

Appendix E. Project Design Envelope and Maximum-Case Scenario

Empire proposes the Project using a PDE concept. This concept allows Empire to define and bracket proposed Project characteristics for environmental review and permitting while maintaining a reasonable degree of flexibility for selection and purchase of Project components such as WTGs, foundations, export cables, and OSS.¹

BOEM provides Empire and other lessees with the option to submit COPs using the PDE concept—providing sufficiently detailed information within a reasonable range of parameters to analyze a “maximum-case scenario” within those parameters for each affected environmental resource. BOEM identified and verified that the maximum-case scenario based on the PDE provided by Empire and analyzed in this Final EIS could reasonably occur if approved. This approach is intended to provide flexibility for lessees and allow BOEM to analyze environmental impacts in a manner that minimizes the need for subsequent environmental and technical reviews as design changes occur.

This Final EIS assesses the impacts of the reasonable range of Project designs that are described in the COP by using the maximum-case scenario process. The maximum-case scenario analyzes the aspects of each design parameter that would result in the greatest impact for each physical, biological, and socioeconomic resource. This Final EIS considers the interrelationship among aspects of the PDE rather than simply viewing each design parameter independently. This Final EIS also analyzes the planned action impacts of the maximum-case scenario together with other past, present, and reasonably foreseeable future actions.

A summary of Empire’s PDE parameters is provided in Table E-1 and Table E-2. Table E-3 details the full range of maximum-case design parameters for the proposed Project and which parameters are relevant to the analysis for each EIS section in Chapter 3, *Affected Environment and Environmental Consequences*.

Table E-1 Summary of PDE Parameters

| Parameter | EW 1 | EW 2 | Total |
|------------------------------|--------------------------|--------------------------|--------------------------|
| Type of foundation (WTGs) | Monopile | Monopile | Monopile |
| Type of foundations (OSS) | Piled jacket | Piled jacket | Piled jacket |
| Number of foundations | 58 | 91 | 149 |
| Number of OSS | 1 | 1 | 2 |
| Number of WTGs | 57 | 90 | 147 |
| Rotor diameter | 853 feet (260 meters) | 853 feet (260 meters) | 853 feet (260 meters) |
| Hub height | 525 feet (160 meters) | 525 feet (160 meters) | 525 feet (160 meters) |
| Upper blade tip height | 951 feet (290 meters) | 951 feet (290 meters) | 951 feet (290 meters) |
| Voltage of interarray cables | 66 kV | 66 kV | 66 kV |

¹ Additional information and guidance related to the PDE concept can be found here: <https://www.boem.gov/Draft-Design-Envelope-Guidance>.

| Parameter | EW 1 | EW 2 | Total |
|---|----------------------------|----------------------------|----------------------------|
| Total length of interarray cables | 116 nm (214 kilometers) | 144 nm (267 kilometers) | 260 nm (481 kilometers) |
| Voltage of submarine export cables | 230 kV | 345 kV | - |
| Total length of submarine export cable route ¹ | 41 nm (76 kilometers) | 26 nm (48 kilometers) | 67 nm (124 kilometers) |

¹ This length refers to the distance along the centerline of the submarine export cable route and is measured from the edge of the Lease Area to the export cable landfall. Multiple cables may be included within each cable route.

Table E-2 Summary of Project Siting Options in the PDE

| Project Element | EW 1 | EW 2 |
|---------------------------------|--------------|--|
| POI | Gowanus | Oceanside |
| Submarine export cable route | EW 1 Route B | EW 2 Route C |
| Onshore substation | EW 1 | EW 2 Onshore Substation A and EW 2 Onshore Substation C |
| Submarine export cable landfall | EW 1 | EW 2 Landfall A: Riverside Boulevard and East Broadway EW 2 Landfall B: Shore Road and Monroe Boulevard EW 2 Landfall C: Lido Beach West Town Park EW 2 Landfall E: Laurelton Boulevard and West Broadway |
| Onshore cable route | EW 1 | LB-A through LB-H, LB Variant, and IP-A through IP-H |

