

ANNUAL UPDATE REPORT - 1980
ON THE
CONSTRUCTION SETTLEMENT MONITORING PROGRAM
FOR
NORTH ANNA POWER STATION - UNITS 3 AND 4
VIRGINIA ELECTRIC AND POWER COMPANY

February 29, 1980

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TABLE OF CONTENTS

	<u>Page</u>
1.0 GENERAL	1
2.0 CONSTRUCTION STATUS	1
3.0 PERMANENT REFERENCE MONUMENTS	2
4.0 REVISIONS	2
5.0 SETTLEMENT DATA	3
5.1 SERVICE WATER PUMP HOUSE	3
6.0 SUMMARY	3
APPENDIX A - Settlement Data Sheets	

LIST OF FIGURES

<u>No</u>	<u>Title</u>
16A	Circulating Water Intake Tunnel
18A	Circulating Water Discharge Tunnel

1.0 GENERAL

As specified in the "Report on the Construction Settlement Monitoring Program for North Anna Nuclear Power Station - Units 3 and 4," dated April 2, 1979 (April 2, 1979 report), all settlement data obtained for Category I structures during construction will be submitted annually. This report is the first annual report submitted in fulfillment of that requirement. A discussion of the settlement history of each Category I structure will be included along with the settlement data.

The April 2, 1979 report also stated that changes in location or additions to the initial settlement monitoring points would be submitted with the annual reports. Section 4.0 of this first annual report addresses pertinent revisions.

2.0 CONSTRUCTION STATUS

Construction activities were limited during 1979. No additional settlement monitoring points were installed during this period. As stated in the April 2, 1979 report, monitoring of the Service Water Pump House (SWPH), which began in December 1974, was initiated prior to development of the construction settlement monitoring program. Presently, construction of the SWPH is approximately 60 percent complete. Monitoring of this structure was continued during 1979. At present, this is the only Category I structure being monitored. Construction of the remaining Category I structures, which are all rock founded,

has generally not progressed beyond foundation placement. The settlement monitoring points for these structures will be installed when construction is resumed.

3.0 PERMANENT REFERENCE MONUMENTS

Two permanent reference monuments have been installed in the Units 3 and 4 construction area. The location of these reference monuments is as shown on Figure 27 of the April 2, 1979 report.

4.0 REVISIONS

Figures 16 and 18 (circulating water intake and discharge tunnels respectively) of the April 2, 1979 report have been revised to correct the number of existing settlement monitoring points. The revised figures are numbered 16A and 18A. The changes consist of the following:

1. Figure 16A - Circulating Water Intake Tunnel: Settlement monitoring point I-105 is an existing point established in December, 1977.
2. Figure 18A - Circulating Water Discharge Tunnel: Settlement monitoring points D-3, D-4, and D-5, shown as installed points in the April 2, 1979 report, have not been installed. Point locations D-3 and D-4 have been eliminated due to access problems. Point D-5 will be installed when construction of the circulating water discharge tunnel is resumed.

5.0 SETTLEMENT DATA

5.1 SERVICE WATER PUMP HOUSE

The settlement history of the service water pump house (SWPH) has been evaluated in the "Report on Settlement of the Service Water Pump House, North Anna Units 3 and 4," dated March 1976 (Serial No. 957, dated March 31, 1976). Since the issuance of that report, no additional construction of the SWPH has taken place. The service water reservoir was filled in August and September 1976. Settlement subsequent to January 1976 (last data reported in the March 1976 report) has been approximately 0.6 inch for the south wall and 0.3 inches for the north wall. Of this, approximately 0.5 inches and 0.2 inches had occurred by October 1976 for the south and north walls respectively. Since late 1976, actual settlement for both the south and north walls is approximately 0.1 inch.

Data sheets of SWPH settlement readings taken since the initiation of the SWPH monitoring are included as Appendix A. Future reports will include only additional data obtained subsequent to the previous annual report.

