Figure 2.5-181 — {Settlement Tracking Cross Sections}

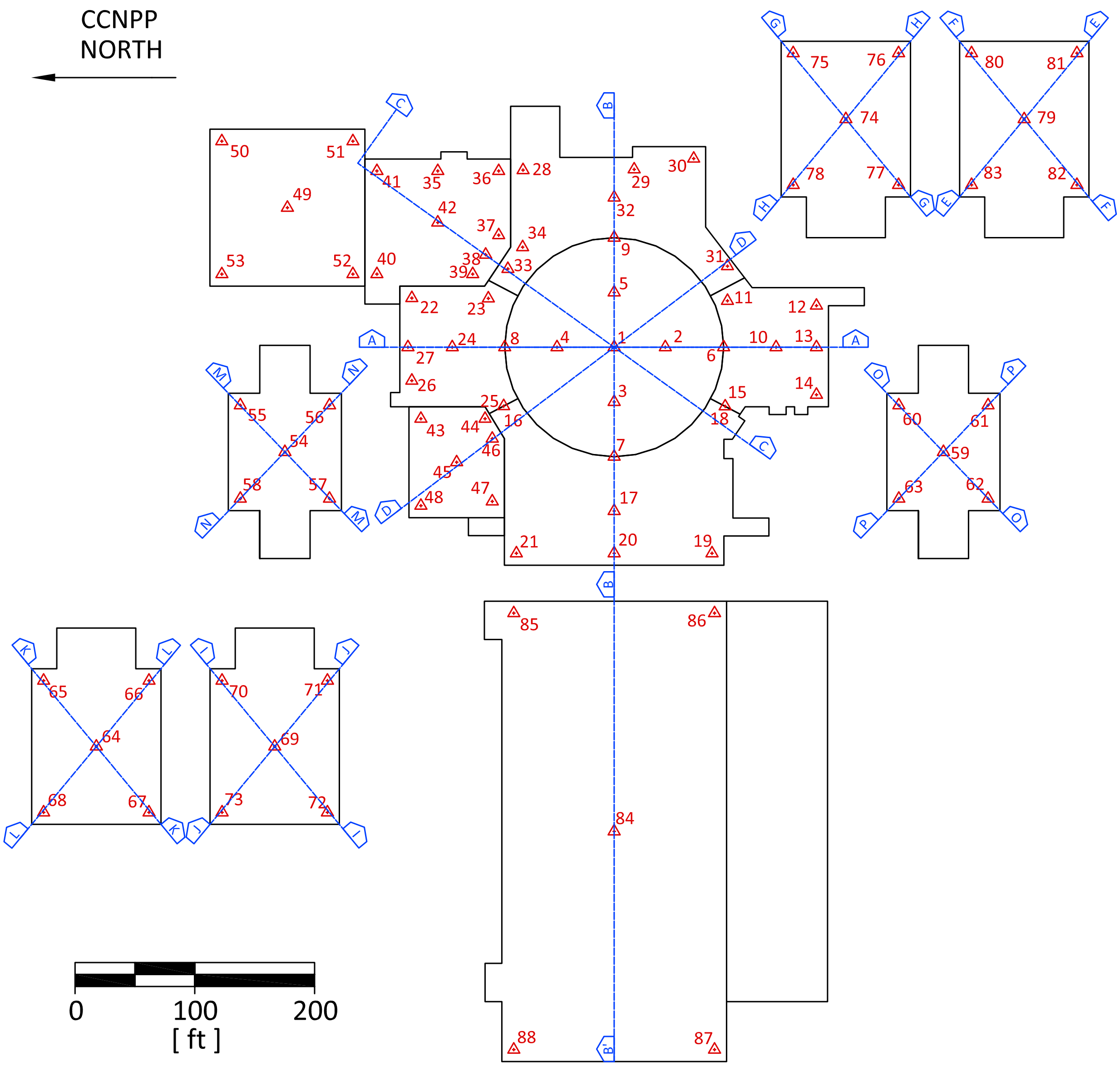


Figure 2.5-182 — {Foundation Settlement across NI and TB Footprint}

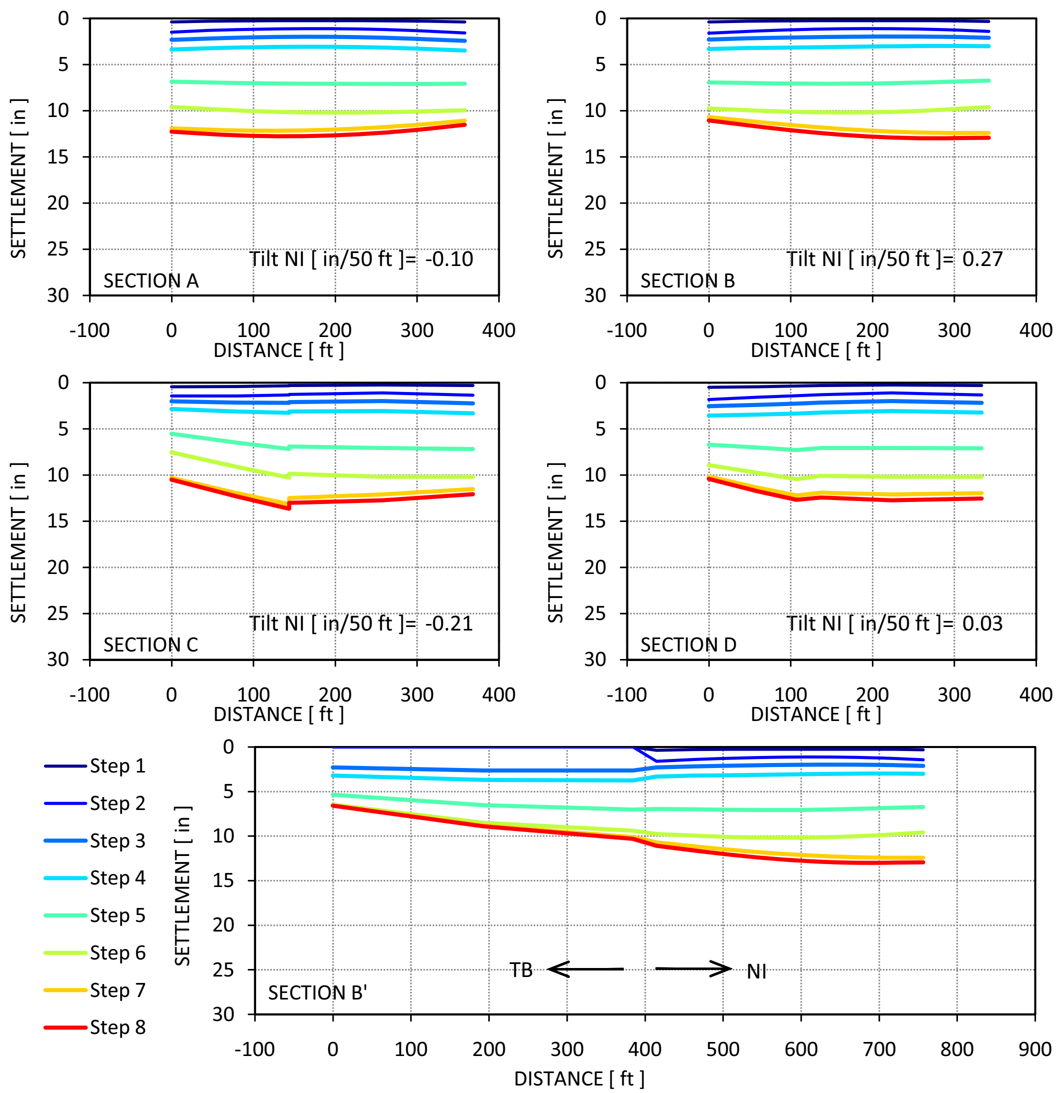


Figure 2.5-183 — {Settlement at Center of Facilities After Adjustment for Topography}

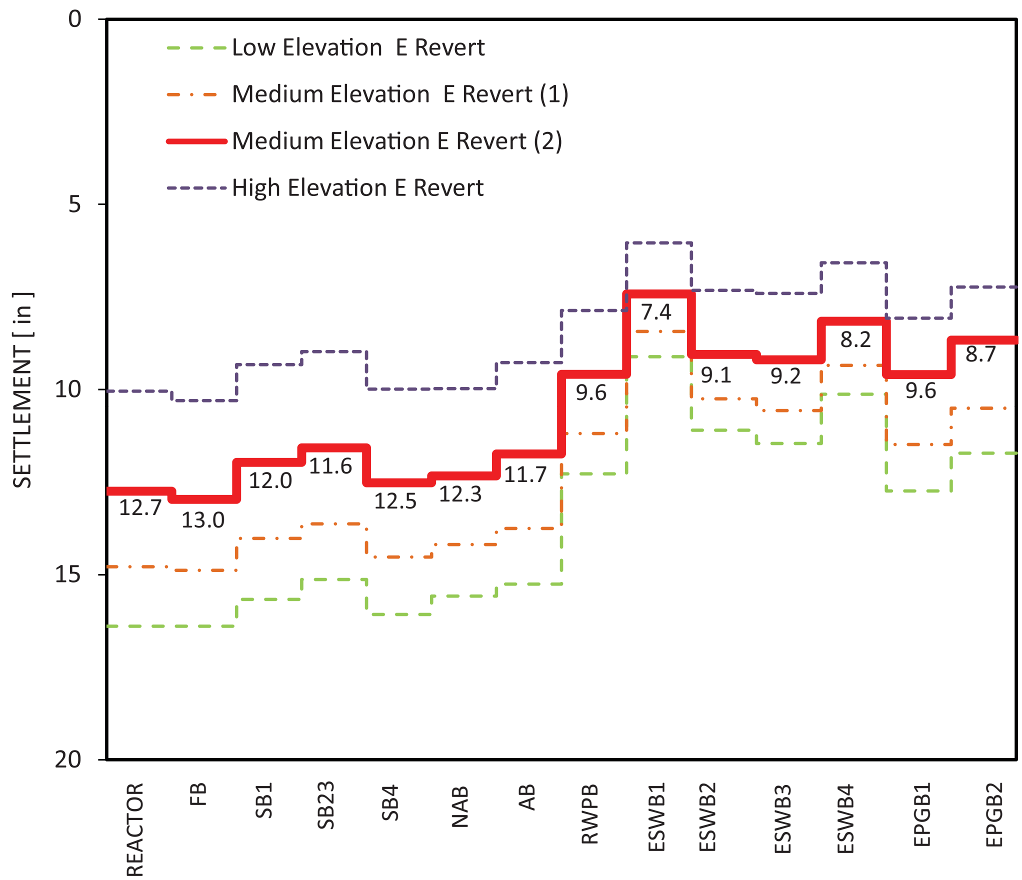
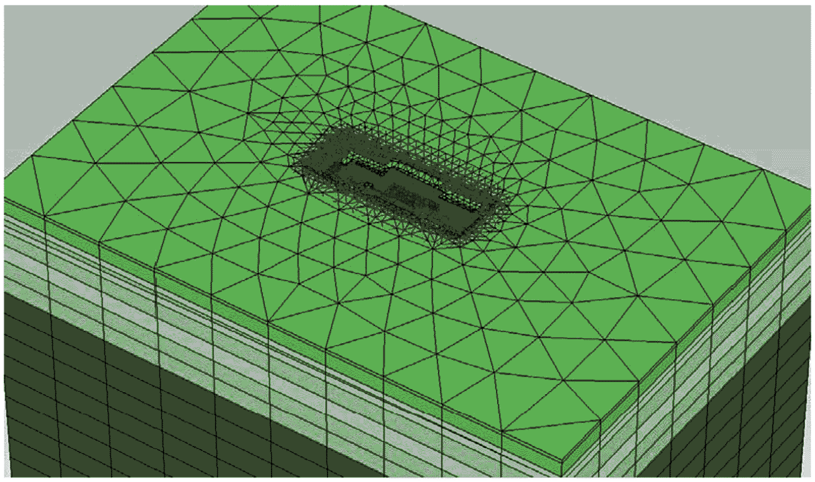
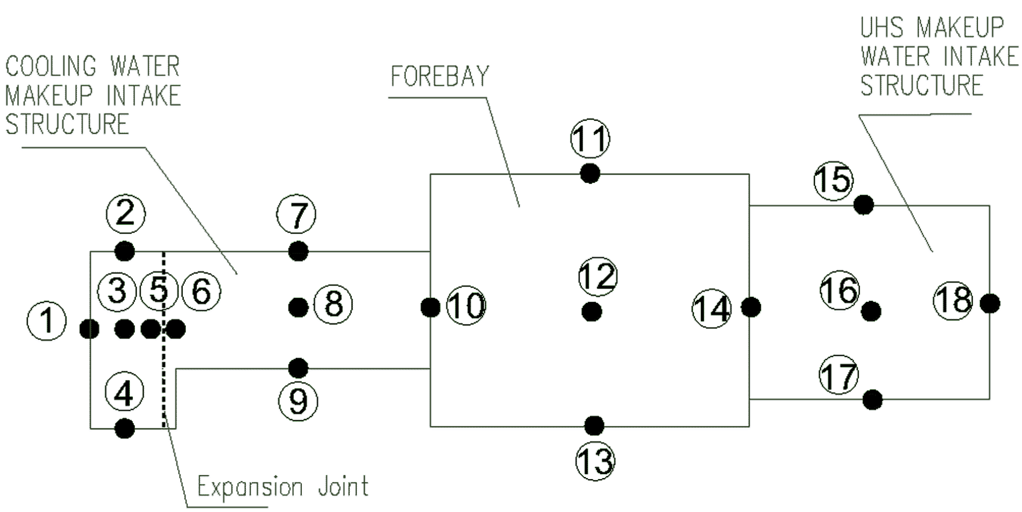


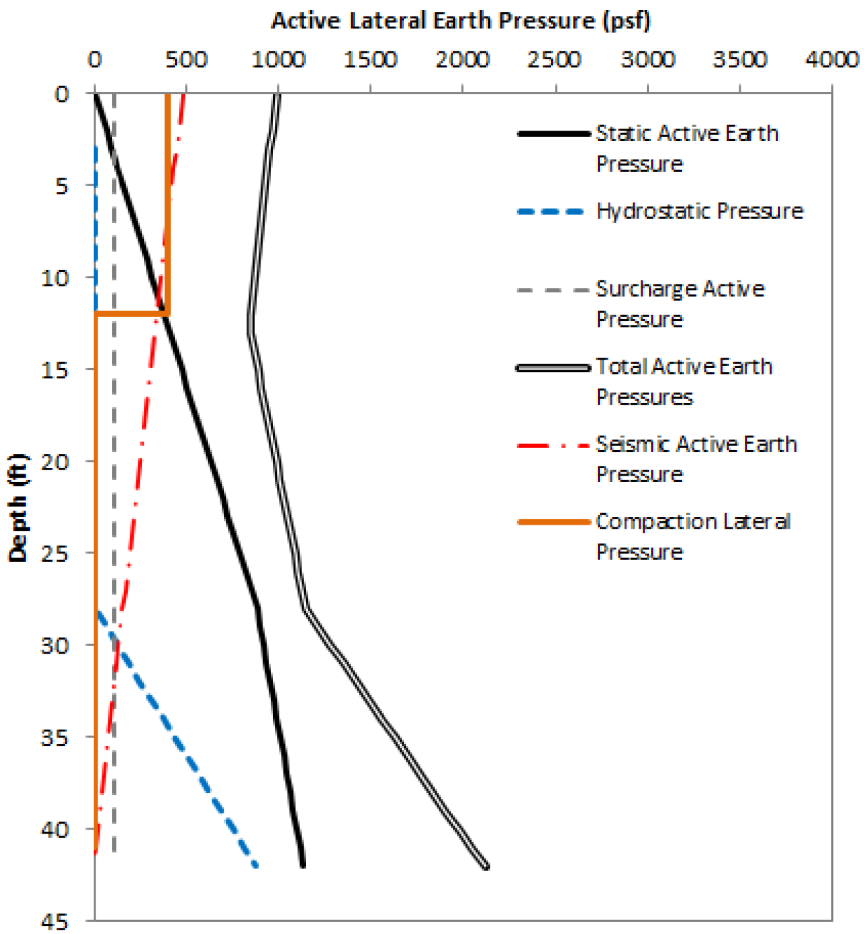
Figure 2.5-184 — {UHS FEM Model}





Note: Numbers correspond to the settlement and tilt calculation points in the settlement analysis model.

