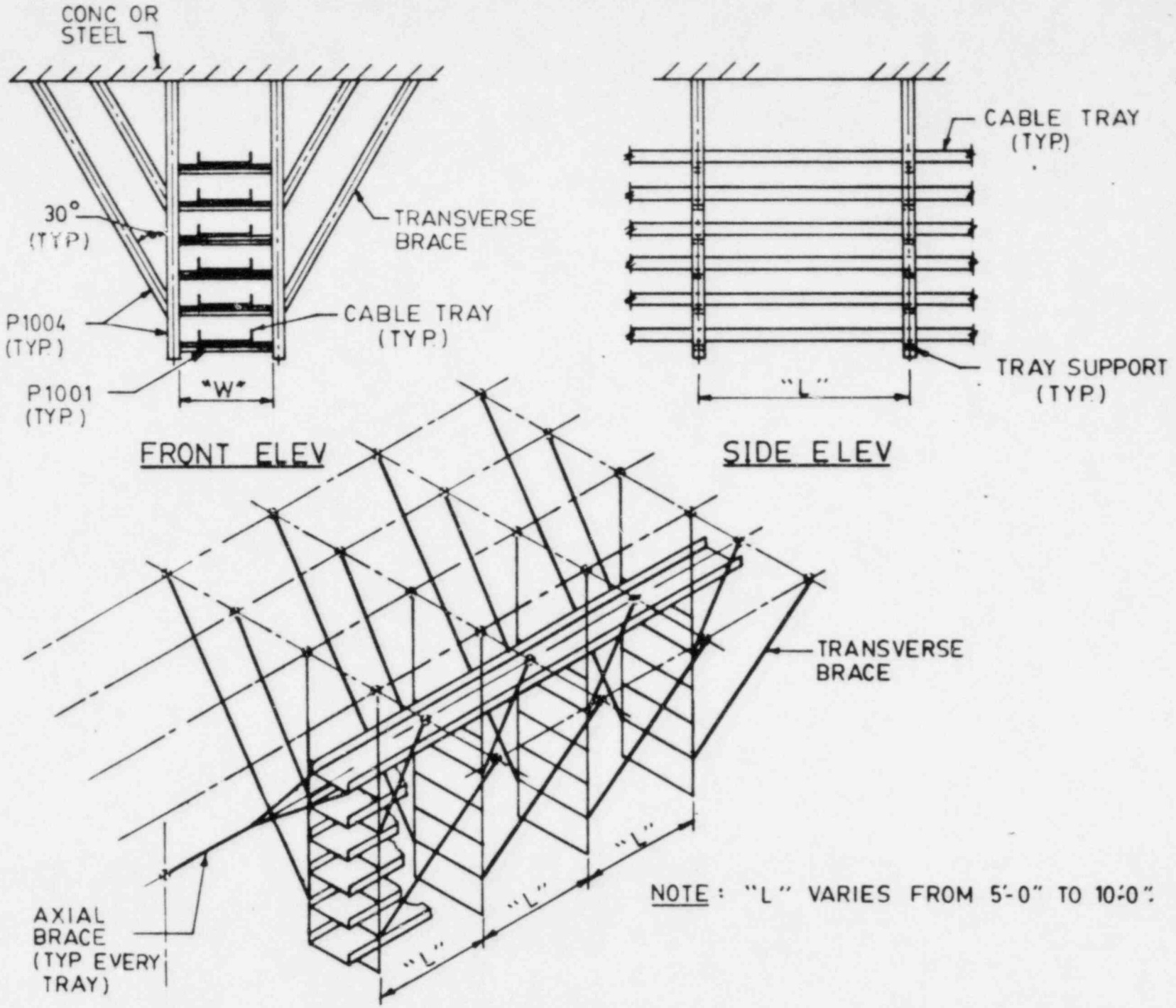
- DOCUMENTATION REVIEW
- CRITERIA REVIEW
- STANDARD DETAILS REVIEW
- PLANT WALKDOWN
- SYSTEM COMPATIBILITY WITH THE TEST PROGRAM

