

Downtown Tunnel / Midtown Tunnel / MLK Extension

PURPOSE OF THE CEEES JUNIOR CLASS ANNUAL FIELD TRIP: To expose students to some of the biggest and most innovative infrastructure design and construction efforts going on in the United States; to provide an opportunity to see first-hand that the need to rebuild our often failing infrastructure is huge; to learn about the complexity of the structural, transportation, water resources, and environmental projects that keep our nation productive, efficient and healthy; and to interact one on one with project and design engineers. These trips help students see the wide range of opportunities available to become innovative leaders and also help connect the classroom to the outside world.

Tuesday, September 23

2:15pm Meet at bus/van in front of bookstore

Depart Notre Dame
(9 hours driving time to overnight destination)
Roadside travel stops for fuel/restroom/food

Overnight Marriott Courtyard, Springfield, VA
6710 Commerce Street, Springfield, VA

Wednesday, September 24 ****Construction Site Attire today****

6:30am-7:15am Breakfast in hotel (in order to accommodate our group, we are eating early this morning in the Purple Heart Meeting room)

7:45am Meet at bus

8:00am-11:00am Continue to Portsmouth, VA (3 hours)
152 Tunnel Facility Drive, Portsmouth VA 23707

11:00am – 3:00pm

Mid-Town Tunnel project ****Construction Site Attire for this site****

Pizza lunch from Sal’s Pizza at SKW office

Overview of project

Safety briefing

Site tour



THE MIDTOWN TUNNEL PROJECT – a 2.1 billion dollar public-private partnership project, joint venture of Skanska, Kiewit, and Weeks Marine (SKW Constructors)

The existing US 58 Midtown Tunnel between Norfolk and Portsmouth, Virginia is the most heavily traveled two-lane road east of the Mississippi. Since it opened in 1952, population has increased nearly 70% and tunnel usage by 600%. A second tunnel is being built to relieve congestion and improve safety by eliminating bi-directional traffic in the existing Midtown Tunnel. (https://www.driveert.com/wp-content/uploads/2014/04/ERT_factsheets_Midtown-Tunnel_WEB.pdf)



Construction of the new US 58 West Midtown Tunnel began in 2013. New construction includes:
A new two-lane tunnel under the Elizabeth River adjacent to the existing US 58 Midtown Tunnel.
Interchange improvements in Norfolk at Brambleton Avenue/Hampton Boulevard to enhance traffic flow.
The new tunnel is being built adjacent to the existing Midtown Tunnel. Bi-directional traffic in the existing Midtown Tunnel will be converted to one-way. The new tunnel will carry westbound traffic from Norfolk to Portsmouth. Eastbound traffic will use the existing tunnel.

Marine Operations

Before placing the new tunnel elements, a trench will be dredged in the Elizabeth River and excavated on land. Approximately 1.2 million cubic yards of material will be dredged and 80,000 cubic yards excavated. For the land excavation and a portion of the dredging, a steel support of excavation (SOE) system will be installed to protect the adjacent existing tunnel and to support the excavation. Ground within the system will be removed to make way for the new tunnel. Approximately two and a half elements of the new Midtown Tunnel must be built under the federal channel and an active waterway.

“Elizabeth River Tunnels” <https://www.driveert.com/construction/midtown-tunnel/>

3:00pm – 7:00pm

Drive to DC (3 hours)
Snack on road: Panera sandwich boxes

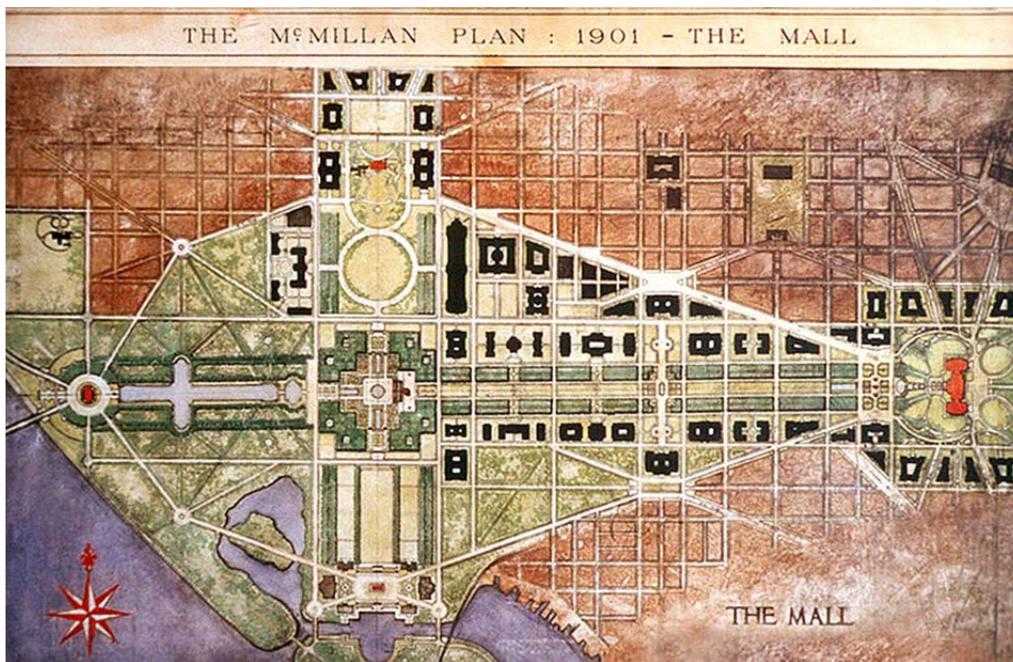
7:00pm – 9:00pm

Meet John LaBarge (ND CEEES Class of 2011, ND CEEES Masters 2013, and is working at Capital Rail Constructors, a Clark and Kiewit Joint Venture) at Washington Monument, walk to the Lincoln Memorial, stopping at the WWII Memorial, Korean War Memorial and the Vietnam Veterans Memorial along the way. John will be sharing some information about the Clark/Smoot/Russell construction project, the 19th division of the Smithsonian Institution [The National Museum of African American History and Culture](#), along the Mall.



**NIGHTTIME WALK ON THE NATIONAL MALL and a look at
THE NATIONAL MUSEUM OF AFRICAN AMERICAN HISTORY AND CULTURE**

THE NATIONAL MALL



In his 1791 plan for the future city of Washington, D.C., Pierre Charles L'Enfant envisioned a garden-lined "grand avenue" approximately one mile in length and 400 feet wide, in an area that would lie between the Capitol building and an equestrian statue of George Washington to be placed directly south of the White House. The National Mall occupies the site of this planned "grand avenue" which was never constructed. The Washington Monument stands

near the planned site of its namesake's equestrian statue. Mathew Carey published a map in 1802 which is reported to be the first to name the area "The Mall."

