SECTION 16460

TRANSFORMERS

PART 1 - GENERAL

1.01 SUMMARY

Work Included: All labor, materials, appliances, tools equipment necessary for and incidental to performing all operations in connection with furnishing, delivering and installation of the work of their Section, complete, as shown on the drawings and/or specified herein.

1. Examine all other specification section and drawings for related work required to be included as work under Division Sixteen.

2. General provisions and requirements for electrical work.

1.02 REFERENCE: MANUFACTURER — Olsun Electrics as represented by Engineered Power Sales

1.03 SUBMITTALS

Shop Drawings: Include manufacturer, catalog number, dimensions, enclosure type, finish winding material, type of core steel, insulation class, design temperature, K-Factor rating and taps provided.

1.04 APPLICABLE STANDARDS

Transformers shall be constructed in accordance with the relevant NEMA and ANSI specifications and must be UL Listed with a 220 degrees C insulation system

PART 2- PRODUCTS

2.01 Furnish and install dry type insulating transformers of the voltage, phasing and KVA as shown on the drawings.

2.02 The transformer cores are to be constructed of high grade, non-aging silicon steel laminations with high magnetic permeability, and low hysteresis and eddy current losses. Electrical steel graded M-6 or better shall be used. Magnetic flux densities are to be kept well below the saturation point. The core shall not saturate even when the transformer is subjected to 110 percent of nameplate voltage. The core shall be of the cruciform configuration. The core laminations shall be clamped together with heavy structural steel angles.

2.03 All transformers shall have a full load temperature rise of 115 degrees C above a 30 degrees C average ambient and a maximum ambient of 40 degrees C. All insulating materials used shall have a minimum UL 220 degrees C system rating. The temperature rise shall be designated on the transformer nameplate.

2.04 The trans windings shall be electrical grade copper. The coils shall be barrel wound and have an outer wrap of insulating material when the BIL level specified is 30 KV or below. Transformers with a BIL level higher than 30 KV shall have their primary wound in a disc effect of short circuit currents. The coils shall be impregnated with a 220 degrees C UL recognized insulating varnish and thoroughly baked.

2.05 Primary taps shall be full capacity, with a minimum of 2-2.5% above and below normal high voltage rating.

2.06 The enclosure shall be constructed of heavy gauge sheet metal in accordance with the latest NEMA, ANSI, and UL requirements for dry type transformer enclosure. Bases for general

purpose transformers shall b fabricated of 12 gauge steel; substation transformer enclosures shall be manufacture of structural steel. Suitable lifting means shall be provided. The enclosure shall be 1) cleaned and phosphatized, 2) water rinsed, 3) coated with a non-chromated seal, 4) powder coated with ANSI 61 gray paint to a thickness of approximately 1 2 mils and 5) powder paint finish is to be baked for 20 minutes at 375 degrees F. Paint shall be UL recognized for outdoor service.

2.07 The transformer enclosure shall be NEMA 1 or NEMA 3R. When the enclosure is required to be NEMA 3R, the entire assembly shall be UL Listed for outdoor application. All equipment exposed to the weather shall be provided with NEMA 3R enclosures whether or not shown on the drawings. Equipment located in rooms, building cavities or closets without doors or protection from the weather shall be provided with NEMA 3R enclosures.

2.08 Sound levels of the transformers shall be guaranteed by the manufacturer not to exceed the standards established by NEMA. The core and coils of all transformers above a rating of 25 KVA shall be isolated from the enclosure by vibration pads.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Transformer core frame shall be installed level.

B. Mounting bolts on floor mounted transformers shall be extended into pads only and shall not be in direct contact with building structural members.

C. Flexible jumpers shall be installed for grounding continuity from enclosure to conduits or bus ducts where required.

D. Liquid tight flexible metal conduit shall be used on both feeders on primary and secondary side of transformer.

E. For Floor-mounted transformers, we recommend type E isolator, with 0.3 inch static deflection. Type E is a neoprene isolator incorporating a steel housing capable of resisting a seismic load of 1.0 G in all directions. The mount shall consist of a captive steel insert embedded into a neoprene element which is enclosed by a steel housing which also includes floor mounting holes. The isolator shall have a rated deflection of 0.15 inches compression, 0.12 in tension and 0.09 inches in shear.

3.02 VOLTAGE CHECK

The Contractor shall set the taps on all transformers which are a part of this contract, as necessary to provide satisfactory operating voltages with all present loads energized, including the new loads and any existing loads. A check shall be made in the presence of the Engineer at a panel fed from each transformer which is the farthest from the transformer. Voltages at the transformers ranging from 118 to 122 Volts inclusive, for 120 volt systems and proportionately equivalent for higher voltage systems are acceptable]

END OF SECTION

SECTION 16500

LIGHTING FIXTURES

PART 1 - GENERAL

1.01 GENERAL

A. Provide light fixtures complete including lamps, ballasts, sockets, housing, ceiling trim rings for special ceilings, brackets, diffusers/ lenses and outlet boxes.

B. The catalog numbers included in the description of the various types of lighting fixtures shall be basically considered to establish the type or class of the fixture with a particular manufacturer only. The fixture length, number of lamps, component materials, accessories, mounting type and all other features required to fulfill the total description of the fixture based on all drawing and specification information shall be complied with regardless of whether or not the catalog number specifically includes these features. If any conflict exists between the catalog number and the description, the Contractor shall either resolve the conflict with the Architect prior to submittal of his bid or furnish the fixture to meet the intent as later interpreted by the Architect without change in contract price.

C. Lighting fixtures shall be of types as indicated in fixture schedule on drawings.

D. All fixtures of one type shall be of one manufacturer and of identical finish and appearance, unless indicated otherwise on drawings.

1.02 SCOPE

A. Work Included: All labor, materials, appliances, tools, equipment necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other specification sections and drawings for related work required to be included as work under Division Sixteen.

2. General provisions and requirements for electrical work.

1.03 SUBMITTALS

A. If requested by the architect, provide a sample of any fixture proposed as a substitution for a specified fixture. Sample fixture shall be complete with lamps, cord and plug for 120 volt operation. Fixture shall be delivered to the Engineer's office for review and shall be picked up within ten (10) working days after review comments have been received; any samples left over this time will be discarded by the Engineer. Decision of Engineer regarding acceptability of any fixture is final.

B. Provide complete manufacturers catalog data information for each light fixture, ballast and lamp.

PART 2 - PRODUCTS

2.01 BALLASTS (HID & FLUORESCENT)

A. Fluorescent fixtures shall be equipped with ETL approved C.B.M. certified high ballasts. Ballasts shall have Class "P" protection. Where not available provide dual element fusing. Ballast shall be sound rated "A". Fluorescent ballasts shall be full light output rated.

B. High intensity discharge ballast shall be suitable for -20F starting be a high power factor type ballast. Voltage required per drawings, and low noise type.

2.02 LAMPS

A. Provide lamp as specified on drawings, and shall be energy saving type except when fixture is to be dimmed, provide standard lamps.

B. Mercury vapor lamps shall be Deluxe White or Bright White Deluxe phosphor coated Bonus-Line with proper base and configuration for the fixture being furnished. Lamps shall be equipped with automatic switching device to de-energize lamp when outer glass envelope is broken on lamp.

C. High pressure sodium lamps shall be clear unless noted otherwise on drawings.

2.03 LIGHT FIXTURES

A. Lighting fixtures shall have all parts and fittings necessary to complete and properly install the fixture. All fixtures shall be equipped with lamps of size and type specified.

B. Fixtures shall be wired from outlet boxes supplied with fixture to socket with #14 AWG Underwriters' Type "AF" or "CF" fixture wire.

C. Surface and/or wall mounted lighting fixtures shall not have any exposed chase nipples or conduit knockouts visible to view within fixture housing. Lighting fixtures mounted in continuous rows shall have chase nipples or conduit knockouts between lighting fixture housing, but shall not have visible chase nipples/conduit knockouts on the visible ends of the continuous row of lighting fixtures.

D. Where fixture color is indicated to be selected by the Architect, provide two color chip samples for review.

E. Recessed fixtures where noted to have attached junction box shall have a junction box permanently attached to the plaster ring so that it is accessible when the fixture is removed. Connection between fixture and pull box to have flexible conduit and 2 #14 AWG "AF" wires. The flexible conduit to be sufficient length so that when the fixture is dropped, the pullbox is readily accessible.

F. Recessed fixtures must all have Underwriters' Laboratory approval for recessed installation with plaster frame and attached pull box. Lamp enclosure, reflectors and finish wiring shall not be installed until plastering is completed. Finish trim shall not be installed until finish painting of the adjacent surface is completed.

G. The fixture to bear Underwriters Laboratories' label of approval for the wattage indicated.

H. Light fixtures installed outdoors in damp or wet locations shall be U.L. labeled for said location.

2.04 LENS AND DIFFUSERS

A. Diffusers shall be formed from cast sheet having a minimum unpenetrated thickness of 0.125" and, in any event, shall be of sufficient thickness and or proper construction and camber to prevent the diffusers from having any noticeable sag over the entire normal life of the installation.

B. Acrylic lenses shall be manufactured from 100% acrylic as manufactured by Rohm & Hass, called Plexiglas V, V Type 920, VM, or an approved equal by either injection molding or by extraction.

PART 3 - EXECUTION

3.01 LIGHT FIXTURE MOUNTING HARDWARE

A. It is the Contractor's responsibility to verify actual ceiling construction type as defined on the architectural drawings and furnish all lighting fixtures with the correct mounting devices and proper operating voltage whether or not such variations are indicated by fixture catalog number. The Contractor shall verify depth of all recessed lighting fixtures with architectural drawings prior to ordering fixtures. Any discrepancies that would cause recessed lighting fixtures not to fit into ceiling shall be reported to the Architect prior to ordering of the fixtures.

B. Recessed fluorescent fixture mounted flush in "lay-in" T-bar or concealed spine ceilings shall be provided with two clips on each end of the fixture and connected to the ceiling cross runners. Provide two 12-gauge fixture hanger wires attached to structural members and connect to diagonal corners of the fixture. Fixture shall set level and flush with ceiling grid system.

C. Fluorescent fixtures surface mounted to a suspended "tee" ceiling shall be installed with a one and one-half inch steel channel or angle which spans across and above the main runners. The channel or angle member shall be provided with threaded studs for attaching to the fixture housing through the lay-in tile. Two members shall be installed per four foot fixture. Two 12-gauge hanger wires shall be provided per member, attached 6" from each end of the member and anchored to the structure above.

D. Pendant mounting fixtures shall be supplied with swivel hangers. Fixture shall swing in any direction a minimum of 45 degrees of gravity, position. Fixtures shall have special stem lengths to give the mounting height indicated on the drawings. Stem to be 1-piece without coupling, and to be finished the same color as the canopy and the fixture, unless otherwise noted. The Contractor shall check all lock-nuts and set screws to rigidly secure the socket to the stem, and the stem to the outlet box. Fixtures to be plumb and vertical. Where obstructions occur restricting 45 degrees swing of fixtures, the fixtures shall be guy wired to prevent fixtures from striking obstructions. Method of guying shall be approved by the Architect and Electrical Engineer. Swinging fixtures shall have a safety cable attached to the structure and the fixture at each support capable of supporting four times the vertical load.

E. Suspended fixtures weighing in excess of 50 pounds shall be supported independently of the fixture outlet box. Provide "air craft" hanger cable for suspended fixtures route cable concealed or in pendant where possible. Each cable shall support four times the weight of the fixture. Securely attach the cable to the building structure.

F. On acoustical tile ceilings, fixture outlets shall be accurately located in the center, at the intersection of the four corners or at the center of the joints of two tiles.

G. Surface mounted fixtures installed on drywall or plaster ceilings and weighing less than 50 pounds may be supported from outlet box. Provide structural supports above drywall or plaster ceilings for installation of fixtures weighing more than 50 pounds and secure fixture to structural supports. The use of toggle bolts is prohibited.

H. The electrical Contractor shall aim the exterior adjustable lighting fixtures after dark in the presence of, and at a time convenient to the Architect.

3.02 RECESSED LIGHTING FIXTURES

A. Lighting fixtures recessed in ceiling or wall which has a fire resistive rating of 1 hour or more shall be enclosed in a box which has a fire rating equal to that of the ceiling or wall. The space from the fixture to the enclosure to be a minimum of 3" and the light fixture to

be provided with Advance Mark III Kool-Koil ballast (full light output).

3.03 LAMPS

A. Fluorescent and H.I.D. lamps controlled by dimming equipment shall be operated (aged) for 100 continuous hours without interruption, at 100% output prior to occupancy of the building by the Owner.

B. Energy saving fluorescent lamps shall not be used in dimming systems.

3.04 LENS AND DIFFUSERS

A. Lens and diffusers shall be completely cleaned of all dust, dirt and fingerprints after the installation of the light fixtures, ceiling, painting, lamps, and prior to occupancy of the facility by the Owner.

3.05 BALLASTS

A. Ballasts remote from the lighting fixture, mounted as shown on the drawings and designed for remote operation. Additional wiring and conduit shall be provided whether shown on the drawing or not, between lighting fixture and remote ballasts with required quantity of "THHN" wire to operate said fixture(s).

B. Provide proper type and quantity of conductors with conduit system for proper operation of dimming system, whether or not shown on drawings.

C. Contractor shall tandem wire (1) one lamp or (3) three lamp fluorescent fixtures when fixture is recessed mounted and within (8) eight feet of each other or if surface or pendant mounted within (1) one foot of each other. To accomplish tandem wiring, a tandem wiring harness shall be installed between inboard master ballast and inboard slave lamp located in adjacent fixture. Night light or emergency light fixtures shall not apply.

END OF SECTION

SECTION 16621

STANDBY POWER WITH FUEL TANK

PART 1 - GENERAL

1.01 DESCRIPTION

* Division 1 applies to this Section. Provide standby power complete as indicated, specified, and required.

A. Work In This Section. Principal items include:

1. Furnishing and installation of an emergency continuous standby diesel engine driven generator with all accessories and other appurtenant work and material required for a complete installation.

2. The standby power system shall include an electric generating set rated to deliver 80 kW (100 KVA) at 0.8 power factor, engine 130 Bhp minimum, 4 cylinders at 1800 RPM. Rating shall be based on the continuous standby rating at the altitude of the generator installation site. The voltage shall be 277/480 volts, 3 phase, 4 wire, and 60 hertz. The generator set shall be built, tested and shipped by a single manufacturer so there is one source of supply and responsibility. As manufactured by Cummins/Onan or Caterpillar.

1.02 SUBMITTALS

A. The factory authorized Distributor supplying the equipment shall employ full service and parts capability on a 24-hour basis and shall instruct the involved contractors on the proper method of installing the engine generator set and related equipment.

1. The supplier shall provide documentation of maintaining local 24-hour parts and factory-trained service personnel within a 100 mile radius of the project site with his submittal.

B. Submit one set of reproducible transparencies of emergency generator set and all accessories.

C. Make shop drawings to scale, showing overall dimensions and other dimensions required for proper installation of equipment. Identify clearly each item on drawings to show piece of equipment it represents. Indicate corrosion resisting treatment and finish.

D. Contractor shall include complete layout of room and/or area where new equipment is being installed indicating equipment layout, conduits, junction boxes, etc., complete with dimensions and clearances for review of the Engineer.

E. Wiring Diagrams: Submit one set of reproducible transparencies of wiring diagram(s) of emergency generator and all accessories.

F. Diagrams shall be schematic and point-to-point using standard symbols and with components arranged in logical sequence, so that system operation can be checked easily. Where special symbols are used or where function of components is not obvious, include suitable legend or functional guide. Number all terminal for external wiring connections on diagrams. A composite control wiring diagram shall be provided showing

the integrated control and load connection for the following:

1. Engine generator and control panel.

2. Engine generator annunciator panel.

3. Automatic transfer switch.

4. Battery charger.

5. Special interlocks noted on drawings.

G. Submit certified prototype test reports for engine generator unit of identical size, type and construction showing conformance with performance requirements:

1. Maximum power level.

2. Maximum motor starting capacity.

3. Fuel consumption.

4. Engine/alternator cooling air flow (heat rejection).

5. Transient response and steady state governing.

6. Alternator temperature rise.

7. Single step load pickup.

8. Harmonic analysis and voltage wave form.

9. Three phase short circuit test for mechanical electrical strength.

H. Operating Manuals:

1. Provide in acceptable form, three (3) bound copies of operating manuals for electrical equipment.

2. Provide catalog cuts, functional description of operation, wiring diagrams, operating and maintenance instructions, parts lists and other data useful and necessary for complete maintenance and operation of equipment.

3. Deliver operating manuals to the Architect.

I. Manufacturer shall have printed literature and brochures on the complete unit describing the standard series specified.

J. Critical Speeds: Each complete electric generating unit shall be free of critical speeds of either a major or minor order that will endanger the satisfactory operation of the unit or cause undue vibration in any part of the plant equipment or structure. Satisfactory operation will be considered endangered if torsional vibration stresses exceed 5,000 psi within 10 percent above or below rated engine speed. Copies of a summary of computations of critical speeds shall be submitted upon request.

K. All openings for fuel lines, air, exhaust, conduits, etc., shall be capped or plugged prior to

shipment.

L. South Coast Air Quality Management District (SCAQMD) requirements:

1. The standby power system shall conform to all requirements of SCAQMD for standby generators.

2. The generator supplier shall equip the engine generator with necessary devices to meet the current SCAQMD regulations for operation of a standby generator.

3. Supplier shall provide contractor with engine data needed to obtain permit. The contractor shall submit application, pay for, and obtain a SCAQMD permit to construct and operate the standby power system.

4. If generator is located within 328 feet from a K through 12 school or day care, the generator manufacturer is to equip the exhaust system with a combination PM trap muffler. PM emissions shall not be greater than 0.01g/bhp-hr.

5. If generator is located within 1,000 feet of outer boundary of a K through 12 school or day care, the manufacturer will issue a note to the facility that a generator will be installed and issue a 30 day public notice.

PART 2 - PRODUCTS

2.01 ENGINE

A. The engine shall be compression ignited diesel, four cycle only, 1800 RPM, water cooled type with unit mounted radiator, turbo-charged and after cooled for operation in 120EF ambient. Engine speed shall be governed by a Barber Coleman electronic governor with electric activator, or equal by Woodward Governor Company. A unit mounted, 12 volt, 65 ampere battery charging alternator and solid state regulator shall be provided. Engine shall be rated for continuous standby duty and shall include the horsepower required to operate the engine radiator cooling fan, cooling water pump, battery charging alternator, lubricating oil pump, filters, silencers and other engine driven accessories at generator synchronous speed.

B. The engine lubrication system shall be pressure type with engine driven lubrication oil pump and replaceable element, full flow oil filter. A breather pipe suitable for adding engine lubricating oil while the engine is running shall be provided. Provide lubricating oil per manufacturers recommendations.

2.02 COOLING

A. The engine shall have an engine driven centrifugal type water circulating pump with bypass, for circulating thermostat controlled water through the engine cooling system.

B. Radiator Cooling: A unit-mounted radiator and pusher type fan shall be provided for full load continuous standby operation in an ambient temperature of 120 degrees Fahrenheit. Provide a fan shroud and protective guard. Provide radiator drain petcock and pressure relief filler cap, and 50% permanent solution anti-freeze protection.

C. The pusher radiator fan shall be sized to provide proper cooling air flow to overcome the static back pressure of the supply and exhaust cooling air ducts and louvers associated with the engine generator installation.

2.03 ALTERNATOR

A. The alternator shall be a revolving field, broad range, 4 pole, two-thirds pitch, brushless, subtransient reactance not to exceed 0.10, low voltage waveform distortion and maximum efficiency. The rotor amortissuer windings shall improve the AC waveform;

reduce field heating with single phase or unbalanced loads. The rotor shall be dynamically balanced, connected and aligned to the engine by a semi-flexible disc coupling. The three phase alternator shall be twelve lead reconnectable. The insulation shall be class H per NEMA MG1-1.65. Temperature rise 115° centigrade per NEMA MG1-22.40. Insulation shall be vacuum impregnated for improved protection and cooling.

B. The exciter shall be brushless, 3 phase, full wave rectified, with silicon diodes mounted on common rotor shaft and sized for maximum motor starting.

C. Provide permanent magnet generator (PMG) for power to voltage regulator to provide isolation from non-linear loads and sustain main field excitation power for optimum motor starting and to sustain short circuit current at 300% for 10 seconds.

D. The automatic voltage regulator shall be temperature compensated, three phase sensing, solid-state asynchronous pulse width modulated. The system shall feature automatic voltage reduction if the load demand exceeds the engine capacity to eliminate engine stalling due to temporary overload such as motor starting. The regulator shall allow frequency to decline to 58 Hz before correcting the output voltage in a linear volts/hertz manner. The regulator shall prevent overheating or blowing of fuses if the load circuit due to saturation of magnetic components when the voltage remains constant at reduced frequency.

E. The regulator shall be insensitive to load induced wave-shape distortion from "SCR" type loads on the generator. The system shall be capable of operating UPS system and electronic ballasts for fluorescent lighting as indicated on plans.

2.04 ENGINE CONTROLS

A. Oil pressure gauge.

B. Oil temperature gauge.

C. Coolant temperature gauges.

D. DC voltmeter.

E. Engine speed (rpm)

F. Engine starts counter.

G. Solid state, microprocessor controlled monitor system including visible pre-alarms prior to engine shutdown for low water temperature, low oil pressure, high water temperature, and low fuel. Engine shutdown and manual reset with visible fault lights and individual alarm terminals for overcrank, overspeed, high water temperature, and low oil pressure. Over speed shall provide positive fuel supply shut-off at approximately 110% RPM of operating.

H. Solid state plug-in type cycle cranking control. After 3 cranking attempts of approximately 15 seconds each, the crank/rest cycles will be terminated and locked out with alarm and manual reset. Cranking shall cease upon engine starting and running. Two means of cranking termination shall be provided, one as a backup to the other.

2.05 GENERATOR CONTROLS

A. Provide emergency stop push-button.

B. Manual reset exciter circuit breaker.

C. Voltmeter.

D. Ammeter

E. Wattmeter

F. Combination voltmeter-ammeter selector switch.

G. Elapsed running time meter. 0-99999 hours minimum

H. Frequency meter. (True relative to engine speed)

I. Voltage adjusting rheostat, plus or minus 5% rated voltage and voltage regulator.

J. Provide the necessary relays, controls and wiring to initiate shutdown and indicate on control panel upon:

1. Overvoltage of 110% for ten seconds

2. Undervoltage below 85% for ten seconds

3. Underfrequency below 90% for twenty seconds

4. Overcurrent over 110% on any phase for 60 seconds.

K. Provide necessary relays, controls and wiring to close dry control contact if generator maintains rated KW for 5 seconds or if frequency is below 59 hertz for 5 seconds. Indicate overload on control panel.

L. Cranking controls.

M. Output circuit breaker mounted in NEMA I enclosure on the side of the generator control panel and within the generator weather protective housing. Circuit breaker shall be molded case type with solid state protection with adjustable inverse time delay trip characteristics and instantaneous trip to provide optimum alternator protection; UL listed. Provide one each auxiliary contacts to indicate breaker position and tripped condition.

N. AC meters shall be RMS indicating not less than 2 2 inches, 1% accuracy.

O. Three position control selector switch "Automatic-Off-Run". When the switch is in the "off" position a red pilot light shall activate with a nameplate "Generator not in automatic".

P. Remote stop-start connection terminals.

Q. Reset push-button to reset automatic shutdown lockout circuits.

R. Exposed control wiring shall be enclosed in plastic, flexible protective covering.

S. All controls shall be identified as to function by nameplates or engraved control panel.

T. Combination engine and generator control panel shall be shock mounted over the rear end of the alternator, and include switched panel lights. Controls shall be microprocessor solid state type.

2.06 UNIT PERFORMANCE

A. Frequency Regulation: Isochronous no-load to rated load.

B. Voltage regulation: Shall be within plus or minus 0.5% of rated voltage from no-load to full rated load.

C. Recovery to stable operation after application of full rated load shall occur within 4-10 seconds.

D. Steady State Operation: The frequency variation shall not exceed plus or minus 0.25 Hertz and voltage variation plus or minus 0.5% of their mean value for constant loads from no load to full rated load.

E. Electromagnetic Interference Level: Attenuation shall exceed requirements for data processing equipment, standard AM radio, television and marine radio-telephone equipment. Telephone influence factor shall be less than 50 per NEMA MG1-22.43.

F. Total harmonic distortion from no load to full load shall not exceed 5% of rated voltage (L-N, L-L, L-L-L) and no single harmonic shall exceed 3% of rated voltage.

2.07 ACCESSORIES

A. Batteries: Starting batteries shall be lead acid type. Batteries shall provide sufficient capacity to provide three cranking cycles with a cold engine and final battery voltage of 1.75 volts per cell at 77 degrees F. Specific gravity of fully charged battery shall not exceed 1.220 at 77 degrees F. Provide insulated stranded copper conductors to connect batteries to generator electric starting motor sized per manufacturer's recommendation. Batteries shall be mounted within base rails of engine generator.

B. Battery Charger: Completely solid state. DC output shall be voltage regulated and current limited so as not to require a cranking disconnect relay. The charger shall include: full wave output, silicon semiconductors, automatic boost equalize mode, surge suppression, individual potentiometer adjustments for boost and float voltage, DC output voltmeter and ammeter, AC & DC fuse, input and output terminals, DC output completely isolated from AC input, and shall be capable of charging batteries within a 12 hour period, which have been discharged to zero volts. Input voltage shall be 120 volts, as indicated on the drawings. Charger shall be UL listed and mounted within generator housing.

C. DC voltage monitor: To detect sustained low voltage (15 VDC or less) during engine cranking and indicate weak battery on control panel. Indicate high and low DC voltage on control panel.

D. Engine Muffler: Critical grade exhaust silencer with companion flanges, raincap, and seamless stainless steel flexible exhaust tubing, 18" minimum length. Provide approximately 8" length of rigid schedule 40 black iron pipe between the exhaust manifold and the flexible tubing. Sweep elbows a minimum radius of three times the exhaust pipe diameter shall be used for exhaust pipe bends. Provide safety guards on exposed exhaust manifolds.

E. Provide spring type vibration isolators suitable for Zone 4 earthquake condition at the jobsite. Furnish certified anchor calculations.

F. The water jacket engine preheater shall provide positive water circulation, thermostatically controlled to operate within range of 100 degrees to 120 degrees F. 120 volts AC, single phase, equipped with power cut-off relay. Provide shut-off valves on heaters at both the inlet and outlet sides. Unit shall be U.L. listed and readily accessible.

G. The generator shall be completely housed in a weather-protective enclosure with at least 4 hinged, removable doors and rear hinged control panel door. Silencer shall be side inlet type, mounted on top of housing and terminate with rain cap. Engine exhaust going through housing shall be provided with a suitable rain shield to prevent water from entering the housing. Louvers shall be fixed type. Provide locking provisions on all doors.

H. 250 gallon sub-base fuel tank with electrical stub up area for cable entry. Tank shall be double wall and include level gauge, low level contacts wired to control panel, rupture

basin alarm contacts wired to control panel, basin drain, all fuel lines, fill cap, drain valve, vents, UL label and other necessary items.

I. Radiator, engine and alternator shall be mounted on a twin steel beam base. Base shall be suitable for lifting, hoisting, or skidding of the entire unit into installation position.

J. Replaceable dry element intake combustion air filters.

K. Remote annunciator, NEMA 1, shall include the following lights:

1. Generator supplying load.
2. Overcrank (Shutdown)
3. Low Oil Pressure (Pre-Alarm)
4. High Oil Pressure (Shutdown)
5. High Engine Temperature (Prealarm)
6. High Engine Temperature (Shutdown)
7. Overspeed (Shutdown)
8. Low Fuel (Prealarm)
9. Low Battery Voltage (Alarm)
10. High Battery Voltage (Alarm)
11. Not In Auto (Alarm)

2.08 FINISH

Engine generator set shall have a manufacturer's finish paint color. Housing shall have a rust inhibitor prime coat and finish paint coat of manufacturer's standard color.

