City of Chicago

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Office of the City Clerk

Document Tracking Sheet

Meeting Date:	10/16/2013
Sponsor(s):	Emanuel (Mayor)
Type:	Ordinance
Title:	Intergovernmental agreement with Metropolitan Water Reclamation District to construct diversion tunnel for Albany Park
Committee(s) Assignment:	Committee on Budget and Government Operations

BUDG.

OFFICE OF THE MAYOR

CITY OF CHICAGO

RAHM EMANUEL
MAYOR

October 16, 2013

TO THE HONORABLE, THE CITY COUNCIL
OF THE CITY OF CHICAGO

Ladies and Gentlemen:

At the request of the Commissioner of Transportation, I transmit herewith an ordinance authorizing the execution of an intergovernmental agreement with the Metropolitan Water Reclamation District.

Your favorable consideration of this ordinance will be appreciated.

Very truly yours,

Rahm Emanuel

Mayor

CHICAGO, November 13, 2013

To the President and Members of the City Council:

Your Committee on the Budget and Government Operations, having had under consideration an Ordinance authorizing the execution of an intergovernmental agreement between the Metropolitan Water Reclamation District and the City of Chicago Department of Transportation necessary for the construction of the Albany Park Storm Water Diversion Tunnel; and having had the same under advisement, begs leave to report and recommend that Your Honorable Body pass the Ordinance transmitted herewith.

This recommendation was concurred in by a viva voce vote of the members of the Committee.

7 members of the Committee with _____ dissenting vote(s).

(Signed) Carrie M. Austin

Carrie M. Austin
Chairman

ORDINANCE

WHEREAS, the City of Chicago (the "**City**") is a home rule unit of government under Article VII, Section 6(a) of the Constitution of the State of Illinois, and as such may exercise any power and perform any function pertaining to its government and affairs; and

WHEREAS, the Metropolitan Water Reclamation District of Greater Chicago is a body corporate and politic, organized and existing under the laws of the State of Illinois (hereinafter the **"District"**); and

WHEREAS, on November 17, 2004, the Illinois General Assembly passed Public Act 093-1049 (the "Act"); and

WHEREAS, the Act declares that stormwater management in Cook County shall be under the general supervision of the District; and

WHEREAS, "stormwater management" as defined in the Act (and codified at 70 ILCS 2605/7h(a)) means the management of floods and floodwaters; and

WHEREAS, the Act specifically authorizes the District to plan, manage, implement, and finance activities relating to stormwater management in Cook County; and

WHEREAS, the Act provides that stormwater management in a municipality with a population over one million will be conducted by that municipality, or by the District subject to an intergovernmental agreement between the District and that municipality; and

WHEREAS, the City has a population greater than one million people; and

WHEREAS, on December 13, 2006, the City Council of the City adopted the "Chicago Stormwater Management Ordinance," codified as Chapter 11-18 of the Municipal Code of Chicago (the "City Ordinance"); and

WHEREAS, pursuant to Section 11-18-110 of the City Ordinance and other provisions of the Municipal Code of Chicago, the Commissioner of the City's Department of Water Management has issued regulations for sewer construction and stormwater management; and

WHEREAS, the Intergovernmental Cooperation Act, 5 ILCS 220/1 et seq. and Section 10 of Article VII of the Illinois Constitution allow and encourage intergovernmental cooperation; and

WHEREAS, on October 6, 2009, the City and the District entered into an intergovernmental agreement ("Stormwater IGA") regarding stormwater management within the corporate limits of the City; and

WHEREAS, pursuant to the Stormwater IGA, the District and City agreed to work together on identifying and prioritizing stormwater management problems within the corporate limits of the City; and

WHEREAS, pursuant to the Stormwater IGA, the District and the City further agreed to work together on identifying potential projects to address stormwater management problems within the corporate limits of the City and to perform feasibility studies as may be necessary for such potential projects; and

WHEREAS, the neighborhood of Albany Park is located within the corporate limits of the City; and

WHEREAS, the North Branch of the Chicago River (the "**NBCR**") bisects the Albany Park neighborhood on its way to flowing into the Chicago River and a low-lying area near the NBCR is prone to flooding; and

WHEREAS, during a major rainfall event on September 13 and 14, 2008 the NBCR overtopped its banks and caused significant flooding in the Albany Park neighborhood; and

WHEREAS, the City's Department of Transportation ("**CDOT**") responded by placing sandbags along the shore as a temporary measure against flooding, but recommends that a diversion tunnel be constructed 100 feet below grade (roughly following the right of way of Foster Avenue), to take the excess waters during a potential flood and divert them directly into the Chicago River, thereby bypassing the Albany Park neighborhood and reducing the potential for flooding; and

WHEREAS, the City and the District are sharing the cost of a study performed by MWH Americas, Inc. ("**MWH**") regarding the feasibility of building a diversion tunnel in the soft ground (the "**Engineering Study**"); and

WHEREAS, the City has received a proposal from MWH to design a diversion tunnel in Albany Park based upon the Engineering Study (the "**Design**") for an amount not to exceed Two Million Three Hundred Thirty-Nine Thousand One Hundred and Ninety-Four Dollars ($2,339,194); and

WHEREAS, on August 29, 2013, the District's Board of Commissioners authorized the District to negotiate and enter into intergovernmental agreements with the City for the design and construction of the diversion tunnel.

