



# Request for Quote

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
ONE CAPITOL HILL  
PROVIDENCE RI 02908

**CREATION DATE :** 22-AUG-12  
**BID NUMBER:** 7457992  
**TITLE:** TRANE AIR HANDLER REPLACEMENT - DOT TRAFFIC MANAGEMENT CENTER  
  
**BLANKET START :** 17-SEP-12  
**BLANKET END :** 31-DEC-12  
**BID CLOSING DATE AND TIME:**06-SEP-2012 11:00:00

**BUYER:** Hill, Lisa  
**PHONE #:** 401-574-8118

**B**  
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DOT ACCOUNTS PAYABLE  
TWO CAPITOL HILL, RM 243  
SMITH ST  
PROVIDENCE, RI 02903  
US

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DOT TRAFFIC MANAGEMENT CENTER  
TWO CAPITOL HILL, RM 126  
PROVIDENCE, RI 02908  
US

Requisition Number: 1283642

Line	Description	Quantity	Unit	Unit Price	Total
1	TOTAL COST TO PROVIDE EQUIPMENT, MATERIALS AND LABOR TO REPLACE THE TRANE COOLING UNIT LOCATED OUTSIDE THE TMC @ RIDOT, 2 CAPITOL HILL, PROVIDENCE, RI IN ACCORDANCE WITH THE ATTACHED SPECIFICATIONS DATED AUGUST 2012	1.00	Each		

Delivery: \_\_\_\_\_

Terms of Payment: \_\_\_\_\_

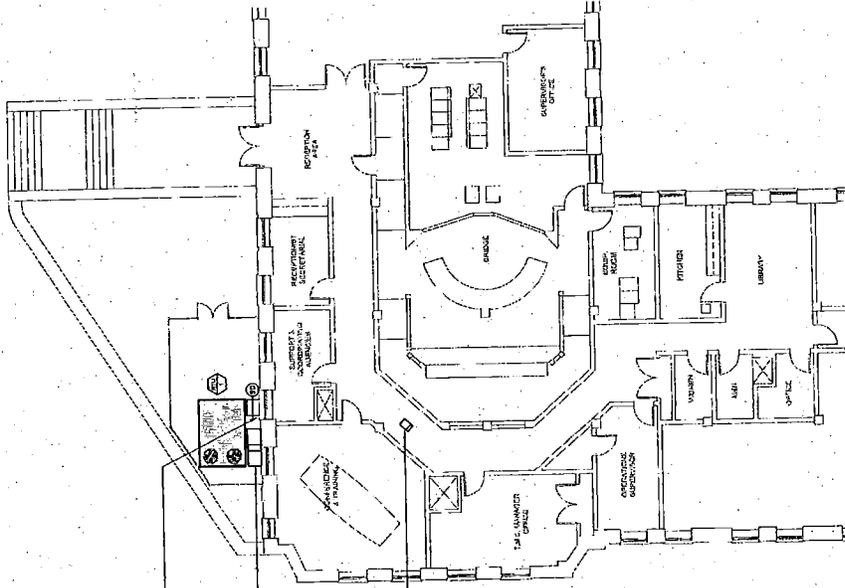
It is the Vendor's responsibility to check and download any and all addenda from the RIVIP. This offer may not be considered unless a signed RIVIP generated Bidder Certification Cover Form is attached and the Unit Price column is completed. The signed Certification Cover Form must be attached to the front of the offer

NO.	DATE	BY	REVISION
1			
2			

**SHEET NOTES**

- GENERAL NOTES:**
1. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL EXISTING MECHANICAL AND ELECTRICAL DUCTS.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF PROVIDENCE.
- DEMO NOTES:**
1. REMOVE EXISTING RTU AND EXHAUST FAN ON GRADE OUTSIDE THE BUILDING.
  2. REMOVE EXISTING EXHAUST FAN AND EXHAUST DUCTWORK BACK TO THE EXHAUST CURB.
- INSTALLATION NOTES:**
1. MOISTURE CURE CONCRETE SHALL BE REQUIRED TO ACCEPT NEW CONCRETE.
  2. ALL EXISTING MECHANICAL AND ELECTRICAL DUCTS SHALL BE REMOVED AND THE OPENINGS SHALL BE RECONSTRUCTED TO MATCH THE EXISTING FINISH.
  3. ALL EXISTING MECHANICAL AND ELECTRICAL DUCTS SHALL BE REMOVED AND THE OPENINGS SHALL BE RECONSTRUCTED TO MATCH THE EXISTING FINISH.
  4. ALL EXISTING MECHANICAL AND ELECTRICAL DUCTS SHALL BE REMOVED AND THE OPENINGS SHALL BE RECONSTRUCTED TO MATCH THE EXISTING FINISH.
  5. ALL EXISTING MECHANICAL AND ELECTRICAL DUCTS SHALL BE REMOVED AND THE OPENINGS SHALL BE RECONSTRUCTED TO MATCH THE EXISTING FINISH.
- CONTROL NOTES:**
1. CONNECT MECHANICAL SYSTEMS TO EXISTING BUILDING TRASH TRAP.
  2. ALL MECHANICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF PROVIDENCE MECHANICAL CODE.
  3. ALL MECHANICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF PROVIDENCE MECHANICAL CODE.
- RE-BALANCING NOTES:**
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF PROVIDENCE.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF PROVIDENCE.