2.09 SOUND ATTENUATED DUCT SILENCERS

Provide straight through design air intake and discharge silencers, sized for a maximum pressure drop of 0.25 on discharge and 0.19 on intake. Silencers shall be constructed from galvanized sheet steel with a factory applied self etching primer. Silencers shall have dynamic insertion loss characteristics to reduce the noise to 60 dB (A) at 25 in front on discharge. Utilize acoustic insulation with a flanges to install ducts to generator room walls. Provide removable galvanized bird screen on both ducts. The silencers shall be Sound Tech AHushduct≅ Model RE1A or pre-approved equivalent. The silencers shall be provided by the generator supplier.

PART 3 - EXECUTION

3.01 ENGINE-GENERATOR TESTS

A. Before delivery to the site, the set shall be given a preliminary operation and load test. The test shall be performed by an approved testing laboratory. The test shall include full load test with a load bank of adequate capacity and shall assure performance of all specified function to the satisfaction of the Architect. Upon completion of the preliminary tests, the unit, complete with equipment, shall be delivered and installed at site by the Contractor. Provide four copies of complete test records. A copy shall be framed and mounted in the unit by the Contractor. All shop load tests must be run at 80% lagging power factor.

B. Upon completion of the installation work, including the electrical connections, and grounding of equipment and neutral, the Contractor shall provide all necessary facilities, instruments and equipment, including full capacity load bank required for the load tests, and arrange for final tests runs. Field tests are to be run at unity power factor with Contractor provided unity power factor load bank, and fuel.

1. Generator shall start and pick up full load at normal voltage and frequency within ten seconds, from a cold start. (No prerunning within the last 12 hours prior to the test).

2. Load test at 0, 1/4, 2, 3/4 and full load until readings are constant for 10 minutes

3. Two hour 100% continuous full load test conducted immediately after completion of the above tests.

C. Readings required during the load tests shall be taken on recently calibrated instruments as well as those on the equipment and shall include:

1. Frequency.

2. Voltage.

3. Current.

4. Wattage.

5. Ambient temperature.

6. Water jacket temperature.

7. Oil pressure.

8. Frequency and voltage tests shall include a record of response time recovery from load changes.

9. All adjustments, replacement of unsatisfactory equipment, and retesting shall be made by the Contractor at his own expense.

D. Before acceptance of set, the Contractor shall instruct the owner's maintenance forces in the operation and maintenance of this equipment. Three complete written instructions manuals, operating schedules, parts lists blueprints, wiring diagrams, maintenance/repair manuals, engine and generator specifications including actual performance curves shall be submitted to the Architect before final approval.

E. Perform tests as specified and as requested by the Architect to prove installation is in accordance with contract requirements. Perform tests in presence of the Architect, and furnish all test equipment, facilities, and technical personnel required to perform tests.

3.02 GENERATOR INSTALLATION

A. The engine-generator shall be mounted on spring isolators and anchor bolts having telescopic top and bottom housing with vertical stabilizers to resist lateral and vertical forces. This is to be constructed of shatterproof ductal iron per AST4-A-536 grade G5-4-12, type RJ from California Dynamic Corporation or equal.

B. Generator engine shall have a crankcase drain pipe that is at least 8" from the floor, equipped with a readily accessible positive locking shut-off valve. All units shall have a removable full length drip pan under the engine.

C. Provide expansion type or cast in place type anchor bolts to anchor generator to

equipment slab. Installation shall comply with seismic requirements of California Administrative Codes (CAC) Title 21 and Title 24.

3.03 TRAINING

The generator factory trained service personnel shall perform two field inspections and service maintenance visits at six twelve calendar months after the generator testing is complete. The manufacturer's standard recommended maintenance procedures shall be performed as part of the contract requirements. A letter certifying the work has been completed and shall be sent to the Architect after each visit.

*****END OF SECTION*****

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SECTION 16723

FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Provide and install a complete and properly operating fire alarm system within new building that ties into existing buildings fire alarm system as described herein.

1.02 QUALITY ASSURANCE

A. Manufacturer: Notifier Co. or equal by Simplex or Pyrotronics.

1. All equipment shall be by the Notifier Company.

B. Installer:

1. All conduit, wire wiring and erection of equipment shall be by the electrical contractor.

2. Installation company shall be U.L. listed (UUJS).

C. Codes and standards: The system shall conform to all local and state codes for file alarm systems.

1.03 SUBMITTALS

A. Submit redrawn building floor plan for entire building, same scale as the contract drawing. Drawings shall be on reproducible sepias. Plans shall show walls, doors, windows and all fire alarm system equipment locations. Show interconnecting conduit, conduit sizes, wire size and quantity between all components. Plans shall be drawn to the satisfaction of the local fire department having jurisdiction, and shall be based upon the most up-to-date floor plans available.

B. Shop Drawings: Submit manufacturer's literature completely describing fire alarm system components, equipment, and accessories.

C. As-built wiring diagrams shall be provided to the Owner prior to the completion for the project.

D. Instructions to the Owner on the systems operation shall be by manufacturer.

E. Submit plans and catalog data to the local fire department having jurisdiction and make modifications as necessary to comply with their requirements.

1.04 APPLICABLE STANDARDS

A. The equipment shall be listed, labeled, and approved for their application shown in contract documents, as fire alarm equipment complying with requirements of NFPA 72A, 72B, 72C, 72E, and UL and the State Fire Marshal.

B. Written certification by the fire alarm equipment manufacturer shall be submitted to the Architect, stating that the system and its component parts are listed and approved by the State Fire Marshal and the installation has been tested, is operational and conforms to the requirements as set forth in Part 2 Article 24. Title 19, California Administrative Code.

1.05 GUARANTEE

A. Maintenance and warranty of all equipment and installation shall be one year from date of acceptance by the Owner. All malfunction, broken or defective parts not caused by accident, misuse or negligence during the guarantee period shall be replaced or repaired without charge to the Owner

PART 2 - PRODUCTS

2.01 GENERAL SYSTEM OPERATION

A. Alarm Conditions:

1. Actuation of any manual or automatic alarm initiating device, connected to the system shall cause the following automatic functions.

a) All alarm signaling units shall activate continuously.

b) Activate the central alarm system.

c) Release all magnetic door hold-open devices.

d) Activate spare dry contacts for remote system.

e) Close associated smoke fire dampers.

f) Duct detectors in addition to the above "a" & "e" shall shut down their respective air handler.

g) Flow switch in addition to the above "a-e" shall sound the sprinkler bell.

h) Activate elevator recall ans shunt trip required functions.

B. Trouble Condition:

1. A break or short in a manual or automatic fire initiating wiring circuit shall light the respective zone trouble lamp on the fire alarm control panel and sound a trouble signal at the control panel.

2. A break or short in the evacuation alarm signaling wiring circuit shall light the trouble lamp in the control panel and sound a trouble signal at the control panel. A signaling circuit "activated" lamp shall be provided for each signaling loop for system testing and trouble signaling in the control panel.

3. 120 Volt., AC normal power shall be monitored with indicating by a "power on" lamp. Upon normal power outage, the system shall light a power trouble condition lamp, and indicate a trouble condition.

4. The control panel shall monitor the standby batteries and, upon a low battery condition, light the low-battery battery lamp and indicate a trouble condition.

5. System ground detection shall be provided for the entire system. Upon ground detection, the ground detection lamp shall light and a trouble signal shall sound.

C. Equipment shall be weatherproof gasketed where installed in locations exterior to the building, or where indicated on the drawings. Weatherproof equipment shall be tamper resistant.

2.02 FIRE ALARM CONTROL PANEL: Notifier

A. The fire alarm control panel shall be modular in design, with all electronic, solid-state circuitry, having the following:

B. Analog addressable technology.

C. Supervised annunciator module.

D. Modules and Control panel shall provide zones and operations are indicated on the plans.

2.03 ANNUNCIATOR: Notifier LCD-80 or NCA

A. Furnish and install as indicated on the plans.

B. Custom zone descriptions shall be as shown on plans.

C. 80 character liquid crystal display.

2.04 MANUAL PULL STATIONS: Notifier NBG-12LX

A. Dual-action pull stations shall be non-coded, semi-flush mounted with breakglass rod and recessed pull lever.

B. Keyed reset shall be the same as the main FACP.

2.05 ALARM SIGNALS: Wheelock: AS-24 and RSS series

A. Audible-Visual alarm signals shall consist of horn and high intensity light as shown on the plans.

B. Visual alarm shall be UL1971 listed minimum 15, 30, 75, 100, 110 Candela as required.

C. All strobe lights shall be synchronized.

2.06 SMOKE DETECTORS: Notifier FSP-751

A. Ceiling mounted smoke detectors shall be analog photoelectric type complete with base.

B. Duct mounted smoke detectors shall be complete with Remote Test Station. Install the remote test station RTS-451/KEY on the wall at 6 ft. above finished floor as near as possible directly beneath each duct mounted detector mounted above the ceiling.

2.07 WATERFLOW ALARM SWITCHES: Notifier WFD

A. Furnish and coordinate installation with the sprinkler Contractor.

B. Switches shall be vane type with retard, sized for the pipe.

2.08 VALVE TAMPER SWITCHES: Notifier OSY2/PIV2

A. Furnish and install sprinkler system valve tamper switches as indicated on the plans.

2.09 MAGNETIC DOOR HOLDERS: Notifier DH24120-FC

A. Furnish and install magnetic door holders as indicated on the plans.

B. Shall operate on 24VDC.

C. Minimum holding force 25 lbs.

2.10 DIGITAL ALARM COMMUNICATOR TRANSMITTER: Notifier UDACT

A. Shall be capable of transmitting all zones to the central station receiver.

B. Shall communicate via two (2) RJ31X phone lines.

2.11 WIRING

A. All system wiring shall be U.L. approved for fire alarm installation and installed in accordance with N.E.C. Article 760 and as required by the equipment manufacturer.

2.12 BATTERY BACK-UP OPERATION

A. Internal batteries and battery power supplies shall be provided to allow 48 hours continuous automatic normal operation of the entire control panel and fire alarm system after the failure of the incoming utility power. Sufficient battery capacity shall remain at the end of 24 hour period to provide 15 minutes of continuous operation of all connected evacuation alarm devices.

B. Batteries shall be sealed lead-acid. Batteries shall be earthquake restrained.

C. The battery charger shall be automatic, dual rated with capacity to recharge completely discharged batteries in 24 hours. Charger shall be temperature compensated.

PART 3 - EXECUTION

3.01 INSTALLATION OF BASIC MATERIALS

A. Installation of all wiring shall be run in a system of conduit, boxes hangers, and supports, pulling devices as specified in other sections of the specification. All cables shall be tagged at all junction points and shall be tested free of opens, shorts, or grounds.

B. Install empty conduits, pullboxes, etc., as indicated and/or as needed to facilitate the future system extension.

C. Securely fasten system components, independent of wiring to their supports. Runs of conduit shall be straight, neatly arranged, and properly supported, and shall be parallel or perpendicular to walls and partitions.

D. All work shall be coordinated and review beforehand with the manufacturer and the installer of the equipment and shall be accomplished in such a manner as to not effect operation and/or supervision of the system.

3.02 INSTALLATION OF WIRING

A. The Sub-Contractor for the system shall provide complete wiring diagrams with routings and sizes of conduits, location, and size of pull boxes, number of conductors to be installed, etc.

3.03 TESTING

A. All equipment shall be tested and proven to be operating properly. Wiring shall be checked and tested by the installing contractor in accordance with the instruction provided by the manufacturer to insure that the system is free of ground, open and shorts.

3.04 INSTALLATION AND OPERATING INSTRUCTIONS

A. Manufacturer shall supply adequate information to the Owner personnel in the operation and usage of the equipment.

END OF SECTION

SECTION 16744

DOOR ACCESS SECURITY SYSTEM

1.0 Overview

1.1 Web-Based Access Control

The proposed system shall fulfill the functions and specifications described in this document. In particular, the access control system shall be an IP web based access control system whereby any computer can be used to operate the controller (or control panel) directly using a standard web browser program available freely. The controller shall be a black-box design with embedded software built-in, including a web server program. The basic functions are:

- Card access control
- Alarm monitoring and handling procedures
- Time attendance data capture and post processing
- Video verification and video surveillance

1.2 System Architecture and Specifications

The proposed PC shall be based on the latest version of Intel or AMD based computers.

1.2.1 The controller used shall be based on minimum 32-bit embedded microprocessor chip, and communicate with the central PC via Ethernet network directly at speed of 100 Base-T.

1.2.2 The controller, input-output interfaces and card readers shall be able to work in off-line mode even if there is a failure with the computer network.

1.3 Main Hardware Components for the proposed system

The overall system shall consist of the following major equipments:

1.3.1 A standard desktop PC to be used for cards assignment to users and monitoring of alarms in the whole system.

1.3.2 A controller (control panel) used for access control and alarm monitoring and control functions. This controller shall be able to support a maximum of 32 doors and monitor 64 alarm sensors. It shall also be able to control xx units of siren boxes and control an alarm communicator box to send alarms to a central alarm monitoring station. The controller shall be able to connect to an external GSM communicator to send out alarm messages via the standard GSM telecommunication network.

1.3.3 Card readers for access control, attendance data capture, intrusion alarm arming/disarming.

- Provide for XX units of entry card readers for access control
- Provide for XX units of exit card readers for access control
- Provide for XX units of arming/disarming card readers
- Provide for XX units of card readers for time attendance
- Provide for XX units of PIR sensors as intrusion alarm sensors
- Provide for XX units of magnetic door contacts as intrusion alarm sensors
- Provide for XX units of dual PIR + motion sensors as intrusion alarm sensors
- Provide for XX units of siren box with strobe light
- Provide for connection to a GSM communicator to send alarm text messages to hand phones

1.3.4 Provide an UPS for the central computer lasting minimum of 2 hours of uninterrupted power during power failure.

1.3.5 Power supplies with back-up batteries for all other access control equipments and electric locking devices, providing minimum 4 hours of uninterrupted power during power failure shall be provided.

1.3.6 Provide a PC with following minimum specifications:

- Latest version of Intel Pentium IV with the fastest speed
- Microsoft Windows 2000 SP4 or later
- 1 GB RAM (2GB for Vista and later)
- Hard disk: 80 GB

- CD-ROM drive
- 15" color LCD monitor
- Ethernet network port: 10/100 Base-T
- DirectX 9.0c
- Video card that supports DirectX 9.0c
- Microsoft.NET Framework 3.0
- Printer Port: Parallel port (LPT-1)
- DirectX
- Keyboard
- Printer

1.4 Technical Specifications of the Controller

The controller shall be a generic unit that is designed with a common firmware running all embedded software. It shall be able to perform multiple tasks concurrently.

1.4.1 Minimum specs for the embedded controller shall be:

- At least a 32-bits CPU
- Have a minimum speed of 500 MHZ
- Support a communication port for remote dial-in via modem
- Support standard RS 232 port
- Support a Ethernet 100 Base-T port
- Minimum of 512 Megabytes of Flash memory, upgradeable to 2 Gigabytes
- Minimum of 512 Megabytes of RAM

1.4.2 Support up to 64 digital input monitoring channels for alarm monitoring. Each monitoring channel shall employ end-of-line sensing devices to detect against alarm and cable fault. Each input shall provide selection choice of 2-state or 4-state alarm monitoring. For 4-state monitoring, it shall be possible to detect cable short circuit or open circuit.

1.4.3 Supports up to 64 channels of voltage-free relays for alarm signaling and on/off controls using form-C type of relays.

1.4.4 Each controller shall consist of at least one CPU board, one or two card readers' controller board, and/or one 8 channels input and output board, AC Line Filter, one regulated power supply unit with an optional on-line battery charger charging a single 12V 7AH maintenance-free backup battery.

1.4.5 Each card reader's controller board shall support atleast 4 industry standard wiegand compatible reader interface ports. Each board shall also provide digital input interfaces to egress switches and door status sensors, and form-C relay output interfaces to door strikes, magnetic or electronic locks. All output relay shall be rated 24VDC @ 1 ampere with at least 2 spare relay circuits.

1.4.6 The 8 channels Input and Output board shall provide 8 digital input channels to be connected to intrusion alarm sensors. The 2 form-C relay output channels shall be provided for alarm devices control.

1.4.7 Additional Extension Unit shall be provided if additional doors or inputs/outputs are required.

1.4.8 A modem port shall be provided for PSTN/dial-up or lease line operation. Dial-up operation shall use standard PPP protocols. Upon successful log-in, the accessing computer shall only require a standard web browser program to operate, monitor or control it.

1.4.9 The controller memory buffer shall be able to hold 100,000 transactions when the controller is operating in a standalone mode (off-line mode)

1.5 Technical Parameters of the Controller

1.5.1 Card Parameters:

The controller database shall have a memory capacity for a minimum of 20,480 cardholders, each having a programmable 4 - 7 digits (Personal Identification Number) PIN codes

1.5.1.1 The PIN for each card number in the database shall be unique. The capacity of the card numbers in the database shall not be decreased due to the use of PIN for each card.

1.5.1.2 Each cardholder shall be able to change his/her own PIN on the card reader itself without the needs of having it done by the system

administrator at the central PC. Change of any cardholder's PIN code shall not affect the rest of the user's PIN codes

1.5.1.3 The card reader-controller shall be able to select 2 modes of operations, between "Card" only or "Card + PIN". It shall also be possible to program up to 8 sets of schedules (different start time and end time periods) per person everyday to be used for automatic activation of the PIN requirements as described earlier. To further enhance the security level, this mode shall be able to work differently during weekends or holidays by utilizing another set of schedules (time zones.)

1.5.1.4 It shall be possible to allow a cardholder to carry only one card, where that card can function as a normal access card, or as an arm/disarm card, or as a time attendance card, or a combination of any of these functions. All cards shall be generic in nature and the controller shall be able to reassign the function(s) of each card.

1.5.1.5 Every card shall have a start and expiration date parameter, so that the card is valid on 'start date' and becomes void on the 'expired date'. This function allows a card to be issued to contract employees or contractors in advance.

1.5.1.6 It shall be possible to assign a cardholder to a 2-person rule (alternatively known as dual-card group) and operate with the following security access control requirement:

- Any normal access cards may be assigned to a dual-card grouping. There shall be at least 255 dual-card groupings.
- Card readers shall grant access based on dual-card rule for important access doors.
- Card readers shall be able to change operational behavior automatically, from dual-card rule to single access rule; and then reverting back to dual-card rule; or remains at dual-card rule at all time.

1.5.2 System Parameters

1.5.2.1 Access Groups

Each controller shall have at least 254 programmable Access Groups. Each Access Group defines access for a particular group of doors associated with its own set of schedules (time zone groups) where a person can enter.

Each cardholder shall be assigned a minimum of 2 access groups.

1.5.2.2 Schedules (Time Zones)

Each controller shall have at least 255 weekly schedule (time zone) groups for all operations. Each schedule consists of at least 4 different start and stop time zone periods.

These schedules (time zones) shall be usable for any or all of these applications:

- activating different card access operation modes
- automatic locking/unlocking of doors
- automatic arming/disarming of an alarm point
- automatic arming/disarming of the intrusion monitoring modes
- automatically control electrical equipments on and off
- sending Email/SMS

1.5.2.3 It shall be possible to pre-program up to 32 regular holiday dates and 32 special holiday dates so that its operations will change automatically. It shall also adjust itself to leap year computations automatically and also GMT date/time reference.

1.5.2.4 The controller shall provide anti-passback feature for a single reader or a group of readers as a standard feature.

1.5.2.5 True anti-passback shall be implemented with selectable forgiveness or non-forgiveness modes. In forgiveness mode, a cardholder shall be able to get out of the controlled area even if he/she forgets to use his/her card at the entry reader and instead followed someone in.

1.5.3 Door Parameters:

1.5.3.1 When a card reader reads a valid card, the controller shall unlock the door for 3 seconds (shall be programmable from 3-255 seconds). For each handicap person, it shall be possible to provide extended door unlocking timings to facilitate their slower movement.

1.5.3.2 A door ajar (partially open) alarm shall be generated if the door is held open longer (example 1 minute, but programmable from 60 seconds to 255 seconds) than the allowed preprogrammed time. This alarm shall automatically be reset when the door is closed back.

1.5.3.3 It shall be possible to control the locking/unlocking of doors automatically up to four time zone periods per day based on schedule (time zone) control. The card reader shall emit a beeping warning signal if the door is not closed at the end of the time where the door is supposed to be re-locked.

1.5.3.4 It shall be possible to set the video verification camera and the surveillance camera.

1.5.4 Alarm Messaging Via Built-in Email:

1.5.4.1 It shall be possible to select and send specific events, transaction(s) or alarms via integrated built-in email function. The email messaging shall be deployed using industry standard SMTP protocols.

1.5.4.2 Each email subject text message and body text message shall be user programmable in alphanumeric, just like normal email.

1.5.4.3 It shall be possible to send any event or alarms generated throughout the systems and the following minimum events and alarms transactions shall be provided:

- any selectable events with location, date, time and the cardholder name such as access denied, invalid schedule and wrong PIN code used
- any alarms indicating the location, date and time of occurrence
- duress alarm, date and time of occurrence
- illegal log-in attempts via modem, date and time of occurrence
- power failure and restore, date and time of occurrence
- alarm points being armed/disarmed, date and time of occurrence
- controller being tampered, date and time of occurrence
- door being forced opened or left opened, date and time of occurrence

1.5.5 Video Parameters:

1.5.5.1 Each card reader shall support up to three cameras.

1.5.5.2 It shall be possible to view 'Live' and 'Playback' video. It shall be possible to compare the 'Live' and 'Playback' video using the compare option.

1.5.5.3 The surveillance window shall pop up when an event is triggered in the configured location.

1.5.5.4 When a card is presented to the reader the video verification function shall enable the live video display of the access point for comparison with the cardholder's photo for the operator to grant or deny door access.

1.5.5.5 The system shall auto detect the available cameras and shall add the selected cameras to the system

2.0 Access control system -- Computer and software requirements:

2.1 It shall be possible to use an Intel based PC as the central monitoring computers to operate the system.

2.2 All software provided shall reside within the controller. There shall be no need to install any software in the PC. When user logs in to the controller via a standard web browser software with .NET Framework 3.0 (Microsoft Internet Explorer 7.0 and above) User shall be able to operate the entire system, whether to view transaction activities, make changes to system operating behavior, add or delete cards.

2.3 Up to 25 users shall be able to operate, monitor and control the entire system, each with a unique ID and password. All user ids and password are encryption protected and case sensitive. The system shall support up to a maximum of 8 concurrent users. The system shall allow multiple users to log in and monitor activities, view alarms or administrate different database for different purposes, whether access control or alarm monitoring.

3.0 Access Control and alarm monitoring -- Software Functions:

The following software functions shall be provided:

- Administrators or users access rights setup
- Password assign to all users and administrators
- Centralized access control and alarm transactions monitoring

- Remote control functions for access control, arming/disarming of alarm points and on/off controls
- Alarm monitoring and alarm handling procedures
- Card database administration
- Global card formats setup
- View 'Live' or 'Playback' video
- Compare 'Live' and 'Playback' video
- Grant/Deny access based on video verification feature
- Auto detect the available cameras
- Report generation of transactions

3.1 Database Access Rights & Setup:

3.1.1 It shall be possible to select a language from the Multilanguage webpage provided for the GUI interface

3.1.2 It shall be possible to setup different access rights for each administrator and users to allow them access to different database.

3.1.3 The controller shall have different web pages for parameters setup, monitoring or control purposes.

3.1.4 Any administrators shall have their own access rights to view the card database only or include rights to add or delete cards.

3.1.5 Any system administrators shall have their own access rights to monitor transactions and alarms only, or include alarm handling.

3.1.6 Any system administrators shall have their own access rights to remotely unlock doors via web browser.

3.1.7 Any system administrators shall have its own access rights to view alarm monitoring status only or include rights to arm/disarm a point or group of points via web browser.

3.1.8 Any system administrators shall have its own access rights to control any relays on/off, where such relays are used to control any electrical devices or equipments via web browser.

3.2 Transaction Activity Viewing Functions:

The transaction activity viewing webpage shall display the photo of the cardholders when the user moves along the card number column.

The transaction activity page shall provide the reset APB option.

The system shall provide multiple choices of View Modes:

3.2.1 All Transactions View

The All transactions view shall display each and every transaction as it occurs in the system, consisting of normal as well as alarm transactions. For card access events, the transactions shall consist of the date and time of occurrence, door location, cardholders name and his or her card number.

3.2.2 Alarm View

The Alarm view shall only display the alarm transactions.

- For card access events, it shall consist of the date and time of occurrence, door location, person's name, his or her card number and the type of alarm.
- For alarm monitoring function, it shall consist the date and time of occurrence, intrusion location and the type of alarm.

3.2.3 Alarm & Restore View

The Alarm & Restore view shall display the alarm condition has been restored to normal state.

3.2.3 APB View

The APB view shall display the cardholders name currently in the selected APB zone or all the zones.

3.2.4 Time Attendance View

The Time attendance view shall display the date and time details when the cardholder accessed the system.

3.2.5 Online Swipe View

The online swipe view shall display the latest three cardholders with photo, who accessed the system. It shall also display the cardholder's photo and cardholder details that accessed the system in the selected location.

It shall allow the authorized users to reset APB for the APB violating users.

3.2.6 Surveillance View

When an alarm event is triggered the surveillance window shall automatically display the 'Live' event video of the location. It shall allow the user to toggle between the 'Live' and 'Playback' event video.

The compare option shall compare the 'Live' video and the event video playback clip simultaneously. In the surveillance playback view the user shall download the event clip or capture a snapshot from the even video.

3.2.7 Camera Monitoring View

The camera monitoring view shall display the 'Live' and 'Playback' video for a selected date. The user shall view the 'Live' or 'Playback' video of any configured camera.

This view is used to monitor the cameras.

3.2.8 Video Verification View

The video verification view shall display the live video of the access point for comparison with the cardholder's photo. This allows the door operator to grant or deny access to the cardholder via webpage manually. In event that there is no action and the timeout occurs, the access is granted automatically based on the settings of the video verification feature.

Video verification feature shall be enabled or disabled based on schedules. This view shows the 'Live' video of all the cameras configured to the reader.

3.3 Remote control Functions:

All remote control actions shall be executed via specific web pages. Each control action shall be designed for minimum mouse clicks. Web pages shall show the current state of the devices and the state after a control action has been executed.

3.3.1 Locking & Unlocking of Doors

- User(s) shall be able to unlock and re-lock a door from web page directly. A door can be momentarily or permanently unlocked and re-locked.
- The controller shall generate a transaction indicating who has unlocked a door and the date and time of his or her action.
- All doors shall show its status on web pages, whether it's locked or unlocked.
- It shall also be possible to execute this function without any limitation via modem dial-in remotely.

3.3.2 Arming & Disarming of Alarm Functions

- Users shall be able to arm/disarm the alarm monitoring functions via the card readers or web pages
- Users shall be restricted to arm/disarm alarm zone(s) within their access rights only.
- Transaction shall show who has armed or disarmed a specific alarm zone(s) and the date and time of action.
- It shall also be possible to execute this function without any limitation via modem dial-in.

3.3.3 Output Control Functions

- Users shall be able to turn on or off electrical equipments or devices, such as lightings, air-conditioning units, motors etc., via web pages.
- It shall also be possible to execute this function without any limitation via modem dial-in.

3.3.4 Advance IO Functions

- It shall allow unique programming options for input and output linking based on logic programming.

- It shall allow pre defined logic programming such as Guard Tour, Feed Through, OR Logic, AND Logic, XOR Logic, NAND Logic, Interlock, Up-Down Counter, Exit door, One shot and Intrusion.

