SUBSECTION 2.5.5: STABILITY OF SLOPES
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2.5.5 STABILITY OF SLOPES

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Information on the slopes at Units 6 & 7 that could adversely affect the safety of the units is provided in this subsection. The information has been developed based on guidance provided in RG 1.206, Subsection C.I.2.5.5.

The subsurface information presented in this subsection was obtained from the subsurface investigation data report included as Reference 201 and the geotechnical design data as presented in Subsection 2.5.4.

2.5.5.1 Slope Characteristics

2.5.5.1.1 Permanent Slopes

The location for Units 6 & 7 is approximately one-half mile south of existing nuclear Units 3 & 4 and fossil Units 1, 2, and 5. The original site was relatively flat with an approximate elevation at sea level. The grade of the site was raised to avoid effects of design storm surge. The Units 6 & 7 power block areas have a finished grade of approximately elevation 25.5 feet (NAVD 88). A plan drawing is shown with profiles of the finished site grade in Figure 2.5.4-221. Table 2.5.5-201 summarizes the slopes. The finished slope at the site is 0.5 percent, or 200 horizontal to 1 vertical. Each of the finished slopes is directed away from the power block. The grade change from the finished grade around the power block to the existing grade will be made with a mechanically stabilized earth (MSE) retaining wall. At its closest point, the MSE wall is no closer than 500 feet from any safety related structure. Site grading is performed with compacted backfill on suitable subgrade. Failure or significant movement of the slopes could impact some structures including roadways, swales, underground utilities, MSE retaining walls, detention ponds, perimeter canals, and small buildings. The MSE walls are analyzed for global stability, internal stability, sliding, and bearing capacity during the final design phase. However, no Seismic Category I structures would be impacted by movement or failure of the MSE wall. Table 2.5.5-201 shows a summary of the site finished grade slopes with the elevation change, length, width, and grade.

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The Units 6 & 7 design does not use safety-related dams or embankments. As described in Subsection 2.4.1, there are no existing upstream or downstream dams that could affect safety-related facilities.

2.5.5.1.2 Temporary Slopes for Plant Construction

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The reactor excavation is described in Subsection 2.5.4.5. As indicated on Figure 2.5.4-222, a temporary wall (reinforced diaphragm wall) provides support of the excavation and groundwater control. The Key Largo Limestone provides the bearing stratum supporting the nuclear island. The top of the Key Largo Limestone ranges from approximately El. –27 feet to El. –50 feet (Reference 201). Subbasement concrete is placed on suitable Key Largo Limestone subgrade below the nuclear island foundation at approximately El. –35 feet and filled up to a maximum elevation of –14 feet. If competent rock is found at a higher elevation, the excavations may be terminated prior to extending the excavation to El. –35 feet.

No construction-related slopes are constructed outside of the diaphragm wall, with the exception of the diaphragm wall for the other unit during construction of that unit, approximately 500 feet away.

During construction, temporary slopes are created and maintained in accordance with applicable OSHA requirements. Failure of a temporary slope created for construction of the plant would not adversely affect the safety of the nuclear power plant facilities because such slopes are sufficiently away from the Category I structures and restrained by the reinforced diaphragm wall. The nearest cooling water canals are approximately 700 feet from the nuclear island for each unit and would not be impacted by a temporary slope failure.

2.5.5.2 Design Criteria and Design Analyses

Based on the description in Subsection 2.5.5.1, no slopes require analyses for stability.

2.5.5.3 Results of the Investigations

The investigation and a summary of the results are contained in the subsurface investigation data report (Reference 201). Applicable data from the subsurface investigation report used for consideration of stability of the structures are summarized in Subsection 2.5.4.

2.5.5.4 Properties of Borrow Material, Compaction, and Excavation Specifications

Borrow material sources and their properties are described in Subsection 2.5.4.5. Excavation specifications are developed at detailed design. Compaction requirements are described in Subsection 2.5.4.5.

2.5.5.5 Stability of Slopes Conclusions

The permanent slopes are directed away from the power block and have a maximum grade of 0.5 percent. Thus, significant movement or failure of these slopes would not adversely affect the safety of the nuclear power plant facilities. As shown on Figure 2.5.4-201, the MSE walls sit no closer than 500 feet away from the Seismic Category I structures, and, therefore, any failure of the MSE walls would not impact the safety-related structures.

The temporary slopes that will be excavated for plant construction do not adversely affect the safety of the nuclear power plant facilities.

2.5.5.6 Reference

201. MACTEC Engineering and Consulting, Inc., *Final Data Report—Geotechnical Exploration and Testing: Turkey Point COL Project Florida City, Florida*, Rev. 2, included in COL Application Part 11, October 6, 2008.

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Table 2.5.5-201
Finished Grade Slopes

Area	Height	Length	Width	Grade	Downhill Structures
South of power block	4 feet	800 feet	1600 feet	0.5%	Roadway, swale, wall, reservoir
North of power block	5 feet	1000 feet	2150 feet	0.5%	MSE wall, swale, roadway, parking lot
East of power block	3 feet	600 feet	1150 feet	0.5%	MSE wall, small buildings, canal
West of power block	3 feet	600 feet	1150 feet	0.5%	MSE wall, small buildings, canal