Table E-3 Maximum-Case Design Parameters for the Empire Wind Project (an “X” indicates that the parameter is relevant to an EIS resource analysis)

| Design Parameter | Empire Wind 1 | Empire Wind 2 | 3.4 Air Quality | 3.5 Bats | 3.6 Benthic Resources | 3.7 Birds | 3.8 Coastal Habitat and Fauna | 3.9 Commercial Fisheries and For-Hire Recreational Fishing | 3.10 Cultural Resources | 3.11 Demographics, Employment, and Economics | 3.12 Environmental Justice | 3.13 Finfish, Invertebrates, and Essential Fish Habitat | 3.14 Land Use and Coastal Infrastructure | 3.15 Marine Mammals | 3.16 Navigation and Vessel | 3.17 Other Uses (Marine Minerals, Military Use, Aviation) | 3.18 Recreation and Tourism | 3.19 Sea Turtles | 3.20 Scenic and Visual | 3.21 Water Quality | 3.22 Wetlands |
|--|--|---------------|-----------------|----------|-----------------------|-----------|-------------------------------|--|-------------------------|--|----------------------------|---|--|---------------------|----------------------------|---|-----------------------------|------------------|------------------------|--------------------|---------------|
| | | | | | | | | | | | | | | | | | | | | | |
| Wind Farm | | | | | | | | | | | | | | | | | | | | | |
| Wind farm capacity | 816 MW | 1,260 MW | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Wind Turbines | | | | | | | | | | | | | | | | | | | | | |
| Approximate total number ¹ | 57 | 90 | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Hub height above HAT | 525 feet (160 meters) | | | X | | X | | X | X | X | X | | X | | X | X | X | | X | | |
| Upper blade tip above HAT | 951 feet (290 meters) | | | X | | X | | X | X | X | X | | X | | X | X | X | | X | | |
| Lower blade tip above HAT ² | 85 feet (26 meters) | | | X | | X | | X | X | X | X | | X | | X | X | X | | X | | |
| Rotor diameter | 853 feet (260 meters) | | | X | | X | | X | X | X | X | | X | | X | X | X | | X | | |
| Wind Turbine Oil/Grease/Fuel | | | | | | | | | | | | | | | | | | | | | |
| Transformer oil | 2,378 gallons (9,000 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Main bearing grease | 95 gallons (360 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Yaw grease | 32 gallons (120 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Yaw gear oil | 95 gallons (360 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Main bearing grease | 95 gallons (360 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Hydraulic oil | 317 gallons (1,200 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Cooling (water/glycerol) | 872 gallons (3300 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Pitch lubrication (grease) | 53 gallons (200 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Pitch system hydraulic accumulators (nitrogen) | 17,171 gallons (65,000 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Pitch gearbox oil | 18 gallons (70 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Gearbox oil (gear oil) | 1,057 gallons (4,000 liters) | | X | | X | X | | | | X | | X | | | X | | | X | | X | |
| Sulfur hexafluoride (SF ₆ gas) | 287 pounds (130 kilograms) | | X | | X | | | | | X | | X | | | X | | | X | | | |
| Monopile Foundation | | | | | | | | | | | | | | | | | | | | | |
| Base diameter | 36 feet (11 meters) | | | | X | X | | X | X | | | X | | X | X | | X | X | | | |
| Seabed penetration | 180 feet (55 meters) | | | | X | | | X | X | | | X | | X | X | | X | X | | | |
| Seabed footprint (without scour protection) ³ | 1,023 square feet (95 m ²) | | | | X | X | | X | X | | | X | | X | X | | X | X | | X | |
| Seabed footprint (with scour protection) ⁴ | 39,902 square feet (3,707 m ²) | | | | X | X | | X | X | | | X | | X | X | | X | X | | X | |
| Diameter at MSL | 33 feet (10 meters) | | | | | | | X | | | | X | | | X | | X | | X | | |
| Monopile Foundation Scour Protection | | | | | | | | | | | | | | | | | | | | | |
| Depth of scour protection | 16.4 feet (5 meters) | | | | X | | | X | X | | | X | | | | | X | | | X | |
| Diameter for monopile (including foundation) | 207 feet (63 meters) | | | | X | X | | X | | | | X | | X | X | | X | X | X | X | |

