MONTICELLO NUCLEAR GENERATING PLANT		3494	
TITLE:	CALCULATION/ANALYSIS CONTROL FORM	Revision 2	10/12/94
		Page 1 of 1	

Calculation/Analysis No.: CA-95-044

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Revision No.: 0

Title: Estimation of Cable Spreading Room Equipment Floor Loading

System: NA Topical Subject Area: S.2

Modification No.: NA Vendor Name/Calc No.: NA

Assigned Personnel (Names & Titles)

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Verification: DENNIS ZERCHER SR CIVIL ENGINEER

Verification:

☐ NA

References/Filing

File		Description/Location
	1.	
	2.	
	3.	
X	Calculation/Analysis file.	

Verification Method(s)

Review X Alternate Calculation ____ Test ____ Other ____

Explanation:

Completion (Signatures) ☐ NA Verification/Approval in Document

Prepared By: F. A. Villarreal, Ward D Andersen Date: 5-17-95

Verified By: Dennis Zercher Date: 5-19-95

Verified By: Date:

Approved By: John Grubb Date: 5/19/95

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PURPOSE

This calculation will estimate the current floor loading on the Cable Spreading Room (CSR) floor based upon current available documentation, field survey results and engineering judgment. This evaluation is performed in support of closure for LER 94-008 (Ref. 1).

METHODOLOGY

The current floor loading is estimated as follows:

1. Review current drawings for equipment loading on the floor (both top and bottom).

2. Review documentation for estimation of equipment weights. The most reasonably conservative cable tray weights will be assumed based upon actual cable tray weights and the mean cable tray weights based upon a 95% confidence level.

3. Survey room for confirmation of floor loading assumptions.

4. Draw conclusions based upon best information available.

Note: To ensure that all cable tray weights are properly considered, all cable tray weights will be conservatively increased by 5% for variations and unknowns.

ACCEPTANCE CRITERIA

No acceptance criteria applies to this calculation. This calculation supports the close-out of LER 94-008 (Ref. 1). Floor loading requirements and/or limitations are identified in other documentation, such as reference 2.

INPUTS

The following inputs apply to this calculation:

1. Drawings referenced in the Reference section of this calculation.

2. Cable tray weights based upon a query of the MNGP raceway tracking database. This database query is based upon the same methodology as described in reference 18. This query restricts its scope to those trays located in fire area VI as indicated by reference 22. The CSR is located in fire area VI. See results listed in Attachment 1.

3. Calculations referenced in the Reference section of this calculation.

4. Survey results conducted on 5-12-95 and 5-16-95 identified herein.

ASSUMPTIONS

1. Miscellaneous conduits do not impose a significant floor loading.

2. CSR panels have a weight density of 25 pcf per references 3, 4, 5 and 6.

3. Acoustic ceiling panels and other miscellaneous equipment (e.g. H&V ducting) hung from the underside of the CSR floor do not impose an effective load in excess of 5 psf. This assumption is based upon building material weights presented in reference 7 for acoustic ceiling panels (Refs. 8 and 9) (i.e. 1 psf) and the effective H&V ducting weight of 3 - 4 psf per references 9 and 10.

   However, in areas where acoustic ceiling panels are not present and relatively little equipment is suspended from the CSR floor system (e.g. the battery rooms), a lower uniform weight for suspended equipment of 3 psf is assumed.

4. No other live load exists on the CSR floor other than attached equipment (e.g. cable trays, conduits, panels, acoustic ceiling panels and miscellaneous equipment hung from the underside of this floor).

5. All cable trays are 2'-0" wide, unless noted otherwise.

6. The weight of a single empty cable tray (covered or uncovered) is 4.23 lbs/ft (Ref. 18).

7. All cable tray data reported within the raceway and cable tray database are correct.

ANALYSIS

The estimation of equipment (namely CSR panels and cable trays) loading is performed separately as follows. The conclusions drawn from these estimations follow the equipment load estimations.

CSR Panel Weights:

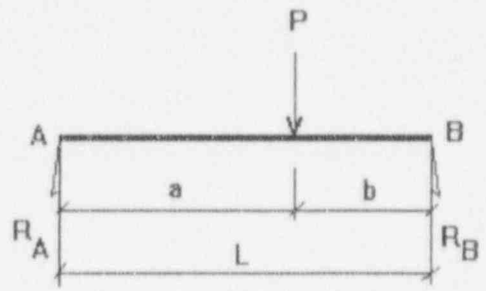
According to references 3, 4, 5 and 6, the CSR panel weights have been estimated to be 25 pcf. According to survey results, the panel heights are approximately 7'-6". It is noted that some panels are actually shorter than 7'-6". Therefore, based upon this height and assumed weight density, the floor loading immediately below the panels and within the area plan of these panels is:

(25 pcf)(7'-6") = 187.5 psf

According to reference 11, these panels are predominately located on the east end of the CSR. Using information supplied by reference 11, the effective floor area consumed by these panels between the south wall and column line L_e is:

beam span = L = 23'-1" (Ref. 2 pgs 42 and 43 for beams B6 - B10)

According to references 2, 11 and 12, the most heavily loaded beam on the east side of the CSR is located on column line M_a. According to references 2 and 12, the tributary width for this beam is 8'-0". According to references 11 and 12, the partial weights of the panels (i.e. C33, C39, C18, C42 and C305, or C28, C30 and C289A) are distributed to this beam. Therefore, considering the width of these panels is 2'-6" and the panel loads are distributed via the floor slab, the effective uniform panel load from the slab is calculated as follows:

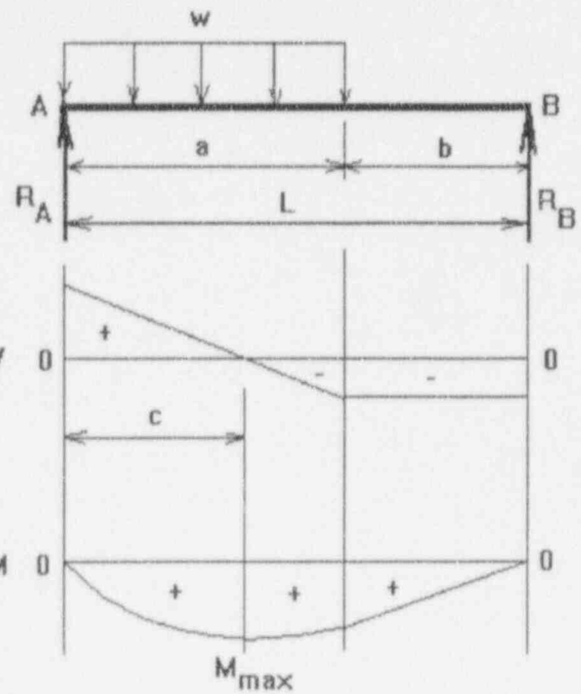


According to references 11 and 21, the panel loads (idealized as a point load on a simply supported beam) are located 5'-6 ½" north of column line M_a and 2'-11 ½" south of column line M_a. Therefore, assuming equal loading due to each set of panels (i.e. essentially the same panel widths), the imposed load on the beam, w_{beam}, on column line M_a is,

$$w_{beam} = w_{panel}\left\{\left[1-\left(\frac{5'-6\frac{1}{2}"}{8'-0"}\right)\right]+\left[1-\left(\frac{2'-11\frac{1}{2}"}{8'-0"}\right)\right]\right\} = 0.937 w_{panel}$$

