FLOOD INSURANCE STUDY

ST. JOHN THE BAPTIST PARISH, LOUISIANA

AND INCORPORATED AREAS

Community Name	Community Number
St. John the Baptist Parish (Unincorporated Areas)	220164

EFFECTIVE
November 4, 2010

Federal Emergency Management Agency
FLOOD INSURANCE STUDY NUMBER
22095CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Selected Flood Insurance Rate Map (FIRM) panels for the community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels (e.g., floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X
C	X

Part or all of this FIS may be revised at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS report. It is, therefore, the responsibility of the users to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Parishwide FIS Report Effective Date: November 4, 2010

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ST. JOHN THE BAPTIST PARISH, LOUISIANA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the entire geographic area of St. John the Baptist Parish, Louisiana and incorporated areas (referred to collectively herein as St. John the Baptist Parish). This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. This information will also be used by St. John the Baptist Parish to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

The previous FIS was to revise the Flood Insurance Rate Map (FIRM) to include wave action for the following flooding sources; Lake Pontchartrain and Lake Maurepas.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State or other jurisdictional agency will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for all revised flooding sources were prepared by the New Orleans District, U.S. Army Corps of Engineers (USACE-MVN), for the Federal Emergency Management Agency (FEMA) as a part of contract with the USACE-MVN under Interagency Agreement No. HSFE-06-05-X-0011 for St. John the Baptist Parish, Louisiana. This work was completed in April 2008.

1.3 Coordination

The initial Consultation Coordination Officer (CCO) meeting was held on August 9, 2005, and attended by representatives of FEMA, the communities, and the study contractors to explain the nature and purpose of Flood Insurance Studies and to identify the streams to be studied by detailed methods.

The results of the study were reviewed at the final CCO meeting held on October 15, 2008 and attended by representatives of FEMA, USACE-MVN, the contractor and the community. All problems raised at that meeting have been addressed in this study.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS report covers the entire geographic area of St. John the Baptist Parish, Louisiana.

The USACE has completed the detailed study for the portion of the Louisiana Parishes of Ascension, Assumption, Lafourche, St. James, and St. John the Baptist. This entire study, called the Donaldsonville To The Gulf Feasibility Study (D2G WEST), also includes portions of the Parishes of St. Charles, Jefferson, Orleans, and Plaquemines (D2G EAST). This specific St. John the Baptist study area was taken from this study. Due to the flat land characteristics, the entire land was considered as potential runoff storage areas. The flooding sources studied by detailed methods are shown in Table 1.

The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through 2007.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and community officials.

Coastal flooding from The Gulf of Mexico affecting Lake des Allemands and the adjacent land areas was also studied by detailed methods.

All streams reaches, including the Mississippi River, not subsequently studied by either detailed or approximate methods were redelineated for this parish-wide update.

TABLE 1 – SCOPE OF STUDY

New Detailed Study Streams and Lakes
Bayou Becnel
Bayou Chevreuil
Bayou Lasseigne
Bayou Lassene
Brazan Canal
Vacherie Canal
Lake des Allemands

2.2 Community Description

St. John the Baptist Parish is located in southeast Louisiana and is bounded by Lake Maurepas on the north, Lake Pontchartrain and St. Charles Parish on the east, St. James Parish on the west, and Lafourche Parish on the south. The Mississippi River bisects the parish into north and south. The Parish covers approximately 347.8 square miles, of which 218.9 square miles is land and 128.9 square miles is water. The population in the year 2000 was reported to be 43,044 by the U.S. Bureau of the Census (Reference 1). The normal annual precipitation averages 54 – 58 inches (Reference 2). The climate of the area is subtropical and is strongly influenced by the Gulf of Mexico. Extremes of temperature are seldom experienced and the average temperatures range from an average high of 82.7 degrees Fahrenheit in July to an average low of 52.6 degrees in January (Reference 3).

2.3 Principal Flood Problems

Past hurricanes affecting St. John the Baptist Parish were Hilda in 1964, Betsy in 1964 and Carmen in 1974. The maximum recorded stages on the west shore of Lake Pontchartrain for these events are 4.93 feet, 12.09 feet, and 4.54 feet NGVD, respectively (Reference 4). The most recent hurricanes affecting St. John the Baptist Parish were Hurricanes Katrina and Rita, which occurred August 29 and September 24, 2005, respectively.

2.4 Flood Protection Measures

St. John the Baptist Parish operates and maintains numerous drainage pumps within parish. These drainage areas are bounded by the Mississippi River levees. The Mississippi River levees provide protection from 1-percent-annual-chance flood on the river. No detailed flood and hurricane protection measures are discussed in this report.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail, standard hydrologic and hydraulic study methods were used to determine the flood hazard data. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source as well as direct runoff inflow hydrographs from the associated contributing areas for each flooding source studied by detailed methods affecting the community.

Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) version 3.1.0 (Reference 5) was utilized for the hydrologic analyses. The HEC-HMS model prepared by the USACE, the Donaldsonville To The Gulf Feasibility Study, includes open channels as well as ponding areas within the several adjacent parishes including St. John the Baptist Parish. From the study, runoff hydrographs generated by HEC-HMS were then routed through the hydraulic models including open channels and storage areas for channel/storage routing to establish the peak stages. Rainfall depth, frequency, and duration data were obtained from National Weather Service information (Reference 6) for hypothetical storms of 10-, 2-, 1-, and 0.2-percent chance recurrence intervals, and time distributions were developed for each hypothetical storm.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 2, "Summary of Discharges."

It should be noted that the Donaldsonville To The Gulf model was performed using unsteady-state condition. Therefore, the peak discharges listed in Table 2 are resulted in hydraulic analysis including channel and floodplain routings.

TABLE 2 – SUMMARY OF DISCHARGES

Flooding Source and Location	Drainage Area (sq.mi)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Bayou Becnel					
At mouth (Lake des Allemands) *	-	2,951	3,598	3,779	4,278
At LA 3127	-	8,314	9,948	10,681	11,362
Bayou Chevreuil					
At mouth (Lake des Allemands) *	-	431	565	725	1,172
At parish boundary	-	142	172	194	253
Bayou Lasseigne					
At mouth (Lake des Allemands) *	-	181	182	178	159
At LA 3127	-	661	1263	1603	2491
Bayou Lassene					
At mouth (Lake des Allemands) *	-	15	26	25	1**
At parish boundary	-	591	815	929	50

TABLE 2 – SUMMARY OF DISCHARGES (Continued)

Flooding Source and Location	Drainage Area (sq.mi)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Brazan Canal					
At mouth (Lake des Allemands) *	-	73	83	85	76
At parish boundary	-	91	104	110	110
Vacherie Canal					
At mouth (Lake des Allemands) *					
At parish boundary	-	460**	562**	606**	750**
	-	205	172**	156**	102**

* Influenced by the stages of Lake des Allemands.
- : Drainage area is not available
All peak discharges listed are the results from unsteady HEC-RAS modeling at the time when the maximum stage occurs, those identified as ** indicate a flow direction reversal.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the FIRM. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

For streams as well as storage areas studied for this parishwide analyses included in the Donaldsonville To The Gulf Feasibility Study, water surface elevations for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods were computed using the U.S. Army Corps of Engineers' HEC-RAS version 3.1.3 (Reference 7). It was modeled using unsteady-state condition simulation.

Stage-storage relationship curves were established from 2-foot contour topographic maps (Reference 8). Storage volumes for rainfall runoff were computed by routing flood hydrographs through drainage structures and over roadways into the individual drainage units. Flood hydrographs were routed to outfall canal and drainage ditches. The following Table 3 shows the initial stages used for the detailed hydraulic model.

TABLE 3 – SUMMARY OF STORAGE AREA ELEVATIONS

Storage Area (within parish from D2G WEST)	Initial Stage (FT.NAVD)
4C-9	-2.0
11A	2.0
11A2	3.0
11A3	2.0
11B	1.0
11C	2.5

Storage Area (within parish from D2G WEST)	Initial Stage (FT.NAVD)
12A	-1.0
12B	2.0
13	2.0
14A	1.0
15A	-1.0
15B	-1.0
15C	-2.0
SA16	1.0
Lake des Allemands	0.0

Due to the flat terrain characteristics, no significant water surface elevation changes exist in long distance of open channels. Also the flood stages in the channel are influenced by the stages of adjacent storage areas. Therefore, no water surface profiles were developed except for the Mississippi River. In addition, since most channels are well defined by man-made berms between storage areas, floodway analysis was not necessary.

Roughness coefficients were estimated based on field inspection of stream channels and floodplain areas. The following Table 4 shows the Manning's "n" ranges for the streams studied by detailed methods in this study:

TABLE 4 - SUMMARY OF ROUGHNESS COEFFICIENTS

Stream	Channel "n"	Overbank "n"
Bayou Becnel	0.035	0.045
Bayou Chevreuil	0.035	0.045
Bayou Lasseigne	0.035 ~ 0.045	0.045
Bayou Lassene	0.035	0.045
Brazan Canal	0.030	0.045
Mississippi River	N/A	N/A
Vacherie Canal	0.035	0.045

N/A: Not available

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations on the FIRM are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.3 Coastal Analyses

The hydraulic characteristics of flooding from possible sources were analyzed to provide estimates of flood elevations for selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown in the coastal data tables and flood profiles in the FIS report.

3.3.1 Storm Surge Analysis and Modeling

For areas subject to tidal inundation, the 10-, 2-, 1-, and 0.2-percent-annual-chance stillwater elevations and delineations were taken directly from a detailed storm surge study documented in the Technical Study Data Notebook (TSDN) for this new Louisiana coastal flood hazard study.

The Advanced Circulation model for Coastal Ocean Hydrodynamics (ADCIRC) developed by the USACE, was applied to predict the stillwater elevations or storm surge levels for coastal Louisiana. The ADCIRC uses an unstructured grid and is a finite-element long wave model. It has the capability to stimulate tidal circulation and storm surge propagation over large areas and is able to provide highly detailed resolution in the areas of interests along shorelines, open coasts and inland bays. It solves three dimensional equations of motion, including tidal potential, Coriolis, and nonlinear terms of the governing equations. The model is formulated from the depth averaged shallow water equations for conservation of mass and momentum which result in the generalized wave continuity equation.

Nearshore waves required to calculate wave runup and overtopping on structures, and the wave momentum (radiation stress) contribution to elevated water levels (wave setup). The numerical model STWAVE was used to generate and transform waves to the shore. STWAVE is a finite-difference model that calculates wave spectra on a rectangular grid. The model outputs zero-moment wave height, peak wave period (Tp), and mean wave direction at all grid points and two-dimensional spectra at selected grid points. STWAVE includes an option to input spatially variable wind and surge field. The surge significantly alters the wave transformation and generation for the hurricane simulations in shallow areas flooded.

STWAVE was applied on several grids for the Southern Louisiana area. The input for each grid includes the bathymetry (interpolated from the ADCIRC domain), surge fields (interpolated from ADCIRC surge fields), and wind (interpolated from the ADCIRC wind fields, which apply land effects to the OWI wind fields). The wind applied in STWAVE is spatially and temporally variable for all domains. STWAVE was run at 30-mintue intervals.

An existing ADCIRC grid mesh developed by the USACE was refined along the shoreline of Louisiana and surrounding areas using bathymetric and topographic data from various sources. Bathymetric data consisted of ETOPO5 and Digital Nautical chart databases in the offshore regions. In the nearshore areas, bathymetric data came from regional bathymetric surveys conducted by the USACE. The topographic portion of the ADCIRC mesh was populated with topographic light detection and ranging (LiDAR) from several sources. In addition, subgrid sized features such as roads and levees were captured in the grid and modeled as weirs. Further details about the terrain data and how it was processed can be found in the TSDN.

The completed ADCIRC grid mesh resulted in a finite element model coded with over 2,200,000 grid nodes. The National Oceanic and Atmospheric Administration (NOAA) high definition vector shoreline was used to define the change between water and land elements. The grid includes other features, such as islands, roads, bridges, open waters, bays, and rivers. Field reconnaissance detailed the significant drainage and road features, and documentation of coastal structures in the form of seawalls, bulkheads, and harbors. The National Land Cover Dataset was used to define Manning's n values for bottom roughness coefficients input at each node to the mesh. A directional surface wind roughness value was also applied. Further details about the ADCIRC mesh creation and grid development process can be found in the TSDN.

Predicted tidal cycles were used to calibrate the ADCIRC model and refine the grid. Tidal boundary conditions were obtained from a total of 40 NOAA tide gauges. Seven tidal constituents were used (K1, O1, Q1, M2, S2, N2, and K2). The simulated water-surface elevation time series was compared to measured tides from tide gauge stations for over a 30-day period. Model validation, which tests its ability to reproduce historical events, was performed against Hurricanes Katrina (2005), Rita (2005), and Andrew (1992). Simulated water levels for each event were compared to observed water levels from NOAA tidal gauges, as well as available high water marks. Further details about the model calibration and validation can be found in the TSDN.

Production runs were carried out with STWAVE and ADCIRC on a set of hypothetical storm tracks and storm parameters in order to obtain the maximum water levels for input to the statistical analysis. The hypothetical (synthetic) population of storms was divided into two groups, one for hurricanes of Saffir-Simpson scale Category 3 and 4 strength or "greater storms" and another set for hurricanes of Category 2 strength or "lesser storms." A total of 304 individual storms with different tracks and various combinations of the storm parameters were chosen for the production run set of synthetic hurricane simulations. Each storm was run for at least 3 days of simulation and did not include tidal forcing. Wind and pressure fields obtained from the PBL model and wave radiation stress from the STWAVE model were input to the ADCIRC model for each production storm. All stillwater results for this study include the effects of wave setup. Maximum water-surface was output at every ADCIRC grid point that was wetted by a model storm. This resulted in more than 1,000,000 locations where statistical methods were applied to obtain return periods of the stillwater elevation. A

Triangular Irregular Network (TIN) was created to represent the stillwater surface based on the density of the output points from ADCIRC. Further details about the production run process can be found in the TSDN.

3.3.2 Statistical Analysis

The Joint Probability Method (JPM) was used to develop the stillwater frequency curves for the 10-, 2-, 1-, and 0.2-percent-annual-chance stillwater elevations. The JPM approach is a simulation methodology that relies on the development of statistical distributions of key hurricane input variables such as central pressure, radius to maximum wind speed, maximum wind speed, translation speed, track heading, etc., and sampling from these distributions to develop model hurricanes. The resulting simulation results in a family of modeled storms that preserve the relationships between the various input model components, but provides a means to model the effects and probabilities of storms that historically have not occurred. The JPM approach was modified for this coastal study based on updated statistical methods developed by FEMA and the USACE for Mississippi and Louisiana.

Due to the excessive number of simulations required for the traditional JPM method, the Joint Probability Method-Optimum Sampling (JPM-OS) was utilized to determine the stillwater elevations associated with tropical events. JPM-OS is a modification of the JPM method developed cooperatively by FEMA and the USACE for Mississippi and Louisiana coastal flood studies that were being performed simultaneously, and is intended to minimize the number of synthetic storms that are needed as input to the ADCIRC model. The methodology entails sampling from a distribution of model storm parameters (e.g., central pressure, radius to maximum wind speed, maximum wind speed, translation speed, and track heading) whose statistical properties are consistent with historical storms impacting the region, but whose detailed tracks differ. The methodology inherently assumes that the hurricane climatology over the past 60 to 65 years (back to 1940) is representative of the past and future hurricanes likely to occur along the Louisiana coast.

3.3.3 Stillwater Elevation

The results of the ADCIRC model, as described above, provided stillwater elevations, including wave setup effects that are statistically analyzed to produce probability curves. The JPM-OS is applied to obtain the return periods associated with tropical storm events. The approach involves assigning statistical weights to each of the simulated storms and generating the flood hazard curves using these statistical weights. The statistical weights are chosen so that the effective probability distributions associated with the selected greater and lesser storm populations reproduced the modeled statistical distributions derived from all historical storms.

Stillwater elevations for each Louisiana coastal parish, obtained using the ADCIRC and JPM-OS models, are provided for JPM and ADCIRC grid node locations for the 10-, 2-, 1-, or 0.2-percent-annual-chance return period stillwater elevations in the TSDN.

3.3.4 Wave Height Analysis

Areas of coastline subject to significant wave attach are referred to a coastal high hazard zones. The USACE has established the 3-foot breaking wave as the criterion for identifying the limit of coastal high hazard zones. The 3-foot wave has been established as the minimum size wave capable of causing major damage to conventional wood frame and brick veneer structures. Wave heights were computed along transects (cross-section lines) that were located along the coastal areas.

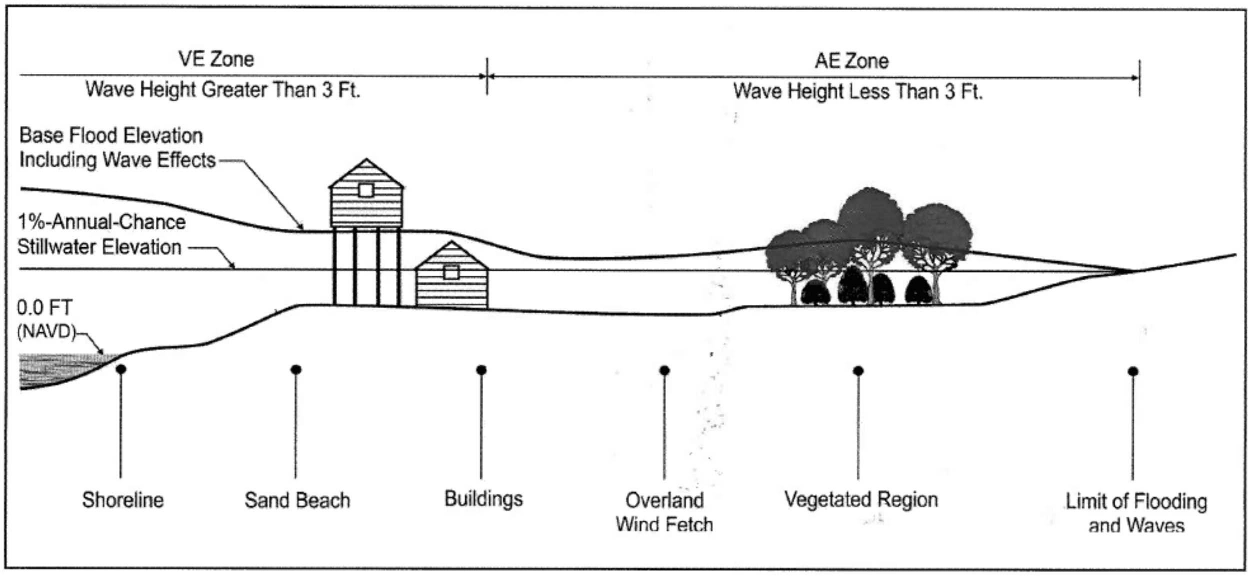


FIGURE 1 – TRANSECT SCHEMATIC

Figure 1 shows a profile for a typical transect illustrating the effects of energy dissipation and regeneration of wave as it moves inland. This figure shows the wave crest elevations being decreased by obstructions, such as buildings, vegetation, and rising ground elevations, and being increased by open, unobstructed wind fetches. Figure 1 also illustrates the relationship between the local stillwater elevations, the ground profile, and the location of the VE/AE boundary. This inland limit of the coastal high hazard area is delineated to ensure that adequate insurance rates apply and appropriate construction standards are imposed, should local agencies permit building in this coastal high hazard area.

For St. John the Baptist Parish, all transects are primarily running in an east-west direction. For the flooding source of Lake Pontchartrain, transects start at the coastline of Lake Pontchartrain and end at the parish border with St. James, Lake Maurepas or the Mississippi River. For the flooding source of Lake Maurepas, transects start at the shoreline of Lake Maurepas and end at either the parish boundary with Ascension or Lake Pontchartrain. The initial wave heights representing 1- and 0.2-percent-annual-chance flood events were determined based on depth-limited breaker heights, which is 78% of the stillwater depth under the corresponding surge conditions. Wave periods were extracted from STWAVE modeling results.

The wave transects listed in Table 5 “Coastal Data Table” for this study were developed considering the physical and cultural characteristics of the land so that they would closely represent physical conditions in their locality. Transects were spaced dense enough to represent the hydraulic conditions and to capture hydraulic changes. In areas having more uniform characteristics, the transects were spaced at relatively larger intervals. Transects are also located in areas where unique flooding existed and in areas where computed wave heights varied significantly between adjacent transects. For transects with flood sources from both directions, Wave Height Analysis for Flood Insurance Studies (WHAFIS, Reference 9) were performed from both directions. The higher wave height was delineated on the FIRM panel. Transects are shown on the respective FIRM panels for the Parish.

The topographic information applied to transect profiles was based on ADCIRC grid bathymetry and LiDAR data collected by the State of Louisiana and FEMA between 2003 and 2005 (Reference 8). The vertical datum for topographic/bathymetry data is the NAVD88.

The Louisiana Gap Analysis Program (GAP) Analysis, developed by the U.S. Geological Survey (USGS), served as the primary source for the spatial distribution of vegetative cover. Aerial imagery and field reconnaissance were performed to verify the Louisiana GAP Analysis data. Aerial photos and images downloaded from http://atlas.lsu.edu/ were applied to verify features such as buildings, levees, forested vegetation, and marsh grass for input to the wave height models.

Levees that do not meet the free board requirements of 44 CFR 65.10 were removed from the analysis. No storm-induced erosion analysis was performed. Primary frontal dune erosion was not applicable for this Parish.

Wave height calculation used in this study follows the methodology described in Appendix D of the October 2006 FEMA Guidelines and Specifications for Flood Hazard Mapping Partners. WHAFIS 4.0 was applied to calculate overland wave height propagation and establish base flood elevations. In addition to the 1-percent-annual chance event, the 0.2-percent-annual-chance event was also modeled with WHAFIS 4.0. The 0.2-percent-annual-chance wave height results are not included on the FIRMs but are provided as wave transect profiles in the FIS.

Stillwater elevations are applied to each ground station along a transect and input to WHAFIS. The stillwater elevations were obtained from the ADCIRC storm surge study, using the stillwater TIN generated by the USACE. Wave setup was not calculated separately because wave setup was included in the base stillwater elevations from the storm surge analysis.

Levees and embankment structures not meeting the free board requirements of 44 CFR 65.10 were removed in the WHAFIS wave height analysis. In some areas, there is high ground in front of levees, so the surge did not reach those levees such as the Mississippi River levees. Therefore, no wave runup analysis was necessary for this Parish.

TABLE 5. COASTAL DATA TABLE

Community Name	Transect	Description	Latitude & Longitude at Start of Transect		Starting Stillwater Elevations (feet NAVD 88) Range of Stillwater Elevations (feet NAVD 88)				Zone Designation and BFE (feet NAVD88)
					10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance	
From Lake Pontchartrain									
St. John	1	The northern-most transect in the Parish, traversing west from Lake Pontchartrain to Lake Maurepas	30.2705	90.3312	6.2 Range Not Available	8.6 Range Not Available	10.2 9.0-10.2	12.4 10.9-12.4	AE 10-12 VE 11-15
St. John	2	Located to the south of transect 1, traversing west from Lake Pontchartrain to Lake Maurepas	30.2499	90.3483	6.2	8.7	10.3 8.0-10.3	12.6 9.8-12.6	AE 9-12 VE 12-15
St. John	3	Located to the south of transect 2, traversing west from Lake Pontchartrain to Lake Maurepas	30.2369	90.3688	6.3	9.0	10.8 7.1-10.8	13.2 9.0-13.2	AE 8-13 VE 13-16
St. John	4	Located to the south of transect 3, traversing west from Lake Pontchartrain to Lake Maurepas	30.2309	90.3810	6.4	9.2	11.1 6.6-11.1	13.5 8.6-13.5	AE 7-13 VE 9-16
St. John	5	Located to the south of transect 4, traversing west from Lake Pontchartrain to Lake Maurepas	30.2191	90.4018	6.5	9.5	11.5 6.4-11.6	14.2 8.41-14.3	AE 7-14 VE 14-17
St. John	6	Located to the south of transect 5, traversing west from Lake Pontchartrain to Lake Maurepas	30.2031	90.4155	6.6	9.7	11.9 6.4-11.9	14.6 8.3-14.6	AE 7-14 VE 14-18

TABLE 5. COASTAL DATA TABLE (continued)

Community Name	Transect	Description	Latitude & Longitude at Start of Transect		Starting Stillwater Elevations (feet NAVD 88) Range of Stillwater Elevations (feet NAVD 88)				Zone Designation and BFE (feet NAVD88)
					10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance	
From Lake Pontchartrain									
St. John	7	Located to the south of transect 6, traversing west from Lake Pontchartrain to Lake Maurepas	30.1831	90.4272	6.7	10.0	11.8 6.3-11.8	14.8 8.3-14.8	AE 7-13 VE 13-17
St. John	8	Located to the south of transect 7, traversing west from Lake Pontchartrain to Lake Maurepas	30.1528	90.4334	6.7	10.1	12.1 6.4-12.1	14.9 8.3-14.9	AE 7-13 VE 13-16
St. John	9	Located to the south of transect 8, traversing west from Lake Pontchartrain to Lake Maurepas	30.1455	90.4346	6.7	10.3	11.6 6.6-11.6	14.7 8.3-14.7	AE 7-13 VE 9-15
St. John	13	Located to the south of transect 9, traversing from Lake Pontchartrain to west of Parish boundary	30.1372	90.4325	6.7	10.2	12.1 4.9-12.1	14.9 6.8-14.9	AE 5-14 VE 14-17
St. John	14	Located to the south of transect 13, traversing from Lake Pontchartrain to west of Parish boundary	30.1312	90.4310	6.8	10.1	12.1 4.4-12.1	14.8 6.2-14.9	AE 5-14 VE 14-17
St. John	15	Located to the south of transect 14, traversing from Lake Pontchartrain to west of Parish boundary	30.1265	90.4304	6.7	10.2	12.1 2.1-12.1	14.8 2.9-14.8	AE 2-14 VE 14-17

TABLE 5. COASTAL DATA TABLE (continued)

Community Name	Transcect	Description	Latitude & Longitude at Start of Transect		Starting Stillwater Elevations (feet NAVD 88) Range of Stillwater Elevations (feet NAVD 88)				Zone Designation and BFE (feet NAVD88)
					10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance	
From Lake Pontchartrain									
St. John	16	Located to the south of transect 15, traversing from Lake Pontchartrain to Mississippi River	30.1220	90.4290	6.6	10.2	12.1 3.4-12.1	14.8 4.4-14.8	AE 3-14 VE 14-14
St. John	17	Located to the south of transect 16, traversing from Lake Pontchartrain to Mississippi River	30.1180	90.4284	6.7	10.1	12.1 0-12.1	14.7 0-14.7	AE 0-14 VE 14-17
St. John	18	Located to the south of transect 17, traversing from Pontchartrain to Mississippi River	30.1133	90.4268	6.7	10.2	12.1 6.8-12.1	14.7 8.0-14.7	AE 7-14 VE 14-18
St. John	19	Located to the south of transect 18, traversing from Pontchartrain to Mississippi River	30.1088	90.4231	6.7	10.1	12.0 7.1-12.0	14.6 10.3-14.7	AE 7-14 VE 14-18
St. John	20	Located to the south of transect 19, traversing from Pontchartrain to Mississippi River	30.0973	90.4188	6.6	10.1	12.0 7.2-12.0	14.6 7.9-14.6	AE 7-14 VE 14-17
St. John	21	Located to the south of transect 20, traversing from Pontchartrain to Mississippi River	30.0911	90.4156	6.6	10.1	11.9 7.1-11.9	14.4 9.0-14.5	AE 7-12 VE 12-17
St. John	22	Located to the south of transect 21, traversing from Pontchartrain to Mississippi River	30.0850	90.4117	6.6	10.0	11.9 6.2-11.9	14.4 9.0-14.4	AE 6-11 VE 11-17

TABLE 5. COASTAL DATA TABLE (continued)

Community Name	Transcect	Description	Latitude & Longitude at Start of Transect		Starting Stillwater Elevations (feet NAVD 88) Range of Stillwater Elevations (feet NAVD 88)				Zone Designation and BFE (feet NAVD88)
					10% Annual Chance*	2% Annual Chance	1% Annual Chance	0.2% Annual Chance	
From Lake Maurepas									
St. John	3	Located to the south of transect 2, traversing east from Lake Maurepas to Lake Pontchartrain	30.2820	90.3977	4.5	6	7.1 7.1-10.8	9 9.0-13.2	AE 9-12 VE 9-11
St. John	4	Located to the south of transect 3, traversing east from Lake Maurepas to Lake Pontchartrain	30.2614	90.4202	4.4	5.5	6.6 6.6-11.1	8.6 8.6-13.5	AE 9-12 VE 9-10
St. John	5	Located to the south of transect 4, traversing east from Lake Maurepas to Lake Pontchartrain	30.2373	90.4285	4.3	5.3	6.4 6.4-11.6	8.4 8.4-14.3	AE 9-13 VE 9-9
St. John	6	Located to the south of transect 5, traversing east from Lake Maurepas to Lake Pontchartrain	30.2145	90.4389	4.3	5.2	6.5 6.5-11.9	8.4 8.4-14.6	AE 9-14 VE 9-10
St. John	7	Located to the south of transect 6, traversing east from Lake Maurepas to Lake Pontchartrain	30.1983	90.4527	4.3	5.2	6.3 6.3-12.1	8.3 8.3-15.0	AE 9-14 VE 9-9

TABLE 5. COASTAL DATA TABLE (continued)

Community Name	Transcect	Description	Latitude & Longitude at Start of Transect		Starting Stillwater Elevations (feet NAVD 88) Range of Stillwater Elevations (feet NAVD 88)				Zone Designation and BFE (feet NAVD88)
					10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance	
From Lake Maurepas									
St. John	8	Located to the south of transect 7, traversing east from Lake Maurepas to Lake Pontchartrain	30.1827	90.4699	4.3	5.3	6.4 6.4-12.1	8.3 8.3-14.9	AE 8-14 VE 9-9
St. John	9	Located to the south of transect 8, traversing west from Lake Pontchartrain to Lake Maurepas	30.1699	90.5183	4.3	5.5	6.6 6.6-11.7	8.4 8.3-14.8	AE 7-13 VE 9-10
St. John	10	Transect begins at west end of Lake Maurepas, traversing from Lake Maurepas to west of Parish boundary	30.1764	90.5766	4.5	6.2	7.7 5.3-7.7	9.8 7.1-9.8	AE 5-10 VE 10-11
St. John	11	Located to the north of transect 10, traversing from Lake Maurepas to west of Parish boundary	30.1941	90.5931	4.5	6.5	8.0 5.6-8.0	10.3 7.4-10.3	AE 7-10 VE 8-12
St. John	12	Located to the north of transect 11, traversing from Lake Maurepas to west of Parish boundary	30.2062	90.5995	4.5	6.5	7.6 5.9-7.6	9.7 7.6-9.7	AE 6-10 VE 10-11

3.4 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD). With the completion of the North American Vertical Datum of 1988 (NAVD), many FIS reports and FIRMs are now prepared using NAVD as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD88. The datum conversion factor from NGVD29 to NAVD88 in St. John the Baptist Parish is -0.13 foot.