6.0 SUMMARY

No additional settlement monitoring points were installed during 1979 due to limited construction activity. Monitoring of the Category I SWPH was continued. Settlement of the SWPH has been negligible since late 1976.

APPENDIX A

VIRGINIA ELECTRIC AND POWER CO.
NORTH ANNA POWER STATION UNITS 3&4

ELEVATIONS OF SETTLEMENT MONITORING POINTS

STRUCTURE: Service Water Pump House

Page 1

DATE	DATA-FEET							
	POINT No. 721 (NW)	Δ ELEV. (FROM BASE ELEV.)	POINT No. 722 (SW)	Δ ELEV. (FROM BASE ELEV.)	POINT No. 723 (NE)	Δ ELEV. (FROM BASE ELEV.)	POINT No. 724 (SE)	Δ ELEV. (FROM BASE ELEV.)
* 12/26/74	322.083	—	324.341	—	321.694	—	321.961	—
6/6/75	321.983	0.100	324.237	0.104	321.614	0.080	321.885	0.076
6/16/75	321.984	0.099	324.238	0.103	321.615	0.079	321.884	0.077
6/23/75	321.982	0.101	324.237	0.104	321.613	0.081	321.884	0.077
6/30/75	321.984	0.099	324.237	0.104	321.616	0.078	321.888	0.073
7/7/75	321.987	0.096	324.235	0.106	321.619	0.075	321.890	0.071
7/14/75	321.983	0.100	324.238	0.103	321.614	0.080	321.886	0.075
7/21/75	321.983	0.100	324.235	0.106	321.615	0.079	321.886	0.075
7/28/75	321.983	0.100	324.233	0.108	321.614	0.080	321.884	0.077
8/4/75	321.982	0.101	324.232	0.109	321.611	0.083	321.881	0.080
8/11/75	321.975	0.108	324.225	0.116	321.610	0.084	321.879	0.082
8/18/75	321.966	0.117	324.219	0.122	321.601	0.093	321.873	0.088
8/25/75	321.956	0.127	324.216	0.125	321.587	0.107	321.863	0.098
9/2/75	321.944	0.139	324.208	0.133	321.572	0.122	321.857	0.104

REMARKS * INDICATES INITIAL BASE ELEVATION

VIRGINIA ELECTRIC AND POWER CO.
NORTH ANNA POWER STATION UNITS 3&4

ELEVATIONS OF SETTLEMENT MONITORING POINTS

STRUCTURE: Service Water Pump House

Page 2

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* 12/26/74	322.083	—	324.341	—	321.694	—	321.961	—
9/8/75	321.935	0.148	324.200	0.141	321.571	0.123	321.856	0.105
9/15/75	321.921	0.162	324.197	0.144	321.555	0.139	321.849	0.112
9/22/75	321.925	0.158	324.198	0.143	321.565	0.129	321.852	0.109
9/29/75	321.926	0.157	324.197	0.144	321.566	0.128	321.855	0.106
10/6/75	321.926	0.157	324.196	0.145	321.566	0.128	321.851	0.110
10/13/75	321.918	0.165	324.189	0.152	321.556	0.138	321.851	0.110
10/20/75	321.917	0.166	324.187	0.154	321.553	0.141	321.847	0.114
10/27/75	321.918	0.165	324.188	0.153	321.556	0.138	321.846	0.115
11/3/75	321.915	0.168	324.185	0.156	321.555	0.139	321.846	0.115
11/10/75	321.915	0.168	324.187	0.154	321.556	0.138	321.847	0.114
11/18/75	321.903	0.180	324.185	0.156	321.550	0.144	321.846	0.115
11/24/75	321.904	0.179	324.182	0.159	321.552	0.142	321.847	0.114
12/1/75	321.901	0.182	324.181	0.160	321.550	0.144	321.847	0.114