WHEREAS, the District's Board of Commissioners further authorized that the District may contribute up to, and no more than, Twenty-Five Million Nine Hundred Twenty Thousand Dollars ($25,920,000) for the design and the construction of the diversion tunnel; and

WHEREAS, subject to the terms and conditions of an intergovernmental agreement, it is the District's intent to contribute up to, and no more than, One Million One Hundred Sixty-Nine Thousand Five Hundred and Ninety-Seven Dollars ($1,169,597) for the Design, as defined in the "**Scope of Work**", attached hereto as **Exhibit 1** and made a part hereof; and

WHEREAS, the remainder of the cost of the Design will be funded from the City's Fund C51 Commercial Paper Account by proceeds from the issuance of its Commercial Paper, as authorized by an ordinance adopted by the City Council of the City (the "**City**

Council") and published on May 1, 2002 in the Journal of the Proceedings of the City Council ("**Journal of the Proceedings**") at pages 83072 to 83167, as amended by an ordinance adopted by the City Council and published on March 14, 2012 in the Journal of Proceedings at pages 210707 to 21748; and

WHEREAS, the District has full power to pass all necessary ordinances, orders, rules, resolutions and regulations for the proper management and conduct of the business of the District and for carrying into effect the object for which it was formed. It is the policy of the State that all powers granted, either expressly or by necessary implication by the District's enabling legislation or any other Illinois Statute, to the District may be exercised by the District under 70 ILCS 2605/4; and

WHEREAS, the City and District have agreed to enter into an agreement that will be substantially in the form previously used for similar agreements between the City and the District in order to memorialize their respective roles in such an effort; now, therefore,

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CHICAGO:

SECTION 1. The above recitals are expressly incorporated in and made part of this ordinance as though fully set forth herein.

SECTION 2. The Commissioner of CDOT (the "Commissioner") is authorized to execute the Agreement, and such other documents as are necessary, between the City and District, subject to the approval of the Corporation Counsel of the City as to form and legality.

APPROVED

CORPORATION COUNSEL

APPROVED

Mayor

11/20/13

EXHIBIT 1

Scope of Work
(See Attached)

Albany Park Stormwater Diversion Tunnel
Engineering Design Services
Scope of Work

BACKGROUND

The Albany Park Stormwater Diversion Tunnel project consists of a 5700 foot long, 18-ft finished diameter rock tunnel to be located in generally beneath Foster Avenue in the City of Chicago. The proposed tunnel will divert excess stormwater from the North Branch of the Chicago River (NBCR) near Springfield and Foster to the North Shore Channel (NSC) just south of Foster. Project components will include the finished rock tunnel located approximately 110 feet below grade, inlet and outlet shafts, flow diversion facilities at the tunnel west end, flow discharge facilities at the North Shore Channel, channel side slope protection at both the NSC and NBCR, pumps for tunnel dewatering, and site restoration at the construction areas at either end of the tunnel alignment. The inlet and outlet shafts are estimated to be 20 feet in diameter and the pumping station submersible pumps will be located in the outlet shaft on the east bank of the NSC.

MWH will design and prepare bidding documents for the project as described above. A total of three submittals will be produced for CDOT and MWRD review at 60%, 98% and 100% completion. Upon incorporation of CDOT and MWRD comments a ready to advertise (RTA) set of plans and specifications will be prepared. The detailed scope of work is defined below.

SCOPE OF WORK

TASK 1 – Survey and Preparation of CADD Base Sheets

MWH will conduct a survey and prepare base sheets for the inlet and outlet shaft / structure sites located near the North Branch of the Chicago River (NBCR) and the North Shore Channel (NSC) respectively and prepare base sheets for the Foster Avenue tunnel alignment as shown on Figure 1. The scope of work for the inlet and outlet shaft areas will include a topographic survey and identification of property boundaries. The Foster Avenue tunnel alignment base sheets will be prepared from existing aerial photography with elevations taken along the Foster Avenue centerline at an interval of 50 feet. The detailed scope is defined below:

A. <u>Inlet and outlet shafts / staging areas</u>

1. Perform a topographic survey at the locations of the inlet and outlet shafts located on the west and east ends of the tunnel alignment as shown on Figure 2 and Figure 3. Areas to be surveyed are identified on Figures 2 and 3 and will include the location of permanent structures and the anticipated construction staging areas. Surveyor shall also generate cross section elevations plots from

top of bank to top of bank at 25 foot intervals within a 200 foot long reach of the NSC as defined in Figure 3.

2. All work will be performed in IL State Plane Coordinates, East Zone, NAD 83 and City of Chicago Vertical Datum. Reference monuments will be cited.

3. Determine elevations and horizontal coordinates for utilities and other permanent structures located in the areas designated for survey in Task 1.A.1 (other than the NSC). For each identified utility structure determine underground configuration and inverts for connecting pipes.

4. Define property boundaries and ownership for each site.

5. Deliverables shall include:

   a. Digital copy (AutoCAD Version 2011) and one set of printed survey drawings (24"x26", 1"=20' scale) showing surface features, utility locations, and property boundaries for areas described under Task 1.A.1 above.

   b. Digital copy (AutoCAD Version 2011) and one set of printed cross section plots (24"x26") for the section of the NSC described in Task 1.A.1 above.

   c. All printed drawings must be sealed by an Illinois Registered Land Surveyor.

B. Tunnel Alignment

1. Prepare 1"=50' base sheets in AutoCAD Version 2011 along Foster Avenue for the full length of the proposed tunnel (nominally 6,000 ft.).