SEABROOK CABLE TRAY SUPPORT TYPES



PLAN

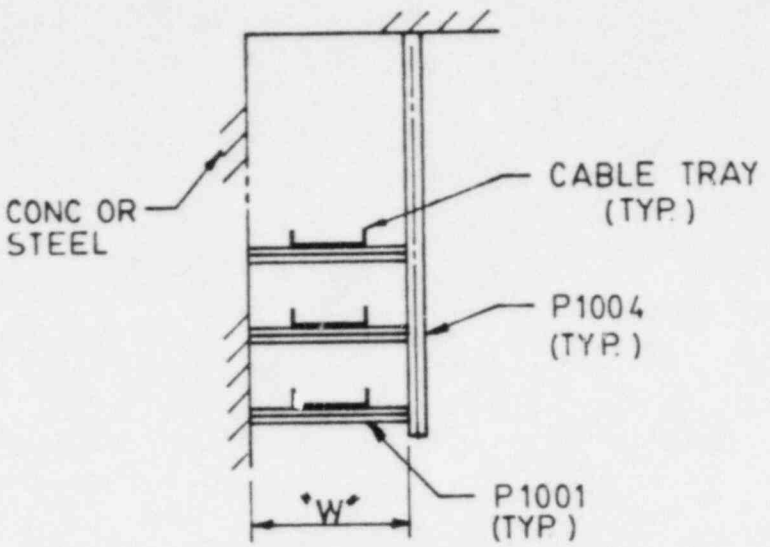
SEABROOK CABLE TRAY SUPPORT TYPES



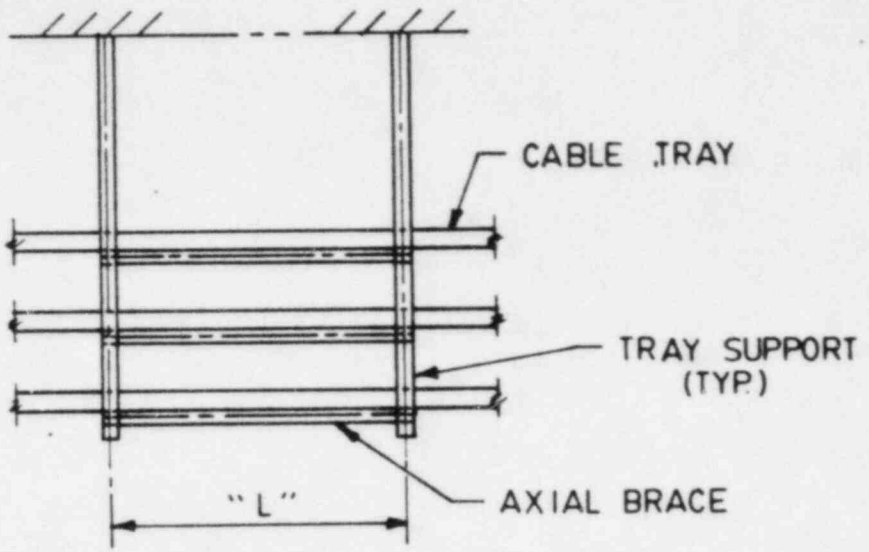
NOTE: "L" VARIES FROM 5'-0" TO 10'-0".