For additional information regarding conversion between the NGVD and NAVD, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent-annual-chance flood data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at scales of 1:6000, with a contour interval of 2 feet (Reference 8).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent-annual-chance floodplain boundary correspond to the boundaries of the areas of special flood hazard (Zones A, AE, and VE), and the 0.2-percent-annual-chance floodplain boundaries correspond to the boundaries of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM.

Approximate 1-percent-annual-chance floodplain boundaries in some portions of the study areas were taken directly from the previous FIRM.

4.2 Floodway Analyses

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation (WSEL) of the base flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

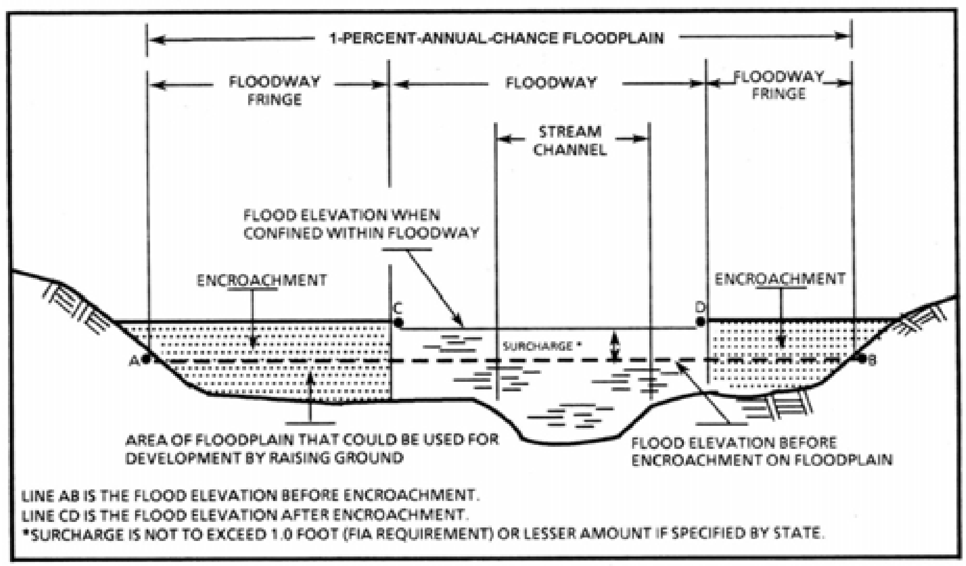


FIGURE 2 – FLOODWAY SCHEMATIC

No floodways were computed for this St. John the Baptist Parish because no water surface profiles are provided and all the studied channels are defined by the berms between the storage areas.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the base flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The parishwide FIRM presents flooding information for the entire geographic area of St. Johns the Baptist Parish. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the parish identified as flood-prone. This parishwide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for this community is presented in Table 6, “Community Map History”.

TABLE 6 – COMMUNITY MAP HISTORY

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FIRM EFFECTIVE DATE	FIRM REVISIONS (DATES)
St. John the Baptist Parish (Unincorporated Areas)	August 9, 1974	April 8, 1977	July 16, 1980	February 2, 1983

TABLE 6	FEDERAL EMERGENCY MANAGEMENT AGENCY **ST. JOHN THE BAPTIST PARISH AND INCORPORATED AREAS**	**COMMUNITY MAP HISTORY**

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with previous studies published on streams studied in this report, and it should be considered authoritative for purposes of the NFIP.

FIRMs for the adjacent St. Charles, Jefferson, Livingston, Tangipahoa and Lafourche Parishes are being revised concurrently for parishwide. The revised Ascension Parish study was recently effective. The revised studies will be in agreement with this study.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA Region VI, Federal Insurance and Mitigation Division, 800 North Loop 288, Denton, Texas 76209.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U.S. Department of Commerce, U.S. Census Bureau, Census 2000.

2. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatography of the United States No.81, Supplemental No. 1, Monthly Precipitation Probabilities and Quantities 1971-2000, Asheville, NC, 2002.

3. U.S. Department of Commerce, National Climatic Data Center, National Virtual Data System, http://www/ncdc.noaa.gov/oa/climate/online/ccd/nrmavg.txt.

4. Federal Emergency Management Agency, Flood Insurance Study, Wave Height Analysis, St. John the Baptist Parish, Louisiana, January 1982.

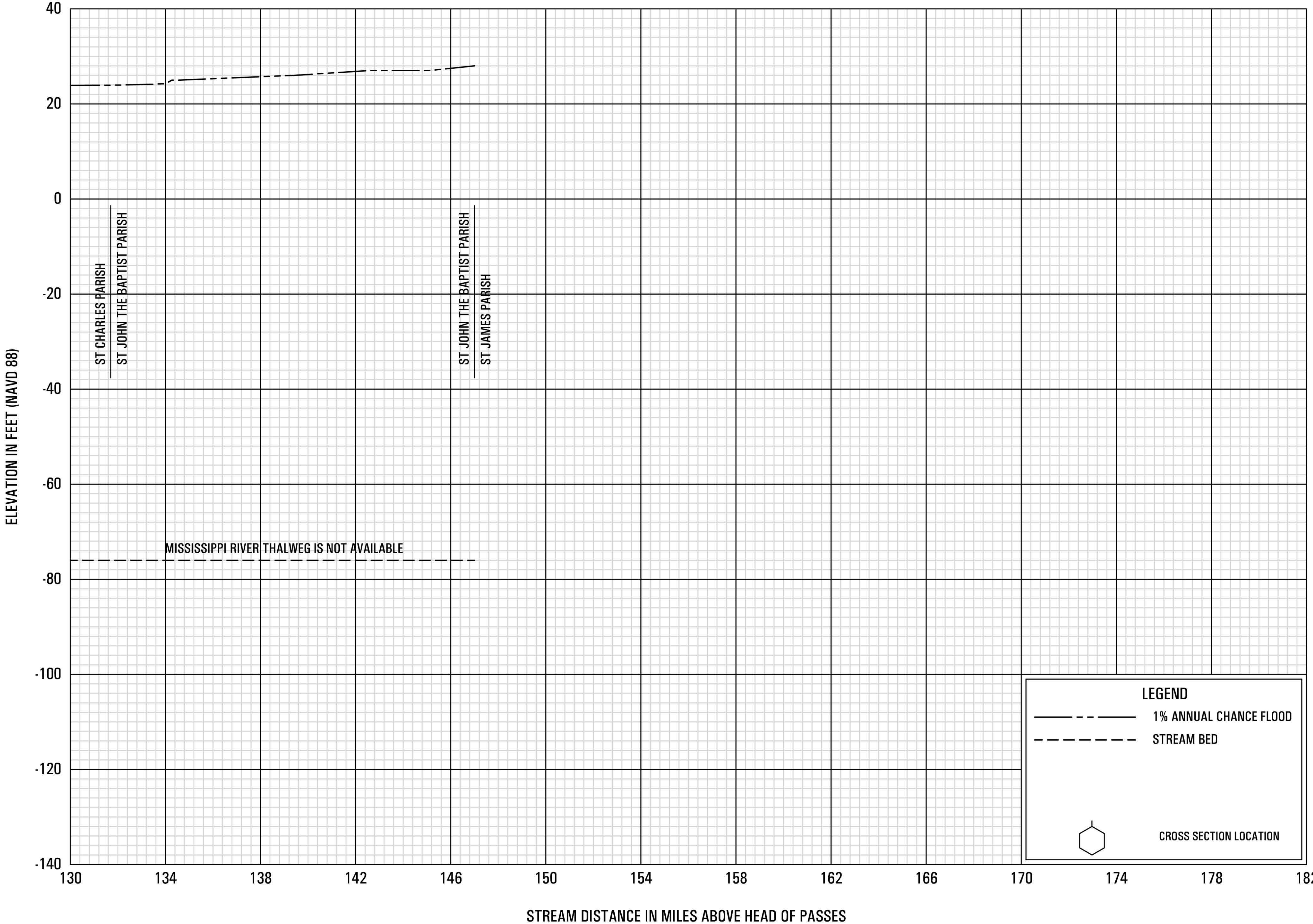
5. U. S. Army Corps of Engineers, Hydrologic Engineering Center, Hydrologic Modeling System (HEC-HMS), Version 3.1.0, December 2006.

6. National Weather Service, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Government Printing Office, Washington, D.C., 1961.

7. U. S. Army Corps of Engineers, Hydrologic Engineering Center, River Analysis System (HEC-RAS), Version 3.1.3, May 2005.

8. The Louisiana Statewide GIS website for Atlas for aerials and LiDAR data, http://atlas.lsu.edu.

9. Federal Emergency Management Agency, Users Manual for Wave Height Analysis, Revised February 1981.



FLOOD PROFILES

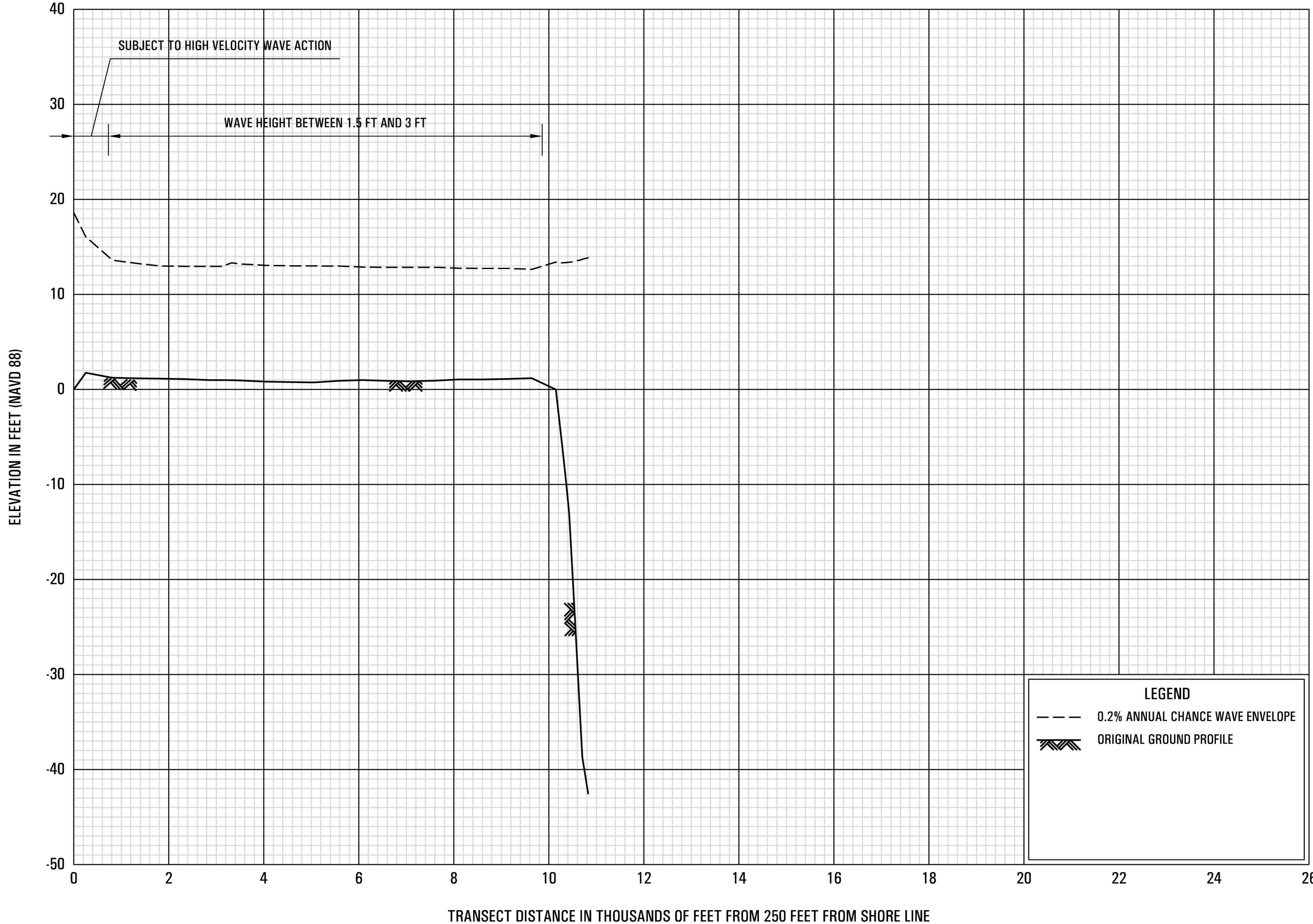
MISSISSIPPI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

01P



0.2% ANNUAL CHANCE WAVE ENVELOPE

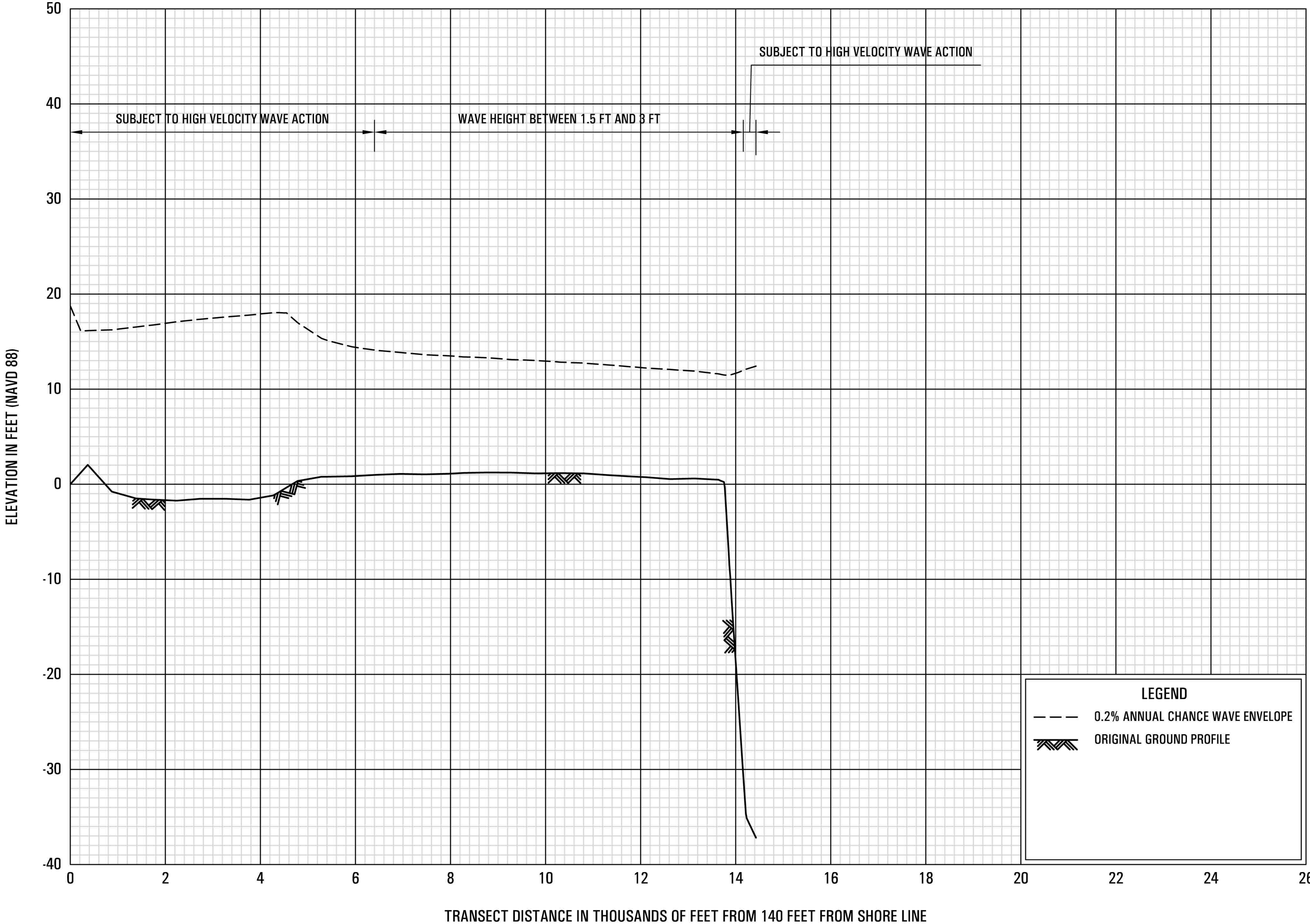
TRANSECT 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

01P



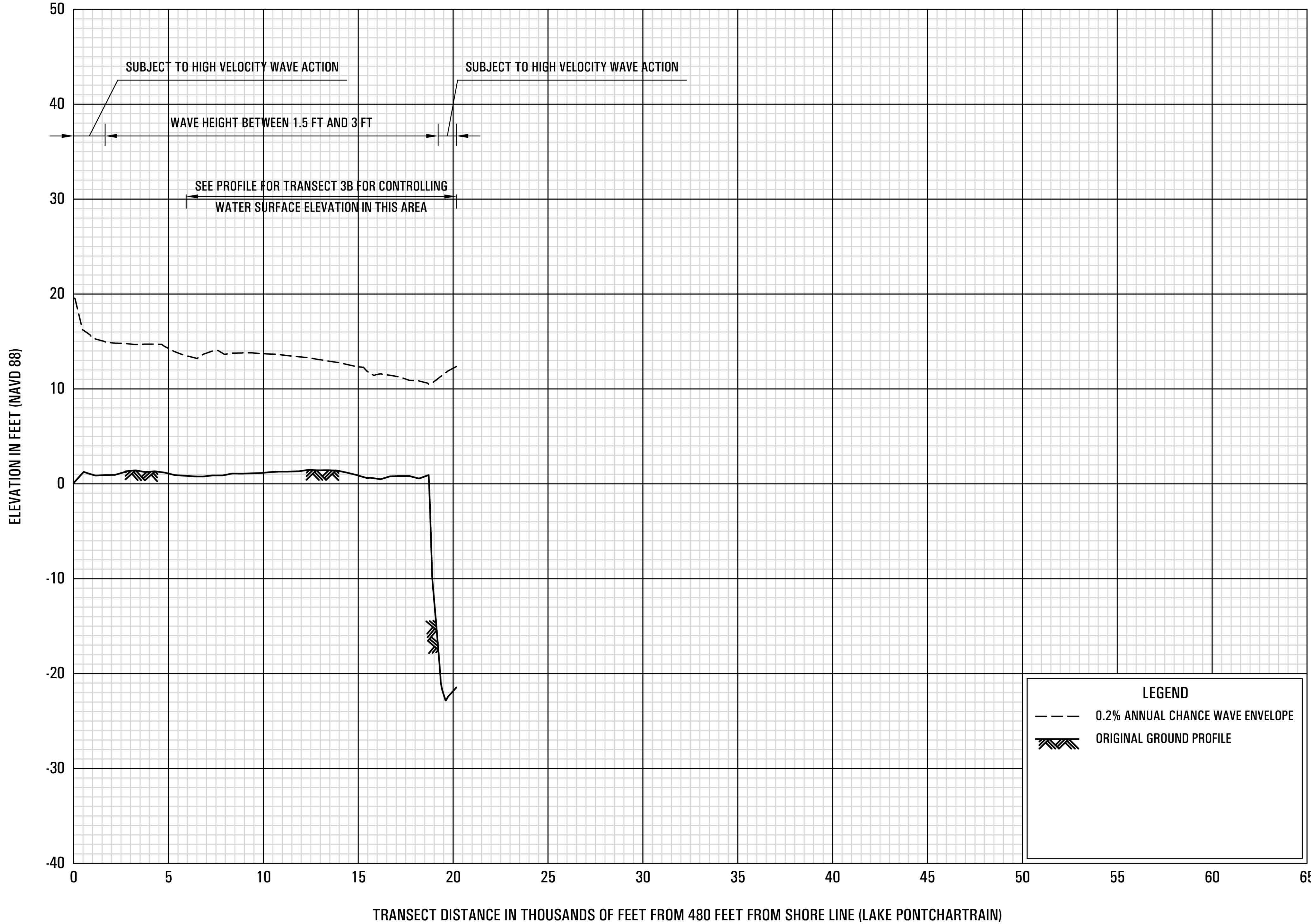
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