2. Prepare tunnel base sheets from existing aerial photographic data. Base sheets will show existing buildings, surface features visible on the photography, and approximate right-of-way boundaries.

3. Survey elevations along the Foster Avenue centerline at intervals of no more than 50 feet to verify elevations obtained from other sources which may include record drawings provided by the City and the District.

4. Define property boundaries and ownership for portions of the tunnel alignment that extend outside the right-of-way of Foster Avenue. This will be limited to short sections at the ends required to accommodate the tunnel geometry.

5. Deliverables shall include:

   a. Digital copy (AutoCAD Version 2011) and one set of printed drawings (24"x 36", 1"=20' scale, plan and profile format) for base sheets along the proposed tunnel alignment. The ground profile along the alignment of the proposed tunnel should also be plotted on the profile section of the base sheet.

   b. All printed drawings must be sealed by an Illinois Registered Land Surveyor.

TASK 2 – Easements Definition / Property Assessments.

MWH will prepare plat/legal descriptions for the two permanent easements and the two temporary construction easements located on the sites of the inlet and outlet shafts / structures. The permanent easements will include easements for the permanent structures including access and parking. The temporary easements will include areas provided for temporary offices and material storage on these sites during construction.

MWH will also prepare plat/legal descriptions of the required permanent easements for the two short sections of the tunnel alignment outside the Foster Avenue right-of-way. These sections include: 1) the property on the west side of the NSC potentially belonging to the North Park University and 2) the property at the west end of the tunnel alignment potentially belonging to the Bohemian National Cemetery.

MWH will perform right-of-way consulting services including property value appraisal and appraisal review for the permanent easements defined above.

TASK 3 – Hydraulic Design

MWH has completed initial evaluations of the hydraulic performance of the proposed tunnel under previous agreements using the North Branch Chicago River Detailed Watershed Plan model. Under this Agreement, MWH will perform and document the hydraulic analyses of the NBCR and the NSC under existing conditions and with the project in place (for the design flow condition) to support review and permitting of the project by stakeholders and regulatory entities. The intent of this analysis is to document the effectiveness of the project, the size and location of project components, and conditions in downstream reaches of the NBCR and the NSC with and without the proposed project. Specifically, the analyses will determine:

- the effect of the project on model-predicted flood elevations upstream and downstream of the project site on the NBCR and the NSC,
- the effect of the project on model-predicted flood elevations in the vicinity of the Corps of Engineers ecosystem restoration project at Horner Park,

- the effect of the project on model-predictions of the frequency and volume of reversals from the Chicago River to Lake Michigan through the locks at Wilmette and Chicago Harbor, and

- the potential impact of the project on water quality conditions in the NBCR and NCS.

MWH will also perform a hydraulic analysis of the inlet and outlet structures as a basis for final design. The detailed scope for services related to Task 3 is defined below:

1. MWH will arrange and lead a meeting with representatives from CDOT, MWRD, IDNR, IEPA, and the U.S. Army Corps of Engineers to review the proposed project concept, confirm the scope of hydraulic analyses that need to be performed in support of permitting efforts, and agree on the appropriate models to be used for the analysis. MWH will document results of the meeting in brief meeting notes and distribute them to all participants.

2. MWH has the existing North Branch Chicago River Detailed Watershed Plan Model. MWH will coordinate with the agencies indicated below to obtain the following additional models and supporting documentation:

   a. Chicago Trunk Sewer Model (most updated version) – Chicago Department of Water Management

   b. Chicago Area Waterway System Model – U.S. Army Corps of Engineers

   It is assumed that this information can be obtained within 2 weeks of the notice to proceed. MWH will notify CDOT if this information cannot be obtained in a timely manner.

3. MWH will use the models to define existing baseline conditions along the North Branch of the Chicago River and the North Shore Channel for the 10-year and 100-year design events as follows:

   a. Flows in the North Branch Chicago River upstream of Beckwith Road (NBCR DWP Model).

   b. Estimated combined sewer overflows to the North Branch Chicago River from sewers in Niles and Morton Grove with TARP full and TARP infinitely available (Estimated).

   c. Estimated combined sewer overflows to the North Branch Chicago River from sewers within the City of Chicago with TARP full and TARP infinitely available (Chicago Trunk Sewer Model).

d. Flows in the North Branch Chicago River between Beckwith Road and confluence with the North Shore Channel (NBCR DWP Model adjusted for CSO contributions).

e. Flows and Levels in the North Shore Channel/North Branch Chicago River downstream of the North Branch Dam (CAWS Model).

4. MWH will develop water surface elevation profiles for 10-year and 100-year flood events along the North Branch Chicago River and the North Shore Channel for proposed scenarios including:

   a. No Albany Park Stormwater Diversion Tunnel – TARP Infinitely Available.

   b. Albany Park Stormwater Diversion Tunnel in service – TARP Full.

   c. Albany Park Stormwater Diversion Tunnel in service – TARP Infinitely Available.

5. Based on the hydraulic analyses, MWH will consider the potential impact of the proposed project on water quality conditions in the NSC and NBCR. No detailed water quality modeling will be performed. Rather, MWH will consider the potential impact of temporary storage on dissolved oxygen levels in the floodwater to be pumped from the tunnel and evaluate cascade aeration as a means for increasing dissolved oxygen levels in the discharge.