TYPICAL TRAPEZE-TYPE TRAY SUPPORT TYPE ⟨26⟩

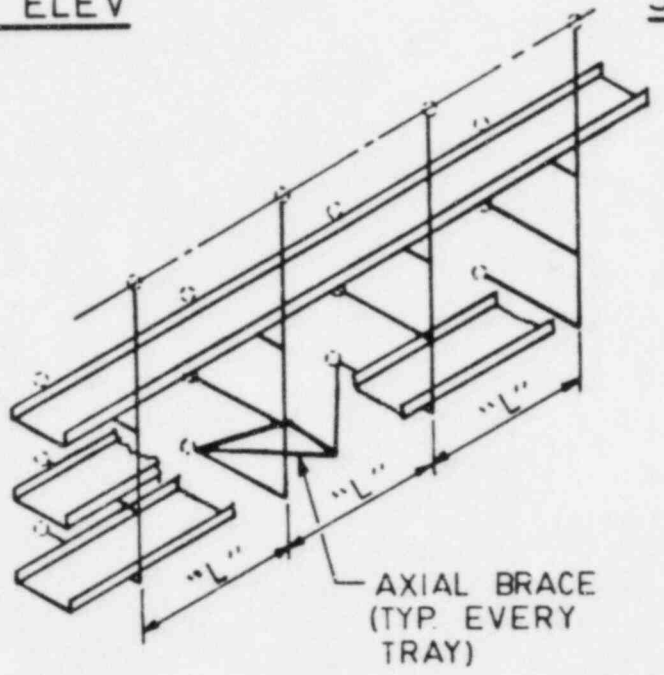
SEABROOK CABLE TRAY SUPPORT TYPES



FRONT ELEV



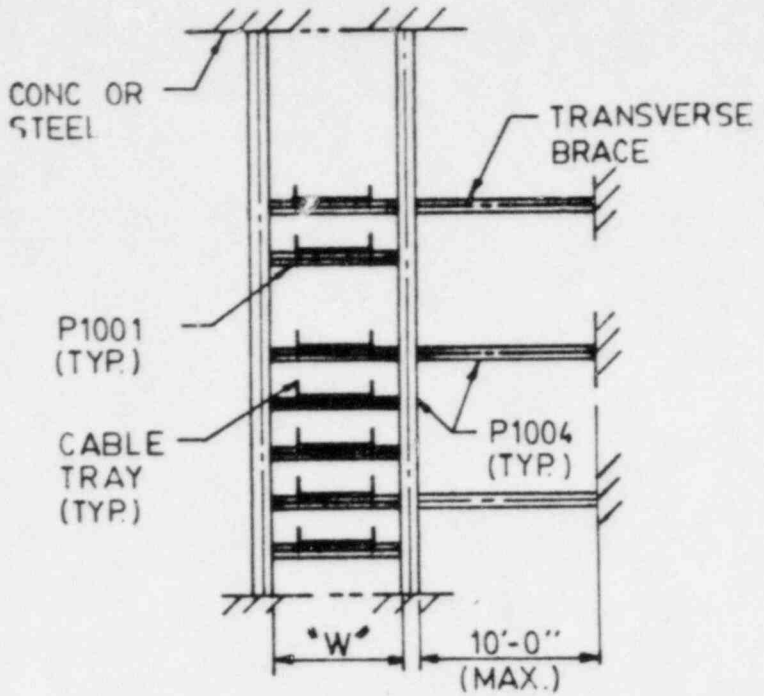
SIDE ELEV



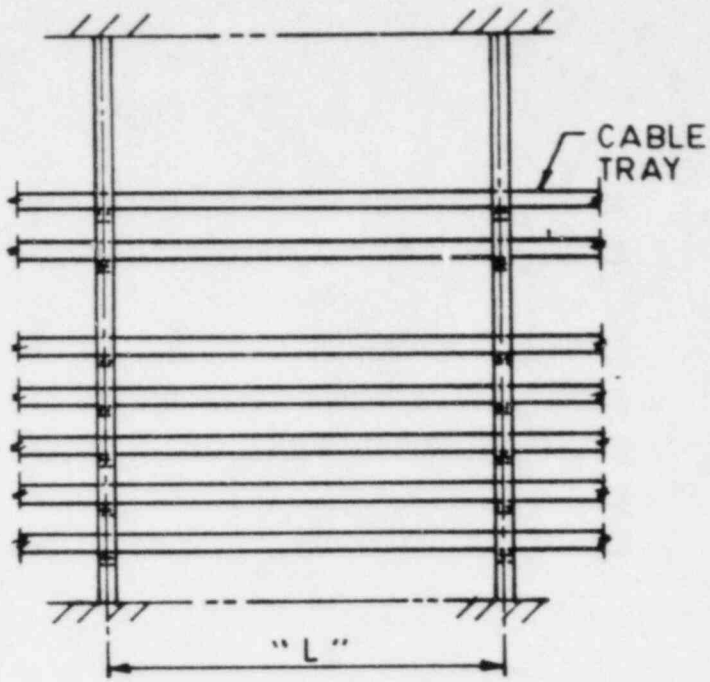
NOTE: "L" VARIES FROM 5'-0" TO 10'-0"