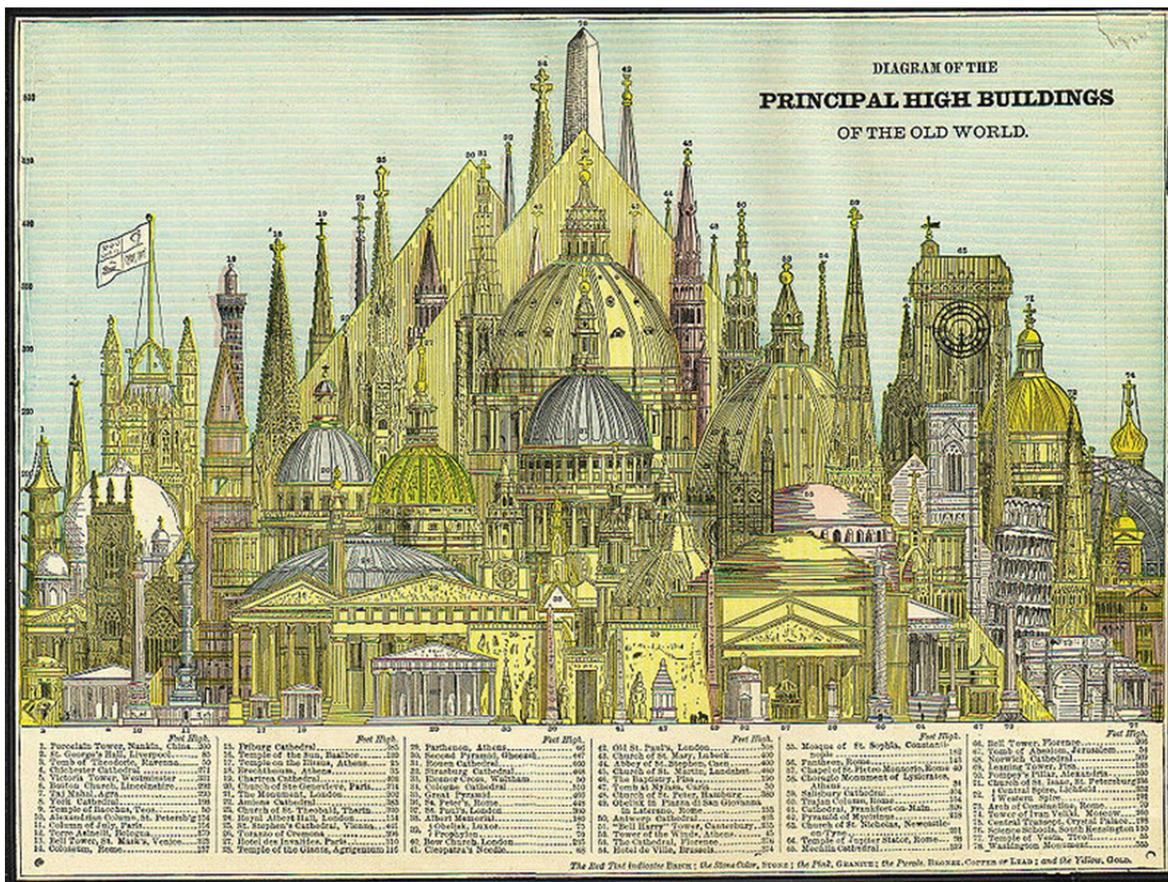
During the early 1850s, architect and horticulturist Andrew Jackson Downing designed a landscape plan for the Mall. Over the next half century, federal agencies developed several naturalistic parks within the Mall in accordance with Downing's plan. In 1901 the McMillan Commission's plan, which was partially inspired by the City Beautiful Movement and which purportedly extended L'Enfant's plan, called for a radical redesign of the Mall that would replace its greenhouses, gardens, trees, and commercial/industrial facilities with an open space.

National Mall Dimensions:

- Between the Capitol steps and the Lincoln Memorial, 1.9 miles
- Between the Capitol steps and the Washington Monument, 1.2 miles
- Between the Ulysses S. Grant Memorial and the Lincoln Memorial, the Mall covers 309.2 acres
- Between Constitution Avenue NW and Independence Avenue SW at 7th Street, the width of the Mall is 1,586 feet

(Pfanz, Donald C. (1981-02-11). "National Register of Historic Places Inventory Nomination: National Mall". National Park Service. Retrieved 2010-03-17. Sherald, James L. (December 2009). *Elms for the Monumental Core: History and Management Plan*. Washington, D.C.: Center for Urban Ecology, National Capital Region, National Park Service. pp. 2–5. Natural Resource Report NPS/NCR/NRR–2009/001. Retrieved 2010-10-14. "Map 1: The L'Enfant Plan for Washington". National Park Service. Retrieved 2009-10-27. Hanlon, Mary. "The Mall: The Grand Avenue, The Government, and The People". University of Virginia. Retrieved 2010-05-05.)

WASHINGTON MONUMENT



One of the nation's most recognizable structures, the Washington Monument, is located at the center of the National Mall, in between the U.S. Capitol and the Lincoln Memorial, and just east of the Reflecting Pool. The obelisk-shaped memorial is made up of marble, granite and bluestone gneiss. It is the world's tallest structure made of stone and the tallest obelisk, at 555 feet tall. The National Park Service estimates that more than 800,000 people visit the monument per year.

The Washington Monument was built to honor George Washington, the commander-in-chief of the Continental Army and the first president of the United States. The structure was designed by Robert Mills, with construction beginning in 1848. Construction was halted from 1854 to 1877, due to the Know Nothing Party's rise to control of the Washington National Monument Society through an illegal election, lack of funding, and the Civil War. It was completed in 1884 by Thomas Casey and the U.S. Army Corps of Engineers and an elevator was added to the monument in 1889, which shuttles tourists to the top of the monument to this day. A restoration project was

carried out from 1998 to 2002, and a \$15 million renovation was completed from 2004-2005. The monument officially reopened on April 1, 2005 until August 22, 2011 when an earthquake damaged the granite and marble structure. On May 12, 2014, the monument reopened to the public.

Interesting Facts:

At the time of its completion, the Washington Monument was the tallest building in the world.

There are 36,491 total blocks in the monument.

The Washington Monument weighs 81,120 tons.

There is a noticeable color change in the blocks at the 150 foot mark, where construction slowed in 1854.

In the interior walls, there are 193 commemorative stones presented by individuals, societies, States, cities and nations from around the world.

(<http://washington.org/DC-guide-to/washington-monument>)

WORLD WAR II MEMORIAL



The National World War II Memorial is dedicated to Americans who served in the armed forces and as civilians during World War II and consists of 56 pillars and a pair of small triumphal arches surrounding a plaza and fountain.

World War II veteran Roger Durbin proposed the memorial to Rep. Marcy Kaptur from Ohio in 1987, and the World War II Memorial Act was eventually approved in 1993. Fundraising began in 1994, with total donations reaching \$197 million. The location was settled upon in 1995, and a nationwide design competition saw Friedrich St. Florian's proposal selected in 1997. Construction began

in 2001 and was completed in 2004. On May 29 of that year, a reunion of veterans was held on the National Mall, followed by a dedication by President George W. Bush, whose father, the former president, was among the 16 million to serve in the Second World War.

Interesting Facts:

The memorial includes two inconspicuously located "[Kilroy was here](#)" engravings.