6. MWH will prepare a technical report documenting the effects of the project on upstream and downstream model-predicted flood levels and operation of the locks at Wilmette and Chicago Harbor for the release of floodwaters into Lake Michigan. A separate technical report will be prepared to document the hydraulic basis of design for the proposed project. The technical reports will be used as attachments to permit applications that require documentation of hydraulic conditions with and without the project. MWH will prepare and submit five (5) printed copies and one digital copy (pdf format) of each of the draft reports to CDOT for review. Upon receipt of CDOT comments, MWH will prepare and submit twenty (20) printed copies of the reports to CDOT along with one digital copy (pdf format) for its use and distribution with relevant permit applications.

7. MWH will participate in up to three (3) half-day or shorter meetings with potential permitting agencies to review the results of the hydraulic analysis and address questions. It is assumed that all meetings will be held in downtown Chicago. MWH will prepare minutes for each of the meetings and distribute them to all participants.

8. MWH will recommend the tunnel diameter based on the existing condition hydraulic analysis to eliminate flood damages within Albany Park for the 100-yr event defined in the MWRD Detailed Watershed Plan and develop initial configurations of the shafts and inlet / outlet structures.

9. MWH will verify the discharge capacities of the inlet and outlet structures using computational fluid dynamics (CFD) modeling. Topographic information will come from the surveying done in Task 1.

10. MWH will prepare a technical memorandum to present the findings of the hydraulic analysis. Dimensional sketches of the inlet and outlet structure configurations and shafts will be prepared for review and comment. CDOT and MWRD comments will be incorporated and a final TM will be prepared.

TASK 4 – Geotechnical Investigation and Analysis

The geotechnical investigation completed in the summer of 2013 (Phase I) in support of the evaluation of rock tunnel vs. overburden tunnel selection must be supplemented to provide sufficient information to design and bid the selected rock tunnel design. A total of four borings were taken along the tunnel alignment including one each at the end points. Up to six additional borings are required along the tunnel route to be able to define the soil / rock characteristics adequately to prepare the detailed design / Geotechnical Baseline Report and to provide sufficient information to allow informed competitive bidding without excessive contingencies due to unknown conditions.

1. **Preparation of GDR of Previous Subsurface Data.** MWH will compile old boreholes, boreholes from Phase I and available site geology in the Geotechnical Data Report (GDR) for Phase I.

2. **Preparation of Phase II Investigation Program.** MWH will prepare a detailed subsurface geotechnical and environmental investigation program for drilling and testing to finalize the characterization of subsurface conditions along the route of the proposed Albany Park Stormwater Tunnel in rock. Conditions to be characterized include thickness and consistency of the overburden soil layers, soil and rock properties, aquifers and groundwater condition, groundwater fluctuations and yields, potential ground and groundwater contamination, evaluate the top of rock, potential presence of cobbles and boulders, presence of water bearing zones. It is expected that the Phase II program will include the following overall activities:

    a. Locate the boreholes and secure permits from the City and other agencies for borehole drilling.

b. Drill a total of up to 4 vertical boreholes and two angle boreholes (30 degrees with vertical) through the overburden and into the rock to a depth of approximately 180 feet below ground surface (bgs) along the 5,700-foot tunnel alignment to fill the gaps between previously drilled boreholes. It is assumed that one angle hole will be at location of each of the proposed shafts (starting shaft, ending shaft), with other boreholes being distributed to include two west of St. Louis and two east of St. Louis.

c. Drilling includes up to 420 feet in overburden with sampling at 5' intervals and coring 600 feet in rock taking H-size corings.

d. Install three piezometers in rock.

e. Perform a series of geotechnical field testing including standard penetration testing on soil at 5-ft intervals (ASTM D1586 & 1587), permeability testing on pervious soils, rock coring with Rock Quality Designation (RQD), rock water pressure testing, and mini pump testing.

f. Perform environmental and gas screening of the holes for volatiles, semivolatiles and gases.

g. Collect soil and groundwater samples and test for disposal characteristics parameters to landfills at location of shafts.

h. Collect soil and water samples for analysis of chlorides, sulfates, pH, resistivity, total dissolved solids in water only.

i. Collect soil and rock samples to perform geotechnical laboratory testing including: moisture content (ASM D-2216), gradation (ASTM D-422), Atterberg Limits (ASTM D-4318), unconfined compressive strength on soil samples (ASTM D-2116), unconfined strength on rock (ASTM D 2938), Splitting Tensile Strength of Rock (ASTM D-3697), point load test on rock samples (ASTM D5731), hardness and cerchar abrasivity of the rock.

j. Convert holes to standpipe piezometer in overburden material or open hole piezometer in rock and perform mini pump tests in the holes for yield.

k. Provide a Geotechnical Data Report (GDR) including borehole logs, results of field and laboratory testing, survey location of boreholes, and analytical test results in a tabular form. Subsurface information (GDR-Phase I) from prior boreholes and boreholes drilled in Phase I will be attached to the GDR as an appendix.

MWH will document the proposed program in a technical memorandum for review by CDOT. No external approvals are anticipated to be required for the performance of the proposed program. Should MWH determine that any type of external permit or authorization is required, MWH will notify CDOT so that provisions for securing the required approval can be developed and appropriate budget allocated for any additional effort.

3. **Conduct Field Investigations.** MWH will coordinate and monitor the activities of the drilling contractor selected to complete the borings. MWH staff will establish the approximate location for the supplemental boreholes, confirm that the drilling subcontractor has requested and obtained utility locates in the vicinity of the borings, observe and monitor the drilling program and field testing and sampling, and prepare list of samples for laboratory testing. All drilling and testing will be performed by a subcontractor to MWH. The subcontractor will be responsible for documenting conditions in the vicinity of the borings prior to the start of drilling, and for restoring the area back to the pre-investigation conditions following completion of the field activities.