02P



0.2% ANNUAL CHANCE WAVE ENVELOPE

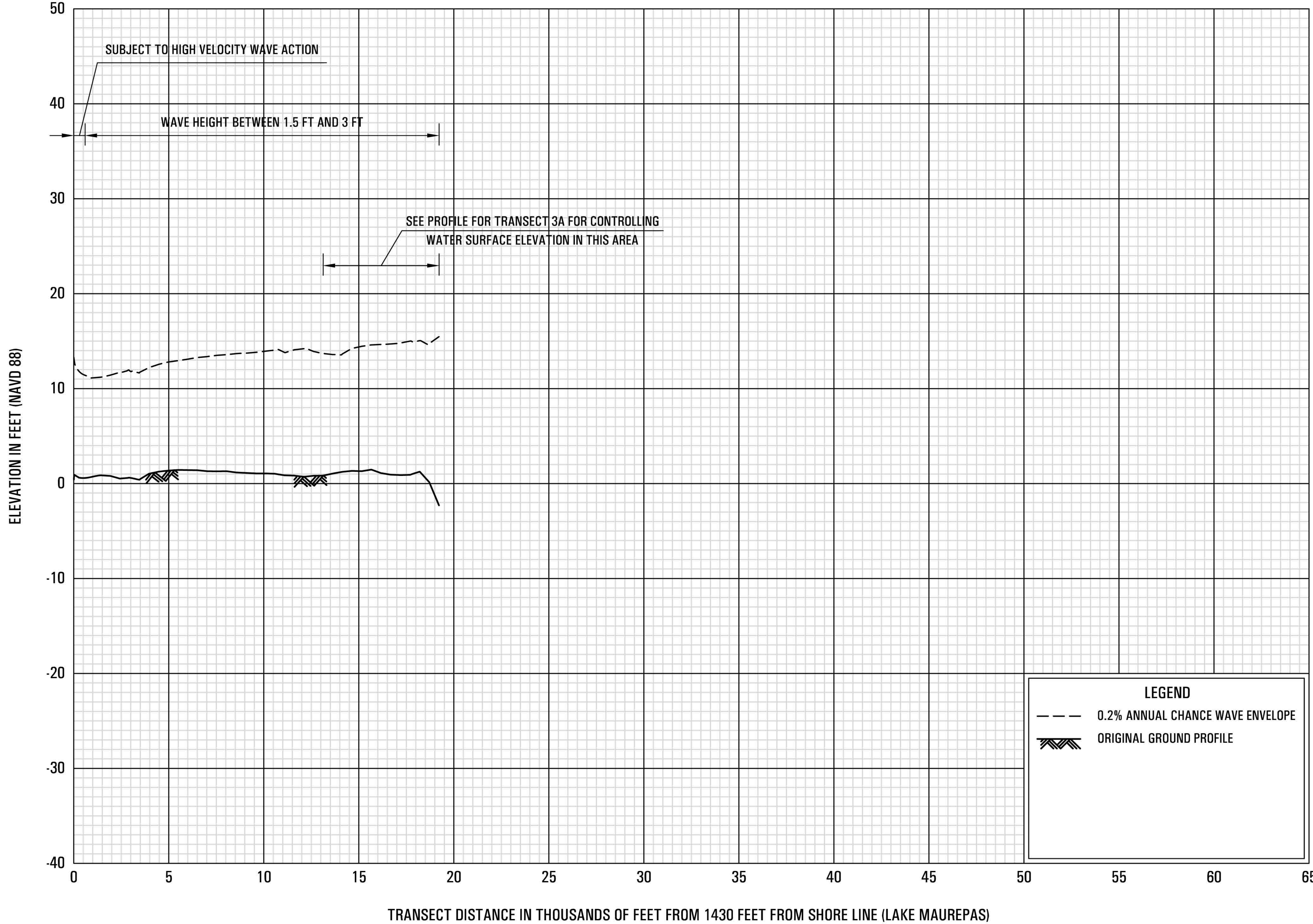
TRANSECT 3A

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

03P



0.2% ANNUAL CHANCE WAVE ENVELOPE

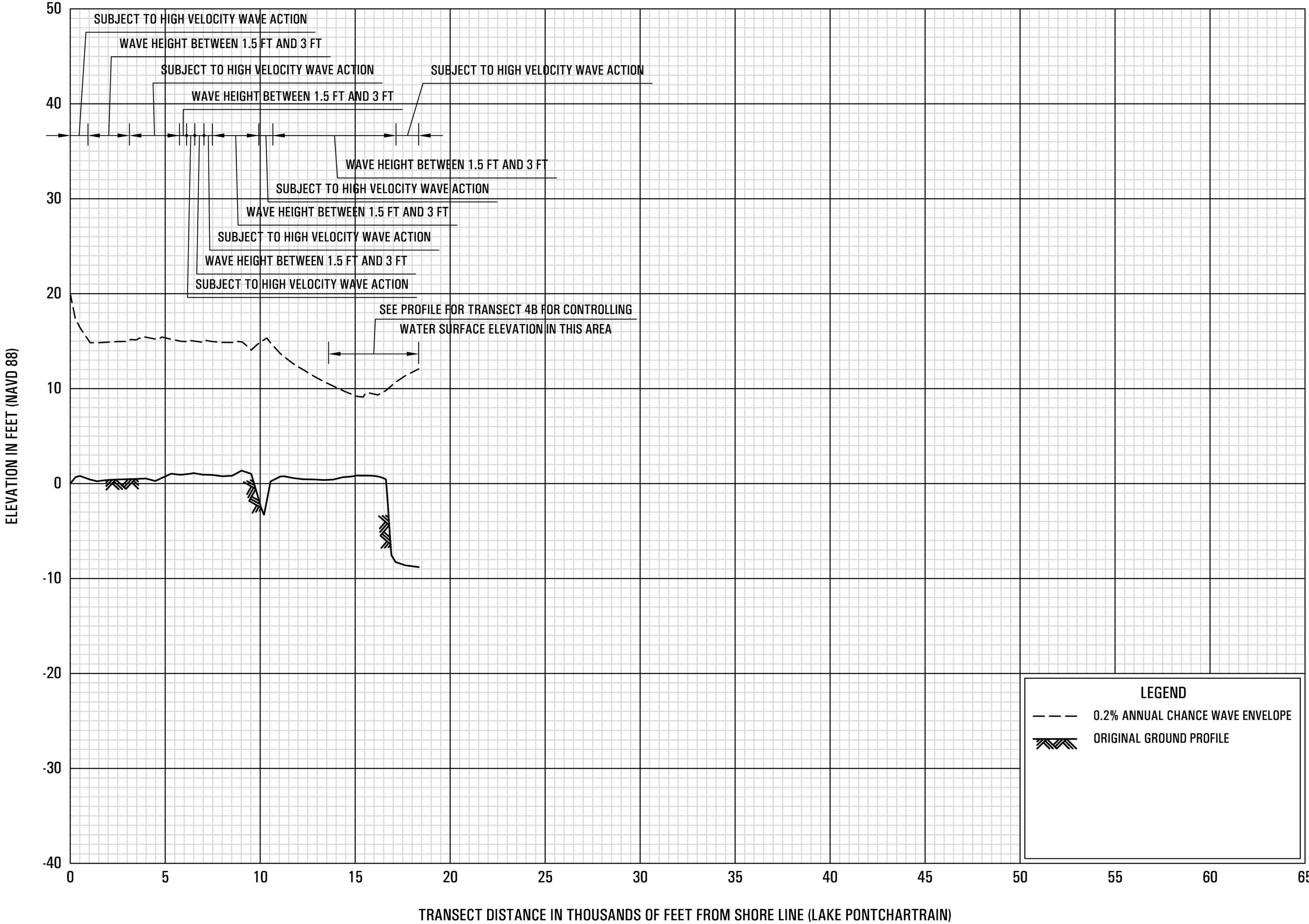
TRANSECT 3B

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

04P



0.2% ANNUAL CHANCE WAVE ENVELOPE

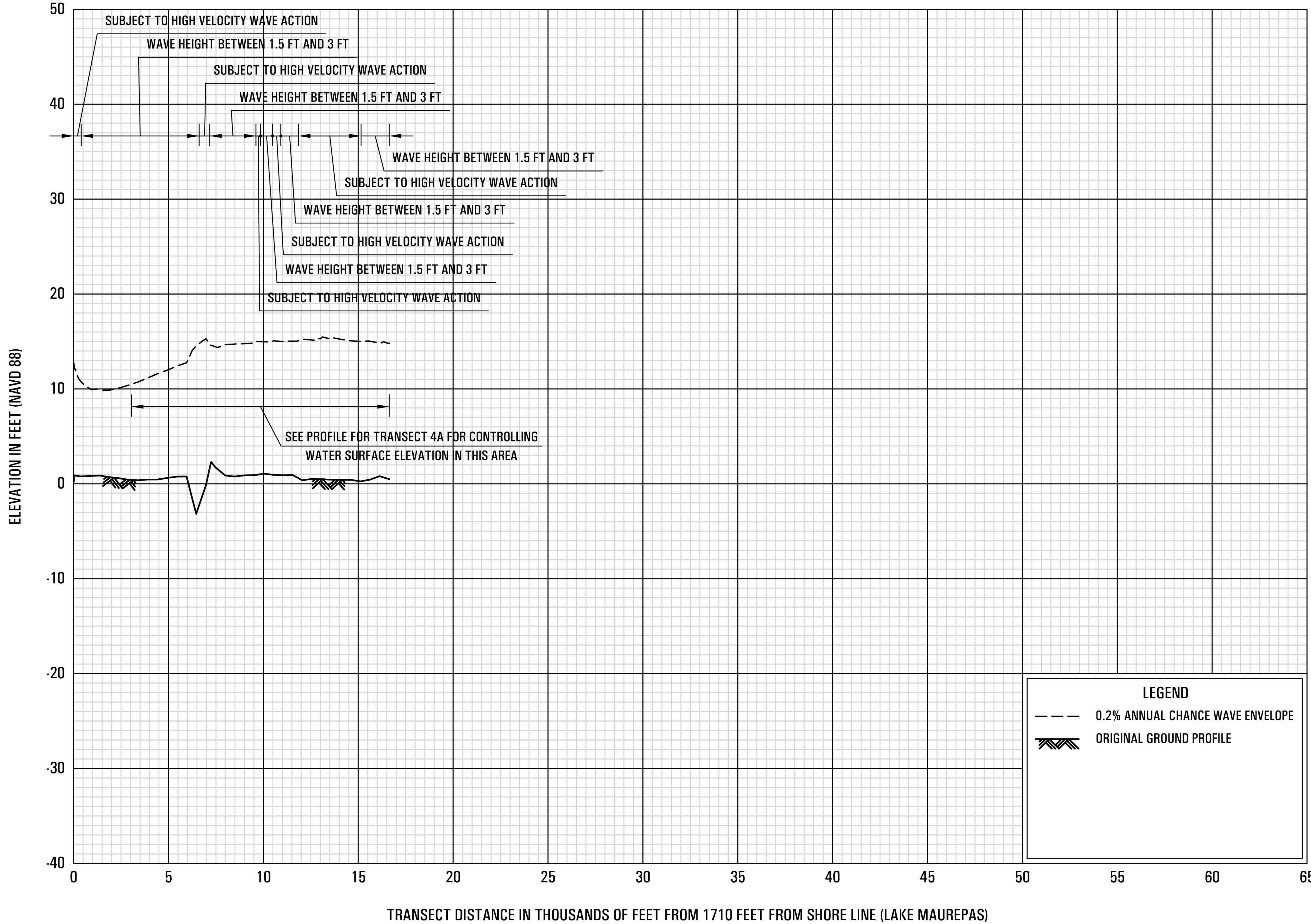
TRANSECT 4A

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

05P



0.2% ANNUAL CHANCE WAVE ENVELOPE

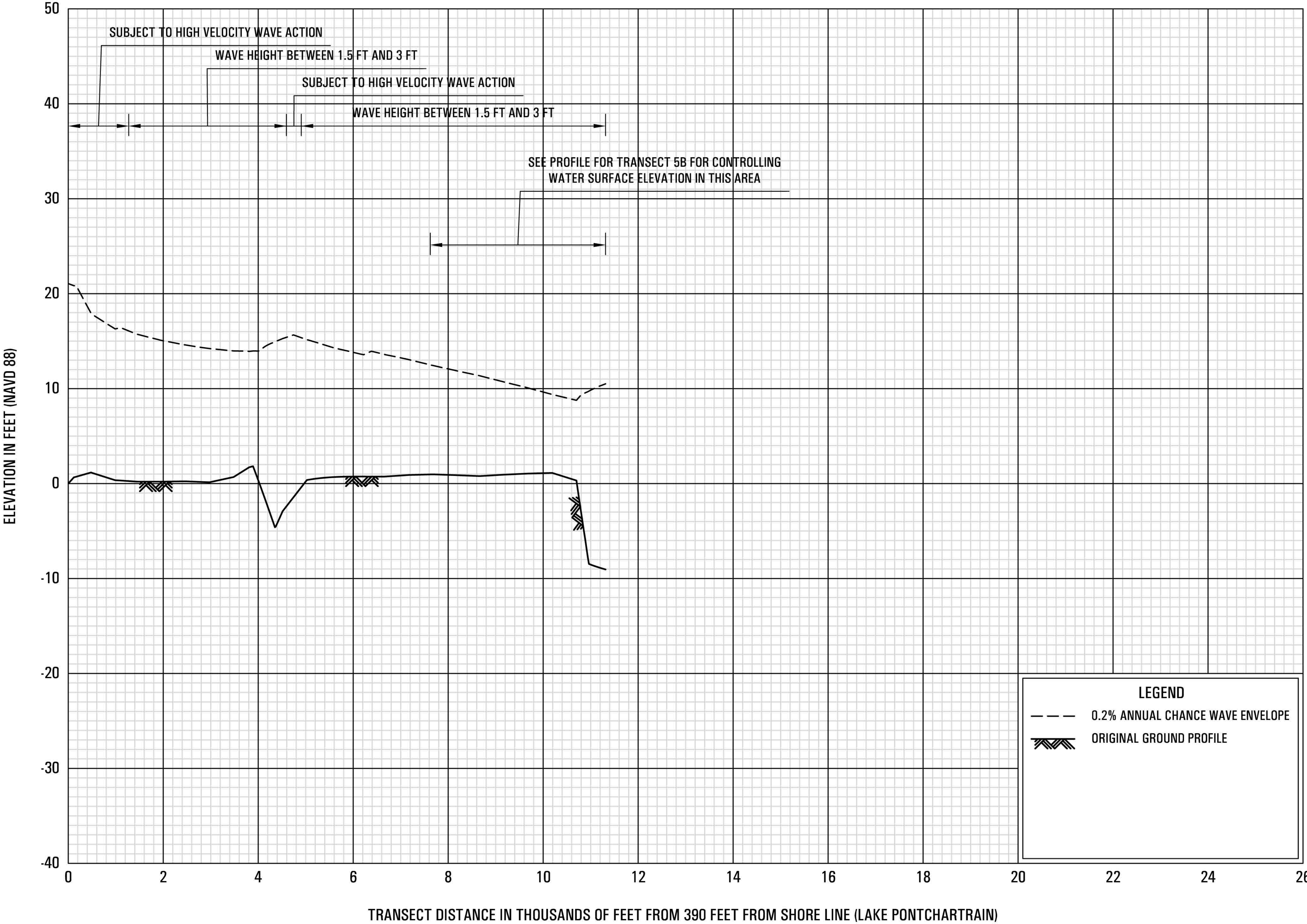
TRANSECT 4B

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

06P



0.2% ANNUAL CHANCE WAVE ENVELOPE

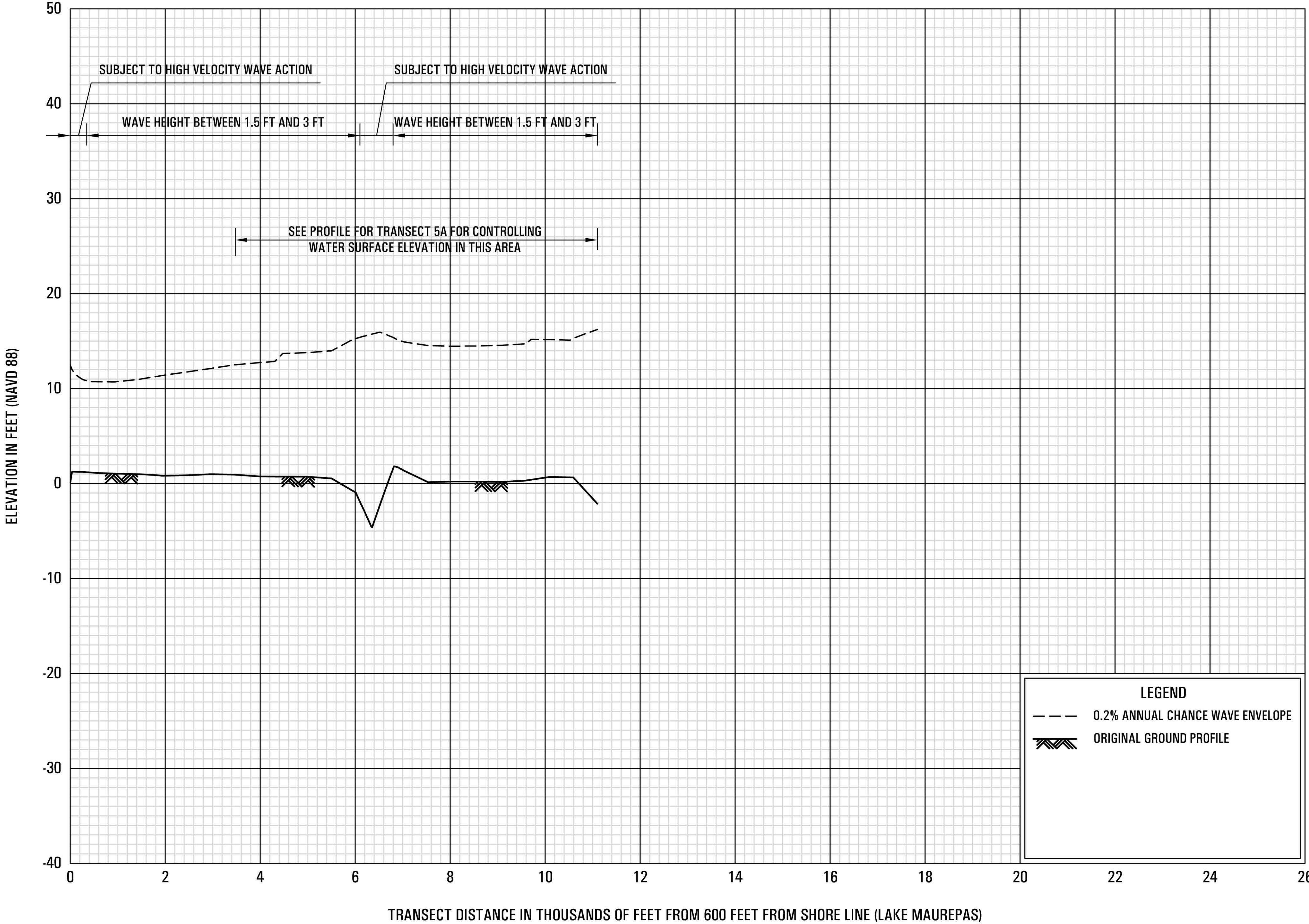
TRANSECT 5A

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

07P



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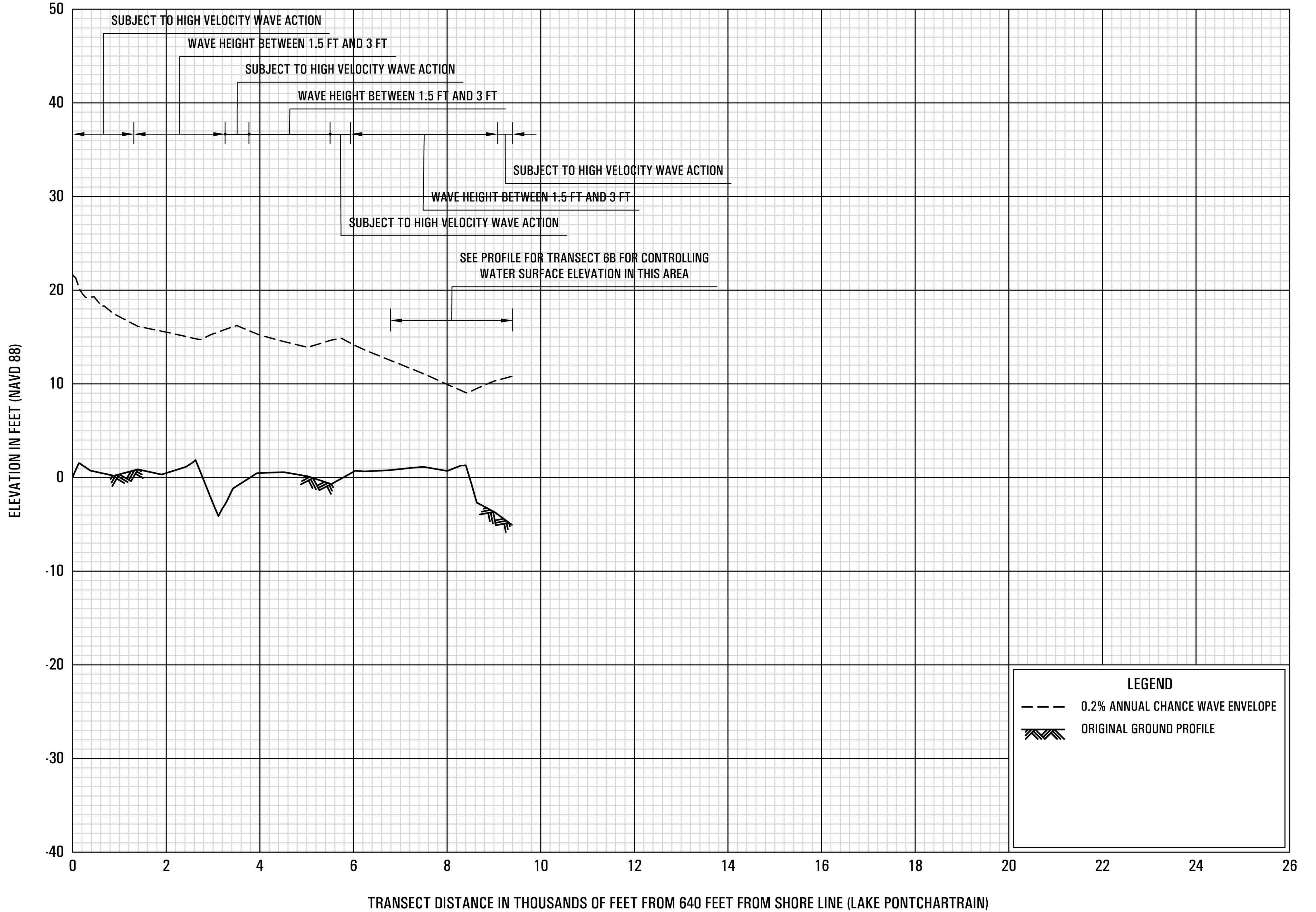
TRANSECT 5B

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

08P



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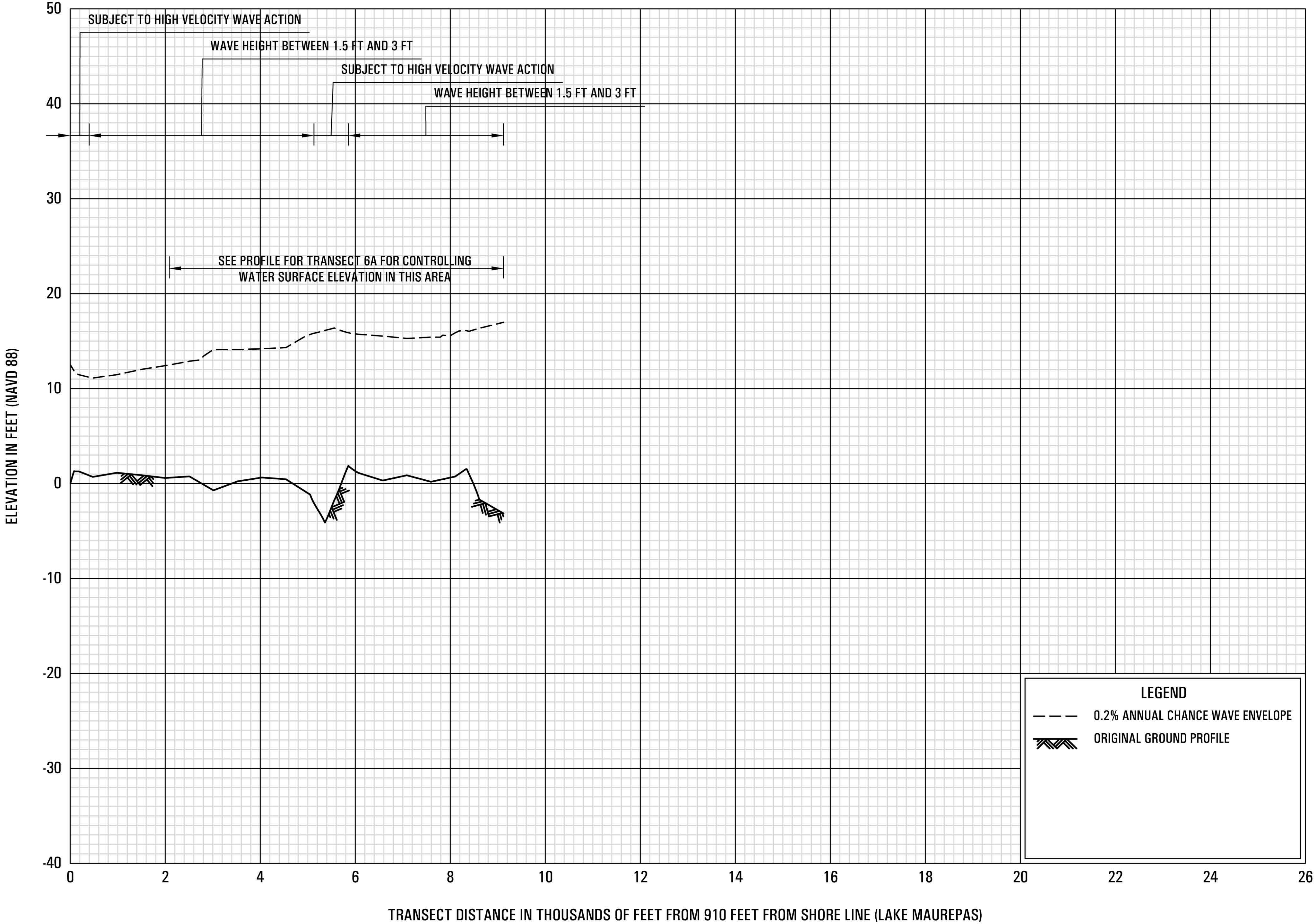
TRANSECT 6A

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

09P



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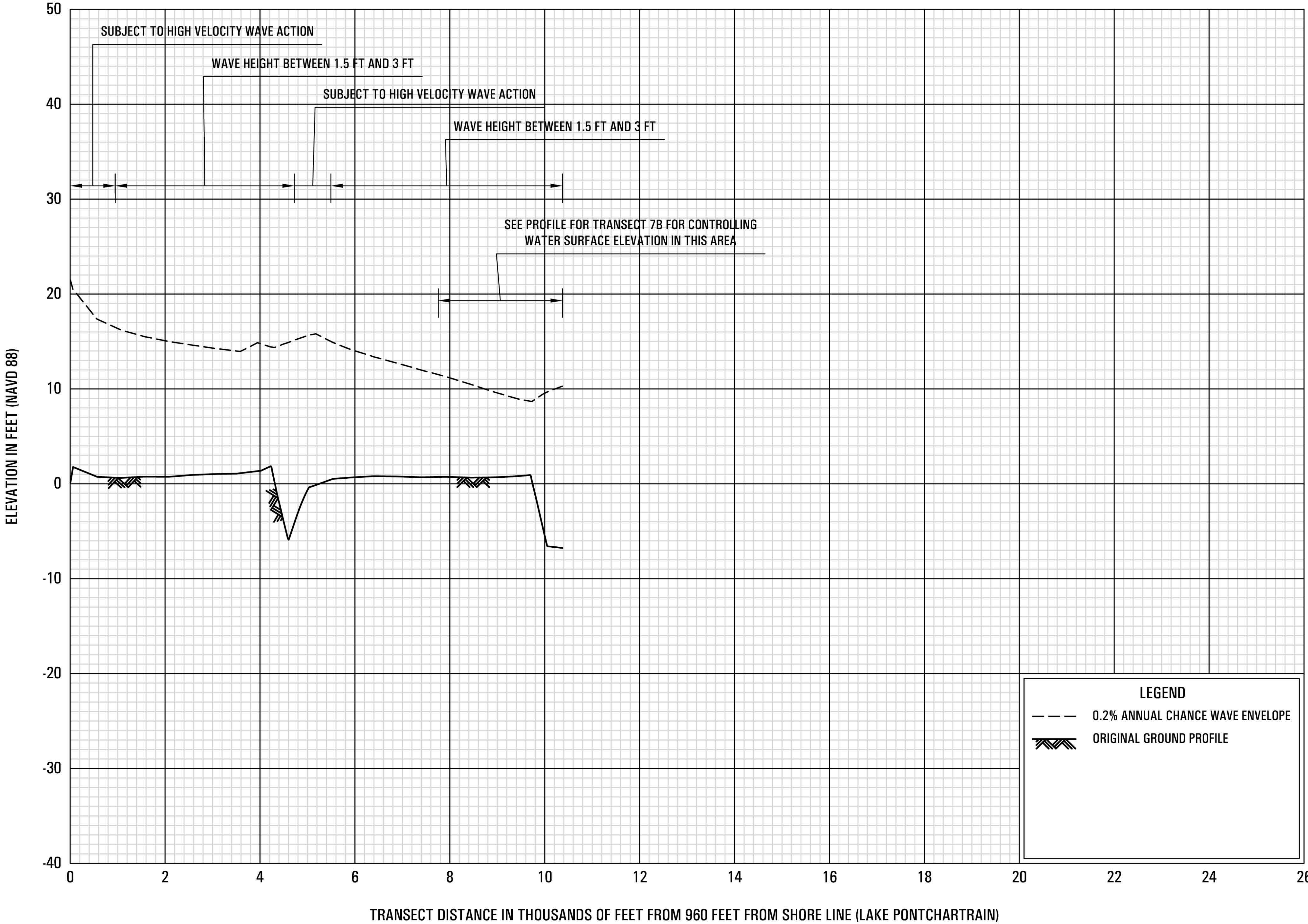
TRANSECT 6B