- It shall integrate a 3rd party intrusion system using standard input/output from the system.

3.4 Alarm Handling Procedures

3.4.1 All alarm transactions shall be acknowledged individually.

3.4.2 When an alarm transaction is received, the computer shall generate an alarm tone to alert the operator. This audio alarm shall sound continuously until the alarm has been turned off by the operator.

3.4.3 The controller shall generate a transaction record in its memory for every alarm and restore conditions, which include –

- Date and time of occurrence and restoration

- Location of alarm sensors

- Date and time of user's acknowledgement

3.5 Card Database Administration

3.5.1 It shall be possible to add or delete cards and define all other card related parameters for the controller.

3.6 Report Generation

3.6.1 It shall be possible to generate any reports within the controller. All reports generations shall also be executed via web page command.

3.6.2 System Reports

- Reports generated shall include normal transactions, alarm transactions, system parameters set up and the controllers' parameters set up.

3.6.3 It shall be possible to view the reports on computer screen first prior to printing.

3.6.4 Activity reports

The reporting program shall allow report filter selection by:

- Activities (transaction types)
- Card Number
- Cardholder name
- Department
- Location
- Date range selection
- APB zone

3.6.5 Card reports

The reporting program shall allow report filter selection by:

- Card Number
- Access group

3.6.6 Device reports:

The reporting programs shall be able to generate the following reports

- Reader
- Input point
- Output point
- IO Function blocks
- Camera description
- Video device

3.6.7 Configuration reports:

The reporting programs shall be able to generate the following reports

- Criteria
- Schedules

- Regular holiday
- Special holiday

3.6.8 Audit Log Reports

Audit log reports shall be available to provide the following minimum information:

All operators' log-in and log-out date and time stamp

The date and time stamp of each operator whenever the operator made a change in any of the database, including the exact changes made.

3.7 Card Formats Setup

3.7.1 The controller shall be able to program and set up to 16 different card formats. Each card format template shall be programmable and only require the card number field, facility code (site code) field and parity bit pattern/location data fields to be entered.

4.0 Attendance Data Capture

4.1 It shall be possible to setup card readers for the purpose of capturing of attendance data for 'date and time clock-in' and 'date and time clock-out' for staff or guards. Standard card readers with keypad similar to those configured for access control shall be able to perform these functions.

4.2 A separate web page shall be dedicated for this function and be able to view the date and time the transactions occurred.

4.3 It shall be possible to export transaction file in comma separated value file format (CSV or XLS file format) that is readable by Microsoft Excel programs for further processing.

5.0 Configuration

5.1 The user can upgrade the firmware in a separate dedicated webpage

5.2 It shall be possible to set a daily auto backup to the compact flash or a manual backup of the system database

5.3 It shall be possible to upload the customer logo to the webpage. The uploaded customer logo is seen on all the WebPages and in the reports generated and printed

6.0 Approvals

6.1 The offered controller shall be FCC or CE and UL approved.

END OF SECTION

SECTION 16800
PHOTOVOLTAIC POWER SYSTEM GRID CONNECTED
ALTERNATE #1

PART 1 - GENERAL

1.1 SUMMARY

A. Description of work: This section describes in general the work required to Build, furnish and install a complete, operational grid connected photovoltaic power system.

B. The intent of this portion of the specifications and drawings is a complete, operational roof-mounted solar photovoltaic array and all balance of system components for the building and shall include, but not be limited to:

1. Photovoltaic panels, modules and array.
2. Array supporting structure.
3. Interconnect wiring, disconnecting means and over current protection.
4. UL listed grid-connect micro-inverter system.
5. Metering and monitoring hardware.
6. Web based metering and monitoring software.

1.2 QUALITY ASSURANCE AND REFERENCE STANDARD

A. Codes and Standards:

1. NFPA 70-1999 National Electrical Code.
2. IEEE 929, P929, 928, 1262, P1`373, P1374.
3. UL 14o741 Std. For Static Inverters & Change Controllers.
4. IEEE 519.
5. ASTM E1036-B5.
6. IEC 61215, TC082.
7. SAND 96-2797 Sandia Report Photovoltaic Power Systems and The National Electrical Code: Suggested Practices.
8. NEC – 690.

B. Related work: This section is a Division 16 specification and as such will be taken as an integral part of all other Division 16 sections, including Section 16010, General Requirements for Electrical Work.

1.3 SUBMITTALS

A. Submit manufacturer's data demonstrating compliance with these specifications and the drawings. Information shall include, but not be limited to:

1. Photovoltaic modules.
2. Micro Inverter system.
3. Power communication filter.
4. Electrical load center.
5. Terminals and terminal blocks.
6. DC rated circuit breakers and fusing.
7. Operating and Maintenance Manuals.

8. Provide all completed and approved utility grid tie connection and permission forms from utility company.

B. Submittals for Rebates.

1. Submit all completed appropriate energy rebate submittal forms that are to be sent to appropriate utility company.

PART 2 - PRODUCTS

2.1 MATERIALS AND WORKMANSHIP

A. Materials, equipment and parts comprising the units specified herein shall be new and unused, of current manufacture, of highest grade, and assembled in a workmanlike manner.

2.2 MANUFACTURER

A. All photovoltaic system components and all major items of auxiliary equipment shall be manufactured by manufacturers regularly engaged in the manufacture of photovoltaic system components. Each component shall be factory assembled and tested by the manufacturer. Delivery, parts, service and warranty shall be furnished by the manufacturer or an authorized dealer within 300 miles of the project. Acceptable manufacturers of system components shall be:

1. Sharp Solar.
2. Enphase Energy.
3. Canadian Solar.
4. Cutler Hammer.
5. Evergreen.
6. Andalog.
7. BP Solar.
8. Square D.
9. Vantres.
10. Outback.

B. Acceptable Installers:

1. Premier Power Renewable Energy, Inc.
2. Akeena.
3. Energy Efficiency Solar.

2.3 WARRANTY

A. Equipment furnished under this section shall be warranted against defective parts and workmanship as outlined under Division 1 and in accordance with the terms of the manufacturer's and dealer's standard warranty for a period of no less than ten (10) years. Solar collector panels shall have a manufacturer's limited warranty for power output of 25 years.

2.4 STARTUP AND TRAINING

A. Upon completion of the installation, the contractor shall perform startup by a factory trained and authorized dealer service representative. Contractor shall supply maintenance and instruction books to the Owner during startup and demonstration. In addition, the contractor shall furnish training in the amount of 8 hours to the Owner on startup, operation, maintenance and

troubleshooting of the complete system.

2.5 PHOTOVOLTAIC MODULES

A. Photovoltaic modules shall consist of 60-cell monocrystalline silicone laminated between sheets of ethylene vinyl acetate (EVA) and high transmission glass. Each module shall be assembled in an extruded and anodized aluminum frame and shall include bypass diodes. Each module shall include Potted (IP 67) rated rain tight junction boxes for wiring connections to system panels and the array. Nominal performance characteristics per module shall be:

Maximum Power (Pmax)	250W
Voltage at Pmax (Vmpp)	30.4V
Current at Pmax (Impp)	8.22A
Short Circuit Current (Isc)	8.74A
Open Circuit Voltage (Voc)	37.5V
NOCT	45.0°C
Max System Voltage	600V
Nominal Size	38.7" wide x 64.5" high

B. Modules shall be Canadian Solar model CS6P-250M panels or equivalent.

2.6 POWER CONVERSION INVERTER SYSTEM

A. The photovoltaic system inverter assembly shall be Enphase Micro-Inverter M215 or equivalent. The inverter assembly shall incorporate insulated gate bipolar transistor based power electronics to convert nominal 300-600V DC input to a pulse width modulated 208V three phase output. The inverter shall contain an integrated operator interface for access to metering, status and control functions. In addition, the inverter shall have the following salient performance characteristics and features:

Recommended input power (STC)	260W
Maximum input DC voltage	45V
Peak power tracking voltage	22V-36V
Min. / Max. start voltage	16V/36V
Max. DC short circuit current	12A
Max. input current	10A
Maximum output power	215W @ 208 Vac
Nominal output current	1.03A @ 208 Vac
Nominal voltage / range @ 208 Vac	208V/183V-229V
Extended voltage / range @ 208 Vac	208V/179V-232V
Nominal frequency / range @ 208 Vac	60.0/59.3-60.5
Extended frequency / range @ 208 Vac	60.0/59.2-60.6
Power factor	>0.95
Maximum units per 20A branch @ 208 Vac	18
Peak inverter efficiency	96.5%
CEC weighted efficiency	96.0%
Nominal Peak tracking	99.6%
Operating temperature range	-40°C to +65°C
Night time power consumption	30mW
Dimensions (WxHxD)	6.8"x6.2"x1"
Weight	3.5 lbs.
Cooling	Natural Convection – No Fans

Enclosure environmental rating	Outdoor – NEMA 6
Communication	Power line
Warranty	15 Years
Compliance	UL1741/IEEE1547, FCC Part 15 Class B

2.7 TERMINALS

A. Only W-listed terminals shall be used where connections are required and connector blocks are not furnished with a component. Only heavy-duty die crimpers shall be used for crimping connections. Unlisted electronics or automotive grade terminals will not be permitted.

2.8 LINE COMMUNICATION FILTER WITH ENPHASE ENVOY COMMUNICATION GATEWAY

A. The load center shall connect to the Line Communication Filter (LCF). The LCF includes the communication Gateway. LCF shall be ELCF-120-001. LCF dimensions are: 16.75"W x 16.75"H x 6" D. The Enphase micro inverters continuously monitor itself and the performance of its associated PV Modules. This data is communicated over the existing power line to the Enphase Envoy Communications Gateway. Enphase Envoy may be plugged into any AC wall socket and connected using a standard Ethernet cable to a broadband router. Data collected by Enphase Envoy is then transmitted to the Enphase Enlighten website for monitoring and analysis. In addition, the envoy communication gateway shall have the following salient performance characteristics and features:

Power line	Enphase Proprietary
LAN	10/100 Auto sensing, auto negotiating
AC Outlet	120 Vac, 60Hz, 100mA
Power Consumption	5W
Dimensions (WxHxD)	8.8"x4.4"x1.7"
Weight	12oz
Ambient temperature range	-40°F to 149°F
Cooling	Natural Convection – No Fans
Enclosure Environmental Rating	Indoor NEMA 1
Compliance	UL 60950, EN 60950, FCC Part 15 Class B

PART 3 -EXECUTION

3.1 INSTALLATION

A. General requirements: Install all system components in strict compliance with NEC-1999 and in accordance with recommended practices as outlined in SAND96-2797 incorporated herein by reference.

B. All system wiring is required to be installed in conduit in accordance with Section 16110 including roof mounted conductors.

C. At all panel (single and multiple modules) connections, a terminal bar or bus bar connection is required to allow the selective disconnecting of any module or panel. Multiple wire splices or daisy chaining will not be permitted even if indicated schematically on the drawing.

END OF SECTION

SECTION 16822

VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH NDN-498 SERIES FLEXIDOME 2X DAY/NIGHT IP CAMERAS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
1. Section 16822 - Video Surveillance Remote Devices.

B. Related Sections

1. Section 16850 – Closed Circuit Video Surveillance Systems.

2. Section 16870 – Digital Video Recorders and Analog Recording Devices.

1.2 REFERENCES

A. Canadian Standards Association (CSA)

1. CSA 22.2 No. 950-1

2. CAN/CSA No. 60950

B. European Norm

1. EN 50102, exceeding IK 10 – Protection Against Vandalism And Hostile Environments

2. EN50121-4 (CE) - Railway applications. Electromagnetic compatibility. Emission and immunity of the signaling and telecommunications apparatus

3. EN50130-4 (CE) Alarm Systems, Part 4 – Electromagnetic Compatibility – Product Family Standard: Immunity Requirements for Components of Fire, Intruder and Social Alarm Systems

4. EN55022 class B (CE) – Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement for Emission

5. EN60950-1 (CE) – Information technology equipment. Safety. General requirements

6. EN61000-3 – Electromagnetic compatibility (EMC) Limits. – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $3L 16 A per phase and not subject to conditional connection

C. Federal Communications Commission (FCC) (www.fcc.gov)

1. FCC CFR 47 part 15 class B – Telecommunications – Radio Frequency Devices – Digital Device Emission.

D. International Electrotechnical Commission (IEC)

1. IEC 60068-2-6

2. IEC 60068-2-75 test Eh, 50 J

E. International Organization for Standardization (ISO)

1. 9001 – Quality System

F. Underwriters Laboratories, Inc. (UL) (www.ul.com)

1. UL1950-1 Standard for Information Technology Equipment Including Electrical Business Equipment

2. UL60950 – Information technology equipment. Safety. General requirements

G. Water/Dust Protection

1. IP 66

2. NEMA 4X

1.3 DEFINITIONS

A. Day/Night (infrared sensitive): A camera that has normal color operation in situations where there is sufficient illumination (day conditions), but where the sensitivity can be increased when there is little light available (night conditions). This is achieved by removing the infrared cut filter required for good color rendition. The sensitivity can be further enhanced by integrating a number of fields to improve the signal-to-noise ratio of the camera (this may introduce motion blur).

B. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.

C. SensUp (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s – PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.

D. Smart BLC (Back Light Compensation): Smart back-light compensation allows the camera to automatically compensate for bright areas of a high contrast scene without having to define a window or area.

1.4 SYSTEM DESCRIPTION

A. Video Surveillance Remote Devices

1. NDN-498 Series FlexiDome2X Day/Night IP Dome Camera

B. Performance Requirements

1. 1/3-inch day/night CCD with progressive scan.

2. 20-bit image processing technology.

3. Wide Dynamic Range, 2X-dynamic engine and SmartBLC

4. Tri-streaming IP video: Simultaneous Dual H.264 streams and one M-JPEG stream

5. ONVIF compliant.

6. High-impact, vandal-resistant enclosure.

1.5 SUBMITTALS

A. Submit under provisions of Section [01 33 00].

B. Product Data:

1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.

C. Shop Drawings; include

1. System device locations on architectural floor plans.

2. Full Schematic of system, including wiring information for all devices.

D. Closeout Submittals

1. User manual.

2. Parts list.

3. System device locations on architectural floor plans.

4. Wiring and connection diagram.

5. Maintenance requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer:

1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.

2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.

B. Video Surveillance System

1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

C. Installer:

1. Minimum of [5] years experience installing Video IP Surveillance System.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with requirements of Section [01 60 00].

B. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

C. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

D. Handle and operate products and systems according to manufacturer's instructions.

E. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

A. Provide manufacturer's warranty covering [3] years for replacement and repair of defective equipment.

1.9 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us]

B. Substitutions: Under provisions of Division 1.

1. All proposed substitutions must be approved by the Architect or Engineer professional.

2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH NDN-498 FLEXIDOME 2X DAY/NIGHT IP DOME CAMERAS NDN-498V03-21P

A. General Characteristics:

1. The IP dome camera shall be a high-impact, vandal-resistant, CCD camera with 20-bit digital signal processing (DSP).

2. The IP dome camera shall utilize 1/3-inch day/night CCD image sensor capable of producing up 540 TVL of resolution.

3. The IP dome camera shall provide direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.

4. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.

5. The IP dome camera shall conform to the ONVIF standard.

6. The user shall be able to view video on a PC using a Web browser, with the Bosch Video Management System, with VIDOS, or on an analog monitor with a Bosch video decoder.

7. The IP dome camera shall provide MOTION+ video motion detection analysis system that provides basic video content analysis.

8. The IP dome camera shall provide protection against water and dust up to IP 66 (NEMA 4X) standards.

9. The IP dome camera shall provide a cast-aluminum housing, polycarbonate dome and hardened inner liner able to withstand the equivalent of 55 kg (120 lbs) of force.

10. The IP dome camera shall provide six distinct preprogrammed operational modes stored in the camera.

11. The IP dome camera shall provide four independent, fully programmable privacy mask areas.

12. The IP dome camera shall provide an on-screen display to simplify the camera/lens back focus and network configuration settings.

13. The IP dome camera shall provide a lens wizard during lens back focus setup to allow focusing at maximum lens opening to ensure that the object of interest within the field of view always remains in focus.
14. The IP dome camera shall provide a feature (SensUP) that enhances camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s – PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.

15. The IP dome camera shall provide a frame integration mode (Bosch SensUp feature) that can produce a color image with a minimum scene illumination of 0.248 lux (0.023 fc) and a monochrome image, when in the night mode, with a minimum illumination of 0.1 lux (0.0093 fc).

16. The IP dome camera shall provide enhanced night viewing through the increase of IR sensitivity by automatically switching a motorized IR filter from color to monochrome operation in low-light or IR illuminated applications. Allow the IR filter to be switched manually via the alarm input, preprogrammed in a camera mode or profile.

17. The IP dome camera shall utilize 2X-Dynamic technology to extend the dynamic range of the camera to provide a sharper, more detailed image for increased accuracy in color reproduction in harsh lighting conditions.

18. The IP dome camera shall utilize pixel-by-pixel analysis to automatically compensate for bright areas of a high contrast scene (Back light) without having to define a window or area.

19. Backlight compensation shall work in conjunction with dynamic range.

20. The IP dome camera shall utilize AutoBlack technology to adjust the black level of the image so as to maximize the contrast.

B. Installation Requirements

1. Shall contain a full-featured camera and integral varifocal lens.

2. Shall be capable of being mounted to a surface, 4S (USA) electrical box, wall, corner, and suspended ceiling.

3. Shall provide power, video, and control via an Ethernet connection.

4. Shall provide power connections on flying leads.

5. Shall provide a built-in test pattern generator.

6. Shall provide a multi-language on-screen display.

C. IP Connectivity

1. The IP dome camera shall allow full camera control and configuration capabilities over the network.

2. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.

3. The IP dome camera shall be capable of capturing and storing images using H.264 and JPEG encoding and compression at 4CIF/D1 and CIF resolutions.

4. The IP dome camera shall deliver DVD-quality 4CIF video, at rates up to 30 images per second, via TCP/IP over Cat5/Cat6 UTP cable. Leverages bandwidth throttling and multicasting capabilities to manage bandwidth and storage requirements efficiently while delivering the best possible image quality and resolution.

5. The IP dome camera shall generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.

6. The IP dome camera shall support iSCSI devices to allow a network-enabled AutoDome to stream video directly to an iSCSI RAID array.

7. The IP dome camera shall conform to the ONVIF standard.

8. [The IP dome camera shall offer Embedded Intelligent Video Analytics (IVA) eliminates dedicated PCs and associated software maintenance.]

D. Embedded Video Content Analysis

1. The IP dome camera shall be VCA ready; it shall need only a single software license to enable all VCA features in the camera.

2. The VCA software license shall not requires multiple licenses to enable multiple VCA features in the IP dome camera; it shall enable all VCA features with a single license.

3. The VCA software license shall allows user to choose between processing intensive applications, such as Flow control and face detection features or less processing intensive application, such as idle object.

4. The VCA software license shall enable the following VCA applications

   a. Idle object
   b. Remove object
   c. Multiple line crossing
   d. Object in field
   e. Loitering
   f. Condition change
   g. Following route
   h. Tampering
   i. Object in field
   j. Entering field
   k. Leaving field]

E. Alarm Handling Features:

1. The IP dome camera shall provide an alarm input that may be triggered by either a normally opened or normally closed contact.

2. The IP dome camera shall provide the capability on alarm to display up to a 31 character, programmable alarm message.

3. The IP dome camera shall provide a relay output that may be selected for normally opened or normally closed operation. The relay can be activated from an external alarm input to the camera, manual activation from the browser, upon video motion detection, or video loss.

F. Electrical:

1. Rated Voltage:

   a. NDN-498Vxx-1xP:
      1) 12 VDC ± 10%, 50 Hz
      2) 24 VAC ± 10%, 50 Hz
      3) PoE]

   b. NDN-498Vxx-2xP
      1) 12 VDC ± 10%, 60 Hz
      2) 24 VAC ± 10%, 60 Hz
      3) PoE]

2. Current Consumption:

   a. 12 VDC: 500 Ma

   b. 12 VDC with IVA: 650 mA

c. 24 VAC: 500 mA

d. 24 VAC with IVA: 650 mA

e. PoE: 200 mA

G. Sensor

1. Type: 1/3-inch CCD, WDR, dual shutter

2. Active Pixels:

a. [PAL: 752 x 582]

b. [NTSC: 768 x 494]

H. IP Video

1. Standards: H.264 (ISO/IEC 14496- 10), M- JPEG, JPEG

2. H.264 Profile: Main Profile and Baseline Profile

3. Streaming: Multiple, individually configurable streams in H.264 and JPEG, configurable frame rate and bandwidth

4. GOP Structure: I, IP, IPBB

5. Data Rate: 9.6 kbps to 6 Mbps

6. Frame rate:

a. H.264: 1 to 50/60 (PAL/NTSC)

b. M-JPEG: 1 to 25/30 (PAL/NTSC)

7. Resolution:

a. 4CIF: 704 x 576/480 (25/30 ips)

b. CIF: 352 x 288/240 (25/30 ips)

I. Video Out

1. Signal: Analog composite (NTSC or PAL) for service

2. Connector: 2.5 mm jack, 75 Ohm

3. Horizontal resolution: 540 TVL

4. Video S/N: 50 dB

J.Sensitivity

1. NDN-498V03 (F1.2)

   a. Full Video (100 IRE)

      1) Color: 2.48 lx (0.23 fc)

      2) Color + SensUP 10 x: 0.248 lx (0.023 fc)

      3) Monochrome: 1.01 lx (0.093 fc)

      4) Monochrome + SensUP 10x: 0.1 lx (0.0093 fc)

   b. Usable Picture (50 IRE):

      1) Color: 0.621 lx (0.058 fc)

      2) Color + SensUP 10 x: 0.062 lx (0.0058 fc)

      3) Monochrome: 0.23 lx (0.021 fc)

      4) Monochrome + SensUP 10x: 0.023 lx (0.0021 fc)

   c. Usable Picture (30 IRE):

      1) Color: 0.28 lx (0.027 fc)

      2) Color + SensUP 10 x: 0.028 lx (0.0027 fc)

      3) Monochrome: 0.099 lx (0.0092 fc)

      4) Monochrome + SensUP 10x: 0.0099 lx (0.00092 fc)

2. NDN-498V09 (F1.4)

   a. Full Video (100 IRE)

      1) Color: 2.7 lx (0.26 fc)

      2) Color + SensUP 10 x: 0.27 lx (0.026 fc)

      3) Monochrome: 1.1 lx (0.090 fc)

      4) Monochrome + SensUP 10x: 0.11 lx (0.01 fc)

   b. Usable Picture (50 IRE):

      1) Color: 0.69 lx (0.064 fc)

      2) Color + SensUP 10 x: 0.069 lx (0.0064 fc)

3) Monochrome: 0.27 lx (0.026 fc)

4) Monochrome + SensUP 10x: 0.027 lx (0.0026 fc)

c. Usable Picture (30 IRE):

1) Color: 0.321 lx (0.03 fc)

2) Color + SensUP 10 x: 0.032 lx (0.003 fc)

3) Monochrome: 0.11 lx (0.01 fc)

4) Monochrome + SensUP 10x: 0.011 lx (0.001 fc)

K. Video

1. Horizontal Resolution: 540 TVL
2. Signal-to-Noise Ratio: >50 dB
3. Video Output: Composite video 1 Vpp, 75 Ohm
4. Synchronization:
   a. Internal
   b. Line Lock
   c. HV-lock
   d. Genlock (Burst Lock)
5. Shutter:
   a. Auto (1/50 [1/60] to 1/10000) selectable
   b. Auto (1/50 [1/60] to 1/150000) automatic flickerless, fixed selectable
6. Sensitivity Up: Adjustable from Off to 10x
7. Day/Night: Color, Mono, Auto
8. Auto Black: Automatic continuous, Off
9. Dynamic Engine:
   a. 2X-dynamic
   b. XF-dynamic
   c. SmartBLC+2X dynamic

10. Dynamic Range: 120 dB (20-bit image processing)

11. Image processing : 20-bit processing

12. Dynamic Noise Reduction: Auto, On/Off selectable

13. Sharpness: Level selectable

14. SmartBLC: On (includes 2X-dynamic) / Off

15. AGC: On or Off (0 – 30 dB) selectable

16. Peak White Invert: On/Off

17. White Balance:

    a. ATW

    b. ATW hold and manual (2500 to 10000K)

18. Cable Compensation: Up to 1000 m (3000 ft) coax without external amplifiers

19. Camera ID: 17-character editable string, position selectable

20. Test Pattern Generator:

    a. Color bars 100%
    b. Grayscale 11-step
    c. Sawtooth 2H
    d. Checker board
    e. Cross hatch
    f. UV plane

21. Modes: 6 preset programmable modes

22. Privacy Masking: 4 independent areas, fully programmable

23. Controls: OSD with softkey operation

L. Alarms

1. Alarm Output: Relay

2. Alarm Input (TTL): Profile switching, +3.3 V nominal, +40 VDC max.

3. Alarm Output Relay: 30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA

4. External Synchronization Input: 75 Ohm or high impedance selectable

M. Audio

1. Standard G.711: 300 Hz to 3.4 kHz at 8 kHz sampling rate

2. Signal-to-Noise Ratio: > 50 dB

N. Input/Output

1. Audio: 1 x mono line in, 1 x mono line out

   a. Signal Line In: 9 kohm typical, 5.5 Vpp max.

   b. Signal Line Out:

      1) 3.0 Vpp at 10 ohm typical

      2) 2.3 Vpp at 32 ohm typical

      3) 1.7 Vpp at 16 ohm typical

2. Alarm

   a. Activation Resistance: 10 ohm max.

3. Relay: 1 output

   a. Signal: 30 Vpp (SELV), 0.2 A

4. Data: RS-232/422/485

O. Software Control

1. Unit Configuration: Via Web browser or Configuration Manager

2. Motion Detection: On/Off

3. Flicker Control: 50/60 Hz, selectable

4. Software Update: Flash ROM, remote programmable

P. Network

1. Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x

2. Encryption: TLS 1.0, SSL, AES (optional)

3. Ethernet: 10/100 Base-T, auto-sensing, half/full duplex, RJ45

4. Power over Ethernet: IEEE 802.3af compliant

Q. Optical

1. Varifocal Lens: IR-corrected, manual zoom, and focus adjustment
2. Iris Control: Automatic Iris control
3. Viewing Angle (H x V):
   a. 2.8 to 10 mm:
      1) Wide 100.8° x 73.7°
      2) Tele: 28.5° x 21.4°
   b. 9 to 22 mm
      1) Wide 31.2° x 22.8°
      2) Tele: 12.8° x 9.6°

R. Mechanical:

1. Weight: 740 g (1.63 lb)
2. Mounting: Flush mount or surface mount
3. Color:
   a. Trim ring: White (RAL91010)
   b. Inner Liner: Black
4. Adjustment range:
   a. Pan: 360°
   b. Tilt: 90°
   c. Azimuth: ±90°
5. Construction:
   a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
   b. Trim ring: Aluminum

S. Environmental:

1. Operating Temperature Range, with heater off: -30° to 50°C (-22° to 122°F)
2. Operating Temperature Range, with heater on: -50° to 50°C (-58° to 122°F)
3. Storage Temperature Range: -55° to 70°C (-67° to 158°F)
4. Operating Humidity: 5% to 93% relative humidity
5. Storage Humidity: Up to 98% relative humidity
6. Impact Protection:
   a. IEC 60068-2-75 test Eh, 50 J
   b. EN 50102, exceeding IK 10
7. Water/Dust Protection;
   a. IP 66
   b. NEMA 4X
8. Vibration:
   a. IEC60068-2-6

2.3 ACCESSORIES

T. Mounts/Components

1. VDA-455SMB Surface Mount
2. VDA-455TBL Tinted Bubble
3. VDA-455CBL Clear Bubble
4. S1460 Service/Monitor Cable

U. Power Supplies

1. UPA-2410-60 Power Supply
2. UPA-2430-60 Power Supply
3. UPA-2450-60 Power Supply
4. UPA-2420-50 Power Supply
5. UPA-2450-50 Power Supply

V. Software Options

1. MVC-FIVA4-CAM IVA License

2. MVC-FENC-AES BVIP AES 128 bit Encryption License

PART 2 - PRODUCTS

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.