Figure 2.5-185 — {Earth Pressure Representative Diagrams}



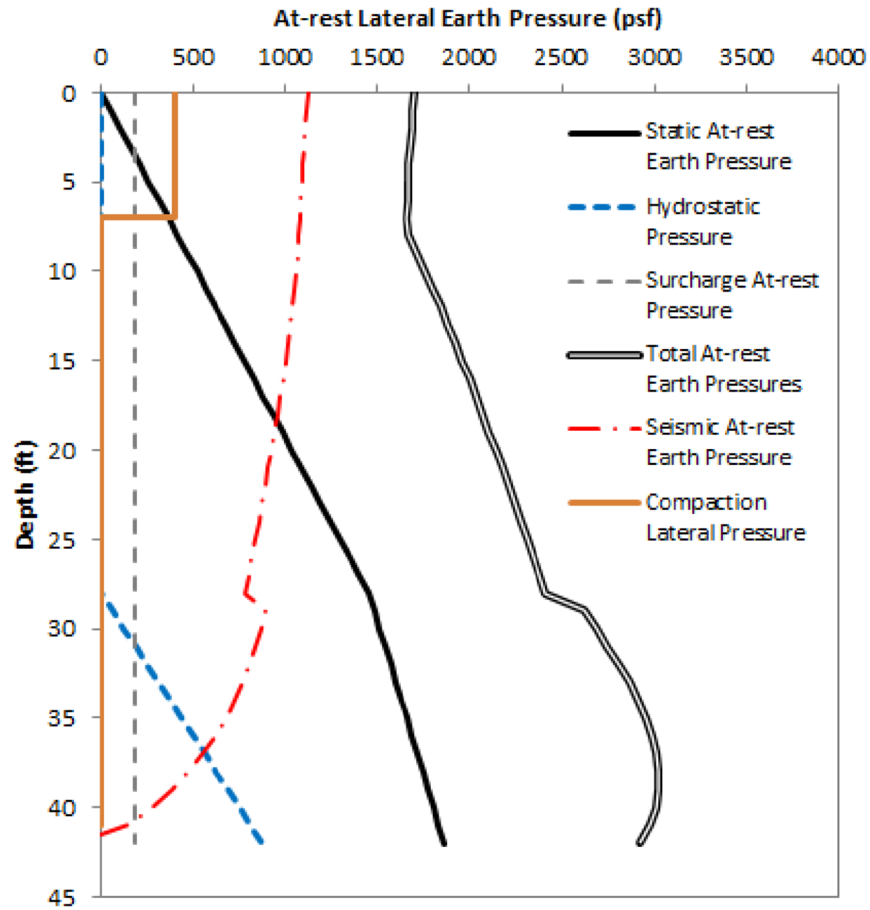


Figure 2.5-186 — {Site Grading Plan with Slope Cross-Sections}

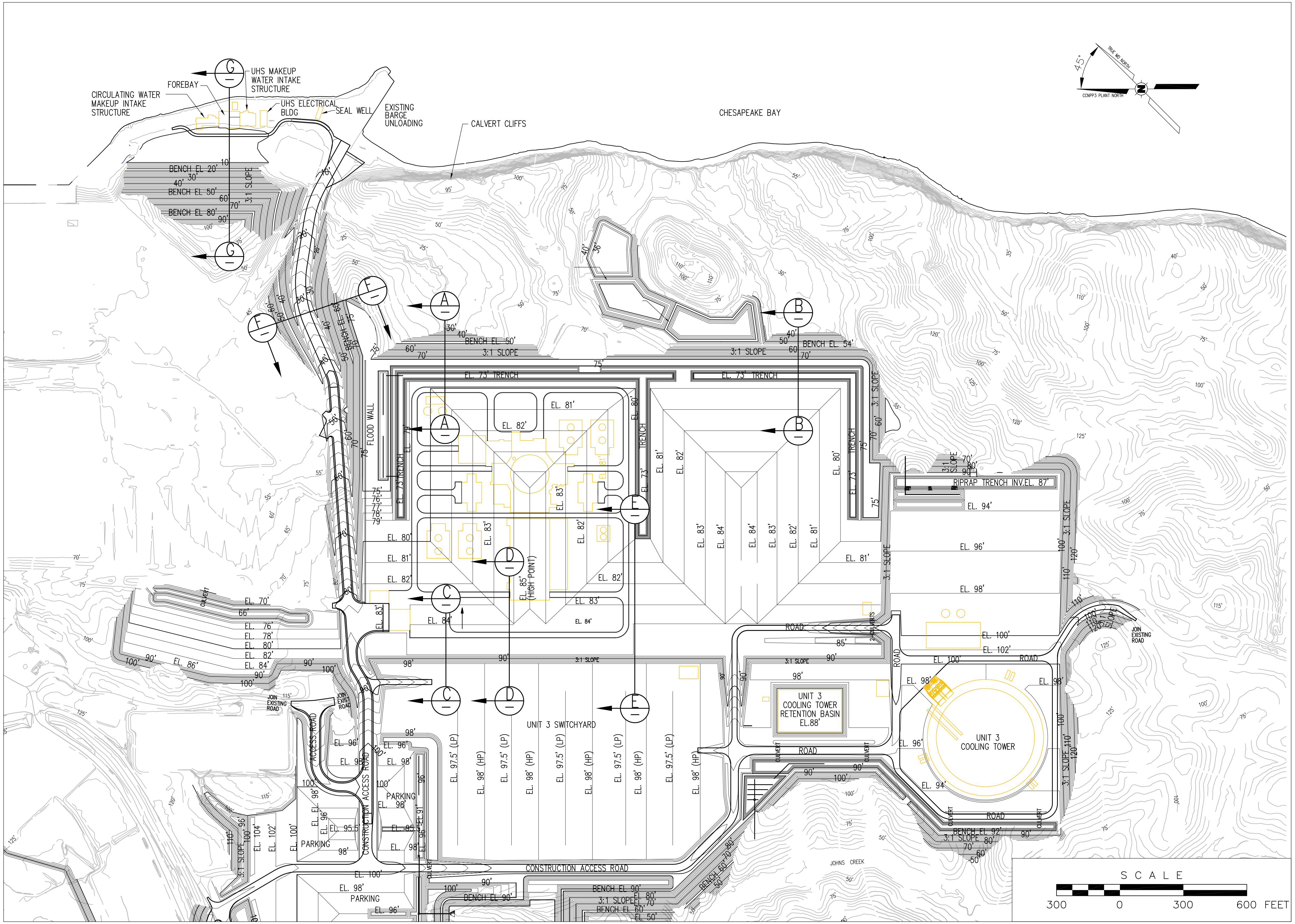


Figure 2.5-187 — {Cross-sections in Powerblock Area}

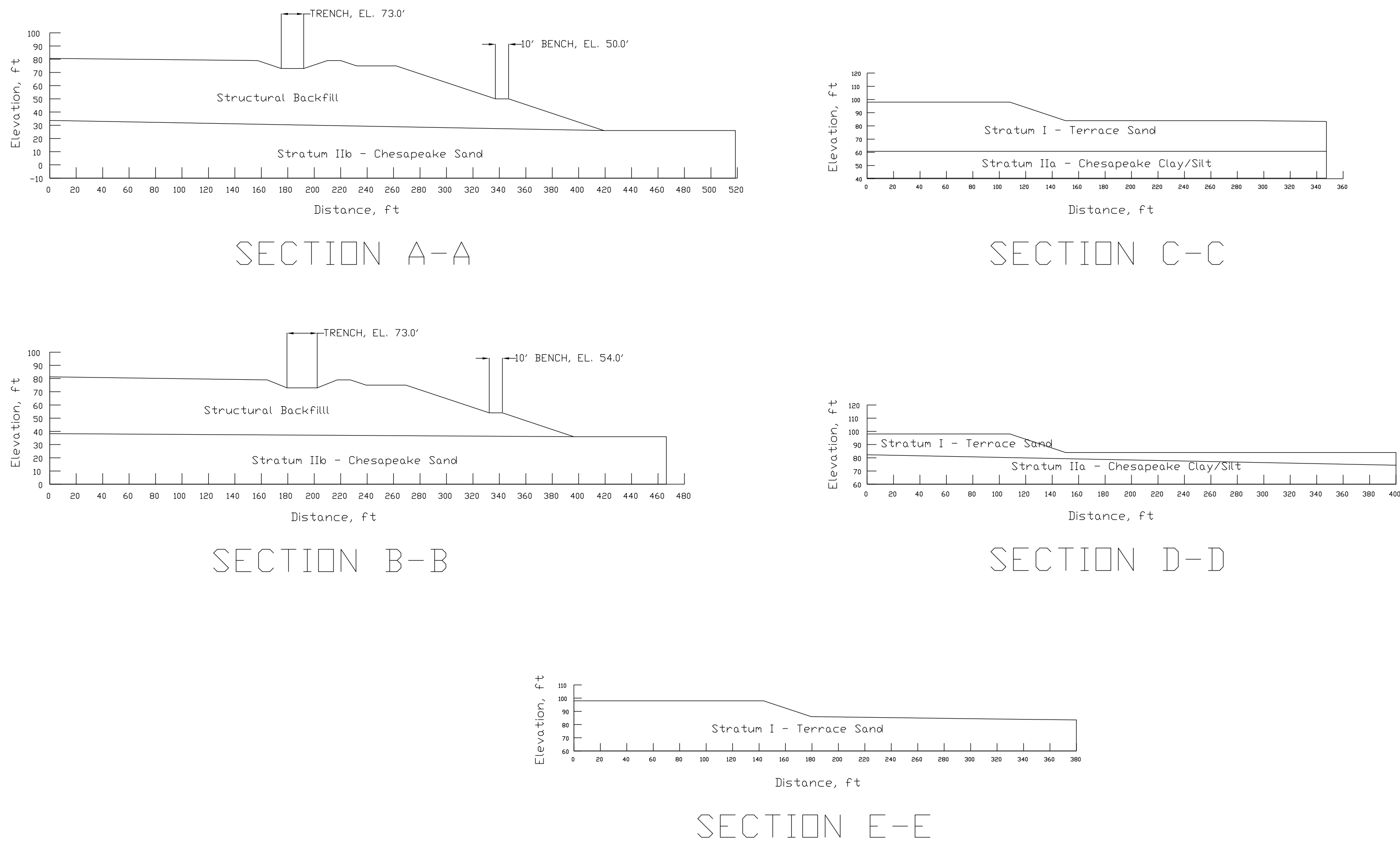


Figure 2.5-188 — {Cross-sections in Intake Area and Utility Corridor}

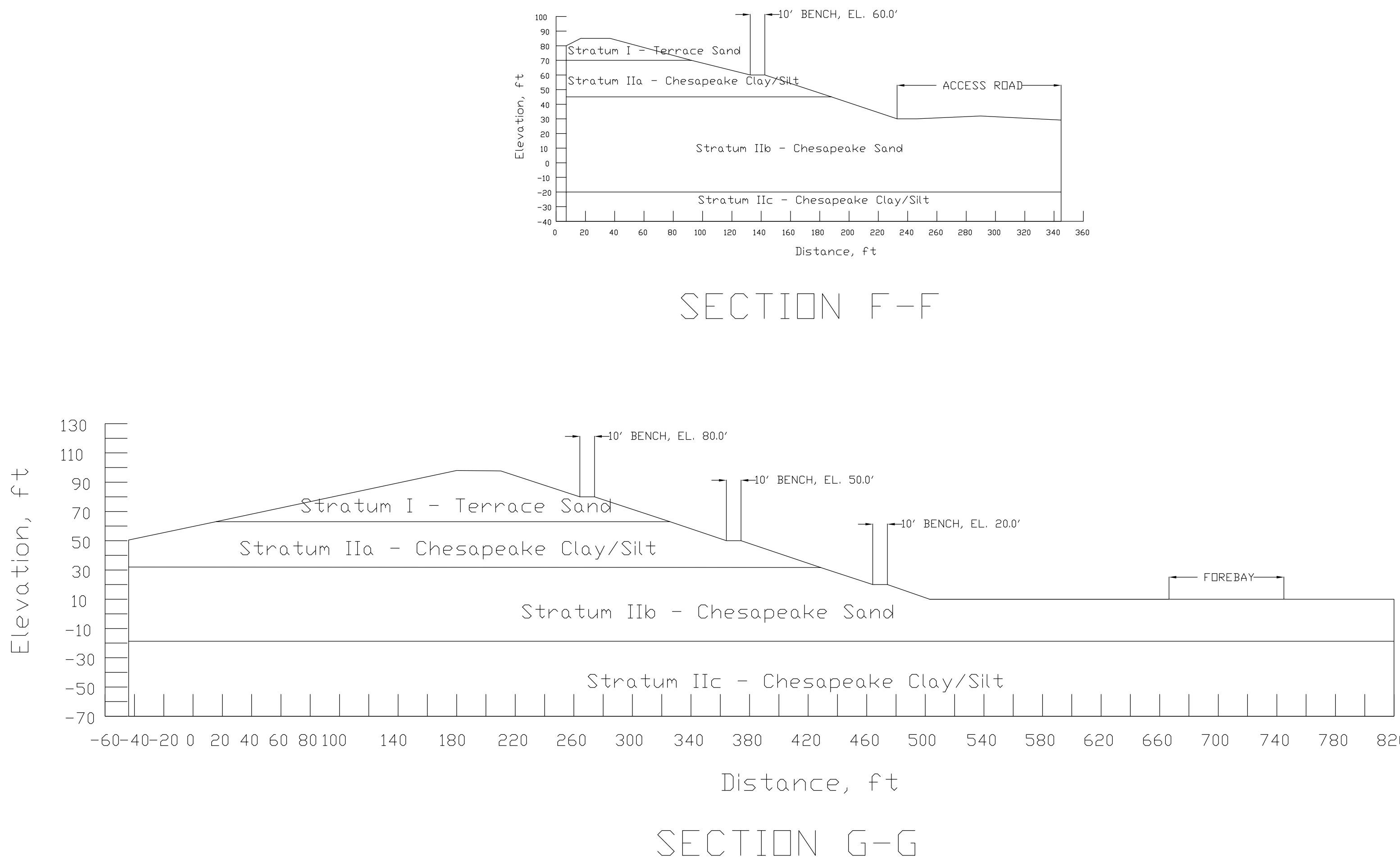


Figure 2.5-189 — {Location of Excavation Cross-sections in CCNPP Unit 3}

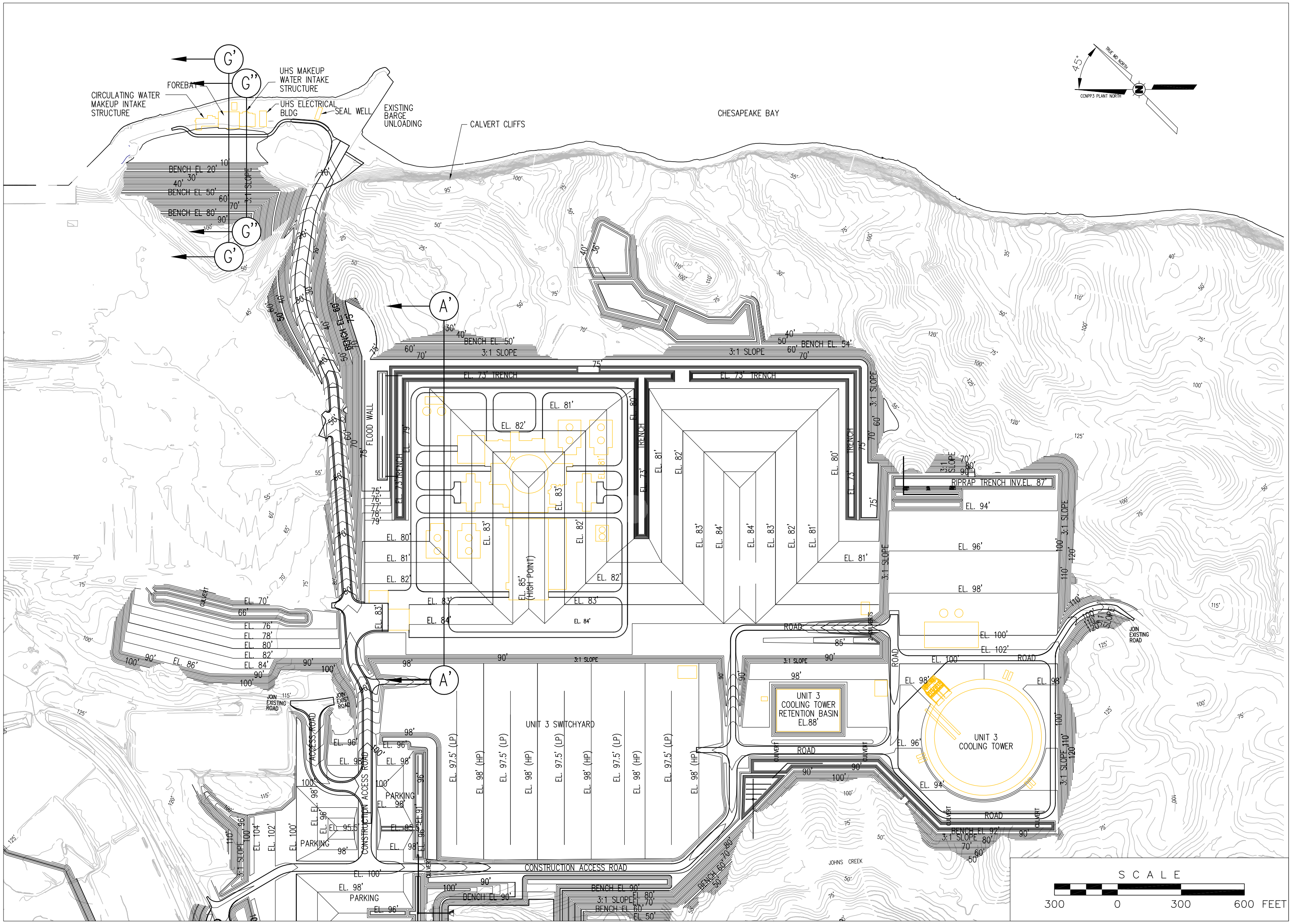


Figure 2.5-190 — {Excavation Cross-sections in CCNPP Unit 3}

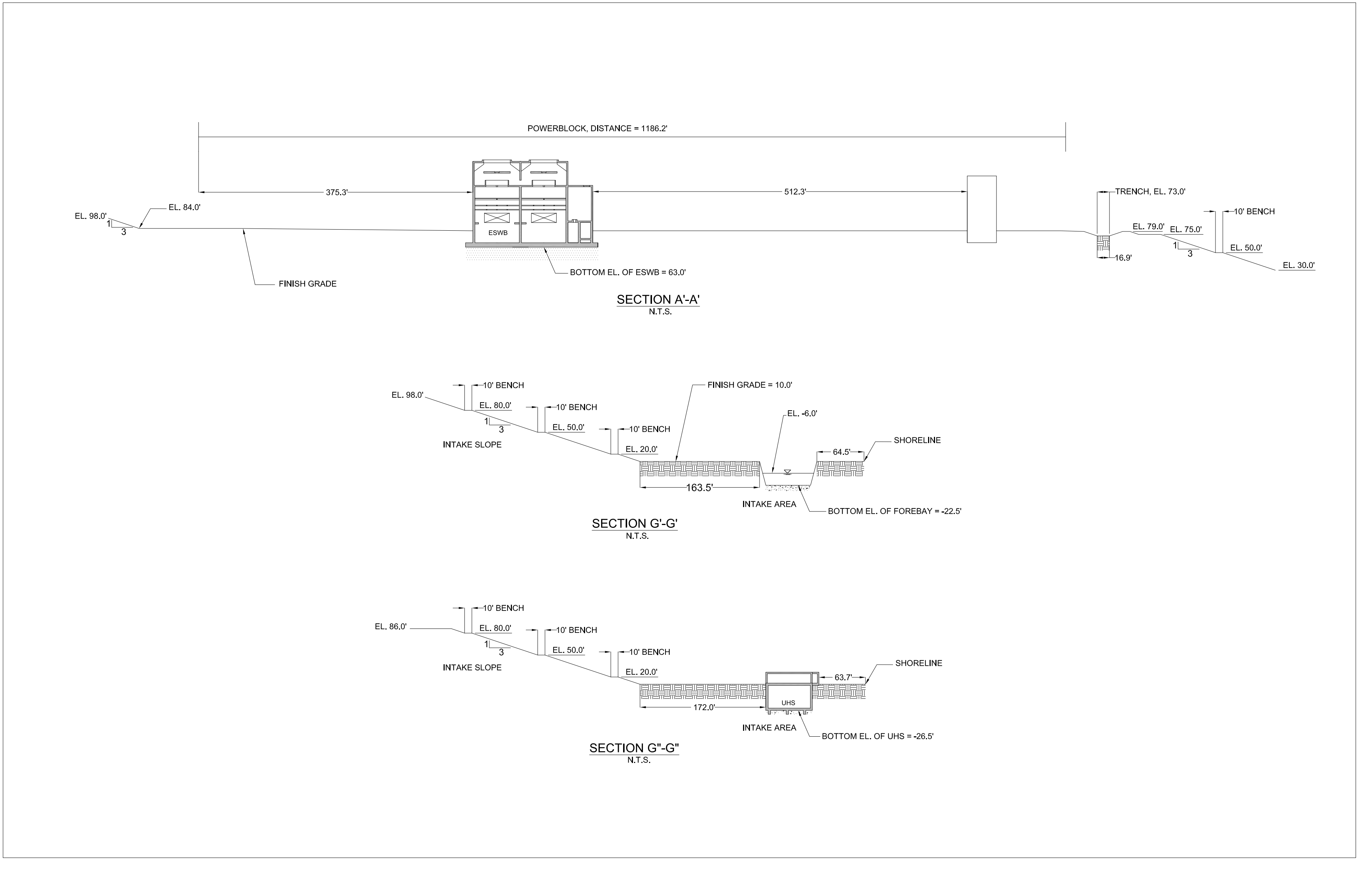
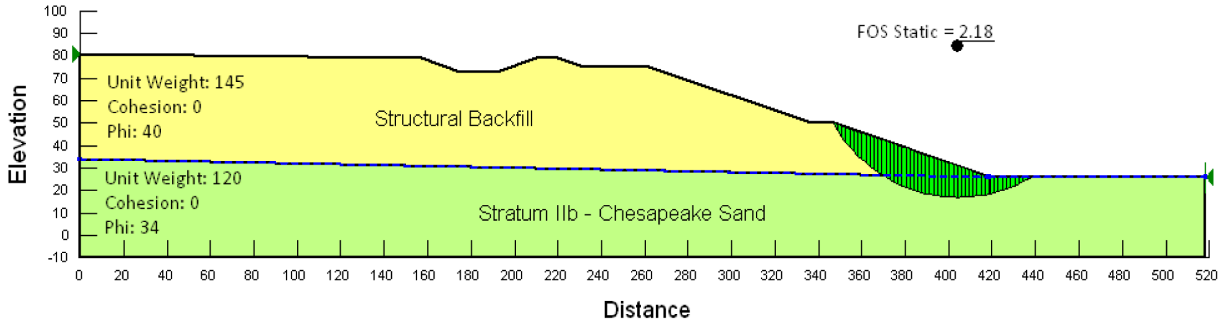
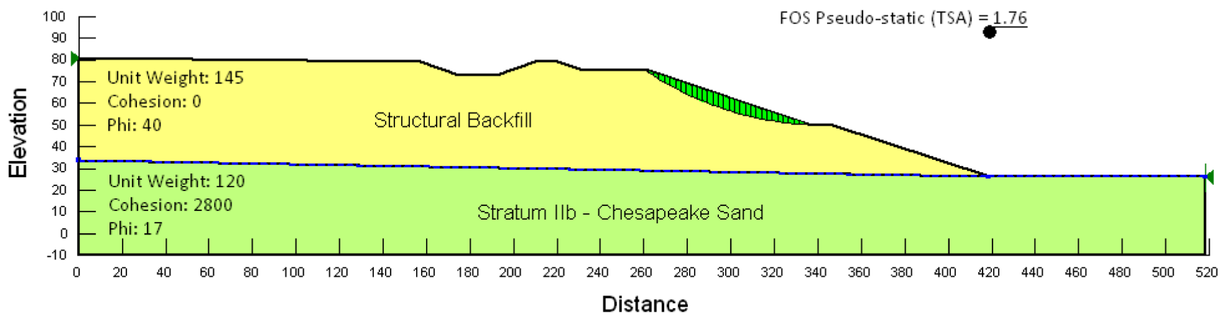


Figure 2.5-191 — {Static and Pseudo-Static Stability Analyses of Slope Section A - Case a}





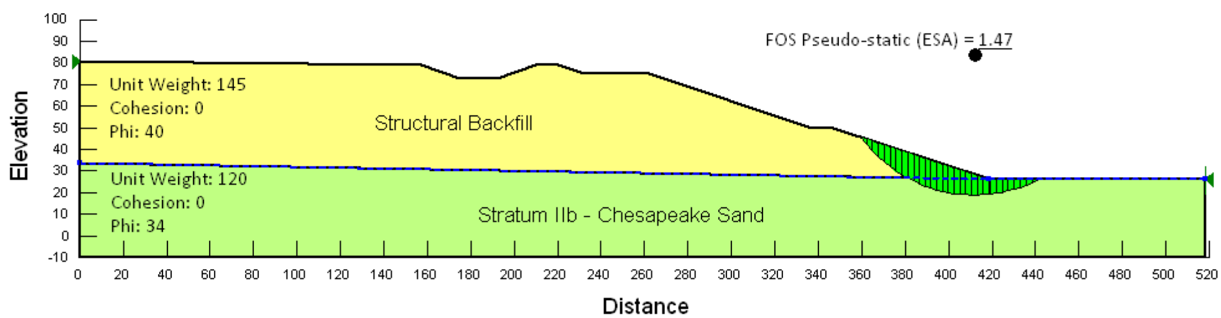
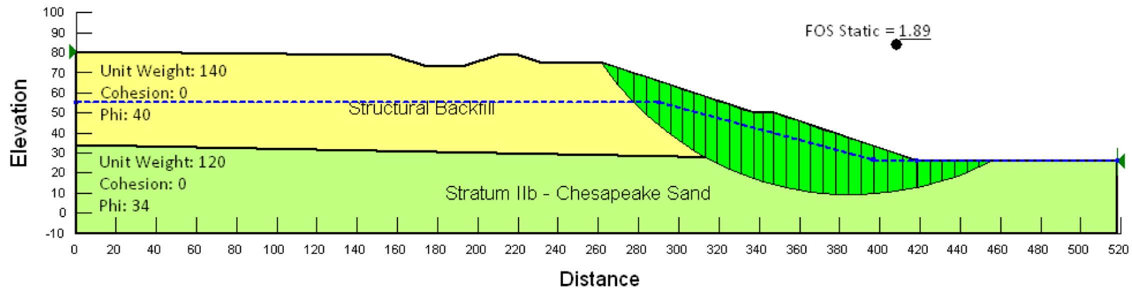
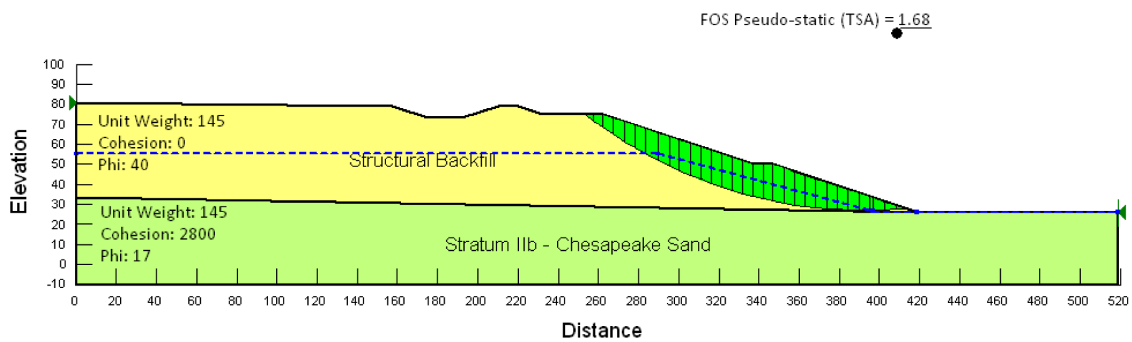


Figure 2.5-192 — {Static and Pseudo-Static Stability Analyses of Slope Section A - Case b}





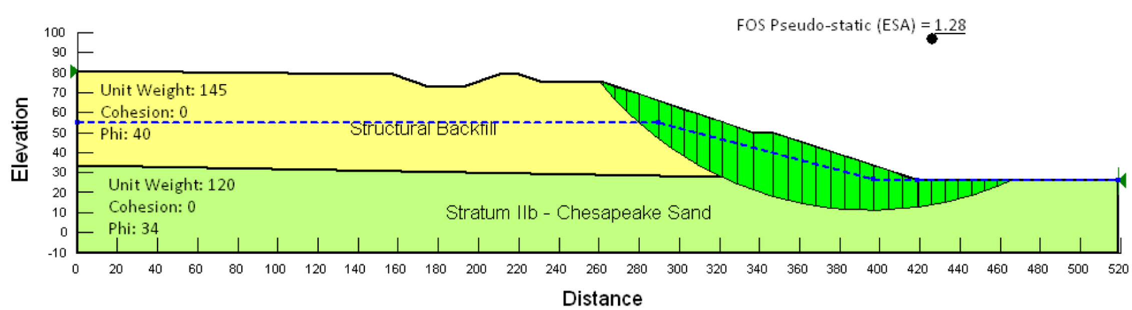


Figure 2.5-193 — {Static and Pseudo-Static Stability Analyses of Slope Section B - Case a}