TYPICAL WALL BRACED TYPE TRAY SUPPORT TYPE 7 (ALSO 20)

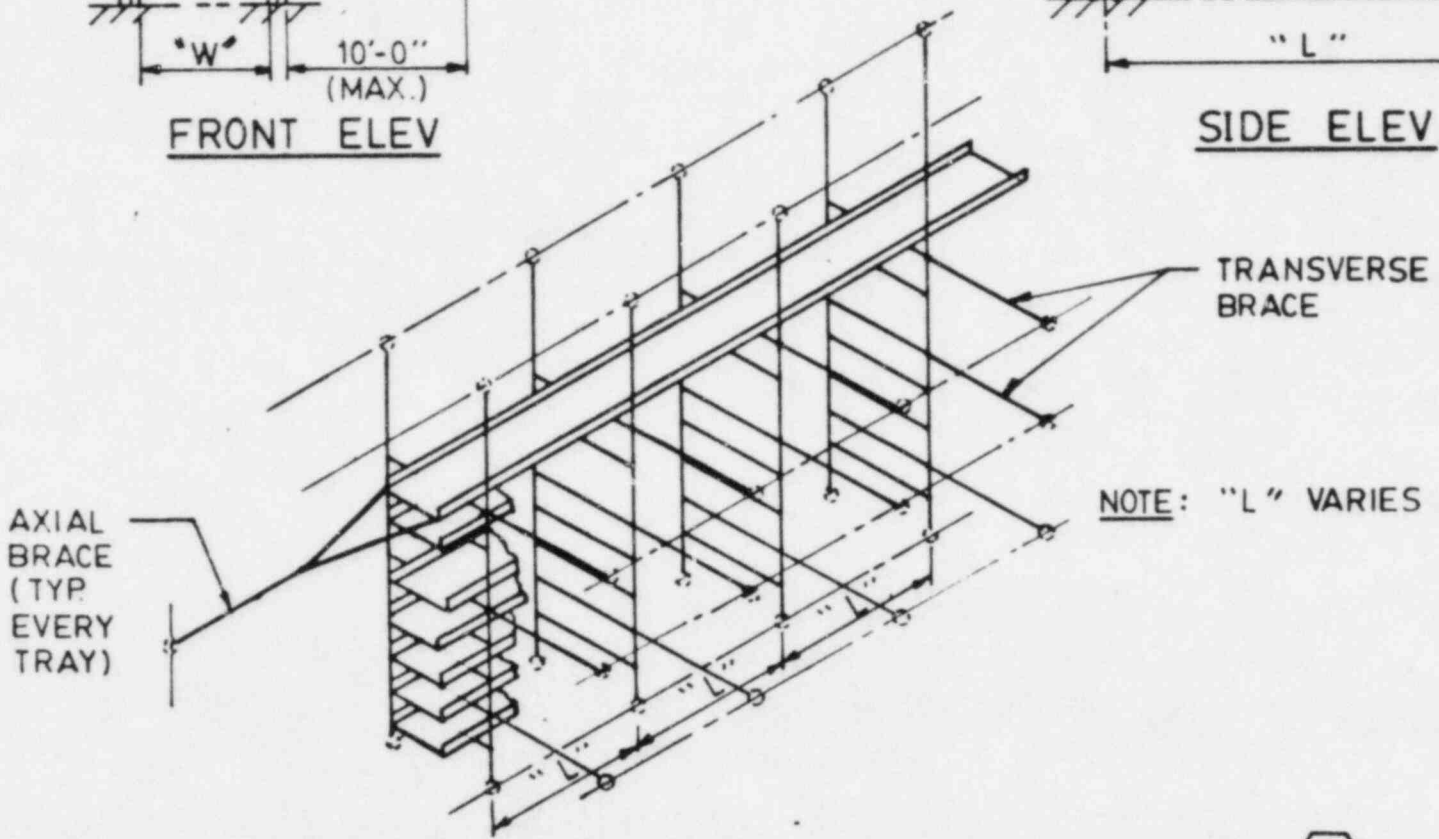