EXISTING VAV AIR BALANCING SCHEDULE											
VAV #	TOTAL CFM	IN. SUP.	CFM	IN. SUP.	CFM	IN. SUP.	CFM	IN. SUP.	CFM	IN. SUP.	CFM
VAV1	1,000	1	475								
VAV2	1,400	2	625								
VAV3	315	1	315								
VAV4	498	1	498								
VAV5	1,435	1	460	2	300	2	315				
VAV6	1,070	2	515								
VAV7	1,040	4	260	2	240						
VAV8	370	1	180								
VAV9	200	1	200								
VAV10	800	1	200	2	60	1	100	3	200		
VAV11	1,200	1	1,200								



REMOVE EXISTING EXHAUST FAN AND EXHAUST DUCTWORK. RECONSTRUCT TO MATCH EXISTING FINISH.

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REMOVE EXISTING EXHAUST FAN AND EXHAUST DUCTWORK. RECONSTRUCT TO MATCH EXISTING FINISH.

NO.	DATE	BY	REVISION
1			
2			

RHODE ISLAND  
DEPARTMENT OF TRANSPORTATION  
RIDOT TMC  
HVAC & CONTROLS UPGRADE  
PROVIDENCE, RHODE ISLAND  
MECHANICAL LAYOUT  
FIRST FLOOR PART PLAN  
CHECKED BY: J.L.W. DATE: AUG. 2013 SCALE: 1/8"=1'-0"



1 MECHANICAL LAYOUT FIRST FLOOR PART PLAN  
1/8" = 1'-0"



## SECTION 237413 - PACKAGED, OUTDOOR, CENTRAL-STATION AIR-HANDLING UNITS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes packaged, outdoor, central-station air-handling units (rooftop units) with the following components and accessories:
  - 1. Direct-expansion cooling.
  - 2. Electric-heating coils.
  - 3. Economizer outdoor- and return-air damper section.
  - 4. Variable frequency drive suitable for VAV operation.
  - 5. Integral, space temperature controls.

#### 1.2 DEFINITIONS

- A. Outdoor-Air Refrigerant Coil: Refrigerant coil in the outdoor-air stream to reject heat during cooling operations and to absorb heat during heating operations. "Outdoor air" is defined as the air outside the building or taken from outdoors and not previously circulated through the system.
- B. Outdoor-Air Refrigerant-Coil Fan: The outdoor-air refrigerant-coil fan in RTUs. "Outdoor air" is defined as the air outside the building or taken from outdoors and not previously circulated through the system.
- C. RTU: Rooftop unit. As used in this Section, this abbreviation means packaged, outdoor, central-station air-handling units. This abbreviation is used regardless of whether the unit is mounted on the roof or on a concrete base on ground.
- D. Supply-Air Fan: The fan providing supply-air to conditioned space. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.
- E. Supply-Air Refrigerant Coil: Refrigerant coil in the supply-air stream to absorb heat (provide cooling) during cooling operations and to reject heat (provide heating) during heating operations. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.

#### 1.3 SUBMITTALS

- A. Product Data: Include manufacturer's technical data for each RTU, including rated capacities, dimensions, required clearances, characteristics, furnished specialties, and accessories.

- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Wiring Diagrams: Power, signal, and control wiring.
- C. Field quality-control test reports.
- D. Operation and maintenance data.
- E. Warranty.