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

10P



0.2% ANNUAL CHANCE WAVE ENVELOPE

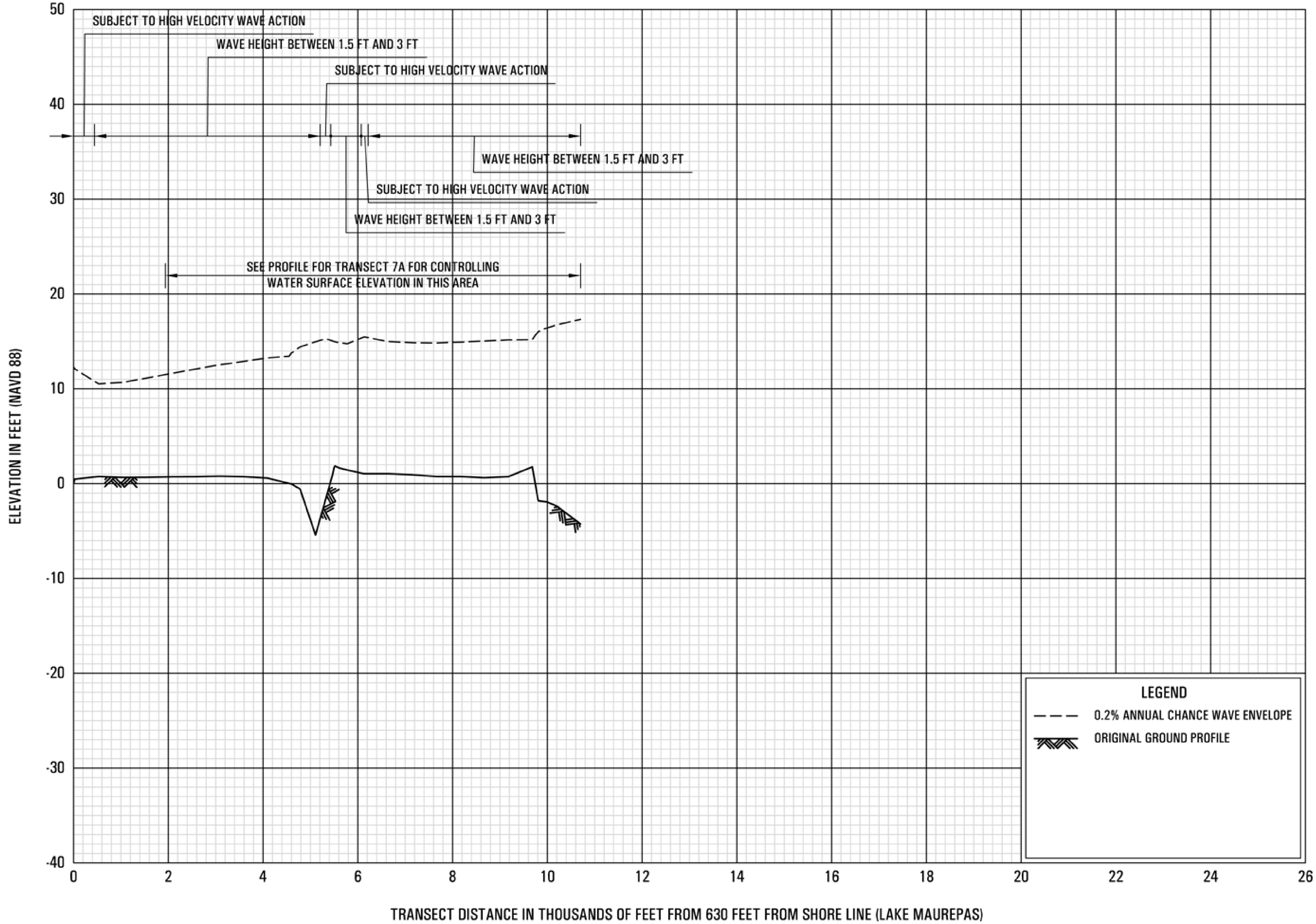
TRANSECT 7A

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

11P

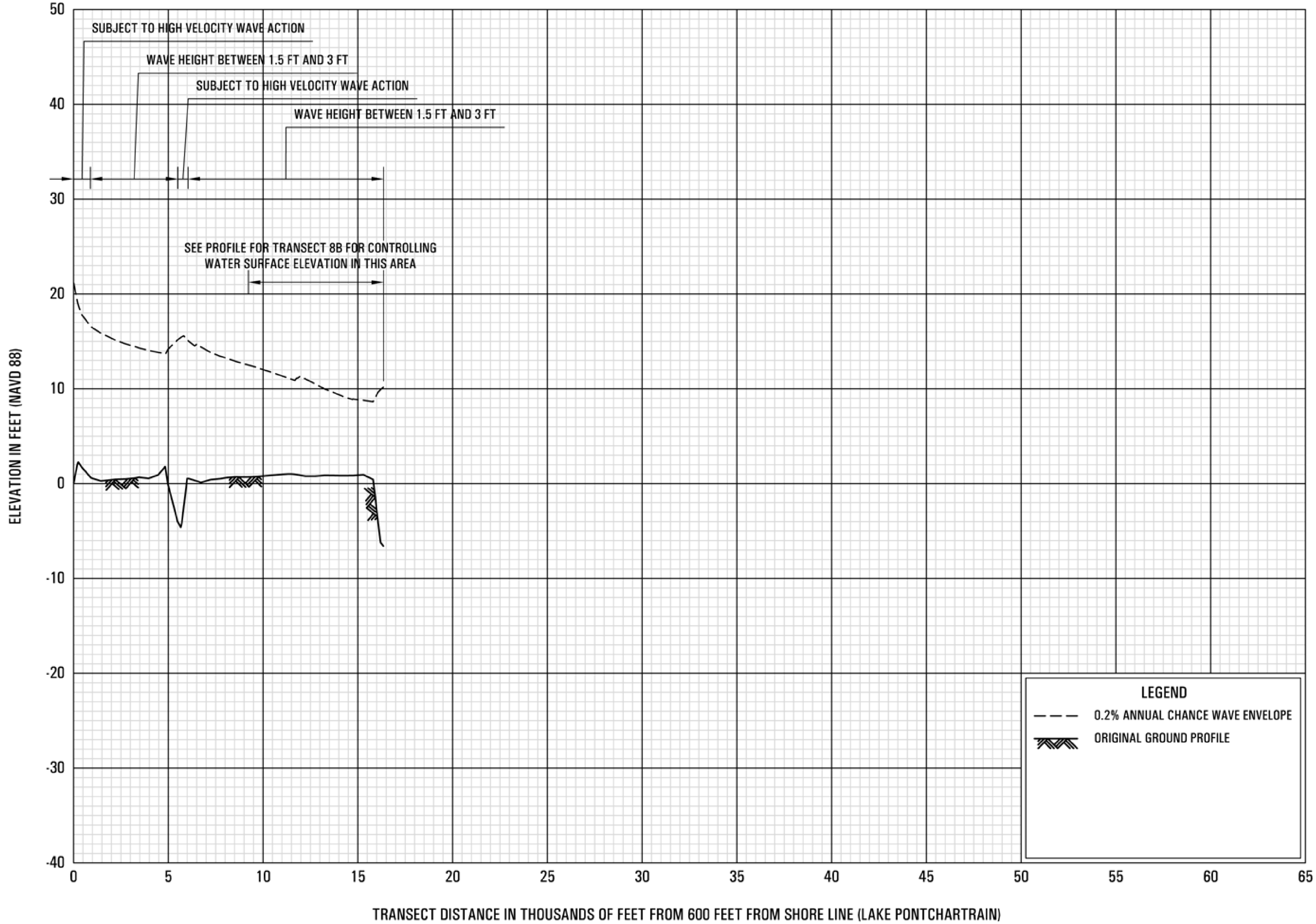


0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 7B

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS



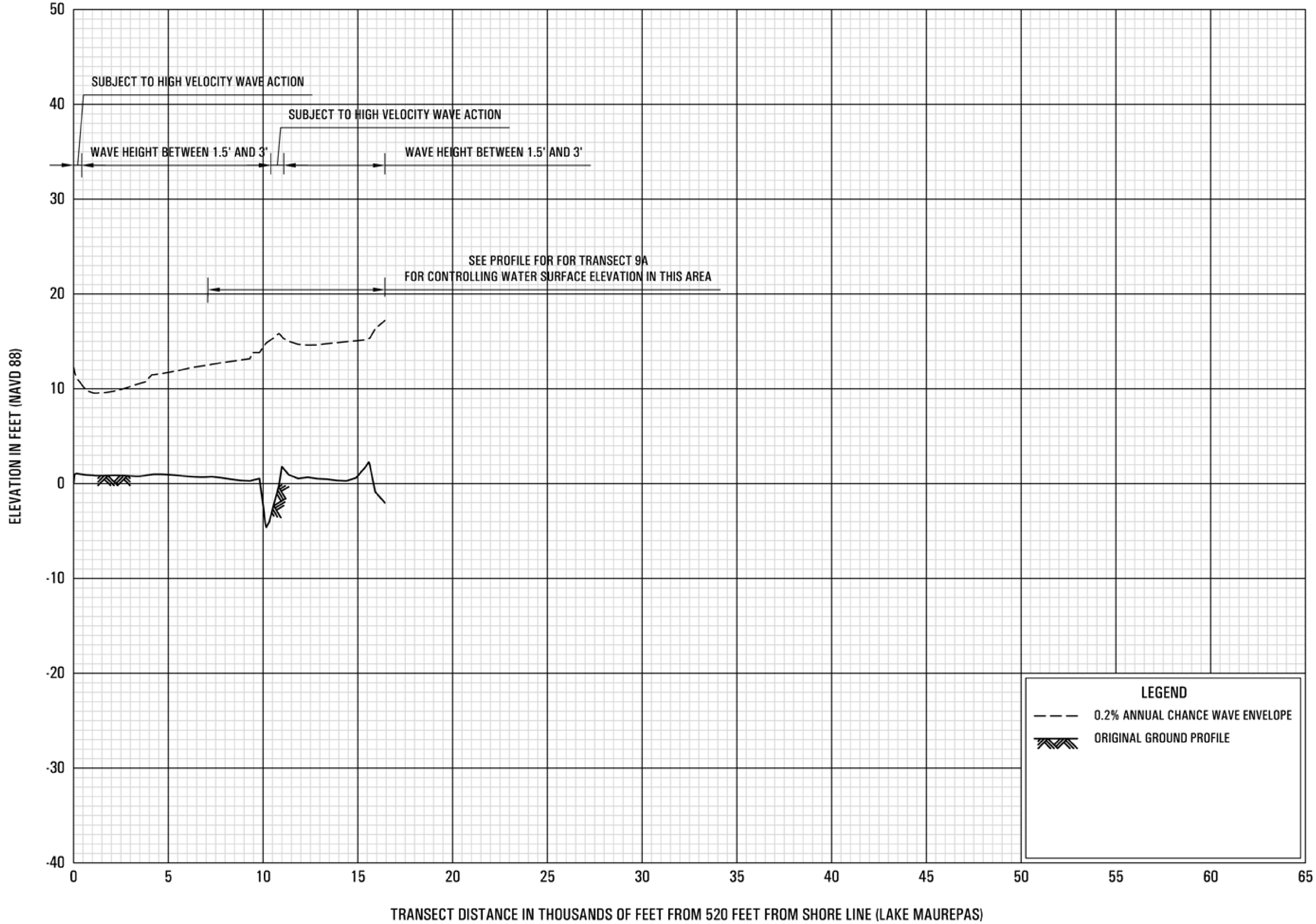
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 8A

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS



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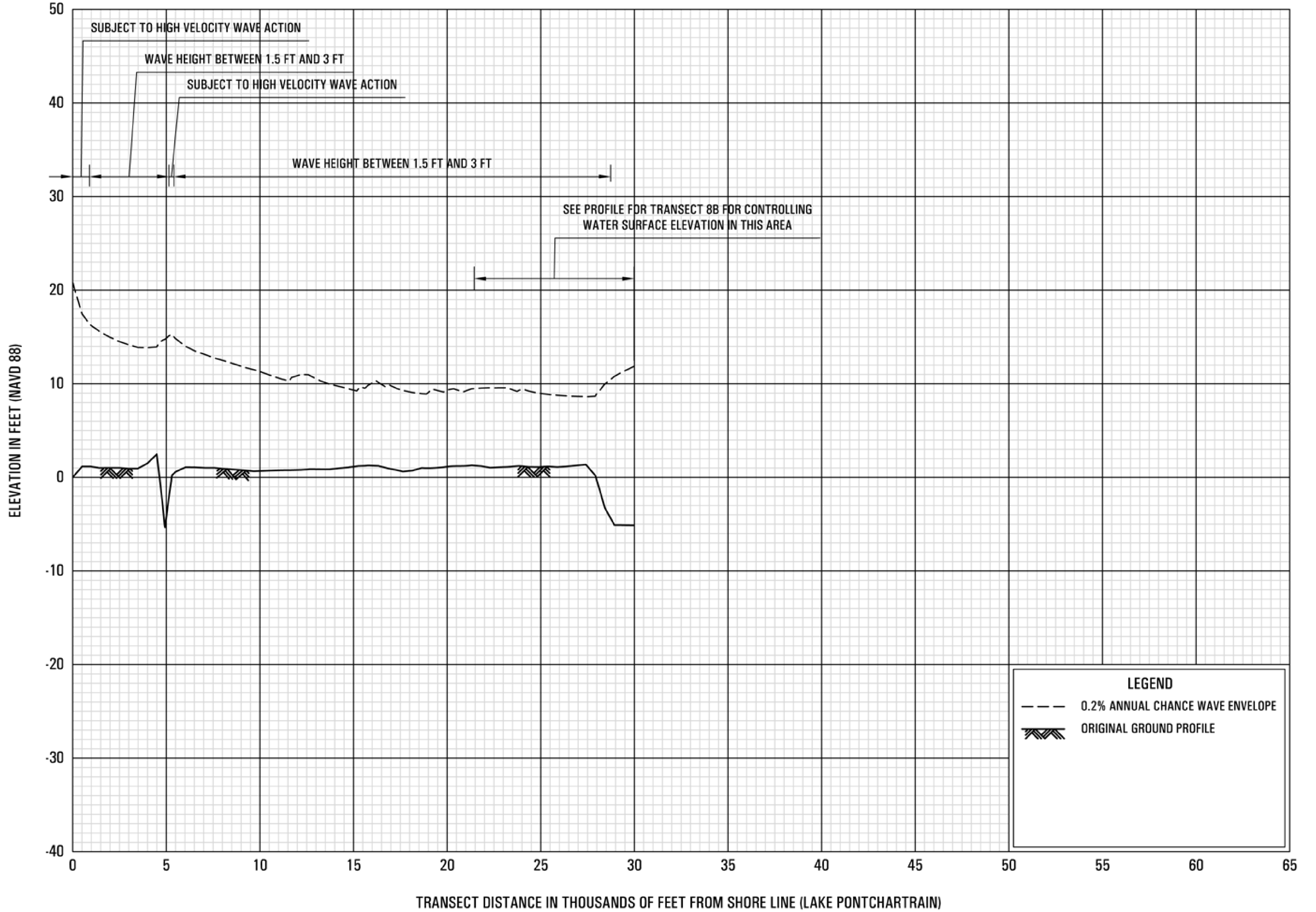
TRANSECT 8B

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

14P



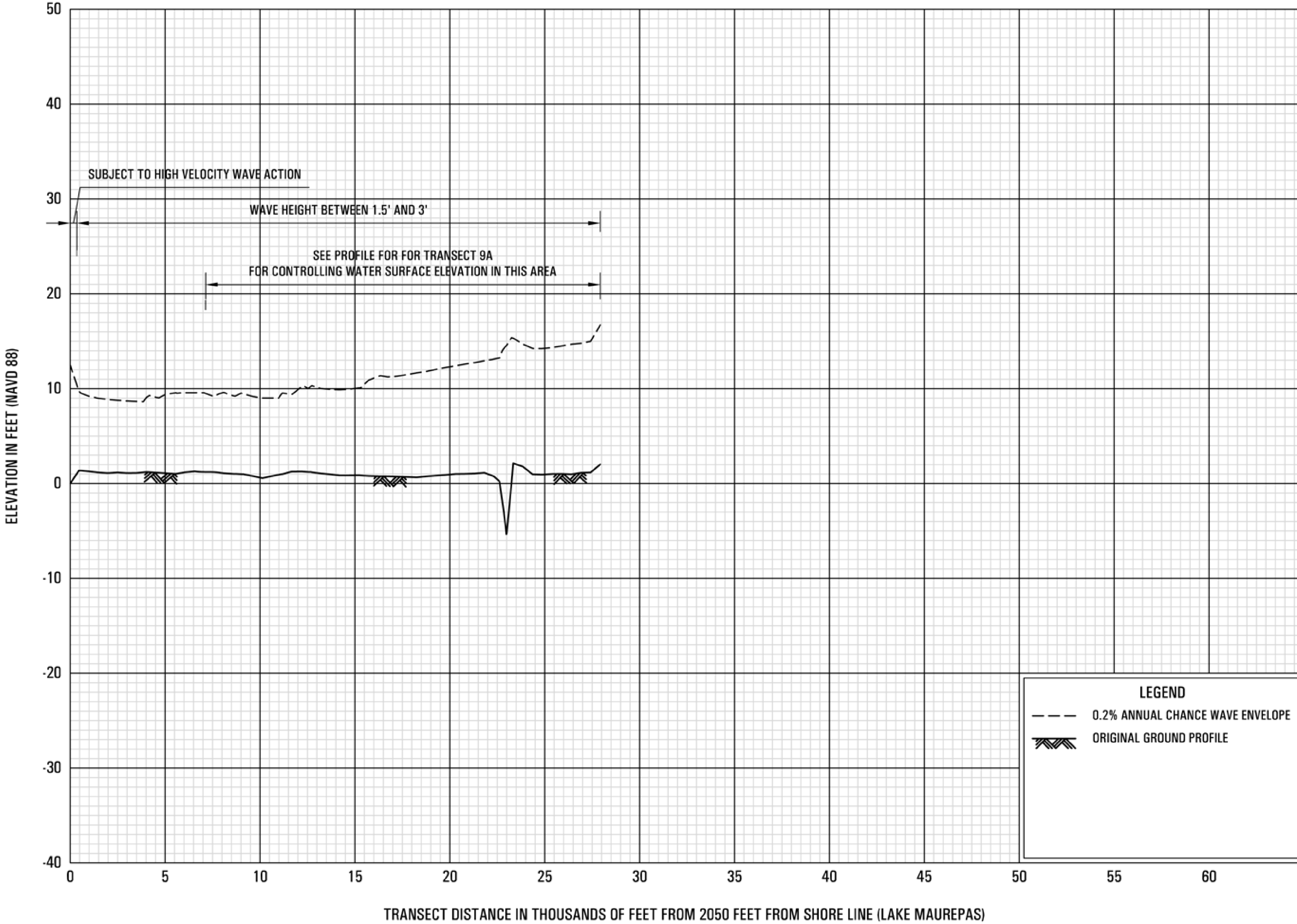
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 9A

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

15P



0.2% ANNUAL CHANCE WAVE ENVELOPE

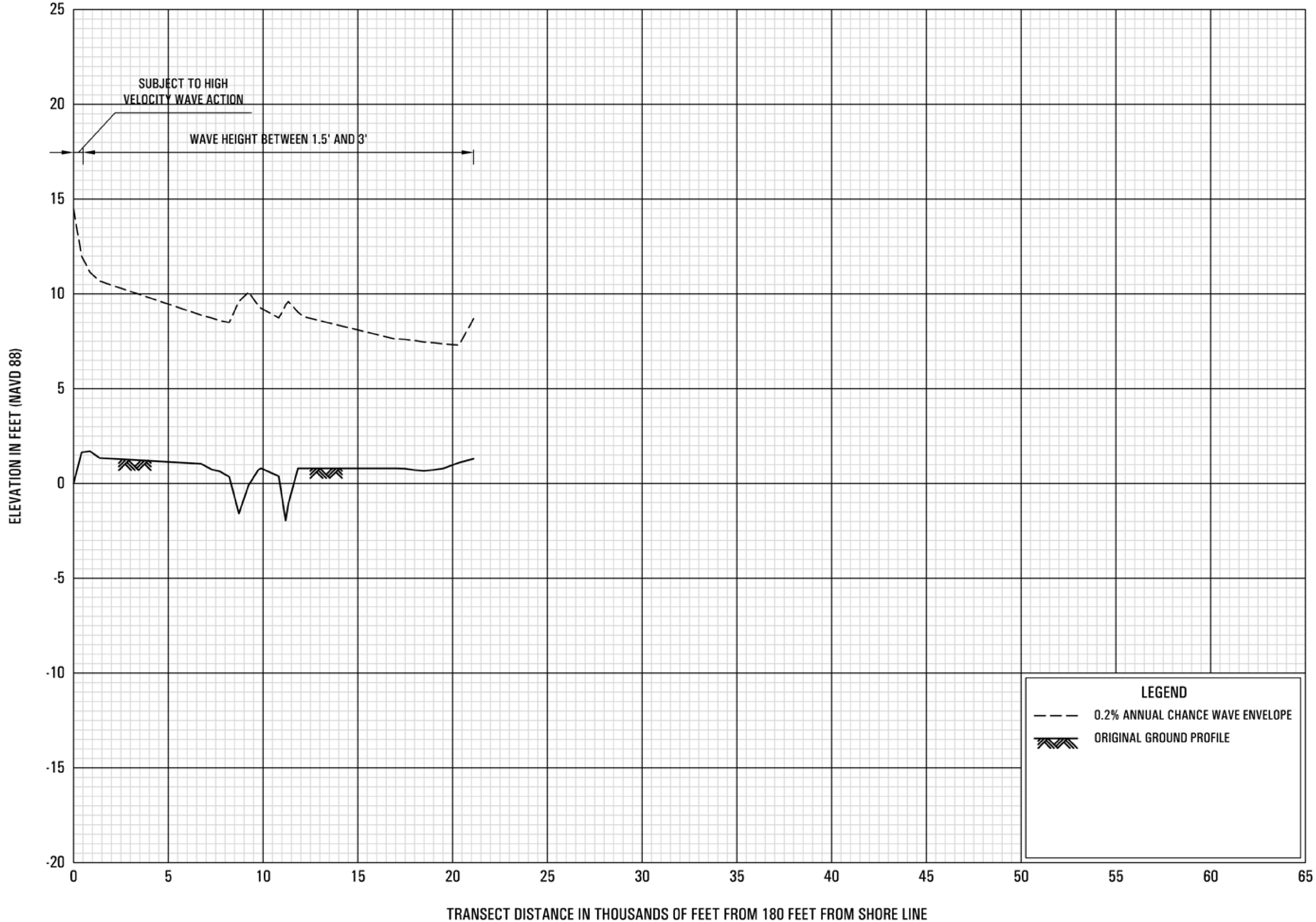
TRANSECT 9B

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

16P



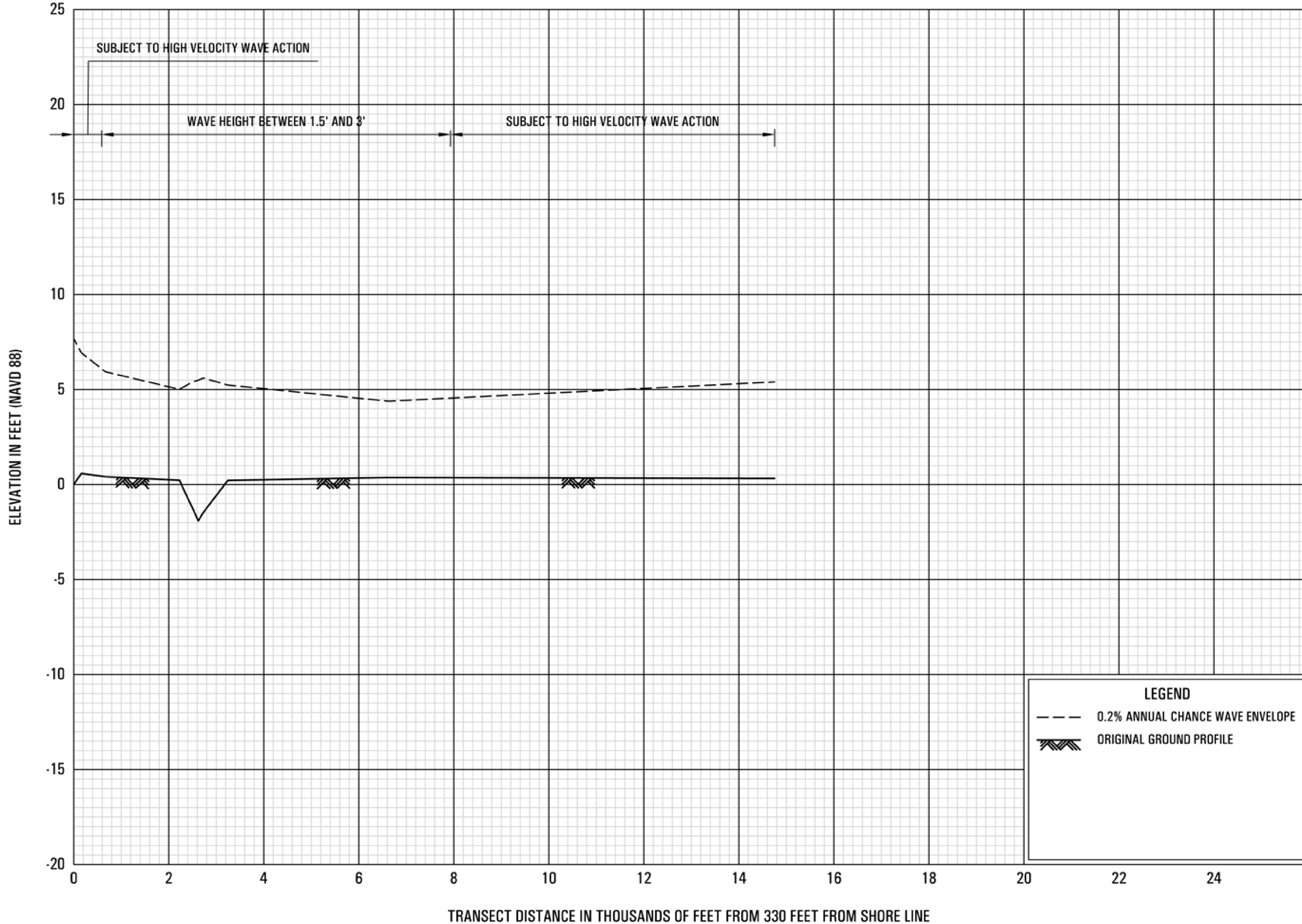
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

17P



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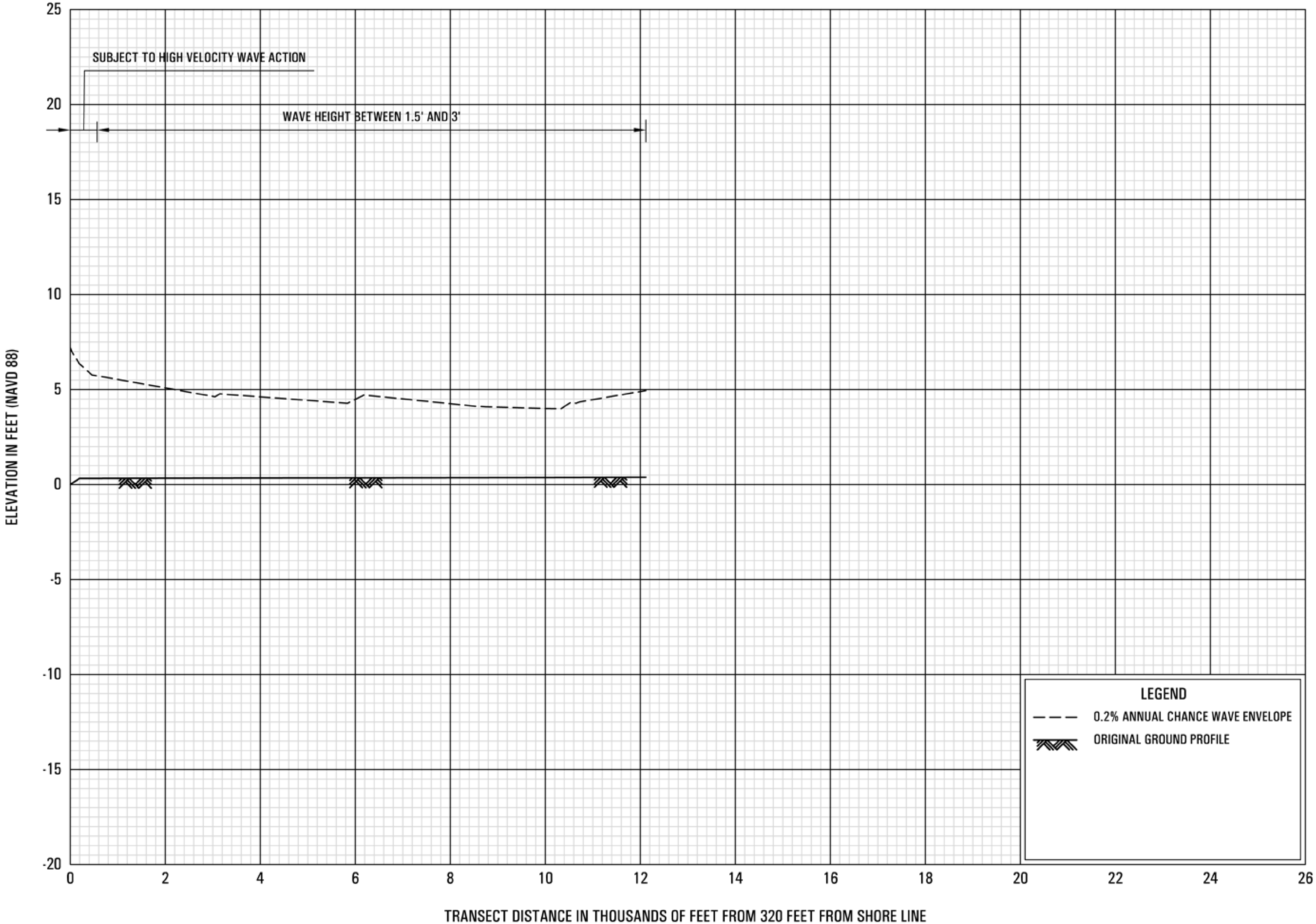
TRANSECT 11

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

18P



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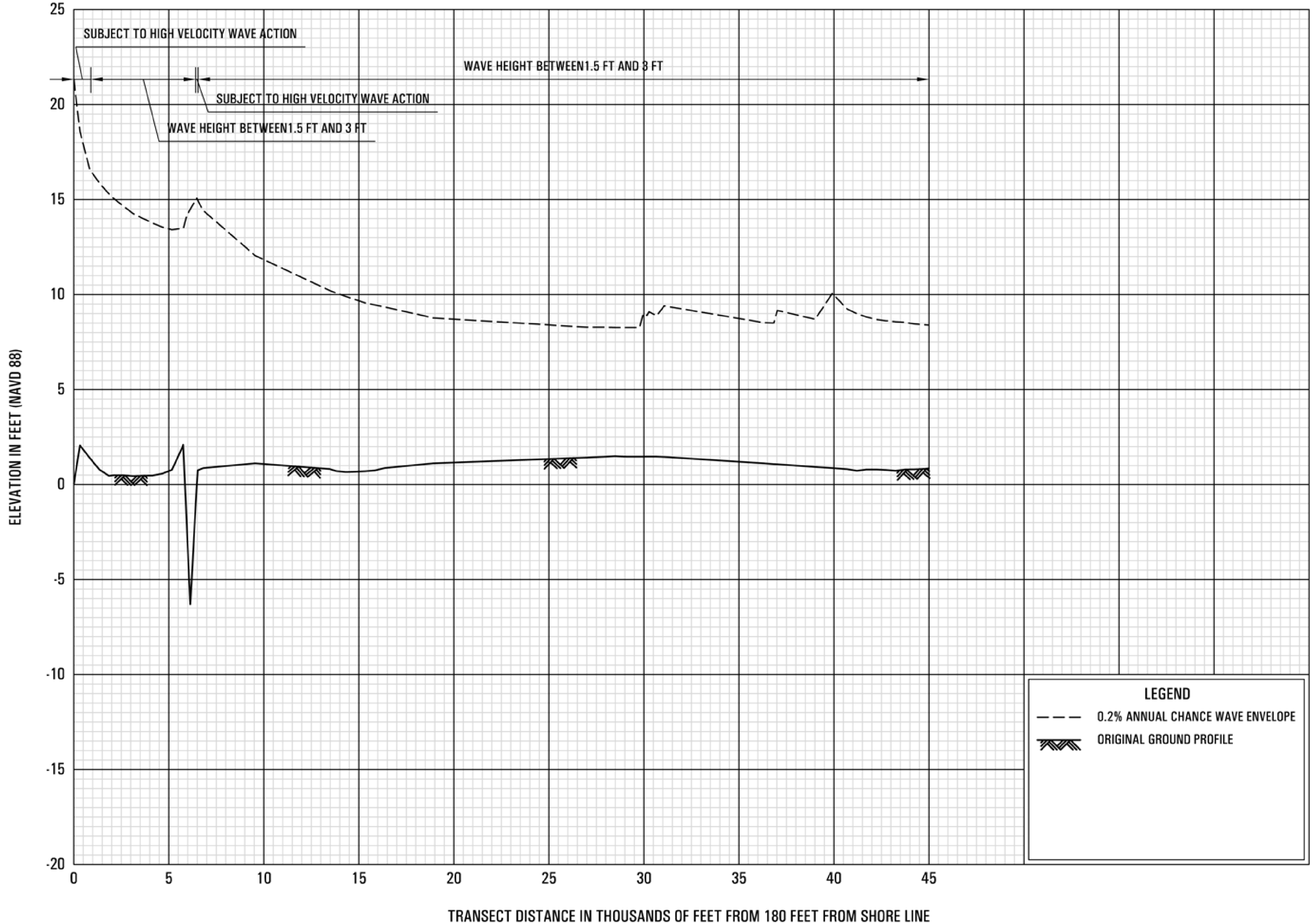
TRANSECT 12