B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

C. Protect devices from damage during construction.

3.3 INSTALLATION

D. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.

E. Ensure selected location is secure and offers protection from accidental damage.

F. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

G. Test snugness of mounting screws of all installed equipment.

H. Test proper operation of all video system devices.

I. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

J. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.

K. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMOSTRATION

L. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION

PART 2 – PRODUCTS

2.01 MANUFACTURER

A. Bosch Security Systems
850 Greenfield Road
Lancaster, PA 17601
Tel (800) 326-3270
Fax (717) 735-6560

B. This product shall be manufactured by a firm whose quality system is in compliance with the I.S. /ISO 9001/EN 29001, QUALITY SYSTEM.

2.02 OUTDOOR DAY/NIGHT PREPACKAGED CAMERA UNIT GENERAL DESCRIPTION

A. The prepackaged camera unit will consist of a high resolution day/night camera with a 2.8-11 mm, f/1.4 to 360 IR corrected auto iris lens, or a 7.5-50 mm, f/1.6 to 360 IR corrected auto iris lens, pre-wired into an outdoor housing. The camera will automatically switch from color to monochrome operation when the ambient light level becomes too low for satisfactory color video pictures. The switching between color and monochrome operation is accomplished automatically with a removable mechanical IR cut filter. The prepackaged camera is supplied with a heater, blower, and sunshield. This prepackaged day/night camera will be supplied with 5 feet (1.5 m) of pre-wired coaxial cable terminated with a female BNC connector, and 5 feet (1.5 m) of pre-wired 18AWG (1 mm^2) 3 conductor power cable with flying leads, wired through the base of the housing. A compatible feed-through wall mount will be provided by the manufacturer that supports a maximum load of 20 lbs (9 kg). The prepackaged camera unit will operate at a rated voltage of 21 to 28 VAC, 60Hz. Power requirement is 45 watts.

B. The prepackaged outdoor units will be available with any of the following camera units installed:

1. A Bosch Model LTC 0495 Series high resolution, day/night camera with a 1/3-inch format, interline transfer imager consisting of 768 H x 492 V active picture elements and capable of producing a minimum horizontal resolution of 540 TVL. The prepackaged unit will be equipped with a factory installed and back-focused 2.8-11 mm, f/1.4 to f/360, or a 7.5-50 mm, f/1.6 to 360 IR corrected, varifocal, auto iris lens. The day/night camera will provide remote control and setup via Bosch Bilinx bi-directional, coaxial communication capability embedded in the video signal that allows change of camera settings, status checks, and firmware updates to be made from anywhere along the video cable. The Bilinx communication will use the standard coaxial video cable to transmit alarm and status messages. An optional USB adapter and the software required for remote control and setup using Bilinx communication will be available from the camera manufacturer.
2. A Bosch Dinion Model NWC 0495 Dinion Hybrid IP Network Series high resolution, 1/3-inch format, fully automatic, day/night camera with a 2.8-10mm, f1.4/360 auto iris lens or a 5-50mm, f1.7/360 auto iris lens, capable of producing DVD quality video over an IP network while simultaneously providing analog video up to 540 TVL to support existing analog equipment. The camera will incorporate a network video server whose primary function is to encode video for transmission over an IP network. Camera setup and configuration can be done via menu keys on the camera, or using a web browser. The camera will be capable of providing MPEG-4 compression video at 4CIF quality at the rate of 30 images per second (NTSC) or 25 images per second (PAL) over an IP network.

C. The camera will provide a day/night mode to enhance night viewing by increasing the IR sensitivity. An internal IR filter will be switched from color to monochrome mode automatically by

either sensing the illumination level or via the alarm input. The IR filter can also be switched manually via the alarm input, through the camera menu selection, or via the Bilinx coaxial control interface. An internal through-the-lens IR detector will enhance the monochrome mode stability by preventing the camera from reverting to color mode when IR illumination is dominant.

D. In the color mode, a full video picture will be produced with as little as 2.4 lx (.24 fc) scene illumination. A usable video picture will be produced with a minimum scene illumination of 0.59 lx (.059 fc) at 50 IRE. When in the monochrome mode, a usable video picture will be produced with a minimum scene illumination of 0.08 lux (.008 fc) at 50 IRE.

E. The camera will provide a SensUp mode that enhances the effective sensitivity of the camera by increasing the integration time of the CCD up to 10 times. In SensUp mode, a video picture will be produced with a minimum scene illumination of 0.024 lx (0.002 fc). In the monochrome mode, a video picture will be produced with a minimum scene illumination of 0.0038 lux (0.0004 fc) in SensUP mode.

F. The day/night camera will provide Bosch XF-Dynamic technology to extend the dynamic light range of the camera by 32X, and will automatically process the digital signal produced by the 15-bit DSP technology to optimally, and simultaneously, capture the picture detail in both the highlight and lowlight areas to maximize the information visible in the picture.

G. The day/night camera will be delivered by the manufacturer with the line-lock function enabled. The line lock function synchronizes the camera to the power line zero crossing to ensure roll-free switching when used with matrix or vertical interval switchers. The unit will also have the capability to be switched to a crystal-lock mode that eliminates the camera's dependency on the utility power line frequency that can, in many installations, be noisy or unstable.

H. The day/night camera will include an on-board video motion detector that provides up to four (4) fully programmable areas with individual thresholds. The camera will have a built-in global scene change detector that minimizes false alarms caused by sudden changes in the lighting conditions. Upon motion sense, the camera will display the alarm on screen, close an alarm relay at the camera, and communicate via Bosch Bilinx communication.

I. The LTC 0495 camera will provide cable compensation, without external amplifiers, to extend the normal range of control from the head end by up to 2 times when used with the Bilinx coaxial communication.

J. The day/night camera will provide the following shutter modes: Auto (1/60 [1/50] to 1/500,000 sec.), fixed, flickerless mode, and default mode.

K. The camera will provide the following modes of White Balance:

1. Automatic Tracking White Balance (ATW) that allows the camera to constantly adjust for optimal color reproduction.

2. White Balance Hold (ABW) that puts the ATW on hold and saves the current color settings.

3. Manual mode that allows manual gain adjustment of red, green and blue.

4. White Balance Speed that adjusts the speed of the white balance control loop for slow, medium, or fast operation.

2.03 DAY/NIGHT PREPACKAGED CAMERA UNIT REQUIREMENTS

A. The day/night prepackaged camera housing will consist of an aluminum housing casing, neoprene gaskets, UV-resistant polymer end caps, and all stainless steel hardware. The viewing window will be 3mm (0.12 in.) thick UV-stabilized polycarbonate and will be self cleaning. The housing will come with tamper-resistant screws for the locking clasps to prevent illegitimate

access to the camera. The prepackaged outdoor camera unit will meet IP66 and NEMA-4x enclosure protection standards.

B. The prepackaged day/night camera will be supplied with 5 feet (1.5 m) of pre-wired coaxial cable terminated with a female BNC connector, and 5 feet (1.5 m) of pre-wired 18AWG (1 mm^2) 3 conductor power cable supplied with flying leads wired through the base of the housing. The IP prepackaged camera will be supplied with the power cable only.

C. A compatible feed-through wall mount will be provided by the manufacturer that supports a maximum load of 20 lbs (9 kg). The mount will have a swivel head that rotates 360° and tilts 180°. To ensure neatness of installation, the mount will be designed to allow feed through wiring.

D. The prepackaged camera unit will be supplied with a heater and blower capable of maintaining an internal temperature within the housing between -20°C to +55°C (-4°F to +131°F) when the external temperature is -40°C to +50°C (-40°F to +122°F).

E. The prepackaged camera unit will have a humidity rating of 0% to 93% relative, non-condensing.

F. The camera housing will provide enclosure protection to IP66 and NEMA-4x standards.

G. The outdoor prepackaged camera will be optionally available with a fiber optic transmitter. The transmitter will be compatible with the Bosch Model LTC 4642/60 Fiber Receiver.

H. The outdoor prepackaged camera will be optionally available with UTP transmitter. The UTP transmitter will be compatible with UTP passive receivers up to 750 ft distance and UTP active receivers up to 3,000 ft distance.

2.04 ELECTRICAL SPECIFICATIONS

A. Sensitivity:

	Full video	Usable Picture (50 IRE)
Color	2.4 lx (0.24 fc)	0.59 lx (.059 fc)
Monochrome		0.08 lx (.008 fc)

B. Signal-to-noise ratio: ..... >50 dB (AGC off)

C. Video Output: ..... Composite Video, 1.0 Vp-p, 75 ohms

D. Power:

Housing	21-28 VAC, 60 Hz, 40 watts
Analog Cameras and Housing	21-28 VAC, 60 Hz, 45 watts
IP Camera only	PoE 21–28 VAC (700 mA), (IEEE 802.3af compliant)

2.05 MECHANICAL SPECIFICATIONS

A. Prepackaged Unit Weight: ..... 2.85 kg (6.28 lbs)

B. Mount max load: ..... 9 kg (20 lbs)

2.06 CERTIFICATIONS AND APPROVALS

A. Electrical Compatibility (EMCC): ..... Complies with FCC Part 15, ICES-003 and CE Regulations

B. Product Safety: ..... Complies with CE Regulation, UL, CSA, EN AND IEC Standards

Part 3 – EXECUTION

3.01 INSTALLATION

A. Installation should be performed by qualified service personnel only in accordance with the National Electrical Code or applicable local codes.

The product specified will be the Model KBE-495V28-20, KBE-495V75-20, KBE-495V28-20N, KBE-495V75-20N, as required by the application, manufactured by Bosch Security Systems.

Outdoor_KBE-495V28(75)-20(N) Specifications subject to change without notification.
08-22-07

END OF SECTION

JURUPA SHERIFF'S EVIDENCE WAREHOUSE
ALTERNATE #2

SPECIFICATIONS FOR

JURUPA SHERIFF'S FRONT LOBBY EXPANSION

PREPARED BY
HOLT ARCHITECTS, INC.
FOR
COUNTY OF RIVERSIDE
REDEVELOPMENT AGENCY
APRIL 2011

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***** END OF SECTION ****

SECTION 03200

CONCRETE REINFORCEMENT

PART I -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 WORK INCLUDED

A. Reinforcing steel bars, welded steel wire fabric for cast-in-place concrete, fabricated, placed and supported, as specified herein and shown on the Drawings.

B. Support chairs, bolsters, bar supports, spacers, for supporting reinforcement, as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

A. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice, and Documents 63 and 65.

B. Conform to ACI 301 and 315.

1.04 SHOP DRAWINGS

A. Indicate sizes, spacings, locations and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting and spacing devices.

B. Prepare shop drawings under seal of professional structural engineer registered in the State of California.

1.05 CERTIFICATES

A. Submit mill test certificates of supplied concrete reinforcing, indicating physical and chemical analysis.

B. In lieu of mill test certificate provide samples:

1. Samples for physical tests of reinforcement will consist of at least two pieces, each 18" long, of each size of reinforcement steel, selected by the testing agency from material at the building site or at the fabricator's or supplier's yard.

2. Material to be sampled at the building site shall have been delivered thereto at least 72 hours before it is needed.

3. Where samples are taken from bundles as delivered from the mill, with the bundles identified as to heat number, and provided mill analyses accompany the report, then one tensile test and one bend test will be made from a specimen of each ten tons or fraction thereof of each size of reinforcement steel.

4. Where positive identification of the heat number cannot be made, or where random samples are taken, then one series of tests will be made from each 2-1/2 tons or fraction thereof of each size of reinforcement steel.

1.06 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.07 SUBMITTALS

In accordance with Article 5 of the General Conditions.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Reinforcing Steel: ASTM A615, 40 ksi for #4 and smaller and 60 ksi for #5 and larger yield grade billet-steel deformed bars, uncoated finish. Deformations shall conform with ASTM A305.

B. Welded Steel Wire Fabric: ANSI/ASTM A185 plain type; in coiled rolls; uncoated finish.

C. Stirrup Steel: ANSI/ASTM A82.

D. Bending to conform to ASTM 318. Fabricate reinforcement in accordance with recommendations contained in CRSI " Manual of Standard Practices".

E. Brackets for centering vertical steel shall be similar and equal to Wall-Brac as manufactured by W.C.R. Fabricators, San Clemente. (714) 492-2370.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place:

1. Use wire bar type supports complying with CRSI recommendations, unless otherwise shown on the Drawings.

2. Do not use wood, brick or other non-complying material.

3. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs and to prevent vapor barrier puncture.

4. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic-protected legs.

2.03 FABRICATION

A Fabricate reinforcing bars to conform to the required shapes and dimensions with fabrication tolerances complying with ACI 315, providing concrete cover specified in Section 03300. In case of fabricating errors, do not straighten or rebend reinforcement in a manner that will weaken or injure the material.

B Reinforcement with any of the following defects will not be acceptable.

1. Bar lengths, depths and/or bends exceeding the specified fabrication tolerances;

2. Bends or kinks not shown on the Drawings;

3. Bars with reduced cross-section due to excessive rusting or other cause.

C Locate reinforcing splices not indicated on Drawings at points of minimum stress. Indicate location of splices on shop drawings.

D Weld reinforcing bars in accordance with ANSI/AWS D1.4.

E Reinforcement shall be clean and shall be free from oil, excessive mill scale or rust, and shall be stored on the site in such a manner as to permit easy access for proper inspection and identification.

Reinforcement shall be shop-bent to shapes and dimensions as shown and shall be placed where indicated on the Drawings or reasonably required to carry out the intent of the Drawings and Specifications. Reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the Drawings shall not be used.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. Comply with the specified standards for detail and method of placing reinforcement and supports, except as may be modified herein.

B. Clean reinforcement to remove loose rust and mill scale, earth, and other materials which reduce or destroy bond with concrete.

C. Position, support and secure reinforcement against displacement by formwork, construction and concrete placing operations.

D. Locate and support reinforcement by metal chairs, runners, bolsters, spacers and hangers, as required. (Such chairs or stools shall be bound, shall have squared vertical sides, and shall conform to the requirements for Grade A concrete as specified herein.)

E. Place reinforcement to obtain minimum coverages for concrete protection.

F. Arrange, space and securely tie bars and bar supports together with the specified tie wire.

G. Set wire ties so twisted ends are directed away from exposed concrete surfaces.

H. Do not displace or damage vapor barrier required by Section 03300. If vapor barrier is damaged, Contractor shall repair or replace that section to be water resistant.

I. Install welded wire fabric in as long lengths as practicable, lapping adjoining pieces at least one full mesh.

J. Provide sufficient numbers of supports and of strength to carry the reinforcement.

K. Do not place reinforcing bars more than 2" beyond last leg of any continuous bar support.

L. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

M. Wall steel shall be wired together at all points where bars cross. Splices in horizontal bars shall be staggered so that adjacent splices will not be less than 4 feet apart, unless shown otherwise on the Drawings.

N. Bars shall be continuous insofar as practical.

O. Dowels required to receive and engage subsequent work shall be of sufficient length to develop the strength of the bar and be securely set in the forms prior to placing the concrete.

P. All stirrups shall be accurately and securely wired to the bars at both top and bottom.

3.03 SPLICES

A. Lap splices: Tie securely with the specified wire to prevent displacement of splices during placement of concrete.

B. Splice devices:

1. Obtain the Architect's approval prior to using splice devices.
2. Install in accordance with manufacturer's written instructions.
3. Splice in a manner developing at least 125% of the yielding strength of the bar.

C. Do not splice bars except at locations shown on the Drawings, unless otherwise specifically approved by the Architect.

D. In general, the reinforcing steel shall be lapped at least 30 diameters.

E. A clear space equal to 2-1/2 diameters (and in no case less than 1-1/2") shall be maintained between the spliced bars, unless otherwise directed by the Architect.

F. Splices shall not be made at the points of maximum stress and where made, the splices shall be lapped as indicated on the Drawings or as otherwise required to develop the strength of the bars.

3.04 MASONRY REINFORCEMENT

A. Splices for masonry wall shall lap not less than 40 bar diameters, except where otherwise shown.

B. Vertical foundation dowels for masonry wall shall be accurately set to match reinforced masonry cells.

C. Dowels shall not be bent after foundation concrete has been placed.

3.05 WELDED WIRE FABRIC

A. Shall be rolled out, straightened, cut to size and laid in place reasonably flat.

B. Splices in wire mesh shall lap not less than 8 inches and shall be tied with No. 16 or 18 gauge wire at not more than 12 inches.

C. As concrete is placed, mesh used as reinforcement for slabs on grade shall be lifted at intervals as required to insure proper embedment in the concrete.

*****END OF SECTION*****

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

All of the requirements of the Contract Documents apply to this Section. The work under this section includes furnishing all labor, materials and equipment and performing all operations in connection with all concrete work indicated on the Drawings, specified herein or reasonably required to complete the work.

1.03 QUALITY CONTROL

A. INSPECTION: All concrete work shall be under continuous inspection by a representative of the Owner. Concrete shall not be placed until and unless all forms, reinforcement and all embedded materials have been inspected and approved by the job inspector, nor shall concrete be placed outside of regular working hours unless satisfactory arrangements have been made with the inspector and he is available to observe.

B. TESTING: It shall be the Contractor's responsibility to determine, prior to their delivery to the job site or to the batching plant, that all materials to be incorporated into the work comply with these Specifications. All costs incurred by the Contractor in complying with the above requirements, including the cost of concrete design mixes, shall be paid by the Contractor. The Owner will do such sampling and testing of materials and concrete after their arrival at the job site or batching plant as he may deem necessary, and all costs in connection therewith will be paid by the Owner. No concrete shall be placed until test results on materials to be used have been approved by the Architect.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Condition.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Contractor shall submit all necessary Product Data and a complete list of material sources for all products to be incorporated into the project for review and approval of the Architect. The Performance of all Mix Designs shall be established either by stamped by an individual licensed to specify concrete mix designs engaged by Concrete Supplier or by break test data from at least 30 different projects for each mix design.

PART 2 -- PRODUCTS

2.01 CONCRETE MIX

A. All concrete mixes shall produce concrete that will work readily into corners and angles of forms and around reinforcement with the methods of placing employed on the work, but without permitting the materials to segregate or excess free water to collect on the surface.

B. If the concrete fails to conform to these Specifications, the Architect may order a change in the mix or require that a new design mix be provided.

C. All mixes shall be submitted to and approved by the Architect prior to placement of concrete. All concrete mixes except Class C shall be designed by an approved testing laboratory. However, multiple use of mix designs will be permitted to the extent indicated below. Mixes shall produce concrete conforming to the following requirements:

1. Class A Concrete: For all concrete work except where otherwise indicated on the Drawings or specified herein.

   a. Compressive strength at 28 days = 3000 pounds per square inch minimum

   b. Aggregate size = 3/4 inch maximum.

   c. Slump = 4 to 5 inches.

   d. Reinforcing fibers: Shall be polypropylene, collated, fibrillated fibers from Fibermesh Company (615) 892-7243, or approved equal. Follow NER 284 and manufacturers requirements for installation. Only fibers designed and manufactured specifically for use in concrete and so certified shall be acceptable.

2. Class B Concrete: For all slabs on grade.

   a) Compressive strength at 28 days = 3000 pounds per square inch minimum

   b) Portland Cement Content = 5-1/2 sacks per cubic yard.

   c) Aggregate size = 1 inch maximum.

   d) Water Content = Maximum water / cement ratio of 0.48.

   e) Slump = 4-1/2 to 5-1/2 inches.

   f) Reinforcing fibers: Shall be polypropylene, collated, fibrillated fibers from Fibermesh Company (615) 892-7243, or approved equal. Follow NER 284 and manufacturers requirements for installation. Only fibers designed and manufactured specifically for use in concrete and so certified shall be acceptable.

3. Class C Concrete: For piping thrust blocks, for envelopes around conduit or piping, or such other uses as may be indicated on the drawings or specified herein.

   a. Cement content = 4-1/2 sacks per cubic yard.

   b. Slump - 4 to 6 inches.

   c. Compressive strength at 28 days = 2500 pounds per square inch minimum

2.02 CONCRETE MATERIALS

A. All materials shall be delivered, stored, and handled so as to prevent the inclusion of foreign material and/or damage. Packaged materials shall be delivered and stored in original packages until ready for use. Packages or materials showing evidence of damage shall be rejected.

B. Aggregate (standard): Aggregate shall conform to the requirements of "Specification for Concrete Aggregates" (ASTM). Aggregates shall be stored and weighted separately and in a manner to avoid inclusion of foreign materials. No aggregate shall be incorporated into the work until approved by the Architect, and the source shall not be changed after such approval without written authorization from the Architect.

C. Aggregate (for exposed aggregate slabs and walks on grade): Aggregate shall be an approved washed, hard, smooth, well rounded local beach-line rock, passing a 3/4 inch screen and retained on a 3/8 inch screen.

D. Cement: All cement shall conform to "Standard Specifications for Portland Cement", ASTM Designation C-150 (latest), except where otherwise specified, and shall be of Type I or Type II. The brand of cement shall not be changed during the process of the work without written approval of the Architect. Sacked cement shall be so piled as to permit tally, inspection, and identification of each shipment.

E. Water: Water for washing aggregates and for mixing and watering concrete shall be free from oil, acids, alkali, organic or other deleterious matter. During extremely warm summer months, mixing water shall be the coolest available at the site.

F. Expansion Joint Filler shall be performed, asphalt saturated fiberboard containing not less than 25% nor more than 50% asphalt by weight (ASTM D1751).

G. Curing Compound shall be an approved, clear, resin base compound. Compound for use on architectural concrete surface shall be field demonstrated to be non-staining and oil and wax free before it will be approved. Compound for use on roof deck surface shall be of a type that will not affect the bond of the roofing or membrane to be used. Curing compounds shall not be used on interior slab-on-grade floors to receive low permeable flooring.

H. Admixtures shall be Pozzolith, of the types specified herein or, at the option of the Contractor, as may be indicated by job conditions. Admixtures shall be used only after approval by the Architect.

I. Bond Breaking Compounds must be approved by the Architect, and shall be suitable for the casting and erection techniques used.

J. Color Pigment shall be Davis Colors as manufactured by Frank D. Davis Co., and shall be selected from the manufacturer's standards colors. (213) 269-7311.

K. Form Lining for pre-cast concrete shall be Burke Form Coating.

L. Form Coating for cast-in-place architectural concrete shall be Nox-Crete Form Coating.

M. Waterstop: Waterstop - RY; flexible material with sodium bentomite; continuous maximum lengths; recessed from joint; a minimum of 2" concrete cover; as manufactured by Volclay, American Colloid Company or approved equal.

N. Metal Formed Construction Joints: Burke Kold Keyed Joint or approved equal for use in light traffic areas, office areas.

O. Reinforcing fibers: Shall be polypropylene, collated, fibrillated fibers from Fibermesh Co., or approved equal. Follow NER 284 and manufacturers requirements for installation. Only fibers designed and manufactured specifically for use in concrete and so certified shall be acceptable. (615) 892-7243.

2.03 FORM MATERIALS

A All forms, unless otherwise indicated on the Drawings, or specified herein, shall be of wood. Before erection, the inside surface of all wood forms shall be coated with non-staining material to seal against moisture loss. Forms for architectural concrete and forms at construction joists shall also be coated with "Nox-Crete".

1. Board Form for concrete shall be 1" x 6" T & G or shipped Douglas Fir, free from loose knots, holes and irregularities. Surface irregularities of T & G or shiplap must not exceed 1/8 inch.

2. Plywood Forms shall be of five ply Douglas Fir Plywood form grade, not less than 5/8 inch thick.

3. Curb and Slab Edge Forms may be of steel or wood.

B Form Ties. Form ties shall be of a type that can be removed, having no part of the tie permanently embedded less than 1-1/2 inches from any concrete surface. Ties passing through exposed surfaces shall be of the removable type that are removable without spalling concrete surfaces.

2.04 VAPOR BARRIER

All interior slabs shall be placed over 2" of sand over a Vapor Barrier.

1. Vapor Barrier shall be at least 3-mil "Vaporshield", a high density cross laminated poly or equal.

2. Vapor Barrier membrane shall be in as large sheets as possible with joints lapped 4-inches minimum and taped to form a watertight seal. All holes and penetrations by plumbing, conduit, etc., shall be sealed with tape and made watertight.

2.05 SOIL POISONING

A. Soil shall be treated against subterranean termites by a reliable and established, licensed termite control firm thoroughly familiar with local soils and chemicals.

B. Contractor shall notify Architect 24 hours before application of chemicals.

C. Apply an aqueous solution of 2% chlordane or 0.3% Dieldrin or 0.5% Aldrin as follows:

1. Under all floor slabs within the foundation walls -- 1 gallon per 10 square feet.

2. Along inside of foundation walls -- 2 gallons per 5 lineal feet.

3. Along outside of foundation walls -- 1 gallon per 5 lineal feet.

D. Chemicals under slabs shall be applied after fill is tamped and rough plumbing installed. Chemicals shall be applied not more than 24 hours before pouring concrete.

E. Guarantee: Treatment shall remain effective for not less than 5 years. The Contractor shall furnish a written 5 year guarantee in 3 copies stating if at any time during the 5 year period ground nesting termites occur, treatment will be applied to exterminate all infestation without cost to the Owner.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 BATCHING AND MIXING

A. Concrete, except as hereinafter, specified shall be mixed by a mechanical batch-type mixing plant. Plants shall be provided with adequate facilities for accurate measurement and control of each of the materials entering the mixer. All aggregate shall be measured by weight and stationary mixers shall be equipped with automatic apparatus for timing and for metering or measuring water. The apparatus shall have locks that will prevent unauthorized persons from changing the adjustment thereof. Fibermesh for slabs on grade shall be mixed into the concrete at the batch plant.

B. Any concrete that has not been placed within 90 minutes after water is first added to the batch shall be rejected.

C. Care shall be taken to avoid contamination of architectural concrete. All equipment must be thoroughly cleaned before use and each mixer shall be thoroughly washed out prior to charging with the first batch of each type of concrete to be used in exposed finished surfaces.

D. Approximately two thirds of the mixing water shall be added to the mixer when charging with lightweight aggregate. The aggregate and water shall then be mixed for not less than three minutes before cement and the balance of the water is added.

3.03 TRANSMIT MIX CONCRETE

Transmit mixed concrete shall be mixed for a period of not less than 10 minutes at a peripheral drum speed of approximately 200 feet per minute, and mixing shall be continued until discharge is completed. At least three minutes of the mixing period shall be at the job. Transit mixers shall be equipped with water measuring devices consisting of either accurately calibrated water tanks or water meters.

3.04 FORMS

A. General Construction. Forms, complete with all necessary cores and molds, shall be constructed to conform to shape, line, and dimensions as indicated on the Drawings, and shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be properly supported, braced and tied so as to maintain their position and shape when filled with wet concrete, and shall be removable without damage to the concrete.

B. The limiting tolerance for thickness, misalignment, curvature, plumb and level shall be 1/4 inch plus or minus, for the surfaces shown on the Drawings; except that for concrete having a thickness of 4 inches or less, the thickness tolerance shall be plus 1/4 inch to minus 1/8 inch; for concrete in foundation walls below grade, the tolerance shall be plus 1/2 inch to minus 1/4 inch; and for footing pads the tolerance shall be plus 1 inch to minus 1/2 inch. Forms shall not be constructed more than 1 foot above any construction joint on the side of the wall from which concrete will be poured.

C. Vertical surfaces of foundations may be formed against earth where, in the opinion of the Architect, such surfaces are suitable. Excavations for unformed concrete shall be provided with a surround consisting of 2 x 8 inch boards laid flat along the edges of the excavation and secured in place prior to placing concrete.