4. **Conduct a Geophysical Investigation.** MWH will develop a program to utilize a firm to perform a seismic reflection geophysical (seismic refraction) study and testing to map the top of rock.

5. **Preparation of GIR.** After receiving the GDR, MWH will prepare a Geotechnical Investigation Report (GIR) consistent with the ASCE Guideline for GBR/GIR that includes the following:

    a. Results of subsurface geotechnical and environmental investigations (previous, Phase I and Phase II results)

    b. Analysis of data analysis

    c. Subsurface geotechnical profile along the tunnel and available utilities

    d. Subsurface geotechnical profile at location of shafts

    e. Shaft and tunnel initial and final support discussion and recommendation

    f. Vibration and noise study by vibration and blasting

    g. Hydrogeological and aquifer study and groundwater inflow to shaft and tunnel analysis

    h. Interaction between tunnel and shaft lining system, lowering groundwater aquifer and potential settlements

i. Considerations regarding the proposed design/construction philosophy and approach

j. Mucking and disposal discussion

k. Finite element analysis of shafts and tunnel

l. Excavation Method for shaft and tunnel and discussion about TBM

m. Risks

n. Discussion and establish baseline parameters

o. Geotechnical design parameters

p. Prepare rock surface map/contours and discontinuities of rock formation

q. Structural design parameters

MWH will plan and conduct a one-day workshop with CDOT staff and key members of the MWH technical review team to present the project, interpretation, and design philosophy. MWH will collect comments and discussion notes and revise the GIR accordingly

Three (3) copies of the draft GIR will be submitted to CDOT for their information and comment. It is assumed that CDOT will complete review of the draft GIR-BODR within two weeks.

6. **Preparation of GBR.** MWH will prepare a geotechnical baseline report in line with the ASCE Guidelines for GBR, to establish the baseline subsurface conditions and risk allocation to be included in the construction package.

7. **Conduct Finite Element Analysis:**

   a. Tunnel Analysis – Perform a total of three (3) 2D Model for tunnel Section using ABAQUAS or Plaxis FE model using elastoplastic model for rock and concrete:
      1. Develop soil rock profile and parameters
      2. Set up the model
      3. Perform the model run/analysis for Initial Support of rock (reinforcement and shotcrete)
      4. Perform the model run/analysis for Final Support (Concrete) or one composite run for staged excavation and support (full model, excavation, Initial Support, Concrete Liner)

b. Launching Shaft – 3D – Setup Model, Excavation, Initial Support, Concrete Liner.

c. Receiving Shaft - 3D – Set Model, Excavation , Initial Support, Concrete Liner.

TASK 5 - Structural Design

MWH will perform the detailed structural design for project structural components: Inlet and outlet shafts, inlet structure and weir, outlet structure / energy dissipation, and the finished concrete lining of the tunnel. The structural design will be based upon the following:

1. The inlet and outlet shafts located on Chicago Park District property will be cylindrical with a nominal inside diameter of 20 feet.

2. A sump will be designed at the invert of the outlet shaft for the submersible dewatering pump. The sump will be designed below the invert of the tunnel and the tunnel will be able to be completely dewatered.

3. Both the inlet and outlet shafts will be vented and will have hatch access to lower equipment to the bottom of the shaft for cleaning and other maintenance.

4. The inlet weir and outlet structure will each include a trashrack and stop log groves.

5. The floor of the inlet structure will be constructed of high strength concrete to resist erosion.

6. The connection from the outlet shaft to the outlet structure will be buried to allow reinstatement of the bicycle path following construction.

TASK 6 – Dewatering Pump Design

MWH will design a pumping system to dewater the tunnel and shafts following a flow diversion through the tunnel when the flow through the diversion tunnel has ceased. Two variable speed submersible pumps will be located in the outlet shaft at the NSC and will be designed to completely dewater the tunnel and shafts by discharging water to the NSC. The dewatering pumps will have a firm capacity of 5 cfs and will operate remotely. It is anticipated that dewatering will be only a periodic occurrence following events of sufficient volume to cause a diversion. Design will include the design of a predesigned building to house the electrical gear including the VFD.

The submersible pumps will be housed in sump located at the bottom of the outlet shaft to allow the water in the inlet and outlet shafts and tunnel to be pumped out. MWH will size and layout sump, discharge piping and electrical and instrumentation to allow for efficient operation. The design will conform to the standards of the Hydraulic Institute. The submersible pumps will be removable through hatches or removable grating from the surface.

MWH will coordinate with Commonwealth Edison to bring power to the site. It is expected that the dewatering pumps will be started remotely with level control shut off. MWH will coordinate with the CDOT SCADA department; however system integration is not included in this effort.

TASK 7 – Site Design and Site Restoration

MWH will develop site plans for inlet shaft and related structures and for the outlet shaft and related structures. Restoration plans will include final grading, seeding or sodding and replacement of trees and shrubs.

It is anticipated that these plans will include:

1. Design of access driveways and parking areas on the sites of the inlet and outlet shafts and structures.

2. Bicycle path restoration on the east bank of the NSC. This effort will include development of a plan to relocate the bicycle path during construction of the outlet shaft and related structures and a plan to reinstate the bicycle path following construction.

3. Restoration of outlet structure site. This will include final restoration plans for the outlet structure site, the adjacent side slope of the NSC and Chicago Park District property disturbed during construction. The later will include reinstatement of the City Park south of Foster Avenue which is expected to be used as a construction yard.