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS



0.2% ANNUAL CHANCE WAVE ENVELOPE

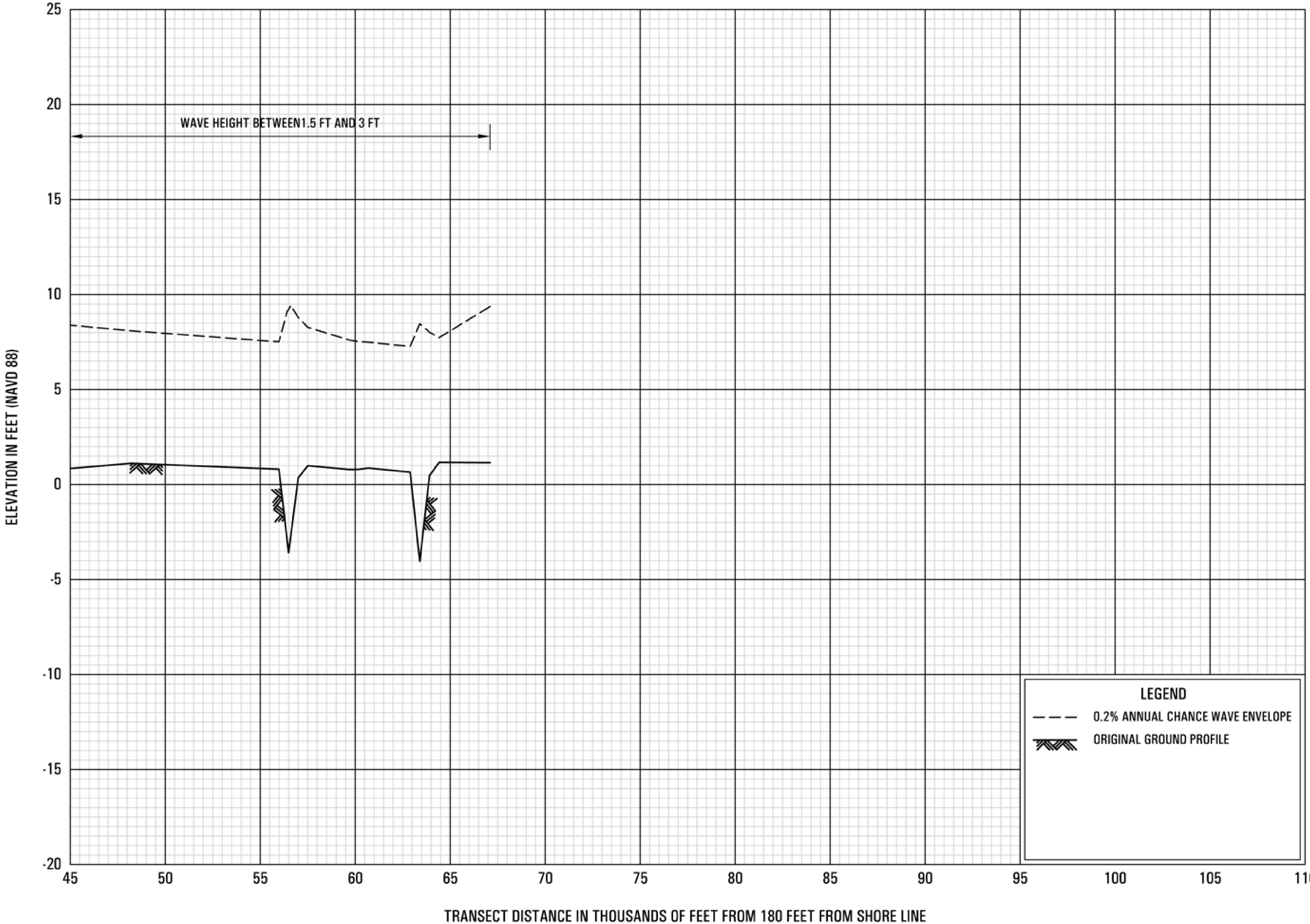
TRANSECT 13

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

20P



0.2% ANNUAL CHANCE WAVE ENVELOPE

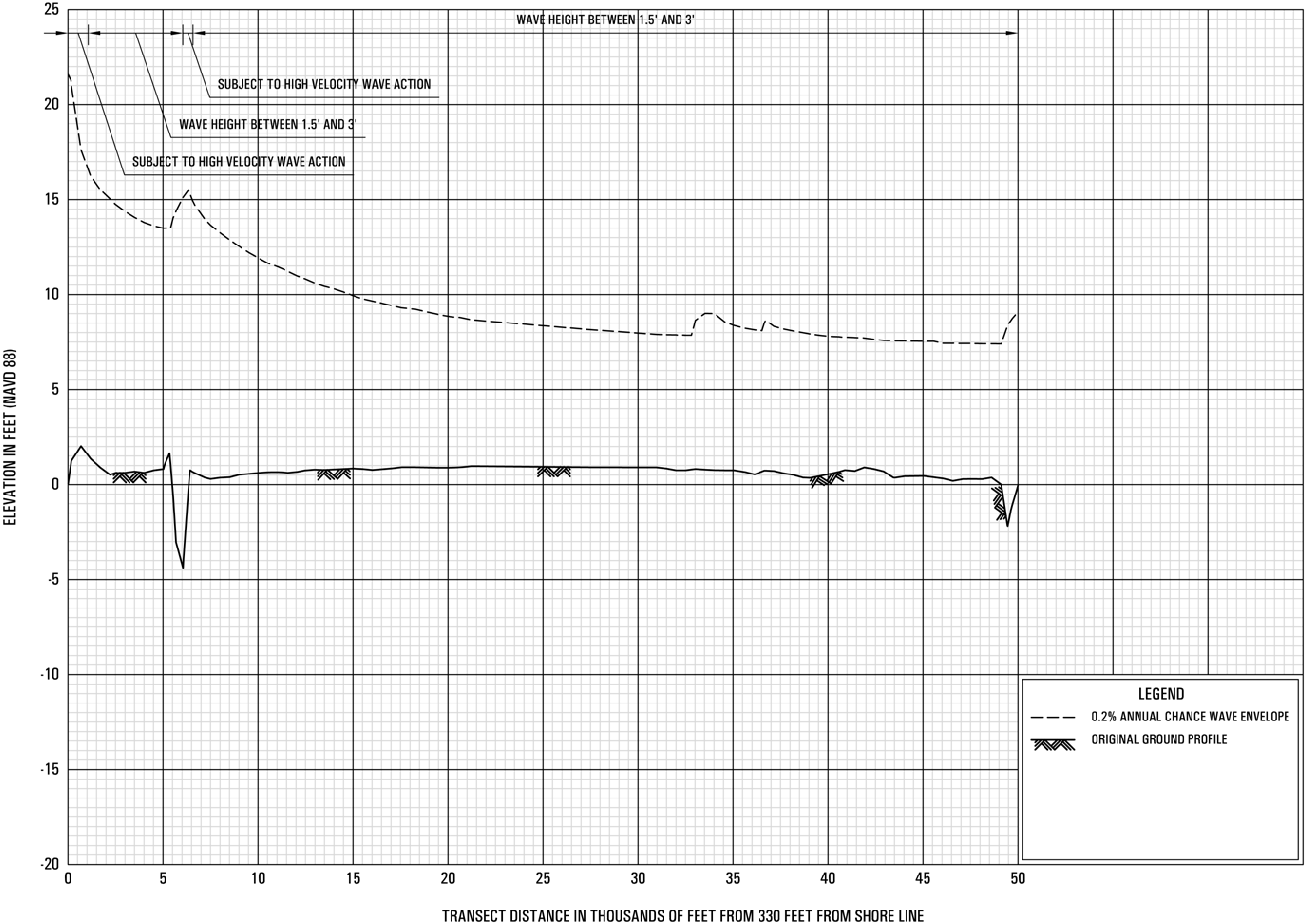
TRANSECT 13

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

21P



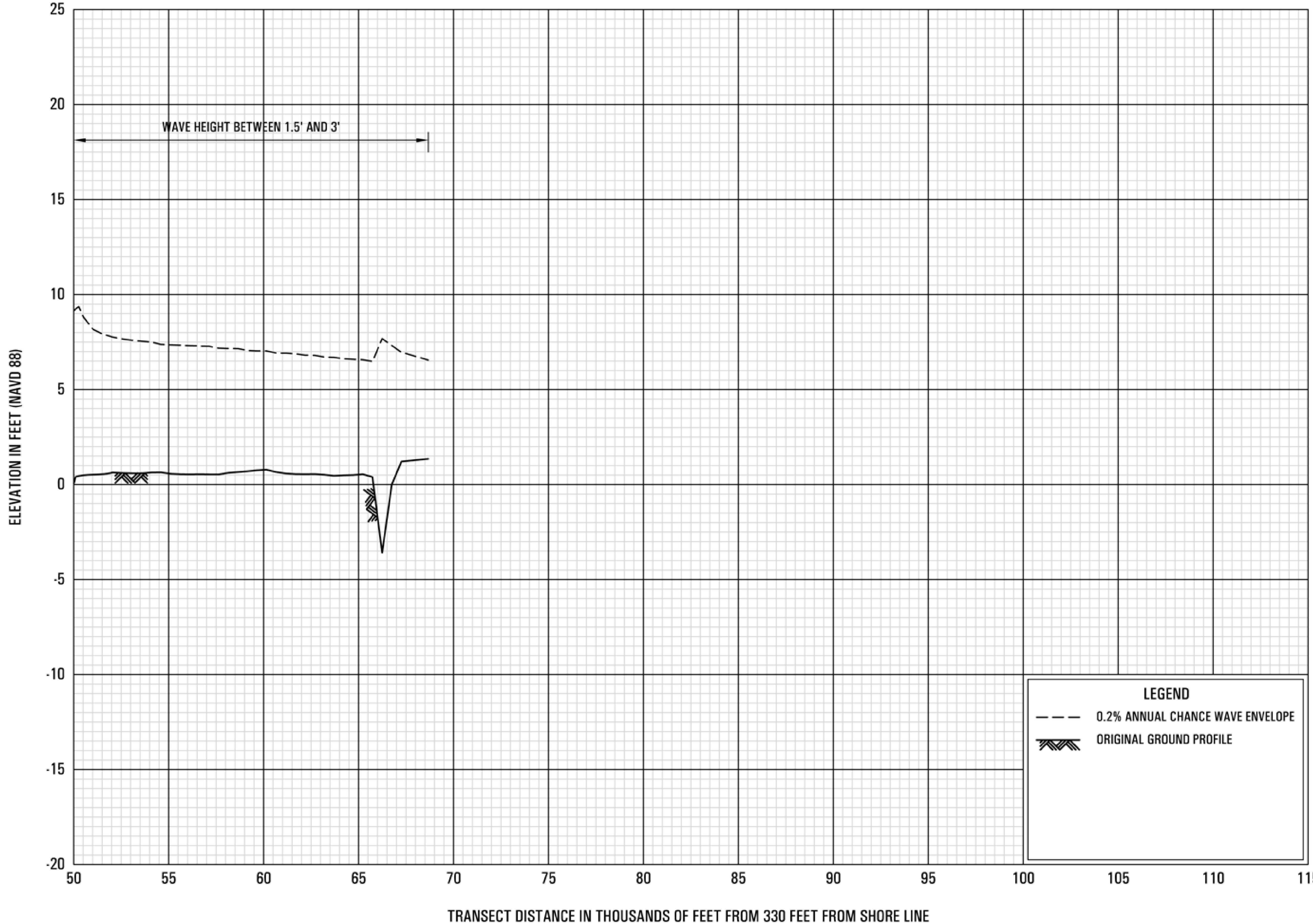
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

22P



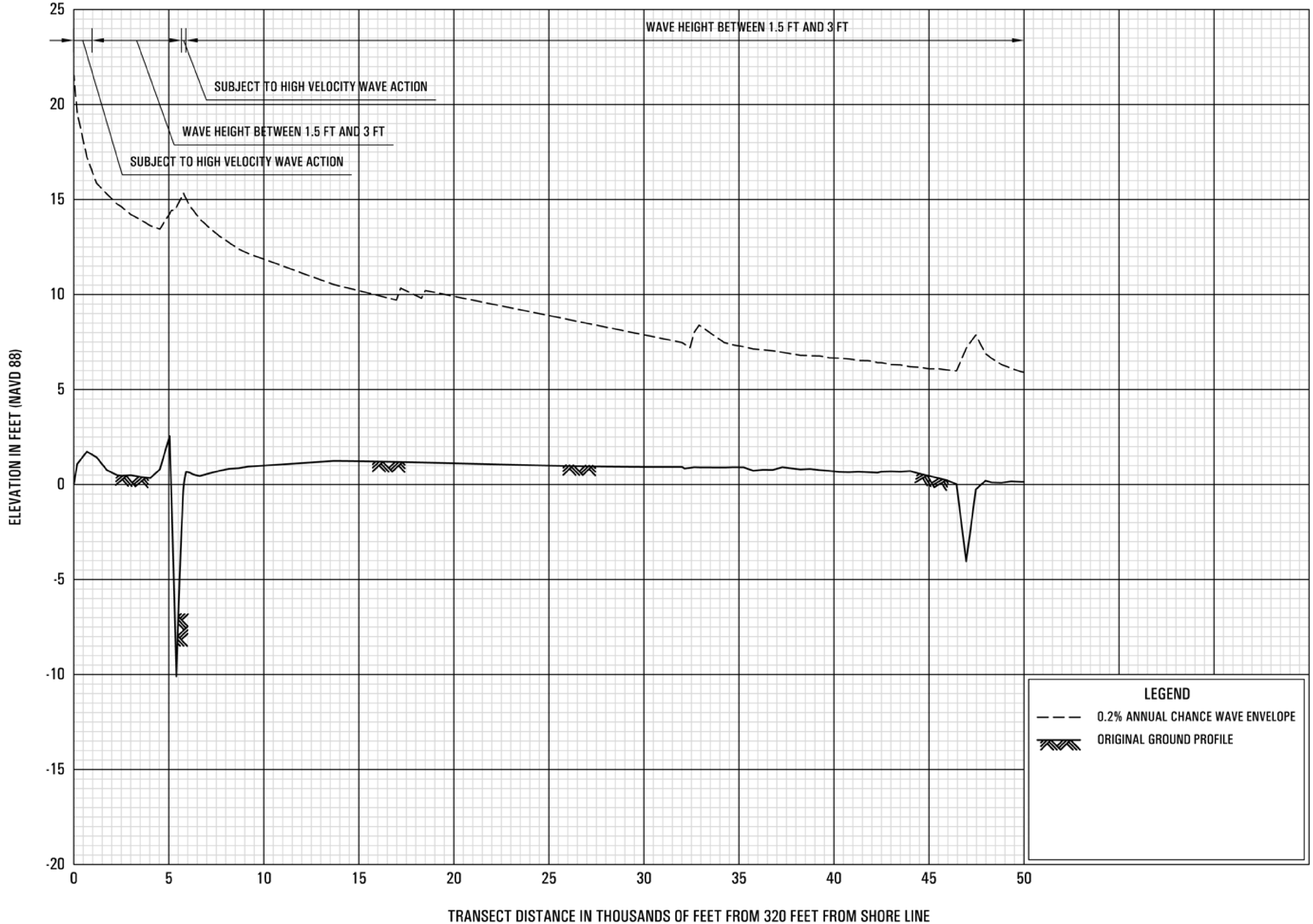
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 14

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

23P



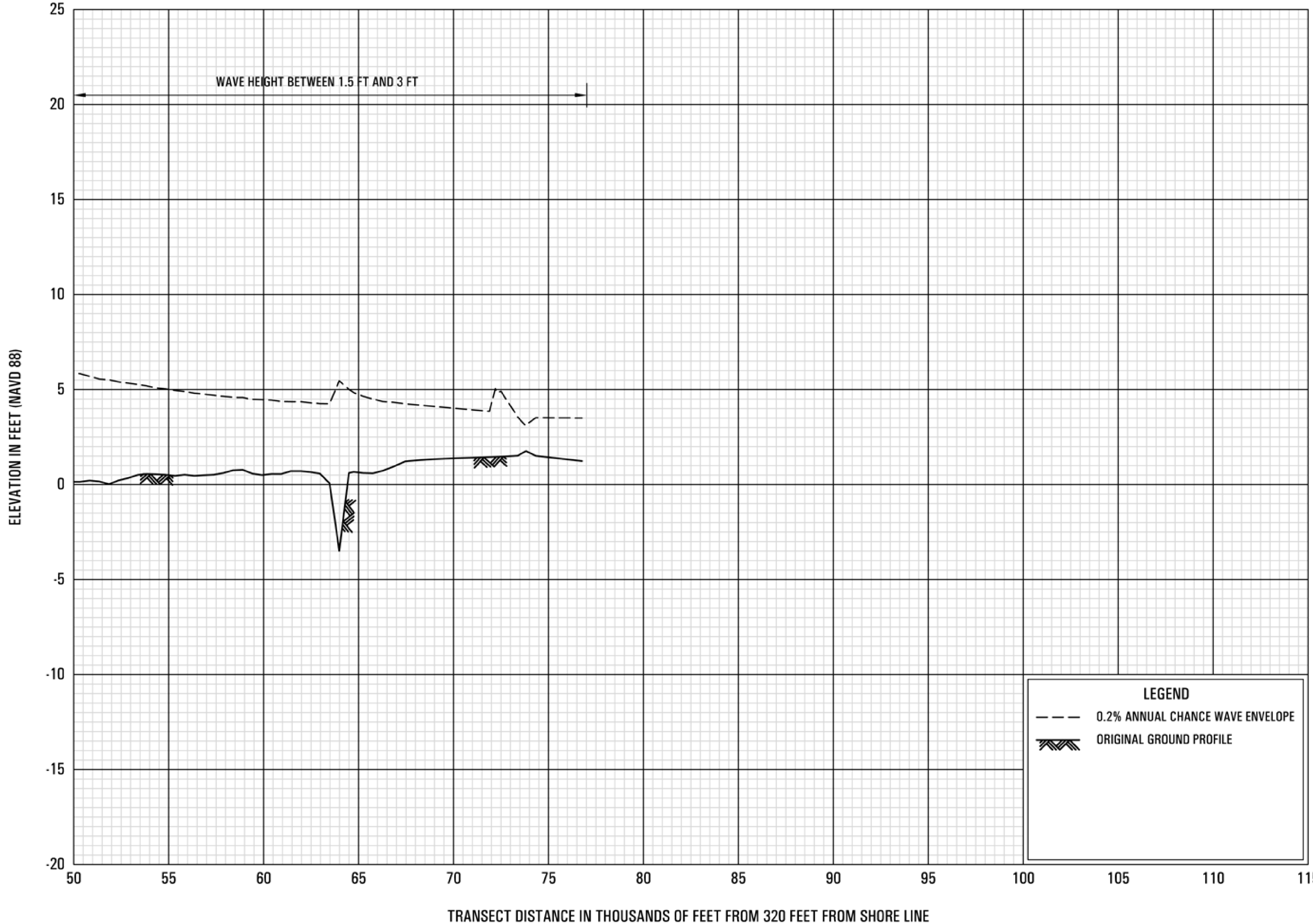
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 15

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

24P



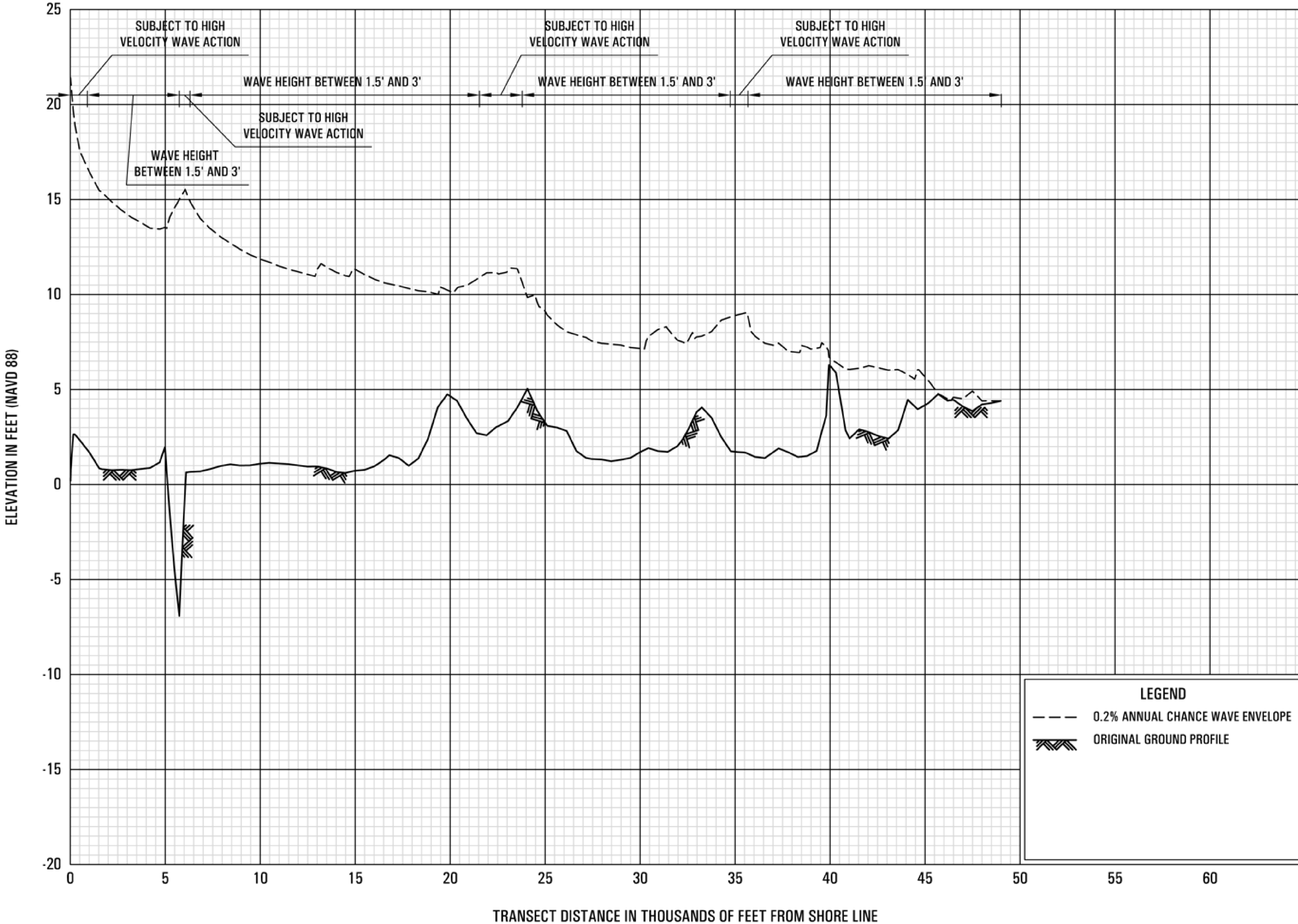
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 15

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

25P

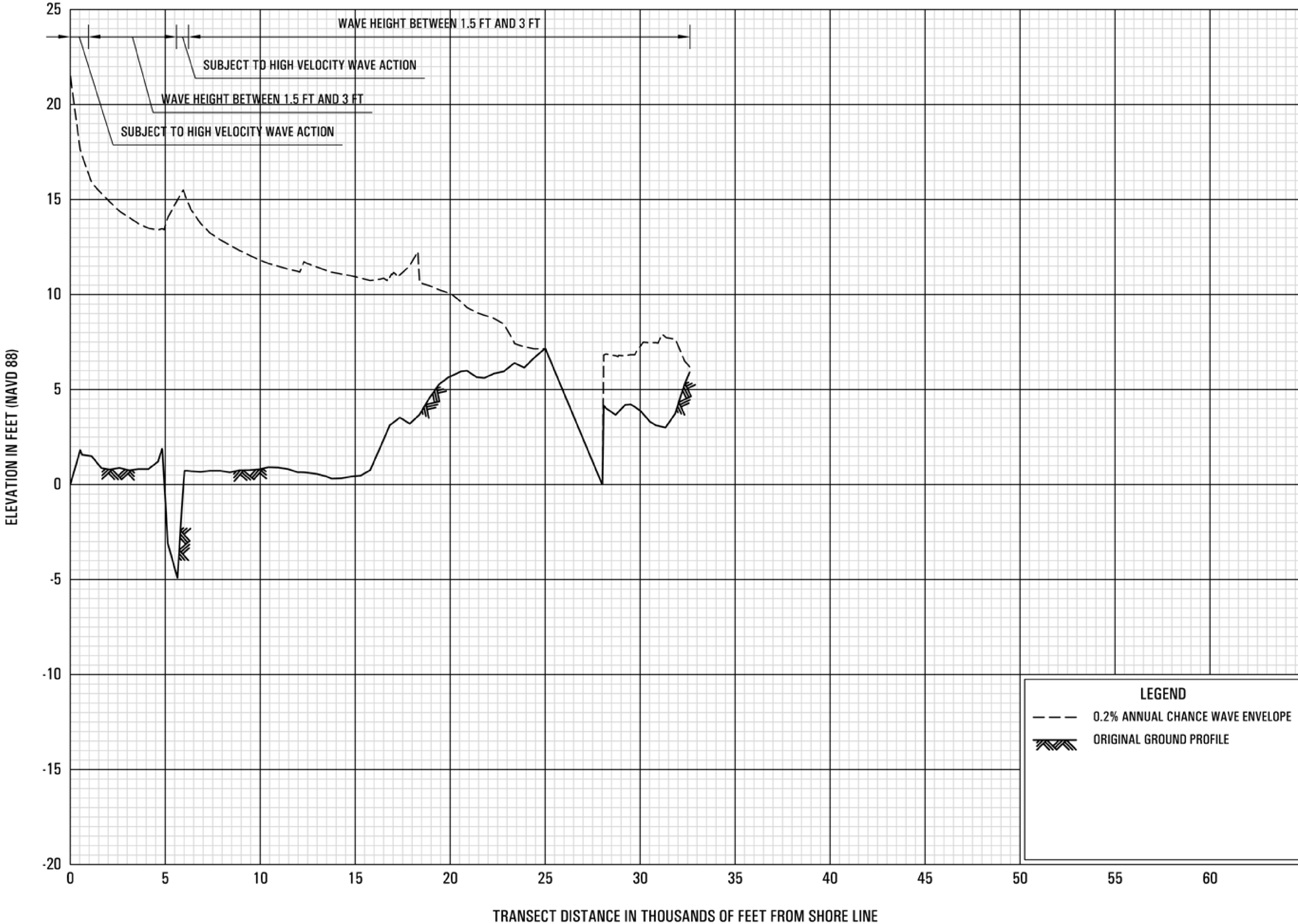


0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 16

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS



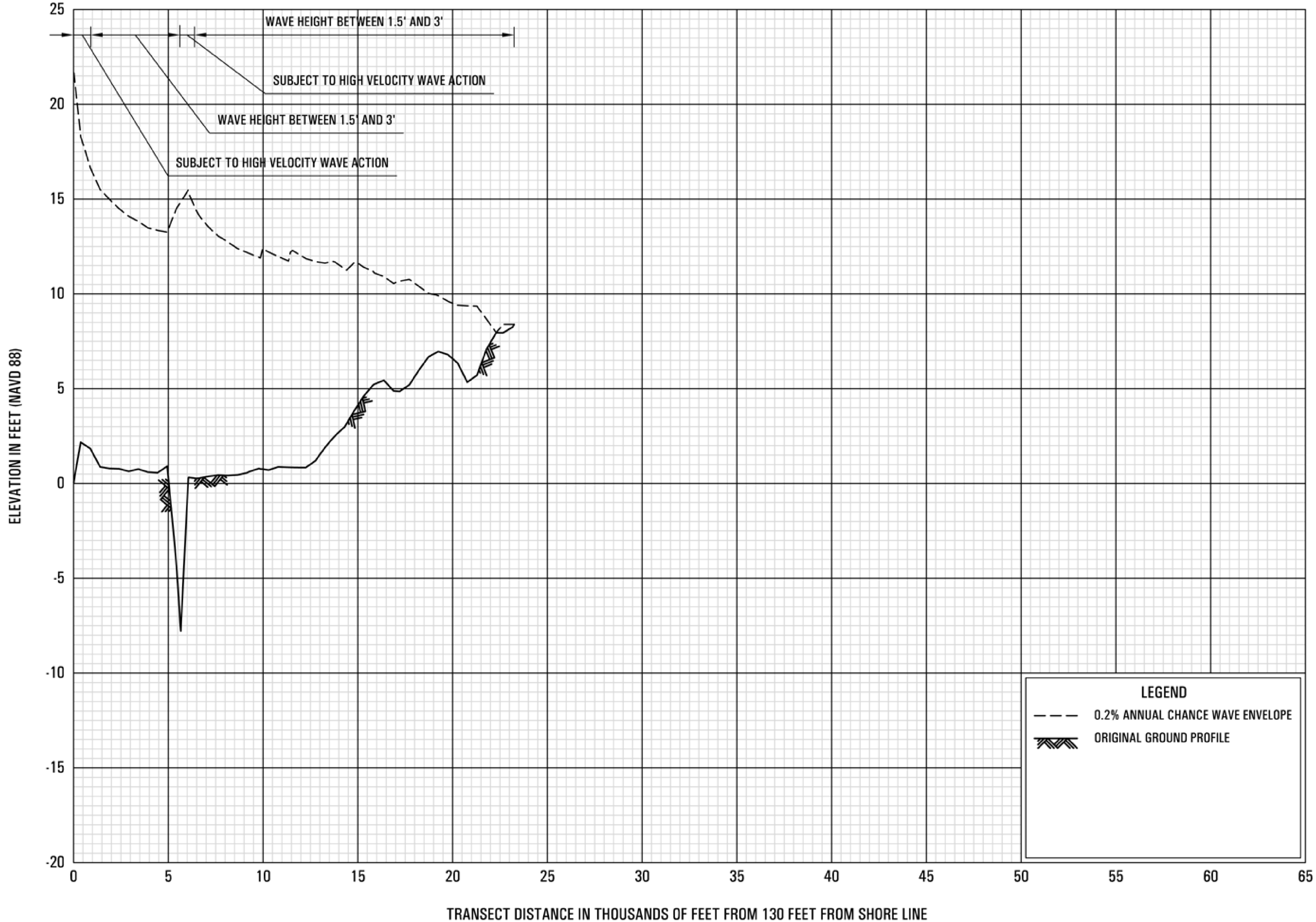
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 17