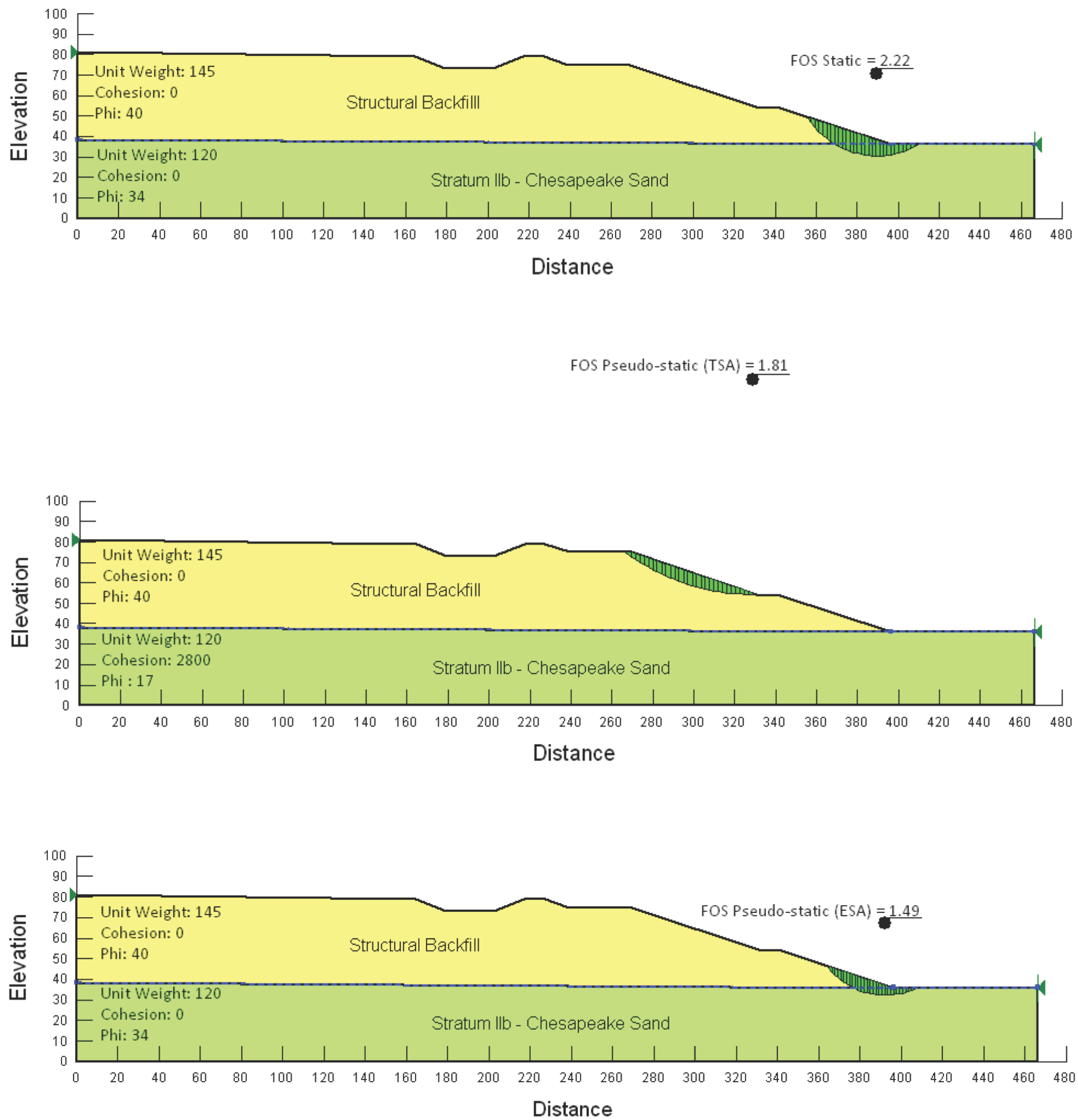


Figure 2.5-194 — {Static and Pseudo-Static Stability Analyses of Slope Section B - Case b}

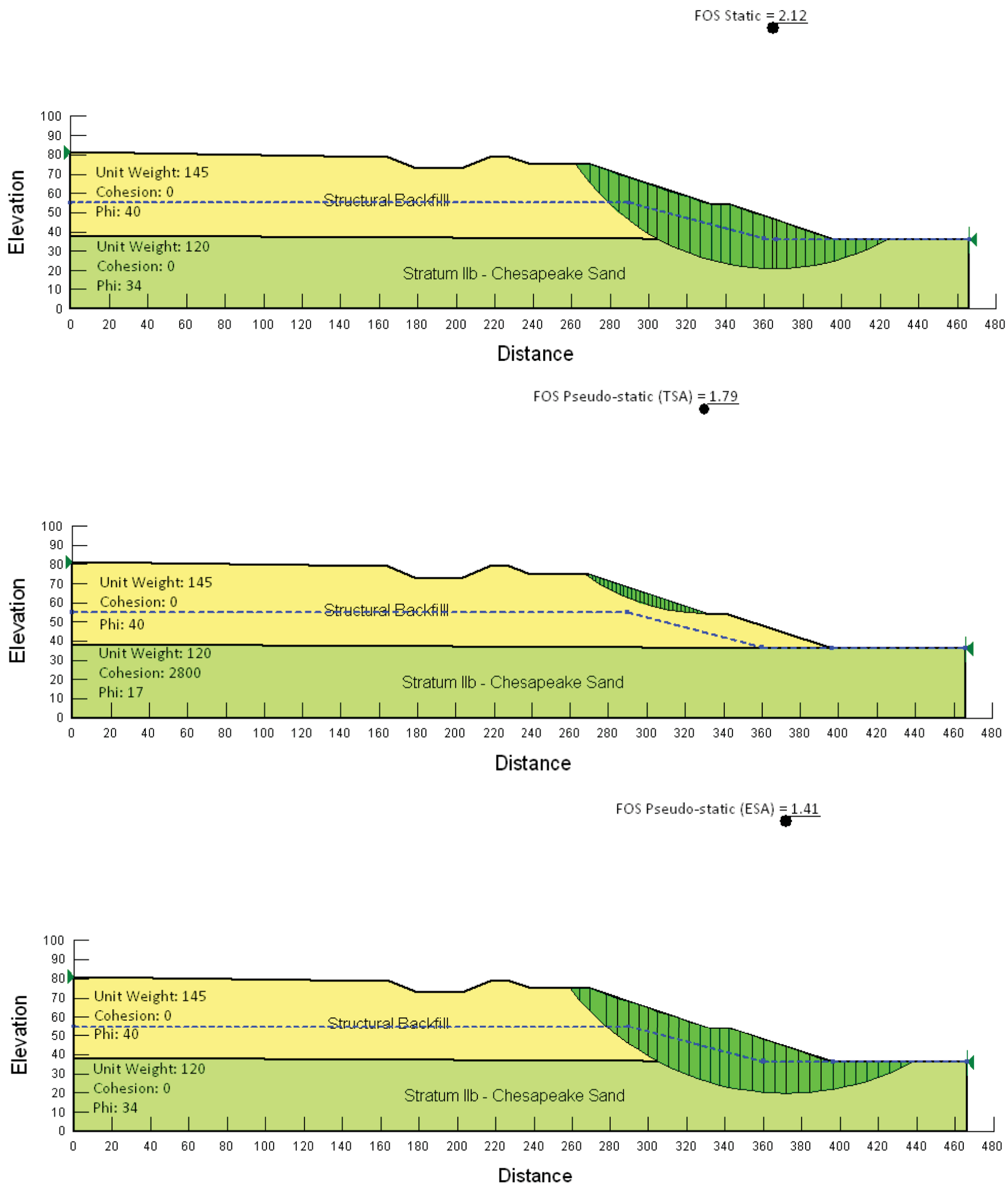


Figure 2.5-195 — {Static and Pseudo-Static Stability Analyses of Slope Section C}

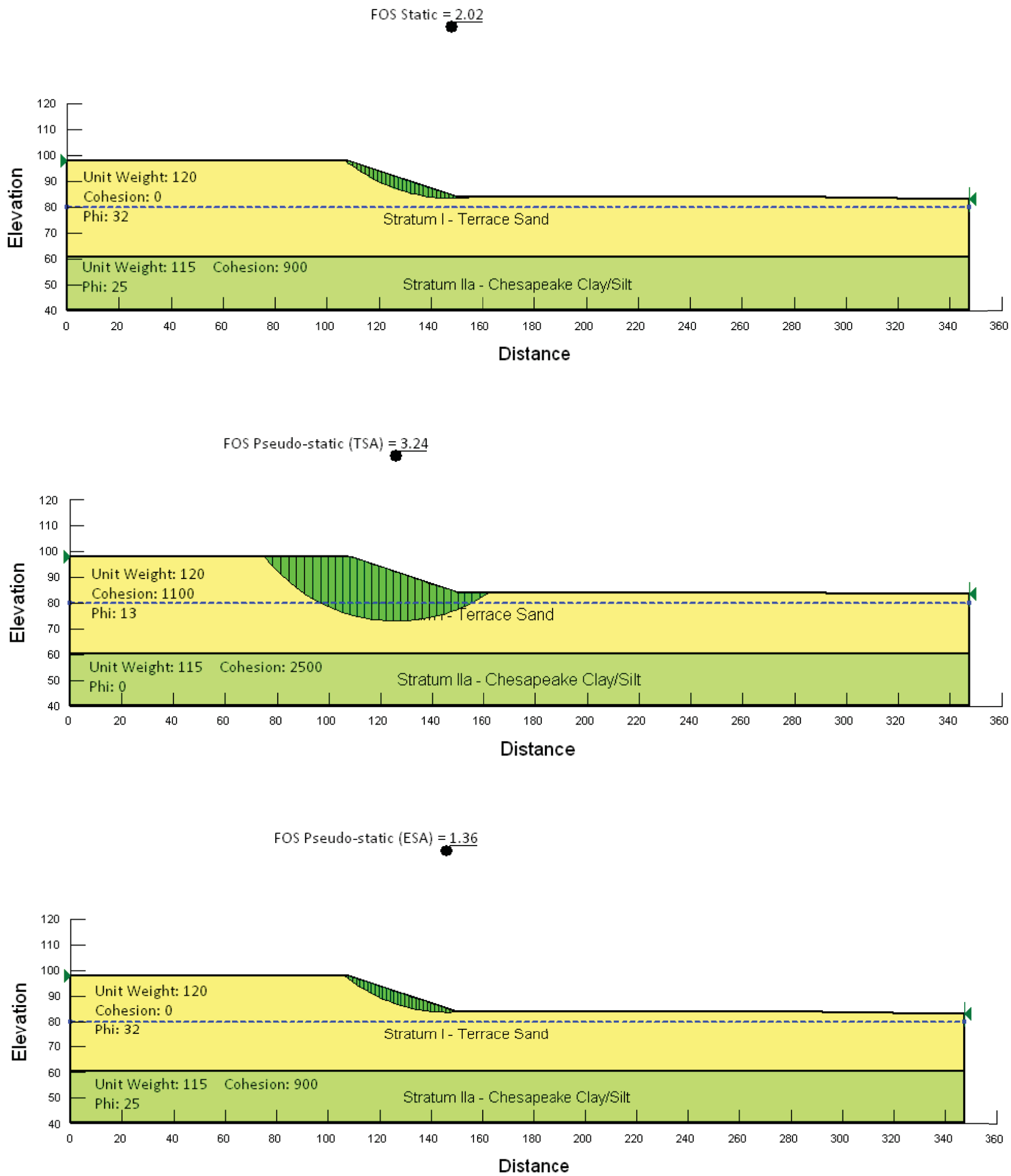


Figure 2.5-196 — {Static and Pseudo-Static Stability Analyses of Slope Section D}

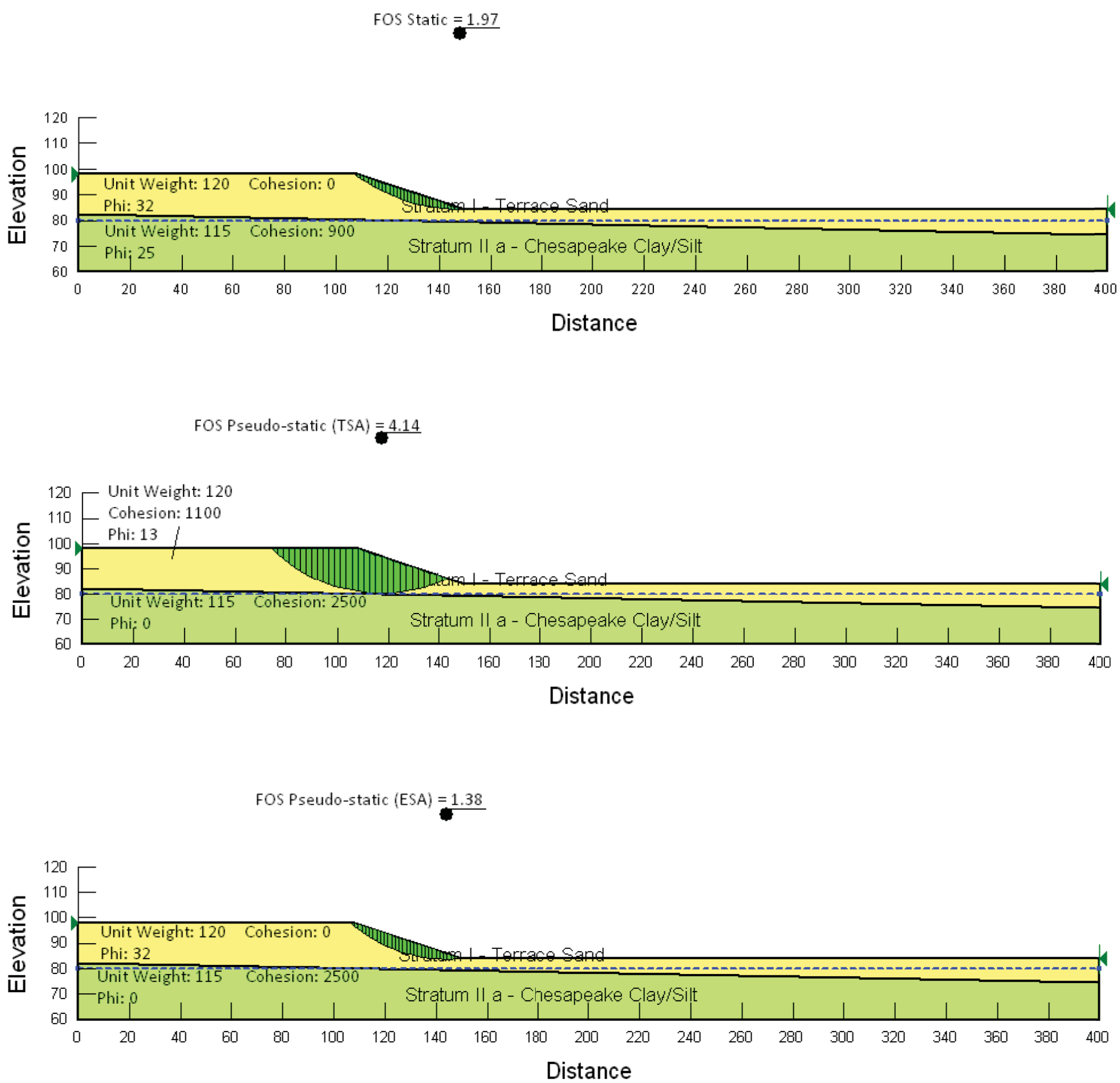


Figure 2.5-197 — {Static and Pseudo-Static Stability Analyses of Slope Section E}

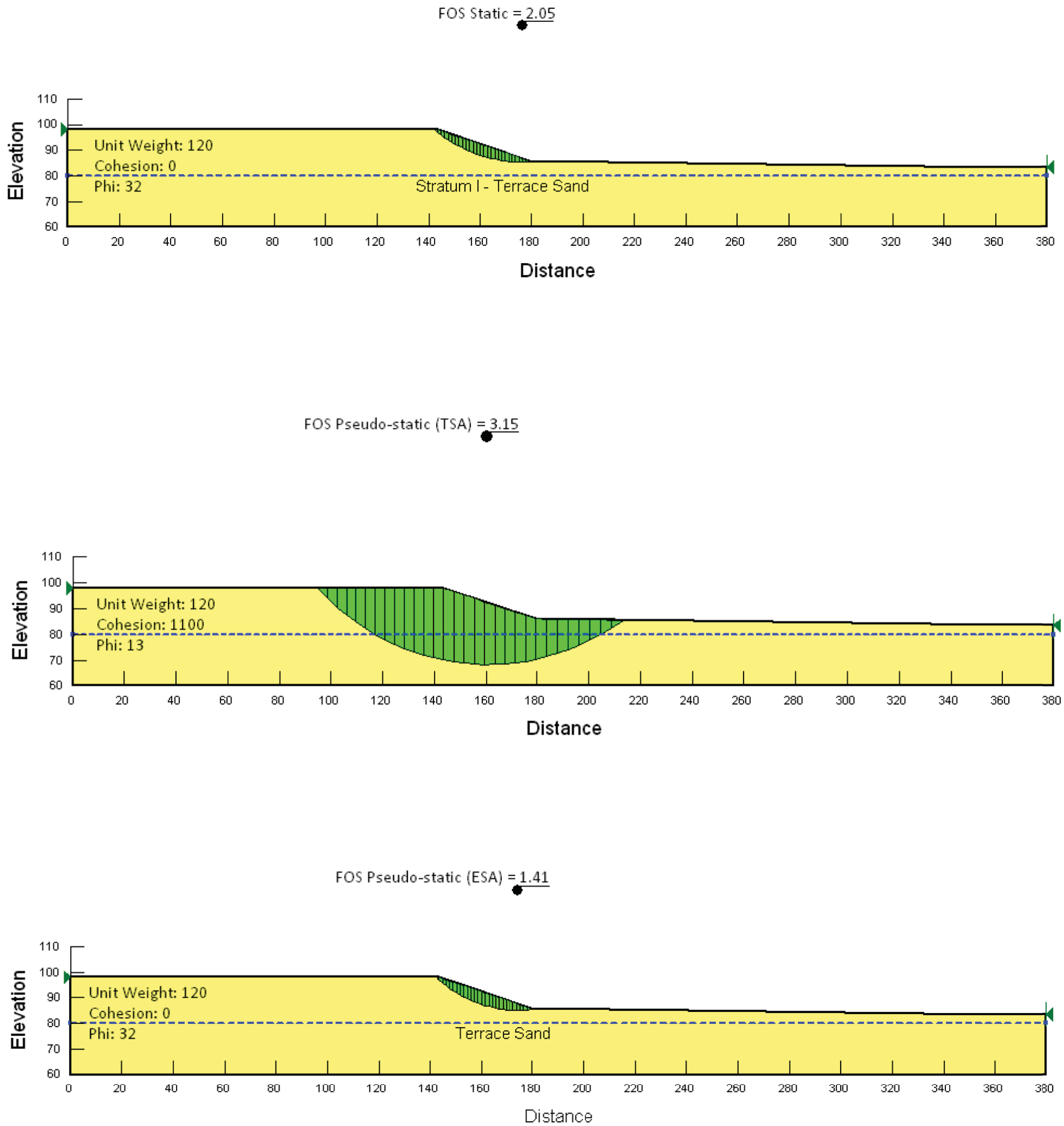


Figure 2.5-198 — {Static and Pseudo-Static Stability Analyses of Slope Section F (Utility Corridor)}

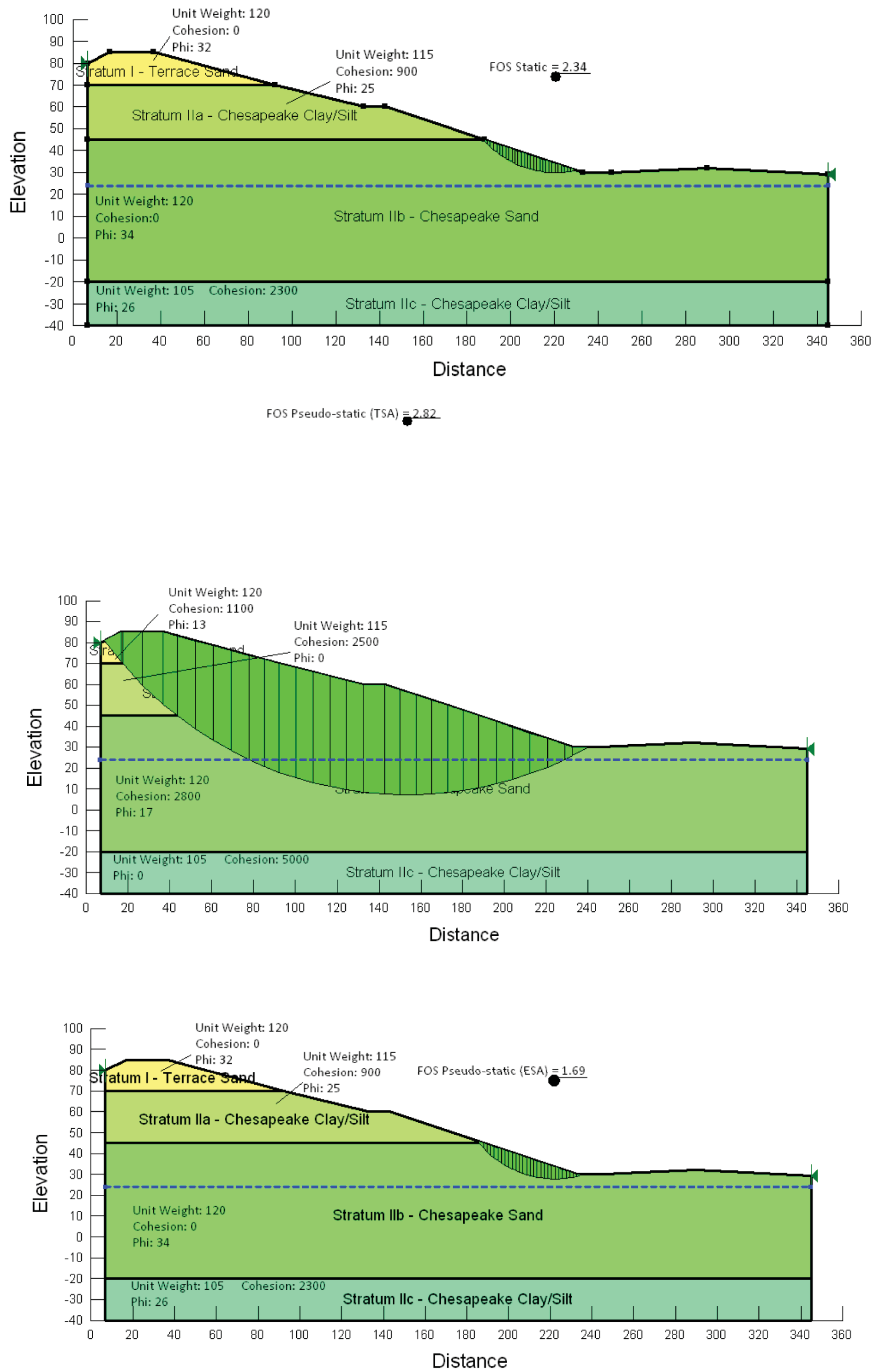
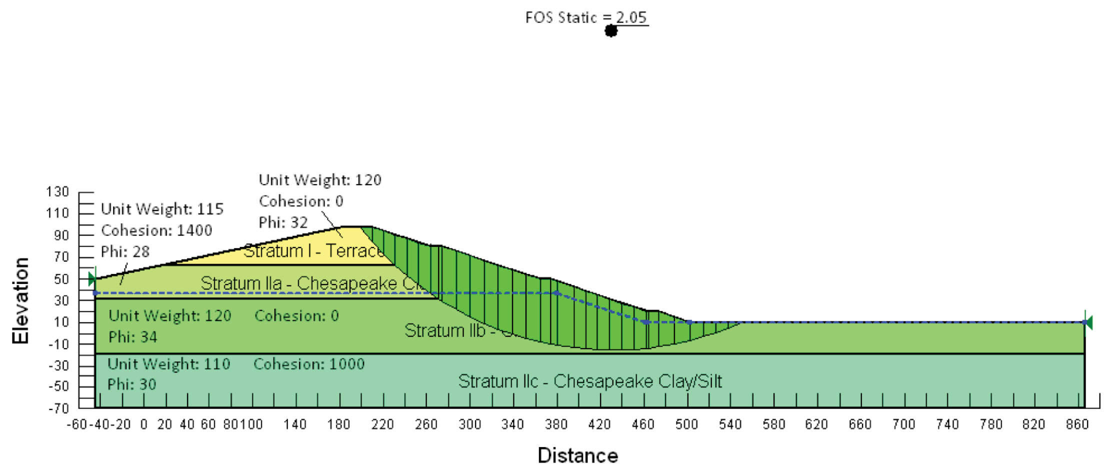
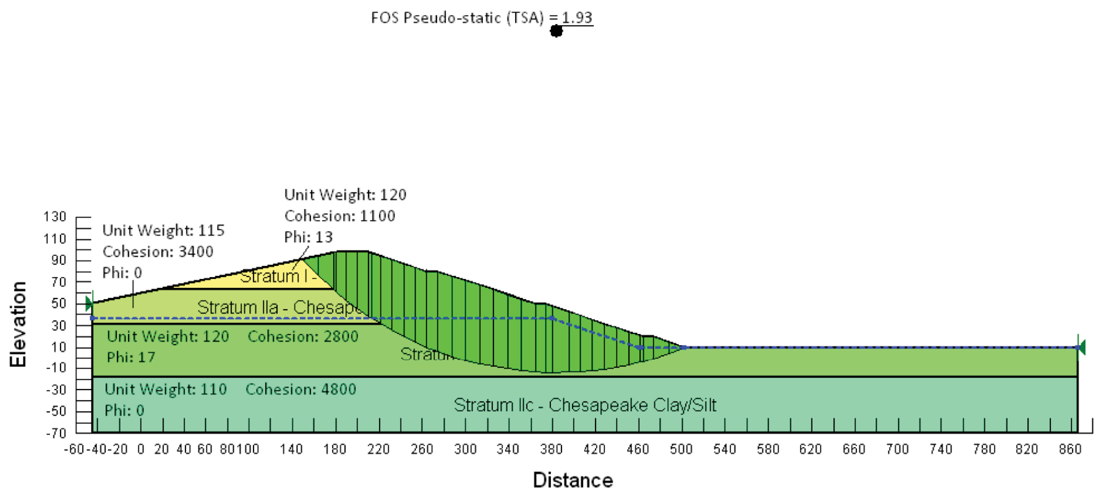