REMARKS * INDICATES INITIAL BASE ELEVATION

VIRGINIA ELECTRIC AND POWER CO.
NORTH ANNA POWER STATION UNITS 3&4

ELEVATIONS OF SETTLEMENT MONITORING POINTS

STRUCTURE: Service Water Pump House

Page 3

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* 12/26/74	322.083	—	324.341	—	321.694	—	321.961	—
12/9/75	321.901	0.182	324.184	0.157	321.551	0.143	321.847	0.114
12/15/75	321.900	0.183	324.182	0.159	321.553	0.141	321.846	0.115
12/24/75	321.893	0.190	324.170	0.171	321.544	0.150	321.847	0.114
12/30/75	321.888	0.195	324.167	0.174	321.542	0.152	321.843	0.118
1/6/76	321.894	0.189	324.176	0.165	321.541	0.153	321.845	0.116
1/12/76	321.886	0.197	324.169	0.172	321.531	0.163	321.838	0.123
1/19/76	321.884	0.199	324.162	0.179	321.534	0.160	321.835	0.126
1/26/76	321.876	0.207	324.157	0.184	321.534	0.160	321.835	0.126
2/2/76	321.879	0.204	324.158	0.183	321.534	0.160	321.834	0.127
2/9/76	321.874	0.209	324.155	0.186	321.534	0.160	321.835	0.126
2/16/76	321.884	0.199	324.162	0.179	321.540	0.154	321.838	0.123
2/24/76	321.883	0.200	324.162	0.179	321.537	0.157	321.836	0.125
3/1/76	321.877	0.206	324.163	0.178	321.533	0.161	321.835	0.126

REMARKS * INDICATES INITIAL BASE ELEVATION

VIRGINIA ELECTRIC AND POWER CO.
NORTH ANNA POWER STATION UNITS 3&4

ELEVATIONS OF SETTLEMENT MONITORING POINTS

STRUCTURE: Service Water Pump House

Page 4

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* 12/26/74	322.083	—	324.341	—	321.694	—	321.961	—
3/8/76	321.876	0.207	324.159	0.182	321.532	0.162	321.836	0.125
3/15/76	321.874	0.209	324.158	0.183	321.534	0.160	321.837	0.124
3/25/76	321.885	0.198	324.161	0.180	321.536	0.158	321.835	0.126
4/5/76	321.874	0.209	324.156	0.185	321.534	0.160	321.833	0.128
4/13/76	321.874	0.209	324.155	0.186	321.534	0.160	321.835	0.126
4/19/76	321.885	0.198	324.165	0.176	321.540	0.154	321.842	0.119
4/28/76	321.884	0.199	324.167	0.174	321.540	0.154	321.839	0.122
5/3/76	321.883	0.200	324.166	0.175	321.539	0.155	321.838	0.123
5/10/76	321.883	0.200	324.163	0.178	321.540	0.154	321.839	0.122
5/20/76	321.883	0.200	324.162	0.179	321.541	0.153	321.849	0.112
5/25/76	321.886	0.197	324.164	0.177	321.536	0.158	321.840	0.121
6/2/76	321.884	0.199	324.162	0.179	321.533	0.161	321.833	0.128
6/7/76	321.870	0.213	324.160	0.181	321.535	0.159	321.838	0.123