D. Temporary openings shall be provided at a sufficient number of points in the form work to permit proper cleaning and inspection. No wood of any kind, either temporary or permanent, shall be used or installed inside of the forms unless otherwise indicated on the plans or as directed.

E. Embedded Materials. Ample opportunity and full cooperation shall be given to the various trades to install their required embedded items. All embedded materials shall be securely fastened in place before placing of concrete is started. Bolts and anchors shall be attached to forms or adequate temporary supports to effectively prevent movement during placement concrete.

F. Specific Requirements:

1. Forms for Vertical Wall Closures. Forms for outside (exposed) surfaces shall be of new 5/8" plywood, free from surface irregularities. Vertical edges shall be carefully scribed to pre-cast panel edges, and joints shall be carefully caulked and finished to prevent leakage and provide a smooth form surface. Plywood shall be secured to back-up members at horizontal splices and joints shall be filled and sanded smooth. A full length vertical 2 x 8 shall be secured against and support each edge of this (exposed outside face) form. Ties shall have removable spreader cones and be used in pairs at about 6 foot centers. Tie holes in forms for exposed faces shall be drilled 1/32" small and ties shall be inserted from the inside face to avoid splintering the contact surface. All mortar leakage in and around exposed surfaces must be prevented. Window for concrete placement

shall be provided on inside (concealed) surfaces, with adequate provision for closure and for securing against displacement. Additional form ties at windows will not be permitted.

2. Forms for Bottom Wall Closures. Forms for outside (exposed faces) shall be of 2 inch lumber, plywood lined. Joints in lining shall be staggered with joints in back-up material and shall be filled and sanded smooth. Forms shall be supported in such a manner as to insure against movement and to provide a concrete surface in a plane with vertical closures. The top edge of the outside form shall be notched at 12 inches to permit the escape of air. Notches may be round, square or triangular and shall be approximately 1/2 inch deep.

3.05 PREPARATION FOR PLACING

Forms, soil bottoms, reinforcement and all embedded items shall be approved by the Inspector before concrete is deposited. Water and all foreign matter shall be removed from forms, excavations, and mixing and conveying equipment. Any flow of water shall be diverted with proper side drains, and shall be removed by methods which will avoid washing over freshly deposited concrete. Screeds shall be provided at all walls and not over eight feet apart in the field of slabs. All slabs shall receive a monolithic finish, unless otherwise shown on the Plans or specified herein. Alternate areas between construction joints shall be placed during any one pour. All materials, except transit-mix concrete, necessary to the placing and curing of any concrete pour shall be on the job site prior to the start of the pour.

3.06 HANDLING CONCRETE

A. Conveying. Concrete shall be conveyed from mixer to forms as rapidly as practicable by a method which will prevent segregation or loss of ingredients. Belt conveyors, bucket chains, chutes or other similar equipment will not be permitted unless approved in writing by the Architect. Concrete for vertical wall closures shall be pumped into place, using equipment that will handle the specified mix without excessive water.

B. Placing. Concrete placing shall be carried on as a continuous operation until the given unit of operation, approved by the Architect, is completed. Concrete shall be deposited as nearly as practicable in its final position to avoid flowing or rehandling. Drops of more than six feet (6') will not be permitted. It shall not be placed in such a manner as to leave accumulations of mortar on the form surfaces or reinforcement above the placed concrete. Where necessary, vertical ducts of canvas, rubber or metal shall be used in the forms. Concrete shall be uniformly distributed during the process of depositing, and in no case after deposition shall any portion be displaced in the forms more than six feet in a horizontal direction. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 18". Each layer shall be placed while the previous layer is still soft. Concrete that has attained its initial set shall not be deposited in the work. No concrete shall be re-tempered nor shall any concrete be used that has stood for more than 30 minutes after the mixer has stopped or after discharge from the mixer. Concrete shall be placed in closures at bottom of wall panels in such a manner as to avoid trapping air against the outside form face.

C. Cold Weather Placement. Concrete shall be mixed and placed only when the temperature is at least 50 degrees F., and rising.

D. Hot Weather Placement. Concrete shall not be placed when the atmospheric temperature is above 100 degrees F and special care shall be taken for placement in temperatures over 80 degrees.

1. All materials and equipment shall be stored in the shade.

2. Shade shall be provided for all slabs to be placed or finished after 10:00 a.m.

3. Special care shall be taken to obtain the coolest mixing water available.

4. Forms to receive concrete shall be kept cool by sprinkling until the pour has started.

When atmospheric temperatures exceed 80 degrees F., and/or wind velocities exceed 5 mph, the water content of concrete shall be adjusted and a retarding agent added as directed by the Architect.

E. Compaction. Concrete shall be thoroughly compacted during placement, and shall be carefully worked around reinforcement and embedded items along surfaces and into corners of forms. Except where compaction by hand-tamping is specified, it shall be placed in layers not over 18" in depth and each layer shall be compacted with internal vibration equipment supplemented by hand-spading, rodding and tamping. Vibrators shall not be used to transport concrete inside forms. There shall be at least one vibrator per ten yards of concrete placed per hour, with one spare vibrator maintained on the job. Vibrators shall not be inserted into lower courses that have begun to set, nor into solid or sand bottoms. Where hand-tamping is used, there shall be not less than one man for each five cubic yards of concrete placed per hours, whose time shall be used in tamping ONLY.

F. Modified Mix. Where conditions make puddling difficult, or where the reinforcing is congested, batches may be modified with Architect's review of revised mix design.

G. Record of Placing. The Contractor shall coordinate keeping of a record with the Construction Manager at the job of the time and date of placing the concrete in each portion of the structure. Such record shall be kept until the completion of the structure and shall be open to the inspection of the Architect.

H. Wall Closures. Placement of concrete in vertical wall closures shall be carried out in 18-inch lifts, with concrete being pumped through form windows in the back of the form. The number of closures poured during one operation shall be limited and the rate of pour regulated so that successive lifts are placed while the lift below is still liquid, while avoiding excessive depth of liquid material in the forms. Placing of concrete shall not be started until the Contractor can be sure, beyond a reasonable doubt, of the continuous arrival of material at the pump hopper. Concrete shall be compacted by rodding along the face of the form with a piece of reinforcing steel. The length of the rod for the first pour shall equal the height of the wall. The rod shall be shortened after each lift so that it will penetrate 6 inches into the lift below. Each lift shall be worked sufficiently to insure a solid mass, but care shall be used to avoid causing segregation of coarse aggregate.

3.07 CONSTRUCTION JOINTS

A Location and detail of all construction joints not shown on the Plans shall be approved by the Architect in advance of placing operations and shall conform to ACI's recommendations.

B Existing surfaces shall be thoroughly roughened and cleaned of all laitance, foreign matter, loose particles and dust before placing new concrete. Forms shall be re-tightened, and the existing surfaces in structural concrete treated as follows, immediately ahead of concrete placement:

1. Vertical construction joints shall be washed with clean water and then slushed with a grout coat of neat cement. Form windows shall be provided as necessary for this operation.

2. Horizontal construction joints shall be washed with clean water and, when so directed by the Architect, shall then be covered with a layer, not less than 2 inches nor more than 6 inches in thickness, of a modified mix as specified herein before. Form windows shall be provided as necessary to insure covering all joint surfaces.

C Place formed construction joints in pattern placement sequence. Set top screed to required elevations. Secure to resist movement of wet concrete.

D Horizontal concrete slab surfaces supporting concrete or masonry walls shall be wire brushed before hardening. Care shall be taken to avoid damage to adjoining concrete surfaces.

E Install joint fillers in accordance with manufacturer's instructions. Use primers of type recommended by joint filler manufacturer.

3.08 PIPES AND CONDUITS

A. Pipes other than conduit for electrical circuits shall not be embedded in structural concrete.

B. Conduit Location. When placed in structural slabs, conduit shall be located within the middle half of the slab and should not be placed between reinforcing steel and the bottom of the slab. Conduit in slabs on grade shall be placed below reinforcement steel and shall be supported on concrete blocks to insure complete concrete encasement. Blocks for supporting conduit shall be as specified for the support of reinforcement bars in the section "Reinforcing Steel". When located in columns, walls or beams, conduit shall be located so that, in the opinion of the Architect, the strength of the structure is not impaired.

C. Conduit Size. No conduit placed in a concrete slab shall have an outside diameter greater than one-third the thickness of the slab. No conduit larger than 1 inch shall be embedded in floor slabs. Larger conduit shall be below bottom surface of slabs and encased separately.

D. Sleeves. Appropriate sleeves shall be provided for all pipe or conduit passing through any walls or floors. Sleeves shall be so located so as not to impair the strength of the structure. Openings larger than 12 inches in dimension will not be permitted unless specifically shown on the Drawings.

3.09 REMOVAL OF FORMS

The removal of forms shall be carried out in such a manner as to insure the complete safety of the structure and to avoid damage to concrete surfaces. In no case shall supporting forms or shoring be removed until concrete has hardened sufficiently to permit their removal with safety. Soffit forms and supports for beams, lintels and slabs above grade shall remain in place until laboratory tests show that they can be removed safely. Forms for surfaces to be sandblasted, except beam soffits, may be removed after three days, if removal can be accomplished without damage to concrete surfaces.

3.010 SLABS ON EARTH

A. Placing. Concrete shall be placed in one continuous operation between construction joints after soil poisoning, vapor barrier and sand protection have been laid. Spreading by hand shall be with shovels; rakes shall not be used. Workmen shall be required to remove all dirt or mud from their footwear before stepping into freshly mixed concrete. Concrete shall be thoroughly compacted by hand tamping in such a manner as to force the larger aggregate into the body of the slab and bring to the top a minimum of free mortar. Surfaces shall be carefully screeded off after compacting, using approved screeds accurately set to the finished grade of the slab, and shall be worked to a true and even grade free from waves and irregularities.

B. Finishing. All slabs shall receive a monolithic finish unless otherwise specified. All slab marking and jointing shall be as detailed and at locations indicated on the Drawings. Perimeters of all slab areas and edges of all walks shall be finished with an edger unless otherwise indicated. Edging tools shall have a radius of 1/8 inch for joints and 1/4 inch for discontinuous edges unless otherwise shown. Corners or edges of slabs which have crumbled and any area which lacks sufficient mortar for proper finishing shall be corrected by removing all loose aggregate and/or soupy mortar and filling with a suitable concrete mixture. Unnecessary tool marks shall be limited and all edges and joints shall be smooth and true to line. Where tooled joints (T.J.) are indicated on the Drawings,

such joints shall be formed using a marking tool with a knife extension. The total depth of depression thus formed shall be not less than 1/2 inch nor greater than 3/4 inch. Such additional scoring as may be required by the Architect shall be with a standard marking tool (without extension) and will be at approximately 4 feet each way. At the Contractor's option, saw-cut joints may be submitted for the weakened plane joints shown, except in exposed aggregate surfaces. Saw cuts must be uniform, straight, to the depth indicated for W .P. joints, and shall be made as soon as they can be made without spalling the concrete surface. Any spillage or splatter of concrete mortar on adjacent slabs or structures shall be removed immediately by flushing with water.

C. Sealing -- Joint sealing is described in the section "Caulking".

3.011 CONCRETE FINISHES

A. All exposed concrete surfaces, exterior and interior, shall be uniformly finished and shall have a surface texture as hereinafter described. Surfaces shall be free from rough spots, stains, hardened mortar or grout, and other imperfections. Cleaning and repairing of concrete surfaces shall be as directed by the Architect.

B. Steel trowel finish shall be used for finish building floor slabs, for top surfaces of pre-cast elements and for all concrete bases and curbs except where otherwise indicated on the Drawings or specified herein.

C. Steel troweling of floated surfaces may begin as soon as the surface has hardened enough to prevent excess fine material from working to the surface. The finished surface shall be hard and smooth and care shall be taken to minimize trowel marks and trowel "burn". Dusting will not be permitted except as hereinafter specified. Except where warped surfaces are indicated, slabs shall be finished to a true plane surface, free from humps or sags. The finished surface shall not deviate more than 1/8 inch from the edge of a 10-foot steel straightedge. Areas not conforming to the intent of these Specifications shall be corrected by grinding or measures satisfactory to the Architect.

D. Broom finish shall be used for concrete walks and exterior slabs where so directed by the Architect. Surfaces to receive broom finish shall first be finished as specified above for steel trowel finish. Immediately after troweling, these surfaces shall be broomed uniformly as directed by the Architect, using a broom with moderately coarse, stiff bristles.

E. Formed surfaces (finished). All exposed or painted formed surfaces, except where a steel trowel finish is required, shall be smooth and uniform. All form tie holes shall be filled, all honeycomb and other imperfections repaired and all fins removed. Rough spots, stains and hardened mortar shall be removed from all surfaces by rubbing lightly with fine carborundum stone. Water shall be used liberally and rubbing shall be sufficient only to remove defects without changing the surface texture.

F. Formed surfaces (rough). Repair all honeycomb and fill all form tie and bolt holes in concealed concrete surfaces.

G. Slab surfaces to receive mud-set tile shall be marked with a grid tamper to provide a suitable surface for bonding.

H. Salt Finish: Surfaces shall be floated finish prior to application of salt. Coarse salt shall be applied to the required slab. Amount and duration shall be determined by sample. Salt shall then be washed clean from all concrete surfaces. Adjacent broom surfaces to be protected.

I. Samples. Prior to placing concrete in areas to receive exposed aggregate or sandblasted finishes, the Contractor shall prepare a 30" x 30" sample panel of each of these types of finishes, using the specified materials. Sample panels must be approved by the Architect, and shall match existing columns as closely as possible. The panels prepared by the Contractor shall then be used as standards for the finishes represented and shall be the basis for acceptance or rejection of these finishes.

3.012 PATCHING

Honeycomb, or minor defects, and hole remaining from form ties, bolts or test cores shall be patched. Mixes for use in patches in architectural concrete finishes shall consist of cement mortar and suitable aggregates that will produce patches to match the patched surface. Mortar for concealed patches shall consist of one part Portland cement and three parts fine aggregate. Exposed patch surfaces shall be finished to match the adjoining surface. Holes passing entirely through the wall shall be filled from the inside face with a device that will force the mortar through to the outside face, using a stop held at the outside wall surface to insure complete filling. Holes which do not pass entirely through the wall shall be packed thoroughly full. Concrete surfaces to be patched shall be thoroughly moist, but free of surface water at the time of patching. Patches shall be cured as specified for concrete. Only 100% portland cement materials shall be used for the patching of slabs to receive flooring.

3.013 DEFECTIVE CONCRETE

If any concrete does not fully conform to the provision of these specifications, such work shall be deemed to be defective materials and/or workmanship, and the Contractor shall remove same from the site, at no extra cost to the Owner. When and as direct by the Architect, defective concrete may be cut out and repaired, at no extra cost to the Owner.

3.014 CURING

A. All concrete surfaces shall be effectively sealed against moisture loss or shall be kept continuously wet for a period of not less than ten (10) days. Forms containing concrete and earth fill against concrete shall be kept continuously moist by sprinkling during this period. Prior to the commencement of each concrete pour, all materials and equipment, including hoses, nozzles, etc., necessary to the curing of that concrete pour, shall be at the job site. Curing operations shall commence immediately after concrete has been placed and shall be continuous for the duration of the curing period.

B. Floor slabs and textured exterior slabs shall be cured by wet-cure method covering with an approved burlap or membrane kept moist by periodic spraying. Edges of the membrane covering shall be lapped not less than 6 inches and shall be weighted with wind-rows of clean sand. At no time shall the membrane be allowed to dry out during the first 10 days after pouring the slab. Units shall be removed from forms as soon as possible and shall be immediately coated on the under surface and edges. Walks, curbs and smooth exterior slabs may be cured as specified for floor slabs or coated with a suitable manufacturer's instructions, and all thin spots or breaks that occur during the curing period shall be repaired by the application of additional material. Special care shall be taken to avoid coating reinforcing steel, construction joint and expansion joint surfaces with curing compound. Exposed surfaces of construction joints and expansion joints shall be cured by sealing under a building paper or by a wet blanket covering. If weather conditions are severe, and when directed by the Architect, surfaces shall be kept moist with a fine fog spray until protected as specified above.

C. Curing water, if any shall be led away from buildings and structures, and shall not be permitted to pond within 10 feet of any construction.

3.015 PROTECTION

A. All finished concrete shall be protected during the course of construction, and any chips, cracks, or other defects that occur during the course of construction to any concrete shall be repaired as may be directed by the Architect.

B. Surfaces of architectural concrete shall be covered to protect them from spatter during placement of adjoining concrete. Strips of Vis-Queen shall be placed under the edges of exposed aggregate slabs adjacent to other concrete to be placed, and shall then be folded back over the finished surfaces to protect them.

3.016 CLEAN UP

Clean up all exposed concrete surfaces and all adjoining work which has been stained by leaking or spatter of concrete, to meet the approval of the Architect, immediately after each concrete pour.

*****END OF SECTION*****

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SECTION 03345

CONCRETE FINISHING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work included: Provide finishes on cast-in-place concrete as called for on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Except as may be modified herein or otherwise directed by the Architect, comply with ACI 301, "Specifications for Structural Concrete for Buildings".

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 PRODUCT HANDLING

Comply with pertinent provisions of Division 1.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. General:

1. Carefully study the Drawings and these Specifications, and determine the location, extent, and type of required concrete finishes.
2. As required for the Work, provide the following materials, or equals accepted in advance by the Architect.

B. Liquid bonding agent: "Weld-Crete," manufactured by the Larsen Products Corporation.

C. Curing and protection paper:

1. Comply with ASTM C171, Type 1, regular.

2. Accepted products:

a) "Sisalkraft, Seekure 896";

b) Equal non-staining products faced with polyethylene film.

D. Slip-resistant abrasive aggregate:

1. Provide aluminum oxide grains, uniformly graded, screen size 12-13, 14-36 or 16-30.

2. Acceptable product:

a) Emerchrome Floor Hardener by L.M. Scofield Company.

b) Frictex H by Sonneborn.

c) or approved equal.

2.02 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FINISHING OF FORMED SURFACES

A. General:

1. After removal of forms, give exposed concrete surfaces the finish specified below.

2. Revise the finish as needed to secure the acceptance of the Architect.

B. Rubbed finish:

1. Do not start cleaning operations until all contiguous surfaces to be cleaned are completed and accessible.

2. Do not permit cleaning as the work progresses.

3. Mix one part portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paint.

4. Substitute white portland cement for part of the gray portland cement as required to produce a color matching the color of surrounding concrete, as determined by a trial patch.

5. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout, and apply the grout uniformly with brushes or spray gun.

6. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.

7. While the grout is still plastic, remove all excess grout by working the surfaces with a rubber float, sack, or other means.

8. After the surface whites from drying (above 30 minutes at normal temperatures), rub vigorously with clean burlap.

9. Keep the surface damp for at least 36 hours after final rubbing.

3.03 FINISHING SLABS

A. Definition of finishing tolerances:

1. "Class A": True plane within 1/8" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.

2. "Class B": True plane within 1/4" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.

B. Scratched finish: For surfaces scheduled to receive bond-applied cementitious applications.

1. After the concrete has been placed, consolidated, struck off, and leveled to a Class B tolerance, roughen the surface with stiff brushes or rakes before the final set.

C. Floated finish: For surfaces intended to receive roofing.

1. After the concrete has been placed, consolidated, struck off, and leveled, do not work the concrete further until ready for floating.

2. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.

3. During or after the first floating, check the planeness of the surface with a ten foot straightedge applied at not less than two different angles.

4. Cut down high spots and fill low spots, and produce a surface with a Class B tolerance throughout.

5. Refloat the slab immediately to a uniform sandy texture.

D. Troweled finish:

1 Provide a floated finish as described above, followed by a power troweling and then a hand troweling which is relatively free from defects, but which still may show some trowel marks.

a. Monolithic Trowel Finish: For all floor surfaces not otherwise specified. Steel trowel and retrowel to smooth surface. After concrete has set enough to ring true, retrowel to a burnished impervious finish, free of trowel marks or other blemishes.

b. Steel Float Finish: for all slabs to receive resilient tile, waterproof membrane, or carpeting. Same as monolithic finish except omit burnish retroweling.

c. Fine Swirl Finish (when shown on the Drawings): Prepare same as steel float finish. When ready, perform such finishing operations as necessary to produce Architect-selected fine textured, non-slip finish. Construct sample panel for Architect's acceptance prior to placement. Sample panel shall consist of tooled edges and have a tooled joint within field of panel.

2 Provide a finished surface essentially free from trowel marks, uniform in texture and appearance, and in a plane of Class A tolerance.

E. Broom finish: For slabs to receive thin set tiles, apply steel float finish followed by very fine broom finish. For surfaces to receive mortar setting beds and for exterior concrete driveway ramps, curbs and gutters, spandrels, etc.

1. Provide a finished surface uniform in texture and appearance, and in a plane of Class A tolerance. Roughen surface with coarse broom.

F. Rock Salt finish: Exterior walkways and pavings except where non-slip finish is specified.

1. Provide a floated finish as described above.

2. While the surface is still plastic, broadcast rock salt into the surface and embed uniformly into the surface by light tamping.

3. Float the surface until it has been brought to a true plane with Class B tolerance.

4. After the concrete has completely set, flood the surface with water to dissolve the rock salt, using a fine bristle brush as necessary to remove the salt.

5. Provide a sample panel at the site of the proposed finish and receive the acceptance of the Architect of that finish prior to placing of the paving.

G. Non-slip finish: For exterior platforms, steps, and landings; and Interior and exterior pedestrian ramps.

1. Provide a floated finish as described above.

2. While the surface is still plastic, broadcast abrasive aggregate as specified in Paragraph 2.01.F above and work into the surface according to the manufacturer's recommendations.

3. Complete finishing surface as described above for a troweled finish, and as recommended by the aggregate manufacturer.

3.04 CURING AND PROTECTION

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures, and mechanical injury.

B. Preservation of moisture:

1. Unless otherwise directed by the Architect, apply one of the following procedures to concrete not in contact with forms, immediately after completion of placement and finishing.

a. Ponding or continuous sprinkling;

b. Application of absorptive mats or fabric kept continuously wet;

c. Application of sand kept continuously wet;

d. Continuous application of team (not exceeding 150° F) or mist spray;

e. Application of waterproof sheet materials specified in Part 2 of this Section;

f. Application of other moisture-retaining covering as accepted by the Architect.

g. Where forms are exposed to the sun, minimize moisture loss by keeping the forms wet until they can be removed safely.

2. Cure concrete by preserving moisture as specified above for at least ten days.

C. Temperature, wind, and humidity:

1. Cold weather:

a) When the mean daily temperature outdoors is less than 40° F, maintain the temperature of the concrete between 50° F and 70° F for the required curing period.

b) When necessary, provide proper and adequate heating system capable of maintaining the required heat without injury due to concentration of heat.

c) Do not use combustion heaters during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.

2. Hot weather: When necessary, provide wind breaks, fog spraying, shading, sprinkling, ponding, or wet covering with a light colored material, applying as quickly as concrete hardening and finishing operations will allow.

3. Rate of temperature change: Keep the temperature of the air immediately adjacent to the concrete during and immediately following the curing period as uniform as possible and not exceeding a change of 5° F in any one hour period, or 50° F in any 24 hour period.

D. Protection from mechanical injury:

During the curing period, protect the concrete from damaging mechanical disturbances such as heavy shock, load stresses, and excessive vibration.

1. Protect finished concrete surfaces from damage from construction equipment, materials, and methods, by application of curing procedures, and by rain and running water.

2. Do not load self-supporting structures in such a way as to over stress the concrete.

*****END OF SECTION*****

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SECTION 05120

STRUCTURAL STEEL

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

The work under this section includes furnishing all labor, materials and equipment, and performing all operations in connection with Structural and Miscellaneous Steel and related items indicated on the Drawings, specified herein or reasonably implied to complete the work.

1. Structural Steel framing members, support members, embed angles, and struts.
2. Base plates, anchor bolts and structural framing accessories for a complete and proper installation of the work.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedures." Conform to AWS Code D1.1-85. Welding Inspection:

1. It shall be the responsibility of the Contractor that the Architect be notified of the commencement of welding, shop or field, in ample time to provide inspection.
2. A representative of the Owner will inspect installation of Automatic end and welded studs. At the beginning of each day's work, a minimum of two test stud welds shall be made with the equipment to be used to metal, which is the same as the actual work piece. The test studs shall be subjected to a 90-degree bend test by striking them with a hammer. After the above test, the weld section shall not exhibit any tearing out or cracking.

C. The American Institute of Steel Construction (AISC) "Manual of Steel Construction" shall apply in the performance of this work, except for clauses contradicted by the General and special Conditions and this section of the Specifications.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Producers' or manufacturers specifications and installation recommendations for the following products, including laboratory test reports and other data required to prove compliance with the specified requirements.
   a. Structural steel, including certified copies of mill test reports covering chemical and physical properties;
   b. Unfinished bolts and nuts;
   c. Structural steel primer paint.

2. Shop Drawings including complete details and schedules for fabrication and shop assembly of members. Shop Drawings shall be generally in accordance with AISC "Structural Steel Detailing"

   a. Include details of cuts, connections, camber, holes, and other pertinent data;

   b. Indicate welds by AWS symbols, and show size, type, and length of weld;

   c. Provide setting drawings, templates, and directions for installing anchor bolts and other required anchors;

   d. Identify details by reference to sheet and detail number of the Drawings.

1.06 PRODUCT HANDLING

A. All material shall be handled, shipped, and stored in a manner that will prevent distortion or other damage. Material shall be stored off of the ground, in a clean location and kept properly drained. All damaged material shall be replaced or repaired as directed by the Architect.

B. Delivery and storage:

1. Delivery materials to the job site properly marked to identify the location for which they are intended.

2. Use markings corresponding to markings shown on the approved Shop Drawings.

3. Store in a manner to maintain identification and to prevent damage.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Rolled steel plates and bars: Comply with ASTM A36.

1. Girder and beam sections and beam cover plates.

2. All other bars, plates and shapes.

B. Steel Tube: Comply with ASTM A500, grade B. 46 ksi

C. Anchor bolts: Comply with ASTM A307, non-headed type with double hexagonal nuts unless otherwise indicated.

D. Unfinished threaded fasteners:

1. Comply with ASTM A307, grade A, regular low carbon steel bolts and nuts.

2. Provide either hexagonal or square heads and nuts, except use only hexagonal units for exposed connections.

3. High strength bolts: ASTM A-325

E. Primer: Use "10-99 Tnemec Primer," "Rustoleum No. 5769 Primer," or equal approved in advance by the Architect.

F. Anchor bolt templates: Provide separate steel templates not less than 10 gage for each anchor bolt group or assembly.

G. Electrodes for welding: Comply with AWS Code, using AWS A5.1 or A5.5 E70XX electrodes as required for intended use.

H. Welding rod for mild steel: ASTM A-233

I. Resistance welded studs shall be as manufactured by Nelson Stud Welding Division of Gregory Industries or by KSM Products, Inc.

2.02 FABRICATION

A. Shop fabrication and assembly:

1. Fabricate items of structural steel in accordance with AISC specifications: "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", latest edition, and as indicated on the approved Shop Drawings.

2. Properly mark and match-mark materials for field assembly and for identifications as to location for which intended.

3. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.

4. Where finishing is required, complete the assembly, including welding of units, before start of finishing operations.

5. Provide finish surfaces of members exposed in the final structure free from markings, burrs, and other defects.

B. Connections:

1. Provide bolts and washers of types and sizes required for completion of field erection.

2. Welded construction: Comply with AWS Code for procedures, appearance, and quality of welds, and methods used in correcting welded work.

3. Assemble and weld built-up sections by methods that will produce true alignment of axes without warp.

C. Experienced welding operators shall do welding. The operator, the welding equipment, the electrodes, the methods of making the welds, and all structural welds, as completed, shall be as approved by the representative of the approved Testing Laboratory.