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

27P



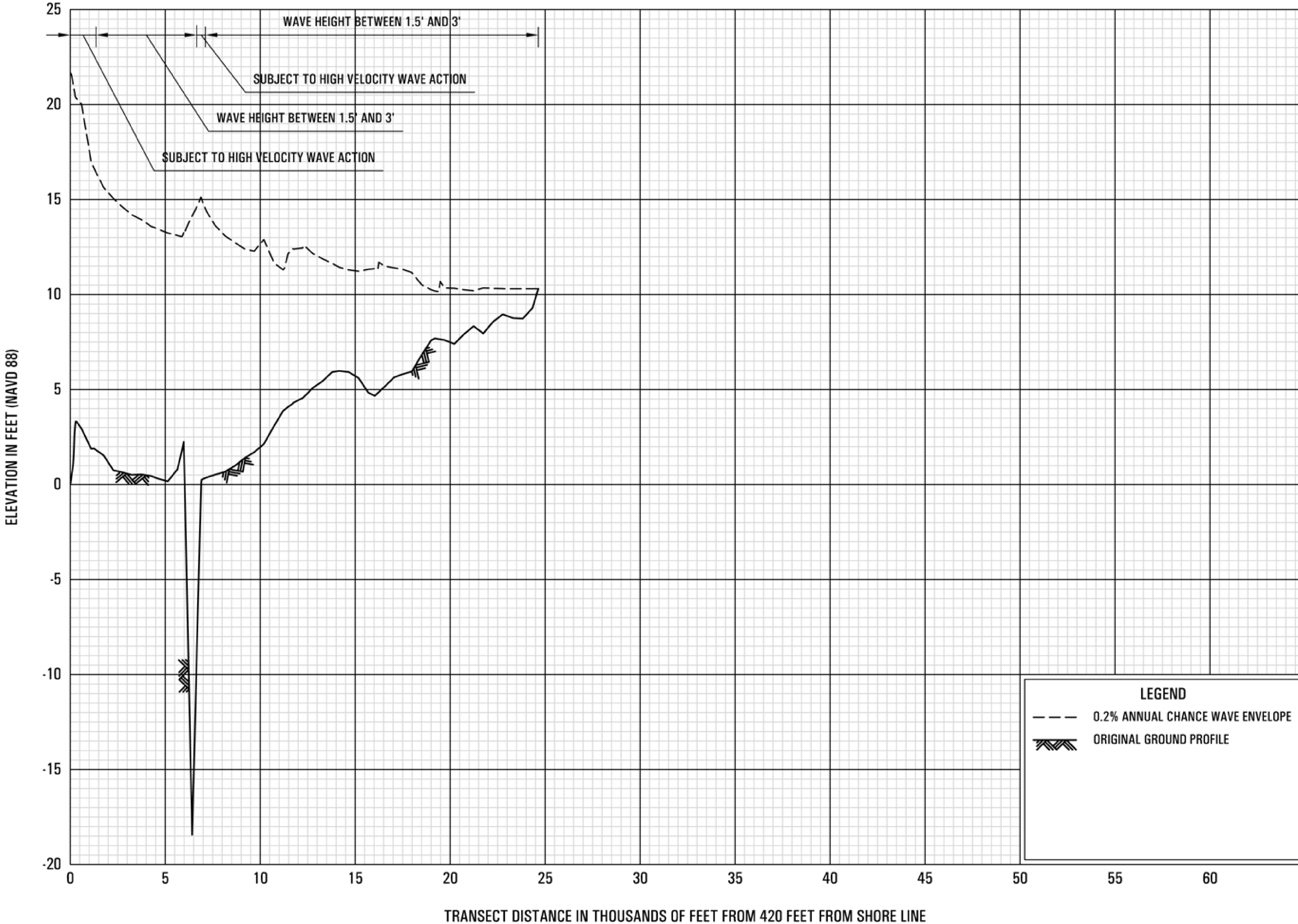
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 18

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

28P



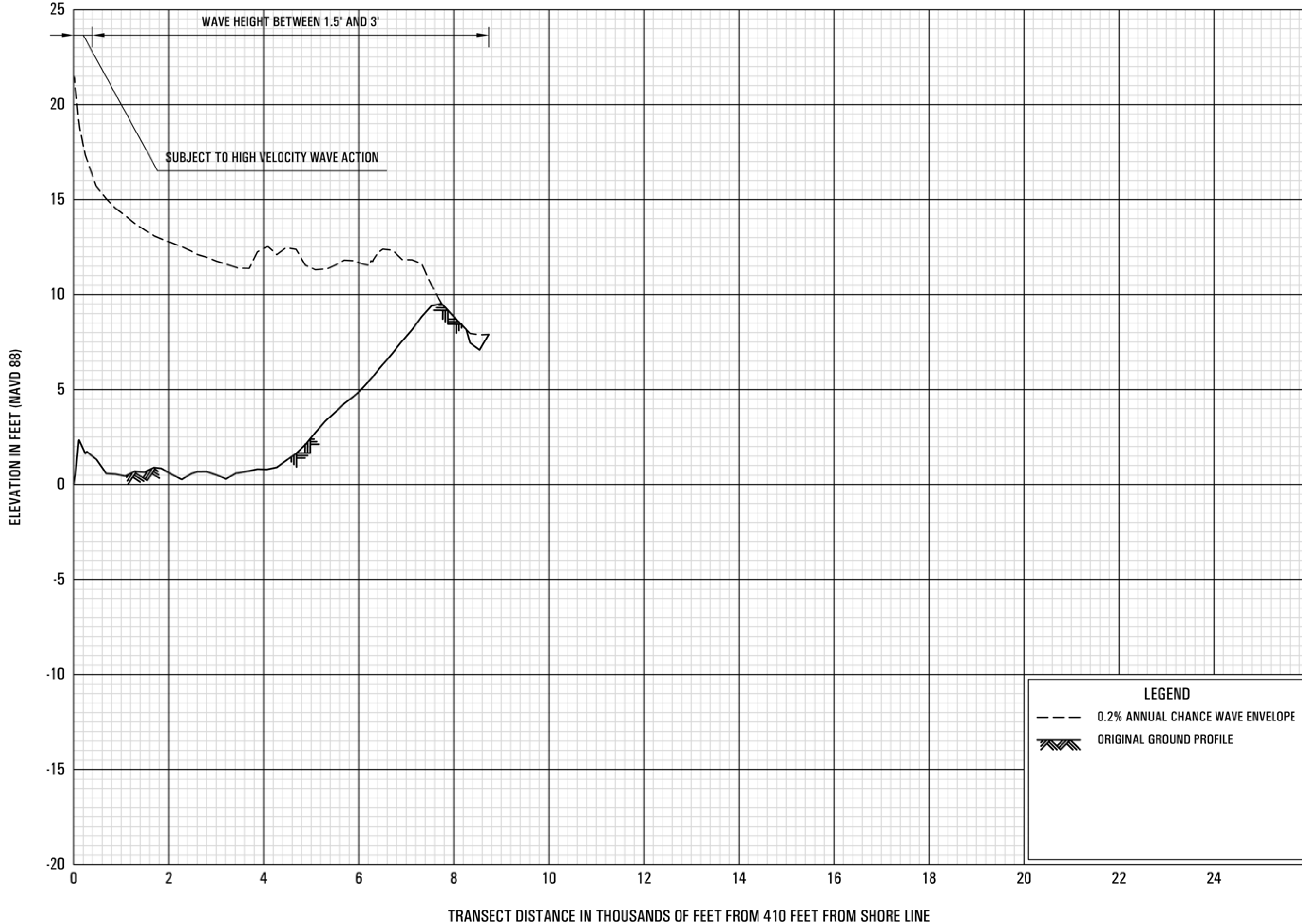
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 19

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS



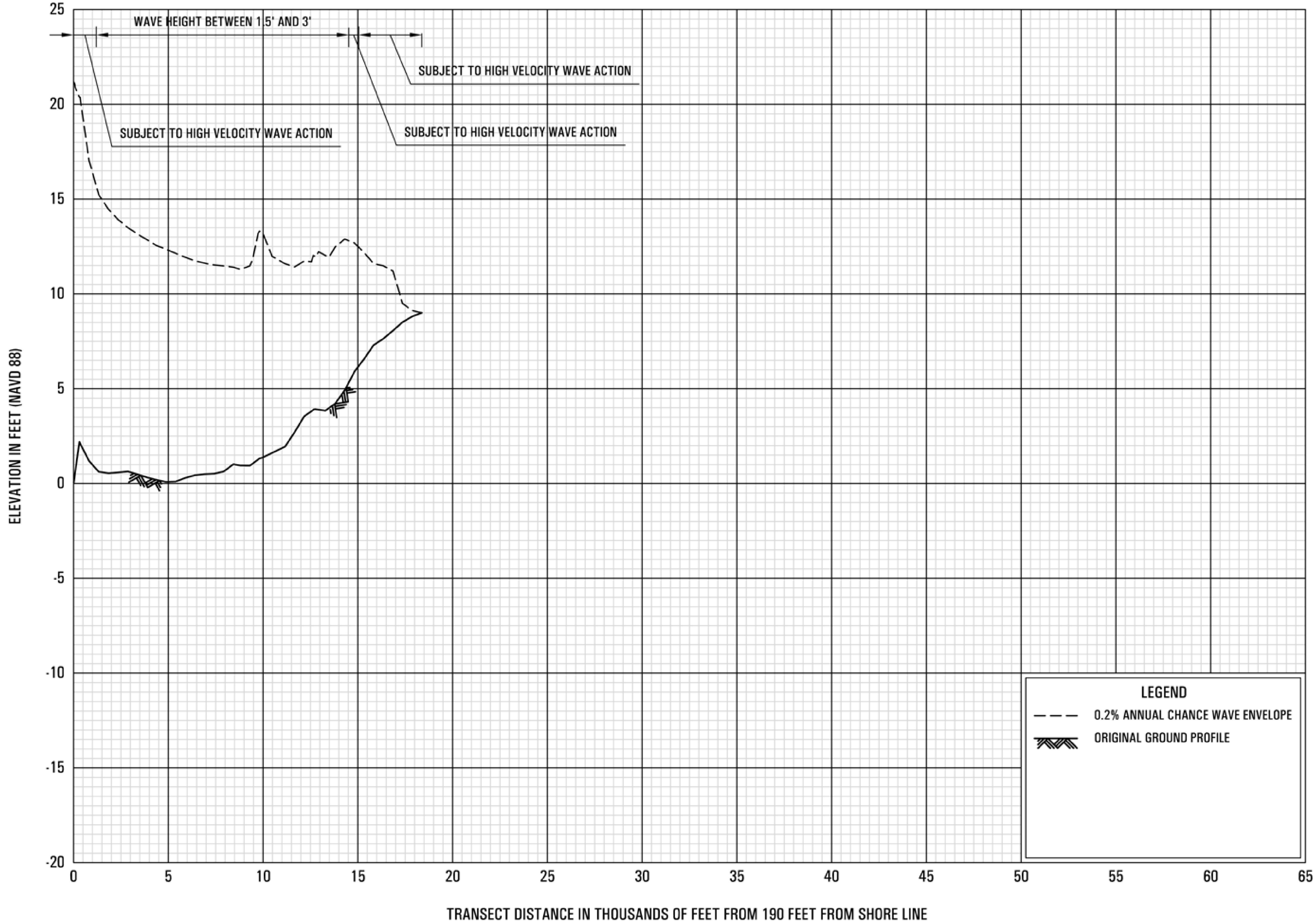
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 20

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

30P

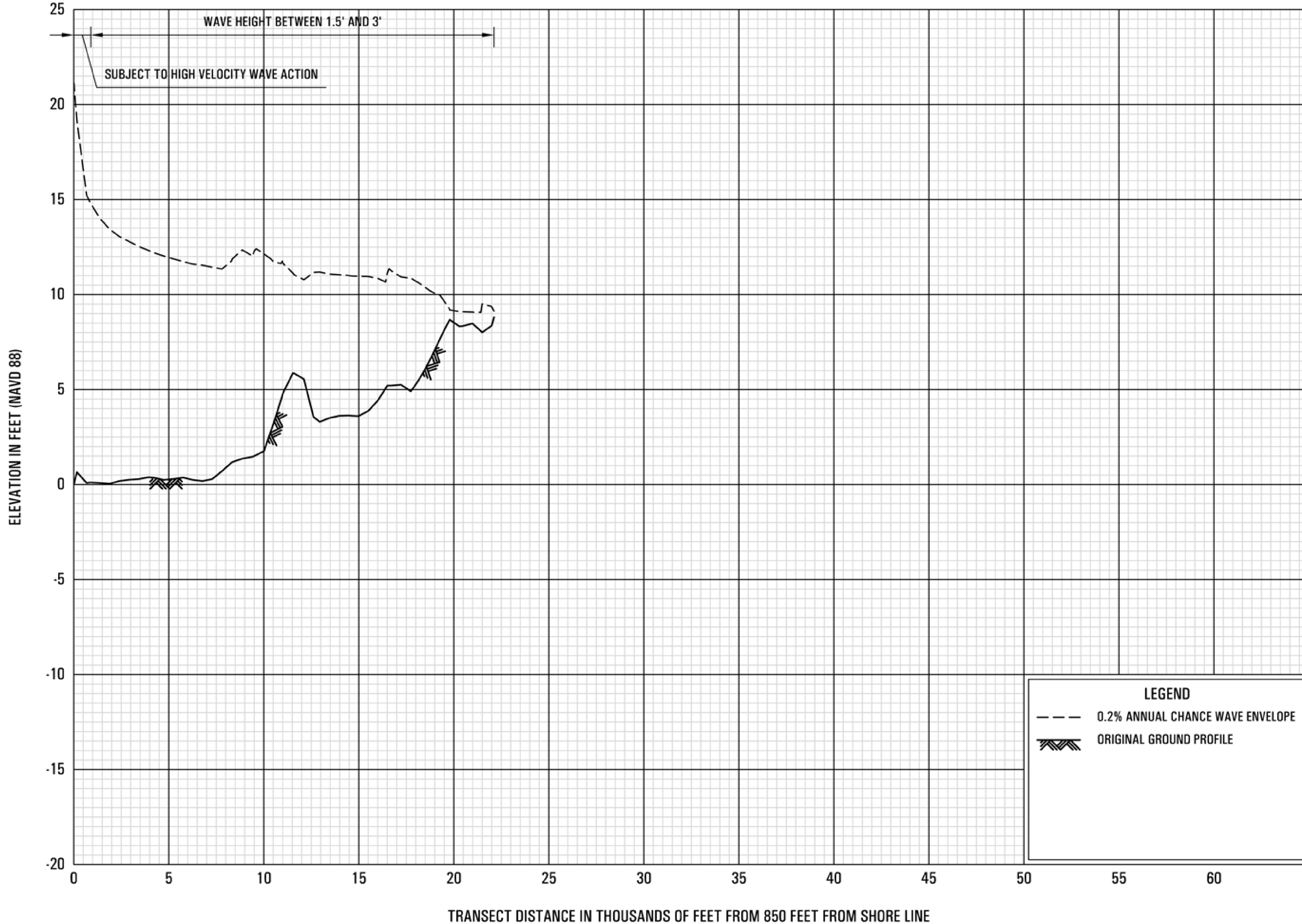


0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 21

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS



0.2% ANNUAL CHANCE WAVE ENVELOPE

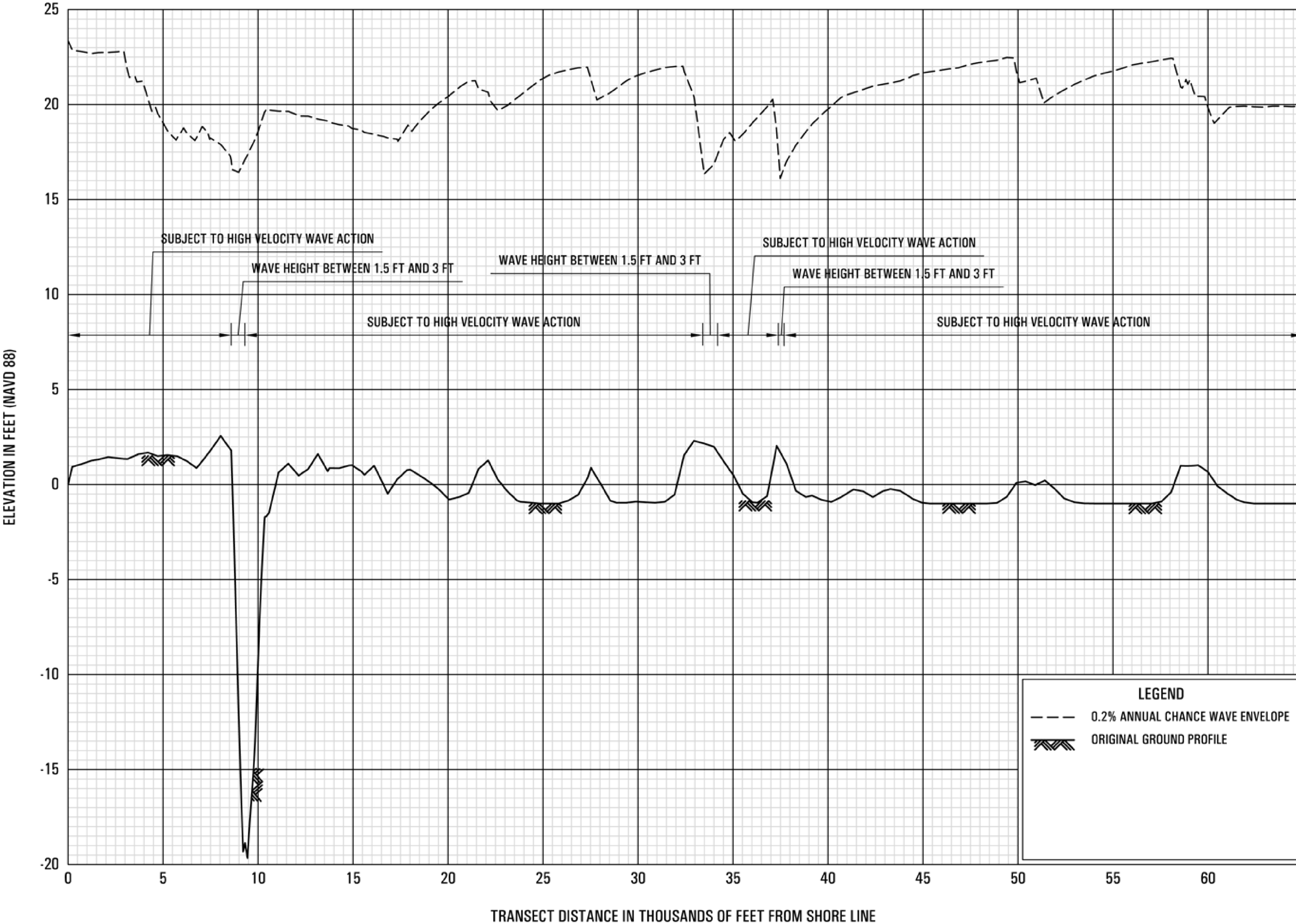
TRANSECT 22

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

32P



0.2% ANNUAL CHANCE WAVE ENVELOPE

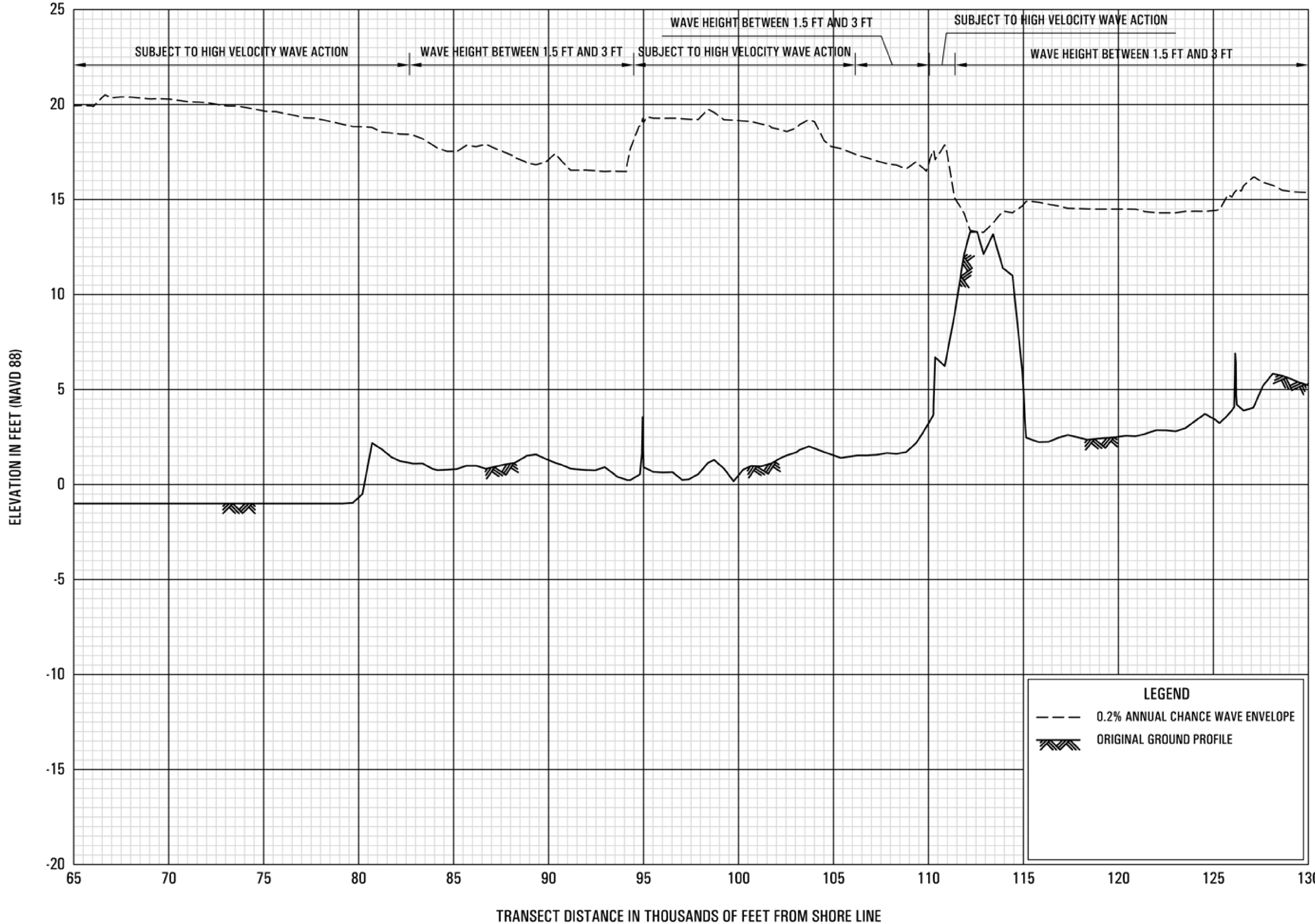
TRANSECT 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

33P



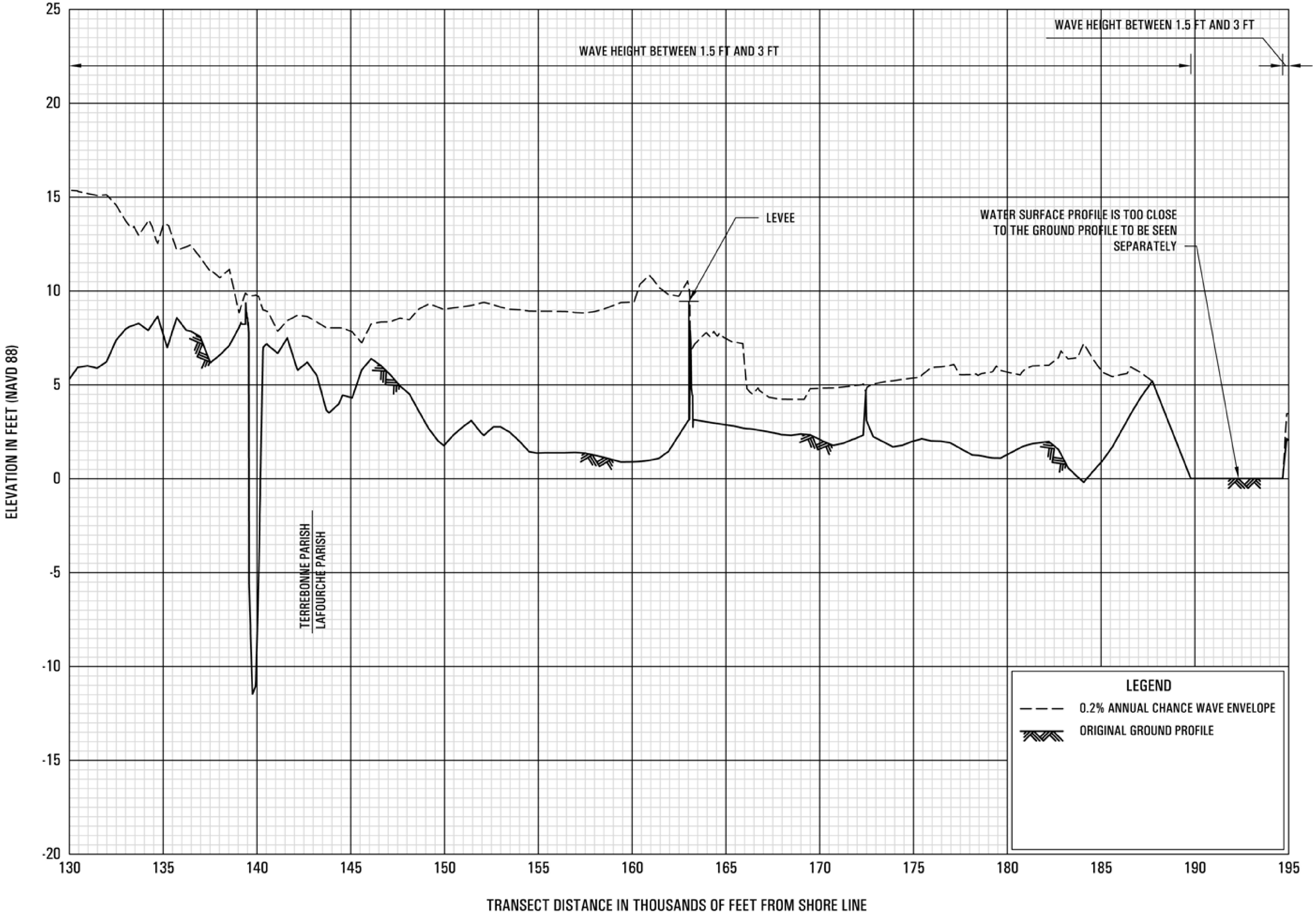
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

34P



0.2% ANNUAL CHANCE WAVE ENVELOPE

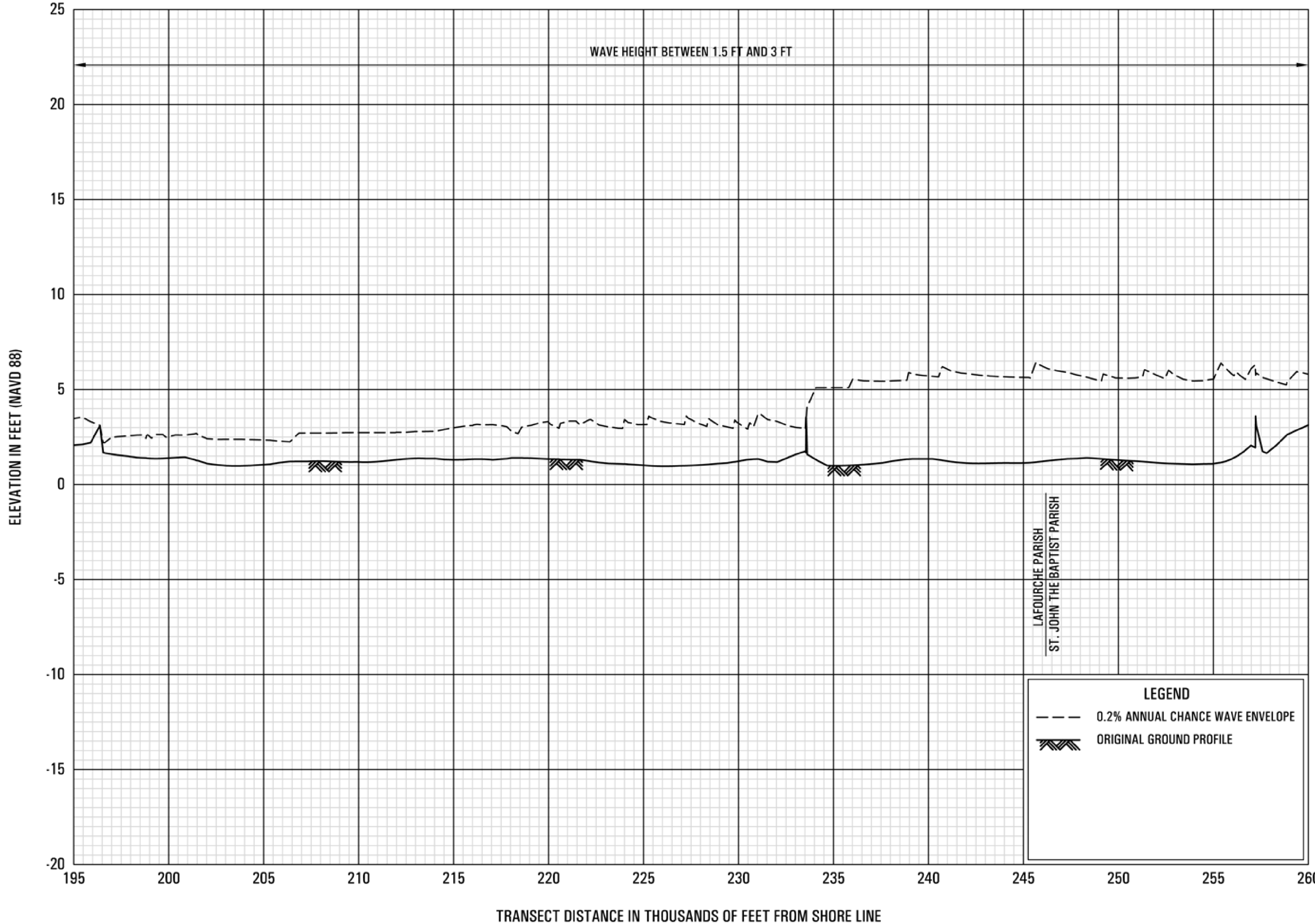
TRANSECT 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