4. Restoration of inlet structure site. This will include final restoration plans for the inlet structure site, the adjacent side slope of the NBCR and Chicago Park District property disturbed during construction. The later will include reinstatement of areas to be used as a construction yard.

It is understood that CDOT will work directly with the Chicago Park District to determine its requirements regarding restoration of the two sites. MWH will provide technical support to CDOT during negotiations. MWH has included 40 hours of support in its budget for this effort.

It is also assumed that the Park District will provide the concept and details for any required park restoration.

TASK 8 – Prepare Contract Drawings

MWH will prepare contract drawings for the Albany Park Stormwater Project for 60%, 98% and 100% (RTA) submittals. Drawing preparation will include 90 drawings, which are allocated by discipline as follows:

1.	General Drawings:	5 drawings
2.	Civil Drawings	12 drawings
3.	Geotechnical Drawings	14 drawings
4.	Structural Drawings	40 drawings
5.	Electrical Drawings	9 drawings
6.	Instrumentation & control drawings	5 drawings
7.	Mechanical Drawings	5 drawings

Three submittals will be prepared for CDOT and MWRD review. Following review, MWH will incorporate the consolidated comments into the drawing set for subsequent submittals. To meet the aggressive schedule a total of 2 weeks is allocated to CDOT and MWRD for each review. Following each review, MWH will meet with CDOT to go over comments prior to incorporating them in the revised set.

Task 9 – Prepare Contract Specifications

MWH will prepare technical specifications for the Albany Park Stormwater Project for 60%, 98% and 100% (RTA) submittals. It is understood that CDOT will prepare the Bidding Forms, the Agreement and the General Conditions for the bid set.

Three submittals will be prepared for CDOT and MWRD review. Following review, MWH will incorporate the consolidated comments into the drawing set for subsequent submittals. To meet the aggressive schedule a total of 2 weeks is allocated for review. Following each review, MWH will meet with CDOT to go over comments prior to incorporating them in the revised set.

Task 10 – Permitting Assistance

Based upon the results of the regulatory agency contacts and meetings that took place in September, MWH will prepare draft permit applications for the City. The City will review the draft permit applications and submit the final applications to the appropriate regulatory agencies. The City will be responsible for paying permit fees.

The following permits and consultations are assumed to be required for the proposed project:

1. MWH will prepare an Individual Permit application for the Joint Permit process (USACE, IDNR, IEPA). The USACE Chicago District is the lead agency for the Joint Permit application process. This permit is anticipated to be triggered by fill within waters of the United States (Section 404 of the Clean Water Act - CWA) and impacts to navigable water bodies (Section 10 of the Rivers and Harbors Act). Joint permit applications generally need to be accompanied by project drawings that are at least at the 50% design stage – MWH will submit the 60% set. Areas of disturbance and construction methodology need to be clearly described before the draft permit application can be prepared and submitted.

2. The Individual Permit will require separate coordination with the IEPA for the CWA Section 401 water quality certification. This scope of work assumes that no detailed water quality modeling will be required by the IEPA. Rather, it is anticipated that any concerns regarding water quality can be met through the inclusion of a cascade aeration feature on the discharge of the dewatering pump system.

3. An alternatives analysis will be prepared in accordance with CWA 404(b) (1).

4. MWH will attend one pre-application meeting for the Joint Permit Application process.

5. Standard coordination with the United States Fish and Wildlife Services (regarding federally threatened and endangered species), Illinois EcoCAT Database (regarding state-listed sensitive species), State Historic Preservation Office, and SWCS (regarding sedimentation and erosion control plans) will be performed.

6. MWH will coordinate with the United States Coast Guard concerning navigation in the NSC.

7. A City of Chicago harbor permit application will be prepared.

8. If mitigation is required for the project for impacts to streams and/or wetlands, MWH assumes that the City will purchase credits from a mitigation bank or through an appropriate in-lieu fee program. If a permitee-responsible mitigation plan is required, MWH can provide the scope and cost for this additional work at a future date.

Deliverables

1. MWH will provide the City with draft permit applications for the following items:

    a. Joint Permit Application (including the wetland delineation report, floristic quality assessment, wildlife habitat assessment, and 404(b)(1) Alternative Analysis)

    b. IEPA 401 WQC

    c. City of Chicago Harbor Permit application

    d. USCG (navigability of NSC during construction and project operation)

2. MWH will incorporate one round of comments from the City on each deliverable.

Assumptions

1. Scope includes one round of City review of the draft deliverables.

2. The scoped effort does not include the preparation of a mitigation plan.

3. The City will pay permit fees.

4. No additional field studies will be required. The stream and streambank at the two construction sites will be characterized based upon the results of the wetland delineation report. Additional information about the NBCR and NSC will be requested from MWRD or other public sources (e.g., water quality, stream quality, invertebrates, and fish).

5. The contractor will prepare the Notice of Intent and Stormwater Pollution Prevention Plan (SWPPP) for this project, in accordance with stormwater general construction permit requirements.

6. The public review period will generate a modest number of comments that require no more than 40 hours of effort for responses.

Task 11 – Constructability Review and Preparation of Class 2 OPCC.

MWH will perform a constructability review of the 60% design submittal package and will update the Class 3 OPCC (opinion of probable construction cost) prepared for the rock tunnel in June 2013. MWH will also prepare an operating and maintenance plan and estimated operating cost based on the 60% design submittal. At the 98% design, MWH will prepare a Class 2 OPCC for the Albany Park Stormwater Diversion Tunnel.