Figure 2.5-199 — {Static and Pseudo-Static Stability Analyses of Slope Section G (Intake Area)}





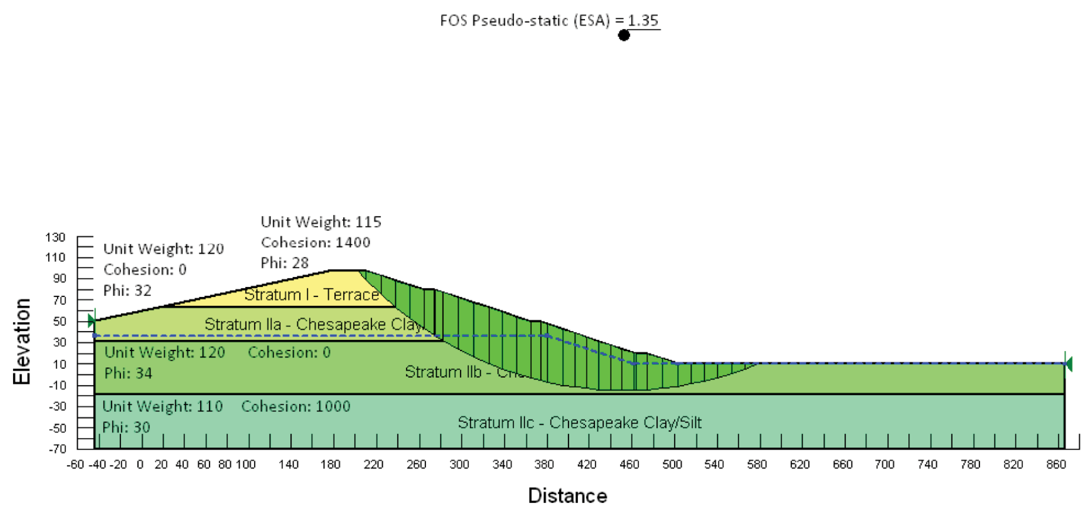


Figure 2.5-200 — {Outline of the Appalachian Orogen and its Major Subdivisions along the Eastern North American Continent}

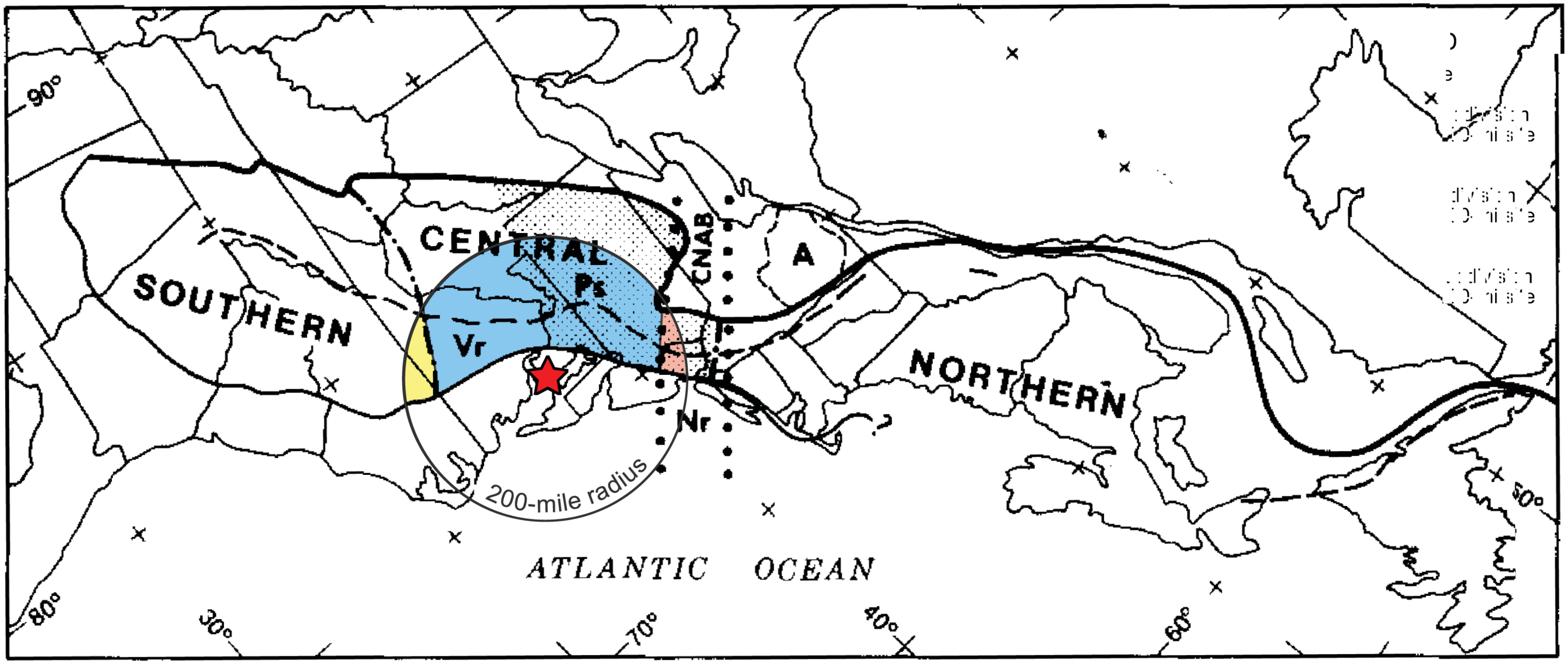


Figure 2.5-201 — {Appalachian Orogen}

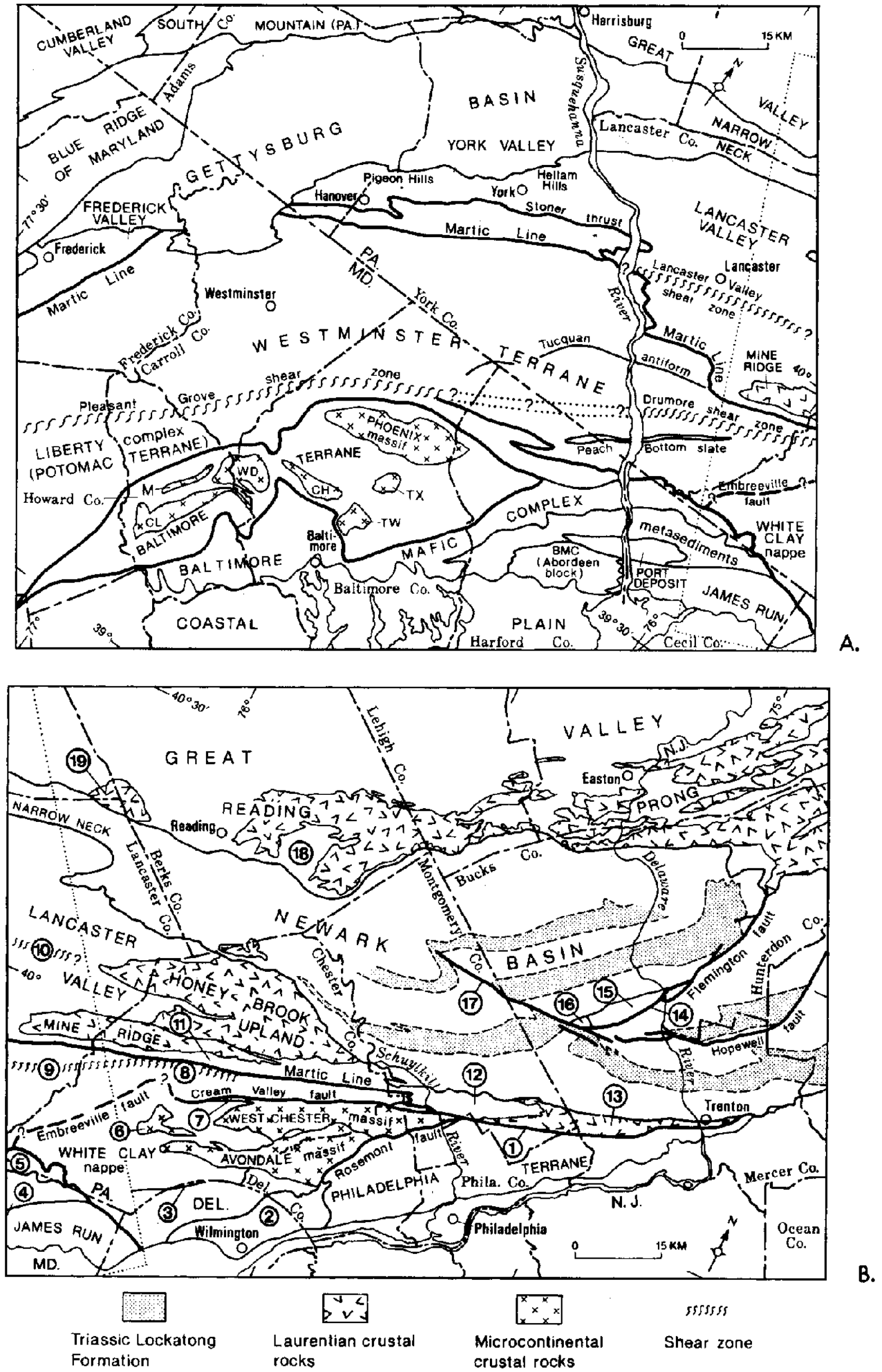


Figure 2.5-202 — {Laurentian-Margin Subdivision and other Tectonic Elements of the Southeast of the Blue Mountain Front}

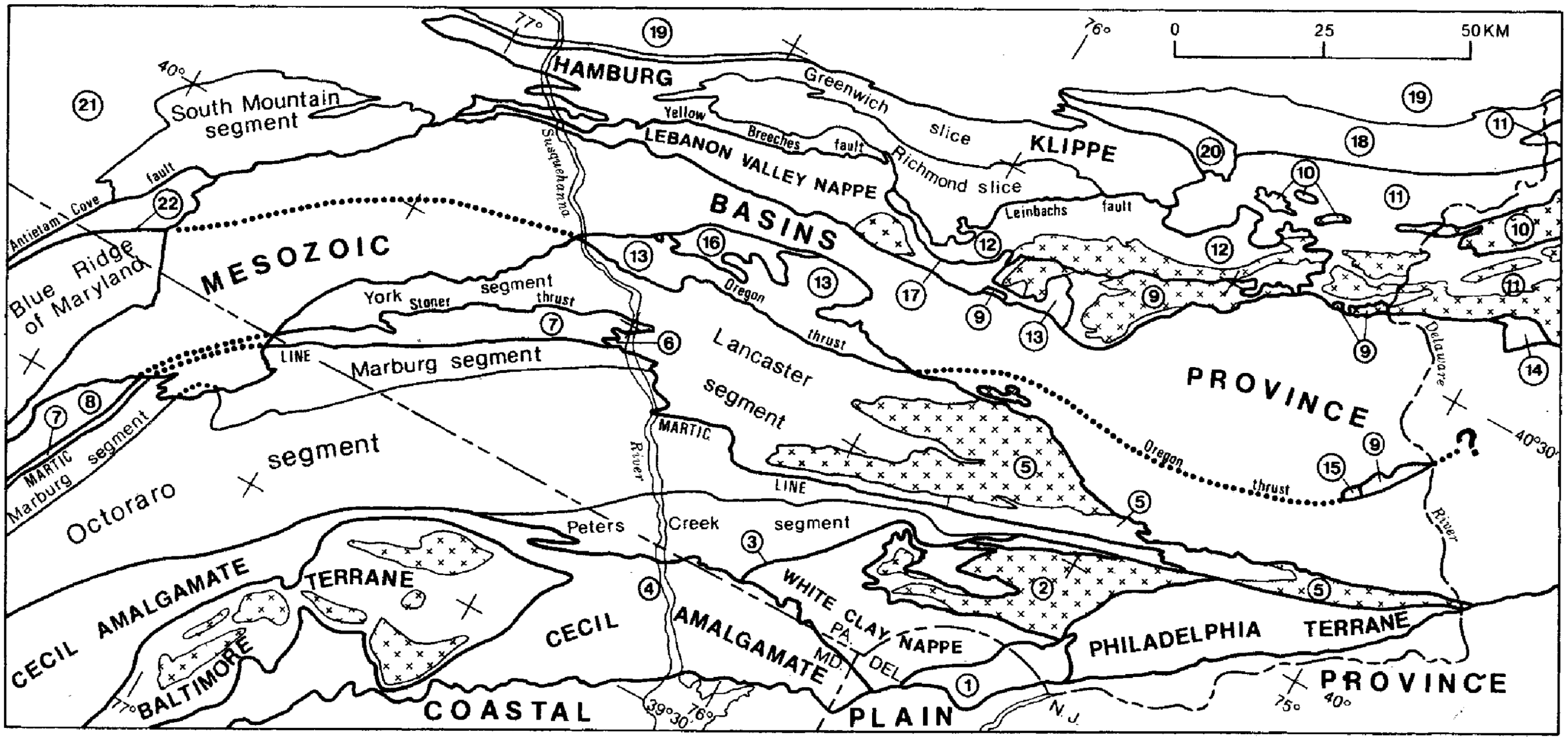


Figure 2.5-203 — {Schematic Map Showing the Relative Positions of Exotic Terranes}

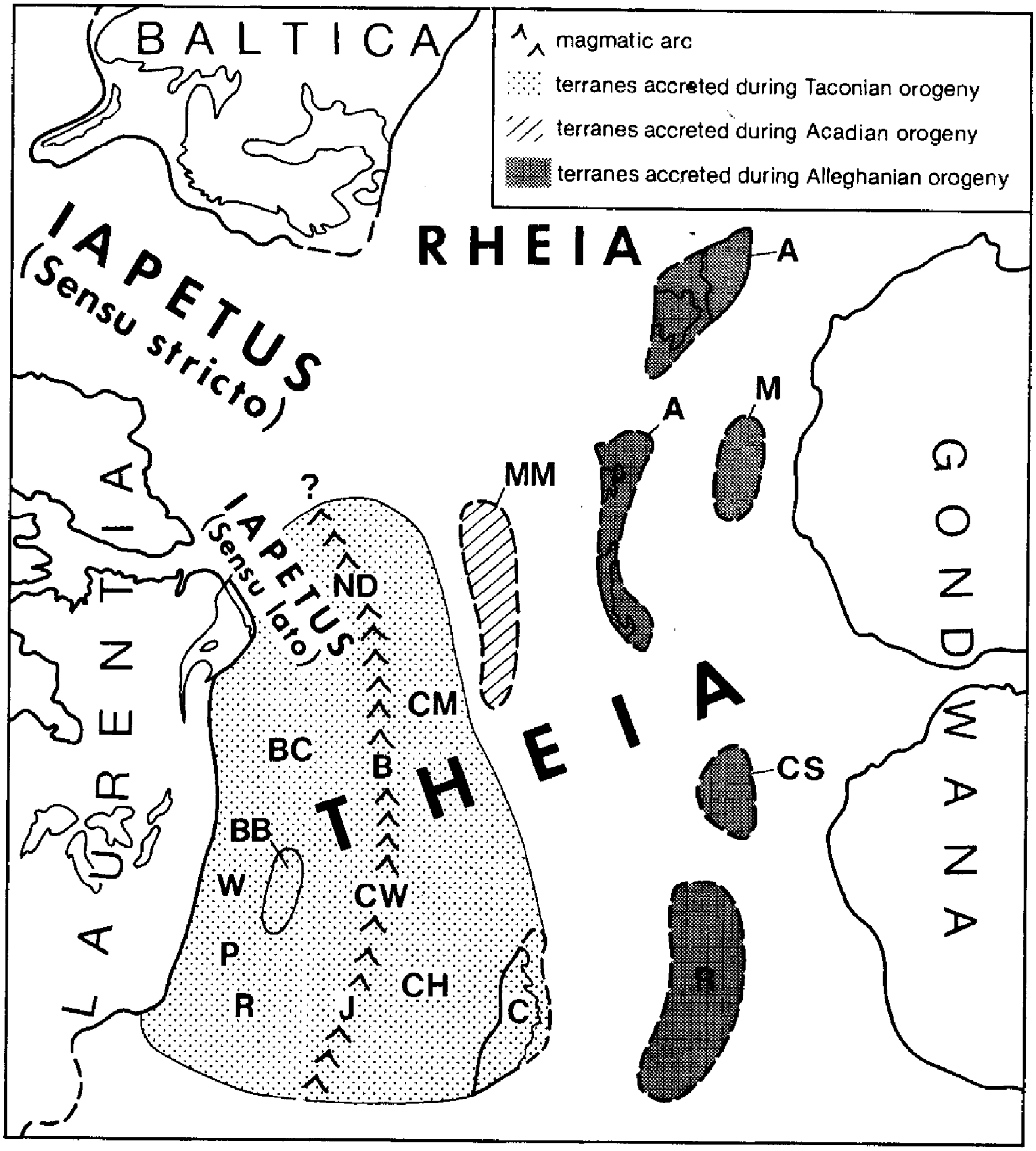


Figure 2.5-204 — {Rifts Formed during the Breakup of Rodinia}

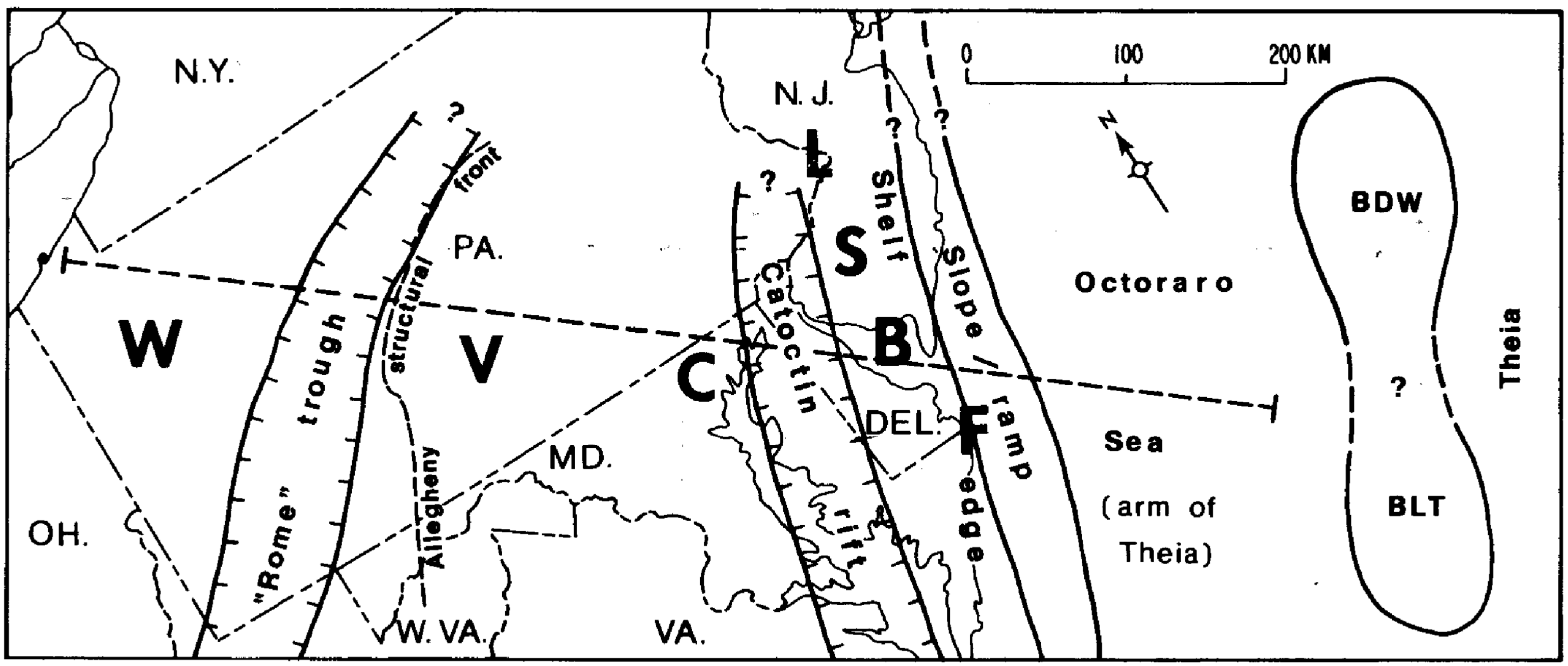


Figure 2.5-205 — {Reconstruction of part of Rodinia at the end of the Neoproterozoic, showing the relative positions of Laurentia, Baltica, and West Gondwana}

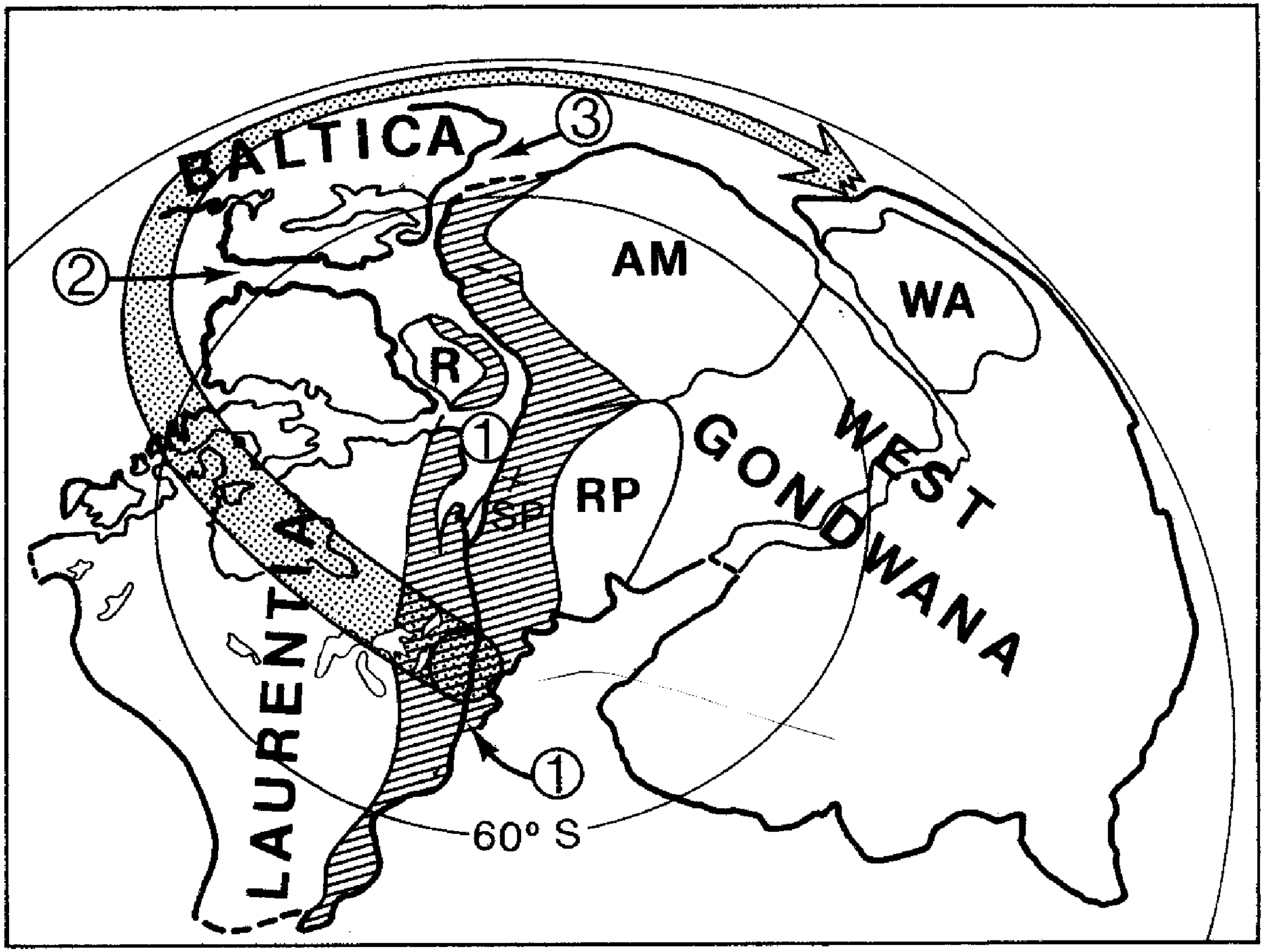


Figure 2.5-206 — {Cross section of the carbonate shelf, shelf/slope/basin/transition, and proximal basin (Octorara seaway) during the Middle Ordovician, from Erie (NW) to the present Atlantic coastline (SE)}