| Design Parameter | Empire Wind 1 | Empire Wind 2 | 3.4 Air Quality | 3.5 Bats | 3.6 Benthic Resources | 3.7 Birds | 3.8 Coastal Habitat and Fauna | 3.9 Commercial Fisheries and For-Hire Recreational Fishing | 3.10 Cultural Resources | 3.11 Demographics, Employment, and Economics | 3.12 Environmental Justice | 3.13 Finfish, Invertebrates, and Essential Fish Habitat | 3.14 Land Use and Coastal Infrastructure | 3.15 Marine Mammals | 3.16 Navigation and Vessel | 3.17 Other Uses (Marine Minerals, Military Use, Aviation) | 3.18 Recreation and Tourism | 3.19 Sea Turtles | 3.20 Scenic and Visual | 3.21 Water Quality | 3.22 Wetlands |
|--|---|---------------|-----------------|----------|-----------------------|-----------|-------------------------------|--|-------------------------|--|----------------------------|---|--|---------------------|----------------------------|---|-----------------------------|------------------|------------------------|--------------------|---------------|
| Volume for monopile ⁵ | 13,080 cubic yards (10,000 cubic meters) | | | | X | | | X | | | | X | | X | X | | X | X | | | |
| Monopile Foundation Parameters | | | | | | | | | | | | | | | | | | | | | |
| Pile hammer size | 5,500 kilojoules | | | X | X | X | | X | | | | X | | X | | | X | X | | | |
| Maximum blows per minute per pile at maximum energy setting | 40 | | | X | X | X | | X | | | | X | | X | | | X | X | | | |
| Average piling time per pile | 3 hours | | | | | | | | | | | | | | | | | | | | |
| Wind Turbine Installation Parameters | | | | | | | | | | | | | | | | | | | | | |
| Seafloor footprint of wind turbine installation vessels ⁶ | 0.5 acre (0.2 hectare) | | | | X | | | X | X | X | | X | | X | X | | X | X | | X | |
| Seafloor penetration of wind turbine installation vessels ⁶ | 82 feet (25 meters) | | | | X | | | X | X | | | X | | | | | X | | | X | |
| Estimated time per component (hours/wind turbine) | 48 hours/wind turbine | | | X | | X | | | | | X | | | | X | | X | | | X | |
| Offshore Substation | | | | | | | | | | | | | | | | | | | | | |
| Piled Jacket Foundation⁷ | | | | | | | | | | | | | | | | | | | | | |
| Leg spacing at seabed | 197 feet x 197 feet (60 meters x 60 meters) | | | | | | | | | | | | | | X | | X | | | | |
| Pile diameter | 8 feet (2.5 meters) | | | | X | | | | | | | X | | X | X | | X | X | | | |
| Seabed penetration | 197 feet (60 meters) | | | | X | | | | X | | | X | | | | | X | | | | |
| Seabed footprint (without scour protection) ³ | 38,750 square feet (3,600 m ²) | | | | X | X | | | X | | | X | | X | X | | X | X | | X | |
| Seabed footprint (with scour protection) ⁸ | 93,560 square feet (8,692 m ²) | | | | X | X | | | X | | | X | | X | X | | X | X | | X | |
| Leg spacing at MSL | 164 feet x 164 feet (50 meters x 50 meters) | | | | | | | | | | | | | | X | | | | X | | |
| Piled Jacket Foundation Scour Protection⁹ | | | | | | | | | | | | | | | | | | | | | |
| Depth for piled jacket | 6.6 feet (2 meters) | | | | | | | | X | | | | | | | | | | | | |
| Area (including foundation) | 93,560 (8,692 m ²) | | | | | | | | X | | | | | | X | | | | | | |
| Total Volume ⁵ | 30,698 cubic yards (23,470 cubic meters) | | | | | X | | | | | | | | | X | | | | | | |
| Offshore Substation Commissioning | | | | | | | | | | | | | | | | | | | | | |
| Seafloor footprint of OSS commissioning accommodation vessel ¹⁰ | 0.5 acre (0.2 hectare) | | | | X | | | X | X | | X | | | X | X | | X | X | | X | |
| Seafloor penetration of installation OSS commissioning accommodation vessel ^{10,11} | 82 feet (25 meters) | | | | X | | | X | X | | X | | | | | | X | | | X | |
| Piled Jacket Foundation Parameters | | | | | | | | | | | | | | | | | | | | | |
| Pile hammer size | 4,000 kilojoules | | | X | X | X | | X | | | X | | | X | | | | X | | | |
| Maximum blows per minute per pile at maximum energy setting | 40 | | | X | | X | | | | | | | | | | | X | | | | |
| Average piling time per pile ¹² | 4.2 hours | | | | | | | | | | | | | | | | | | | | |
| Offshore Substation Topside Maximum Parameters | | | | | | | | | | | | | | | | | | | | | |
| Voltage | 230 kV | 345 kV | | | | | | | | | | | | | | | | | | | |
| Width | 230 feet (70 meters) | | | X | | X | | X | X | | | | | | X | | | | X | | |