Since the effective loading on the beam is a function of the ratio of the panel width (i.e. 2'-6") to the tributary width of the beam (i.e. 8'-0"), the effective loading on this beam is,

$$w_{beam} = \frac{0.937(2'-6")(187.5\ psf)}{8'-0"} = 55\ psf$$



Summing moments about point A, the reaction R_B is,

$$\sum M_A = 0$$

$$\frac{wa^2}{2} - R_B L = 0$$

$$R_B = \frac{wa^2}{2L}$$

Summing forces in the vertical direction,

$$\sum F_\uparrow = 0$$

$$R_A = wa\left(1 - \frac{a}{2L}\right)$$

Determine the maximum moment:

$$c = \left(\frac{R_A}{R_A + R_B}\right)a = \frac{a(2L - a)}{2L}$$

$$M_{\max} = \frac{R_A\, c}{2} = \frac{wa^2(a - 2L)^2}{8L^2}$$

Consider an equivalently loaded simply supported beam with a uniformly distributed load which produces the same bending moment on the beam as the above load configuration. This equivalent uniformly distributed load, w_{eq}, is:

$$M_{\max} = \frac{w_{eq} L^2}{8} = \frac{wa^2(a-2L)^2}{8L^2}$$

$$w_{eq} = \frac{wa^2(a-2L)^2}{L^4}$$

From reference 11, assume b = 8'-0". Then for L = 23'-1", a = 15'-1" and,

$w_{eq} = 0.77w = 0.77(55 \text{ psf}) = 42 \text{ psf}$

Then assuming a suspended uniform load of 3 psf, the effective uniform equipment loading on the floor is approximately 45 psf.

This approximated maximum effective equipment loading on a single floor beam is very conservative based upon the following observations:

- Concrete block walls forming the battery rooms below the CSR are grouted completely to the CSR floor deck. These walls are sealed in order to support Appendix R and fire protection requirements. The wall configurations were confirmed by field survey.

- Although much of the panel weights may have been installed prior to the erection of the block walls, the block walls will provide additional vertical support for the floor system during differential pressure loadings such as a Halon system actuation or a postulated, non-design basis tornado event (see references 1 and 2 for more information).

- By inspection of references 9 and 21, these walls will provide a significant support mechanism for the floor deck. Therefore, a majority of the floor loading due to differential pressures on the floor deck is directly picked up by the concrete block walls below the floor deck. This mechanism was conservatively ignored in the evaluation of the floor system as documented in reference 2.

Therefore, based upon the actual panel distribution on the floor and the actual support system for the CSR floor deck, this overly conservative value of 45 psf actually represents a maximum live load of approximately 1/3 of the design live load of 100 psf for this floor (Ref. 13 Section 12.2.1.5). Therefore, it is reasonable to expect the maximum floor loading due to panels and suspended equipment,

considering the actual support system for the floor deck system, not to exceed approximately 33 psf.

CSR Cable Tray Weights:

CSR cable tray weights will be determined by two independent methods. The first method will be to examine the maximum anticipated loading based upon the maximum number of stacked cable trays. The second method will be to estimate the maximum cable tray loading based upon a mean cable tray weight with an associated 95% confidence level. The use of both methods should ensure that a bounding load case is developed for the existing as well as for future load conditions.

An additional 5% increase in cable tray weights will be applied for consideration for variations and unknowns.

Method No. 1:

According to field survey results and references 15, 16 and 17, the following stack of cable trays appear to be the bounding floor load conditions. This assumption is based upon the number of stacked cable trays as well as its location (i.e. near the center of a beam span).

HP402A
CJ502
GK404
MK402
EM305A
EM305C
EM305B

In addition, the following cable trays are attached to either the support stands for the above cable tray or are attached to the stack itself:

HP402B
1PA317
1PA318
1PA319
2PA406
2PA407

According to references 19 and 20, the weights of these cable trays are as follows. However, note that some of the values for multiply designated cable trays have lower than reported values than shown in references 19 and 20. This is due to the potential for double accounting for cable tray

self-weight. In addition, the vertical cable trays are distributed over a distance of approximately 8 ft. Therefore, the weight of the vertical trays will be converted into an equivalent distributed weight.

Cable Tray No.	Tray Weight	
	(lbs/ft)	(psf)
HP402A	30.9	15.5
CJ502	42.11	21.1
GK404	5.32	2.7
MK402	9.835	4.9
EM305A	24.075	12.0
EM305C	24.075 + 3.09 = 27.165	13.6
EM305B	24.075 + 0.12 = 24.195	12.1
HP402B	30.9 + 0.385 = 31.285	15.6
1PA317	(7')(5.305 lb/ft)/(8') = 4.642	2.3
1PA318	(7')(4.875 lb/ft)/(8') = 4.266	2.1
1PA319	(4')(4.23 lb/ft)/(8') = 2.115	1.1
2PA406	(7')(4.35 lb/ft)/(8') = 3.806	1.9
2PA407	(7'0(4.23 lb/ft)/(8') = 3.701	1.9
	Total:	106.8

Note: The weight of the vertical trays may not be accurate. However, considering the assumptions in method no. 2 below regarding this vertical cable trays, the errors in these weights has no net impact on the overall conclusion of this calculation. Therefore, the above values are acceptable for discussion purposes.

According to this method, the actual weight of the stack of cable trays is 106.8 psf directly below the stack of trays. Increasing this value by 5% yields an adjusted actual weight of 112.1 psf.

Method No. 2:

This method will employ standard statistical methods based upon the assumption that cable tray weights have a normal distribution. Then considering all cable trays located within the CSR, the mean weight and the standard deviation are: (Ref. 20)

$$\text{mean weight} = \overline{w} = 0.637 \text{ lbs/ft/1\% fill}$$
$$\text{average fill} = 23.302\%$$
$$\text{standard deviation} = \sigma = 0.367 \text{ lbs/ft/1\% fill}$$

To account for variations in tray fill, an additional 5% will be added to the average fill. Then the adjusted average fill is (1.05)(23.302%) = 24.5%.