D. Resistance welded studs shall be installed with special approved welding equipment, in accordance with stud manufacturer's recommendations.

E. Shop welds shall in general be made with the material to be welded positioned for down-hand welding. Root passes of all "U" or "V" joints for butt welds by manual process shall be made with #6010 rod; roots of butt welds shall be chipped or flame-gouged prior to deposition of seal weld or of initial pass of back-up weld.

F. Anchors. Welding rod for welded bar anchors shall be E 70 Series low hydrogen.

G. Exposed Welds. Welds that will be exposed to view, after building is completed, shall be neatly dressed off smooth, flush with the parent metal.

H. Holes for other work:

1. Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on the approved Shop Drawings.

2. Provide threaded nuts welded to framing, and other specialty items as shown, to receive other work.

3. Cut, drill, or punch holes perpendicular to metal surfaces.

4. Do not flame cut holes or enlarge holes by burning.

5. Drill holes in bearing plates.

2.03 SHOP PAINTING

A. General:

1. Shop paint structural steel work, except those members or portions of members to be embedded in concrete or mortar.

2. Paint embedded steel that is partially exposed on the exposed portions, and the initial 2" of embedded areas only.

3. Do not paint surfaces that are to be welded or high-strength bolted with friction type connections.

4. Apply two coats of paint to surfaces that are inaccessible after assembly or erection. Change color of the second coat to distinguish it from the first.

B. Surface preparation:

1. After inspection and before shipping, clean steel work to be painted.

2. Remove loose rust, loose mill scale, and spatter, slag, and flux deposits.

3. Clean steel in accordance with Steel Structures Painting Council SP-3k, "Power Tool Cleaning."

C. Painting:

1. Immediately after surface preparation, apply structural steel primer paint in accordance with the manufacturer's recommendations and at a rate to provide a uniform dry film thickness.

2. Use painting methods that will result in full coverage of joints, corners, edges, and exposed surfaces.

2.04 GALVANIZING

A. All steel and ferrous metal items located on the exterior of the building, or otherwise specifically shown or noted on drawings to be galvanized, shall be galvanized by the hot-dip process, conforming to ASTM A123-68a. All required hot-dip galvanizing shall be done after fabrication, in the largest sections possible. Items too large for available dip tanks shall be sprayed, by approved methods, with molten zinc to coating thickness of .003" to .004".

B. Weight of the zinc coating per square foot of actual surface shall average not less than 2.0 ounces and no individual specimen shall show less than 1.8 ounces. The thickness of the zinc coating shall be the normal coating to be obtained by immersion in a bath of molten zinc at a temperature of not more than 865 degrees F., and allowed to remain until the temperature of the work being galvanized becomes the same as the bath.

C. All shop galvanized metal work necessitating field soldering or welding which in any manner removes original galvanizing shall be restored by field cold galvanizing with "Galvaloy," "Galvicon," or "Drygalv."

D. After fabrication, work indicated on the Drawings to be galvanized shall be thoroughly cleaned in a pressure spray of hot alkali solution to remove all oil, grease and dirt, and then rinsed in hot water. Work shall then be hot-dip galvanized. Finish work shall be free from twist, bow, warp and excess spelter.

E. Spelter: The slab zinc (spelter) used shall conform to the standard specification for slab zinc of the American Society for Testing Materials.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. All work shall be executed and finished in accordance with approved shop drawings, and to conform to the best practice required to produce the highest-grade construction. Workmanship shall be equal to the best practice in modern structural shops. Portions of work exposed to view shall be finished neatly. Welds shall be neat and uniform.

B. Construction. Type I and Type II, in accordance with Section 1 of the AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".

C. Substitution of sections or modifications of details, or both, shall not be made without written approval of the Architect.

D. Furnish and deliver anchor bolts, inserts, plates and other incidental items of structural steel required to be built into concrete with instructions or templates for their installation, to respective trades at the proper time to avoid delay in work.

E. Report any errors in shop fabrication or deformation resulting from handling and transportation that prevent proper assembly and fitting of parts immediately to Architect and obtain approval of method of correction. Approved corrections shall be made at no additional cost to the Owner.

3.03 ERECTION

A. Comply with AISC specifications and "Code of Standard Practice," except as may be modified herein.

B. Anchor bolts:

1. Provide anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.

2. Provide templates and other devices necessary for pre-setting bolts and anchors to accurate locations.

C. Bases and bearing plates: Shop weld to columns and members attached to concrete.

D. Splicing:

1. Splice members only where indicated unless, with the Architect's approval, splices not indicated would result in lower costs due to reduced shipping expense.

2. For splices not indicated, submit structural calculations prepared and signed by a structural engineer licensed to practice where the fabricator is located.

E. Gas cutting:

1. Do not use gas-cutting torches for correcting fabricating errors in the structural framing.

2. Cutting will be permitted only in secondary members as acceptable to the Architect.

3. When gas cutting is permitted, finish the gas cut section to a sheared appearance acceptable to the Architect.

F. Surveys:

1. Establish permanent benchmarks necessary for accurate erection of structural steel.

2. Check elevations of concrete surfaces, and locations of anchor bolts and similar items, before erection proceeds.

G. Temporary shoring and bracing:

1. Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads.

2. Provide temporary guy lines to achieve proper alignments of the structure as erection proceeds.

3. Remove temporary connections and members when permanent members are in place and the final connections have been made.

H. Setting bases and bearing plates:

1. Clean concrete bearing surfaces free from bond-reducing materials, and then roughen to improve bond to the surface by either sandblasting or waterblasting.

2. Clean the bottom surface of base and bearing plates.

3. Set loose and attached base plates and bearing plates for structural members in wedges or other adjusting devices.

4. Tighten anchor bolts after the supported members have been positioned and plumbed.

5. Do not remove wedges or shim but, if protruding, cut off flush with the edge of the base or bearing plate prior to packing with grout.

6. Pack grout solidly between bearing surfaces and bases or plates to assure that no voids remain.

7. Finish exposed surfaces, protect installed materials, and allow to cure in strict compliance with the manufacturer's recommendations as approved by the Architect.

I. Field Assembly:

1. Set structural frames accurately to the lines and elevations indicated.

2. Align and adjust members forming part of a complete frame or structure before fastening permanently.

3. Clean the bearing surface, and other surfaces that will be in permanent contact, before assembly.

4. Adjust as required to compensate for discrepancies in elevation and alignment.

5. Level and plumb individual members of the structure within specified AISC tolerances.

6. Establish required leveling and plumbing measurements on the mean operating temperature of the structure, making allowance for the difference between temperature at time of erection and the mean temperature at which the structure will be when completed and in service.

7. Comply with AISC specifications for bearing, adequacy of temporary connections, alignment, and the removal of paint on surfaces adjacent to welds.

8. Bolted connections shown on the Drawings, except as specified otherwise, are for unfinished bolts. Holes for same shall be punched or drilled 1/16 inch larger than the diameter of the bolt, except as called for otherwise on the drawings.

9. Bolting of end under connections and girder splices shall be with turned bolts in reamed holes or with torqued high-strength bolts.

3.04 TESTING AND INSPECTING (Conform to California Code Amendments, Current Edition)

A. Testing:

1. The Owner's selected testing laboratory will pick up specimens and make required tests.

2. Cost of procuring test specimens at locations more than 50 miles from the job site will be paid by the Owner and back-charged to the Contractor.

3. Costs of tests of identified stock will be paid by the Owner; except that if a test fails to comply with the specified requirements, the cost of testing will be paid by the Owner and back-charged to the Contractor.

4. Costs of tests of unidentified stock will be paid by the Owner and back-charged to the Contractor.

B. Test specimens:

1. Test specimens shall be furnished by the steel fabricator, and shall be taken under the direction of the Owner's selected testing laboratory.

2. Each specimen shall be machined by the Owner's selected testing laboratory to dimensions required by ASTM A370.

3. Cost of procuring, making, and machining test specimens shall be considered test costs as defined above.

4. Provide continuous field inspection for all in field welds and tightening of high strength bolts.

C. Identification and tests:

1. Structural steel identified by heat or melt numbers, and accompanied by mill analysis and test reports, does not require additional testing.

2. If structural steel cannot be identified, or if its source is questionable, not less than one tension test and one bend test will be made for each five tons or fractional part thereof.

D. Inspecting:

1. A complete four-sided inspection of steel will be made when required by the Architect.

2. Cost of inspecting will be paid by the Owner subject to the same provisions made above for tests.

3. If, after fabrication and inspection, the work of this Section is found to be defective and to require reinspection, cost of such reinspection will be paid by the Owner and back-charged to the Contractor.

4. Provide labor, equipment, and facilities needed to move and handle the materials to be inspected.

E. Welding inspection:

1. Unless otherwise specified, perform welding under observation of a qualified inspector from a testing laboratory approved by the Architect.

2. Inspect every layer of weld for quality, penetration, and conformity with design requirements.

3. Require the welding inspector to submit a signed report to the Architect, verifying that:

a. The welding is adequate and was performed in conformity with the specified requirements; and

b. Adequate methods have been used to determine the quality of the welding.

4. The welding inspector may use gamma ray, magnaflux, trepanning, or any other aid to visual inspection considered necessary to assure adequacy of welding, or may use ultrasonic testing performed in accordance with pertinent requirements of governmental agencies having jurisdiction.

5. The Owner will pay cost of welding inspection. The Contractor shall pay any reinspections required due to improper installation.

F. Access:

1. Provide access for the testing agencies and inspectors to places where structural steel work is being fabricated or produced, so that required testing and inspecting may be accomplished.

G. Erection inspecting:

1. The Owner's testing and inspecting agency will visually inspect field welded connections, will perform such additional tests and inspections of field work as are required by the Architect, and will prepare test reports for the Architect's review.

2. The testing agency will conduct and interpret the tests, and will state in each report whether the inspected work complies with the requirements, specifically stating all deviations therefrom.

H. Corrections:

1. Correct deficiencies in structural steel work which inspections and test reports indicate to be not in compliance with the specified requirements.

2. Perform additional tests required to reconfirm non-compliance of the original work and to show compliance of corrected work, all at no additional cost to the Owner.

3.05 FIELD PAINTING

A. General:

1. Prepare surfaces in a manner appropriate to the condition, and as approved by the Architect.

2. Clean spots and surfaces where primer coats have been removed, damaged, or burned off, and clean field bolts and other field connections not concealed in the finished work.

3. Remove dirt, oil, and grease.

4. Apply a spot coat of the approved primer.

5. Do not apply paint to wet, damp, oil, or improperly prepared surfaces.

B. Notify the Architect when the work of this Section is ready to receive field painting.

1. Secure inspection and approval by the Architect prior to field painting.

2. Using spray or brush, as recommended by the manufacturer of the approved paint material, fill all joints and corners and cover the surfaces with a smooth unbroken film of at least 1.5 dry mils thickness.

*****END OF SECTION*****

SECTION 05410

METAL STUD FRAMING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

This section includes structural and non-structural cold-formed metal framing and furring systems as indicated and specified.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A 653 – General Requirements for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

2. C 955 – Load Bearing (Transverse and Axial) Steels Studs, Runners (Track) and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.

3. C 1007 – Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

B. American Welding Society (AWS).

1. D1.1 – Structural Welding Code.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Product Data: Submit framing manufacturer's literature, including a current I.C.B.O. Research Committee Report, showing tabulation of structural properties, load capacities, dimensions, metal gages and the type of coating for all framing and furring members. Submit powder driven fastener manufacturer's current I.C.B.O. Research Committee Report.

C. Shop Drawings: Include plans, elevations, and details for wall and ceiling framing systems and special assemblies where the design is not indicated. Show: profiles, gage, cross sections and spacing of framing members; sizes, connections including welding procedures and electrodes, attachments, reinforcing, anchorage, size and type of fasteners, and accessories required for proper installation.

D. Submit certification from manufacturer of steel framing material that all products have been rolled from new steel sheet material.

1.06 QUALITY ASSURANCE

A. Welder Qualifications: AWS Certified.

B. Regulatory Requirements: Support framing for fire resistive walls and ceilings shall conform to "Fire Resistive Standards" of the latest adopted edition of the Uniform Building Code and shall be listed in the current UL "Fire Resistance Directory".

1.07 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the project site and store them in adequately ventilated dry locations. If it is necessary to store materials outside, stack them off the ground on a platform and fully protect them from the weather.

PART 2 -- PRODUCTS

2.01 MANUFACTURER'S

Load Bearing Metal Stud System: One of the following or equal:

1. Dietrich.
2. LA Metal
3. Metal Stud Forming Corp.
4. Western Metal Lath Company.

2.02 MATERIALS

A. Steel:

1. ASTM A 653, Grade 33.
2. Yield Strength; Minimum yield strength of 33,000 PSI.
3. Galvanized to G60 in accordance with ASTM A 653.

B. Screws, Track to Stud, Stud to Stud: Self-drilling, self-tapping, hot-dip galvanized.

C. Screws, Track to Wood: Hot-dip galvanized, long enough for minimum 1-inch penetration into wood.

D. Nails, Track to Wood: Hot-dip galvanized, long enough for minimum 1-1/2 inch penetration into wood.

E. Bolts, Nuts and Washers: As specified in Section 05500, hot-dip galvanized.

F. Anchorage Devices: Powder Activated Fasteners.

G. Welding Materials: AWS D1.1.

H. Primer: As specified in Section 09900.

2.03 FABRICATION

A. Fabricate studs, runners, bracing, and bridging in accordance with ASTM C 955.

B. Studs: Minimum 20 gauge steel sheet, 3-5/8 inches wide, unless otherwise indicated on the Drawings.

C. Track: Minimum 20 gauge steel sheet, channel shaped, minimum 1-3/8 inch flanged same width as studs, for tight fit, unless otherwise indicated on the Drawings.

D. Backing for fixtures: Minimum 16 gauge steel sheet, 3-5/8 inches wide, unless otherwise indicated on the Drawings.

E. Plates, Gussets, Clips: Steel and steel sheet, thickness suitable for conditions, manufacturer's standard shapes.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 NON-STRUCTURAL WALL FRAMING

A. Erect load bearing metal stud system in accordance with ASTM C 1007.

B. Framing may be prefabricated into panels before erection. Brace panels to prevent racking. Lift panels so as to prevent local distortion of members.

C. Make provision for erection stresses. Provide temporary alignment and bracing. Align runners accurately at the floor and ceiling. Where partitions abut underside of steel or concrete construction, install runner and bent plate as detailed. Restrain lateral movement of the runners with bent plated channels.

D. Cut framing members to fit squarely against abutting members. Hold Members firmly in position until fastened.

E. Attach tracks to the floor and ceiling construction at maximum 2 inches for track ends and at maximum 24 inches on center. Fasten track to concrete with powder actuated fasteners or concrete stub nails, to steel with bolts or welds, and to wood with screws or nails. Butt-weld or splice track butt joints in accordance with AWS D1.1.

F. Use 1 piece, full-length studs without splices between tracks.

G. At curved walls, unless otherwise recommended by stud manufacturer, notch runners and form to indicated radius. Reinforce notched flanges with continuous, one inch by 25 gauge straps, clinched to runners around curve and to extend 4 inches beyond curve, where space permits. Space studs not to exceed 8 inches on center. Anchor each stud to strap reinforcing with screws.

H. Seat studs squarely in upper and lower tracks with study flanges abutting track webs. Securely attach studs to tracks. Fasten non-load bearing studs to provide for deflection. Space studs at maximum 16 inches on center, maximum 2 inches from abutting walls, and at each side of openings, unless otherwise indicated on the Drawings.

I. Connect studs to racks with screws or welds in accordance with manufacturer's instructions. Secure both stud flanges at door and window jambs, and partition intersections and corners to track flanges. Weld members that form trusses in accordance with AWS D1.1. Do not tie members with wire.

J. Framing at Doors: Unless otherwise indicated, provide no lighter than 16 gauge studs at each side of all doors or there openings through partitions. Over metal doorframes, place a cut-to-length section of runner with a web-flange bent at each end and fasten to adjacent vertical studs with 2 screws in each flange. Position a cut-to-length stud at the location of vertical joints over doorframe header extending to the top of the wall. Install a horizontal stiffener channel above each door extending to engage first stud beyond each jamb and attach channel to each stud.

K. Use minimum 3 studs at corner and minimum 2 studs at jambs of openings.

L. Frame both sides of expansion and control joints with separate studs. Do not bridge the joint with components of stud system.

M. Install cripple studs above and below openings at same spacing as full-length stud spacing.

N. Attach cross studs or furring channels to studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, grab bars and other items anchored to partitions or walls.

O. Install framing between studs for attachment of electrical boxes and other mechanical and electrical items.

P. Touch-up field welds and scratched surfaces with primer.

3.03 SUSPENDED CEILING FRAMING

A. Space number 9 hanger wires at 36 inches on center to carry 1-1/2 inch runner channels spaced 48 inches apart. Tie wires securely around channels, using at least 2 turns and attach securely to concrete or steel framing above.

B. Install 1-1/2 inch runner channels and adjust so that furring is in true and accurately level planes. Lap runner channels at least 12 inches at splices and securely tied together with number 18 wire, double wrapped 2 inches from each end of splice. Main runners and cross runners shall not be let into nor shall contact abutting partitions. Locate main runners within 6 inches of walls to support ends of cross furring.

C. Space cross furring channels or "hat" sections, as applicable, 16 inches on center (maximum) and in accordance with Uniform Building Code requirements. Saddle-tie cross furring and hat section toe each runner channel with not less than 2 strands of number 16 tie wire 1 inch from ends of splice.

D. Suspensions under Ducts and at Special Conditions: For hangers spaced from 48 inches on center to 66 inches on center (maximum), use number 6 wire hanger and 2 inch channel runners.

3.04 CLEAN-UP

On completion of work, remove all excess material, equipment, debris and cuttings; dispose of away from premises. Leave work in clean condition.

***** END OF SECTION *****

SECTION 06410

CUSTOM CASEWORK

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

A. Furnish all: labor, materials, equipment and services necessary and/or reasonably incidental to the proper execution of cabinetwork, including hardware as shown on Drawings and specified herein.

B. Work includes counters, shelving, countertops and cabinetry.

1.03 STANDARDS OF WORKMANSHIP

Quality of millwork and fabrication shall conform to:

1. Woodwork Institute of California (WIC)
2. National Kitchen Cabinet Association (NKCA)
3. American Woodworkers Institute (AWI)

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Condition.

B. Submit:

1. Submit Shop Drawings, include materials, component profiles, fastening methods and schedule of finishes.
2. Submit samples of finishes.

1.06 WARRANTY

Contractor Guarantee: Contractor guarantees the work covered by the specification against all defects in material and workmanship for a period of not less than two (2) years from the date the Owner records Notice of Completion.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Softwood plywood: PS-1 graded per AWI. Application: 3/4" for cabinets -- plastic laminated.

B. Plastic Laminate: high pressure laminated plastic conforming to NEMA LP-3, 0.50" thickness for tops, and 0.028" thickness for vertical surfaces.

1. All splashes shall be 4" high; provide end splashes with sq. bottom joints.
2. Interiors: Low Pressure Melamine.
3. Backing Sheet: LD-3-BK 20 backing grade undecorated plastic laminate.

C. Wood particleboard: Per AWI standard, composed of wood chips, made with waterproof resin binders, sanded faces, application 3/4" for countertops.

D. Hardboard: PS-58: pressed wood fiber with resin binder, tempered grade, smooth two sides for drawer bottoms.

E. Hardwood Lumber: Grade in accordance with AWI; maximum moisture content of 6%; application.

F. Plastic Edge Trim: Same as face finish -- plastic laminate.

G. Adhesive - Type II adhesive -- an approved thermosetting-on-contact adhesive.

H. Doors and drawer fronts shall be 3/4" plywood with edges veneered or plastic laminate finish.

I. Hardware: Cabinet hardware shall be concealed self-closing hinges, drawer slide, shelf-standards and clips as manufactured by Blum, Knape & Voigt or equal.

J. Drawer Slides for Drawers 24" wide or less: 100 pound load rated, full extension, ball bearing. Accuride 3832.

K. Drawer Slides for File, Paper Storage and Heavy Duty Drawers 42" wide or less: 150 pound load rated, over travel extension, ball bearing. Accuride 4034.

L. Cabinet and drawer hardware: provide U shape wire pulls at all accessible casework or equally accessible pull hardware.

2.02 FABRICATION

A. Assemble casework in Shop for delivery to site in units easily handled and to permit passage through building openings.

B. Apply plastic laminate finish in full-uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline. Locate counter butt joints minimum 2' from sink cutouts.

C. Mechanically fasten splash backs to countertops with steel brackets 16" o.c.

D. Countertop edges and splashes to have radius corners.

E. Outside corners of force standing desks to be radiused per plans.

F. Apply laminated backing sheet to reverse side of plastic laminate finish surfaces.

G. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surface cut edges.

H. On items to receive transparent finishes, use wood filler that match surrounding surfaces. Apply wood filler in exposed nail and screw indentations. Sand work smooth.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

E. Verify that surfaces and openings are ready to receive work and field measurements are as shown on Shop Drawings and instructed by the fabricator. Verify dimensions for work of other trades incorporated into the casework.

F. Verify that mechanical, electrical, and other building items affecting work of this Section are placed and ready to receive this work.

3.02 INSTALLATION

A. All parts shall be precision machined to close tolerances, accurately fitted and assembled with appropriate fastening and adhesives required to produce first quality fixtures, square, true, plumb and level.

B. Carefully scribe casework that is against other building materials, leaving gaps of 1/32" maximum. Do not use additional overlay trim for this purpose.

C. Anchor securely to wall and floor with all anchorage devices required. Coordinate to allow anchorage devices to be set with other work as applicable. Provide temporary protection over finish work as required during construction to protect the work from damage.

D. Installation shall be complete including continuous bases. All work shall be installed by skilled workmen under the control and supervision of personnel trained in the handling and installation of this cabinetwork and equipment.

E. Install and adjust cabinet hardware to correct operations.

***** END OF SECTION *****

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SECTION 06600

PLASTIC SURFACING MATERIALS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Provide factory-finished Surface Materials, and similar items where shown on the drawings, as specified herein, and as needed for a complete and proper installation. Work may include, but is not limited to:

1. Standard Decorative Laminates.
2. Solid Surfacing.
3. Marker Board Laminate.

1.03 REFERENCES

A. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.

B. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

C. ISO 4586-2 - High Pressure Decorative Laminates; International Organization for Standardization.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

A. Samples:

1. Selection Samples: Submit actual samples of surfacing materials to illustrate full range of colors, patterns, and finishes available.
2. Verification Samples: Submit two samples, each 12 inches square, illustrating each selected surfacing material in specified color, pattern, and finish.

B. Manufacturer's Instructions:

1. Submit manufacturer's printed installation instructions for each product.
2. Submit manufacturer's Safety Data Sheets (M.S.D.S.) for each adhesive.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

Acceptable Products: Wilsonart International, Dupont Corian, Avonite, LG Hi-Macs.

2.02 STANDARD DECORATIVE LAMINATES

A. Acceptable Products: Wilsonart Laminate, Formica, Pionite, Nevamar.

B. Product Description: Decorative surface papers, impregnated with melamine resins, bonded under heat and pressure to kraft papers impregnated with phenolic resins.

C. Standard Decorative Laminate – General Purpose Type: having the following physical characteristics:

1. Sheet thickness: 0.048-inch (1.219 mm) plus/minus 0.005-inch (0.127 mm).
2. Exceeding performance requirements of NEMA LD 3-1995 Grade HGS.
3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 55; Smoke developed 30.
4. Patterns and Finishes: Selected from manufacturer's full range of available selections, as selected and approved by Architect.

2.03 SOLID SURFACING MATERIAL

A. Acceptable Product: Wilsonart Gibraltar Solid Surfacing, Type 051, or approved equal.

B. Product Description: Homogenous sheet material composed of acrylic resins, fire-retardant filler materials, and coloring agents.

1. Nominal sheet thickness: 0.50 inch (13 mm).
2. Surface burning characteristics in accordance with ASTM E 84: Flame spread less than 25; Smoke developed less than 25.
3. Liquid Absorption, ISO 4586-2, for 1/2-inch material thickness: 0.4 percent after 2 hours boiling water.

C. Izod Impact, ASTM D 256, Method A: 0.2 foot pounds per inch.

1. Tensile Modulus, ASTM D 638 Nominal: 1.7 million pounds per square inch.
2. Thermal Expansion, ASTM D 696: 0.000019-inch per inch per degree F, maximum.
3. Hardness, ASTM D 2583, Barcol Impressor: 59.
4. Flexural Modulus, ASTM D 790: 1.6 million pounds per square inch.
5. Deflection Temperature under load, ASTM D 648: 90 degrees C.
6. Stain Resistance: ANSI Z124.6 modified, Method 3.4: No effect.
7. Boiling Water Resistance, NEMA LD 3-1995, Method 3.5: No effect.
8. High Temperature Resistance: NEMA LD 3-1995, Method 3.6: No effect.
9. Radiant Heat Resistance: NEMA LD 3-1995, Method 3.10: No effect.
10. Light Resistance: NEMA LD 3-1995, Method 3.3: No effect.
11. Ball Impact Resistance, NEMA LD 3-1995, Method 3.8, one half pound ball, unsupported: 125 inches.
12. Specific Gravity: 0.977 ounces per cubic inch (1.69 grams per cubic centimeter).
13. Approximate weight: 4.2 pounds per square foot (20.5 kg/square m).
14. Weatherability: ASTM D 2565: Pass.
15. Fungus Resistance, ASTM G 21: Pass.
16. Bacterial Resistance, ASTM G 22: Pass.
17. Pittsburgh Protocol Toxicity: 66.9 grams.
18. Patterns and Finishes: Selected from manufacturer's full range of available selections, selected and approved by Architect.
19. Impact Resistance NEMA LD3-1995 (1/2 lb. Ball) SSV bonded to substrate*** Method 3.08 modified. 125" (No Failure)

20. Tensile Toughness ASTM D 638. 21 (in. – lb./in. ^{3})

21. Tensile Modulus ASTM D 638 Nominal. 1.7 x 10^{-5} lb./in.^{3}

22. Density 1.60 gram/cm^3

23. Approximate weight 4.2 lbs./ft^2

24. Pittsburgh Protocol Toxicity = 30 grams range

2.04 MARKER BOARD LAMINATES

A. Acceptable Product: Wilsonart Marker Board Laminate.

B. Product Description: Overlay saturated with melamine resins and decorative surface papers, impregnated with melamine resins, bonded under heat and pressure to kraft papers impregnated with phenolic resins.

C. Marker Board Laminate - Horizontal Grade Type: Type 136.

1. Sheet thickness: 0.050-inch plus/minus 0.005-inch (1.27 plus/minus 0.127 mm).

2. Exceeding performance requirements of NEMA LD 3-1995 Grade HGS.

3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 40; Smoke developed 115.

D. Marker Board Laminate - Vertical Grade Type: Type 336.

1. Sheet thickness: 0.030-inch plus/minus 0.003-inch (0.762 plus/minus 0.076 mm).

2. Exceeding performance requirements of NEMA LD 3-1995 Grade VGP.

3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 40; Smoke developed 70.

4. Colors: Selected from manufacturer's full range of available selections, as selected and approved by Architect.

E. Marker Board Laminate - Fire-Rated Type: Type 636.

1. Sheet thickness: 0.050-inch plus/minus 0.005-inch (1.27 plus/minus 0.127 mm).

2. Exceeding performance requirements of NEMA LD 3-1995 Grade HGF.

3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 25; Smoke developed 110.

4. Color: Selected from manufacturer's full range of available selections, as selected and approved by Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

Surface preparation: Precondition surfacing materials and surfaces to receive surfacing materials in accordance with manufacturer's printed installation instructions.

3.03 APPLICATION

Install materials in accordance with manufacturer's printed instructions.