Their inclusion in the memorial acknowledges the significance of the symbol to American soldiers during World War II and how it represented their presence and protection wherever it was inscribed.

The monument's plaza is 338 feet long and 240 feet wide.

(<http://washington.org/DC-guide-to/national-world-war-ii-memorial>, "Kilroy Is Here--Can You Find Him?". *The Washington Post*, http://www.waymarking.com/waymarks/WM4F0R_Kilroy_Was_Here_World_War_II_Memorial_Washington_DC)



THE KOREAN WAR VETERANS MEMORIAL

The Korean War Veterans Memorial is dedicated to the armed forces that served and sacrificed during the Korean War. The U.S. Congress approved its construction in 1986. Design and construction were managed by the Korean War Veterans Memorial Advisory Board and the American Battle Monuments Commission. Cooper-Lecky Architects were responsible for the design itself, as they oversaw collaboration between several designers. The most notable of these designers was Frank Gaylord, who was responsible for the 19 stainless steel statues. The memorial broke ground on June 14, 1992 and it was dedicated on July 27, 1995, the 42-year anniversary of the armistice that ended the Korean War.

Interesting facts:

Fourteen of the nineteen statues in the memorial represent servicemen from the U.S. Army, while three are from the Marine Corps, one is a Navy Corpsman and one is an Air Force Forward Air Observer. Each statue weighs nearly 1,000 pounds.



Reflected on the wall, the soldiers appear to be 38 in number, which represents the 38th parallel that still divides Korea. The walls of the triangle in the memorial are made of more than one hundred tons of Academy Black granite from California.

(<http://washington.org/DC-guide-to/korean-war-veterans-memorial>)



VIETNAM WAR MEMORIAL

The Vietnam Veterans Memorial honors members of the U.S. armed forces who fought in the Vietnam War, those who perished in Vietnam and South East Asia, and those missing in action. The memorial consists of three separate parts: the Three Soldiers statue, the Vietnam Women's Memorial, and the Vietnam Veterans Memorial Wall, which is the most popular part of the memorial. The "wall" is actually made up of two identical walls that are each 247 feet long, and contain more than 58,000 names. According to the National Park Service, the memorial receives roughly 3 million visitors per year. The Vietnam Veterans Memorial Fund was established in 1979 to raise money for the construction of a memorial to the veterans of the Vietnam War. In 1980, Congress allotted three acres near the Lincoln Memorial for the site of this memorial, and a design competition was held. Maya Ying Lin's design was selected in 1981, and amidst controversy over her design, the Three Soldiers Statue was added to the memorial. Construction on the main wall began in March 1982, and the Vietnam Veterans Memorial Wall was dedicated on

November 13, 1982. The Three Soldiers statue, sculpted by Frederick Hart, was completed and dedicated by 1984. The Vietnam Women's Memorial was designed by Glenna Goodacre and was dedicated in 1993. If you're looking for the name of a relative or friend, search the [Vietnam Veterans Memorial Fund's Virtual Wall](#).

Interesting Facts:

More than 275,000 Americans contributed almost \$9 million to the Vietnam Veterans Memorial Fund for the construction of the memorial.

The names are listed on the Wall in chronological order, based on the date of casualty. Within each day, the names are listed in alphabetic order.

(<http://washington.org/DC-guide-to/vietnam-veterans-memorial>)



LINCOLN MEMORIAL



Built in white stone with 36 iconic columns, The Lincoln Memorial is one of the most recognized structures in the United States. The memorial is at the west end of the National Mall, in West Potomac Park, and is an example of our Capitol's ubiquitous Neoclassical architecture. It features a solitary, 19-foot-tall statue of Abraham Lincoln sitting in contemplation, which is flanked on both side chambers with inscriptions of Lincoln's Second Inaugural Address and arguably his most famous speech, the Gettysburg Address. The statue is 19 feet high and weighs 175 tons.

The memorial honors the “Great Emancipator” and 16th President of the United States, Abraham Lincoln. Designed by Henry Bacon in the style of ancient Greek temples, construction began in 1914, with the memorial opening to the public in 1922. Carving of the Lincoln statue took four years and was completed by the Piccirilli brothers under the supervision of the statue's sculptor, Daniel Chester French. The murals contained on the inside of the memorial were painted by Jules Guerin.

Interesting Facts:

The 36 Doric columns surrounding the memorial represent the 36 states in the Union at the time of Lincoln's death.

The original plan for the Memorial included six equestrian and 31 pedestrian statues of great size, with a 12-foot statue of Lincoln in the middle. This project never began due to a lack of funding.

Plaster casts of Lincoln's face were used by Daniel Chester French in his sculpting of the memorial's statue. The 58 steps of the memorial sit nearly two miles directly west of the U.S. Capitol. Two of the steps represent the number of terms that Lincoln served as President, the remaining 56 steps represent Lincoln's age when he was assassinated.

Lincoln's last living son, Robert Todd Lincoln, attended the memorial's dedication on May 30, 1922.



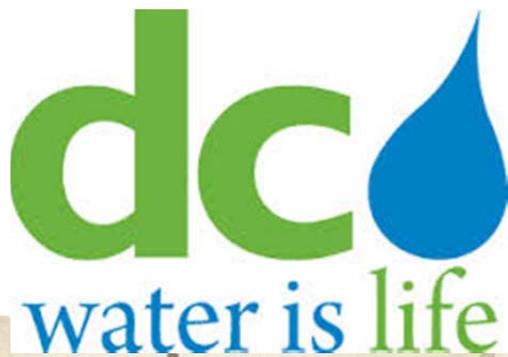
(<http://washington.org/DC-guide-to/lincoln-memorial>)



The National Museum of African American History and Culture: Occupying the last available space on the National Mall, the Smithsonian’s National Museum of African American History and Culture will be situated prominently between the National Museum of American History and 15th Street, next to the Washington Monument. Groundbreaking was in February of 2012, and when it opens to the public in 2015, the museum will be a centerpiece venue for ceremonies and performances, as well as a primary exhibition space for African American history and culture. Designed by a joint venture of Freelon Adjaye Bond and SmithGroup, the 322,600 square-foot facility will look unlike any other structure on the Mall. The bronze and glass-panel facade, known as the Corona, is a representation of traditional African architecture using modern materials and will visually define the museum. The Corona will hang from the top of the museum with no intermediate support. The museum’s five above-grade levels will be supported by four concrete towers linked at the top by steel trusses. Below grade, the project includes three cast-in-place concrete levels: a mechanical level, a concourse level, and a mezzanine level. The museum is designed to achieve LEED® Gold certification. Sustainable elements will include solar hot water panels on the roof and a geothermal ground water system. <http://www.nmaahcproject.com/>

9:00pm	Pick up from National Mall, drive to hotel (short drive)
10:00pm	Late evening snack at hotel
Overnight	Marriott Courtyard, Washington DC/US Capitol (2.6 miles from National Mall, 10 minute drive) 1325 2 nd Street NE, Washington DC