$\overline{w}$ = (0.637 lbs/ft)(24.5) = 15.6 lbs/ft
σ = (0.367 lbs/ft)(24.5) = 9.0 lbs/ft

Using reference 14 Table 1.5 (page 1-24), for a 95% confidence level (single tailed), the average weight of a single cable tray is expected to be:

0.95 - 0.5 = 0.45
z = 1.645
$w_{95} = \overline{w} + z\sigma + 4.23$ lbs/ft = 34.6 lbs/ft, or
w_{95} = (34.6 lbs/ft)/(2 ft) = 17.3 psf

Considering multiple cable tray stacks, the weight of a single cable tray within a multiple cable tray stack is:

No. of Trays (N)	Mean Weight, $\overline{w}$ (lbs/ft)	Standard Deviation, $z\sigma$ (lbs/ft)	$\frac{z\sigma}{\sqrt{N}}$ (lbs/ft)	Self Weight (lbs/ft)	w_{95} (lbs/ft)	Total Weight $w_{95}N$ (lbs/ft)	(psf)
1	15.6	14.8	14.8	4.23	34.6	34.6	17.3
2	15.6	14.8	10.5	4.23	30.3	60.6	30.3
3	15.6	14.8	8.5	4.23	28.3	84.9	42.5
4	15.6	14.8	7.4	4.23	27.2	108.8	54.4
5	15.6	14.8	6.6	4.23	26.4	132.0	66.0
6	15.6	14.8	6.0	4.23	25.8	154.8	77.4
7	15.6	14.8	5.6	4.23	25.4	177.8	88.9
8	15.6	14.8	5.2	4.23	25.0	200.0	100.0
9	15.6	14.8	4.9	4.23	24.7	222.3	111.2
10	15.6	14.8	4.7	4.23	24.5	245.0	122.5
11	15.6	14.8	4.5	4.23	24.3	267.3	133.7
12	15.6	14.8	4.3	4.23	24.1	289.2	144.6
13	15.6	14.8	4.1	4.23	23.9	310.7	155.4

The above calculation applies to the horizontally mounted cable trays. However, in order to consider the 5 vertical cable trays, the sum of the statistical weights of the horizontal and vertical weights are calculated as follows:

$$w_H = \frac{(155.4\ psf)(13-5)}{13} = 95.6\ psf$$

$$w_V = \frac{(155.4\ psf)(5)(7')}{(13)(8')} = 52.3\ psf$$

$w_{TOT} = w_H + w_V$ = 147.9 psf

It should be noted that this total weight is very conservative. Considering that w_H is approximately the same weight as for an 8 cable tray stack at 100 psf, this value is reasonable for this analysis. However, considering that these vertical cable trays have very low fill ratios (verified by the field surveys), w_V is overly conservative by perhaps a factor of 2. As such, the total weight is actually approximately 25 psf less than the above statistically calculated weight. This is a conservatism which will not be explicitly considered in the following calculations.

According to this table, the statistical weight of a seven cable tray stack is 147.9 psf directly below the stack. Since the actual stack weight of 112.1 psf is bounded by the statistical weight of 147.9 psf, the statistical cable tray weight will be used.

Examining the floor space used to support cable trays and cable tray stacks, the effective weight on the floor due to this cable tray stack is calculated as follows:

According to reference 16, the centerline of the cable tray stack is located 13'-1" east of column line 8.97. According to reference 21, the center of the cable tray stack is located (24'-11") - (13'-1") = 11'-10" west of column line 10.1. Since this stack is not located at the center of the floor beam, assume an equivalent point load, P, on the span. The maximum bending moment for a simply supported beam loaded at any point of the beam is:

$$M = \frac{Pab}{L}$$

The equivalent uniform load, w_{eq}, on a simply supported beam which yields the same maximum bending moment is:

$$M = \frac{w_{eq}L^2}{8} = \frac{Pab}{L}$$

$$w_{eq} = \frac{8Pab}{L^3}$$

Then for a beam span length of 20'-3" (Ref. 2, pages 42 and 43 for beam nos. B3 and B4), the equivalent floor loading due to the cable trays is:

w_{eq} = 28 psf (conservative)

where:

L = 20'-3"

$$P = (147.9 \text{ psf})(2 \text{ ft}) = 295.8 \text{ lbs/ft}$$
$$a = 11'\text{-}10''$$
$$b = L - a = 8'\text{-}5''$$

Adding in the weight of suspended equipment (e.g. ceiling panels, etc.), the effective equipment loading on this floor due to cable trays is approximately 33 psf. Since the panels located on the floor area west of column line 10.1 are relatively light and are located relatively near the beam end (verified by field surveys), and the vertical cable tray weights were conservatively assumed, a full evaluation of the impact on the effective floor loading due to these panels is not warranted.

Therefore, considering the assumptions of suspended floor loading and vertical cable tray widths, this effective floor loading value of 33 psf is approximately $\frac{1}{3}$ of the design live load of 100 psf for the CSR floor per USAR (Ref. 13) Section 12.2.1.5.

CONCLUSIONS

This calculation approximates the maximum effective equipment loading on the CSR floor system to be approximately $\frac{1}{3}$ of the design live load of 100 psf per USAR Section 12.2.1.5. The resultant maximum effective equipment loading for a simply supported composite beam floor system is approximately 33 psf. This value considers the supporting mechanism of the concrete block walls below the floor system not considered in reference 2.

FUTURE NEEDS

Future modifications which 1) significantly alters the weight distribution of equipment in the CSR, 2) removes or significantly modifies the concrete block walls forming the battery rooms below the CSR, or 3) adds a significant new load to the CSR floor system should consider the impact on the conclusions drawn in this calculation as well as other calculations supporting LER 94-008 (Ref. 1) (e.g. reference 2). The addition of a few miscellaneous cables or conduits to the CSR will not significantly impact the conclusions of this calculation.

ATTACHMENTS

Attachment No. 1 - Reference 19 (14 pages)
Attachment No. 2 - Reference 20 (2 pages)
Attachment No. 3 - Form No. 3495 - Calculation/Analysis Verification Checklist (1 page)

REFERENCES

1. MNGP LER 94-008, "Structural Beam Connections Associated With the Cable Spreading Room Floor Found to be Different Than Design", rev. 1

2. NSP Calculation No. CA-94-033, "Qualification of Cable Spreading Room Floor for Tornado Loading", rev. 0

3. URS/John A. Blume and Associates, Engineers Calculation No. 8158-C-A, "Determination of Equipment Weights by Measurement, Calculation and Similarity", rev. 0, ISEQ # GOH00127

4. URS/John A. Blume and Associates, Engineers Calculation No. 8158-C-G03, "Evaluation of Existing Anchorage for Cabinets in the Cable Spreading Room, NSP Cabinet Numbers C18, C27, C28, C30, C32, C33, C38, C39, C41, and C42; Blume Item Numbers: 10, 12, 13, 14, 15, 16, 19, 20, 21 and 22, respectively", rev. 0, ISEQ # GOH00007