| Design Parameter | Empire Wind 1 | Empire Wind 2 | 3.4 Air Quality | 3.5 Bats | 3.6 Benthic Resources | 3.7 Birds | 3.8 Coastal Habitat and Fauna | 3.9 Commercial Fisheries and For-Hire Recreational Fishing | 3.10 Cultural Resources | 3.11 Demographics, Employment, and Economics | 3.12 Environmental Justice | 3.13 Finfish, Invertebrates, and Essential Fish Habitat | 3.14 Land Use and Coastal Infrastructure | 3.15 Marine Mammals | 3.16 Navigation and Vessel | 3.17 Other Uses (Marine Minerals, Military Use, Aviation) | 3.18 Recreation and Tourism | 3.19 Sea Turtles | 3.20 Scenic and Visual | 3.21 Water Quality | 3.22 Wetlands |
|--|---|---------------------------------|-----------------|----------|-----------------------|-----------|-------------------------------|--|-------------------------|--|----------------------------|---|--|---------------------|----------------------------|---|-----------------------------|------------------|------------------------|--------------------|---------------|
| Length | 230 feet (70 meters) | | | X | | X | | X | X | | | | | | X | | | | X | | |
| Height ¹³ | 92 feet (28 meters) | 108 feet (33 meters) | | X | | X | | X | X | | | | | | X | X | | | X | | |
| Height AMSL (topside only) ³¹ | 174 feet (53 meters) | 190 feet (58 meters) | | X | | X | | | X | | | | | | X | | | | X | | |
| Height AMSL (with ancillary structures) | 295 feet (90 meters) | 312 feet (95 meters) | | X | | X | | | X | | | | | | X | | | | X | | |
| Offshore Substation Oil/Grease/Fuel Maximum Parameters¹⁴ | | | | | | | | | | | | | | | | | | | | | |
| Transformer/reactor oil | 158,503 gallons (600,000 liters) | | X | | X | X | | | | | | X | | X | X | | | X | | X | |
| Sulfur hexafluoride (SF ₆ gas) | 11,023 pounds (5,000 kilograms) | 16,535 pounds (7,500 kilograms) | X | | | | | | | | | X | | X | X | | | X | | | |
| Diesel fuel | 7,925 gallons (30,000 liters) | | X | | X | X | | | | | | X | | X | X | | | X | | X | |
| UPS batteries | 66,139 pounds (30,000 kilograms) | | | | X | | | | | | | X | | X | X | | | X | | | |
| Submarine Export Cables | | | | | | | | | | | | | | | | | | | | | |
| Number of routes | 1 | 1 | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Number of cables per route | 2 | 2 | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Total length ¹⁵ | 41 nm (76 kilometers) | 26 nm (48 kilometers) | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Voltage | 230 kV | 345 kV | | | | | | | | | | | | | X | | | | | | |
| Diameter (3 core cable) | 1 foot (300 millimeters) | | | | | | | | X | X | | | | | X | X | | | | | |
| Minimum target burial depth ¹⁶ | 6 feet (1.8 meters) 15 feet (4.5 meters) ¹⁷ | | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Trench depth ¹⁶ | 8 feet (2.4 meters) 18 feet (5.5 meters) ¹⁷ | | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Seafloor disturbance width ¹⁸ | 33 feet (10 meters) | | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Separation distance | 33 to 300 feet (10 to 91 meters) | | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Trench width ¹⁹ | 5 feet (1.5 meters) | | | | X | X | | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| Anchor corridor width ²⁰ | 1,250 feet (381 meters) ²¹ | | | | X | | | X | X | X | | X | X | X | X | | X | X | X | X | X |
| Siting corridor width ²² | 500 feet (152 meters) | 900 feet (274 meters) | | | X | X | | X | X | X | | | X | | X | | X | | | X | |
| Permanent easement width ²³ | 200 feet (60 meters) | | | | | | | | X | X | | | X | | X | | X | | | X | |
| Submarine Export Cable Protection Maximum Parameters (Provided per cable within each siting corridor) | | | | | | | | | | | | | | | | | | | | | |
| Width at base | 36 feet (11 meters) | | | | X | X | | X | X | | | X | | | X | X | X | | | X | |
| Width at top | 5 feet (1.5 meters) | | | | X | X | | X | X | | | X | | | X | X | X | | | X | |
| Depth | 5 feet (1.5 meters) | | | | X | X | | X | X | | | X | | X | X | X | X | X | X | X | X |
| Interarray Cable | | | | | | | | | | | | | | | | | | | | | |
| Total length | 116 nm (214 kilometers) | 144 nm (267 kilometers) | X | | X | X | | X | X | X | | X | | X | X | X | X | X | X | X | X |