#### 1.4 QUALITY ASSURANCE

- A. ARI Compliance:
  - 1. Comply with ARI 210/240 and ARI 340/360 for testing and rating energy efficiencies for RTUs.
  - 2. Comply with ARI 270 for testing and rating sound performance for RTUs.
- B. ASHRAE Compliance:
  - 1. Comply with ASHRAE 15 for refrigerant system safety.
  - 2. Comply with ASHRAE 33 for methods of testing cooling and heating coils.
  - 3. Comply with applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
- C. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- D. NFPA Compliance: Comply with NFPA 90A and NFPA 90B.
- E. UL Compliance: Comply with UL 1995.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

#### 1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace components of RTUs that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period for Compressors: Manufacturer's standard, but not less than five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. AAON, Inc.
  2. Carrier Corporation.
  3. Lennox Industries Inc.
  4. McQuay International.
  5. Trane; American Standard Companies, Inc.
  6. YORK International Corporation.
  7. Or Approved Equal.

### 2.2 EFFICIENCY

- A. Unit shall be high efficiency operation.

### 2.3 CASING

- A. General Fabrication Requirements for Casings: Formed and reinforced double-wall insulated panels, fabricated to allow removal for access to internal parts and components, with joints between sections sealed.
- B. Exterior Casing Material: Galvanized steel with factory-painted finish, with pitched roof panels and knockouts with grommet seals for electrical and piping connections and lifting lugs.
- C. Inner Casing Fabrication Requirements:
1. Inside Casing: Galvanized steel.
- D. Casing Insulation and Adhesive: Comply with NFPA 90A or NFPA 90B.
1. Materials: ASTM C 1071, Type I.
  2. Thickness: 1/2" inch.
  3. Liner materials shall have air-stream surface coated with an erosion- and temperature-resistant coating or faced with a plain or coated fibrous mat or fabric.
  4. Liner Adhesive: Comply with ASTM C 916, Type I.
- E. Condensate Drain Pans: Formed sections of galvanized or stainless-steel sheet, a minimum of 2 inches deep, and complying with ASHRAE 62.1-2004.
- F. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

## 2.4 FANS

- A. **Belt-Driven Supply-Air Fans:** Double width, forward curved, centrifugal; with permanently lubricated, single-speed motor installed on an adjustable fan base resiliently mounted in the casing. Aluminum or painted-steel wheels, and galvanized- or painted-steel fan scrolls.
- B. **Condenser-Coil Fan:** Propeller, mounted on shaft of permanently lubricated motor.

## 2.5 COILS

### A. Supply-Air Refrigerant Coil:

- 1. Aluminum-plate fin and seamless internally grooved copper tube in steel casing with equalizing-type vertical distributor.
- 2. Polymer strip shall prevent all copper coil from contacting steel coil frame or condensate pan.
- 3. Coil Split: Interlaced.

### B. Outdoor-Air Refrigerant Coil:

- 1. Aluminum-plate fin and seamless internally grooved copper tube in steel casing with equalizing-type vertical distributor.
- 2. Polymer strip shall prevent all copper coil from contacting steel coil frame or condensate pan.

### C. Electric-Resistance Heating:

- 1. **Open Heating Elements:** Resistance wire of 80 percent nickel and 20 percent chromium, supported and insulated by floating ceramic bushings recessed into casing openings, fastened to supporting brackets, and mounted in galvanized-steel frame. Terminate elements in stainless-steel machine-staked terminals secured with stainless-steel hardware.
- 2. **Overttemperature Protection:** Disk-type, automatically reset, thermal-cutout, safety device; serviceable through terminal box.
- 3. **Overcurrent Protection:** Manual-reset thermal cutouts, factory wired in each heater stage.
- 4. **Control Panel:** Unit mounted with disconnecting means and overcurrent protection. Include the following controls:
  - a. Magnetic contactors.
  - b. SCR Controller: Pilot lights operate on load ratio, a minimum of five steps.
  - c. Time-delay relay.
  - d. Airflow proving switch.

## 2.6 REFRIGERANT CIRCUIT COMPONENTS

- A. **Compressor:** Hermetic, scroll, mounted on vibration isolators; with internal overcurrent and high-temperature protection, internal pressure relief, and crankcase heater.

B. Refrigeration Specialties:

1. Refrigerant: R-407C or R-410A.
2. Expansion valve with replaceable thermostatic element.
3. Refrigerant filter/dryer.
4. Manual-reset high-pressure safety switch.
5. Automatic-reset low-pressure safety switch.
6. Minimum off-time relay.
7. Automatic-reset compressor motor thermal overload.
8. Brass service valves installed in compressor suction and liquid lines.