5. URS/John A. Blume and Associates, Engineers Calculation No. 8158-C-G52, "Evaluation of Existing Anchorages of the Prompt Relief VB-Cabinet, Cabinet 1 north of Blume Item 010, Cabinets C-47, C-48, and C-19; Blume Item Numbers 113, 114, 122, 123 and 120, respectively", rev. 0, ISEQ # GOH00053

6. URS/John A. Blume and Associates, Engineers Calculation No. 8158-C-012, "Remedial Strengthening of Anchorage for the Following Cabinets in the Cable Spreading Room: C27, C28, C30, C32, C33, Prompt Relief VB Cabinet, Cabinet #1 North of C-18, C-19, C47, C48; Corresponding Blume Item No's 012, 013, 014, 015, 016, 113, 114, 120, 122, 123", rev. 0, ISEQ # GOH00064

7. "Manual of Steel Construction", AISC, 6th edition

8. NSP Drawing No. NF-36329 (C-32), "Reflected Acoustic Ceiling Plans", rev. C

9. NSP Drawing No. NF-36310 (C-13), "Office and Control Building Floor Plans", rev. S

10. NSP Drawing No. NF-36737 (M-536), "Office and Control Building H&V Plan Sections and Elevations, Elevation 928'-0"", rev. H

11. NSP Drawing No. NF-120072, "Administration Building, Cable Spreading Room Equipment and Penetration Plan", rev. A

12. NSP Drawing No. NF-36546 (C-462), "Office and Control Building Floor Plans at Elevation 939'-0" and Elevation 951'-0"", rev. L

13. MNGP USAR, rev. 13

14. "Mechanical Engineering Reference Manual", Michael R. Lindeburg, P.E., 8th edition, Professional Publications, Inc.

15. NSP Drawing No. NF-120073, "Administration Building Composite Tray Layout Plan", rev. B

16. NSP Drawing No. NF-120074, "Administration Building Tray System E, G, L, M and IPP1 Layout Plan", rev. B

17. NSP Drawing No. NF-120075, "Administration Building Tray Systems C and H Layout Plan", rev. B

18. NSP Calculation No. CA-94-092, "Cable Tray Mechanical Loading", rev. 0

19. NSP MNGP Cable and Raceway Database QUEL output, dated 5-12-95 (see Attachment No. 1)

20. NSP MNGP Cable and Raceway Database output, dated 5-12-95 (see Attachment No. 2)

21. NSP Drawing No. NF-36551 (C-470), "Office and Control Building Floor Framing Plans at Elevation 939'-0" and Elevation 951'-0"", rev. D

22. NSP Drawing No. NX-16991-15, "Fire Hazards Analysis, Plan View Administration Building Elevation 939'-0"", rev. A

```
/****************************************************************************/
/* Program:      AMWEIGHT1.QUEL                                             */
/* Description: Calculates the total weight for cable trays in fire area VI.*/
/* Inputs:       TABLE amweight                                             */
/* Outputs:      TABLE ward2                                                */
/* By:           Ward Andersen                                              */
/* Last Mod:     5-12-95                                                    */
/****************************************************************************/

set lockmode session where readlock=nolock

destroy ward
destroy ward1
destroy ward2

retrieve into ward (node = ctnode.desig,length = cttray.friction,
          fill=ctnode.pfarea) where
          ctnode.racetype = "T" and
          ctnode.desig = cttray.desig and
          ctnode.desig = ctrwyfa.raceway and
          ctrwyfa.firearea = "VI"
(308 rows)

modify ward to isam on node
(308 rows)

retrieve into ward1 (ctcable.desig,
                     weight = amweight.cweight * ctcable.numreel) where
  ctcable.bom = amweight.bom
(11667 rows)

modify ward1 to isam on desig
(11667 rows)

/* Calculate the weight per linear foot for the cable trays */

retrieve into ward2 (ward.all, weightperft = sum(ward1.weight by
    ward.node where ward.node = ctroute.node and
                       ward1.desig = ctroute.cable))
(308 rows)

/*  Some trays in the database have one name for two or more trays  */
/*  These trays are identified by the following note and note numbers */

retrieve (ctstdnote.all) where
   ctstdnote.notenum = "119" or ctstdnote.notenum = "12[0123]"

|notenu|note
```

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|119 |This tray node consists of two trays, dimensions 3X24.

|120 |This tray node consists of two trays, dimensions 3X24 and 3X18.

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|121 |This tray node consists of two trays, dimensions 3X24 and 3X12.

|122 |This tray node consists of three trays, dimensions 3X24.

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|123 |This tray node consists of two trays, dimensions 4X12.

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-----------------------------------------------------------------------|
(5 rows)

/*  Normalize the tray weight to a 24 inch wide tray for the multiple */
/*  tray sections by dividing the tray weight per foot by the tray width */
/*  and multiplying by 24 inches.  */

replace ward2 (weightperft = ward2.weightperft * 24 / cttray.dimen1) where
   cttray.desig = ward2.node and
   ward2.node = ctrwynote.desig and
   (ctrwynote.notenum = "119" or ctrwynote.notenum = "12[0123]")
(20 rows)

/*  Add the empty weight of a 24 inch wide tray to cable weights */

replace ward2 (weightperft = ward2.weightperft + 4.23)
(308 rows)