| Design Parameter | Empire Wind 1 | Empire Wind 2 | 3.4 Air Quality | 3.5 Bats | 3.6 Benthic Resources | 3.7 Birds | 3.8 Coastal Habitat and Fauna | 3.9 Commercial Fisheries and For-Hire Recreational Fishing | 3.10 Cultural Resources | 3.11 Demographics, Employment, and Economics | 3.12 Environmental Justice | 3.13 Finfish, Invertebrates, and Essential Fish Habitat | 3.14 Land Use and Coastal Infrastructure | 3.15 Marine Mammals | 3.16 Navigation and Vessel | 3.17 Other Uses (Marine Minerals, Military Use, Aviation) | 3.18 Recreation and Tourism | 3.19 Sea Turtles | 3.20 Scenic and Visual | 3.21 Water Quality | 3.22 Wetlands | |
|--|----------------------------|------------------------------------|-----------------|----------|-----------------------|-----------|-------------------------------|--|-------------------------|--|----------------------------|---|--|---------------------|----------------------------|---|-----------------------------|------------------|------------------------|--------------------|---------------|--|
| Voltage | 66 kV | | | | | | | | | | | | | | X | | | | | | | |
| Diameter | 0.6 foot (170 millimeters) | | | | | | | | X | X | | | | | X | X | X | | | | | |
| Target burial depth ¹⁶ | 6 feet (1.8 meters) | | | | X | X | | X | X | X | | X | | X | X | X | X | X | | X | | |
| Trench width ²⁴ | 5 feet (1.5 meters) | | | | X | X | | X | X | X | | X | | X | X | X | X | X | | X | | |
| Seafloor disturbance width ¹⁸ | 33 feet (10 meters) | | | | X | X | | X | X | X | | X | | X | X | X | X | X | | X | | |
| Interarray Cable Protection Maximum Parameters (Provided per cable within each siting corridor) | | | | | | | | | | | | | | | | | | | | | | |
| Width at base | 16 feet (5 meters) | | | | X | X | | X | X | X | | X | | | X | X | X | | | X | | |
| Width at top | 3 feet (1 meters) | | | | X | X | | X | X | X | | X | | | X | X | X | | | X | | |
| Depth | 3 feet (1 meters) | | | | X | | | X | X | X | | X | | X | X | X | X | X | | X | | |
| Cable and Pipeline Crossings (Provided per cable within each siting corridor) | | | | | | | | | | | | | | | | | | | | | | |
| Width at base | 53 feet (16 meters) | | | | X | X | | X | X | X | | X | X | | X | X | X | | | X | | |