35P



0.2% ANNUAL CHANCE WAVE ENVELOPE

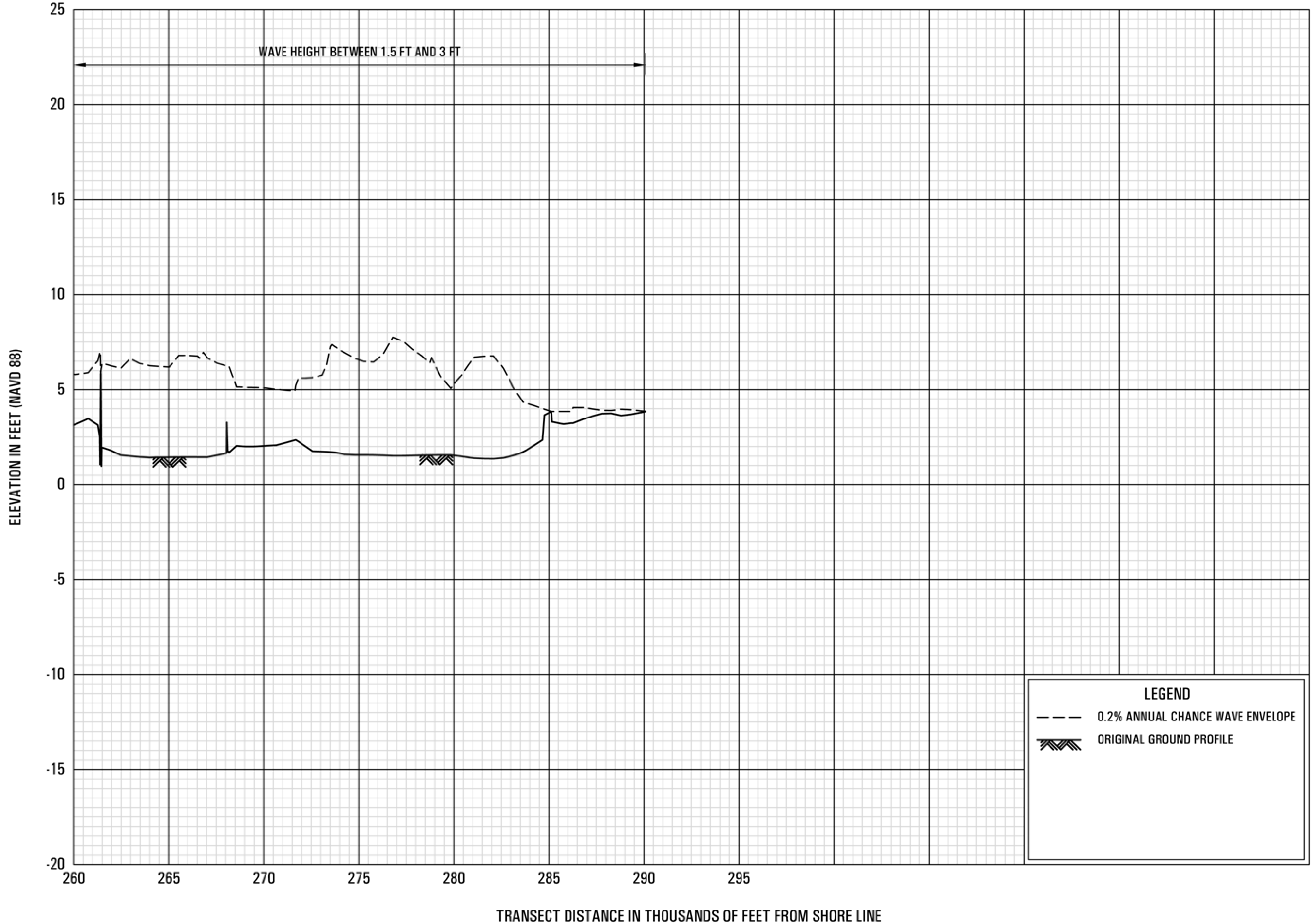
TRANSECT 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

36P



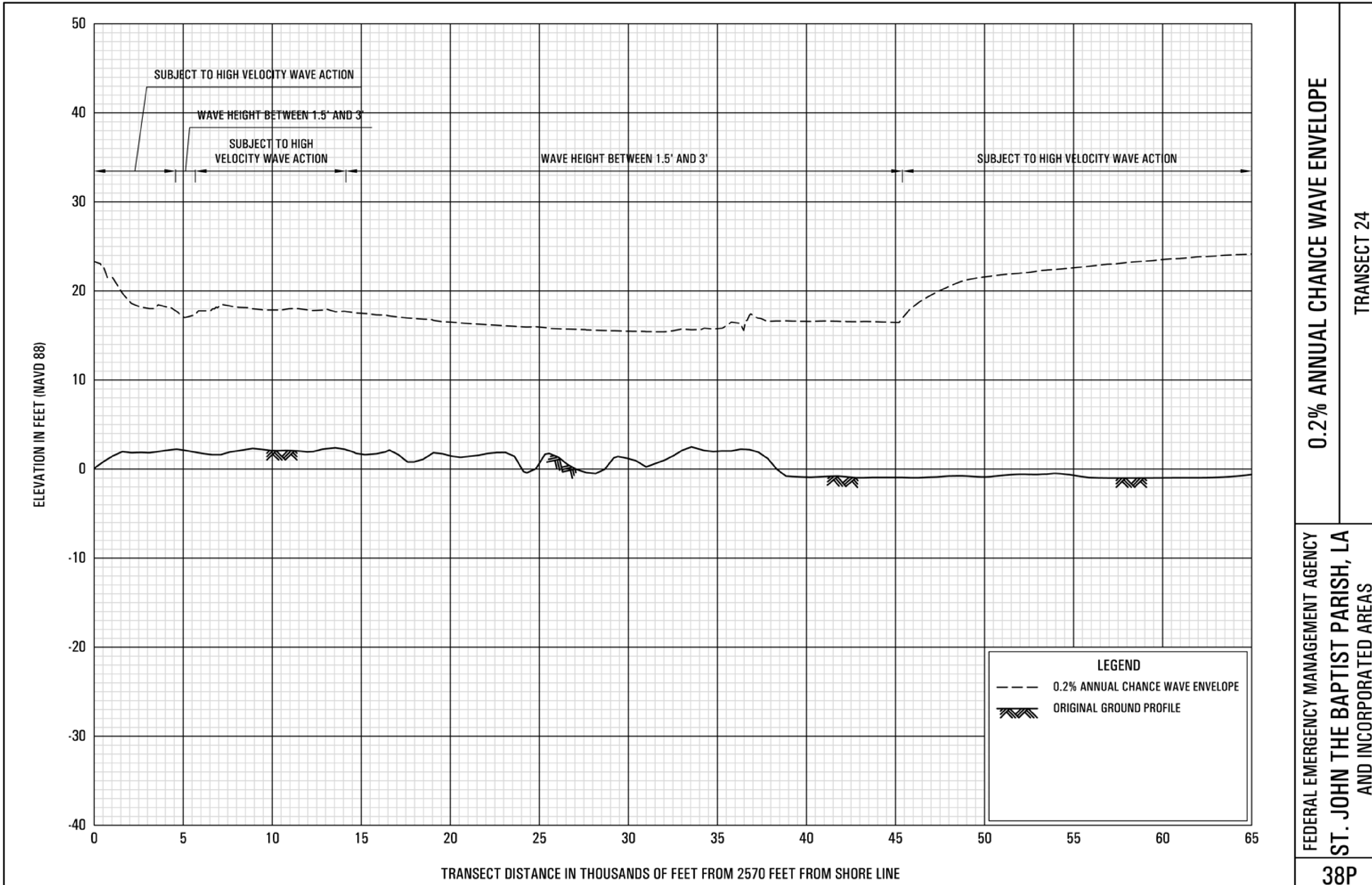
0.2% ANNUAL CHANCE WAVE ENVELOPE

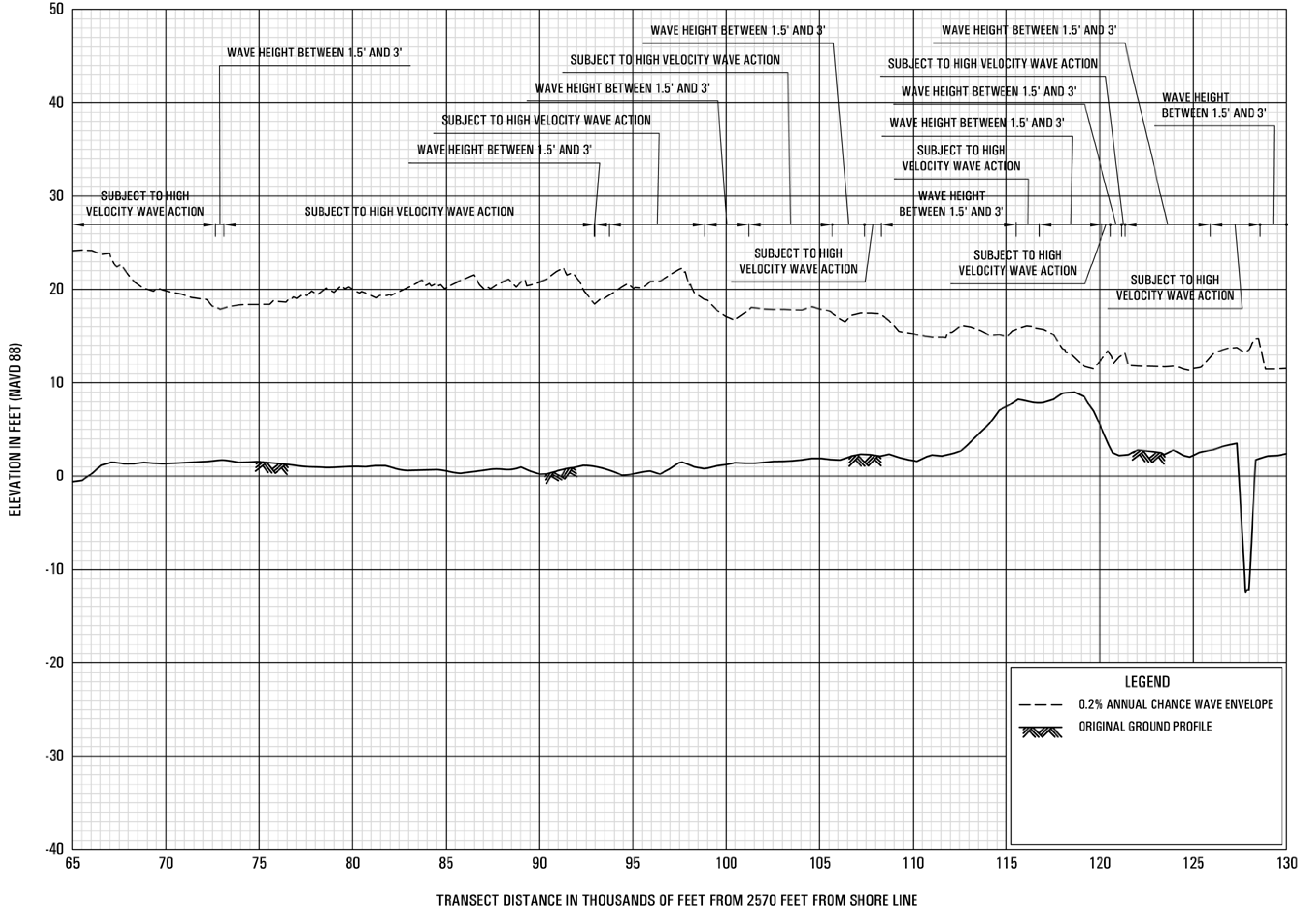
TRANSECT 23

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS


SUBJECT TO HIGH VELOCITY WAVE ACTION
WAVE HEIGHT BETWEEN 1.5' AND 3'
SUBJECT TO HIGH VELOCITY WAVE ACTION
WAVE HEIGHT BETWEEN 1.5' AND 3'
SUBJECT TO HIGH VELOCITY WAVE ACTION
ELEVATION IN FEET (NAVD 88)
50
40
30
20
10
0
-10
-20
-30
-40
0
5
10
15
20
25
30
35
40
45
50
55
60
65
TRANSECT DISTANCE IN THOUSANDS OF FEET FROM 2570 FEET FROM SHORE LINE
LEGEND
0.2% ANNUAL CHANCE WAVE ENVELOPE
ORIGINAL GROUND PROFILE
0.2% ANNUAL CHANCE WAVE ENVELOPE
TRANSECT 24
FEDERAL EMERGENCY MANAGEMENT AGENCY
ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS
38P



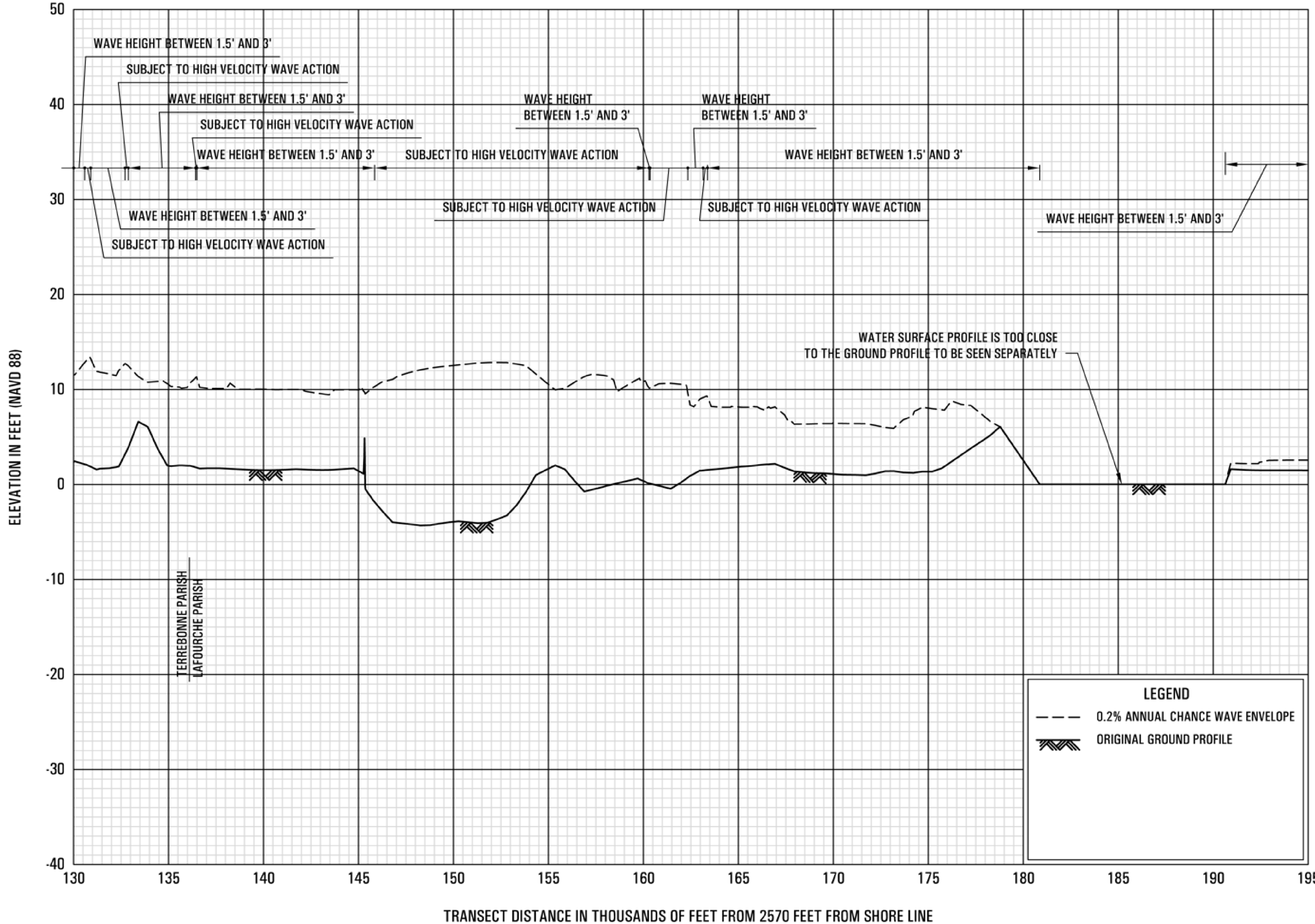
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

39P



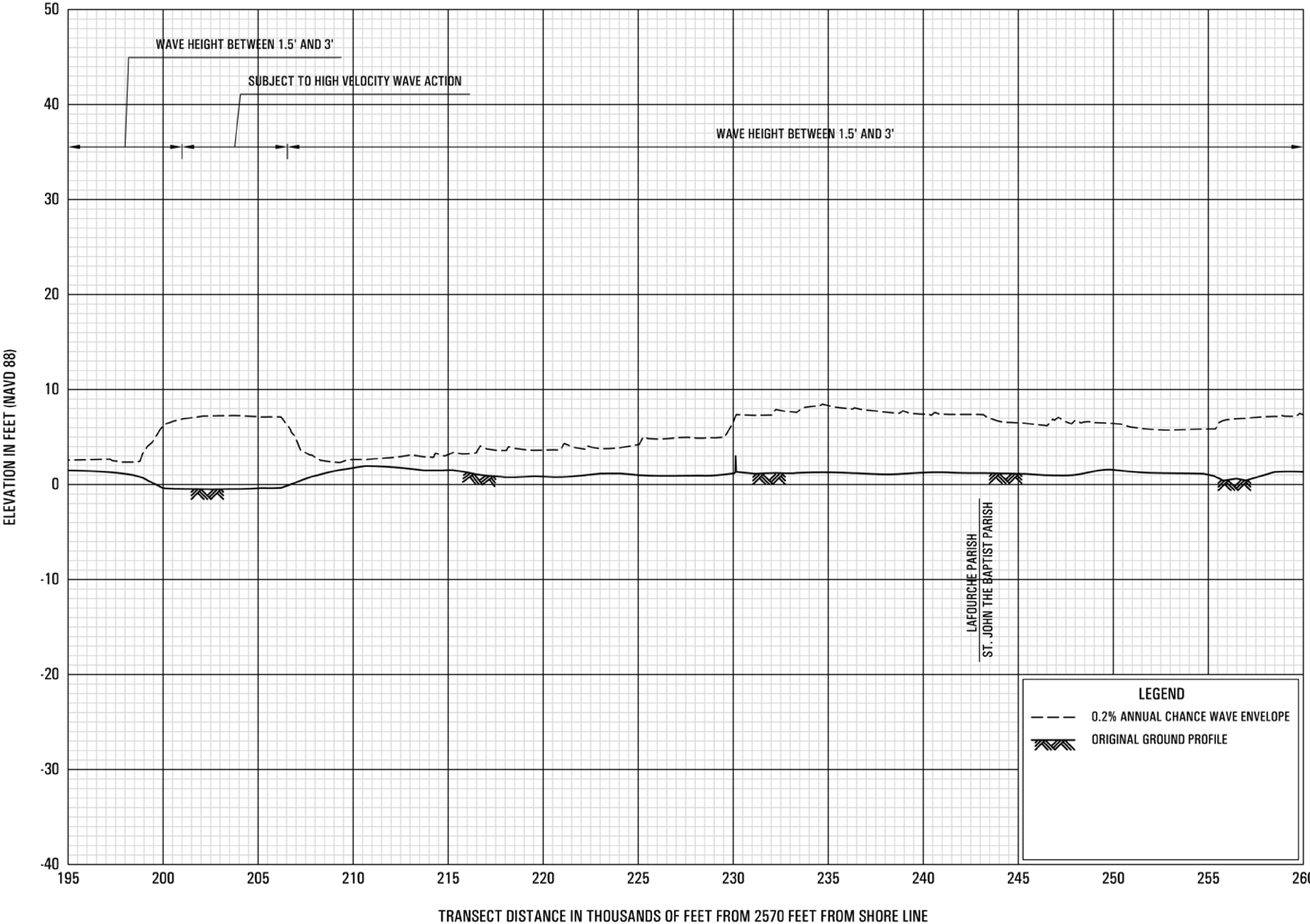
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

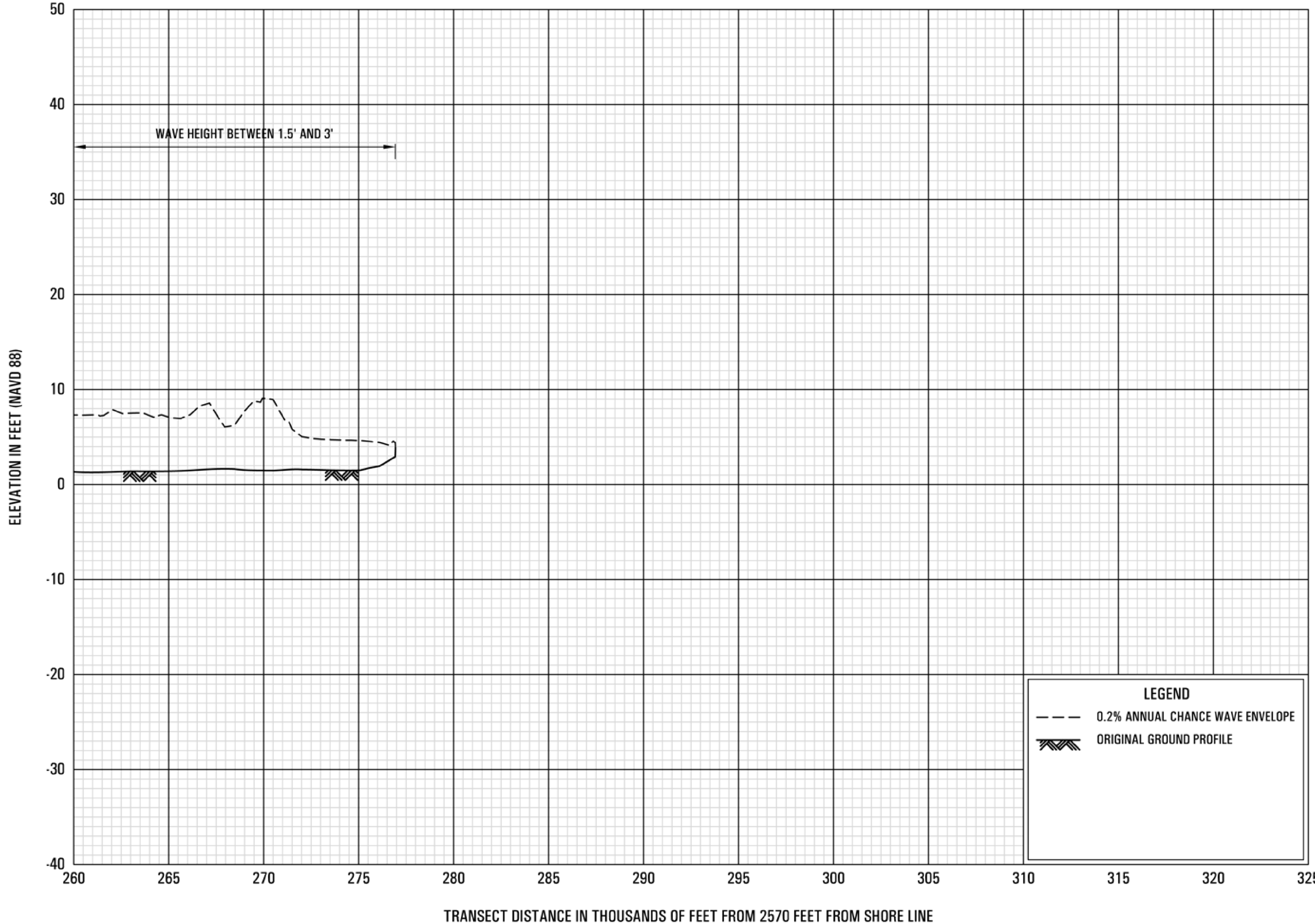


0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS



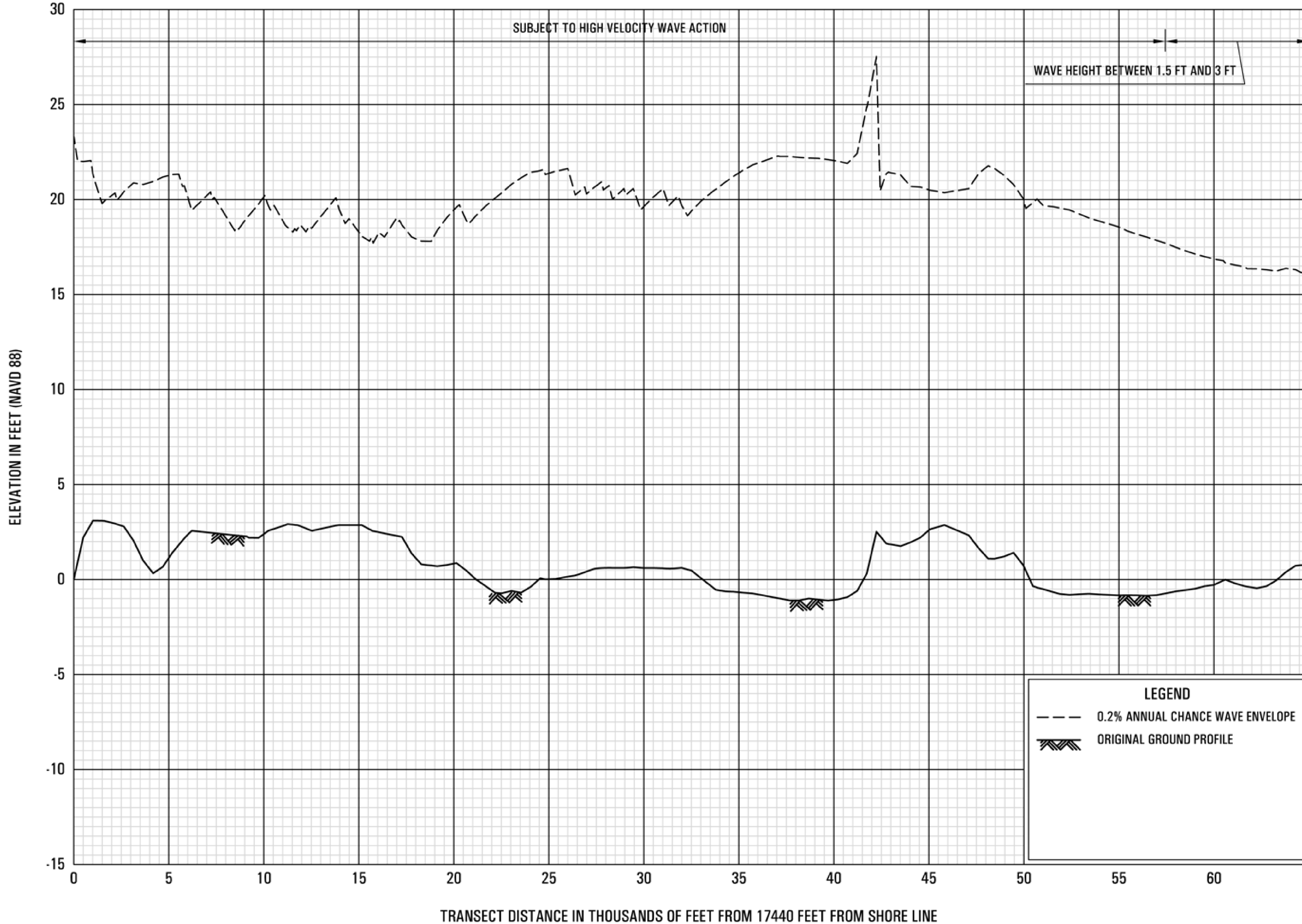
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 24