retrieve (ward2.all) sort by node

|node          |length     |fill        |weightperf|
|--------------------------------------------------|
|1PA303        |      3.000|       0.000|     4.230|
```

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1PA311	3.000	0.000	4.230
1PA312	5.000	0.106	4.325
1PA313	5.000	1.188	5.110
1PA314	5.000	0.361	4.660
1PA315	5.000	0.000	4.230
1PA316	7.000	1.513	4.990
1PA317	7.000	17.374	5.305
1PA318	7.000	1.625	4.875
1PA319	4.000	0.000	4.230
1PA320	4.000	0.000	4.230
1PA321	12.000	1.082	5.015
1PA502	2.000	0.000	4.230
1PA504	3.000	0.000	4.230
1PA505	3.000	0.000	4.230
1PP121	18.000	36.959	20.560
1PP122	21.000	39.075	21.415
1PP125	13.000	7.875	6.970
1PP129	12.000	28.585	17.400
2PA405	7.000	0.000	4.230
2PA406	7.000	0.175	4.350
2PA407	7.000	0.000	4.230
2PA408	5.000	1.607	5.185
2PA409	8.000	0.000	4.230
2PA410	25.000	1.285	4.570
2PA411	2.000	9.000	4.230
2PA412	6.000	0.000	4.230
2PA413	6.000	0.000	4.230
2PA414	4.000	0.106	4.325
2PA415	4.000	0.000	4.230
2PA416	4.000	0.175	4.350
2PA417	7.000	0.000	4.230
2PA418	3.000	0.000	4.230
2PA419	3.000	0.000	4.230
2PA420	7.000	0.000	4.230
2PA421	7.000	0.000	4.230
2PA422	6.000	0.000	4.230
2PA423	7.000	0.694	4.495
2PA424	7.000	17.315	4.420
2PA425	7.000	0.000	4.230
2PA426	7.000	20.135	4.990
2PA427	7.000	0.000	4.230
2PA428	7.000	0.175	4.350
2PA429	7.000	0.175	4.350
2PA430	7.000	0.000	4.230
2PA431	3.000	0.212	4.325
2PA432	5.000	0.000	4.230
2PA433	5.000	1.878	5.690
2PA434	5.000	0.000	4.230
2PA435	6.000	0.000	4.230
2PA436	3.000	0.000	4.230
2PA437	4.000	0.000	4.230
2PA438	9.000	0.673	4.590
2PA439	7.000	0.455	4.565
2PA440	8.000	1.328	4.445
2PA441	4.000	1.241	5.085
CJ501	13.000	49.143	44.895
CJ502	10.000	47.155	42.110
CJ503	7.000	34.042	31.449
CJ504	15.000	29.283	27.925
CJ505	15.000	13.711	20.585
CJ506	4.000	13.764	20.241
CJ507	4.000	13.858	20.371
CJ508	4.000	13.845	20.346
CJ509	4.000	13.645	20.106
CJ510	4.000	12.000	18.366
CK5	0.000	0.015	4.380

CK501	5.000	25.149	34.375
CK5C2	12.000	21.285	29.415
CK502E	0.000	0.010	4.390
CK503	11.000	38.152	49.495
CK504	12.000	25.868	31.520
CK505	11.000	31.737	38.500
CK506	13.000	38.674	42.925
CK507	10.000	47.731	51.040
CK508	6.000	40.822	43.885
CK509	15.000	33.013	38.355
CK510	4.000	24.712	29.480
CK511	4.000	18.123	22.085
CK512	4.000	0.415	4.825
CK513	4.000	0.495	4.975
CK514	4.000	0.562	5.100
CK515	0.000	0.011	4.505
CK522	0.000	0.004	4.310
CK591	0.000	0.008	4.325
CL5	0.000	0.040	4.820
CL501	15.000	22.072	30.205
CL502	8.000	22.984	27.865
CL503	9.000	23.841	28.660
CL504	8.000	20.118	25.710
CL505	15.000	22.966	27.540
CL506	10.000	20.708	24.260
CL507	10.000	17.915	22.010
CL508	16.000	27.151	23.885
CL509	15.000	24.683	24.400
CL510	4.000	15.724	21.910
CL511	4.000	14.435	20.340
CL512	4.000	12.848	19.095
CL513	4.000	12.821	19.090
CL514	4.000	13.954	22.430
CL515	7.000	12.207	12.450
CL516	7.000	12.207	12.450
CM501	0.000	0.120	4.230
CN501	5.000	10.558	13.900
CN502	8.000	16.591	18.875
CN503	7.000	20.783	23.765
CN504	7.000	18.753	22.155
CP501	20.000	5.728	4.230
CP502	16.000	13.847	7.010
CP503	21.000	16.513	7.960
CP504	12.000	16.513	7.960
CP505	15.000	19.889	7.960
CP506	4.000	19.889	7.960
CP507	4.000	20.252	7.960
CP508	4.000	24.287	7.960
CP509	4.000	15.543	7.960
CP510	4.000	9.813	7.960
CR501	39.000	23.892	39.820
CR502	10.000	4.500	8.370
CR503	10.000	4.500	8.370
CS501	10.000	10.128	4.230
CT501	0.000	0.365	4.230
CT502	0.000	0.365	4.230
CT604	12.000	11.272	7.030
CU602	16.000	7.439	6.390
CU603	3.000	11.272	7.030
CU604	12.000	11.272	7.030
CV501	11.000	12.328	4.470
CV502	5.000	4.872	5.110
CV503	3.000	11.272	7.030
CV504	3.000	11.272	7.030
CW501	11.000	22.117	4.710
CW502	5.000	4.872	5.110

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CW503		3.000	11.272	7.030
CW504		3.000	11.272	7.030
CX501		5.000	14.717	16.635
CX502		9.000	17.957	19.275
CX503		6.000	18.599	19.930
CX504		11.000	30.475	28.415
CX505		6.000	19.835	21.515
EM3		0.000	0.025	4.470
EM301		10.000	0.000	4.230
EM301A		10.000	16.855	17.320
EM302		8.000	0.000	4.230
EM302A		8.000	18.683	20.135
EM303		10.000	25.862	22.688
EM303A		10.000	26.455	4.565
EM303B		10.000	22.901	6.890
EM304		10.000	26.961	23.775
EM304A		10.000	31.175	4.350
EM304B		10.000	30.901	6.890
EM305		10.000	27.317	24.075
EM305A		10.000	38.000	4.230
EM305B		10.000	31.175	4.350
EM305C		10.000	28.462	7.320
EM306		13.000	26.270	23.410
EM306A		13.000	45.000	4.230
EM306B		13.000	0.175	4.350
EM306C		13.000	28.462	7.320
EM307		10.000	30.933	26.988
EM307A		10.000	21.000	4.230
EM307B		10.000	0.175	4.350
EM307C		10.000	21.507	6.745
EM308		14.000	33.562	29.600
EM308A		14.000	37.175	4.350
EM308C		14.000	20.507	6.745
EM309		17.000	21.305	20.480
EM309A		14.000	33.175	4.350
EM309C		14.000	16.175	4.350
EM310		15.000	0.000	4.230
EM310A		15.000	25.226	22.645
EP301		46.000	38.358	25.395
ER0RISER		5.000	0.133	4.310
ER2RISER		5.000	0.533	4.550
ER3RISER		5.000	0.400	4.470
ER4RISER		5.000	0.133	4.390
GJ401		12.000	35.747	33.635
GJ402		8.000	22.202	22.045
GJ403		7.000	29.794	27.855
GJ404		7.000	25.575	24.770
GK401		7.000	35.727	32.990
GK402		11.000	28.189	25.805
GK403		5.000	19.259	19.100
GK404		0.000	0.102	5.320
GK405		0.000	0.049	4.740
GK406		0.000	0.000	4.230
GK407		0.000	0.012	4.350
GL401		5.000	30.965	28.325
GL402		8.000	15.074	15.970
GL403		12.000	40.624	35.610
GL404		12.000	18.343	18.355
GL405		11.000	26.189	24.100
GL406		13.000	10.315	11.720
GL407		10.000	24.533	23.440
GP4		0.000	0.010	4.390
GP401		6.000	22.388	21.155
GP402		7.000	19.939	19.280
GP403		6.000	17.406	17.520
GP404		8.000	34.290	26.585

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GP405	6.000	28.222	25.880
GP406	0.000	0.008	4.325
GP407	0.000	0.015	4.370
GQ401	10.000	0.000	4.230
GQ403	0.000	0.018	4.420
GR401	5.000	22.060	22.010
GR402	8.000	31.970	28.770
GR403	8.000	27.637	25.620
GR404	16.000	25.392	23.420
GR405	10.000	36.014	31.500
GR406	10.000	0.664	11.490
GS401	23.000	36.646	29.420
GT401	23.000	43.756	33.810
GU401	23.000	29.783	26.340
GW401	14.000	8.629	10.200