2.7 AIR FILTRATION

A. Minimum arrestance according to ASHRAE 52.1, and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.

1. Glass Fiber: Minimum 80 percent arrestance, and MERV 5.
2. Pleated: Minimum 90 percent arrestance, and MERV 7.

2.8 DAMPERS

A. Outdoor- and Return-Air Mixing Dampers: Opposed-blade galvanized-steel dampers mechanically fastened to cadmium plated for galvanized-steel operating rod in reinforced cabinet. Connect operating rods with common linkage and interconnect linkages so dampers operate simultaneously.

1. Damper Motor: Modulating with adjustable minimum position.
2. Barometric relief damper.

2.9 ELECTRICAL POWER CONNECTION

A. Provide for single connection of power to unit with unit-mounted disconnect switch accessible from outside unit and control-circuit transformer with built-in overcurrent protection.

2.10 CONTROLS

A. Basic Unit Controls:

1. Control-voltage transformer.
2. Wall-mounted thermostat or sensor with the following features:
  - a. Heat-cool-off switch.
  - b. Fan on-auto switch.
  - c. Fan-speed switch.
  - d. Adjustable deadband.
  - e. Unoccupied-period-override push button.

- f. Data entry and access port to input temperature set points, occupied and unoccupied periods, and output room temperature, supply-air temperature, operating mode, and status.
- B. DDC Controller:
1. Provide DDC controller compatible with existing LONtalk control system.
  2. Safety Control Operation:
    - a. Smoke Detectors: Stop fan and close outdoor-air damper if smoke is detected. Provide additional contacts for alarm interface to fire alarm control panel.
    - b. Fire Alarm Control Panel Interface: Provide control to interface with existing fire alarm system.
  3. Economizer Outdoor-Air Damper Operation:
    - a. Occupied Periods: Open to 10 percent fixed minimum intake, and maximum 100 percent of the fan capacity to comply with ASHRAE Cycle II. Controller shall permit air-side economizer operation when outdoor air is less than 60 deg F. Use outdoor-air enthalpy to adjust mixing dampers. Start relief-air fan with end switch on outdoor-air damper. During economizer cycle operation, lock out cooling.
    - b. Unoccupied Periods: Close outdoor-air damper and open return-air damper.
    - c. Outdoor-Airflow Monitor: Accuracy maximum plus or minus 5 percent within 15 and 100 percent of total outdoor air. Monitor microprocessor shall adjust for temperature, and output shall range from 2- to 10-V dc.
- C. Interface Requirements for HVAC Instrumentation and Control System:
1. Interface relay for scheduled operation.
  2. Interface relay to provide indication of fault at the central workstation and diagnostic code storage.
  3. Provide LonWorks compatible interface for central HVAC control workstation for the following:
    - a. Adjusting set points.
    - b. Monitoring supply fan start, stop, and operation.
    - c. Monitoring VFD speed.
    - d. Outdoor air volume.
    - e. Inquiring data to include outdoor-air damper position, supply- and room-air temperature and humidity.
    - f. Monitoring occupied and unoccupied operations.
    - g. Clogged filter status.
    - h. Component failures.

## 2.11 ACCESSORIES

- A. Duplex, 115-V, ground-fault-interrupter outlet with 15-A overcurrent protection. Include transformer if required. Outlet shall be energized even if the unit main disconnect is open.

- B. Filter differential pressure switch with sensor tubing on either side of filter. Set for final filter pressure loss.
- C. Coil guards of painted, galvanized-steel wire.
- D. Hail guards of galvanized steel, painted to match casing.
- E. Differential pressure sensor.
- F. High pressure cut out switch.

## 2.12 CAPACITIES AND CHARACTERISTICS

- A. Supply-Air Fan:
  - 1. Airflow: 11,500 cfm.
  - 2. External Static Pressure: 1 inch w.g.
  - 3. Motor Horsepower: 7.5.
- B. Supply-Air Refrigerant Coil:
  - 1. Total Cooling Capacity: 246 mbh.
  - 2. Sensible Cooling Capacity: 304 mbh.
- C. Electric-Resistance Heating Coil:
  - 1. Capacity: 54 kW.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Equipment Mounting: Install RTUs on concrete base using elastomeric pads.
- B. Install differential pressure sensor between supply and return air ductwork in order to control VFD speed.
- C. Install high pressure cut off switch in supply air duct from unit. Set switch to shut down supply air fan in the event static pressure in duct exceeds setpoint.

### 3.2 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Report results in writing.

B. Tests and Inspections:

1. After installing RTUs and after electrical circuitry has been energized, test units for compliance with requirements.
2. Inspect for and remove shipping bolts, blocks, and tie-down straps.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

3.3 CLEANING AND ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site during other-than-normal occupancy hours for this purpose.
- B. After completing system installation and testing, adjusting, and balancing RTU and air-distribution systems, clean filter housings and install new filters.