Any opinions of probable construction costs (OPCC) prepared by MWH, including evaluations of the Client's project budget, and/or funding, represent MWH's best judgment as a design professional familiar with the Construction industry. Unless and to the extent otherwise indicated by MWH, such opinions or evaluations are based on upon current market rates for labor, materials and equipment. The Client acknowledges that MWH has no control over the costs of said labor, materials, or equipment, construction contractor's methods of determining bid prices, competitive bidding environments, unidentified field conditions, market conditions, hyper-inflationary or deflationary price cycles, or any other factors that may affect the OPCC, the project budget or negotiating conditions at the time of project execution. Client further acknowledges that the OPCC is a "snapshot" in time and that the reliability of the OPCC will degrade over time. Accordingly MWH does not warrant or represent that construction bids or negotiated prices will not vary from the Client's project budget or MWH's good faith OPCC.

The detailed scope is defined below:

1. Based on the 60% design package, MWH will perform a constructability review of the proposed design and document comments, concerns, suggestions for improving the design, reducing cost/risk, etc. in a technical memorandum for review with CDOT.

2. Based on the 60% design package, MWH will develop an operating and maintenance plan for the proposed Albany Park Stormwater Diversion Tunnel. The plan will identify proposed operating guidelines for the system as well as maintenance activities that will be required. Descriptions of the required maintenance activities will include an indication of the anticipated frequency for each activity as well as special provisions required for the activity.

3. Based on the 60% design package, MWH will conduct a review of the Class 3 OPCC prepared for the 18-ft diameter rock tunnel in June 2013 and identify any features of the design that would materially impact that OPCC (additions to the scope, changed information regarding subsurface conditions, etc.). MWH will update the Class 3 OPCC to reflect these items. MWH will not update the overall OPCC based on changes in unit prices or other time-related items and the updated OPCC will remain a June 2013 OPCC. The purpose of this effort is to identify potential cost impacts associated with any significant changes.

4. MWH will also develop an estimate of annual costs associated with operation and maintenance of the stormwater diversion tunnel. Annualized costs will be estimated based on consideration of likely operating and maintenance costs over a 20 year period.

5. Based on the 98% design package, MWH will prepare a Class 2 OPCC and construction schedule to be presented to the client as the Engineer's OPCC for comparison with bids. MWH will also review and update the estimate of annual costs for operation and maintenance of the tunnel system based on the 98% design.

Task 12 – Bidding Assistance

MWH will assist CDOT in obtaining construction bids for the Albany Park Stormwater Project. This effort shall include the following:

1. MWH will attend the prebid meeting and assist CDOT with preparation of the prebid meeting minutes.

2. MWH will prepare responses to questions by prospective bidders on technical issues and provide to CDOT for distribution.

3. MWH will support CDOT to prepare technical addenda during the bidding period. Budget is allocated for up to four addenda will be required.

4. MWH will review and tabulate the bids and provide a recommendation for award.

Task 13 – Public Meetings

During the design effort, MWH will participate in up to four (4) public meetings related to the Albany Park Stormwater Diversion Tunnel. It is assumed that meetings will be up to 3 hours long and will be held at public facilities in the Albany Park neighborhood. Arrangements for meeting sites, audio-visual equipment, security, etc. will be made by CDOT. For each meeting, MWH will work with CDOT to develop a public notice for the meeting, prepare presentation materials (Powerpoint and up to six 30"x42" display boards), lead a technical presentation during the meeting, participate in responding to questions during the meetings, and document key discussions in a meeting summary document. MWH assumes that CDOT and City of Chicago personnel will issue the meeting notices and also participate in the meetings.