HM4	0.000	0.020	4.390
HM401	16.000	20.831	20.080
HM401A	16.000	0.000	4.230
HM401B	10.000	1.709	5.285
HM402	8.000	29.853	28.435
HM403	9.000	29.498	27.310
HM404	4.000	30.659	28.265
HM405	13.000	24.791	23.395
HM406	10.000	0.803	4.845
HN401	4.000	30.242	26.970
HN401A	4.000	0.175	4.350
HN402	9.000	19.319	18.761
HN402A	9.000	0.000	4.230
HN402B	4.000	0.000	4.230
HN403	6.000	26.640	24.284
HN403A	6.000	0.000	4.230
HN403B	6.000	0.000	4.230
HN404	6.000	25.287	23.230
HN404A	6.000	0.000	4.230
HN404B	7.000	0.000	4.230
HP401	7.000	22.988	21.725
HP401A	7.000	0.000	4.230
HP401B	10.000	18.522	4.615
HP402	12.000	35.548	30.900
HP402A	12.000	40.000	4.230
HP402B	12.000	9.522	4.615
HP403	7.000	21.350	20.222
HP403A	7.000	50.000	4.230
HP403B	6.000	9.696	4.735
HP404	0.000	0.082	5.265
HR4	0.000	0.024	4.440
HR401	4.000	12.850	14.297
HR401A	4.000	0.175	4.350
HR401B	3.000	0.000	4.230
HR402	8.000	16.473	16.650
HR402A	8.000	1.535	5.165
HR402B	8.000	0.349	4.350
HR403	7.000	20.006	19.400
HR403A	7.000	1.535	5.165
HR403B	7.000	0.349	4.350
HR404	15.000	44.794	38.287
HR404A	15.000	3.069	5.165
HR404B	15.000	34.831	4.520
HR405	13.000	32.517	28.693
HR405A	26.000	55.535	5.165
HR405B	26.000	27.522	4.615
HR406	0.000	0.027	4.400
IP3260	0.000	0.012	4.350
IP3261	0.000	0.024	4.470
IP3262	0.000	0.012	4.350
JE301	17.000	45.665	34.255

JE302	17.000	26.245	20.120
LK401	10.000	18.524	19.712
LK401A	10.000	0.106	4.325
LK401B	3.000	16.000	4.230
LK402	8.000	20.007	21.545
LK403	12.000	39.749	37.135
LK404	12.000	19.364	20.175
LK405	11.000	28.338	27.370
LK406	13.000	15.865	16.980
LK407	10.000	10.871	12.770
LP401	12.000	22.451	21.715
LP402	10.000	13.256	14.865
LP403	7.000	14.838	15.840
LP404	10.000	22.648	22.325
LP405	10.000	17.616	18.180
MJ401	5.000	19.931	19.325
MJ402	8.000	17.317	17.310
MJ403	12.000	35.481	31.100
MJ404	12.000	9.216	12.185
MJ405	11.000	31.262	23.775
MJ406	13.000	23.826	17.180
MJ407	10.000	34.309	21.190
MJ507	0.000	0.429	8.550
MK401	7.000	39.336	33.900
MK402	11.000	7.085	9.835
MK403	5.000	8.962	11.130
ML401	5.000	7.716	10.225
ML402	8.000	24.693	22.395
ML403	6.000	30.613	27.150
ML404	7.000	31.565	27.870
ML482	0.000	0.000	4.230
MP401	7.000	1.339	5.210
MP402	7.000	32.184	19.695
MP403	6.000	39.884	20.935
MP404	8.000	34.830	21.300
MP405	6.000	30.689	19.375
ZA501	0.000	2.888	9.373
ZA502	0.000	4.986	12.970
ZA503	0.000	0.293	13.861
ZA504	0.000	0.293	13.861
ZC501	0.000	0.015	4.763
ZD501	0.000	0.014	4.846
ZD502	0.000	0.015	4.896

(308 rows)

retrieve (ward2.all) sort by weightperft:d

node	length	fill	weightperf
CK507	10.000	47.731	51.040
CK503	11.000	38.152	49.495
CJ501	13.000	49.143	44.895
CK508	6.000	40.822	43.885
CK506	13.000	38.674	42.925
CJ502	10.000	47.155	42.110
CR501	39.000	23.892	39.820
CK505	11.000	31.737	38.500
CK509	15.000	33.013	38.355
HR404	15.000	44.794	38.287
LK403	12.000	39.749	37.135
GL403	12.000	40.624	35.610
CK501	5.000	25.149	34.375
JE301	17.000	45.665	34.255
MK401	7.000	39.336	33.900
GT401	23.000	43.756	33.810

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GJ401	12.000	35.747	33.635
GK401	7.000	35.727	32.990
CK504	12.000	25.868	31.520
GR405	10.000	36.014	31.500
CJ503	7.000	34.042	31.449
MJ403	12.000	35.481	31.100
HP402	12.000	35.548	30.900
CL501	15.000	22.072	30.205
EM308	14.000	33.562	29.600
CK510	4.000	24.712	29.480
GS401	23.000	36.646	29.420
CK502	12.000	21.285	29.415
GR402	8.000	31.970	28.770
HR405	13.000	32.517	28.693
CL503	9.000	23.841	28.660
HM402	8.000	29.853	28.435
CX504	11.000	30.475	28.415
GL401	5.000	30.965	28.325
HM404	4.000	30.659	28.265
CJ504	15.000	29.283	27.925
ML404	7.000	31.565	27.870
CL502	8.000	22.984	27.865
GJ403	7.000	29.794	27.855
CL505	15.000	22.966	27.540
LK405	11.000	28.338	27.370
HM403	9.000	29.498	27.310
ML403	6.000	30.613	27.150
EM307	10.000	30.933	26.988
HN401	4.000	30.242	26.970
GP404	8.000	34.290	26.585
GU401	23.000	29.783	26.340
GP405	6.000	28.222	25.880
GK402	11.000	28.189	25.805
CL504	8.000	20.118	25.710
GR403	8.000	27.637	25.620
EP301	46.000	38.358	25.395
GJ404	7.000	25.575	24.770
CL509	15.000	24.683	24.400
HN403	6.000	26.640	24.284
CL506	10.000	20.708	24.260
GL405	11.000	26.189	24.100
EM305	10.000	27.317	24.075
CL508	16.000	27.151	23.885
EM304	10.000	26.961	23.775
MJ405	11.000	31.262	23.775
CN503	7.000	20.783	23.765
GL407	10.000	24.533	23.440
GR404	16.000	25.392	23.420
EM306	13.000	26.270	23.410
HM405	13.000	24.791	23.395
HN404	6.000	25.287	23.230
EM303	10.000	25.862	22.688
EM310A	15.000	25.226	22.645
CL514	4.000	13.954	22.430
ML402	8.000	24.693	22.395
LP404	10.000	22.648	22.325
CN504	7.000	18.753	22.155
CK511	4.000	18.123	22.085
GJ402	8.000	22.202	22.045
CL507	10.000	17.915	22.010
GR401	5.000	22.060	22.010
CL510	4.000	15.724	21.910
HP401	7.000	22.988	21.725
LP401	12.000	22.451	21.715
LK402	8.000	20.007	21.545
CX505	6.000	19.835	21.515

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1PP122	21.000	39.075	21.415
MP404	8.000	34.830	21.300
MJ407	10.000	34.309	21.190
GP401	6.000	22.388	21.155
MP403	6.000	39.884	20.935
CJ505	15.000	13.711	20.585
1PP121	18.000	36.959	20.560
EM309	17.000	21.305	20.480
CJ507	4.000	13.858	20.371
CJ508	4.000	13.845	20.346
CL511	4.000	14.435	20.340
CJ506	4.000	13.764	20.241
HP403	7.000	21.350	20.222
LK404	12.000	19.364	20.175
EM302A	8.000	18.683	20.135
JE302	17.000	26.245	20.120
CJ509	4.000	13.645	20.106
HM401	16.000	20.831	20.080
CX503	6.000	18.599	19.930
LK401	10.000	18.524	19.712
MP402	7.000	32.184	19.695
HR403	7.000	20.006	19.400
MP405	6.000	30.689	19.375
MJ401	5.000	19.931	19.325
GP402	7.000	19.939	19.280
CX502	9.000	17.957	19.275
GK403	5.000	19.259	19.100
CL512	4.000	12.848	19.095
CL513	4.000	12.821	19.090
CN502	8.000	16.591	18.875
HN402	9.000	19.319	18.761
CJ510	4.000	12.000	18.366
GL404	12.000	18.343	18.355
LP405	10.000	17.616	18.180
GP403	6.000	17.406	17.520
1PP129	12.000	28.585	17.400
EM301A	10.000	16.855	17.320
MJ402	8.000	17.317	17.310
MJ406	13.000	23.826	17.180
LK406	13.000	15.865	16.980
HR402	8.000	16.473	16.650
CX501	5.000	14.717	16.635