Thursday, September 25	**Construction Site Attire today**
7:00am-8:00am	Breakfast buffet in hotel in the Congressional Room
8:15am	Board bus for DCWater (20 minute without traffic)
9:00am-11:00am	DC Water Blue Plains Advanced Water Treatment Plant **Construction Site Attire for this site** 5000 Overlook Avenue SW, Washington DC 20032



HISTORY OF DC's WATER SYSTEMS

Bryant Street Water Pumping Station, October 8, 1906



Early settlers in the District of Columbia were dependent upon local springs for their water needs. The earliest documented instance of water being piped throughout the D.C. streets for public use was in 1808. The District's sewerage system, one of the oldest in the United States, began around 1810, when sewers and culverts were constructed to safely drain storm and ground water from the streets. These drains were not all built at the same time, and were not linked together to form a "system" as we know it today. By 1850, most of the streets along Pennsylvania Avenue, from First to 15th Street, had spring or well water piped in, thus creating the need for our first sanitary sewage process. Sewage was discharged into the nearest body of water. In 1859, the Washington Aqueduct was supplying river water city-wide to the District and this, together with the surge in population during the civil war, quickly created a marked increase in water pollution in the nation's capital.

Before the end of the war, there were epidemics of smallpox, typhoid and malaria, which took many thousands of lives. These epidemics prompted the Federal Government to investigate the problem of sanitary sewage.

From 1871-1874, a general construction program was undertaken by the Board of Public Works, building approximately 80 miles of sewers. Although the amount of construction was impressive, much of the work was poorly planned, structurally unsound and hydraulically inadequate. As a result of the program and up until 1880, the foul conditions in the Washington canal and along B Street (now Constitution Avenue) were eliminated by the construction of the B Street and Tiber Creek Sewers and filling in the canal. However, the problem was transferred to the marshes along the Potomac and Anacostia Rivers.



-Special gutter inlet, March 21, 1916

Up to this time, the sewerage system that served the District was a combined system that carried and discharged both sanitary sewage and storm water into local water ways. In the 1890's, there was considerable difference of opinion among engineers as to the desirability of retaining such a system.

A Board of Engineers appointed by President Benjamin Harrison recommended that the combined system be retained but, in addition, that extensions be built to serve new areas as a separate system, using separate lines to carry storm water and sanitary flows. The Board also

recommended that all the sewage flows be discharged at a point far enough down the Potomac River to prevent their return to the environs of the city. This discharge point is still located at Blue Plains, the southernmost tip of the District. Upon further recommendation from the Board, construction of a system of large interceptor sewers was undertaken to collect and carry sanitary sewage and some storm water to a pumping station on the bank of the Anacostia River and to the discharge point at Blue Plains. The implementation of those recommendations accounts for the major portion of the current sewage system.

History of Blue Plains Wastewater Treatment Plant

Wastewater treatment plants use such terms as "primary", "secondary", and "advanced", to indicate the level of treatment provided by each process. Primary treatment is the basic stage for removal of materials, which either float on top of the water or settle at the bottom of processing tanks and chambers to remove sedimentation. Secondary

treatment is the process wherein bacteria absorb or feed on organic solids, which will not settle (suspended solids). Advanced treatment is any treatment process that improves the effluent quality of a secondary process. Advanced treatment processes remove phosphorous and nitrogen nutrients, which are adverse to river quality.

When the wastewater treatment plant at Blue Plains opened in 1938, it was a primary treatment facility only. It was designed to serve a population of 650,000 people through the year 1950. The operating cost was less than \$175,000 per year. At that time, the relatively small discharge from Blue Plains to the Potomac River was less than 100 million gallons per day (MGD). As population and industry increased sharply in the District and surrounding Maryland and Virginia counties in the 1950's, primary treatment proved to be inadequate. In 1959, the Blue Plains plant was expanded to accommodate secondary treatment with a capacity of 240 MGD. Flows continued to increase and, by 1969, the influent flow had exceeded the design capacity of Blue Plains once again. The District Government, with authorities from Maryland and Virginia, called a regional conference during which they agreed to expand the facility to increase its ability to meet the Federal Clean Water Act, mandated at that time.



Fleet of four basin cleaning trucks
- Fords, March 15, 1924

From 1970 through 1983, construction at Blue Plains expanded the secondary plant to an advanced wastewater treatment facility, processing more than 300 million gallons per day. Treatment levels were greatly improved in order to restore the Potomac River to recreational and commercial use.

http://www.dewater.com/about/gen_overview.cfm

DC WATER BLUE PLAINS ADVANCED WASTEWATER TREATMENT PLANT TODAY

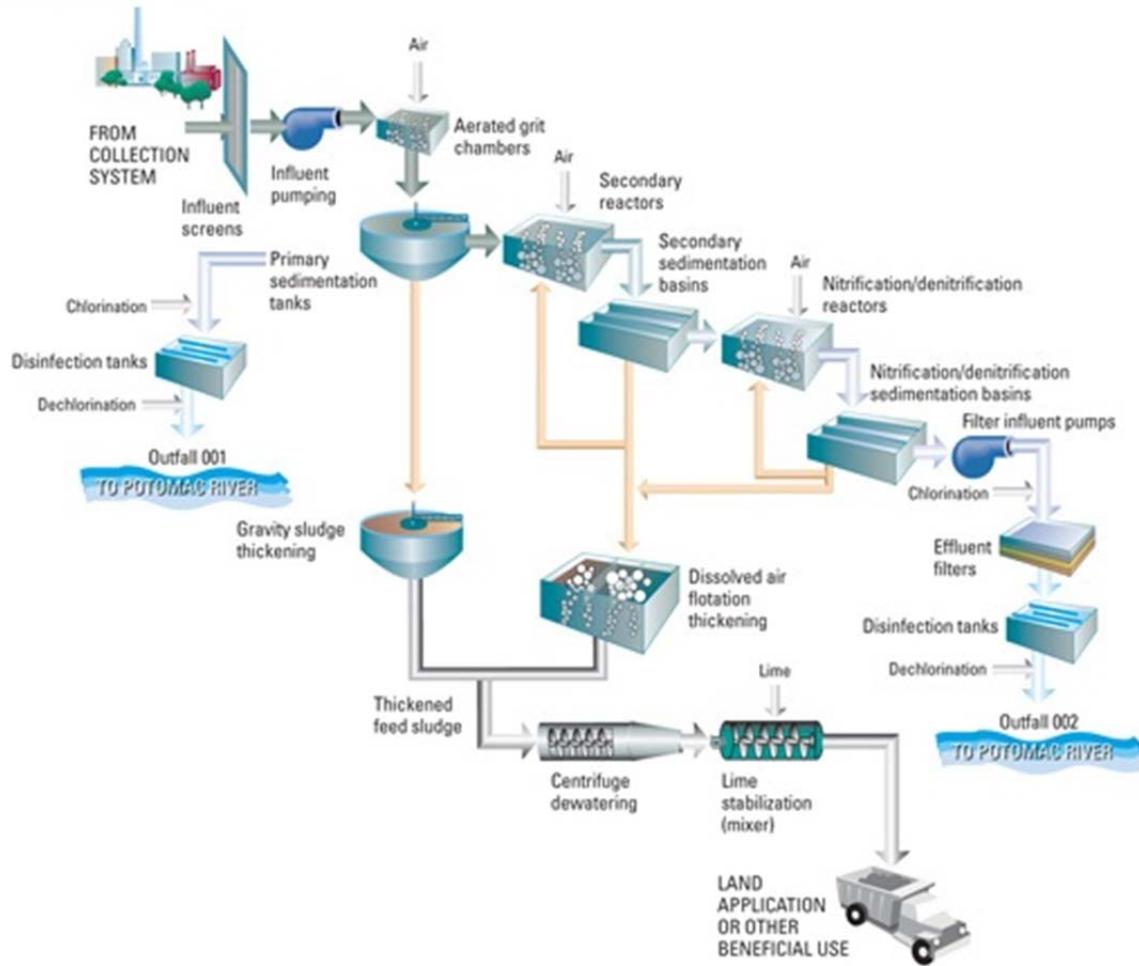
DC Water operates the Blue Plains Advanced Wastewater Treatment Plant, which is the largest wastewater treatment plant of its kind in the world. They provide wastewater collection and treatment services to more than two million Washington metro area customers. The plant has the capacity to treat 370 million gallons of sewage a day. The Blue Plains Advanced Wastewater Treatment Plant has been instrumental in protecting the environment since the beginning of plant operations in 1983. The plant has received awards for peak performance from the National Association of Clean Water Agencies for more than 10 consecutive years, and in 2003, they received an excellence in management award. In the last several years, the plant has dramatically upgraded and improved its liquid processing systems. As a partner to the Chesapeake Bay Agreement of 1987, the Blue Plains Advanced Wastewater Treatment Plant has taken a commanding role in improving the Potomac River and the Chesapeake Bay, and their watersheds. In addition, the plant's new biosolids program will help ensure that the facility's environmental commitment meets this century's demands.