SEABROOK CABLE TRAY SUPPORT TYPES



FRONT ELEV



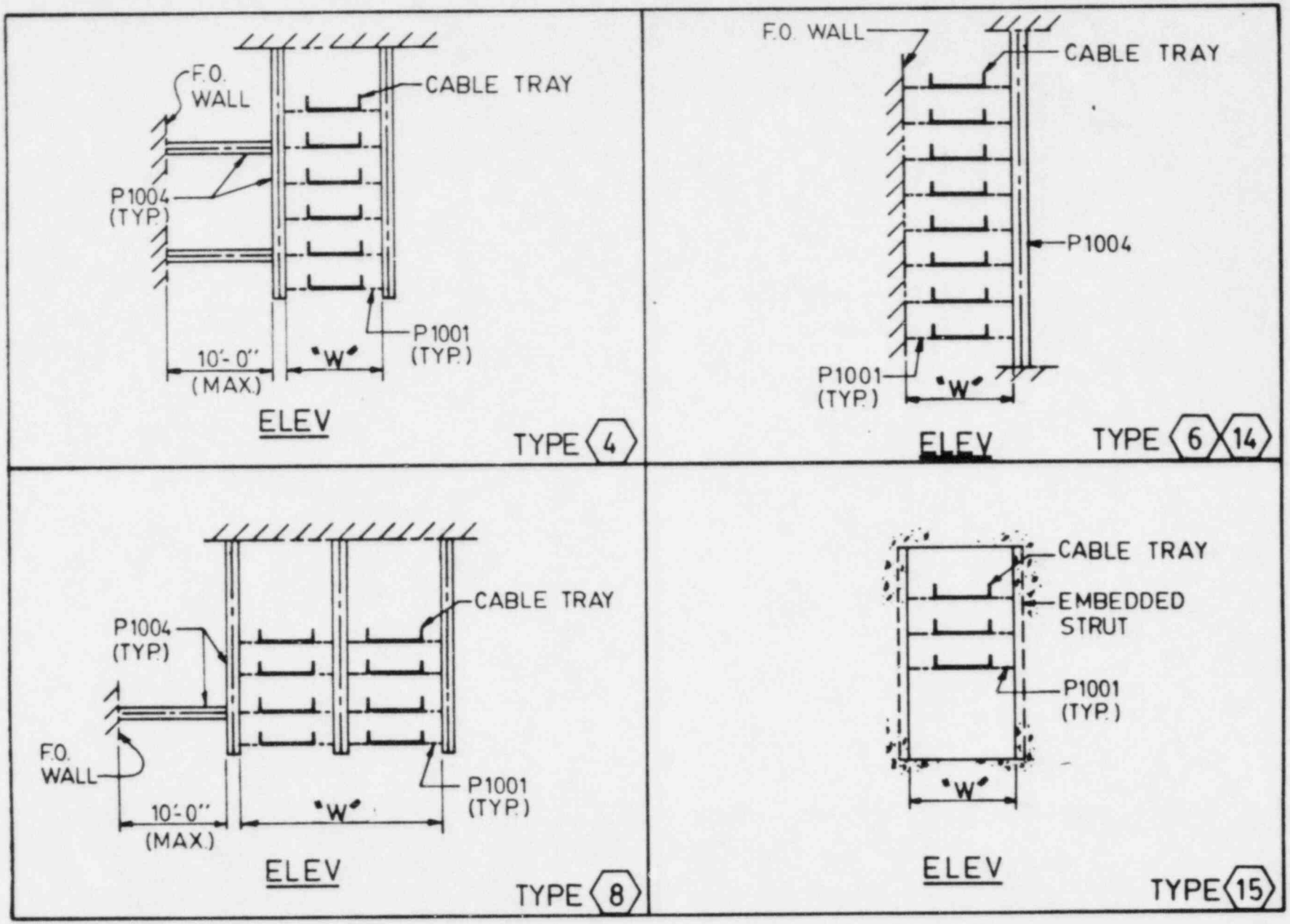