GL402	8.000	15.074	15.970
LP403	7.000	14.838	15.840
LP402	10.000	13.256	14.865
HR401	4.000	12.850	14.297
CN501	5.000	10.558	13.900
ZA503	0.000	0.293	13.861
ZA504	0.000	0.293	13.861
ZA502	0.000	4.986	12.970
LK407	10.000	10.871	12.770
CL515	7.000	12.207	12.450
CL516	7.000	12.207	12.450
MJ404	12.000	9.216	12.185
GL406	13.000	10.315	11.720
GR406	10.000	0.664	11.490
MK403	5.000	8.962	11.130
ML401	5.000	7.716	10.225
GW401	14.000	8.629	10.200
MK402	11.000	7.085	9.835
ZA501	0.000	2.888	9.373
MJ507	0.000	0.429	8.550
CR502	10.000	4.500	8.370
CR503	10.000	4.500	8.370
CP503	21.000	16.513	7.960
CP504	12.000	16.513	7.960

CP505	15.000	19.889	7.960
CP506	4.000	19.889	7.960
CP507	4.000	20.252	7.960
CP508	4.000	24.287	7.960
CP509	4.000	15.543	7.960
CP510	4.000	9.813	7.960
EM305C	10.000	28.462	7.320
EM306C	13.000	28.462	7.320
CT604	12.000	11.272	7.030
CU603	3.000	11.272	7.030
CU604	12.000	11.272	7.030
CV503	3.000	11.272	7.030
CV504	3.000	11.272	7.030
CW503	3.000	11.272	7.030
CW504	3.000	11.272	7.030
CP502	16.000	13.847	7.010
1PP125	13.000	7.875	6.970
EM303B	10.000	22.901	6.890
EM304B	10.000	30.901	6.890
EM307C	10.000	21.507	6.745
EM308C	14.000	20.507	6.745
CU602	16.000	7.439	6.390
2PA433	5.000	1.878	5.690
GK404	0.000	0.102	5.320
1PA317	7.000	17.374	5.305
HM401B	10.000	1.709	5.285
HP404	0.000	0.082	5.265
MP401	7.000	1.339	5.210
2PA408	5.000	1.607	5.185
HR402A	8.000	1.535	5.165
HR403A	7.000	1.535	5.165
HR404A	15.000	3.069	5.165
HR405A	26.000	55.535	5.165
1PA313	5.000	1.188	5.110
CV502	5.000	4.872	5.110
CW502	5.000	4.872	5.110
CK514	4.000	0.562	5.100
2PA441	4.000	1.241	5.085
1PA321	12.000	1.082	5.015
1PA316	7.000	1.513	4.990
2PA426	7.000	20.135	4.990
CK513	4.000	0.495	4.975
ZD502	0.000	0.015	4.896
1PA318	7.000	1.625	4.875
ZD501	0.000	0.014	4.846
HM406	10.000	0.803	4.845
CK512	4.000	0.415	4.825
CL5	0.000	0.040	4.820
ZC501	0.000	0.015	4.763
GK405	0.000	0.049	4.740
HP403B	6.000	9.696	4.735
CW501	11.000	22.117	4.710
1PA314	5.000	0.361	4.660
HP401B	10.000	18.522	4.615
HP402B	12.000	9.522	4.615
HR405B	26.000	27.522	4.615
2PA438	9.000	0.673	4.590
2PA410	25.000	1.285	4.570
2PA439	7.000	0.455	4.565
EM303A	10.000	26.455	4.565
ER2RISER	5.000	0.533	4.550
HR404B	15.000	34.831	4.520
CK515	0.000	0.011	4.505
2PA423	7.000	0.694	4.495
CV501	11.000	12.328	4.470
EM3	0.000	0.025	4.470

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ER3RISER	5.000	0.400	4.470
IP3261	0.000	0.024	4.470
2PA440	8.000	1.328	4.445
HR4	0.000	0.024	4.440
2PA424	7.000	17.315	4.420
GQ403	0.000	0.018	4.420
HR406	0.000	0.027	4.400
CK502E	0.000	0.010	4.390
ER4RISER	5.000	0.133	4.390
GP4	0.000	0.010	4.390
HM4	0.000	0.020	4.390
CK5	0.000	0.015	4.380
GP407	0.000	0.015	4.370
2PA406	7.000	0.175	4.350
2PA416	4.000	0.175	4.350
2PA428	7.000	0.175	4.350
2PA429	7.000	0.175	4.350
EM304A	10.000	31.175	4.350
EM305B	10.000	31.175	4.350
EM306B	13.000	0.175	4.350
EM307B	10.000	0.175	4.350
EM308A	14.000	37.175	4.350
EM309A	14.000	33.175	4.350
EM309C	14.000	16.175	4.350
GK407	0.000	0.012	4.350
HN401A	4.000	0.175	4.350
HR401A	4.000	0.175	4.350
HR402B	8.000	0.349	4.350
HR403B	7.000	0.349	4.350
IP3260	0.000	0.012	4.350
IP3262	0.000	0.012	4.350
1PA312	5.000	0.106	4.325
2PA414	4.000	0.106	4.325
2PA431	3.000	0.212	4.325
CK591	0.000	0.008	4.325
GP406	0.000	0.008	4.325
LK401A	10.000	0.106	4.325
CK522	0.000	0.004	4.310
ER0RISER	5.000	0.133	4.310
1PA303	3.000	0.000	4.230
1PA311	3.000	0.000	4.230
1PA315	5.000	0.000	4.230
1PA319	4.000	0.000	4.230
1PA320	4.000	0.000	4.230
1PA502	2.000	0.000	4.230
1PA504	3.000	0.000	4.230
1PA505	3.000	0.000	4.230
2PA405	7.000	0.000	4.230
2PA407	7.000	0.000	4.230
2PA409	8.000	0.000	4.230
2PA411	2.000	9.000	4.230
2PA412	6.000	0.000	4.230
2PA413	6.000	0.000	4.230
2PA415	4.000	0.000	4.230
2PA417	7.000	0.000	4.230
2PA418	3.000	0.000	4.230
2PA419	3.000	0.000	4.230
2PA420	7.000	0.000	4.230
2PA421	7.000	0.000	4.230
2PA422	6.000	0.000	4.230
2PA425	7.000	0.000	4.230
2PA427	7.000	0.000	4.230
2PA430	7.000	0.000	4.230
2PA432	5.000	0.000	4.230
2PA434	5.000	0.000	4.230
2PA435	6.000	0.000	4.230

2PA436	3.000	0.000	4.230
2PA437	4.000	0.000	4.230
CM501	0.000	0.120	4.230
CP501	20.000	5.728	4.230
CS501	10.000	10.128	4.230
CT501	0.000	0.365	4.230
CT502	0.000	0.365	4.230
EM301	10.000	0.000	4.230
EM302	8.000	0.000	4.230
EM305A	10.000	38.000	4.230
EM306A	13.000	45.000	4.230
EM307A	10.000	21.000	4.230
EM310	15.000	0.000	4.230
GK406	0.000	0.000	4.230
GQ401	10.000	0.000	4.230
HM401A	16.000	0.000	4.230
HN402A	9.000	0.000	4.230
HN402B	4.000	0.000	4.230
HN403A	6.000	0.000	4.230
HN403B	6.000	0.000	4.230
HN404A	6.000	0.000	4.230
HN404B	7.000	0.000	4.230
HP401A	7.000	0.000	4.230
HP402A	12.000	40.000	4.230
HP403A	7.000	50.000	4.230
HR401B	3.000	0.000	4.230
LK401B	3.000	16.000	4.230
ML482	0.000	0.000	4.230

(308 rows)
continue

12-MAY-1995 12:42:09
Executing . . .

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```
destroy ward3
continue
Executing . . .

retrieve into ward3(ward2.all,oneper=0.00,difsq=0.00)
(308 rows)
continue
Executing . . .

modify ward3 to isam on node
(308 rows)
continue
Executing . . .

delete ward3 where ward3.fill < 3
(114 rows)
continue
Executing . . .

replace ward3(oneper=(ward3.weightperft-4.23)/ward3.fill)
(194 rows)
continue
Executing . . .

retrieve (average = avg(ward3.oneper))

|average   |
|----------|
|     0.637|   — avc. 1% fill (lbs/ft)     (conservative)
|----------|
(1 row)
continue
Executing . . .

replace ward3(difsq=ward3.oneper - 0.637)
(194 rows)
continue
Executing . . .

replace ward3 (difsq=ward3.difsq*ward3.difsq)
(194 rows)
continue
Executing . . .

retrieve (cnt = count(ward3.node))

|cnt          |
|-------------|
|          194|   no. of trays
|-------------|
(1 row)
continue
Executing . . .

retrieve(s = sqrt(sum(ward3.difsq)/194))

|s         |
|----------|
|     0.367|   σ (lbs/ft)
|----------|
(1 row)
continue
```

```
Executing . . .

retrieve (afill = avg(ward3.fill))

|afill     |
|----------|
|    23.302|
|----------|
(1 row)
continue
```