Treatment Process

The first treatment phase begins as debris and grit are removed and trucked to a landfill. The sewage then flows into primary sedimentation tanks that separate more than half of the suspended solids from liquid.

The liquid flows to secondary treatment tanks where oxygen is bubbled into it so microbes can break down organic matter. In the next stage of treatment, microbes convert ammonia into harmless nitrogen gas. Residual solids are settled out and the water is percolated down through sand filters that remove the remaining suspended solids and associated phosphorus. The water is disinfected, dechlorinated, and discharged into the Potomac River.

The solids—or sludge—from the primary sedimentation tanks go to tanks where gravity causes the dense sludge to settle to the bottom and thicken. Biological solids from the secondary and nitrification reactors are thickened separately using flotation thickeners. The thickened sludge is dewatered, lime is added to remove pathogens, and the organic biosolids are applied to agricultural land in Maryland and Virginia as nutrient-rich fertilizer.



11:30am	Drive to Glen Burnie, MD for lunch (50 minutes without traffic)
12:30pm-1:30pm	Pappas Seafood –a chance to try famous Baltimore, Maryland crab cakes 6713 Ritchie Hwy, Glen Burnie, MD 21061
1:30pm-2:00pm	Drive to Sparrows Point, Maryland (20 minutes to site) 600 Shipyard Road, Sparrows Point, MD 21219
2:00pm-5:00pm	SKW Constructors Yard , Sparrows Point, Baltimore, Maryland ** Construction Site Attire for this site**

MIDTOWN TUNNEL FABRICATION YARDS

Fabrication: The component tunnel sections for the new Midtown Tunnel in Portsmouth, VA are currently under construction at Sparrows Point, MD. Each of the 11 rectangular tunnel tubes, called elements, is cast of reinforced concrete with temporary bulkheads at each end so that the elements will float, and once complete, have been/will be towed down the Chesapeake Bay to the Project site in Portsmouth for immersion and placement under the Elizabeth River. The 11 elements, are poured in sections: 5 sections = 1 element, 11 elements = 55 concrete pours

of the following: Inverts, Interior walls, Dog houses (exterior walls and roof). The elements are being cast in two casting cycles, called litters. Litter 1: the first 6 elements, Litter 2: the final 5 elements.

Float Out: The elements are built in a dry dock. Each element is constructed with temporary bulkheads on each side, creating a hollow reinforced concrete tube that is capable of floating. Four temporary water ballast tanks are constructed in each element that will provide stability during floating and towing, and are necessary for immersing the elements. Once a litter is complete, the dry dock is filled with water, floating the tubes so they are ready for towing. The elements are being towed 220 miles to the Project site in Portsmouth, Virginia by a tug fleet.



The first litter of elements, six, 14,000-ton hollow concrete tunnel tubes, were floated out of dry dock in June 2014 and then towed from the Baltimore-area graving dock to the southeastern Virginia project site. The 350-foot-long elements make the 220-mile trip down the Chesapeake Bay one at a time, a process taking several weeks. Placement of each tunnel element will be performed using a “lay barge.” The barge is capable of receiving, supporting, and lowering the elements into place beneath the Elizabeth River

The first six elements are now moored at the Project site and will be placed one at a time. Production of the remaining five tunnel elements is in progress. With input provided by local police, fire, ambulance and first responders, the design enables enhanced emergency response and evacuation readiness. State-of-the-art safety features in the new tunnel include a separate escape corridor, jet fans, deluge system, fire sensors, fire alarms/extinguishers/hose connections, motorist aid phones, fireproofing and video monitoring for traveler safety. The new Midtown Tunnel is scheduled for completion in 2016. View the [Project Video](#) for more information. From “Elizabeth River Tunnels” <https://www.driveert.com/construction/midtown-tunnel/>

5:00pm-8:30pm	Drive to Tarrytown, NY near Tappan Zee Bridge/New NY Bridge (3.5 hours) Snack on bus from Rouge Fine Catering Check into hotel before dinner if we arrive on time
9:00pm	Buffet dinner at Sunset Cove, Tarrytown, NY (with a view of the Tappan Zee Bridge) 238 Green Street, Tarrytown
Overnight	Marriott Courtyard – Tarrytown NY (7 min drive) 475 White Plains Road

Friday, September 26

****Construction Site Attire today****

6:30am-8:30am Breakfast at hotel in Sleepy Hollow Room

8:30am Meet at bus for drive to New NY Bridge Project (short drive)

9:00am – 11:30am [New NY Bridge Project](#) ****Construction Site Attire for this site****
41 Hudson View Way, Tarrytown, NY 10591