Scope Exclusions

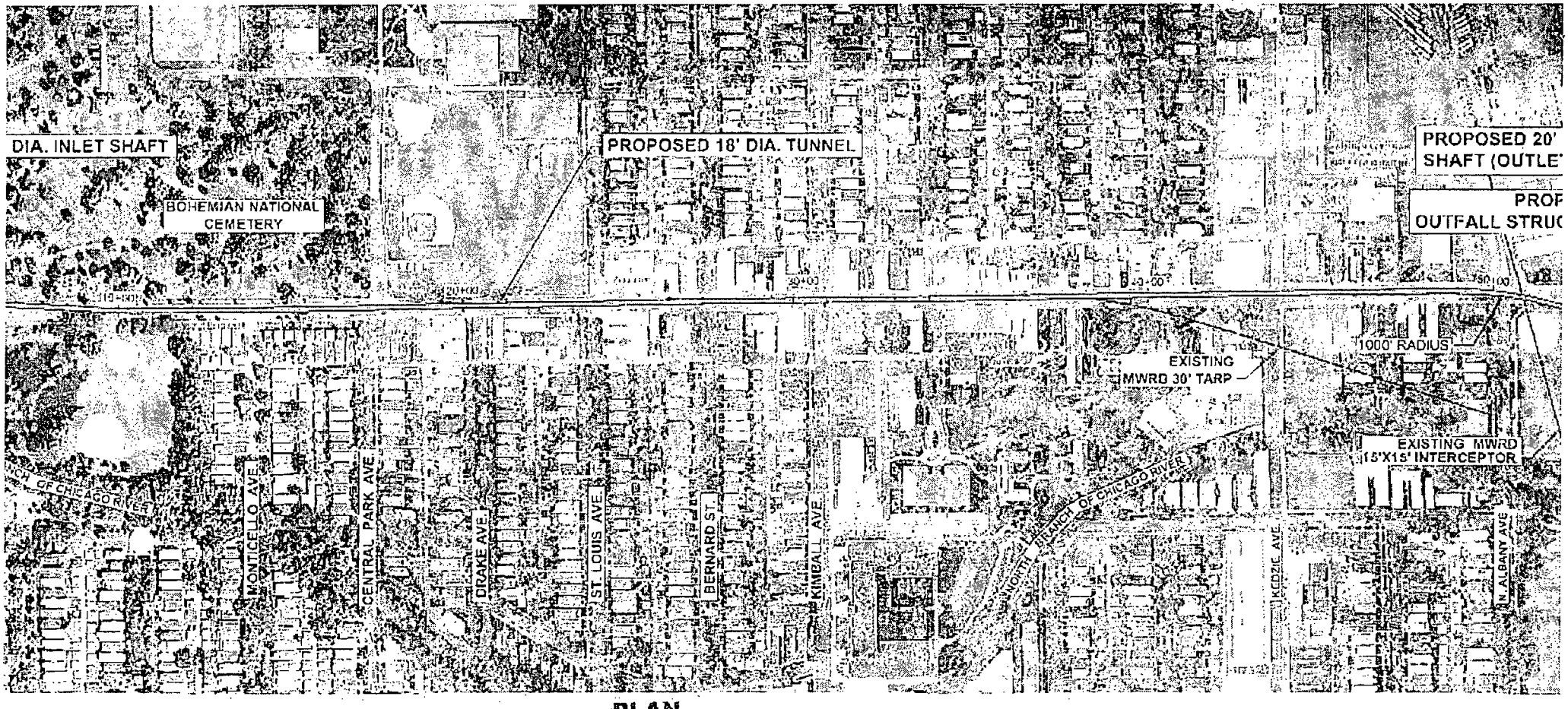
1. The scope does not include any design activities relating to the design of a tunnel in overburden.

2. The design is based upon an 18-ft finished diameter rock tunnel and does not include evaluation of hydraulic designs for alternative levels of protection.

3. MWH will not provide front end documents for the bid package. CDOT will prepare and provide front end documents for the bid package including the Agreement and General Conditions.

4. Scope does not include engineering services during construction; however, the design scope for the tunnel is based upon having a geotechnical engineer in the field during tunnel construction.

5. No Phase I or Phase II environmental work shall be performed under this contract.


DIA. INLET SHAFT
BOHEMIAN NATIONAL CEMETERY
PROPOSED 18' DIA. TUNNEL
PROPOSED 20'
SHAFT (OUTLE
PROP
OUTFALL STRUC
1000' RADIUS
EXISTING
MWRD 30' TARP
EXISTING MWRD
15'X15' INTERCEPTOR
MONTICELLO AVE.
CENTRAL PARK AVE.
DRAKE AVE.
ST. LOUIS AVE.
BERNARD ST.
KIMBALL AVE.
NORTH BRANCH OF CHICAGO RIVER
KEDZIE AVE.
N. ALBANY AVE.

PLAN


Inlet Structure
Excavated Material Spoil Pile
Exit Shaft
Inlet Structure
NORTH BRANCH
OF CHICAGO RIVER
C.W. Settlement Ponds
FOSTER AVENUE
Construction Power Distribution
EUGENE FIELD PARK
RINGFIELD AVE.


FOSTER AVENUE
Gate
Excavated
Material Spoil
Pile
Starter Shaft
Outlet Structure
Construction Power Distribution
CW Settlement Ponds
Outfall Structure
Construction Fence
NORTH SHORE CHANNEL

	MWH Hours	MWH Labor Billings	MWH ODCs	MWH Total	Subcontractor Total	Project Total	Explanation
ation of CADD Base Sheets	178	$ 19,167	$ 1,630	$ 20,797	$ 40,000	$ 60,797	Field Survey
on/Property Assessments	156	$ 20,382	$ 1,000	$ 21,382	$ 50,000	$ 71,382	Easement Descripti
	840	$ 115,255	$ 4,400	$ 119,655	$ 5,000	$ 124,655	
tigation and Analysis	3605	$ 499,970	$ 5,630	$ 505,601	$ 163,550	$ 669,151	Geotechnical Field
	1280	$ 186,669	$ 4,599	$ 191,268	$ 58,434	$ 249,702	Structural Engineer
Design	475	$ 69,272	$ 1,707	$ 70,978	$ 21,684	$ 92,663	Electrical Engineeri
e Restoration	346	$ 50,459	$ 1,243	$ 51,702	$ 15,795	$ 67,497	CAD Support
rawings	2276	$ 331,921	$ 8,177	$ 340,099	$ 103,902	$ 444,001	Structural Engineer
pecifications	360	$ 52,501	$ 1,293	$ 53,794	$ 16,434	$ 70,229	Structural, Electrica
nce	781	$ 92,232	$ 1,000	$ 93,232	$ -	$ 93,232	
eview and Class 2 OPCC	711	$ 112,862	$ -	$ 112,862	$ -	$ 112,862	
e	342	$ 57,424	$ 1,630	$ 59,055	$ 7,750	$ 66,805	
	311	$ 44,572	$ 1,378	$ 45,950	$ 5,000	$ 50,950	
	11662	$ 1,652,687	$ 33,688	$ 1,686,375	$ 487,550	$ 2,173,925	
						$ 165,269	
						$ 2,339,194	