REMARKS * INDICATES INITIAL BASE ELEVATION

VIRGINIA ELECTRIC AND POWER CO.
NORTH ANNA POWER STATION UNITS 3&4

ELEVATIONS OF SETTLEMENT MONITORING POINTS

STRUCTURE: Service Water Pump House

Page 5

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6/15/76	321.884	0.199	324.160	0.181	321.536	0.158	321.836	0.125
6/22/76	321.887	0.196	324.164	0.177	321.539	0.155	321.836	0.125
6/30/76	321.886	0.197	324.164	0.177	321.536	0.158	321.837	0.124
7/7/76	321.889	0.194	324.161	0.180	321.542	0.152	321.842	0.119
7/14/76	321.894	0.189	324.167	0.174	321.544	0.150	321.846	0.115
7/19/76	321.891	0.192	324.162	0.179	321.546	0.148	321.840	0.121
7/26/76	321.897	0.186	324.168	0.173	321.543	0.151	321.842	0.119
8/3/76	321.891	0.192	324.164	0.177	321.543	0.151	321.841	0.120
8/10/76	321.893	0.190	324.165	0.176	321.546	0.148	321.841	0.120
8/16/76	321.896	0.187	324.171	0.170	321.546	0.148	321.846	0.115
8/24/76	321.889	0.194	324.159	0.182	321.539	0.155	321.826	0.135
8/30/76	321.892	0.191	324.152	0.189	321.540	0.154	321.822	0.139
9/14/76	321.889	0.194	324.163	0.178	321.538	0.156	321.825	0.136

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VIRGINIA ELECTRIC AND POWER CO.
NORTH ANNA POWER STATION UNITS 3&4

ELEVATIONS OF SETTLEMENT MONITORING POINTS

STRUCTURE: Service Water Pump House

Page 6

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9/21/76	321.886	0.197	324.153	0.188	321.538	0.156	321.834	0.127
9/27/76	321.884	0.199	324.152	0.189	321.539	0.155	321.825	0.136
10/5/76	321.876	0.207	324.145	0.196	321.526	0.168	321.811	0.150
10/12/76	321.883	0.200	324.136	0.202	321.530	0.164	321.814	0.147
10/21/76	321.864	0.219	324.123	0.218	321.515	0.179	321.796	0.165
12/2/76	321.870	0.213	324.130	0.211	321.526	0.168	321.810	0.151
1/20/77	321.860	0.223	324.137	0.204	321.521	0.173	-	-
2/22/77	321.868	0.215	324.124	0.217	321.522	0.172	321.805	0.156
3/28/77	321.863	0.220	324.130	0.211	321.518	0.176	321.801	0.160
5/24/77	321.867	0.216	324.133	0.208	321.521	0.173	321.799	0.162
8/3/77	321.862	0.221	324.125	0.216	321.522	0.172	321.801	0.160
8/29/77	321.865	0.218	324.124	0.217	321.514	0.180	321.803	0.158
10/6/77	321.863	0.220	324.124	0.217	321.515	0.179	321.805	0.156