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS



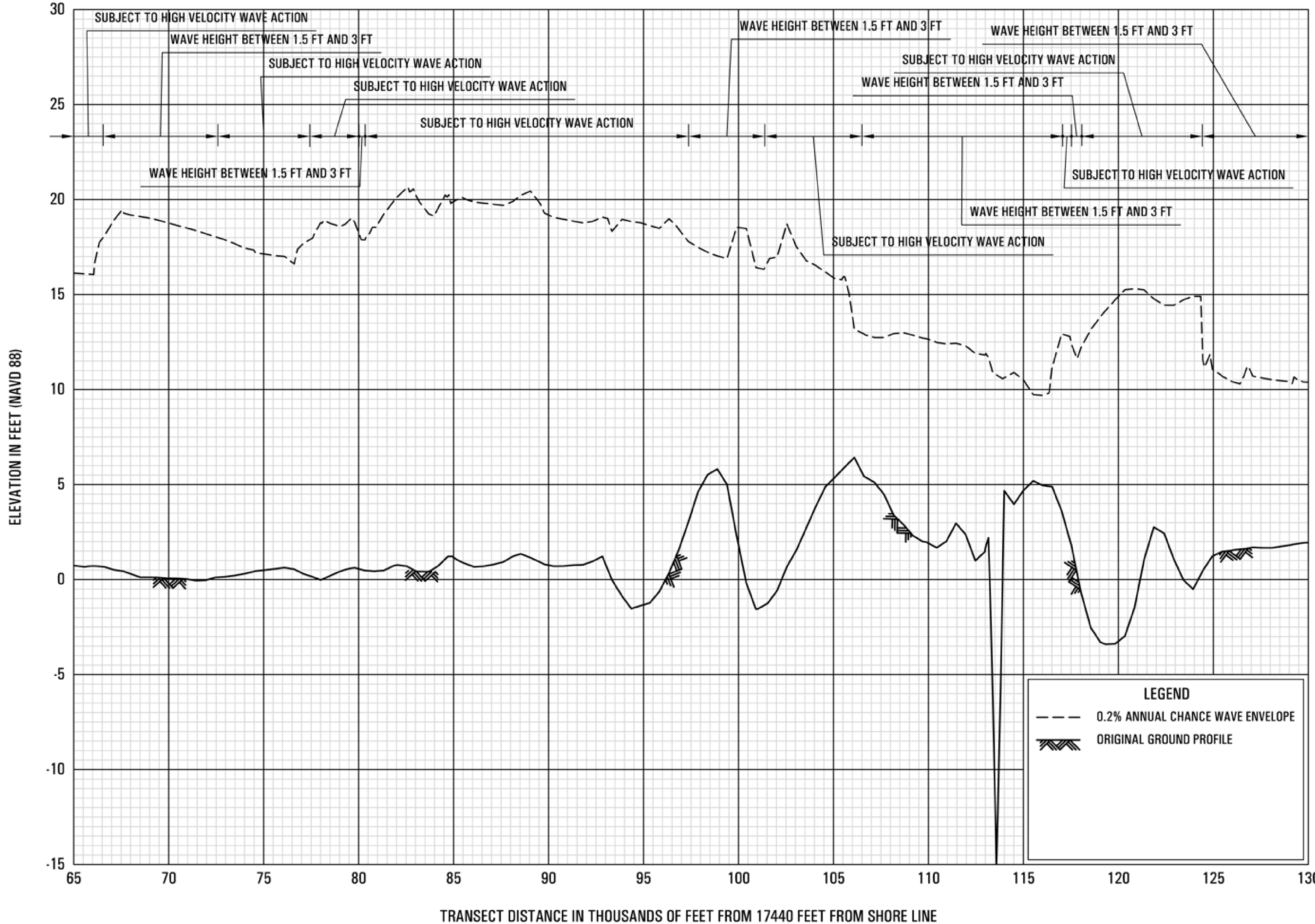
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 25

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS



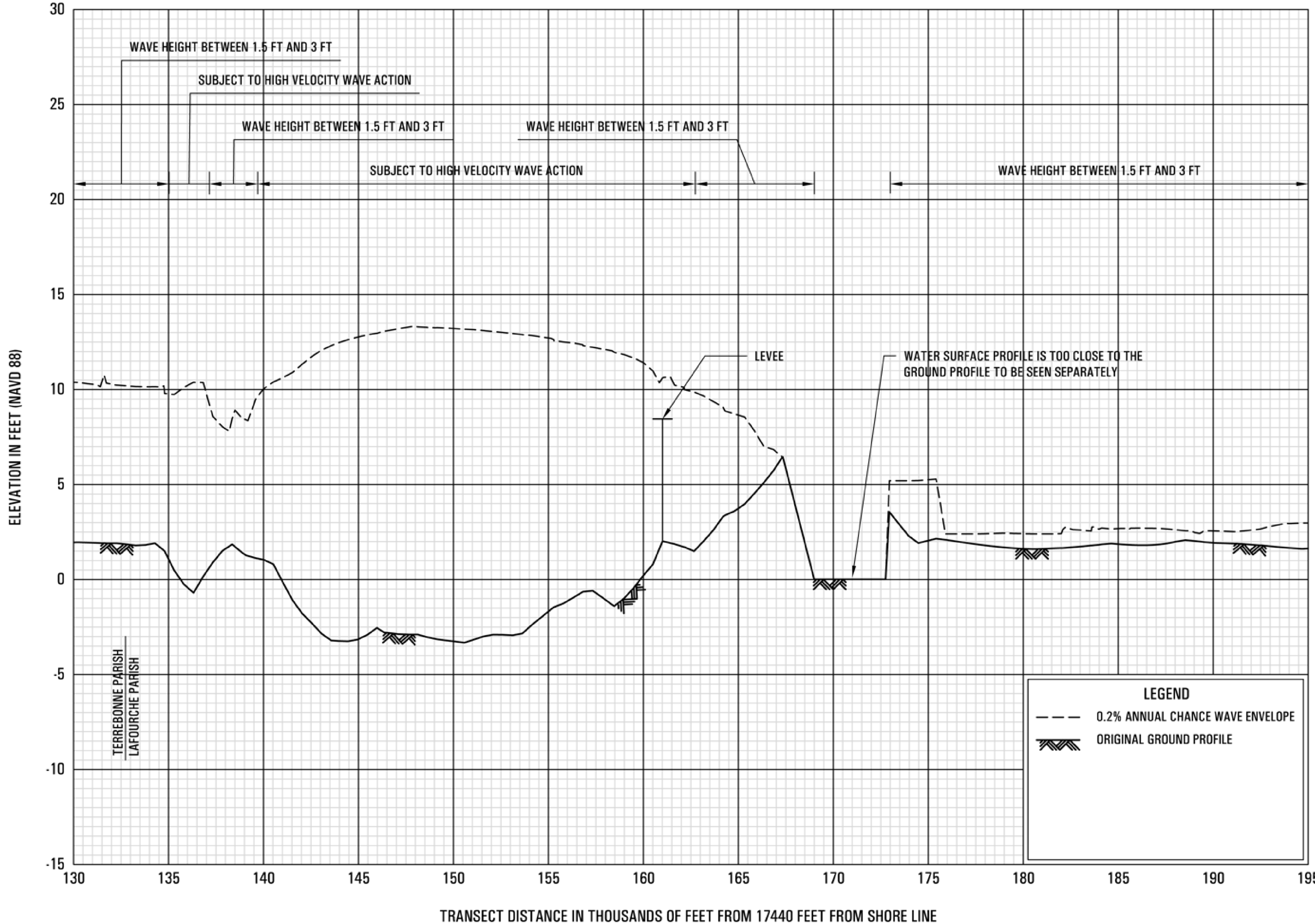
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 25

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS



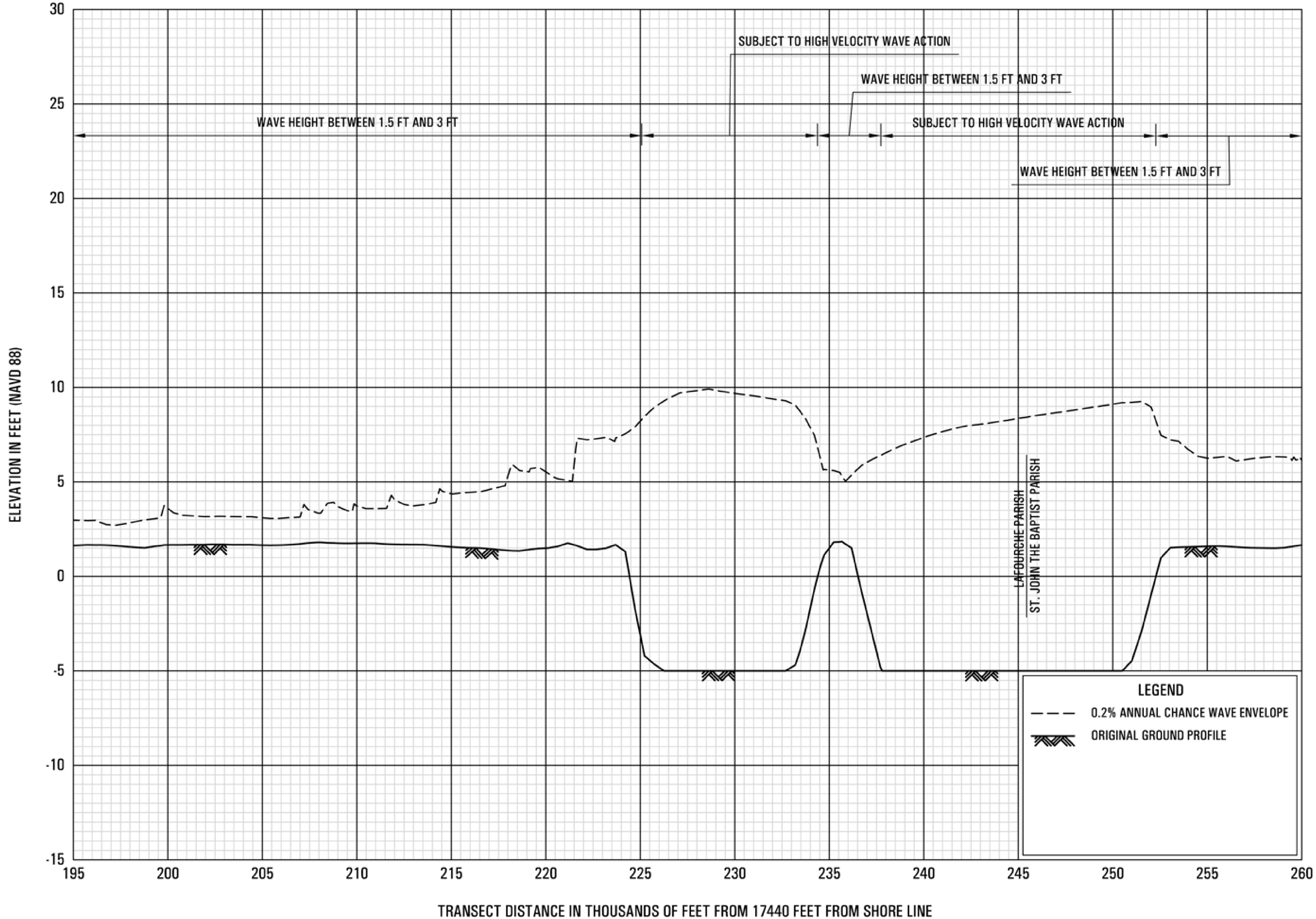
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 25

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA
AND INCORPORATED AREAS

45P



0.2% ANNUAL CHANCE WAVE ENVELOPE

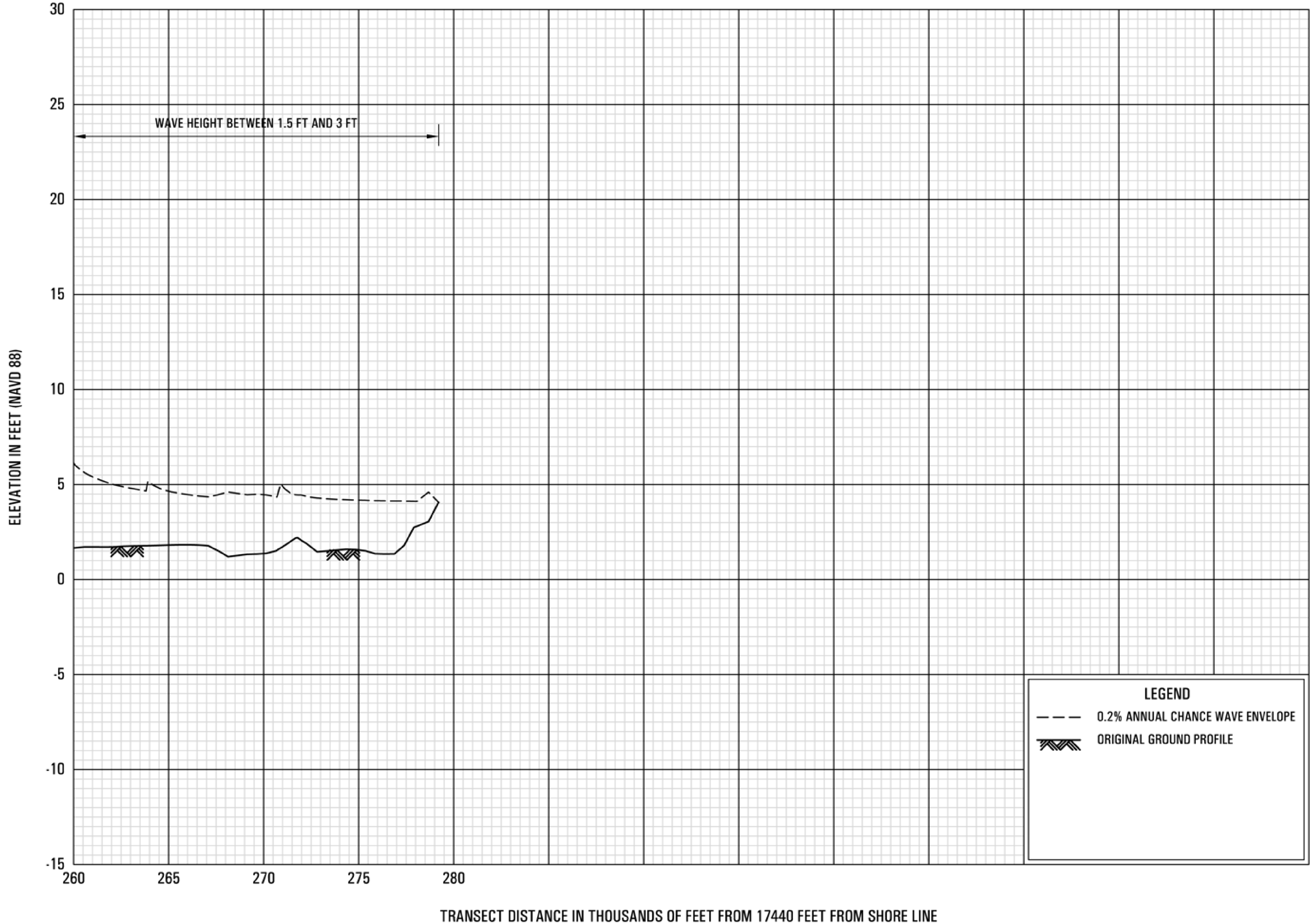
TRANSECT 25

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

46P



FEDERAL EMERGENCY MANAGEMENT AGENCY

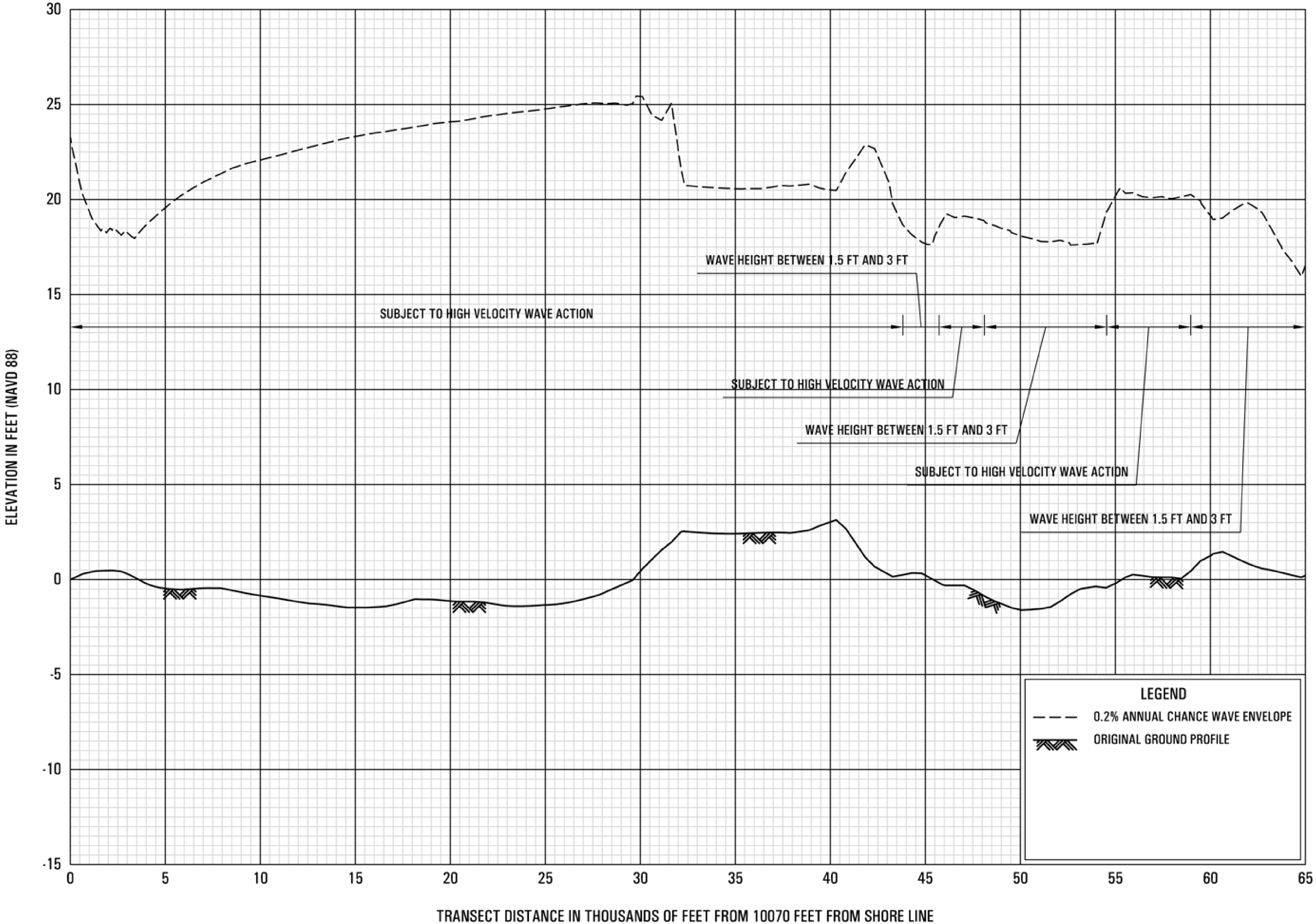
ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 25

47P



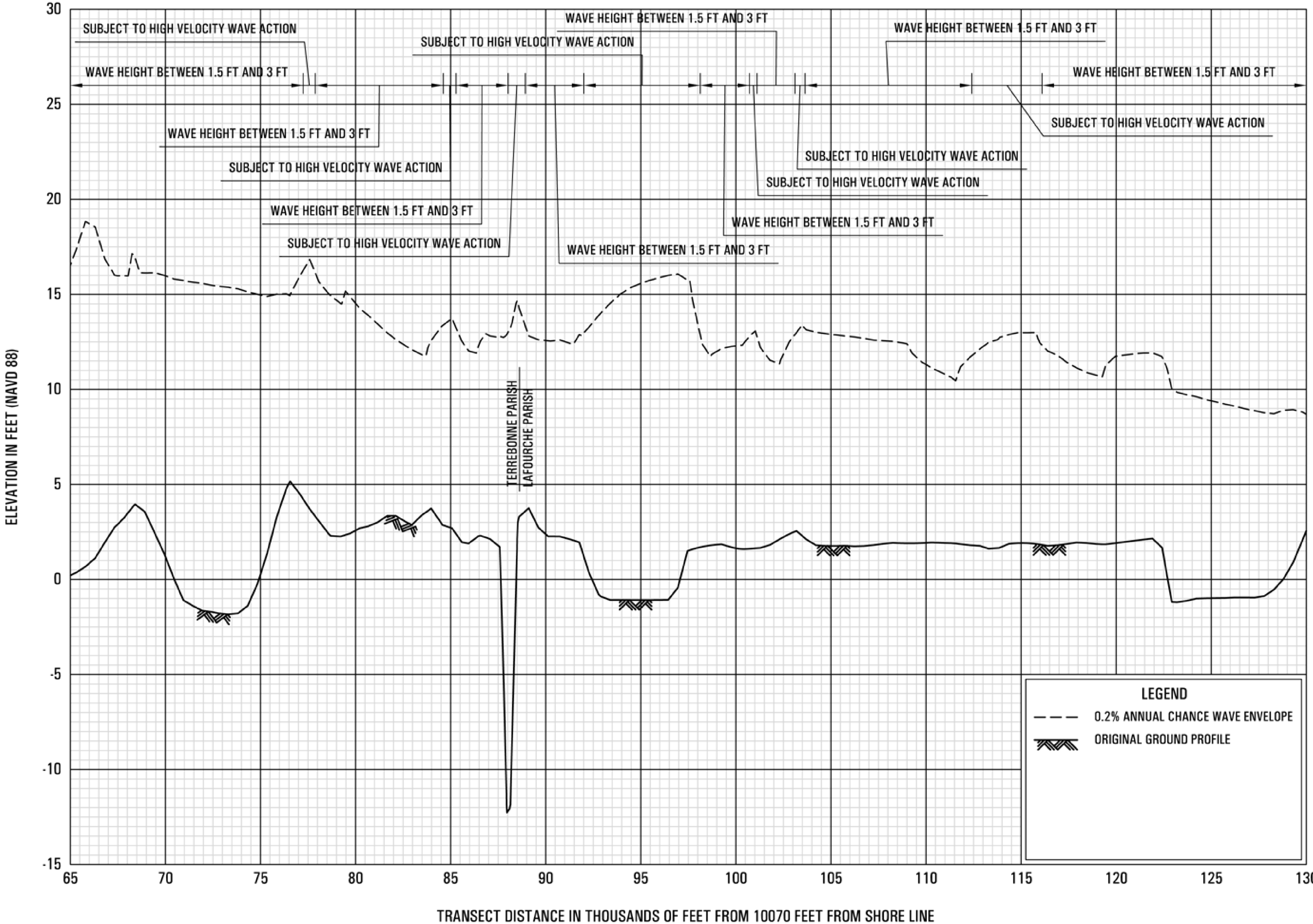
0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 26

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS



0.2% ANNUAL CHANCE WAVE ENVELOPE

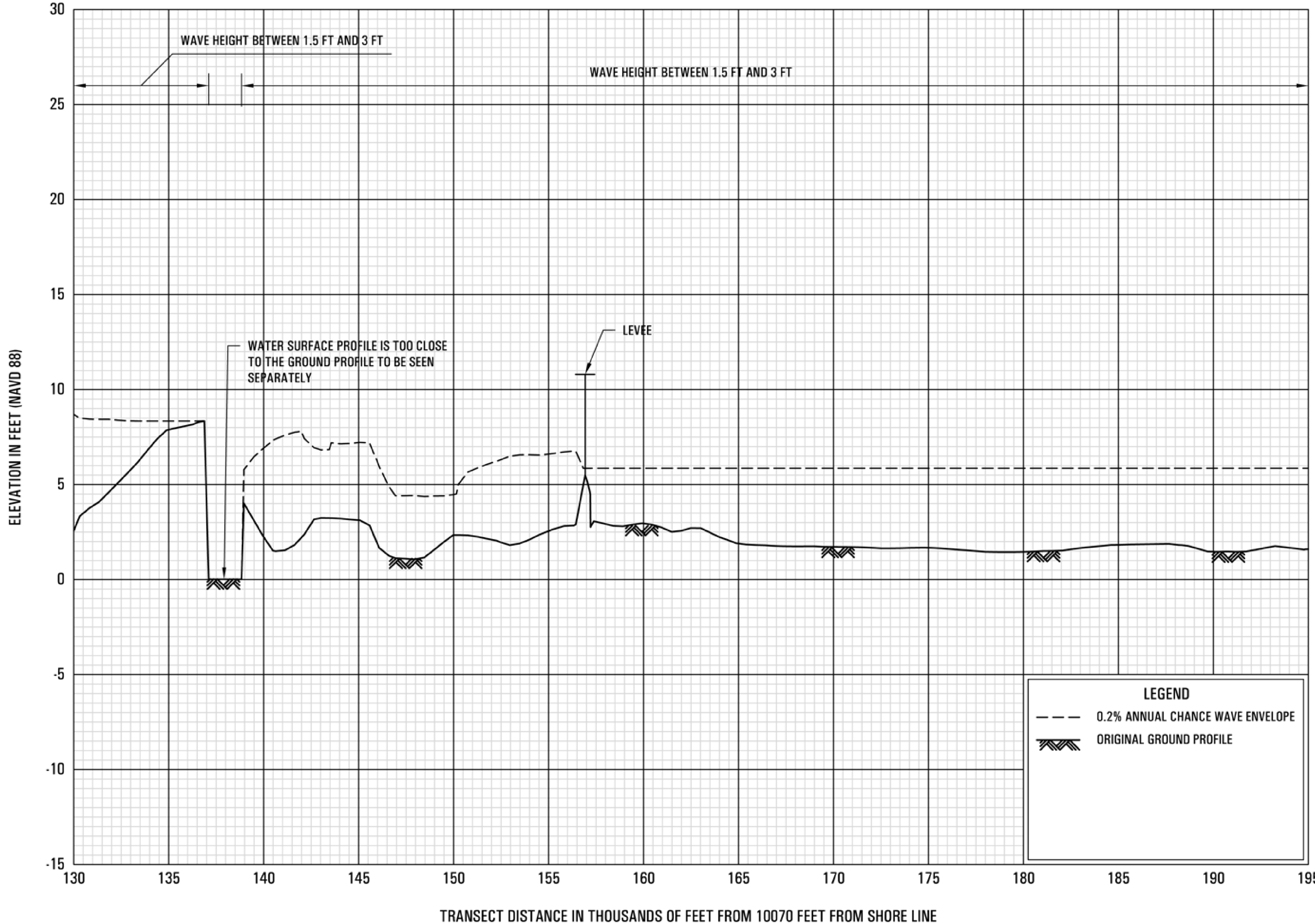
TRANSECT 26

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

49P



0.2% ANNUAL CHANCE WAVE ENVELOPE

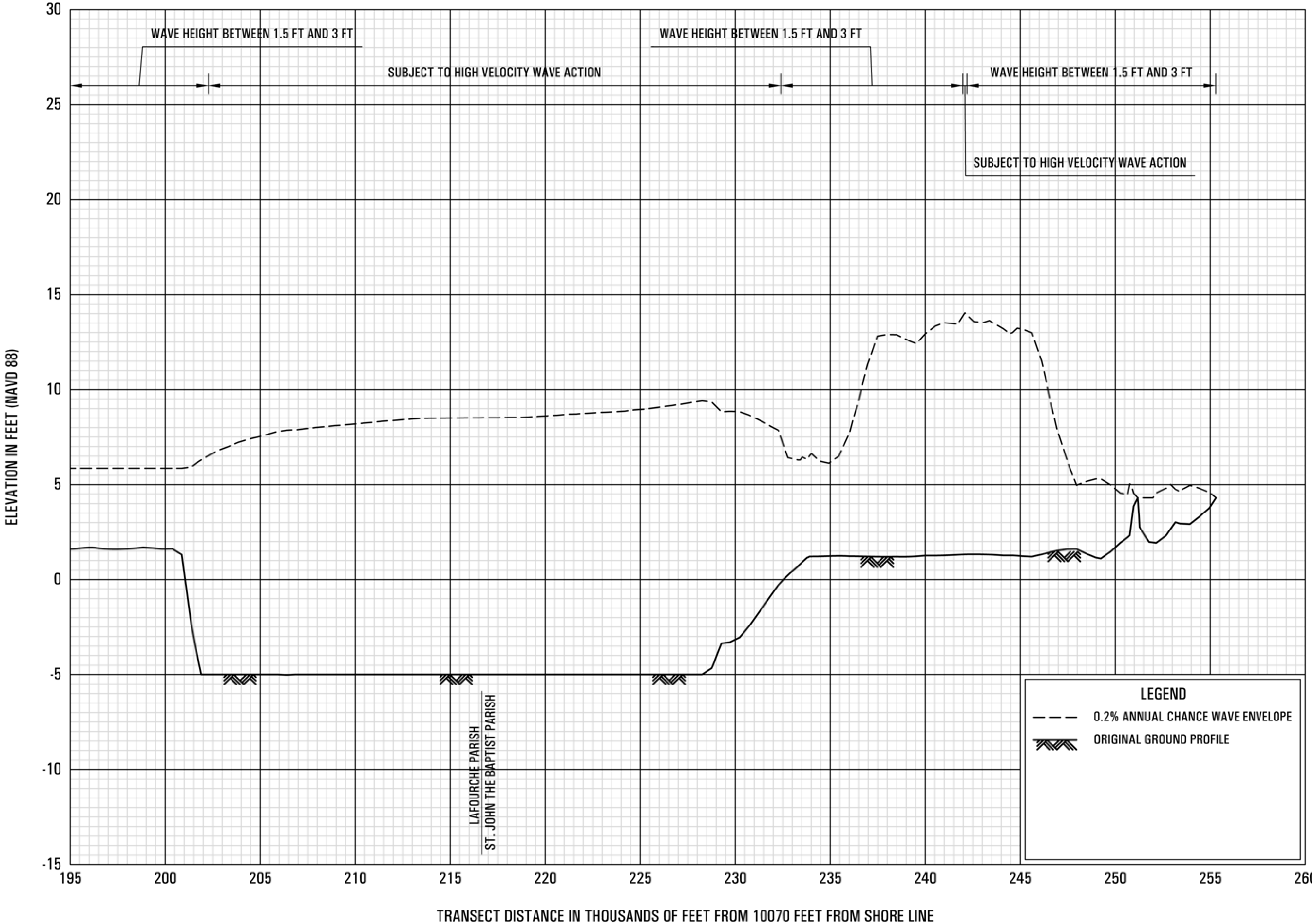
TRANSECT 26

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

50P



0.2% ANNUAL CHANCE WAVE ENVELOPE

TRANSECT 26

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. JOHN THE BAPTIST PARISH, LA

AND INCORPORATED AREAS

51P