SIDE ELEV



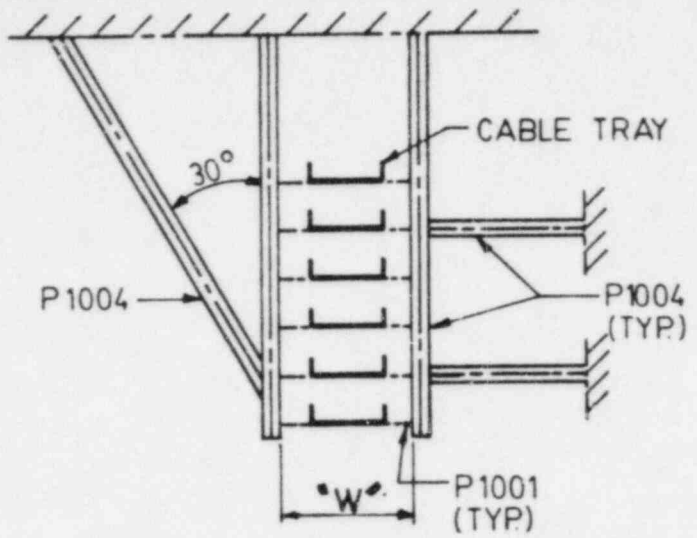
NOTE: "L" VARIES FROM 5'-0" TO 10'-0".