REMARKS * INDICATES INITIAL BASE ELEVATION

VIRGINIA ELECTRIC AND POWER CO.
NORTH ANNA POWER STATION UNITS 3&4

ELEVATIONS OF SETTLEMENT MONITORING POINTS

STRUCTURE: Service Water Pump House

Page 7

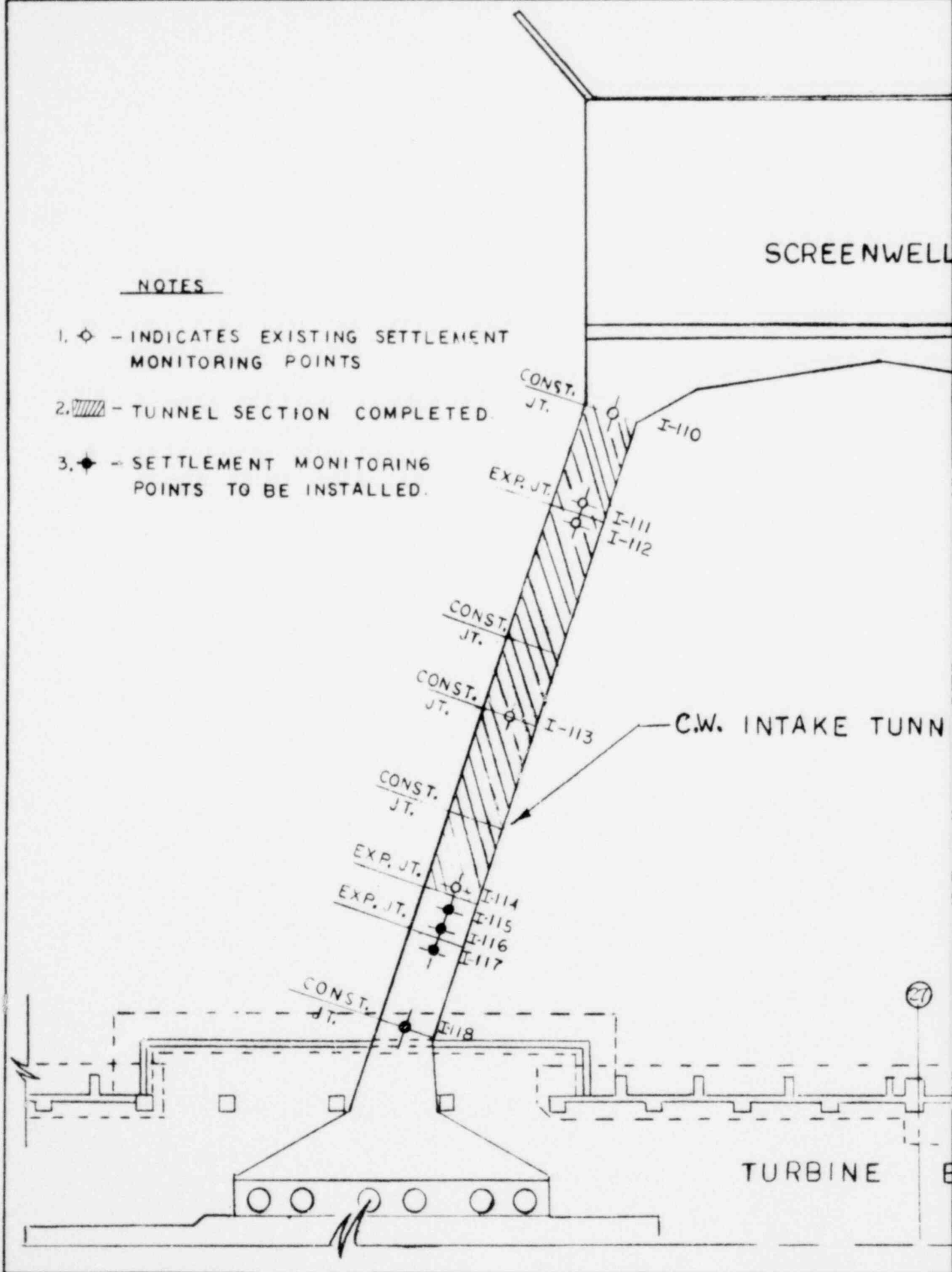
DATE	DATA-FEET							
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10/31/77	321.867	0.216	324.129	0.212	321.519	0.175	321.808	0.153
12/8/77	321.872	0.211	324.133	0.208	321.524	0.170	321.813	0.148
1/5/78	321.875	0.208	324.136	0.205	321.526	0.168	321.816	0.145
3/1/78	321.872	0.211	324.129	0.212	321.529	0.165	321.816	0.145
4/20/78	321.874	0.209	324.132	0.209	321.532	0.162	321.820	0.141
6/11/79	321.848	0.235	324.102	0.239	321.507	0.187	321.785	0.176
8/8/79	321.852	0.231	324.102	0.239	321.508	0.186	321.786	0.175
9/6/79	321.849	0.234	324.101	0.240	321.507	0.187	321.787	0.174
12/4/79	321.852	0.231	324.106	0.235	321.507	0.187	321.786	0.175