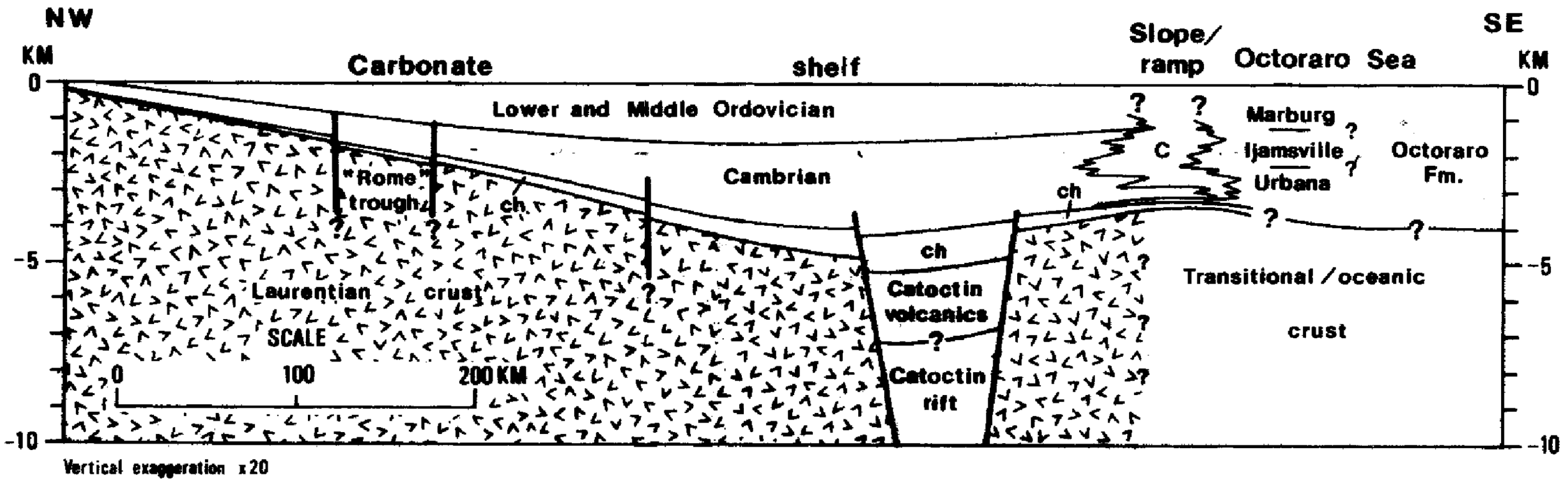


Figure 2.5-207 — {Brandywine Microcontinent}

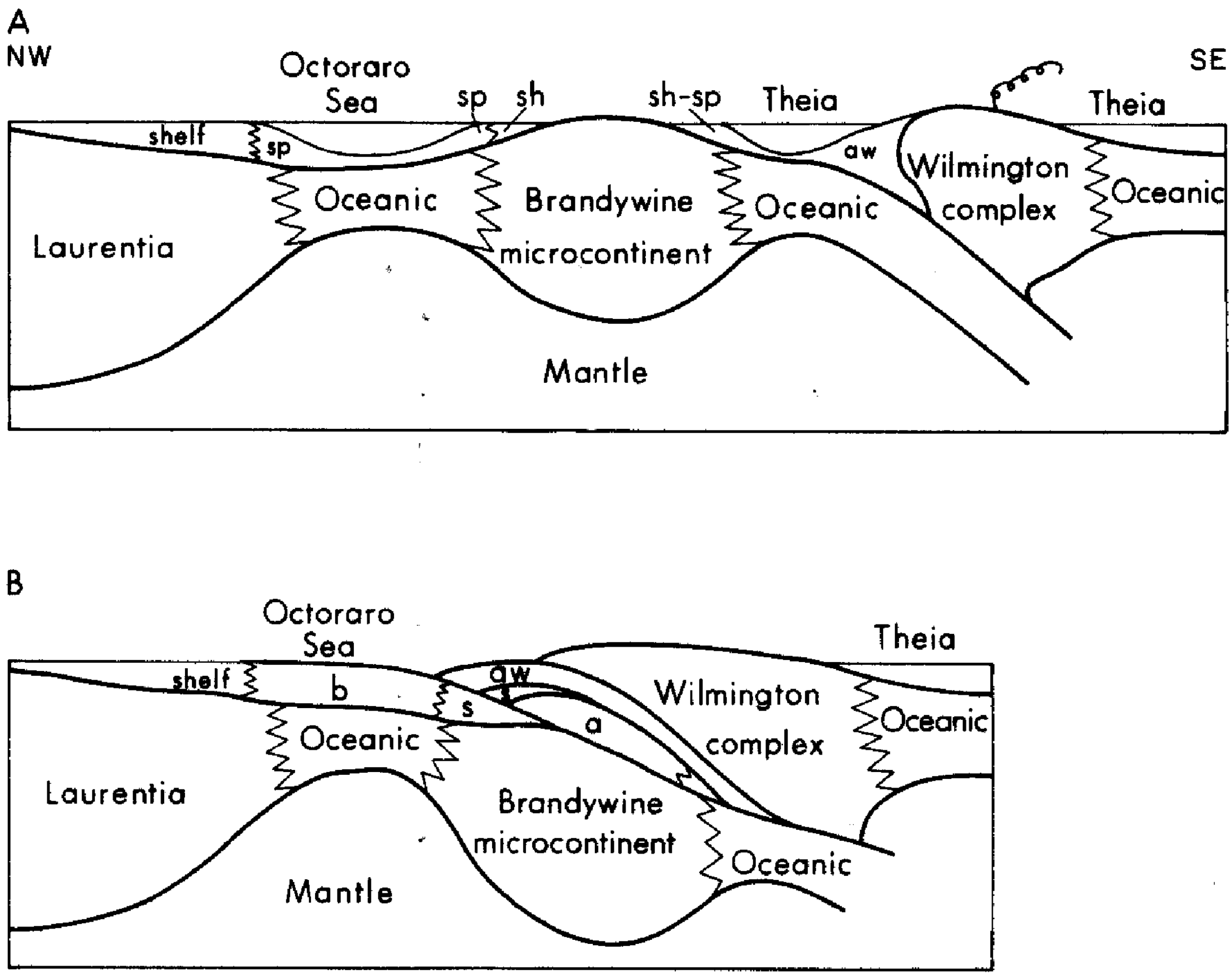


Figure 2.5-208 — {Catskill clastic wedge Structure and Stratigraphy during the Acadian Orogeny}

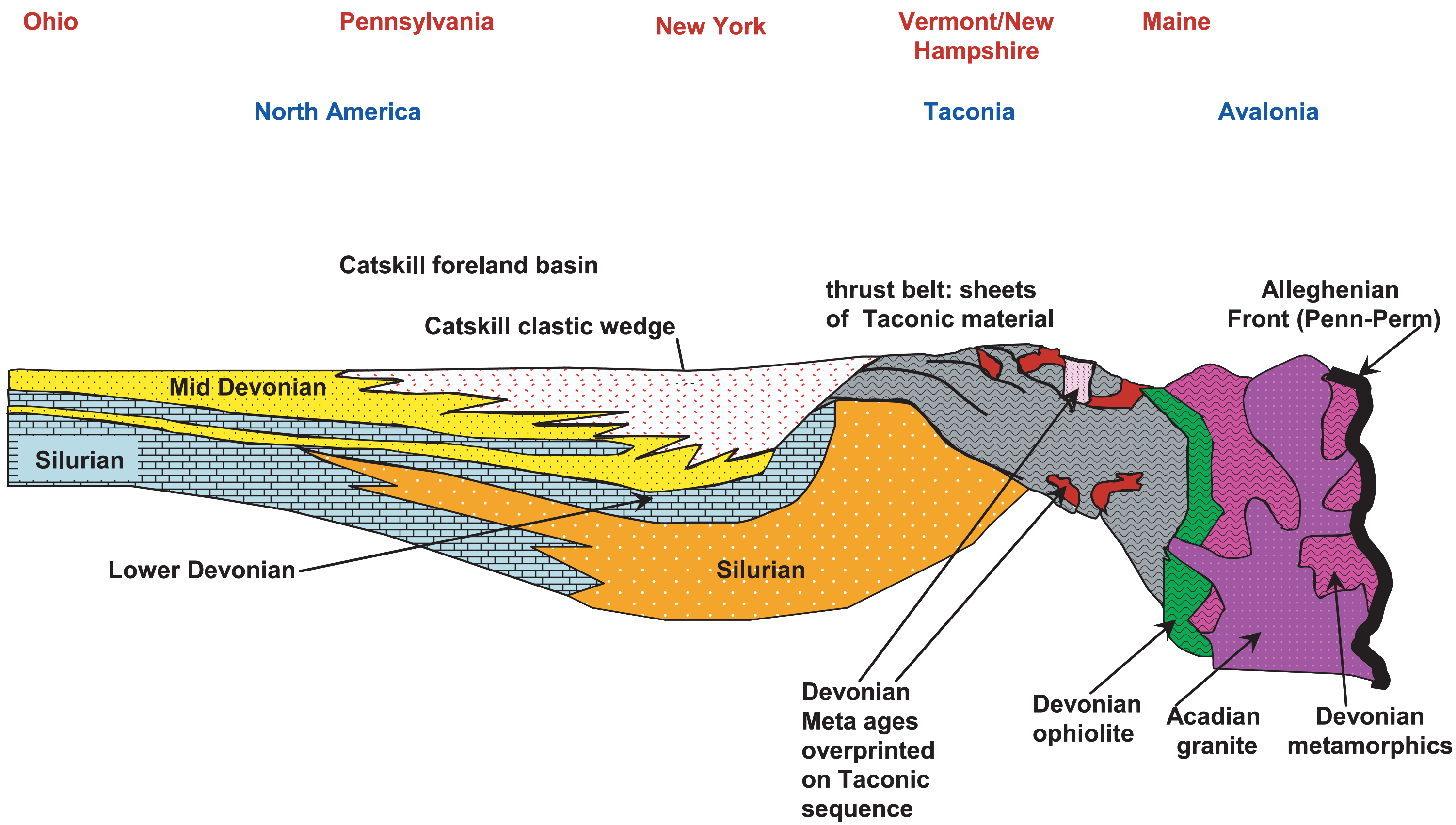
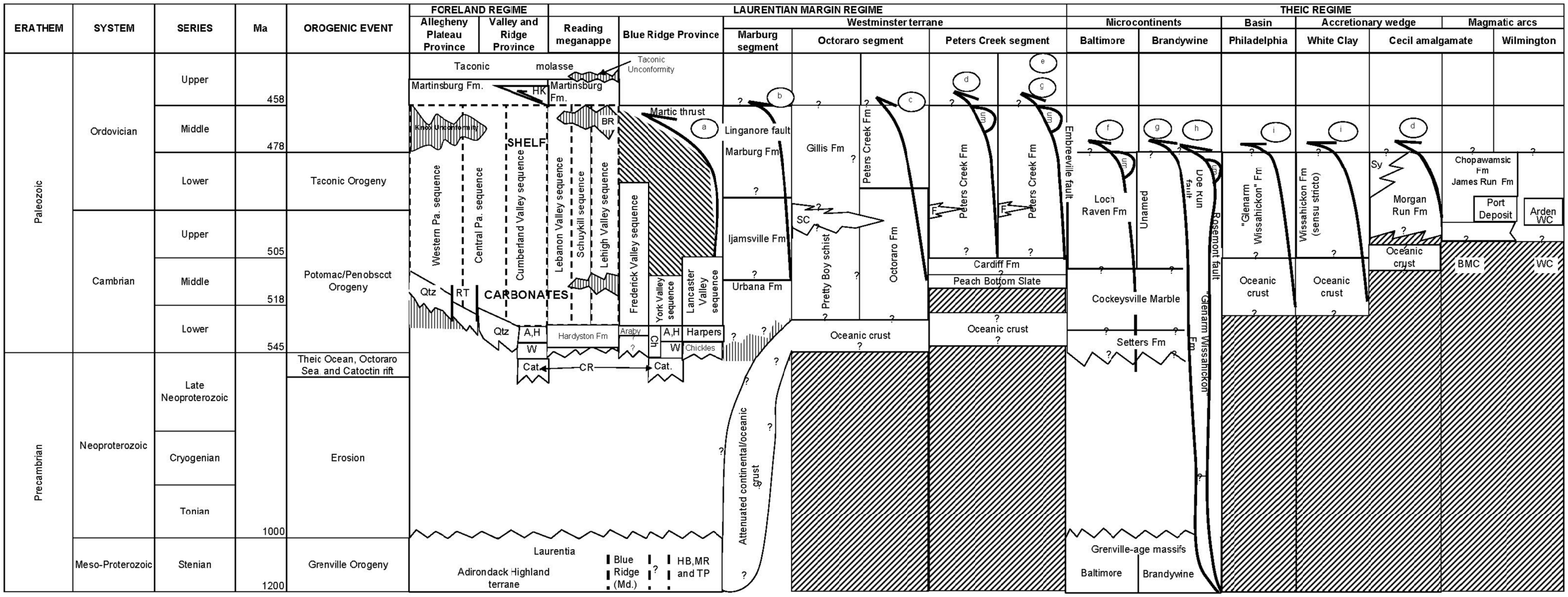


Figure 2.5-209 — {Precambrian through Ordovician Regional Stratigraphy}



NOT DRAWN TO SCALE
modified from Faill 1997a, Castle, 2001, Gates, Mullre and Krol, 1999

Notes:
Correlation chart of Neoproterozoic to Upper Ordovician in the Foreland, Laurentian Margin and Theic Regimes, and/or structural entities within regimes. Vertical lines-unconformity or disconformity; diagonal lines (down to left)-intervals of unknown or no event; diagonal lines (cown to right)-stratigraphic section since tremoved by erosion. Curved arrows-thrust faults; question marks-uncertain age

Figure 2.5-210 — {Legend for Figure 2.5-214 (Precambrian through Ordovician Regional Stratigraphy)}

A-Antietam Formation
BMC-Baltimore Mafic Complex
MBR-Black Riveran hiatus

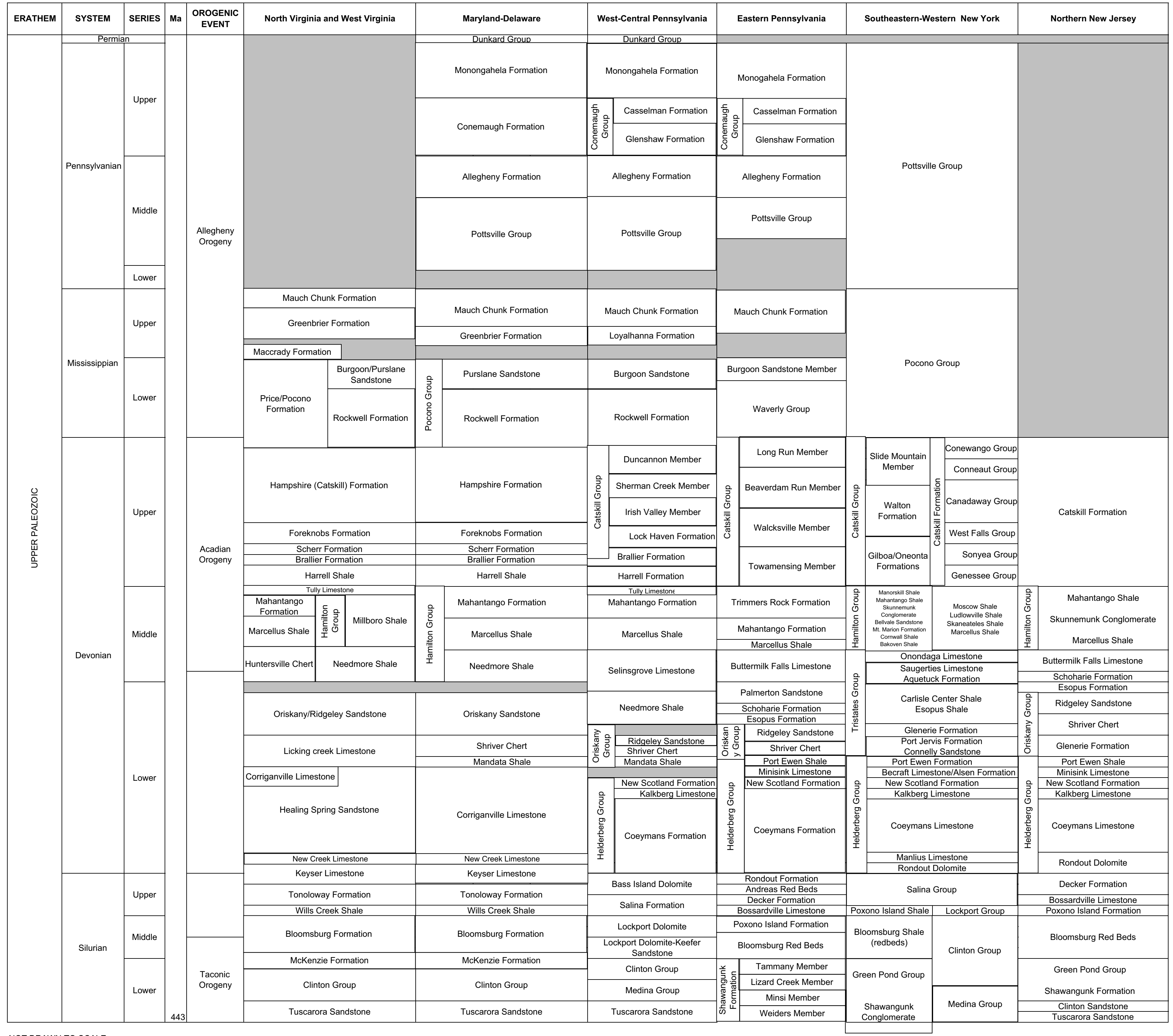
Cat.-Catoctin Formation
Ch-Chickies Formation
CR-Catoctin rift

F-Fishing Creek metabasalt
H-Harpers Formation
HB-Honey Brook Upland
HK-Hamburg klippe
MR-Mine Ridge
Qtz-quartzose siliciclastic rocks
RT-Rome trough
SC-Sams Creek Formation
Sy-Sykesville Formation
TP-Trenton prong
um-ultramafic body tectonically emplaced by entrainment within a fault
W-Weverton (and Loudoun) Formations
WC-Wilmington Complex

Hanging wall identities (in circles):
a-Westinster terrane
b-Linganore nappe
c-Westminster terrane ("Peters Creek" segment)
d-Baltimore Mafic Complex
e-Brandywine terrane
f-Liberty Complex or Baltimore Mafic Complex
g-White Clay nappe
h-Philadelphia terrane
i-Wilmington Complex

modified from Faill 1997a

Figure 2.5-211 — {Silurian through Permian Regional Stratigraphy}



NOT DRAWN TO SCALE

modified from Swezey, 2002, Inners, 1987, Epstein, 1986, Ver Straeten and Brett, 2000, Castle, 2001, Edmunds, 1996, NYDEC accessed on 8/12/2009
Carter, 2007 (accessed on 8/12/2009), Milici and Swezey, 2006, MGS, 2000 (accessed on 8/13/2009),Schmidt, 1993, Ver Straeten, 2007, USGS, 2008, Rader and Evans, 1993

Figure 2.5-212 — {Upper Mesozoic to Cenozoic}

Upper Mesozoic (Cretaceous) and Cenozoic Regional Stratigraphy

ERATHEM	SYSTEM	SERIES	Ma	Virginia (FORMATION)	Maryland-Delaware (FORMATION)	New Jersey (FORMATION)	New York (FORMATION)	Pennsylvania (FORMATION)
CENOZOIC	QUATERNARY	Holocene & Pleistocene	Present	Columbia Group	Lowland deposits; spit, shoreline, marsh, swamp and alluvial deposits; Carolina Bay, dune, upland, deposits, Cypress Swamp Fm. and upland bog deposits; Delaware Bay Group; Columbia Formation	Cape May Formation; glacial, lacustrine and eolian deposits; Pensauken Formation; Bridgetown Formation	Columbia Group	Colluvium; Alluvium; Low terrance deposits
CENOZOIC	TERTIARY – NEOGENE	Pliocene		Chesapeake Group: Yorktown Formation	Upland deposits; Beaverdam Fm.; Yorktown Fm.		Beacon Hill Formation	
CENOZOIC	TERTIARY – NEOGENE	Miocene		Chesapeake Group: St. Marys Formation; Choptank Formation; Calvert Formation	Chesapeake Group: Eastover Fm.; St. Marys Fm.; Choptank Fm.; Calvert Fm.	Beacon Hill Gravel; Cohansey Sand; Kirkwood Formation	Cohansey Sand; Kirkwood Formation	High terrance deposits
CENOZOIC	TERTIARY – PALEOGENE	Oligocene			Old Chruch Fm.; Glauconitic unit	Mays Landing unit		High terrance deposits
CENOZOIC	TERTIARY – PALEOGENE	Eocene		Chickahominy Formation; Pamunkey Group: Nanjemoy Formation; Aquia Formation	Pamunkey Group: Piney Point Fm.; Piney Point Fm.; Shark River Fm.; Nanjemoy Fm.; Manasquan Fm.	Shark River Formation; Manasquan Formation	Shark River Formation; Manasquan Formation	High terrance deposits
CENOZOIC	TERTIARY – PALEOGENE	Paleocene		Mattaponi Formation	Pamunkey Group: Marlboro Clay; Vincentown Fm.; Aquia Fm.; Brightseat Fm.; Hornerstown Fm.	Vincentown Formation; Homerstown Formation	Vincentown Formation; Hornerstown Formaton	High terrance deposits
UPPER MESOZOIC	CRETACEOUS	Upper		Potomac Group: Patuxent Formation	Monmouth Formation; Matawan Formation / Matawan Group: Mt. Laurel Fm; Marshalltown Fm; Englishtown Fm; Merchantville Fm; Magothy Formation	Tinton Sand; Redbank Sand; New Egypt Fm; Navesink Formation; Matawan Group: Mt. Laurel Formation; Wenonah Formation; Marshalltown Formation; Englishtown Formation; Woodbury Shale; Merchantville Formation; Magothy Formation	Tinton Formation; Redbank Formation; Navesink Formation; Mt. Laurel Formation; Wenonah Formation; Marshalltown Formation; Englishtown Formation; Woodbury Shale; Merchantville Formation; Magothy Formation	
UPPER MESOZOIC	CRETACEOUS	Lower	65	Potomac Group: Patuxent Formation	Potomac Formation / Potomac Group: Raritan Fm.; Patapsco Fm.; Arundel Fm.; Patuxent Fm.; Waste Gate Fm.	Raritan /Bass River Formations; Potomac Formation	Raritan Formation; Potomac Formation	
PALEOZOIC	Undifferentiated pre-Cretaceous consolidated-rock basement							
PRECAMBRIAN	Undifferentiated pre-Cretaceous consolidated-rock basement							