| Width at top | 6.6 feet (2 meters) | | | | X | X | | X | X | X | | X | X | | X | X | X | | | X | | |
| Depth | 6.6 feet (2 meters) | | | | X | | | X | X | X | | X | X | X | X | X | X | X | | X | | |
| Onshore Export Cable Maximum Parameters | | | | | | | | | | | | | | | | | | | | | | |
| Number of cables | N/A | 6+2 fiber optic cables | | X | | X | X | | X | X | X | | X | | | | | | X | X | X | |
| Route length ²⁵ | N/A | 5.6 miles (9.1 kilometers) | X | X | | X | X | | X | X | X | | X | | | | | | X | X | X | |
| Number of routes | N/A | 2 | X | X | | X | X | | X | X | X | | X | | | | | | X | X | X | |
| Voltage | N/A | 345 kV | | | | | | | | | X | | | | | | | | | | | |
| Diameter | N/A | 0.4 foot (133 millimeters) | | | | | | | X | X | X | | | | | | | | | | | |
| Construction corridor width (open cut) | N/A | 150 feet (46 meters) ²⁶ | | X | | X | X | | X | X | X | | X | | | | | | X | X | X | |
| Operational corridor width ²⁷ | N/A | 25 feet (8 meters) | | X | | X | X | | X | | X | | X | | | | | | X | X | X | |
| Interconnection Cable Maximum Parameters | | | | | | | | | | | | | | | | | | | | | | |
| Number of cables per route | 6+2 fiber optic cables | 6+2 fiber optic cables | | X | | X | X | | X | X | X | | X | | | | | | | X | X | |
| Total route length | 0.2 mile (0.4 kilometer) | 2.8 miles (4.5 kilometer) | X | X | | X | X | | X | X | X | | X | | | | | | X | X | X | |
| Voltage | 345 kV | 345 kV | | | | | | | | | X | | | | | | | | | | | |
| Diameter | 0.5 foot (150 millimeters) | | | | | | | | X | X | X | | | | | | | | | | | |
| Construction corridor width (open cut) | 50 feet (15 meters) | 100 feet (30 meters) ²⁶ | | X | | X | X | | X | X | X | | X | | X | | | | X | X | X | |
| Operational corridor width ²⁸ | 25 feet (8 meters) | | | X | | X | X | | X | | X | | X | | X | | | | X | X | X | |
| Export Cable and Interconnection Cable Installation Methods | | | | | | | | | | | | | | | | | | | | | | |
| Export Cable Landfall/Inland Waterway Crossings | | | | | | | | | | | | | | | | | | | | | | |
| Trenchless (HDD, direct pipe, jack and bore, or similar) | X | X | | | | X | X | X | X | | | X | X | X | X | | | X | | X | X | |
| Open cut trench/jetting (with or without dredging) | X | X | | | | X | X | X | X | | | X | X | X | X | | | X | | X | X | |