REMARKS * INDICATES INITIAL BASE ELEVATION

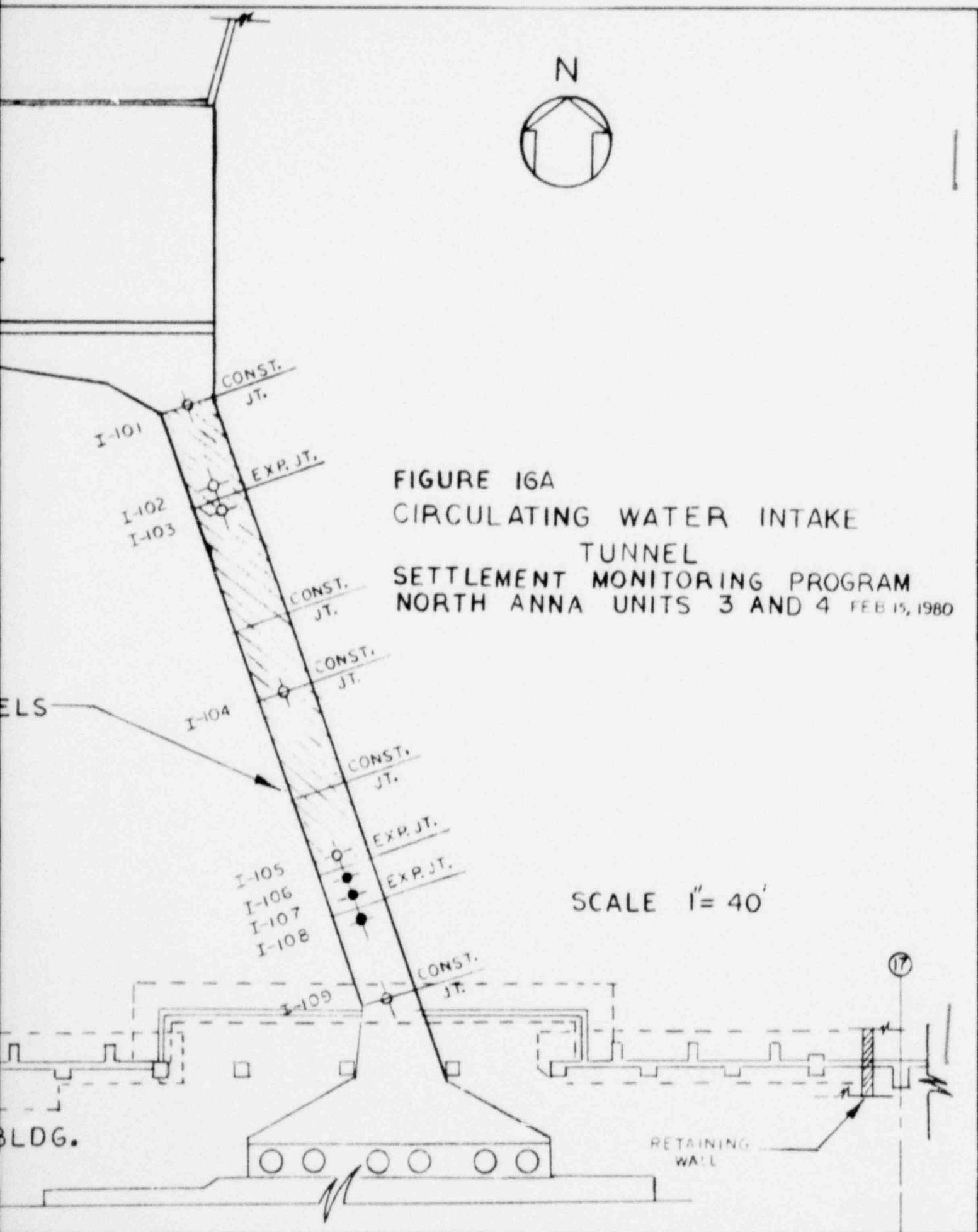
SCREENWELL

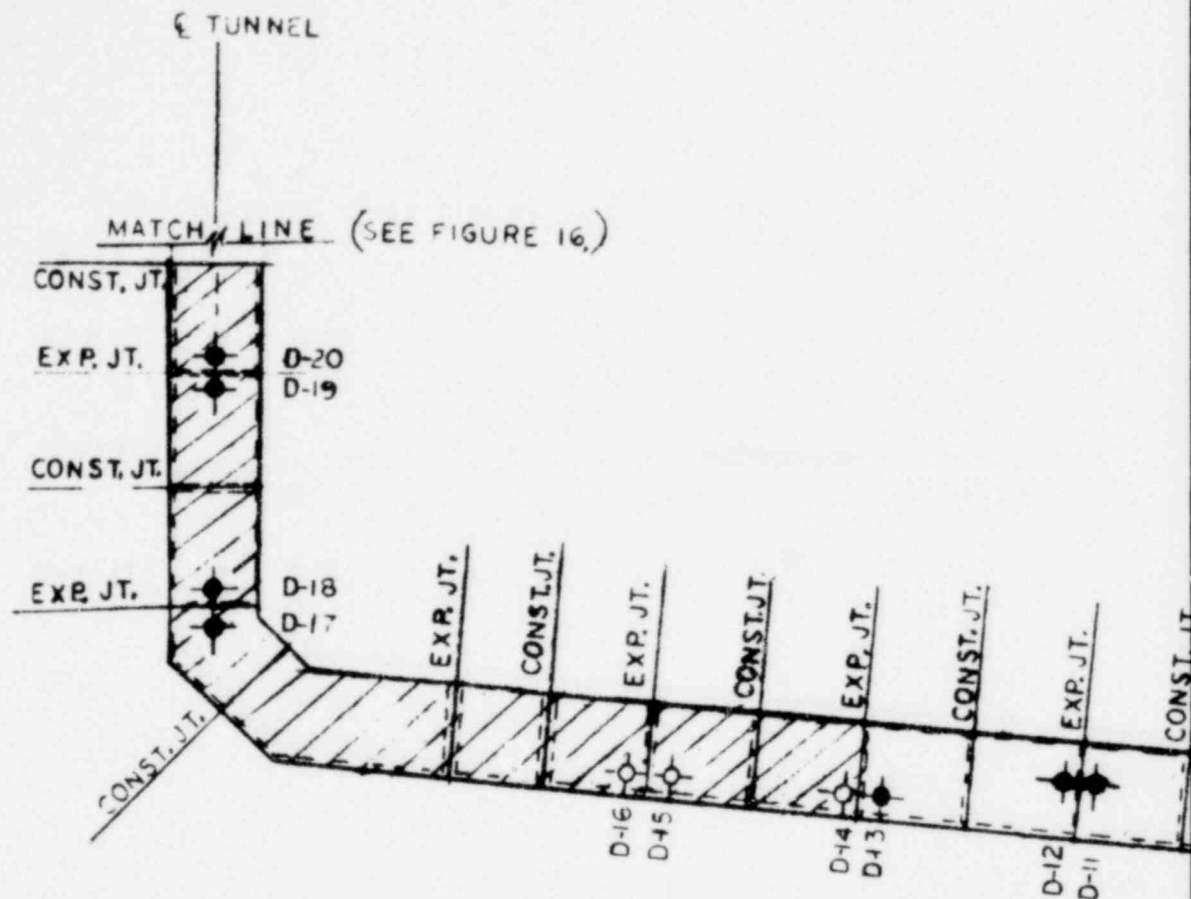
NOTES

1. $\diamond$ - INDICATES EXISTING SETTLEMENT MONITORING POINTS
2.  - TUNNEL SECTION COMPLETED
3. $\blacklozenge$ - SETTLEMENT MONITORING POINTS TO BE INSTALLED.



TURBINE





SCALE: 1"=8'

NOTES

1. ✧ EXISTING SETTLEMENT MONITORING POINTS.
2. ◆ SETTLEMENT MONITORING POINTS TO BE INSTALLED.
3. ▨ -TUNNEL SECTIONS COMPLETED.