NOT DRAWN TO SCALE

Note:

Waste Gate Formation is no longer recognized by the MGS (personal communication 2006)

modified from Hansen 1984, Achmad, 1997, Otton, 1955, Hansen 1996, and Calis and Drummond 2008 and USGS 2003 and Pickett, 1987, Vogt and Eshelman, 1987, Olsson, 1987, NJDEP, 1990 Achmad and Hansen, 1997, Baltimore Gas & Electric, 1968, Cederstrom, 1957, Glaser, 1971, Hansen, 1978, Hansen and Wilson, 1984, Hansen, 1996, Virginia State Water Control Board, 1974 Root, 1977, USGS accessed on 8/13/2009, DGS, 2007 (accessed on 8/12/2009)

Figure 2.5-213 — {Ramapo Seismic Zone}

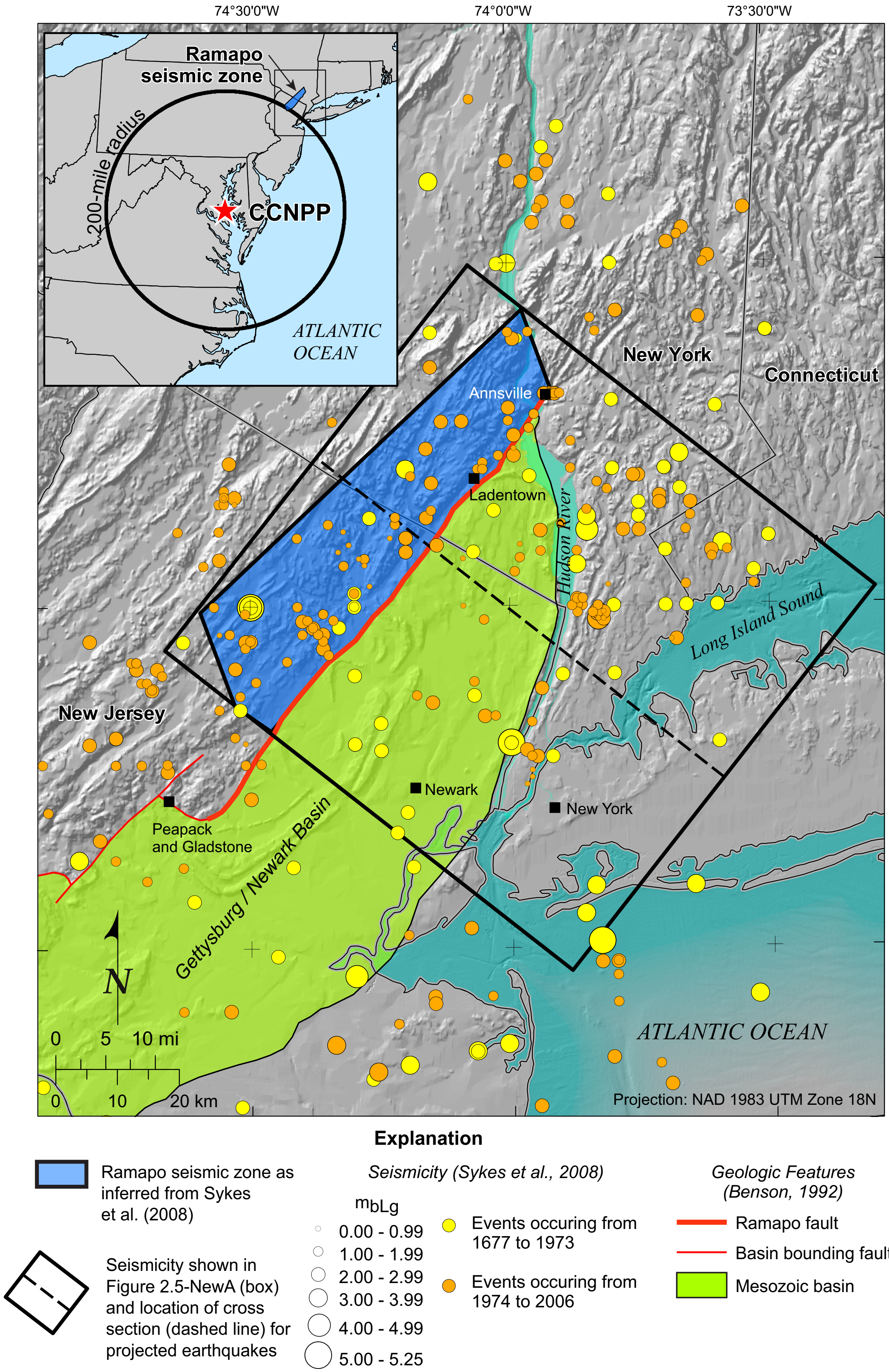


Figure 2.5-214 — {Ramapo Seismicity Cross Section}

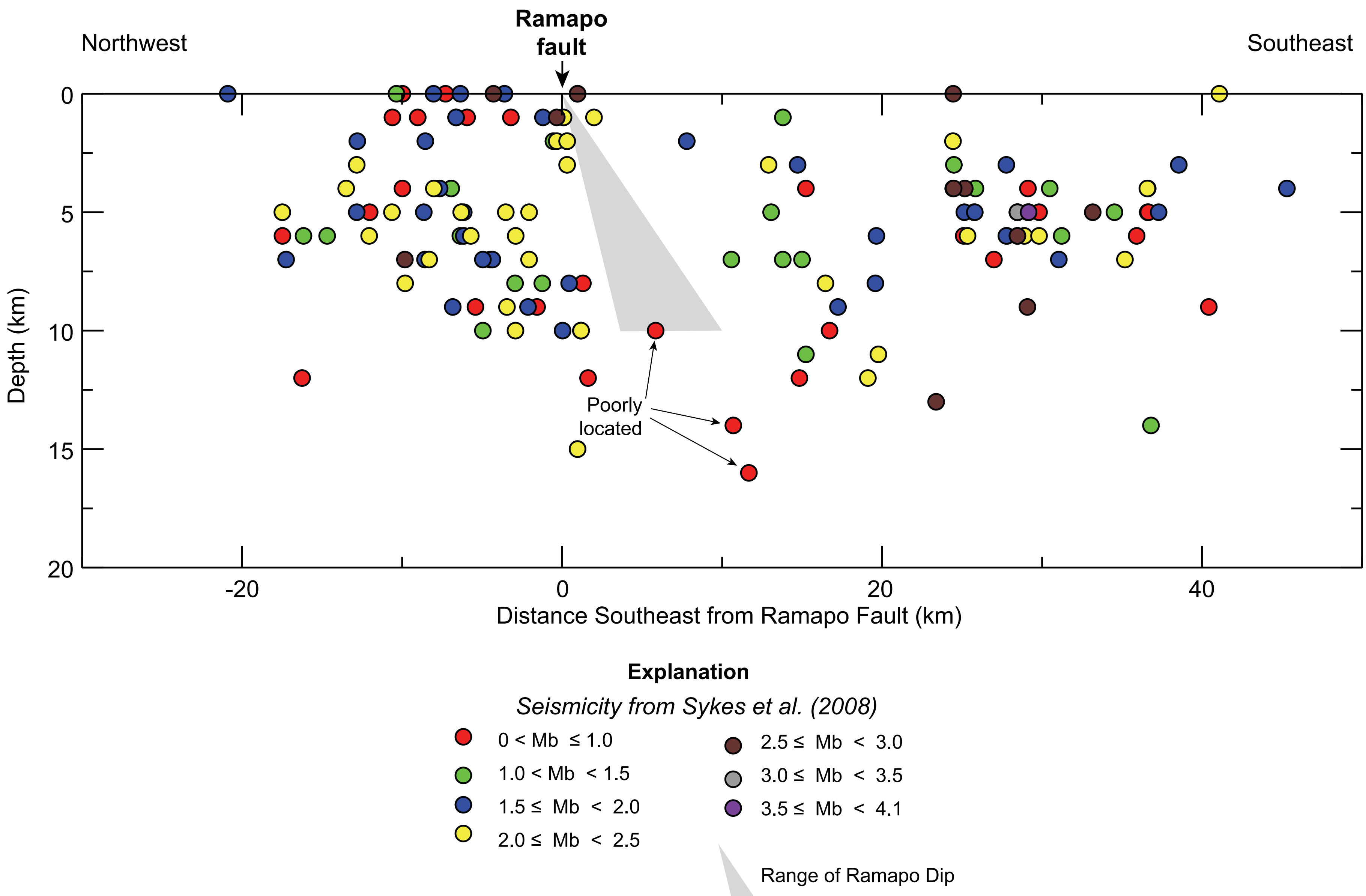


Figure 2.5-215 — {Field and Aerial Reconnaissance Map for CCNPP Unit 3}

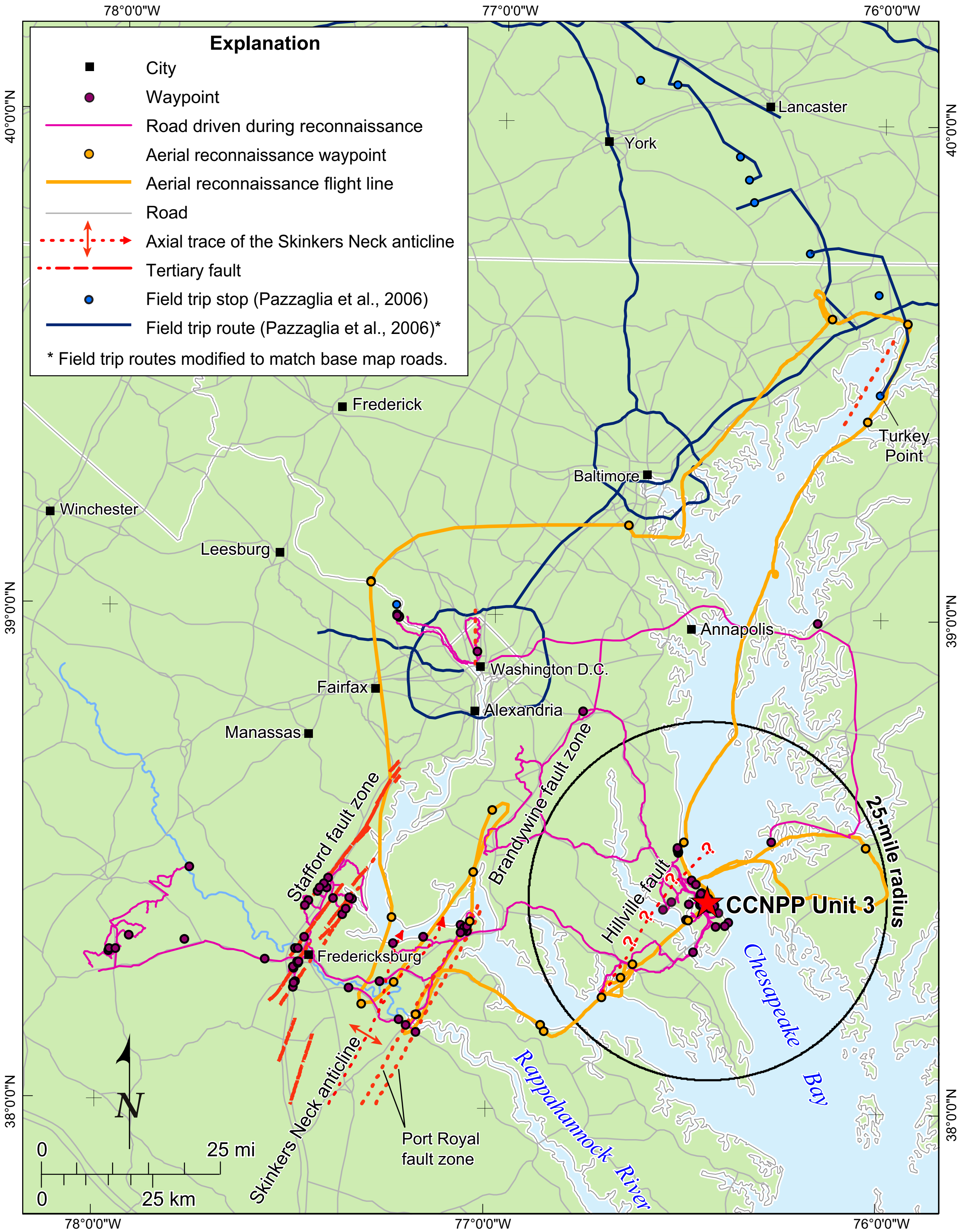
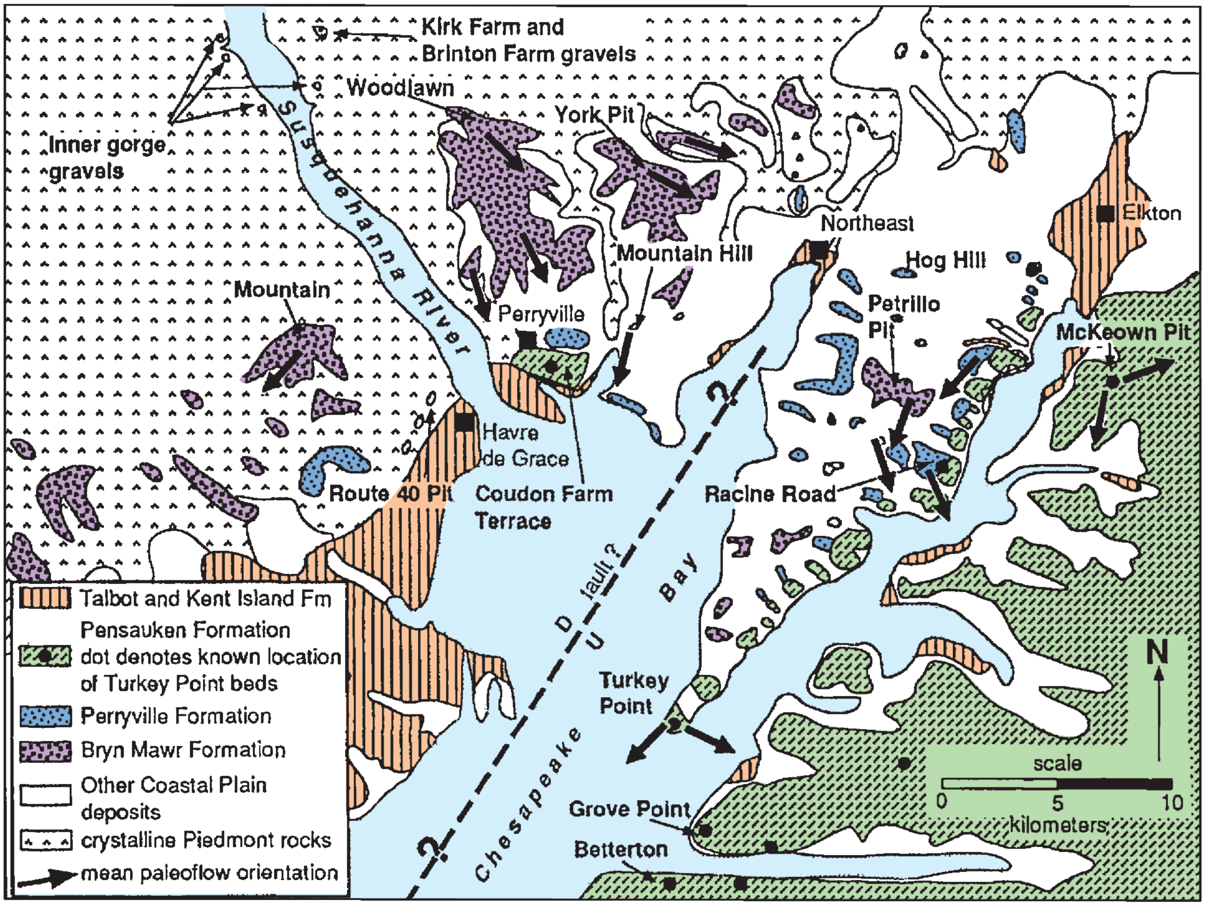
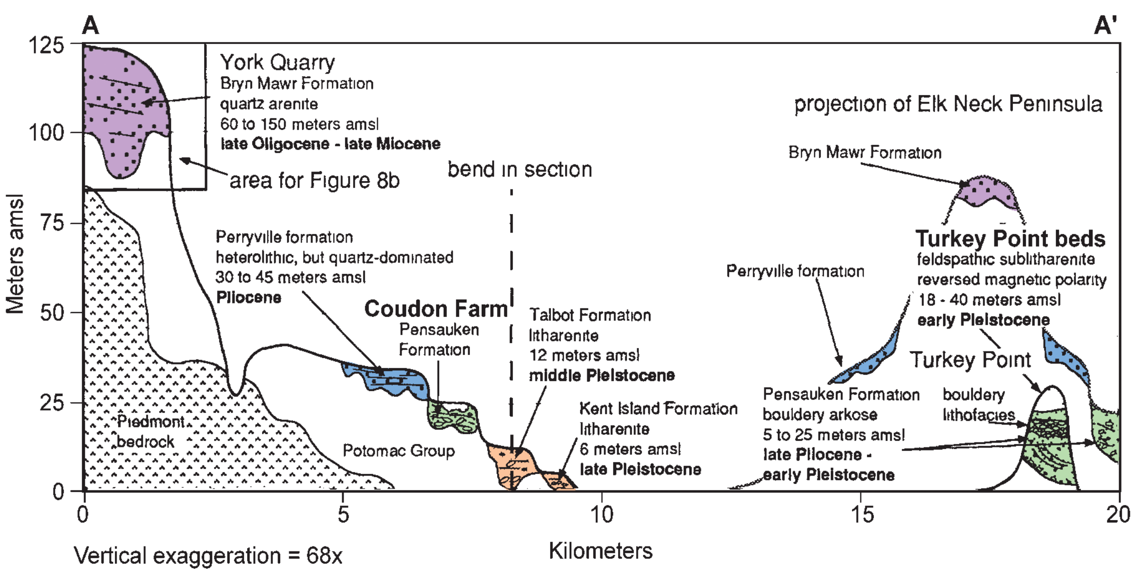


Figure 2.5-216 — {(A) Generalized Geological Map and (B) Schematic Cross Section of the Northern Chesapeake Bay}

A)



B)



Note: (A) and (B) modified from Pazzaglia (1993a and 1993b).

Figure 2.5-217 — {LiDAR Elevation Showing Trace of Pazzaglia's Fault}

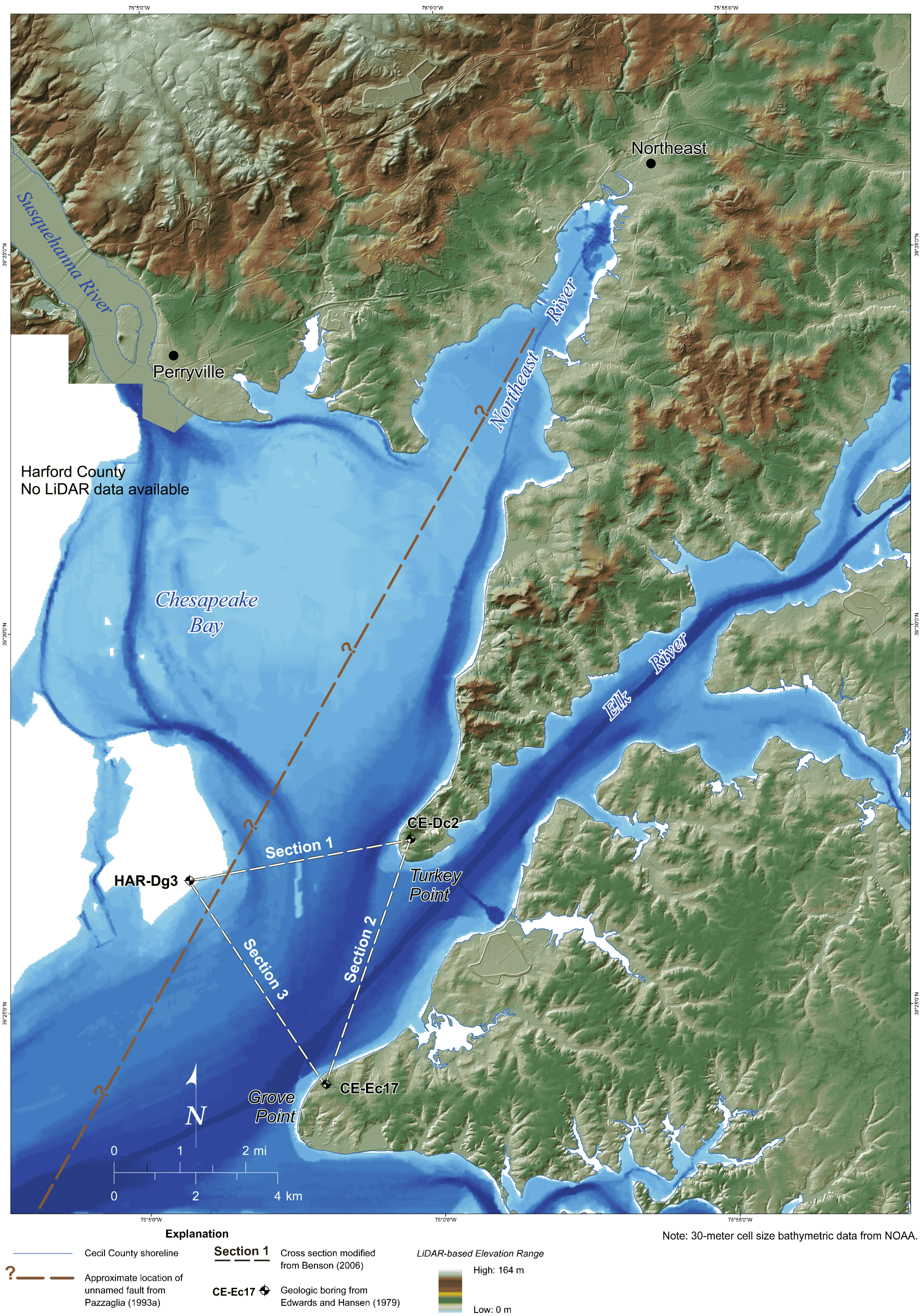


Figure 2.5-218 — {Seismic Reflection Line St. M-1 Showing Hillville Fault of Hansen (1978)}