BUILDING THE NEW NY BRIDGE

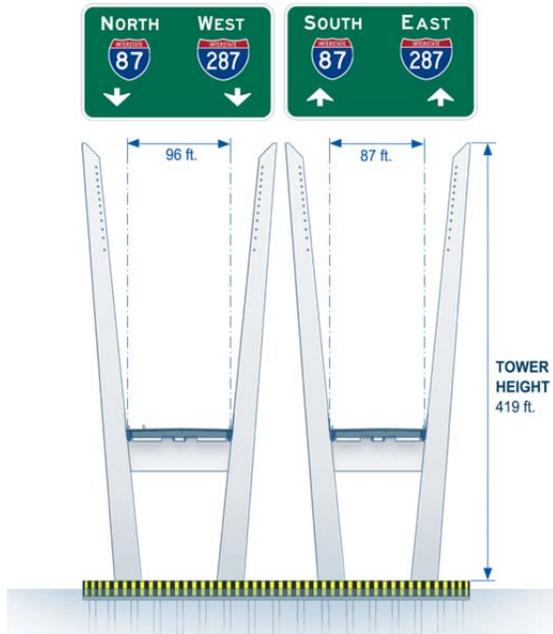


The 570-mile New York State Thruway plays a vital role in the state's transportation and economic infrastructure, linking the New York City metropolitan area to upstate and serving hundreds of millions of motorists from around the state, throughout the northeast and around the country. The existing Tappan Zee Bridge, built in 1955, now serves more than 138,000 vehicles per day, far exceeding its design capacity. The new bridge is designed to meet the needs of a growing community while supporting cultural and economic growth in the process. As the longest and most complex crossing in the New York State Thruway system, it will have the ability to support more lanes, a pedestrian and bicycle path and even a proposed mass-transit system.

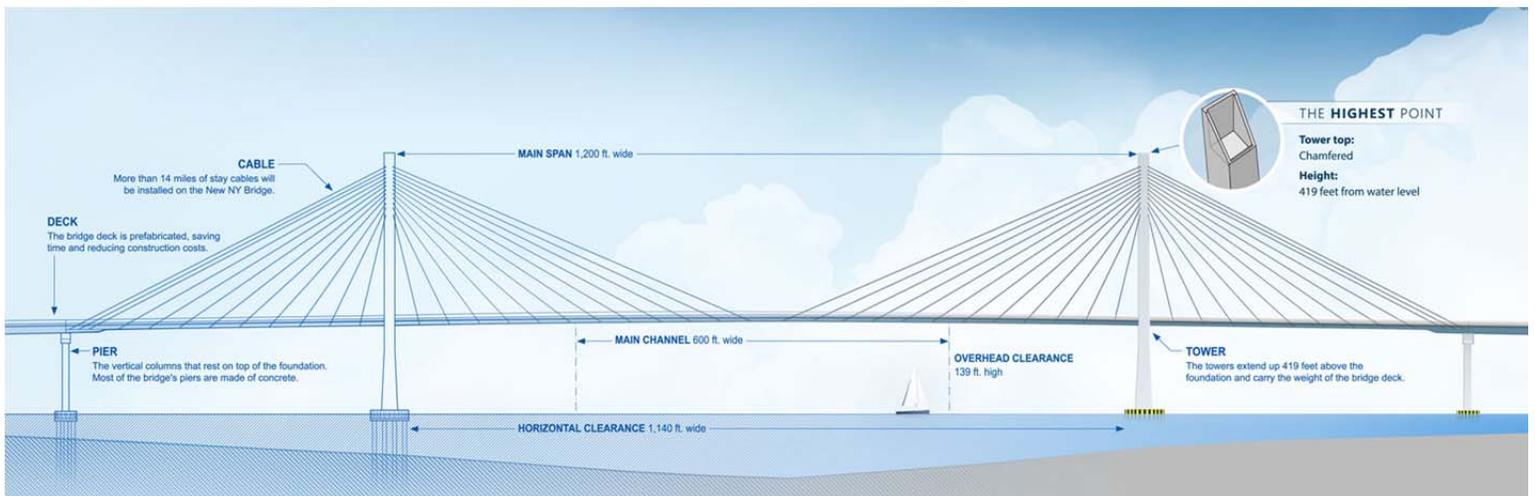
This 3.1-mile twin span cable-stayed bridge with angled main span towers is the single largest bridge construction project in New York's history. The bridge will revitalize the existing Governor Malcolm Wilson Tappan Zee Toll Bridge that connects Rockland County to Westchester County over the Hudson River. <http://www.tappanzeestructors.com/pages/about/>



An iconic main span serves as the signature aspect of the bridge, with 419-foot towers and geometrically aligned cables. The outward incline of the towers creates a unique look and eliminates the need for an upper transverse tower strut – a structural element typical between two towers – adding to the open air experience while crossing the bridge. This solution achieves a clean aesthetic, has vastly improved safety features and provides a high-quality, low-maintenance replacement for this critical crossing.



The new bridge will be a visually striking, recognizable landmark, and one of the widest cable-stayed structures of its kind in the world. It will include eight general traffic lanes, four breakdown/emergency lanes, a bike and pedestrian path and state-of-the-art traffic monitoring systems as well as enhanced express bus service from the day the bridge opens. Designed and constructed to be mass-transit ready, the new crossing will be able to accommodate bus rapid transit, light rail or commuter rail.

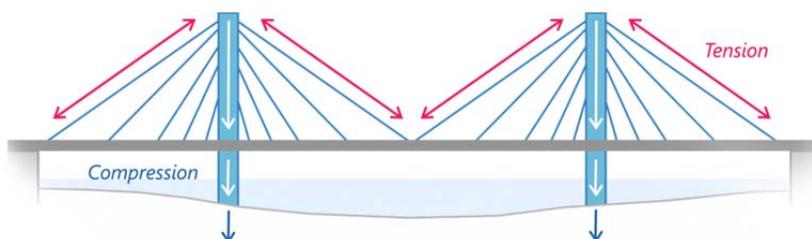


FLUOR

AB American Bridge

TRAYLOR
TRAYLOR BROS., INC.

GRANITE



11:30am-12:30pm	Drive to Bayonne Bridge project (1 hour without traffic)
1:00pm – 4:00pm	Bayonne Bridge ** Construction Site Attire for this site ** 111 Linnet Street, Bayonne, NJ 07002 Lunch Presentation Site visit

BAYONNE BRIDGE NAVIGATIONAL CLEARANCE PROGRAM



Project Background: The Bayonne Bridge, a historic civil engineering landmark designed by Othmar H. Ammann, is the fourth longest steel arch bridge in the world, and was the longest in the world at the time of its completion. It connects Bayonne, New Jersey, with Staten Island, New York, spanning the Kill Van Kull. Construction began in September 1928 and was completed in 1931. The primary purpose of the bridge was to allow vehicular traffic from Staten Island to reach Manhattan via the Holland Tunnel.

Today, because the bridge is only 151 feet above the water, larger container ships often cannot cross under it to reach marine terminals – Port Newark, Elizabeth and Howland Hook in Staten Island. Shippers who rely on these ports for access to a regional transportation network are forced to use other smaller, less-efficient and less environmentally friendly ships to bring goods into the region.



“Raise the Roadway” has significant long-term benefits:

Larger, more efficient ships calling on the ports will mean cleaner air for neighbors.

- Wider lanes, shoulders and median dividers will make the bridge safer for drivers.
- A bikeway and walkway the entire length of the bridge will make traveling the bridge easier for all.
- Stairs will be replaced with access ramps.
- New piers, a new roadway deck and new approach roads will ensure the bridge will be built to last for generations.
- The design allows for future mass transit service.