ave. fill (%)

MONTICELLO NUCLEAR GENERATING PLANT		3495	
TITLE:	CALCULATION/ANALYSIS VERIFICATION CHECKLIST	Revision 3	09/22/94
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Place initial by items verified.

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Attachment 3
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		Verified
REVIEW		
1.	Inputs correctly selected.	[initials]
2.	Assumptions described and reasonable.	[initials]
3.	Applicable codes, standards and regulations identified and met.	[initials]
4.	Appropriate method used.	[initials]
5.	Applicable construction and operating experience considered.	[initials]
6.	Applicable structure(s), system(s), and component(s) listed.	[initials]
7.	Formulas and equations documented, unusual symbols defined.	[initials]
8.	Detailed to allow verification without recourse to preparer.	[initials]
9.	Neat and legible, pages all correctly numbered.	[initials]
10.	Signed by preparer.	[initials]
11.	Interface requirements identified and satisfied.	[initials]
12.	Acceptance criteria identified, adequate and satisfied.	[initials]
13.	Result resonable compared to inputs.	[initials]
ALTERNATE CALCULATION		
14.	Alternate calc results consistent with original.	
15.	Items 1-4 above verified. (Required by ANSI N.45.2.11)	
TESTING		
16.	Testing requirements fully described and adequate.	
17.	Shows adequacy of tested feature @ worst case conditions.	
18.	If test is for overall design adequacy, all operating modes considered in determining test conditions.	
19.	If model test, scaling laws and error analysis established.	
20.	Results meet acceptance criteria, or documentation of acceptable resolution is attached.	

OTHER (Explain)____________________

FINAL DOCUMENTATION (Verify applicable items included)		
21.	Alternate or check calcs.	
22.	Summary of test results.	
23.	Comments (errors, discrepancies, recommendations).	
24.	Method of resolution of comments.	

Completed By: [signature] Date: 5-19-95

3087 (PROCEDURE/FORM CHANGE AND HOLD NOTICE) incorporated: ~~N/A~~ None				
FOR ADMINISTRATIVE USE ONLY	Resp Supv: GSSA [initials]	Assoc Ref: AWI-05.01.~~05~~ 25	SR: N	Freq: 0 yrs
	ARMS: 3495	Doc Type: 3042	Admin Initials: cjs	Date: 10/18/94

l/crs