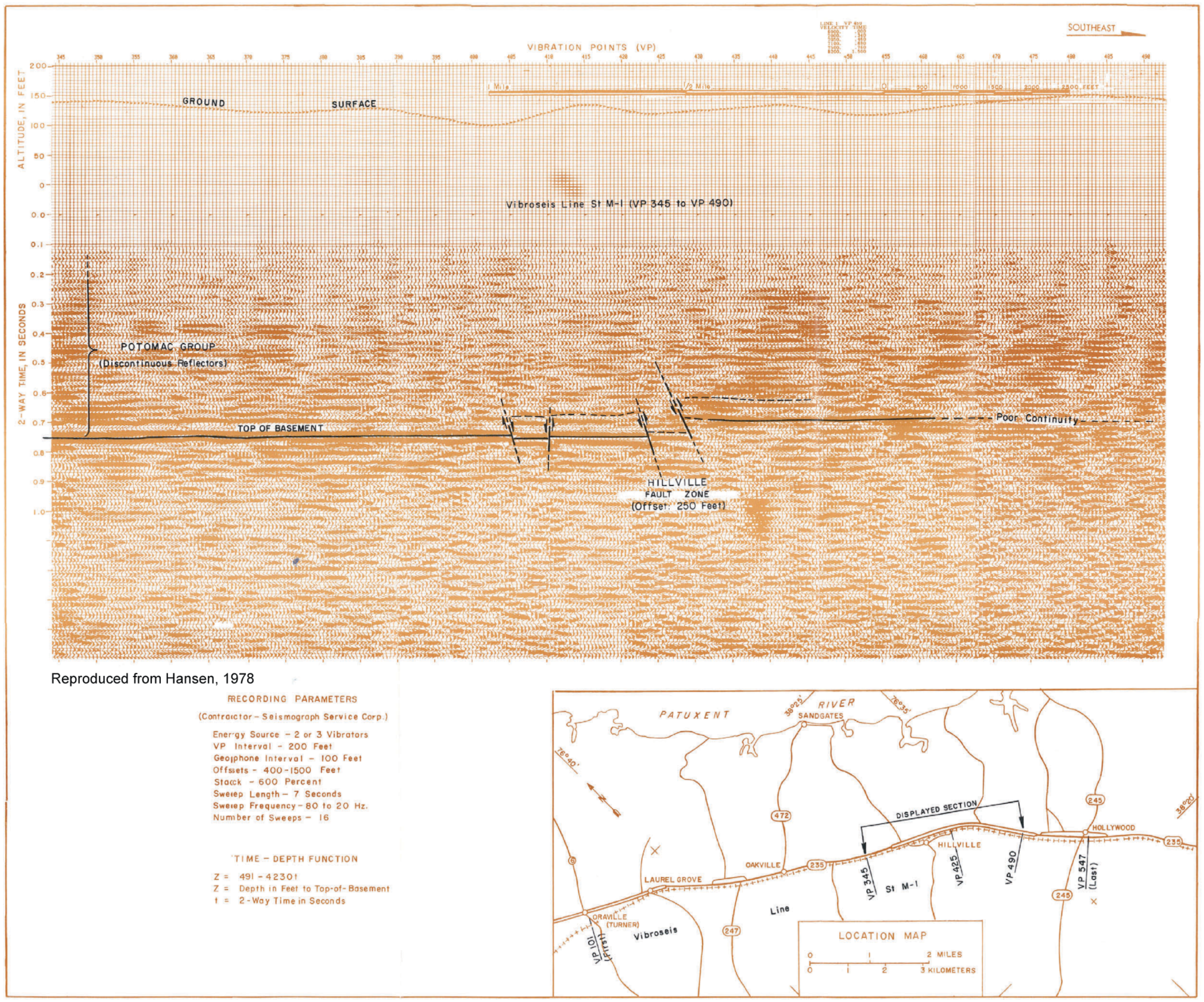


Figure 2.5-219 — {Geologic Map of the Ramapo Fault and Vicinity with Seismicity}

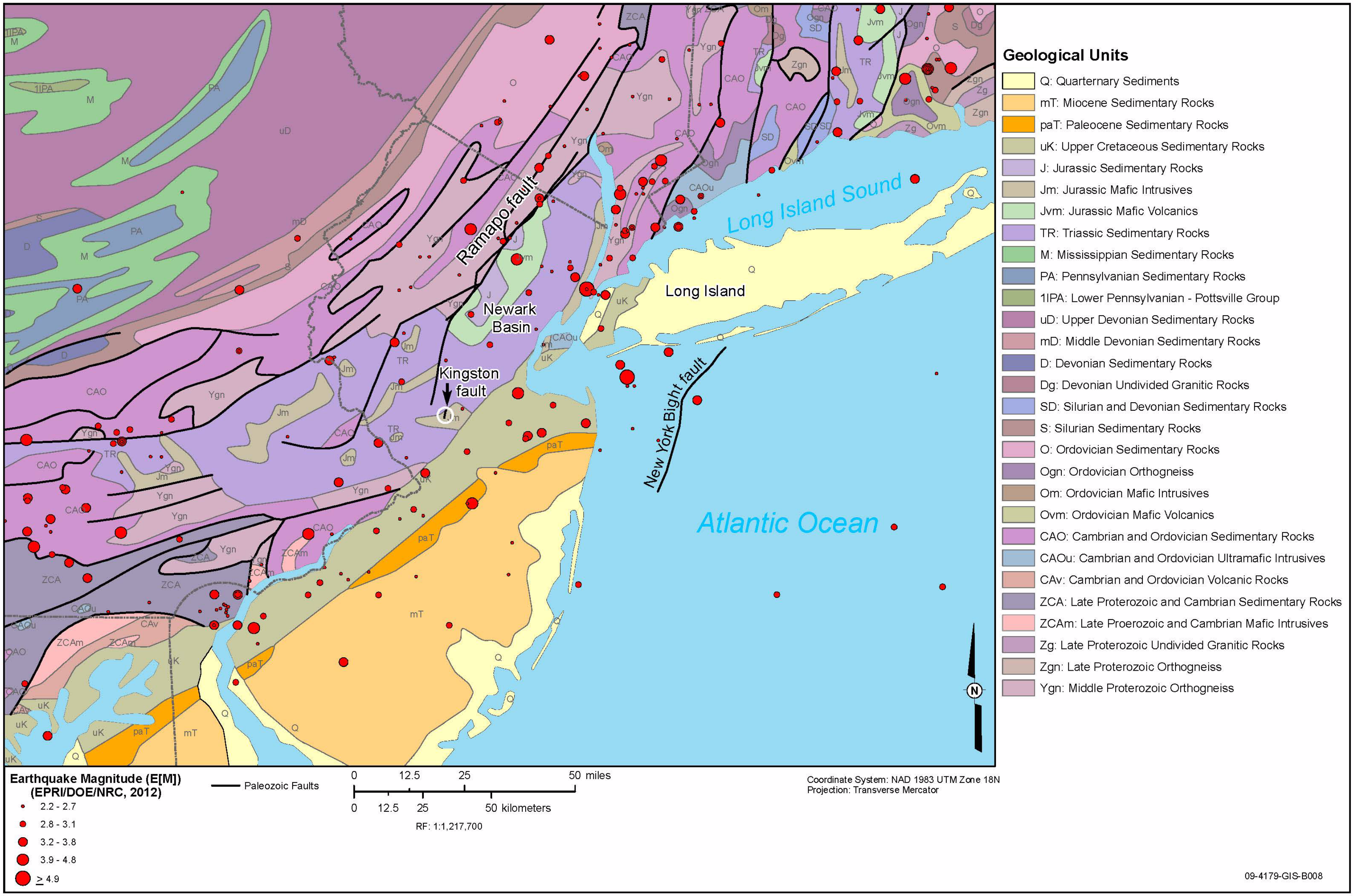
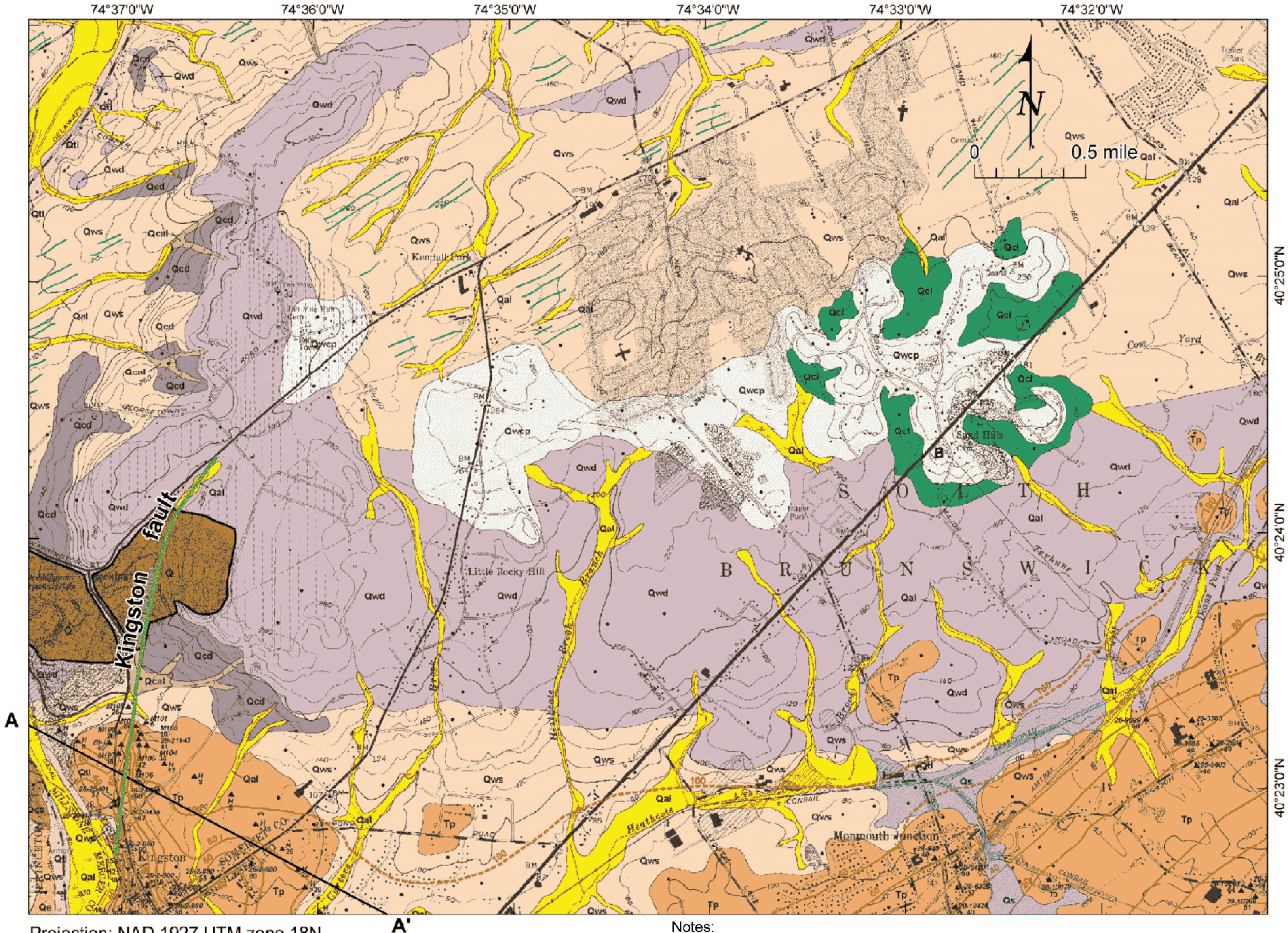


Figure 2.5-220 — {Geologic Map of Kingston Fault}



Projection: NAD 1927 UTM zone 18N

Notes:

1. Reproduced from Stanford, 2002, Surficial Geology of the Monmouth Junction Quadrangle, Sommerset, Middlesex, and Mercer Counties, NJ, 1;24,000.

2. See Figure 2.5-308 for the geologic explanation and cross section A - A'.

Figure 2.5-221 — {Explanation of Map Units and Cross Section A- A' for the Geologic Map of the Kingston Fault}

SURFICIAL GEOLOGY OF THE MONMOUTH JUNCTION QUADRANGLE, SOMERSET, MIDDLESEX, AND MERCER COUNTIES, NEW JERSEY

by
Scott D. Stanford
2002

MAP UNITS

Age of unit indicated in parentheses. For units spanning more than one period, principal age is listed first.

Order of map units in list does not necessarily indicate chronologic sequence.

ARTIFICIAL FILL--Sand, silt, clay, gravel; brown, gray, yellowish brown; may include angular fragments of shale, sandstone, and diabase bedrock. May also include demolition debris (concrete, brick, asphalt, glass) and trash. As much as 30 feet thick. Many small areas of fill in urban areas are not shown.

Qal — ALLUVIUM (Holocene and late Pleistocene)--Sand, silt, clay, peat; yellowish brown, reddish brown, dark brown, gray; and pebble-to-cobble gravel. Abundant organic matter. Sand is chiefly quartz and shale fragments, with some glauconite and mica. Gravel is quartz, shale fragments, and quartzite with minor diabase and ironstone. As much as 20 feet thick. Deposited in floodplains, channels, and groundwater seepage areas.

Qs — SWAMP AND MARSH DEPOSITS (Holocene and late Pleistocene)--Peat and organic silt, sand, and clay; dark brown to black. As much as 10 feet thick.

Qcal — COLLUVIUM AND ALLUVIUM (Holocene and late Pleistocene)--Interbedded alluvium and colluvium in headwater valleys. As much as 15 feet thick.

Qaf — ALLUVIAL FAN DEPOSITS (Holocene and late Pleistocene)--Sand, silt; brownish yellow, reddish brown, brown; and pebble gravel. Minor amounts of organic matter. As much as 15 feet thick. Forms small fans at mouths of steep streams.

Qe — EOLIAN DEPOSITS (late Pleistocene and Holocene)--Fine-to-medium sand, very pale brown to reddish yellow. Sand is chiefly quartz and shale fragments with minor mica in places. As much as 15 feet thick. Forms sand sheets.

Qtl — LOWER TERRACE DEPOSITS (late Pleistocene)--Sand and minor silt; reddish brown, yellowish brown, reddish yellow; and pebble gravel. Sand is chiefly quartz and red and gray shale fragments with some glauconite and mica. Gravel is quartz, quartzite, gray and red shale and siltstone, with minor diabase, gneiss, and chert. As much as 30 feet thick. Forms stream terraces with surfaces 5 to 20 feet above the modern floodplain.

Qcl — LOWER COLLUVIUM (late Pleistocene)--Sand, silt, minor clay; yellow, yellowish brown, reddish yellow, light gray; some quartz and ironstone pebbles. As much as 15 feet thick, generally less than 10 feet thick. Deposited by downslope movement of Cretaceous sand and clay.

Qcs — SHALE COLLUVIUM (late Pleistocene)--Sandy, clayey silt; reddish brown; many angular chips and fragments of shale. As much as 10 feet thick. Deposited by downslope movement of weathered shale. Forms aprons on grade with lower terraces.

Qcd — DIABASE COLLUVIUM (middle and late Pleistocene)--Sandy, clayey silt to sandy, silty clay; reddish yellow, brown, gray; some to many angular to subrounded pebbles, cobbles, and small boulders of diabase and gray hornfels, and a few rounded pebbles and cobbles of quartz and quartzite. As much as 25 feet thick. Deposited by downslope movement of weathered diabase, hornfels, and Beacon Hill lag.

Tp — PENSAUKEN FORMATION (Pliocene)--Sand, minor silt and clay; yellow to reddish yellow; pebble gravel and minor cobble gravel, particularly at the base of the deposit. Sand is chiefly quartz with some weathered feldspar and minor glauconite and mica. Gravel is chiefly quartz and quartzite with some chert and ironstone, and minor sandstone, mudstone, gneiss, and diabase. Gneiss, diabase, and some sandstone and mudstone, clasts are deeply weathered. Locally iron-cemented. As much as 145 feet thick. In erosional remnants of a dissected river plain.

Qwcp — WEATHERED COASTAL PLAIN FORMATIONS--Exposed sand and clay of Coastal Plain bedrock formations. May be overlain by thin, patchy alluvium and colluvium. Quartz, chert, and ironstone pebbles left from erosion of surficial deposits may be present on the surface and in the upper several feet of the formation.

Qws — WEATHERED SHALE--Silty clay to sandy silt; reddish brown, pale red, reddish yellow, gray; some to many angular chips and fragments of shale and a few quartz, chert, and ironstone pebbles left from erosion of surficial deposits. As much as 10 feet thick, generally less than 3 feet thick.

Qwd — WEATHERED DIABASE--Silty clay to clayey sand; yellow, reddish yellow, light gray; some to many angular to subrounded pebbles, cobbles, and small boulders of diabase. A few quartz, chert, and ironstone pebbles and cobbles left from erosion of surficial deposits may be present on the surface and in the upper several feet. As much as 20 feet thick.

MAP SYMBOLS

Contact--Contacts of alluvium, swamp deposits, and lower terrace deposits are well-defined by landforms and are drawn from 1:12,000 scale aerial stereophotos. Contacts of other units are approximately located based on both landforms and field observation points.

Material observed in hand-auger hole, exposure, or excavation.

Shallow topographic basin--Of probable periglacial origin.

28-2459 >54 — Well or boring--Upper number (italicized) is identifier, lower number is thickness of surficial material, in feet. Identifiers of the form '28-xxxx' are N. J. Department of Environmental Protection well permit numbers. Identifiers of the form 'Mxxx' are monitoring wells filed under permit numbers 28-31109 to 28-31122. Identifiers of the form '28-xx-xxx' are N. J. Atlas Sheet grid locations of entries in the N. J. Geological Survey permanent note collection. Borings identified by 'H' are N. J. Department of Transportation borings from Harper (1984).

10 — Thickness of surficial material--From geophysical survey (D. L. Jagel and D. W. Hall, N. J. Geological Survey, 1995)

20 — Elevation of base of Pensauken Formation--In feet above sea level. Contour interval 20 feet. Dashed where eroded Topography of the base of the Pensauken in the Kingston area shows abrupt thickening along the trace of the Kingston Fault, suggesting fault offset of the Pensauken (Stanford and others, 1995). See section AA'.

Trace of Kingston Fault--From Parker and Houghton (1990).

Bedrock strike ridge--Low ridge parallel to strike of bedrock. Drawn from airphotos.

Beacon Hill lag--Pebbles and cobbles of quartz, quartzite, chert, and ironstone left from erosion of the Beacon Hill Gravel, a late Miocene fluvial deposit that formerly covered the quadrangle above an elevation of 320 feet.

Sparse Beacon Hill lag--Pebbles and cobbles as above, but sparsely distributed.

Pensauken lag--Pebbles and a few cobbles of quartz, quartzite, and chert left from erosion of the Pensauken Formation. Only concentrated lags are mapped; sparsely distributed lag pebbles are widespread below 140 feet in elevation.

Upper terrace lag--Pebbles and a few cobbles of quartz and quartzite left from erosion of upper stream terrace deposits. Marks level of Millstone River in the middle Pleistocene.

Fluvial scarp--Line at top, ticks on slope. Cut into shale. On grade with upper terrace lag. Marks level of Millstone River in the middle Pleistocene.

Q — Quarry--Line marks perimeter of excavated area at time of mapping. Diabase and hornfels outcrop, quarried rock, and stripped surficial material occur within perimeter.

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Harper, D. P., 1984, Geologic compilation map of the Monmouth Junction quadrangle, New Jersey: N. J. Geological Survey Open-File Map 1, scale 1:24,000.

Parker, R. A., and Houghton, H. F., 1990, Bedrock geologic map of the Monmouth Junction quadrangle, New Jersey: U. S. Geological Survey Open-File Report 90-219, scale 1:24,000.

Stanford, S. D., Jagel, D. L., and Hall, D. W., 1995, Possible Pliocene-Pleistocene movement on a reactivated Mesozoic fault in central New Jersey: Geological Society of America Abstracts with Programs, v. 27, no. 1, p. 83.

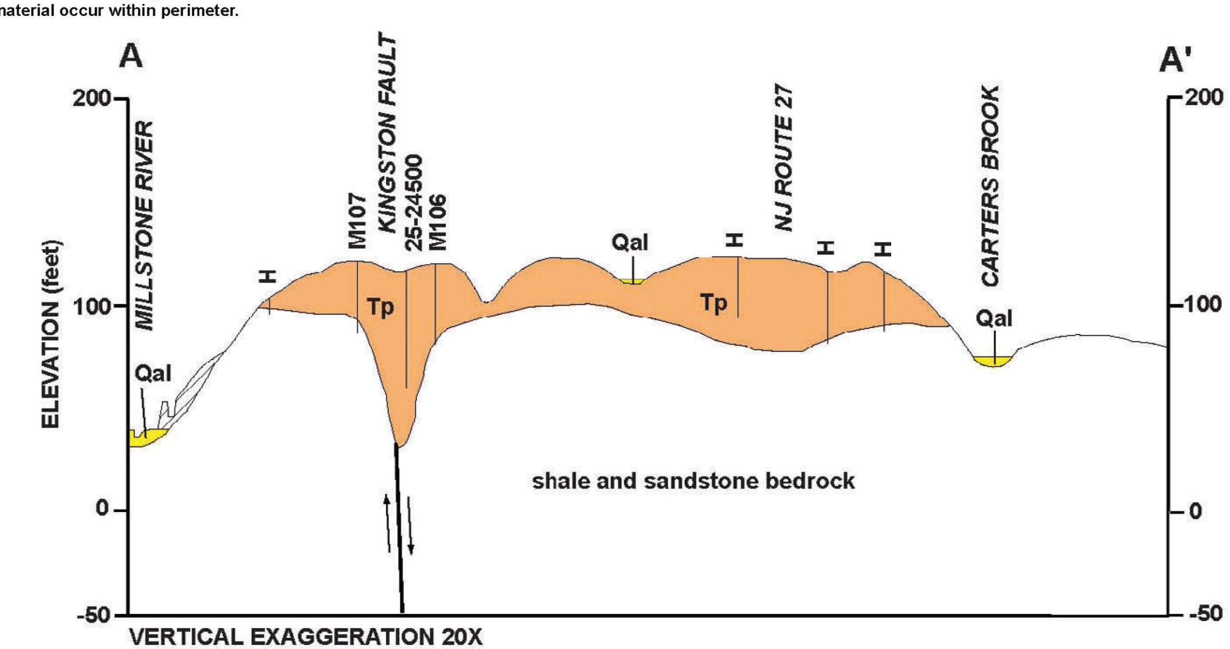
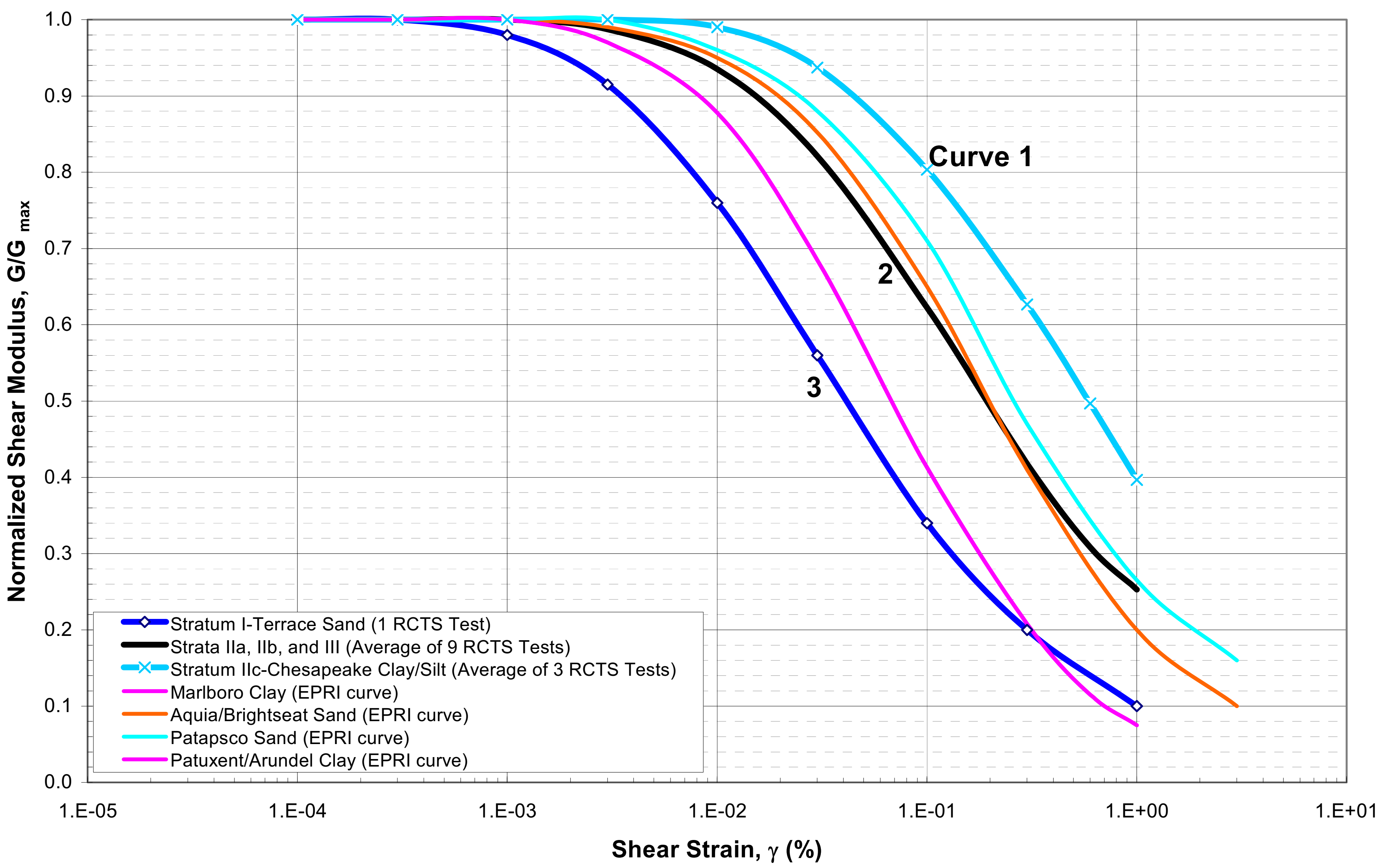