Conceptual Design: How Will This Be Done?

The new conceptual design highlights safety and design improvements: wider lanes, shoulders, a median divider, and the potential for future transit options. The final engineering design and project staging is completed to confirm how the mainspan and approach will physically be raised while maintaining traffic and access in both directions. Click [here](#) to watch a video of the proposed design and construction staging.

The expansion of the Panama Canal is expected to result in a shift to larger, cleaner, more-efficient ships servicing the region and other East Coast markets. In order to ensure these new ships can reach these ports, the clearance limitation must be addressed.

To that end, in December 2010, the Port Authority announced its decision to take action to “Raise the Roadway” of the Bayonne Bridge to 215 feet. The 64 feet of additional air draft under the bridge will allow the Port Authority of New York and New Jersey to welcome larger and more efficient vessels to their ports.

<http://www.panynj.gov/bayonnebridge/>

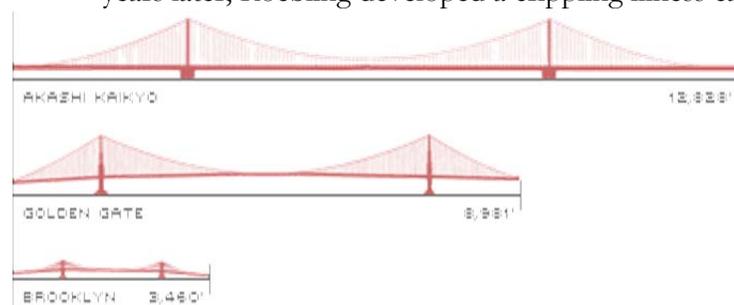
4:00pm	Drive to Brooklyn, check into hotel (30 minute drive without traffic)
6:15pm	Meet in lobby for walk to dinner
7:00pm	Dinner at The Bridges Dumbo 66 Water Street, New York, NY 11201
After dinner	Walk the Brooklyn Bridge
Overnight	aloft New York Brooklyn 216 Duffield Street, Brooklyn, NY



BROOKLYN BRIDGE

Considered a brilliant feat of 19th-century engineering, the Brooklyn Bridge was a bridge of many firsts. It was the first suspension bridge to use steel for its cable wire. It was the first bridge to use explosives in a dangerous underwater device called a caisson. At the time it was built, the 3,460-foot Brooklyn Bridge was also crowned the longest suspension bridge in the world.

But the Brooklyn Bridge was plagued with its share of problems. Before construction even began, the bridge's chief engineer, John A. Roebling, died from tetanus which resulted from a construction site accident.. The project was taken over and seen to its completion by his son, Washington Roebling. Three years later, Roebling developed a crippling illness called caisson's disease, known today as "the bends."



Bedridden but determined to stay in charge, Roebling used a telescope to keep watch over the bridge's progress. He dictated instructions to his wife, Emily, who passed on his orders to the workers. During this time, an unexpected blast damaged one caisson, a fire damaged another, and a cable snapped from its anchorage and crashed into the river. Despite these problems, construction continued at a feverish pace.

By 1883, 14 years after it began, Roebling successfully guided the completion of one of the most famous bridges in the world -- without ever leaving his apartment. Although he was physically able to leave his apartment, Washington Roebling refused to attend the opening celebration honoring his remarkable achievement. The bridge opened to the public on May 24, 1883, at 2:00 p.m. A total of 150,300 people crossed the bridge on opening day. Each person was charged one cent to cross. The bridge opened to vehicles on May 24, 1883, at 5:00 p.m. A total of 1,800 vehicles crossed on the first day. Vehicles were charged five cents to cross. Today, the Brooklyn Bridge is the second busiest bridge in New York City. One hundred forty-four thousand vehicles cross the bridge every day.

<http://www.pbs.org/wgbh/buildingbig/wonder/structure/brooklyn.html>

Saturday, September 27

8:00am Board bus, depart for Carteret, NJ (40 minute drive)
Bagels and bananas on bus

9:00am -10:30am

[Skanska Koch Inc](#)

400 Roosevelt Ave., Carteret, NJ

Presentation on [Meadowlands Stadium](#) construction

SKANSKA

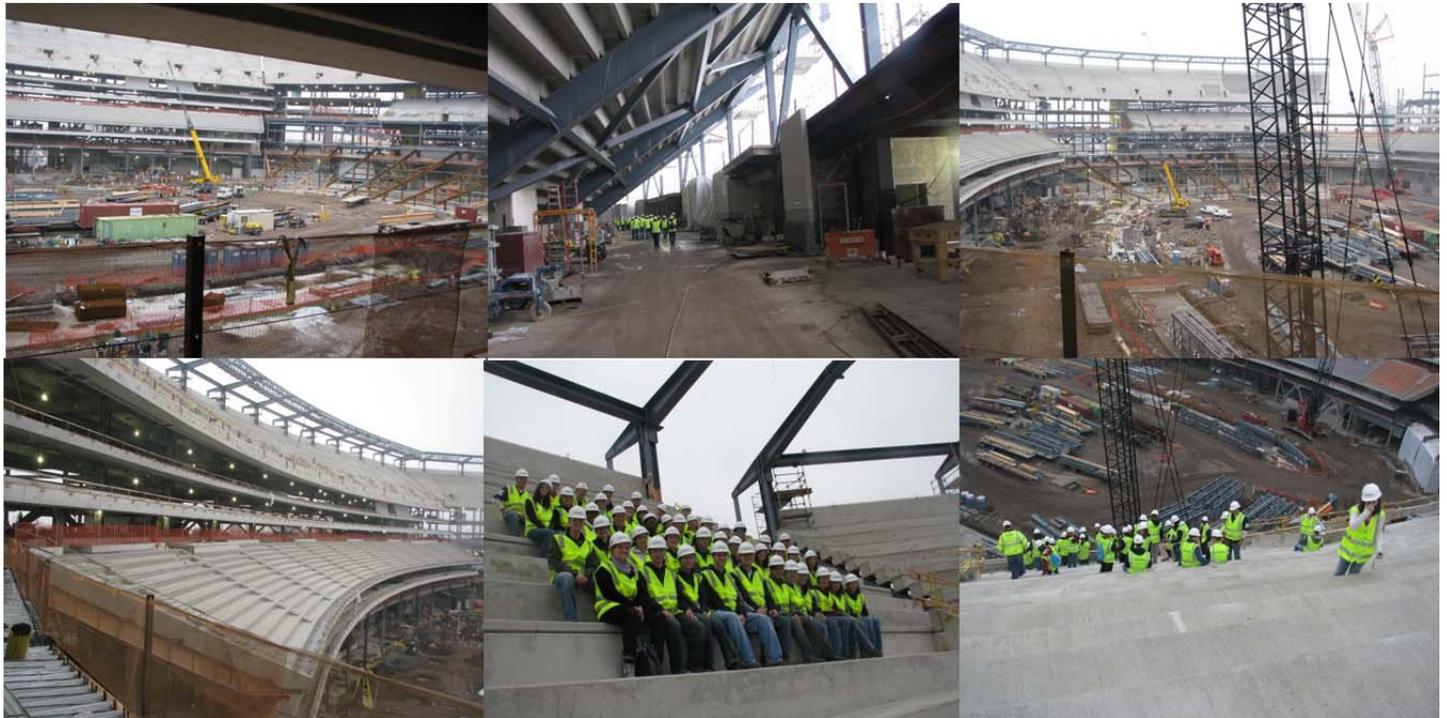
SKANSKA KOCH is a leader in the construction industry with over 96 years' experience. The company has built or rehabilitated some of the nation's most eminent structures such as the World Trade Center, Giants Stadium, Yankee Stadium, Brooklyn Bridge, George Washington Bridge, Manhattan Bridge, Queensborough Bridge, AirTrain-JFK Light Rail System, Jacob Javits Center and Richmond-San Rafael Bridge in San Francisco. Skanska Koch's main office is located in Carteret, NJ and includes storage and dispatching of materials, preassembly of bridge components and miscellaneous fabrication of specialized structural steel members, rigging and erection equipment. A 1,000 ft dock, rail siding and strategic location allows our employees to service the most demanding transportation requirements. Skanska Koch was awarded the structural steel contract for Meadowlands Stadium.