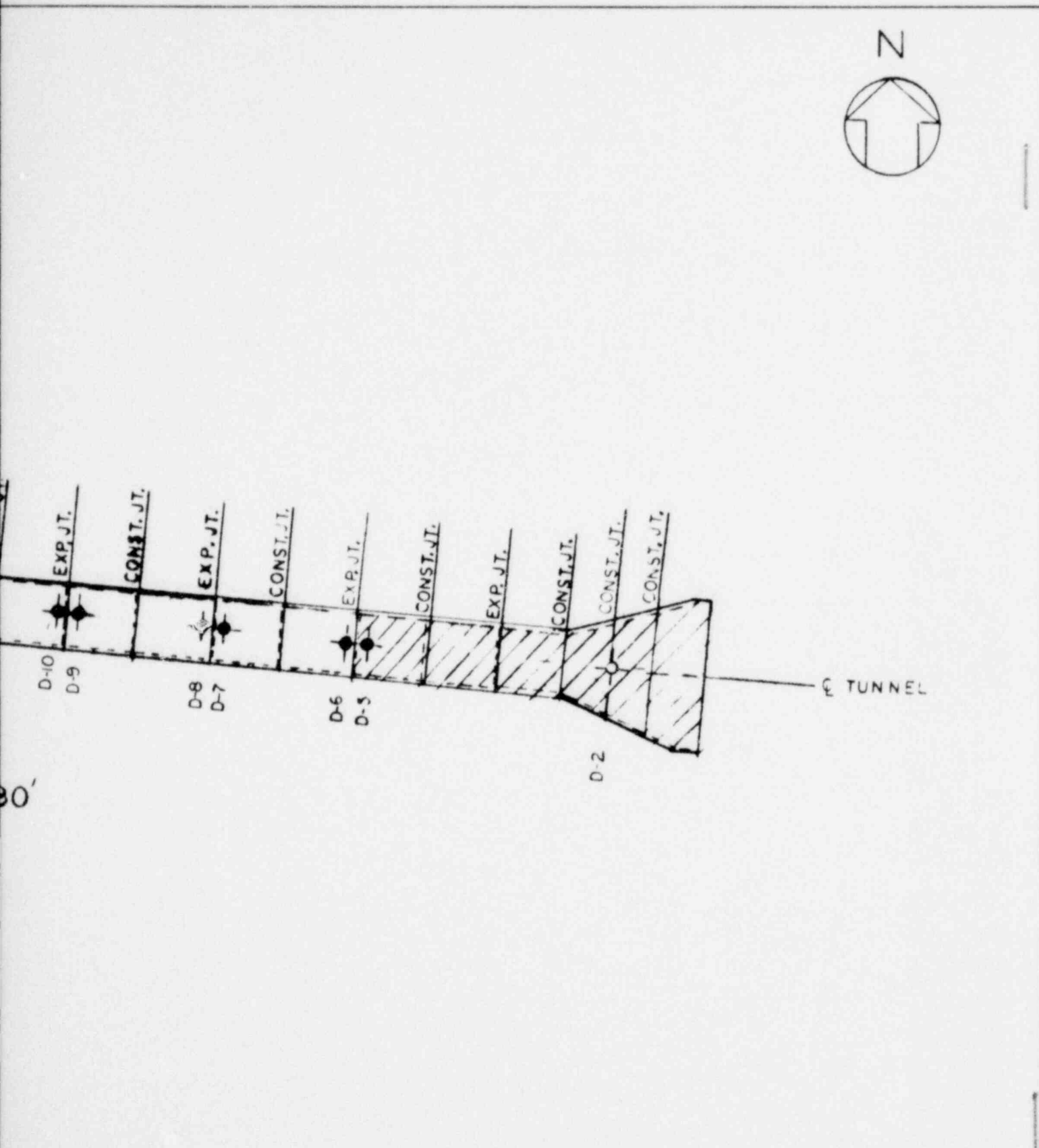


FIGURE 18A
 CIRCULATING WATER DISCHARGE TUNNEL
 SETTLEMENT MONITORING PROGRAM
 NORTH ANNA UNITS 3 AND 4 FEB 15 1980