Figure 2.5-222 — {Selection of Shear Modulus and Damping Ratios for Soils Deeper than 400 Feet}



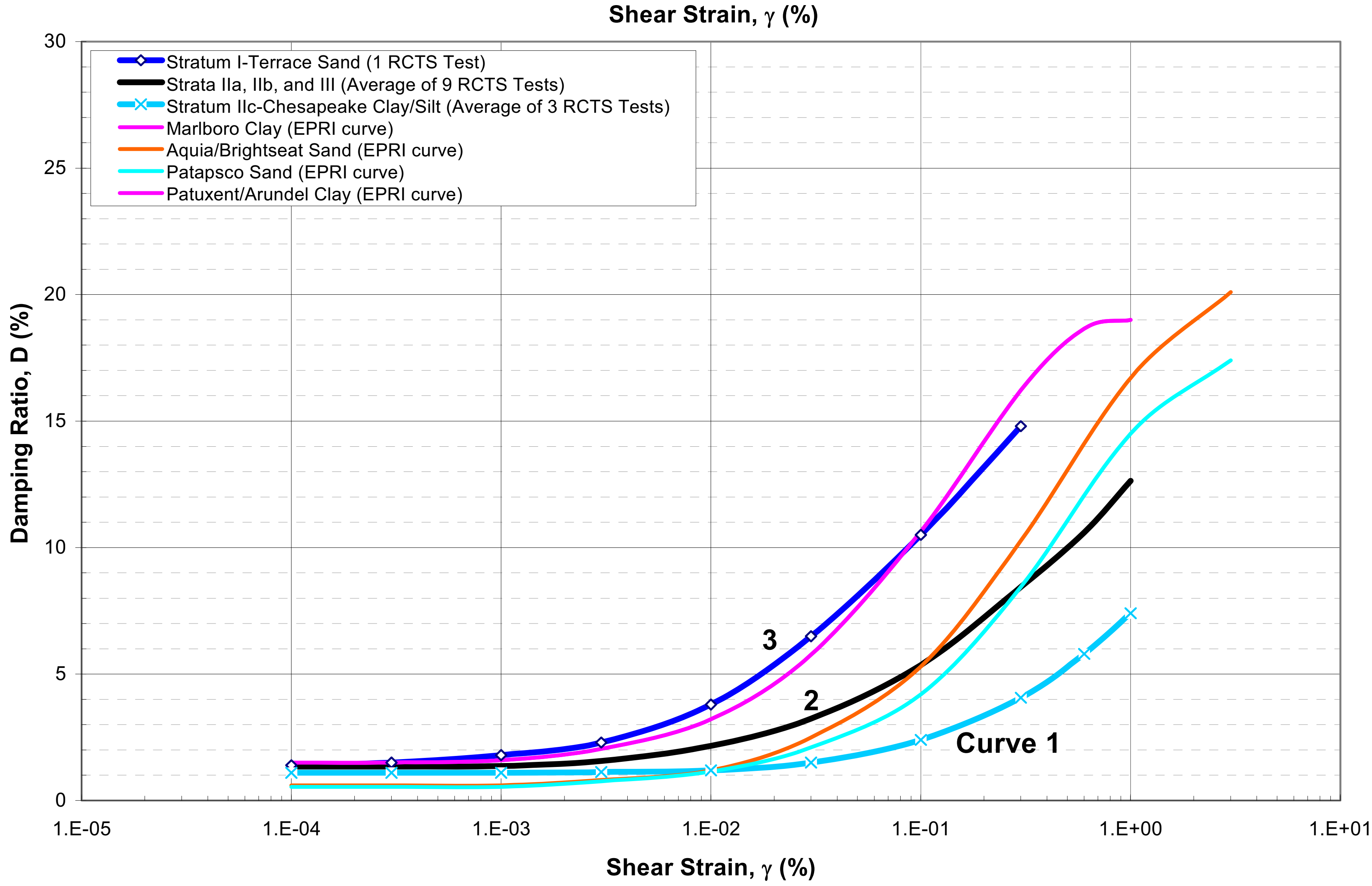
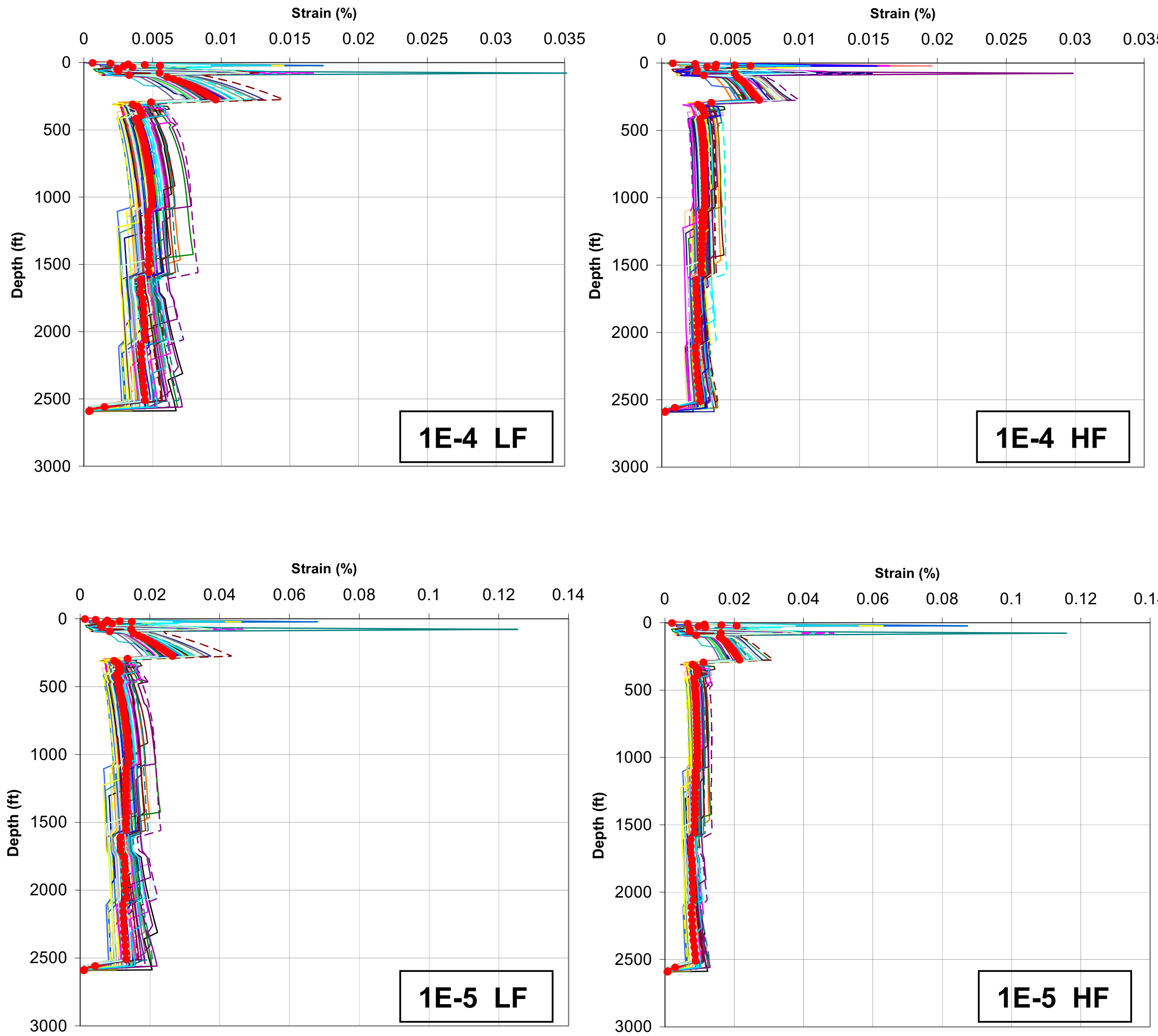


Figure 2.5-223 — {Calculated Maximum Strains Based on Initially Adopted EPRI}



Curves}

Figure 2.5-224 — {Settlement Monitoring Instrumentation in the Powerblock Area}

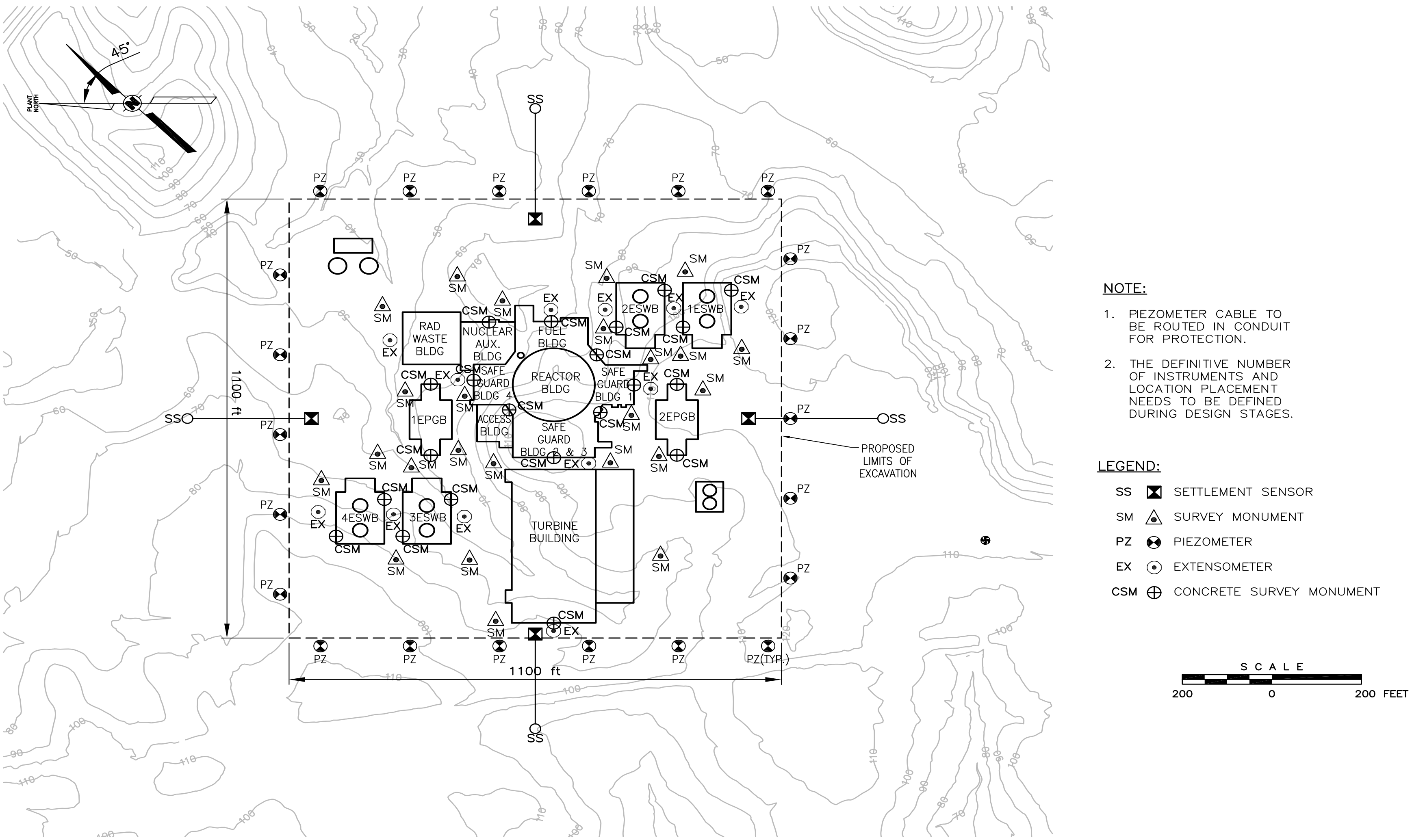


Figure 2.5-225 — {Settlement Monitoring Points for ESWBS and EPGBS}

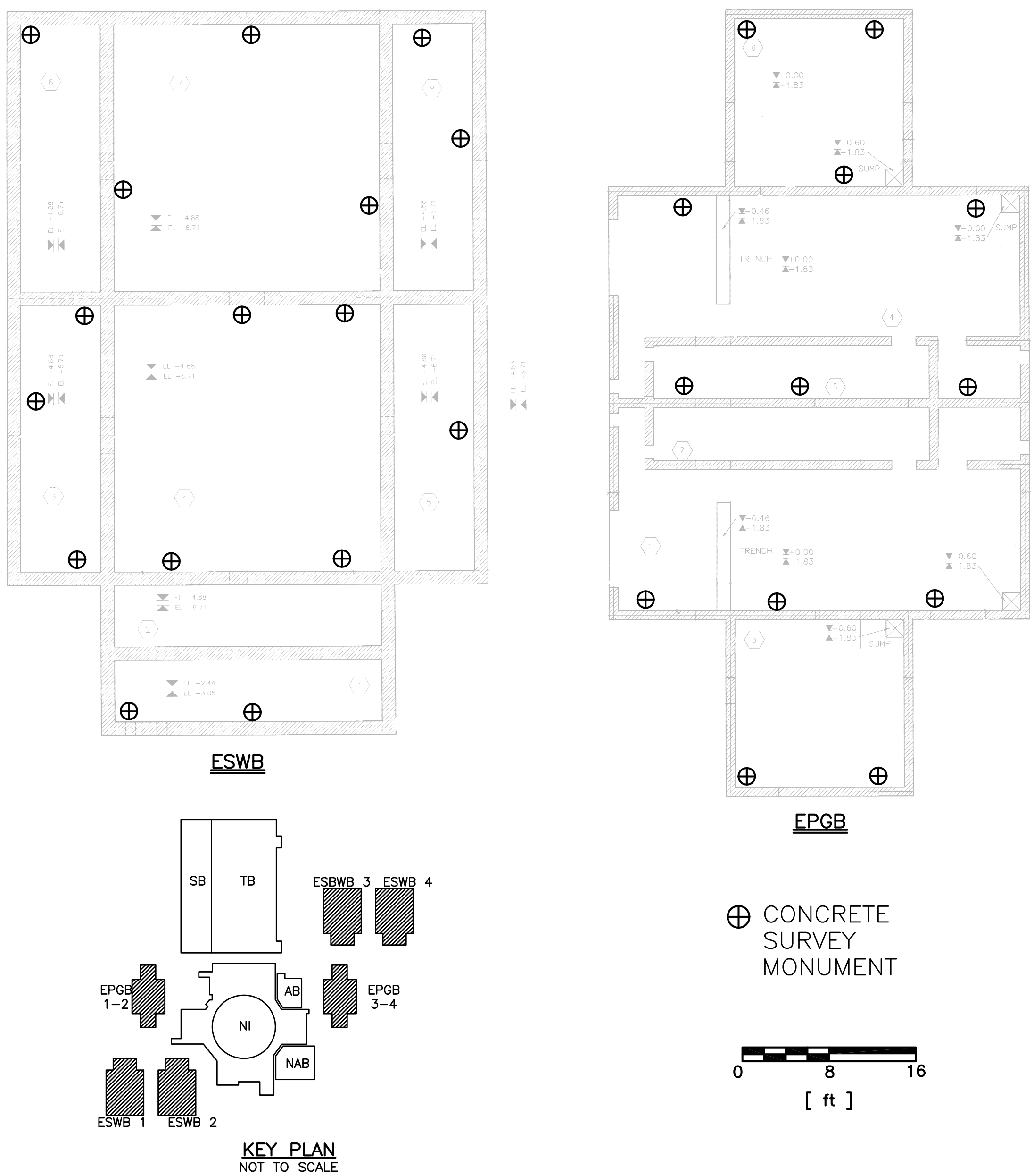


Figure 2.5-226 — {Settlement Monitoring Points for CBIS}

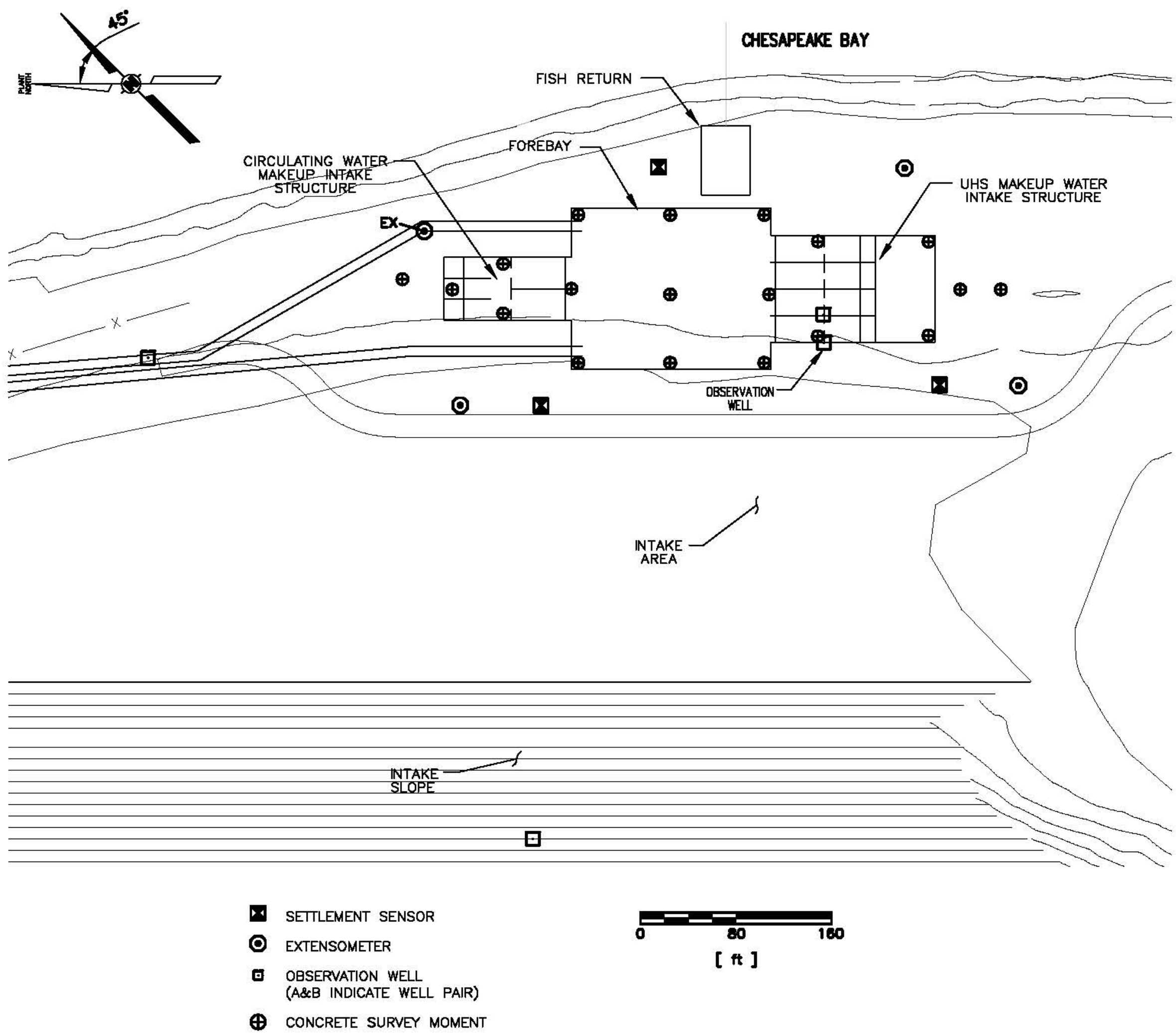


Figure 2.5-227 — {Settlement Monitoring Points for Nuclear Island Common Basemat}

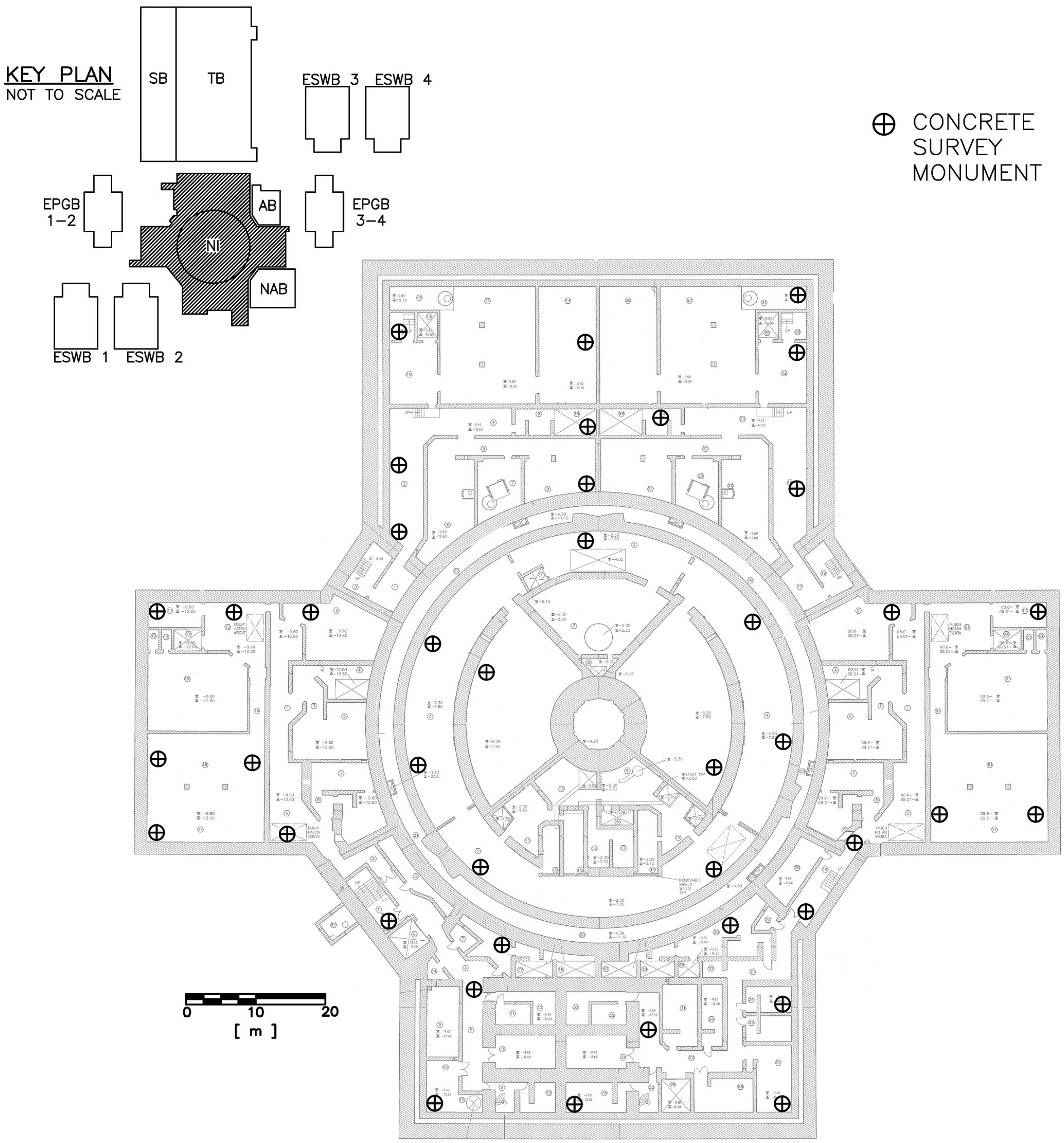


Figure 2.5-228 — Comparison of Plots of Shear Wave Velocity Beneath Structural Fill for B-301