MEADOWLANDS STADIUM STORY: In September 2005, both the Giants and Jets announced that they had reached an agreement to build a new stadium in the Meadowlands. For nearly five years, both teams had been exploring options of having separate stadiums built, the Jets on Manhattan's west side, and the Giants in New Jersey. After the Jets failed to get a new stadium built in Manhattan, they decided to team up with the Giants to build a new stadium adjacent to Giants Stadium. Although site work began in April 2007, official groundbreaking was held on September 5, 2007. The stadium has a seating capacity of 82,500 in four levels that enclose the stadium, including 10,000 club seats and over 200 luxury boxes. Fans sitting in the front row along the 50 yard line seats are the closest to the action in the NFL at 46 feet away. It features two club areas, the Coach's Club and the mezzanine level clubs. The Coach's Club features a 20,000 square foot bar and lounge on the field deck just five yards from the team's bench. On the mezzanine level are the east and west side clubs where fans can enjoy a climate controlled atmosphere and a variety of food and beverages. Fans can see replays from the gridiron on four 40' x 130' video/scoreboards that are located in each corner below the upper deck.



Since the stadium is the home of two teams, individualization is an important concept of the stadium. Interior illumination of colors switch depending on the home team. Outside, giant red pylons at the North and East entrances will show videos of whatever team is playing at the facility. The signature feature at the stadium is the Great Wall. In the shape of a rectangle, this 400' x 40' high wall shows murals of players and team moments outside the stadium. Both the Jets and Giants are committed to staying in New Jersey for the next 99 years. This is the first time two teams have come together 50/50 in a partnership to build a new stadium. Known for its first season as Meadowlands Stadium, the naming rights were purchased by MetLife in August 2011 for 25 years at a cost of \$17 to \$20 million. The New York Giants played their first game at MetLife Stadium on September 12, 2010, winning against the Carolina Panthers. Although MetLife Stadium is primarily the home of the Giants and Jets it is home to many other events, including the Super Bowl in 2014. It marked the first time the Super Bowl was played at an outdoor stadium in a cold-weather climate. <http://www.stadiumsofprofootball.com/nfc/MetLifeStadium.htm>



Notre Dame Juniors tour the construction of Meadowlands Stadium in the fall of 2008

10:30am	Bus to Lower Manhattan (40 minutes without traffic) Drop off at Trinity Place
11:30am – 5:00pm	Free time to grab lunch, walk to and explore World Trade Center Site and Memorial and Gardens, check out construction of World Trade Center Buildings and Transportation Hub, walk to Wall Street or beyond
We'll be handing out a map of the area and some suggested places to eat.	





THE WORLD TRADE CENTER SITE:

The new WTC site will include five new skyscrapers (1, 2, 3, 4, and 5 WTC), The National September 11 Memorial and Museum at the World Trade Center, The World Trade Center Transportation Hub, 550,000 square feet of retail space, and a performing arts center. These buildings represent an unprecedented merging of architects, artists, and urban developers, including Santiago Calatrava, David Childs, Norman Foster, Frank Gehry, Daniel Libeskind, Fumihiko Maki, and Richard Rogers. The museum, memorial and two of the towers are completed to date.



THE WORLD TRADE CENTER TRANSPORTATION HUB: The state-of-the-art World Trade Center Transportation Hub, when completed in 2015, will serve over 200,000 daily commuters and millions of annual visitors from around the world. At approximately 800,000 square feet, the Hub, designed by internationally acclaimed architect Santiago Calatrava, will be the third largest transportation center in New York City, rivaling Grand Central Station in size. In a joint venture with the Westfield Group, the Port Authority of New York and New Jersey will develop, lease and operate a major retail space at the WTC site, including in the Transit Hub. The WTC Transportation Hub's concourse will conveniently connect visitors to 11 different subway lines, the Port Authority Trans-Hudson (PATH) rail system, Battery Park City Ferry Terminal, the World Trade Center Memorial Site, WTC Towers 1, 2, 3, and 4, the World Financial Center and the Winter Garden. It will represent the most integrated network of underground pedestrian connections in New York City.
<http://www.panynj.gov/wtcprogress/transportation-hub.html>

THE NATIONAL SEPTEMBER 11 MEMORIAL is a tribute of remembrance and honor to the nearly 3,000 people killed in the terror attacks of September 11, 2001 at the World Trade Center site, near Shanksville, Pa., and at the Pentagon, as well as the six people killed in the World Trade Center bombing in February 1993. The Memorial's twin reflecting pools are each nearly an acre in size and feature the largest manmade waterfalls in the North America. The pools sit within the footprints where the Twin Towers once stood. Architect Michael Arad and

landscape architect Peter Walker created the Memorial design selected from a global design competition that included more than 5,200 entries from 63 nations. The names of every person who died in the 2001 and 1993 attacks are inscribed into bronze panels edging the Memorial pools, a powerful reminder of the largest loss of life resulting from a foreign attack on American soil and the greatest single loss of rescue personnel in American history. <http://www.911memorial.org/about-memorial>

5:00pm	Meet back at the bus at Trinity Place (same place that we are dropped off)
	Drive to MetLife Stadium (30 minute drive without traffic) 1 MetLife Stadium Dr., East Rutherford, NJ 07073 Notre Dame vs. Syracuse – MetLife Stadium
	** Important Info on what you can bring into stadium: Clear bags that are 12” x 6” x 12” or less in size (1 bag per person), Non-clear, small purses/handbags (clutch-type bags) that are 4.5” x 6.5” or less in size (1 per person)
8:00pm	Kick-off



One half hour after game ends	Be on bus one half hour after game ends for drive hotel (2 hours)
Overnight at hotel	Fairfield Inn & Suites Hazleton, PA 118 Woodbine St., Hazleton, PA

Sunday, September 28, 2014	
6am – 8:45am	Breakfast in hotel
9:00am	Drive back to Notre Dame (9 hours of driving)