END OF SECTION 237413

REQUEST FOR QUOTE #7457992

**BIDDING** (a) A single price shall be quoted for each item against which a proposal is submitted. This price will be the maximum in effect during the agreement period. Any price decline at the manufacturer's level shall be reflected in a reduction of the agreement price to the State. (b) Quantities, if any, are estimated only. The agreement shall cover the actual quantities ordering during the period. Deliveries will be billed at the single, firm, awarded unit price quoted regardless of the quantities ordered. (c) Bid price is net F.O.B. destination and shall include inside delivery at no extra cost. (d) Bids for single items and/or a small percentage of total items listed, may, at the State's sole option, be rejected as being non-responsive to the intent of this request. **ORDERING** (a) The User Agency(s) will submit individual orders for the various items and various quantities as may be required during the agreement period. (b) Exception - Regardless of any agreement resulting from this bid, the State reserves the right to solicit prices separately for any extra large requirements for delivery to specific destinations.

**DELIVERY**

DELIVERY OF GOODS OR SERVICES AS REQUESTED BY AGENCY.

**INSURANCE**

AN INSURANCE CERTIFICATE IN COMPLIANCE WITH PROVISIONS OF ITEM 31 (INSURANCE) OF THE GENERAL CONDITIONS OF PURCHASE IS REQUIRED FOR COMPREHENSIVE GENERAL LIABILITY, AUTOMOBILE LIABILITY, AND WORKERS' COMPENSATION AND MUST BE SUBMITTED BY THE SUCCESSFUL BIDDER(S) TO THE DIVISION OF PURCHASES PRIOR TO AWARD. THE INSURANCE CERTIFICATE MUST NAME THE STATE OF RHODE ISLAND AS CERTIFICATE HOLDER AND AS AN ADDITIONAL INSURED. FAILURE TO COMPLY WITH THESE PROVISIONS MAY RESULT IN REJECTION OF THE OFFEROR'S BID. ANNUAL RENEWAL CERTIFICATES MUST BE SUBMITTED TO THE AGENCY IDENTIFIED ON THE PURCHASE ORDER. FAILURE TO DO SO MAY BE GROUNDS FOR CANCELLATION OF CONTRACT.

NOTE: IF THIS BID COVERS CONSTRUCTION, SCHOOL BUSING, HAZARDOUS WASTE, OR VESSEL OPERATION, APPLICABLE COVERAGES FROM THE FOLLOWING LIST MUST ALSO BE SUBMITTED TO THE DIVISION OF PURCHASES PRIOR TO AWARD: \* PROFESSIONAL LIABILITY INSURANCE (AKA ERRORS & OMISSIONS) - \$1 MILLION OR 5% OF ESTIMATED PROJECT COST, WHICHEVER IS GREATER. \* BUILDER'S RISK INSURANCE - COVERAGE EQUAL TO FACE AMOUNT OF CONTRACT FOR CONSTRUCTION. \* SCHOOL BUSING - AUTO LIABILITY COVERAGE IN THE AMOUNT OF \$5 MILLION. \* ENVIRONMENTAL IMPAIRMENT (AKA POLLUTION CONTROL) - \$1 MILLION OR 5% OF FACE AMOUNT OF CONTRACT, WHICHEVER IS GREATER. \* VESSEL OPERATION - (MARINE OR AIRCRAFT) - PROTECTION & INDEMNITY COVERAGE REQUIRED IN THE AMOUNT OF \$1 MILLION.

**WAGE**

VENDOR IS ADVISED THAT ALL PROVISIONS OF TITLE 37 CHAPTER 13 OF THE GENERAL LAWS OF RHODE ISLAND APPLY TO THE WORK COVERED BY THIS REQUEST, AND THAT PAYMENT OF THE GENERAL PREVAILING RATE OF PER DIEM WAGES AND THE GENERAL PREVAILING RATE FOR REGULAR, OVERTIME, AND OTHER WORKING CONDITIONS EXISTING IN THE LOCALITY FOR EACH CRAFT, MECHANIC, TEAMSTER, OR TYPE OF WORKMAN NEEDED TO EXECUTE THIS WORK IS A REQUIREMENT FOR BOTH CONTRACTORS AND SUBCONTRACTORS.

**START**

STARTING DATE \_\_\_\_\_ NO. OF WORKING DAYS REQUIRED FOR COMPLETION \_\_\_\_\_.