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|---|--|--|-----------------|----------|-----------------------|-----------|-------------------------------|--|-------------------------|--|----------------------------|---|--|---------------------|----------------------------|---|-----------------------------|------------------|------------------------|--------------------|---------------|
| Open cut/jetting (cofferdam) | X | X | | | | X | X | X | X | | | X | X | X | X | | | X | | X | X |
| Open cut/jetting (conduit through bulkhead with or without cofferdam) | X | X | | | | X | X | X | X | | | X | X | X | X | | | X | | X | X |
| Open cut/jetting (conduit over bulkhead with or without cofferdam) | X | X | | | | X | X | X | X | | | X | X | X | X | | | X | | X | X |
| Above-water crossing (cable bridge) | - | X | | | | | | | | | | | | | | | | | | | |
| Onshore Export Cable/Interconnection Cable Routes (Upland) | | | | | | | | | | | | | | | | | | | | | |
| Open cut trench | X | X | | X | | X | X | | X | | | | X | | | | | | X | X | X |
| HDD | X | X | | X | | X | X | | X | | | | X | | | | | | X | X | X |
| Other trenchless (jack and bore) | X | X | | X | | X | X | | X | | | | X | | | | | | X | X | X |
| Summary of Onshore Open Cut Trench Parameters | | | | | | | | | | | | | | | | | | | | | |
| Depth of trench | 10 feet (3 meters) | | | | | | | | X | | | | X | | | | | | | | |
| Width of trench | 10 feet (3 meters) | 30 feet (9 meters) | | | | | | | X | | | | X | | | | | | X | | |
| Construction corridor width | 50 feet (15 meters) | 150 feet (46 meters) ²⁹ | | X | | X | X | | X | | | | X | | | | | | X | X | X |
| Operational corridor width ³⁰ | 25 feet (8 meters) | | | X | | X | X | | X | | | | X | | | | | | X | X | X |
| Summary of HDD Parameters | | | | | | | | | | | | | | | | | | | | | |
| Submarine Export Cable Landfall HDD | | | | | | | | | | | | | | | | | | | | | |
| Onshore (entry) work area footprint | 200 feet x 200 feet (61 meters x 61 meters) | 246 feet x 246 feet (75 meters x 75 meters) | | X | | X | X | | X | | | | X | | | | | | | X | X |
| Offshore (exit) work area footprint | 150 feet x 150 feet (46 meters x 46 meters) | | | X | X | X | X | X | X | | | X | X | X | | | X | X | | X | X |
| Onshore Export Cable/Interconnection Cable Crossing HDD | | | | | | | | | | | | | | | | | | | | | |
| Onshore work area footprint | 200 feet x 200 feet (61 meters x 61 meters) x 2 (entry/exit) | 246 feet x 246 feet (75 meters x 75 meters) x 2 (entry/exit) | | X | | X | X | | X | | | | X | | | | | | | X | X |
| Summary of Other Trenchless Crossing (non-HDD) Parameters | | | | | | | | | | | | | | | | | | | | | |
| Work area footprint | 60 feet x 60 feet (18 meters x 18 meters) | | | X | | X | X | | X | | | | X | | | | | | X | X | X |
| Bore pit footprint | 60 feet x 60 feet (18 meters x 18 meters) | | | X | | X | X | | X | | | | X | | | | | | | X | X |
| Receiving pit footprint | 40 feet x 40 feet (12 meters x 12 meters) | | | X | | X | X | | X | | | | X | | | | | | | X | X |
| Summary of Direct Pipe Workspace Parameters | | | | | | | | | | | | | | | | | | | | | |
| Submarine Export Cable Landfall Direct Pipe Option | | | | | | | | | | | | | | | | | | | | | |
| Onshore (entry) work area footprint | - | 260 feet x 680 feet (79 meters x 207 meters) | | X | | X | X | | X | | | | X | | | | | | | X | X |
| Offshore (exit) work area footprint | - | 100 feet x 100 feet (30 meters x 30 meters) | | X | X | X | X | X | X | | | X | X | X | | | X | X | | X | X |