***** END OF SECTION *****

SECTION 06625

BALISTIC-RESISTANT FIBERGLASS LAMINATE PANELS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

This section includes structural and non-structural cold-formed metal framing and furring systems as indicated and specified.

1.03 REFERENCES

Specifier Notes: List standards referenced in this section, complete with designations is article does not require compliance with standards, but is merely a listing of those used.

A. ASTM D 570 – Standard Test Method for Water Absorption of Plastics.

B. ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

C. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

D. FAA Federal Aviation Regulation 25.853 – Aircraft Compartment Interiors.

E. ISO 9001:2000 – Quality Management Systems.

F. National Institute of Justice NIJ-STD 0108.01 – Standard for Ballistic Resistance Protective Materials.

G. UL 752 – Standard for Bullet-Resisting Equipment.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Product Data: Submit framing manufacturer's literature, including a current I.C.B.O. Research Committee Report, showing tabulation of structural properties, load capacities, dimensions, metal gages and the type of coating for all framing and furring members. Submit powder driven fastener manufacturer's current I.C.B.O. Research Committee Report.

C. Shop Drawings: Include plans, elevations, and details for wall and ceiling framing systems and special assemblies where the design is not indicated. Show: profiles, gage, cross sections and spacing of framing members; sizes, connections including welding procedures and electrodes, attachments, reinforcing, anchorage, size and type of fasteners, and accessories required for proper installation.

D. Submit certification from manufacturer of steel framing material that all products have been rolled from new steel sheet material.

1.06 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Manufacturer regularly engaged, for preceding 5 years, in manufacture of ballistic-resistant fiberglass laminate panels of similar type to that specified.

2. Certification: ISO 9001:2000.

1.07 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the project site and store them in adequately ventilated dry locations. If it is necessary to store materials outside, stack them off the ground on a platform and fully protect them from the weather.

PART 2 -- PRODUCTS

2.01 MANUFACTURER'S

Load Bearing Metal Stud System: One of the following or equal:

1. Dietrich.
2. LA Metal
3. Metal Stud Forming Corp.
4. Western Metal Lath Company.

2.1 MANUFACTURER

A. Norplex-Micarta, 665 Lybrand Street, Postville, Iowa 52162. Toll Free (800) 848-4431. Phone (563) 864-7321. Fax (563) 864-4231. Website www.norplex-micarta.com . E-mail info @norplex-micarta.com .

2.2 BALLISTIC-RESISTANT FIBERGLASS LAMINATE PANELS

A. Ballistic-Resistant Fiberglass Laminate Panels: "ShotBlocker".

1. Grade: "MC504BR".
2. Description:
   a. Opaque, self-extinguishing, phenolic-glass thermoset composite, ballistic-resistant material.
   b. Woven-glass fabric impregnated with high-temperature phenolic resin system.
   c. Projectiles typically captured and retained in ballistic-resistant panels.

B. Conformance:

1. Federal Aviation Regulation 25.853.
2. Fire and Smoke Rating, ASTM E 84: Class 1-A.
   a. Flame Spread Index: 5.
   b. Smoke Development Index: 0.
3. UL listed.

C. Typical Properties:

1. Flexural Strength, ASTM D 790:

a. Crosswise: Minimum 17,000 psi.

b. Lengthwise: Minimum 14,000 psi.

2. Water Absorption, ASTM D 570: Maximum 4 percent.

D. Panels:

1. Product: "ShotBlocker Panel 04".

a. UL 752 Performance Level Standard: Level 4 and Level 5.

b. NIJ-STD 0108.01 Performance Level Standard: Type III.

c. Minimum Thickness: 1.188 inches (30.16 mm).

d. Nominal Sheet Size: 48 inches by 96 inches (1,219 mm by 2,438 mm).

e. Nominal Sheet Weight: 410.2 pounds (168.06 kg).

f. Weight Factor: 11.9 to 14.1 pounds per square foot (58.10 to 68.84 kg/m2).

PART 3 -- EXECUTION

1.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

1.02 INSTALLATION

A. Install ballistic-resistant fiberglass laminate panels in accordance with manufacturer's instructions at locations indicated on the Drawings.

B. Cut and drill ballistic-resistant fiberglass laminate panels in accordance with manufacturer's instructions.

C. Install ballistic-resistant fiberglass laminate panels plumb, level, square, and true to line.

D. Secure ballistic-resistant fiberglass laminate panels securely in place to supports.

E. Decorative Laminate

1. Bonding Decorative laminates to ballistic-resistant fiberglass laminate panels with adhesive in accordance with manufacturer's instructions.

2. Applying adhesive uniformly to both surfaces to be bonded.

3. Follow instructions of adhesive manufacturer.

4. Clean ballistic-resistant fiberglass laminate panel surface in accordance with manufacturer's instructions before bonding to decorative laminates to remove dirt, dust, oil, grease, and other coatings.

F. Stud Walls:

1. Pre-drill holes in ballistic-resistant fiberglass laminate panels to hang panels on stud walls.

2. Pre-drill Hole Diameter: Slightly larger than screw shank

3. Place screws every 12 inches to 24 inches (305 mm to 610 mm)

4. Screw Length: Sufficient length to anchor firmly in stud.

G. Butt Joints: Install 4-inch (102-mm) wide batten-strip backing of same panel product at butt joints for 2-inch (51-mm) overlap on each side of joints for ballistic-resistant fiberglass laminate panels.

1.03 PROTECTION

A. Protect installed ballistic-resistant fiberglass laminate panels from damage during construction.

1.04 CLEAN-UP

On completion of work, remove all excess material, equipment, debris and cuttings; dispose of away from premises. Leave work in clean condition.

***** END OF SECTION *****

SECTION 07210

THERMAL INSULATION

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

A. Furnish and install Thermal Insulation indicated on the Drawings and as specified herein.

B. The principal items of work include:

1. Thermal Insulation within roof.
2. Thermal Insulation within exterior walls.
3. Thermal Insulation within interior walls.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Upon completion of this portion of the Work, complete and post a certificate of insulation compliance in accordance with pertinent requirements of governmental agencies having jurisdiction.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.06 GUARANTEE

Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than two (2) years from the date the Owner records Notice of Completion.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Provide thermal insulation as indicated on Drawings. All insulation shall be inorganic glass fiber insulation. Insulation shall comply with ASTM Testing Standards. Fire Hazard

Classification, Flame Spread Index, Smoke Developed Index, Combustibility, and Fire Endurance Ratings as required by Code.

B. Insulation shall be as manufactured by Certain-Teed, Johns-Manville, Owens-Corning, or Architect approved equal.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Verify adjacent materials are dry and ready to receive installation.

B. Verify mechanical and electrical services within walls have been installed and tested.

3.03 INSPECTION

A. Before any installation is started, determine that the other work is suitable to receive insulation.

B. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

C. Remove or protect against projections in construction framing that may damage or prevent proper insulation.

3.04 INSTALLATION

A. All work shall be performed by licensed applicators, shall comply with the recommendations of the manufacturer and the National Association of Insulation Manufacturers.

B. Install insulation with factory applied membrane facing warm side of building spaces. Lap ends and side flanges of membrane over and between framing numbers. Secure in place. Tape seal butt ends and lapped side flanges. Tape seal tears or cuts in membrane.

C. Trim insulation neatly to fit spaces. Use batts free of damage. Install batt insulation, in wall spaces without gaps or voids.

D. Install Insulation in all indicated walls from floor to underside of roof. Secure insulation with 19-gage wire or 1" wide, 20 gage steel strips. Architect shall approve all insulation details, including methods of fastening, before commencement of the work.

3.05 CLEAN UP AND DISPOSAL

At frequent intervals during and again upon completion of work, remove from building and working premises tools and equipment, surplus materials, all rubbish and debris of whatever nature not caused by other trades, and leave the work in a clean, orderly and acceptable condition approved by the Architect.

***** END OF SECTION *****

SECTION 07900

CAULKING AND SEALANTS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work included: Throughout the work, seal and caulk joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of moisture and passage of air.

1.03 QUALITY ASSURANCE

A. Conform to Sealant and Waterproofers Institute requirements for materials and installation.

B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

C. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

D. Warranty: Provide written warranty for all caulking and sealants against all defects of material or application for a period of five (5) years after date of acceptance. All failures that may occur within this period due to defective application or materials shall, upon written notification of such failures, be repaired or replaced with proper materials and labor as accepted by the Architect, at no additional cost to the Owner.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items that will be provided under this Section.

2. Manufacturer's Data: catalog cuts, dimensioned drawings, and other data needed to prove compliance with the specified requirements.

3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 WARRANTY

A. The guarantee specified herein shall include warranties against leakage, hardening, cracking, crumbling, melting, running, shrinking or staining adjacent surfaces.

B. Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than five (5) years from the date of Substantial Completion.

PART 2 -- PRODUCTS

2.01 SEALANTS

A. Except as specifically otherwise accepted by the Architect, use only the types of sealants described as follows:

1. One component polyurethane sealant, moisture curing, low modulus, FS TT-S-0023OC, Type II, Class A, ASTM-C-920, Class 25, for vertical and horizontal joints in connection with all building materials. Do not use in traffic areas. Minimum ¼" joint; maximum 1-1/4" x 3/8"d.

   a. Dymonic by Tremco

   b. Sonolastic NP1 by Sonneborn

2. One-part silicone sealant, moisture curing, low modulus, FS TT-S-0023OC, Type II, Class A, FS TT-S-001543A, Class A, for vertical and horizontal joints in connection with aluminum, glass and concrete materials which require greater movement capabilities. Do not use in traffic areas. Minimum joint ¼" x 3/16"d; maximum1" x ½"d.

   a. Spectrum 1 by Tremco

   b. Omniseal by Sonneborn

   c. Dow Corning 790

3. One-part silicone sealant, medium modulus, neutral cure, FS S-0023OC, Type II, Class A, FS TT-S-001543A, Type II, Class A, ASTM C920, Class 25, for vertical and horizontal joints in connection with non-porous surfaces such as aluminum, glass, tile, laminated plastic and concrete. Do not use in traffic areas.

   a. Spectrum 2 by Tremco

   b. Omni Plus by Sonneborn

   c. Dow Corning 795

   d. Construction 1200 by GE

4. Multi-Component polyurethane sealant, FS TT-S-00227E, Type I, Class A, ASTM C920 for horizontal joints in traffic areas. Minimum 3/8" wide, depth to be 3/8" to ½" - use primer.

   a. THC-900/901 by Tremco

   b. Chem. Caulk 950 by Bostick

5. One-part translucent silicone sealant, low modulus, moisture curing, FS TT-S-0023OC, Type II, Class A, FS TT-S-001543A, Type II, Class A, for vertical joints in connection with butt glazing.

   a. 895 Silicone by Pecora

   b. Silglaze N by GE

6. One-part mildew resistant silicone sealant meeting requirements of FDA Regulation 21 CFR 177.2600, for vertical and horizontal joints in connection with non-porous applications as sealing around bathroom fixtures, shower-tub enclosures, sinks and urinals.

   a. Dow Corning 786

   b. Sanitary 1700 by GE

7. One-part siliconized acrylic latex polymer caulk, ASTM C834-76, for interior horizontal and vertical joints in connection with window and door buck perimeters, interior wall surfaces, etc.

   a. AC-20 by Pecora

   b. Acrylic Latex by Tremco

8. Roof Penetrations: Use asphalt mastic conforming to ASTM D491.

9. For other services, provide products especially formulated for the proposed use and accepted in advance by the Architect.

B. Colors:

1. The Architect will select Colors for each sealant installation to match adjacent finishes from a standard color list normally available from the specified manufacturers.

2. Should a matching standard color not be available from the accepted manufacturer except at additional charge, the Contractor shall provide such colors at no additional cost to the Owner.

3. In concealed installations, and in partially or fully exposed installations where so accepted by the Architect, use standard gray or black sealant.

2.02 PRIMERS

Use only those primers that are: non-staining, have been tested for durability on the surfaces to be sealed, and are specifically recommended for this installation by the manufacturer of the sealant used.

2.03 BACKUP MATERIALS

A. Use only those backup materials that are specifically recommended for this installation by the manufacturer of the sealant used, which are non-absorbent, and which are non-staining.

B. Acceptable types include:

1. Closed-cell resilient urethane or polyvinyl chloride foam;

2. Closed-cell polyethylene foam;

3. Closed-cell sponge of vinyl or rubber;

4. Polychloroprene tubes or beads;

5. Polyisobutylene extrusions;

6. Oil-less dry jute.

C. Preformed support strips for ceramic tile control joint and expansion joint work: Use polyisobutylene or polychloroprene rubber.

2.04 BOND-PREVENTATIVE MATERIALS

Use only one of the following as best suited for the application, and as recommended by the manufacturer of the sealant used:

1. Polyethylene tape, pressure-sensitive adhesive, with the adhesive required only to hold tape to the construction materials as indicated;

2. Aluminum foil complying with MIL-A-148E;

3. Wax paper complying with Fed. Spec. UU-P-270.

2.05 JOINT PACKING

Shall be installed in all joints to receive sealant. Material shall be a resilient type such as closed cell PVC foam or as recommended by the manufacturer. Oakum or other types of absorptive materials shall not be used as packing material.

2.06 OTHER MATERIALS

A. For masking around joints, provide masking tape complying with Fed. Spec. UU-T-106c.

B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Concrete and ceramic tile surfaces:

1. Install only on surfaces that are dry, sound, and well brushed, wiping free from dust.

2. At open joints, remove dust by mechanically blown compressed air if so required.

3. Use solvent to remove oil and grease, wiping the surfaces with clean rags.

4. Where surfaces have been treated, remove the surface treatment by sandblasting or wire brushing.

5. Remove laitance and mortar from joint cavities.

6. Where backstop is required, insert the approved backup material into the joint cavity to the depth needed.

B. Steel surfaces:

1. Steel surfaces in contact with sealant:

a. Sandblast as required to achieve acceptable surface for bonding.

b. If sandblasting is not practical, or would damage adjacent finish, scrape the metal or wire brush to remove mill scale.

c. Use solvent to remove oil and grease, wiping the surfaces with clean rags.

2. Remove protective coatings on steel by sandblasting or by using a solvent that leaves no residue.

C. Aluminum surfaces:

1. Remove temporary protective coatings, dirt, oil, and grease.

2. When masking tape is used for protective cover, remove the tape just prior to applying the sealant.

3. Use only such solvents to remove protective coatings as are recommended for that purpose by the manufacturer of the aluminum work, and which are non-staining.

3.03 INSTALLATION OF BACKUP MATERIAL

A. Use only the backup material recommended by the manufacturer of the sealant used, and accepted by the Architect for the particular installation, compressing the backup material 25% to 50% to achieve a positive and secure fit.

B. When using backup of tub or rod stock, avoid lengthwise stretching of the material. Do not twist or braid hose or rod backup stock.

C. Interior and exterior joints where no backing has been provided or which is in excess of 3/4" deep shall be packed by this subcontractor with fiberglass or a suitable joint filler to reduce the depth to 1/2" maximum. Maximum movement: the width of the joint shall be at least four times its maximum movement.

3.04 PRIMING

A. Use only the primer recommended by the manufacturer of the sealant, and accepted by the Architect for the particular installation, applying in strict accordance with the manufacturer's recommendations as accepted by the Architect.

B. The priming of joints shall be by brush to reach all surfaces to which compound will be applied. Primer shall be provided on masonry, concrete and wood surfaces as recommended by sealant manufacturer. Primer shall not be applied to surfaces that will be exposed after caulking is completed.

3.05 BOND-BREAKER INSTALLATION

Provide an approved bond-breaker where recommended by the manufacturer of the sealant, and where directed by the Architect, adhering strictly to the installation recommendations as accepted by the Architect.

3.06 INSTALLATION OF SEALANTS

A. Prior to start of installation in each joint, verify the joint type according to details on the Drawings, or as otherwise directed by the Architect, and verify that the required proportion of width of joint to depth of joint has been secured.

B. Equipment:

1. Apply sealant under pressure with power-actuated or hand gun, or by other appropriate means.

2. Use guns with nozzle of proper size, and providing sufficient pressure to completely fill the joints as designed.

C. Thoroughly and complete mask joints where the appearance of sealant on adjacent surfaces would be objectionable.

D. Install the sealant in strict accordance with the manufacturer's recommendations as accepted by the Architect, thoroughly filling joints to the recommended depth.

E. Tool joints to the profile shown on the Drawings, or as otherwise required if such profiles are not shown on the Drawings.

F. Cleaning up:

1. Remove masking tape immediately after joints have been tooled.

2. Clean adjacent surfaces free from sealant as the installation progresses, using solvent or cleaning agent recommended by the manufacturer of the sealant used.

3. The excess material shall be cleaned from the surfaces adjacent to the joint, following the caulking operation and the top of the compound deposit shall be left with a smooth even finish. No material is permitted on the exposed face of aluminum sections.

*** END OF SECTION ***

SECTION 08100

METAL DOORS AND FRAMES

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work included: Provide metal doors and metal door frames which are not specifically described in other Sections of these Specifications, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. All the requirements of the Contract Documents apply to this Section.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Unless specifically otherwise accepted by the Architect, provide all products of this Section from a single manufacturer.

C. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with:

1. SDI Grade II for Heavy Duty metal doors (Steel Door Institute).

2. HMMA Standard CHM-1-74 (Hollow Metal Manufacturers Association).

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items that will be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation, and anchorage.

4. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

PART 2 -- PRODUCTS

2.01 MATERIALS

Doors and Frames shall be made of commercial quality, level cold rolled steel conforming to ASTM A-366, Latest Edition, and free of scale, pitting, or other surface defects. Face sheets and frames of exterior doors shall be zinc coated.

2.02 METAL DOORS

A. Type and design: Provide full-flush polystyrene insulated design, in dimensions and types shown on the Drawings, labeled or non-labeled as indicated on the Door Schedule in the Drawings, in 16 gage for interior doors and 16 gage for exterior doors, properly reinforced. SDI-111A shall be used as the standard for all frame details.

B. Finish: Pre-clean and shop prime each door with rust inhibitive primer for finish painting which will be performed at the job site under Section 09900 of these Specifications. Cleaning shall include a phosphate treatment for paint adhesion and all exposed surfaces shall have a rust inhibiting primer.

C. Acceptable products:

1. Steel Craft Type L Series typically. Type B where security door called out on Drawings, gage of door to be increased to 14.

2. Republic, DB Series typically. Security doors called out on plans to be increased to 14-gauge.

3. Equal products of other manufacturers when accepted in advance by the Architect.

D. Clearances: Provide single swing doors with not more than 1/8" clearance at jambs and heads, not more than ¼" clearance at meeting edges of pairs of doors (1/8" on fire doors) and not more than ¾" clearance at the bottom. Provide door bottom per hardware specifications. All clearance dimensions are nominal and subject to a tolerance of + 1/32". Lock edges of the door shall be designed to provide proper operating clearance conforming to dimensions noted above.

2.03 METAL FRAMES

A. Type and design: Provide frames of the types and dimensions shown on the Drawings, labeled or non-labeled as indicated on the Schedule and Types in the Drawings, in 16 gage for interior and exterior frames, properly reinforced. SDI-111A shall be used as the standard for all frame details.

B. Finish: Pre-clean and shop prime each door with rust inhibitive primer for finish painting which will be performed at the job site under Section 09900 of these Specifications. Cleaning shall include a phosphate treatment for paint adhesion and all exposed surfaces shall have a rust inhibiting primer.

C. Acceptable manufacturers: See Paragraph 2.02-C above.

D. Welded Frames. Secure headers and jambs at the corners either by internal welding of faces or by welded splice plates. Also secure joints at jambs and headers at the rabbet either by tack welding on the inside of the profile or by mechanical interlock. Form neat line joints at faces of frames at junction of head and jamb.

E. Frame Anchors:

1. Wall Conditions. Provide frames with a minimum of three anchors per jamb as required for the adjoining wall construction. Provide anchors of not less than 18 gage steel or 3/16" diameter wire adjustable.

2. Floor Anchors. Provide all frames with minimum 18 gage anchors for attachment to the floor.

2.04 DOOR LOUVERS

A. Fire-Rated Louver: Each fire-rated louver shall have the listing mark of Underwriter's Laboratories Inc. affixed to louver assembly.

All louvers in fire-rated doors shall be Model FLDL-UL, 16 gage cold rolled steel with stainless steel operating springs, as manufactured by Anemostat Products, Carson,

California, or equal products of other manufacturers when accepted in advance by the Architect. Louvers shall be sight-proof per SDI-111C.

B. Fixed-Blade Louver

1. All fixed blade louvers shall be Model FDLS, 18 gage cold rolled steel with mitered and welded frames and countersunk mounting holes, as manufactured by Anemostat Products, or equal products of other manufacturers when accepted in advance by the Architect. Louvers shall be sight-proof per SDI-111C.

2. Provide insect screen where louver occurs in exterior door.

C. Finish

Finish shall be factory painted in color selected by the Architect.

2.05 FINISH HARDWARE

Secure templates from the finish hardware supplier, and accurately install, or make provision for, all finish hardware at the factory.

2.06 INSULATION

Provide polystyrene foam insulation core typically and at all 12" high horizontal mullions and sills. Insulation shall have a minimum R factor of 7.7.

2.07 GLAZING

Non-removable glazing stops shall occur on the outside of exterior doors and the secure side of interior doors. Glazing beads on the inside of glass and louver panels shall be removable. Miter of butt join beads at corners. Glazing beads may be either screw-on or snap-on type. Glazing systems shall be a minimum of 20-gage steel or .040" aluminum.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FABRICATION

A. Doors:

1. All doors shall be of types and sizes on the drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Doors shall be strong, rigid and neat in appearance, free from warpage or buckle. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.

2. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.

3. Top and bottom edges shall be closed with a continuous recessed 16 gauge steel channel extending the full width and spot welded to both faces. Exterior doors shall have an additional flush closing channel at the top edge. Opening shall be provided in the bottom closer for escape of entrapped moisture.

4. Vertical edges of single acting swing doors shall be beveled 1/8" in 2".

5. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully template hardware only. Where surface mounted hardware is to be applied, doors shall have reinforcing plates only, with drilling and tapping to be done in the field. Minimum gauge of hardware reinforcing shall be as follows:

   a. Hinge: 7-gauge

   b. Lock, flush bolts, concealed holders, and for all surface-mounted hardware: 12-gauge.

6. Allow 1/8" clearance between doors and frame at top rail and at lock and hinge stiles. At floors allow 1/2" clearance. At thresholds and curbs allow 1/4" clearance unless otherwise detailed.

7. The Face sheets of Exterior and Security doors shall be stiffened by continuous vertical formed steel sections occupying the full thickness of the interior space between door faces. These stiffeners shall be not less than 20 gauge, spaced not more than 6" apart and securely attached to both face sheets by spot welds not more than 4" o.c. Spaces between stiffeners shall be sound deadened and insulated the full height of the door with an inorganic non-combustible batt-type material.

B. Frames:

1. All door and louver frames shall be strong and rigid, neat in appearance, square, true and free of defects, warp and buckle. Molded members shall be clean cut, straight and of uniform profile and back-bends shall be as detailed.

2. Corner joints shall have all contact edges closed tight, with trim faces and stops mitered and continuously welded. All welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.

3. Hardware reinforcement shall be same as specified for door, with hinge and pivot reinforcement 1-1/2" x 10" minimum size.

4. Unit frames for installation in stud partitions shall be provided with steel anchors of suitable design for welding to steel studs. Anchors shall be not less than 16-gauge and shall be securely welded inside each jamb. Anchors are to be spaced at 24" on center.

5. Provide floor anchor of 14-gauge steel securely welded inside each jamb with two holes provided for floor anchorage.

6. Dust cover boxes of not less than 26-gauge shall be provided at all hardware mortises on frames to be set in masonry or drywall partitions. All frames shall be provided with a steel spreader attached to the feet of both jambs to serve as a brace during shipping and handling.

C. Finish: Finish shall consist of the following items:

1. Thoroughly clean all metal of rust, oil, and grease after fabrication.

2. Bonderize all metal with bonderite solution.

3. Baked-on coat of primer after bonderizing.

4. Additional coat of primer prior to shipping.

D. Labeled Doors and Frames: Labeled doors and frames shall be provided for those openings requiring fire protection ratings, as scheduled on the drawings. Such doors and frames shall be constructed as tested by the Underwriter's Laboratories, Inc., and shall bear their label for the required rating. Provide additional frame accessories as required to maintain the fire protection ratings once the frames are installed in the openings.

3.03 FIELD MEASUREMENTS

Verify all opening dimensions in the field prior to fabrication and assembly of frames.

3.04 INSTALLATION

Placing frames:

1. Where practicable, place frames prior to construction of enclosing walls and ceilings.
2. Set frames accurately into position, plumbed, aligned and braced securely until permanent anchors are set.
3. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
4. At in-place wood stud construction, set frames and secure to adjacent construction with #12 self-tapping flathead wood screws and zee clips.
5. At in-place metal stud construction, set frames and weld anchorage devices to adjacent construction.
6. When installed in prepared openings in concrete construction, provide sealant between frame and concrete in accordance with provisions of Section 07900 of these Specifications.

3.05 ADJUST AND CLEAN

A. Final adjustments:

1. Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.
2. Leave work in complete and proper operating condition.
3. Remove defective work and replace with work complying with the specified requirements.

B. Immediately after erection, sand smooth all rusted and damaged areas of prime coat, and apply touch-up of compatible air-drying primer.

***** END OF SECTION *****

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SECTION 08395

BULLET RESISTANT HOLLOW METAL DOOR & FRAME ASSEMBLY

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

This section includes structural and non-structural cold-formed metal framing and furring systems as indicated and specified.

1.03 REFERENCES

A. The publication below forms a part of this specification:

1. Underwaters Laboratory UL 752 Bullet Resisting Equipment 11th Edition dated September 5, 2005

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. The following shall be submitted in accordance with Division 1 and the SPECIAL CONTRACT REQUIREMENTS. Submit for approval prior to fabrication, VERIFICATION OF UL LISTING OF BULLET RESISTANT COMPOSITE, catalog cuts, brochures, specifications, frame profiles, size, type and spacing of frame anchors, reinforcement size and locations, details of joints and connections, welding details and printed data in sufficient detail to indicate compliance with the contract documents. Provide proof of possession of PRODUCT LIABILITY INSURANCE in an amount not less than five million U.S. dollars. Manufacturer's instructions for installation and cleaning of glazing material. Provide verification of compliance with ASTM E 119.00a One Hour Fire Rating for the ballistic protection barrier from a recognized testing laboratory.

1.06 QUALITY ASSURANCE

A. Welder Qualifications: AWS Certified.

B. Regulatory Requirements: Support framing for fire resistive walls and ceilings shall conform to "Fire Resistive Standards" of the latest adopted edition of the Uniform Building Code and shall be listed in the current UL "Fire Resistance Directory".

1.07 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the project site and store them in adequately ventilated dry locations. If it is necessary to store materials outside, stack them off the ground on a platform and fully protect them from the weather.

PART 2 -- PRODUCTS

2.01 DOOR

Bullet resistant hollow metal door shall be of the "non-ricochet type" as shown on the contract drawings and schedules complete with 16 ga. face plates, foamed in place rigid urethane foam and fiberglass core. The 16 ga. rails and stiles are to be welded to face plates and provide a flush

surface on all edges. Door unit shall be supplied pre hung with a Continuous Gear Hinge in a steel frame. Door and frame shall be mortised and reinforced at the factory for template hardware in accordance with the approved hardware schedule. Doors for a protection level 4 or higher can utilize HI Hard Anti ballistic steel for the protective core.