TYPICAL FLOOR TO CEILING TYPE TRAY SUPPORT TYPE ⟨5⟩

SEABROOK CABLE TRAY SUPPORT TYPES

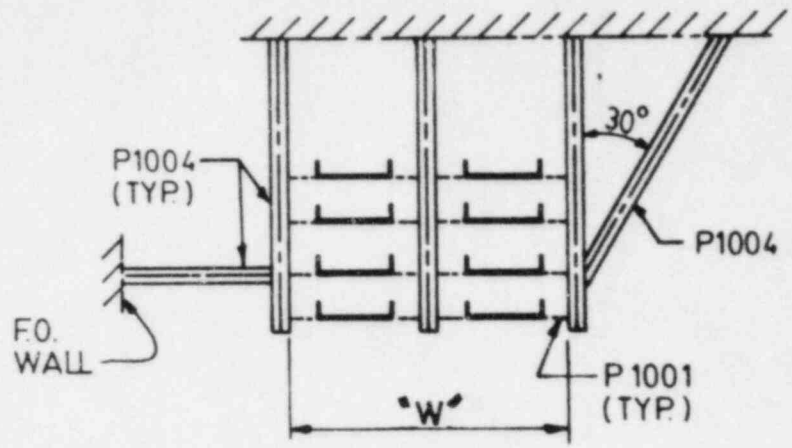


SEABROOK CABLE TRAY SUPPORT TYPES



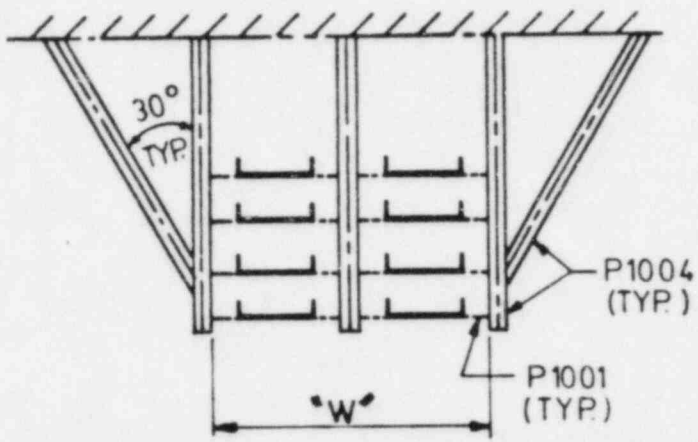
ELEV

TYPE 27



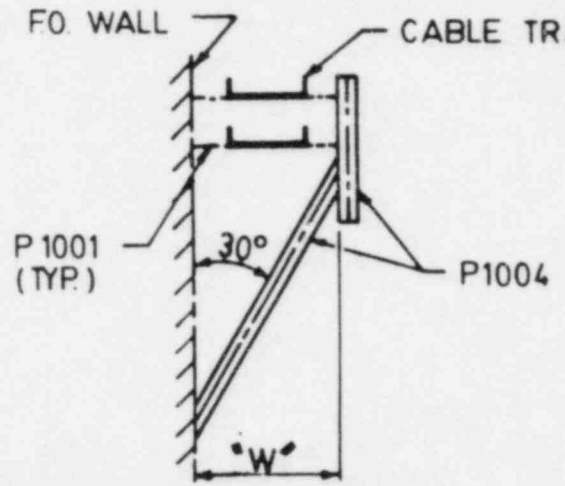
ELEV

TYPE 28



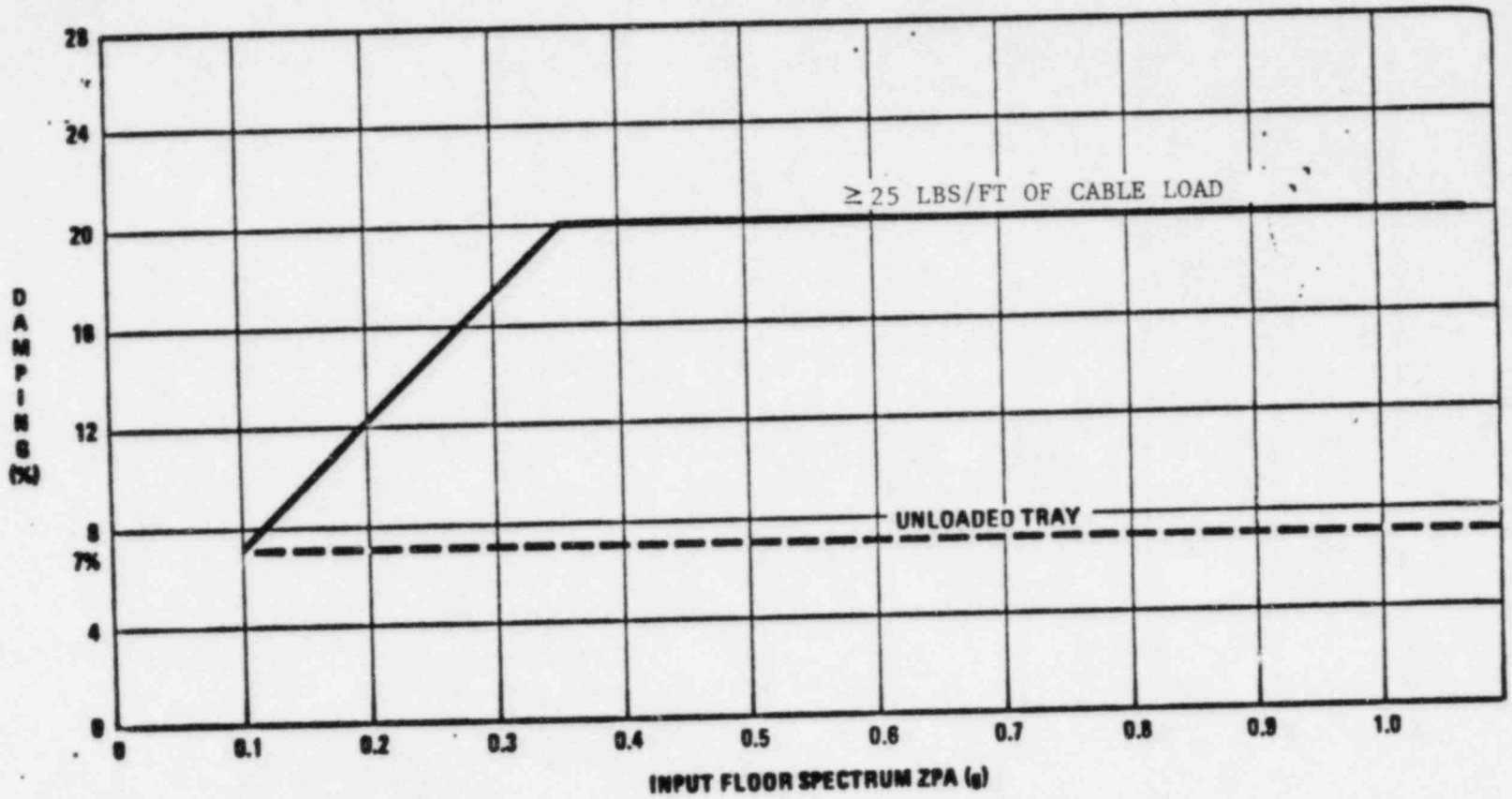
ELEV

TYPE 29



ELEV

TYPE 31



DAMPING AS A FUNCTION OF INPUT ZPA

IMPLEMENTATION OF 20% DAMPING AT THE SEABROOK STATION

DESIGN

- GUIDELINES HAVE BEEN DEVELOPED TO ESTABLISH THE SIGNIFICANT CONTROLLING PARAMETERS SUCH AS CONFIGURATION, TRAY MATERIALS, STRUT MATERIALS AND CONNECTION HARDWARE.

INSTALLATION

- DETAILED SUPPORT DRAWINGS FOR EACH SUPPORT WILL BE ISSUED TO CONSTRUCTION.
- ALL SUPPORTS WILL BE REINSPECTED TO THE DETAILED SUPPORT DRAWINGS.

APPLICATION

- USE OF THE 20% DAMPING WILL BE ON A CASE-BY-CASE BASIS.
- APPLICATION EXAMPLES:
  - RESOLUTION OF CONSTRUCTION FABRICATION PROBLEMS
  - SIMPLIFIED RESOLUTION OF INTERFERENCES WITH FIELD RUN COMPONENTS
  - OPTIMIZATION OF CONNECTION SIZES
  - OPTIMIZATION OF CONNECTION CHANGES

CONCLUSIONS

- DAMPING IS DEVELOPED BY CABLE MOTION.
- SEABROOK CABLE TRAY SUPPORTS ARE ESSENTIALLY RIGID.
- 20% DAMPING OPTIMIZES DESIGN.
- ENGINEERING/CONSTRUCTION SAVINGS CAN BE REALIZED WITHOUT DECREASING THE QUALITY AND SAFETY OF THE SYSTEM.
- IMMEDIATE IMPLEMENTATION IS REQUIRED TO REALIZE OPTIMAL BENEFIT.