¹ The number of WTGs proposed allows for overplanting. Up to 147 WTG will be installed at any of 176 locations. The remaining two locations will be used for OSS.

² For this parameter, the minimum value represents the maximum PDE value to be used for assessing impacts.

³ Per foundation.

⁴ Per foundation if scour protection is required.

⁵ Per foundation if scour protection is required. Includes protection for J-tubes where interarray cables meet the OSS.

⁶ Accounts for jack-up installation vessels. Seafloor footprint will be the short-term impacts associated with construction and installation activities; operational footprint is the long-term impacts.

⁷ Up to 12 piles per foundation. For piled jackets designed with up to four legs, three piles per leg. For piled jackets designed with six legs, up to two piles per leg or three piles per corner.

⁸ Per foundation if scour protection is required. This footprint will also cover scour protection of the submarine cable protection for J-tubes entering the ISS.

⁹ This scour protection will also cover scour protection of the submarine cable protection for J-tubes entering the OSS.

¹⁰ Accounts for jack-up installation vessels. Seafloor footprint will be short term.

¹¹ Range is dependent on soil type.

¹² Only one foundation is proposed to be installed via pile driving at a given time for the Projects (i.e., there would be no overlap in pile-driving activities between EW 1 and EW 2).

¹³ Height from lowest deck on topside or foundation to highest deck on topside.

¹⁴ Values listed are per OSS. Listed fluids and values are representative; approximate actual values will be incorporated into the Projects' emergency response plan.

¹⁵ The approximate distance along the centerline of the surveyed submarine export cable siting corridor from the edge of the Lease Area to the export cable landfall. Actual length of cables may increase as a result of micrositing and final location of OSS. Final installation would be within the surveyed corridor assessed.

¹⁶ Burial depths to be based on CBRA and site-specific conditions, and may be greater than values listed here.

¹⁷ In locations where the submarine export cable would cross federally maintained areas, in accordance with engagement with USACE and other stakeholders. This depth will be determined based upon the current or future authorized depth or the existing water depths, whichever is greater; therefore, minimum burial could be greater.

¹⁸ Direct seabed disturbance, including tracks from the trenching tool.

¹⁹ The width of the trench is defined here as the widest point of the bottom of the trench established by the clearing of the seabed by the trenching tool and will vary based upon the final installation method selected and soil conditions; the seabed surface trench width could be up to 10 feet (3 meters) in select locations, based upon the final installation method selected.

²⁰ The area in which a submarine export cable installation vessel may anchor in support of installation activities; this 1,250-foot width is on either side of the submarine export cable siting corridor in state waters. Corridor width may increase or decrease where site constraints exist. Impacts from Project-related vessel anchoring are expected to be in up to 269 square feet (25 m²) area, with a maximum penetration depth of 49 feet (15 meters) in up to 1,400 locations.

²¹ For EW 1, the anchor corridor would be in New York and New Jersey state waters only.

²² The area in which the submarine export cables could be installed. Assumes cables to be laid in parallel. Corridor width may increase or decrease where site constraints exist

²³ Distance from centerline for each cable. If a field joint is required, a wider easement may be required at the location of the joint.

²⁴ The widest point of the bottom of the trench established by the clearing of the seabed by the trenching tool. The seabed surface trench width could be up to 10 feet (3 meters) in select locations, based upon the final installation method selected and soil conditions.

²⁵ Represents maximum route length for a single onshore export cable route. For EW 2, up to two routes may be used.

²⁶ Where constrained by existing development, the onshore export cable construction corridor width may be less than 100 feet; the maximum width is included herein, as part of the PDE.

²⁷ Based on onshore cable conduits being installed side by side in a single corridor; however, conduits may also be split or stacked depending on site conditions.

²⁸ Based on onshore cable conduits being installed side by side in a single corridor; however, conduits may also be split or stacked depending on site conditions. As such, this width may vary in certain locations.

²⁹ Where constrained by existing development, the onshore export cable construction corridor width may be less than 150 feet (46 meters); the maximum width is included herein, as part of the PDE.

³⁰ Per cable circuit.

³¹ From mean sea level to highest deck on topside

HAT = highest astronomical tide; MSL = mean sea level; N/A = not applicable; SF₆ = sulfur hexafluoride; UPS = uninterrupted power supply