Templates are to be provided to the door manufacturer by the hardware contractor. Drilling and taping for surface mounted hardware shall be performed at the jobsite by the installing contractor. If bullet resistant transparent armor is required for the door vision panel, the vision panel shall be furnished by the door manufacturer and be UL Listed material of the same ballistic level as the door. Door and frame Assemblies shall be manufactured by Armortex, Schertz, Texas. Phone: (210)-661-8306, 800-880-8306 Fax: 210-661-8308. If in compliance with all aspects of this specification products by these manufactures may be acceptable:

Diebold, Inc.	800-999-3600
Ross Engineering	703-971-2442
Norshield Security Products	334-281-8440

2.02 FRAME

Frames shall be a protection level equal to the door. Frame shall be of a "non-ricochet type" design, constructed of 16 ga. commercial grade steel lined with UL LISTED Bullet Resistant Composite. Steel shall be free of scale, pitting, coil breaks or other surface defects. Finish work shall be neat and free of defects. Frames shall be welded. Knocked down and mechanical joints are unacceptable. All exposed welds shall be ground flush, finished smooth and free of defects. Standard manufacturing tolerances shall be +/- 1/16" for frame opening width, height, diagonal dimensions and overall width and height (outside to outside).

2.03 FINISH

Cold rolled steel is factory prime painted gray. The continuous hinge is clear anodized aluminum. Field paint and finish in accordance with and as directed in the Finish Section 9 of these specifications.

PART 3 -- EXECUTION

1.01 INSTALLATION

In accordance with manufacturers instructions.

1.02 PROTECTION

It shall be the responsibility of the contractor to see that any scratches or disfigurement caused in shipping or handling of the products are promptly cleaned, touched up, properly stored in a dry location and covered to protect them from damage. Repair damaged units prior to completion and acceptance of the project or replace with new, as directed.

1.03 CLEAN-UP

On completion of work, remove all excess material, equipment, debris and cuttings; dispose of away from premises. Leave work in clean condition.

***** END OF SECTION *****

SECTION 08580

BULLET RESISTANT HOLLOW METAL FIXED WINDOWS

PART 1 - GENERAL

1.01 REFERENCE

The publications listed below forms a part of this specification.

A. UNDERWRITERS LABORATORY UL 752 11th Edition dated Sept 5, 2005 Standard for Bullet Resistant Equipment

B. AMERICAN WELDING SOCIETY

1.02 DESIGN

Through design, manufacturing technique and material application, frames shall be of the "non-ricochet type". This design is intended to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration. The encapturing barrier shall be UL LISTED BULLET RESISTANT COMPOSITE manufactured by Armortex. PROTECTION LEVEL SHALL BE UL LEVEL 4.

Frames shall be of a protection level equal to or greater than the glazing. Units must be manufactured in strict accordance with the specifications, design and details. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect. All welds shall be in accordance with the requirements and standard practices of the American Welding Society. All exposed welds shall be ground flush and finished smooth. Standard manufacturing tolerances shall be +/- 1/16" for frame opening, diagonal dimensions of frame, overall frame width, height, depth, etc. Aluminum or aluminum clad units are not acceptable.

1.03 SUBMITTALS

The following shall be submitted in accordance with Division 1 and the SPECIAL CONTRACT REQUIREMENTS. Submit for approval prior to fabrication: VERIFICATION OF UL LISTING OF BULLET RESISTANT COMPOSITE, catalog cuts, shop drawings, specifications, frame profiles, size, type and spacing of frame anchors, reinforcement size and locations, details of joints and connections, welding details and printed data in sufficient detail to indicate compliance with the contract documents. The provider of this window must be ISO 9001:2008 Certified by an accredited registrar and provide proof of such. Provide proof of possession of PRODUCT LIABILITY INSURANCE in an amount not less than five million U.S. dollars.

1.04 WARRANTY

All materials and workmanship shall be warranted against defects for a period of one (1) year from date of receipt at job site.

PART 2 - PRODUCTS

2.01 FRAMES

Bullet Resistant Frames and glazing assemblies shall be manufactured by Armortex of Schertz, Texas. Phone: 210-661-8306, 800-880-8306, Fax: 210-661-8308.

If in compliance with all aspects of this specification products by these additional manufactures may be acceptable:

Diebold, Inc. – 800-999-3600
Ross Engineering – 703-971-2442
Norshield Security Products – 334-281-8440

Frames shall be a protection level equal to or greater than the glazing. Frame modules shall be of a "non ricochet type" design, constructed of brake formed commercial grade cold rolled 16 ga. steel ((substitute 16 ga. stainless steel in lieu of 16 ga. cold rolled steel)) lined with UL LISTED BULLET RESISTANT ARMORTEX® COMPOSITE. Frames of a protection level 4 and higher shall be lined with HI Hard Anti ballistic steel of the appropriate level. Steel shall be free of scale, pitting, coil breaks and finish work shall be neat and free of defects. Corners shall be continuously welded the full length of the intersection. Knocked down and mechanical joints are unacceptable. Frame modules shall be capable of being joined with other frame modules to form a continuous hardline. Replacement of glazing shall be from the secure side of the window or wall unit and will not require the removal of the frame from the opening.

2.2 GLAZING

The glazing must be UL Listed Level 3 laminated polycarbonate.

2.3 FINISH

Cold rolled steel is to be factory prime painted gray. ((no paint if stainless steel frames are specified)) Field paint and finish in accordance with and as directed in the Finish Section 9 of these specifications.

PART 3 - EXECUTION

3.1 INSTALLATION

Set frames and glaze in accordance with manufacturer's instructions. Repair damaged units prior to completion and acceptance of the project or replace with new units as directed by the architect.

3.2 PROTECTION

It shall be the responsibility of the contractor to see that any scratches or disfigurement caused by shipping and handling of the product are touched up. Properly store all the frames, glazing material etc. in a dry location and covered to protect them from damage before and after installation.

3.3 CLEANING

Upon completion, clean exposed surfaces of frames and glazing products thoroughly in accordance with manufacturer's instructions. Remove mastic smears and other unsightly marks.

** END OF SECTION **

SECTION 09250

GYPSUM BOARD SYSTEMS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

All of the requirements of the Contract Documents apply to this Section.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.04 SUBMITTALS

A. In accordance with Article 5 of the General Conditions.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items to be provided under this Section.

2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements.

3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

C. Mock-ups:

1. At an area on the site where accepted by the Architect, provide mock-up panels as follows:

a. Make each mock-up panel approximately 4'-0" high and 4'-0" long.

b. Provide one mock-up panel for each variation of panels.

c. The mock-up panels may be part of the Work, and may be incorporated into the finished Work, when so accepted in advance by the Architect.

2. If the mock-up panels are not permitted to be part of the finished Work, completely demolish and remove them from the job site upon completion and acceptance of the other work of this Section.

1.05 DELIVERY AND STORAGE

Deliver all manufactured materials in original packages bearing manufacturer's name and brand. Use only one brand of each material throughout job. Store materials off ground and cover against weather. Remove any damaged materials from the site.

1.06 QUALITY ASSURANCE

A. Comply with all applicable requirements of "American Standard Specifications for the Application and Finishing of Gypsum Wallboard", by the America Standards Association, except where more stringent requirements are called for herein, in local Codes or by manufacturer of wallboard. Do all cutting and patching required to accommodate work of other trades.

B. Maintain temperature of drywalled spaces in range of 55 to 90 degrees F until building is entirely closed and ventilated to eliminate excessive moisture.

C. All work herein requires coordination with trades who's Work connects with, is affected or concealed by drywall. Before proceeding with drywall Work, make certain all required inspections have been made.

D. Inspect surfaces to receive drywall before starting Work and do not start until surfaces are acceptable. Starting Work under this Section implies acceptance of surfaces.

PART 2 -- PRODUCTS

2.01 WALLBOARD MATERIALS

A. Gypsum Board: Conforming to ASTM C-36: 5/8" thick, maximum permissible length, ends square cut, tapered and beveled edges.

B. Fire resistive gypsum board: Type X at all interior conditions: 5/8 inch thick x 4 feet wide. Use moisture resistant type X where used in interior wet conditions (ASTM C79).

C. Moisture-resistant Gypsum Board, conform to ASTM C630, 5/8" thick, maximum permissible length.

D. Exterior Cement Board: Concrete glass-fiber reinforced, ½" thick prefabricated panel, consisting of aggregate and Portland cement reinforced with vinyl coated woven glass fiber mesh embedded in both surfaces. Durock Tile Backer Board by USG or approved equal.

2.02 WALLBOARD ACCESSORIES

A. Trim and Edging: 26 gauge, electro-galvanized steel, with knurled surfaces for bedding cement. Provide angle corner pieces with 1-1/4 inch legs at all external corners and channel type metal trim pieces as detailed at all gypsum board edges meeting dissimilar materials. 136#/1000 l.f.

B. Screws: KW self-tapping sheet metal screws, blued steel, counter sunk Phillips heads, of lengths as required to accommodate thickness of drywall construction, for metal framing attachments.

C. Expansion joints: Conspec Systems, Inc. model FWF and FWFC as applicable in field locations. Extruded clear aluminum with continuous gasket.

D. Adhesive: Manufacturer's recommended adhesive for drywall/masonry condition.

2.03 FINISHES

A. Typical walls and/or ceilings to be painted are to receive a medium stipple (orange peel) textured finish as approved by the Architect. Texture to be applied mechanically by this subcontractor.

B. Sand textured walls shall have white play or plaster sand added into the mud prior to application. The application shall be troweled to simulate a smooth plaster finish.

C. A sample of 4' x 4' is to be prepared of each texture for the Architect's approval prior to application.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. If framing members are out to alignment, bowed or warped, correct to make true surfaces before application of gypsum board. Make finish walls or ceilings plumb and level without ridges, bows or warps.

B. Apply boards with long dimension perpendicular to framing members with all abutting ends and edges over supports. Neatly fit and stagger all end joints. Make joints occur on different studs at opposite sides of partition. Cut and fit neatly around all outlets and switches. Space fasteners 8 inches o.c. along vertical edges, and 12 inches o.c. of midpoints, 3/8 inch from edge of board. Fasten boards to backings specified (unless noted as shear walls).

C. Erection technique shall result in plumb and straight surfaces with no waves or buckles, free of unevenness at joints.

D. Joints wider than 1/8 inch will be cause for rejection of board surface by Architect.

E. Provide all backing, furring, stripping, or blocking indicated or required for installation and attachment of Work of all other trades. Cut and frame all openings required by other trades. Structural members shall not be cut, notched or drilled except as shown or noted on Drawings.

3.03 TAPING AND FINISHING

A. Mix joint and finishing compounds per manufacturer's directions.

B. Center tape over joint and embed in uniform layer of joint compound of sufficient width and depth to provide firm and complete bond. Apply skim coat while embedding tape.

C. Treat angles with reinforcing tape folded to conform to adjacent surfaces and straight true angles.

D. Allow compound to thoroughly dry for at least 24 hours.

E. Over joint compound and tape, apply coat of finishing compound. Spread evenly and feather out beyond edge of board. After first finishing coat is thoroughly dry (at least 24 hours), cover with second coat with edges feathered out slightly beyond preceding coat.

F. Give all dimples at fastener heads and all marred spots on surface of board one coat joint compound and two coats finishing compound, applied as each coat is applied to joints.

G. Install metal corner reinforcement at all external corners. Conceal flanges of metal reinforcement with at least two coats compound. When completed, compound shall extend approximately 8 inches to 10 inches on each side of metal nosing.

H. After each application of joint or finishing compound has dried, lightly sand all joints. Leave all board and treated areas uniformly smooth and ready for texturing and painting.

3.04 SCHEDULE

A. Provide fire-rated gypsum board at all firewalls and shafts as indicated on Drawings and required by code.

B. Provide water resistant gypsum board at all bermed walls, plumbing walls - full height, and walls to receive tile finish.

3.05 CLEAN UP

A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust and to prevent tracking gypsum and joint finishing compound onto floor surfaces.

B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris and surplus material of the Section.

***** END OF SECTION *****

SECTION 09300

TILEWORK

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to comply with the Contract Documents, including, but not limited to ceramic floor, base and wall tile and installation of stone tiles for floor. All the requirements of the Contract Documents apply to this Section.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods for proper performance of the work of this Section.

B. Comply with recommendations of the Ceramic Tile Institute and the Tile Council of America.

C. Field Conditions: Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Meet with Owner and Architect prior to start of installation to review all requirements. Report to the Architect all conditions, which prevent proper execution of this work.

D. Environmental Conditions:

1. Maintain temperature at 50 degrees F. minimum during tilework and for seven (7) days after completion. Do not apply to frozen surfaces.

2. Vent temporary heaters to outside to avoid carbon dioxide damage to new tilework.

3. Provide adequate lighting for work and walking on newly tiled floors.

4. Use kneeling boards for work and walking on newly tiled floors.

5. Provide shade for all tile, materials and work area on exterior applications as required to prevent rapid evaporation caused by excessive heat.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.05 SUBMITTALS

A, In accordance with Article 5 of the General Conditions.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items to be provided under this Section.

2. Manufacturer's Specifications, catalog cuts, and other data needed to prove compliance with the specified requirements of tile, sealants, grout, trim, fasteners, adhesives and sealers.

3. Samples of each type, class, and color of ceramic tile required, not less than 12" square, mounted on plywood or hardboard backing, and grouted as specified. Sample shall include border pattern.

1.06 PRODUCT HANDLING

Blend all tile at factory and again on site to achieve an even color throughout to the Architect's approval.

1.07 CLOSE-OUT

A. Provide maintenance instructions and product for one cleaning of project subsequent to closeout.

B. Furnish written guarantee covering workmanship and materials for one (1) year after acceptance of the buildings.

PART 2 -- PRODUCTS

2.01 CERAMIC TILE

A. Provide ceramic tile and accessories complying with Tile Council of America Specifications 137.1, in colors and patterns selected by the Architect from standard colors and patterns of the accepted manufacturers.

B. Material:

1. Furnish: size(s), color(s), pattern(s) and shape(s) as indicated on the drawings.

2. Provide standard accessory shapes as required and as accepted by Architect.

3. Use appropriate trim shapes to conform to drawings.

4. Metal trims shall have a clear anodized finish – protected as to resist discoloration from adhesives and grouts.

C. Floor Tile: Provide coefficient of friction not less than 0.60 when tested in accordance with ASTM F489, ASTM F609, and the National Bureau of Standards Technical Note 895 at floor tile.

D. Extra Stock: Supply 2% of each type of tile used in clean marked cartons for Owner.

2.02 SETTING MATERIALS

A. Comply with pertinent recommendations contained in the Tile Council of America "Handbook for Ceramic Tile Installation".

B. Dry set mortar:

1. Provide a commercially prepared mixture of Portland Cement, sand, and additives imparting water retentivity, for use as a leveling / bond coat for setting interior tile floors and all exterior mortar beds.

2. Comply with ANSI A118.1, except where specifically indicated on the Drawings or directed in advance by the Architect, provide conductive dry-set mortar complying with ANSI A118.2.

3. Provide acrylic latex additive formulated for use with dry set mortar.

4. Acceptable products:

a. S-759 Thin Set Mortar for floors, S-763 Thin Set for Walls and S-800 Setting Acrylic Latex Additive, as manufactured by Summitville Tiles, Inc., Summitville, Ohio 43962.

b. Equal products of other manufacturers when accepted in advance by the

Architect.

C. Organic Adhesive: TCA A136.1 Type 1, AO 1700 or approved equal; thin set bond for walls.

D. Epoxy Adhesive: TCA AO 4000 AAR-11, ANSI 118.3 Epoxy resign and epoxy hardener

E. Special tile setting mortars will be considered by the Architect when complete technical data is submitted in advance.

F. Mortar system for thin set bond type for interior floors. Typical in all potentially wet areas such as restrooms.

2.03 GROUT

A. Comply with pertinent recommendations contained in the Tile Council of America "Handbook for Ceramic Tile Installation" in colors selected by the Architect from standard colors available from the accepted manufacturers.

B. Latex Portland Cement Grout:

1. Provide a commercially prepared mixture of Portland cement and latex additives producing water-retentivity, and suitable for grouting all walls and floors subject to ordinary use.

2. Provide a product licensed by the Tile Council of America, and bearing that license symbol.

3. Acceptable products:

a. "S-700 Sanded Joint Filler" with "S-775 Grouting Acrylic Latex Additive", as manufactured by Summitville Tiles, Inc.

b. Equal products of other manufacturers when accepted in advance by the Architect.

C. Expansion Joint: Colors to be selected by Architect.

1. Provide expansion joint backing material as closed cell polyethylene foam weighing not less than 2.7 lbs. Per cubic foot and in dimension approximately 20% thicker than the width of the expansion joint in which used.

2. Expansion joints in floors shall be a two component polyurethane sealant with Shore-A hardness between 35-45. Use at perimeter of all stone flooring especially when adjoining other tilework.

D. At joints between floors and walls and at perimeter of metal doorframes, provide one-part silicone material.

2.04 PROTECTIVE MATERIALS

A. Neutral cleaner such as Hillyard Super Shine-All.

B. Grout release agents such as Klein Company Standard Grout Guard.

C. Sealer: Overall the finished work of this Section, provide a sealer, cleaner or water repellent coating and apply in strict accordance with the Manufacturer's recommendations.

D. Heavy-duty non-staining construction paper with compatible tape for securing it.

2.05 FLOORING TRANSITIONS

Manufacturer(s), Type(s), Location(s), Finishes(s), as indicated on drawings.

2.06 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation,

as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Coordinate work with other trades as needed to assure that proper substrate are provided to receive work of this Section.

B. Acceptability of Surfaces:

1. Before tiling, confirm variations of surface to be tiled fall within maximum variations shown below:

		Walls	Floors
1.	Cement Mortar Bed	1/4" in 8'	1/4" in 10'
2.	Epoxy Adhesive	1/8" in 8'	1/8" in 10"
3.	Organic Adhesive	1/8" in 8'	1/8" in 8"

2. Report all unacceptable surfaces to the Architect and do not tile such surfaces until they are leveled enough to meet above requirements. Leveling cost is included in this section.

3. Remove all adhesives for substrate for clean floor. Before tiling, be certain surfaces to be tiled are free from coating, curing membranes, oil, grease, wax, and dust. Scarify concrete substrate, which is hard steel trowel finished or pores filled with curing compound or other adhesive.

4. Verify that grounds anchors, plugs, recess frames, bucks, electrical work, mechanical work and similar items in or behind the tile have been installed before proceeding with the installation of the mortar bed or tile.

3.03 INSTALLATION

A. General:

1. Comply with ANSI A108.1, A108.5, A108.6 and A108.10 and the "Handbook for Ceramic Tile installation" of the Tile Council of America, except as otherwise directed by the Architect or specified herein.

2. Maintain minimum temperature limits and installation practices recommended by materials manufacturers.

B. Layout:

1. Determine locations of all movement joints before starting tilework.

2. Layout tile work and center tile fields both direction in each space or on each wall area.

3. Lay out all tilework so as to minimize cuts less than one-half tile in size.

4. Locate cuts in both walls and floors so as to be least conspicuous.

5. Provide uniform joint width.

6. Align all floor joints to give straight uniform grout lines, parallel with walls, base and trim.

7. Lay tile in grid pattern unless otherwise indicated on the Drawings or directed by the Architect.

8. Align the joints when adjoining tiles on floor, base, trim, and walls are the same size.

C. Install the work of this Section in accordance with the following Handbook procedure:

1. Floors interior -- No. F115 at porcelain / stone floors.

2. Floors exterior – No. F101.

3. Walls -- No. W242.

D. Limits of tile:

1. Extend tile into recesses and under equipment and fixtures to form a complete covering without interruptions. Omit behind full width mirrors above counter lavatories to allow smooth setting of mirror.

2. Terminate tile neatly at obstructions, edges, and corners, without disruption of pattern or joint alignment.

E. Provide expansion and control joints where shown on the Drawings, and where otherwise recommended by the "Handbook for Ceramic Tile Installation" of the Tile Council of America, sealing in accordance with Section 07900 of these Specifications, but not less than:

1. 24'-0" to 36'-0" in each direction on interior.

2. 12'-0" to 16'-0" in each direction on exterior.

3. At all perimeter walls, building expansion joints and where tile abuts restraining surfaces such as walls, curbs, dissimilar floors, pipes, columns or where changes in backing materials occur.

4. Extend joints completely through the tile, mortar, mortar bed and reinforcing.

F. Install metal edge strips at all openings where floor tile abuts dissimilar materials and a threshold has not been called out. Grout solid all thresholds indicated adjacent to tilework.

G. Workmanship:

1. Supply first class workmanship in all tilework.

2. Use all products in strict accordance with recommendations and directions of manufacturer.

3. Proportion all mixes in accordance with latest ANSI Standard Specifications.

4. Be sure all tilework is free of grout film upon completion, conforming to ANSI A 108.5 sub-section A-4.3.4.7.

H. Provide tile surfaces clean and free from cracked, broken, chipped, unbonded, and otherwise defective units.

I. Provide required protection of tile surfaces to prevent damage and wear prior to acceptance of the Work by the Owner.

3.04 GROUTING

A. Allow tile to set for a minimum of 48 hours prior to grouting. Remove all spacers, ropes, glue and foreign material prior to grouting.

B. Follow grout manufacturer's recommendations as to grouting procedures and precautions.

1. Force maximum amount of grout into joints in accordance with pertinent recommendations in ANSI 108.10.

2. Fill-in joints of cushion edged tile to depth of cushion; fill square edged tile flush with surface.

3. Provide hard finished grout which is smooth and without voids, pinholes or low spots.

C. Remove all grout haze, observing grout manufacturer's recommendations as to use of acid and chemical cleaners.

D. Use recommended sealant for perimeter grouting of stone tile to allow for movement of field.

E. Cleaning:

1. Upon completion of placing and grouting, clean the work of this Section in accordance with recommendations of the manufacturers of the materials used.

2. Protect metal surfaces, cast iron, and vitreous items from effects of acid cleaning.

3. Flush surfaces with clean water before and after cleaning.

4. Cure the joints by keeping damp until hardened, during which time all traffic is kept off newly tiled floor areas.

5. Protect grouted floors from drying out for at least three days with a layer of bituminous building paper lapped 4" and sealed against escape of moisture. Keep traffic off floor during this curing period.

3.05 PROTECTION

A. Apply sealer over all finished surfaces of work of this Section. Use in strict accordance with manufacturer's printed instructions.

B. Protection from Construction Dirt:

1. Apply to all clean, completed tile walls and floors a protective coat of neutral cleaner solution, 1 part cleaner to 1 part water.

2. In addition, cover all tile floors with heavy-duty, non-staining construction paper, masked in place.

3. Just before final acceptance of tilework, remove paper and rinse protective coat of neutral cleaner from all tile surfaces.

C. Protection from Traffic:

1. Prohibit all foot and wheel traffic from using newly tiled floors for at least 3 days, preferably 7 days.

2. Place large flat boards in walkways and wheel-ways for 7 days where use of newly tiled floors with cement type grout is unavoidable.

***** END OF SECTION *****

SECTION 09900

PAINTING

PARTS 1 -- GENERAL

1.01 SUMMARY:

A. Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

B. Section Includes: Painting and finishing of all interior and exterior items and surfaces, unless otherwise indicated or listed under exclusions below:

1. Paint all exposed surfaces, except as otherwise indicated, whether or not colors are designated.
2. Include field painting of exposed exterior and interior structural steel, plumbing, mechanical and electrical work, except as indicated below.
3. Paint exterior plaster where indicated on Drawings.

C. Work Included:

1. The intent and requirements of this section is that all work, items and surfaces which are normally painted and finished in a building of this type and quality, shall be so included in this contract, whether or not said work, item or surface is specifically called out and included in the schedules and notes on the drawings, or is, or is not, specifically mentioned in these specifications.
2. All the requirements of Division Zero and Division One apply to this Section.

D. The following general categories of work and items that are included under other sections, shall not be a part of this section:

1. Shop prime painting of structural and miscellaneous iron or steel.
2. Shop prime painting of hollow metal work.
3. Shop finished work and items.
4. Any drywall or plaster permanently concealed from view.
5. Any factory finished equipment and other materials with a complete factory applied finish.
6. Finish hardware except where primed for paint finish.
7. Any glass, plastics, floor tiles and sheet vinyl coved or vinyl top set bases.
8. Plumbing fixtures: Toilet room accessories.
9. Lighting fixtures except as noted on drawings or specified.
10. Any acoustical surfaces; unless otherwise specified.

D. The Room Finish Schedules indicated on the drawings, indicates the location of interior room surfaces to be painted or finished. The schedule indications are general and do not necessarily define the detail requirements. Include all detailed refinements and further instructions as may be given for the required complete finishing of all spaces and rooms.

1.02 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.03 SUBMITTALS:

A. Product Data: Submit complete manufacturer's descriptive literature and specifications in compliance with pertinent provisions of Article 5 of the General Conditions.

1. Materials List: Submit complete lists of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item when applicable. When required, provide a list of paint and coating materials proposed for use, which equates such materials with the design-basis products specified.

B. Samples: In accordance with provisions of Article 5 of the General Conditions, submit, on 8-1/2 inch by 11 inch hardboard, samples of each color, gloss, texture and material selected by the Architect from standard colors available for the coatings required.

1. For natural and stained finishes, provide sample on each type and quality of wood used on the project.

C. Manufacturer's Instructions: Submit the manufacturer's current recommended methods of installation, including relevant limitations, safety and environmental cautions, application rates, and composition analysis.

1.04 QUALITY ASSURANCE:

A. Regulatory Requirements: Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this Specification, comply with the more stringent provisions.

Regulatory changes may affect the formulation, availability, or use of specified coatings. Confirm availability of coatings to be used prior to job going out to bid and before start of painting project.

1. Comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).

B. Field Sample: When and as directed by the Architect, apply one complete coating system for each color, gloss and texture required. When approved, the sample panel areas will be deemed incorporated into the Work and will serve as the standards by which the subsequent Work of this Section will be judged.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Storage and Protection: Use all means necessary to protect the materials of this Section before, during, and after installation.

B. Deliver materials to job site in new, original, and unopened containers bearing manufacturer's name and trade name. Store where directed in accordance with manufacturer's instructions.

1.06 PROJECT CONDITIONS:

Do not apply exterior materials during fog, rain or mist, or when inclement weather is expected within the dry time specified by the manufacturer. No exterior or interior painting shall be done until the surfaces are thoroughly dry and cured. Do not apply paint when temperature is below 50° F. Avoid painting surfaces when exposed to direct sunlight.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS:

Manufacturer's catalog names and number of paint types in this Section herein are based on products of Dunn-Edwards Corporation and is the standard of quality against which the Architect will judge equivalency. The quantity of titanium dioxide, the use of clays, aluminum silicate, talc

and the purity of acrylic materials are a few of the criteria which will be used by the Architect in determining equivalency of materials. Paints of other manufacturers to conform to materials listed and are approved by Architect.

2.02 MATERIALS:

A. Paints: Provide Ready-Mixed, except field catalyzed coatings. Pigments shall be fully ground maintaining soft paste consistency, capable of being readily and uniformly dispersed to complete homogeneous mixture. Paints shall have good flowing and brushing properties and be capable of drying or curing free of streaks and sags.

B. Accessory Materials: Linseed oil, shellac, solvents, and other materials not specified but required to achieve required finishes shall be of high quality and approved by manufacturer.

C. Colors shall be selected from color chip samples provided by manufacturer of paint system approved for use. Match approved samples for color, texture and coverage.

2.03 MIXES:

Mix, prepare, and store painting and finishing materials in accordance with manufacturer's directions.

PART 3 -- EXECUTION

3.01 EXAMINATION:

A. Examine the areas and conditions under which work of this Section will be performed.

B. Examine surfaces to be painted before beginning painting work. Work of other trades that has been left or installed in a condition not suitable to receive paint, stain, other specified finish shall be repaired or corrected by the applicable trade before painting. Painting of defective or unsuitable surface implies acceptance of the surfaces.

C. Beware of a condition known as "critical lighting". This condition causes shadows that accentuate even the slightest surface variations. A pigmented sealer will provide tooth for succeeding decorative coating, but "does not" equalize smoothness or surface texture. Any corrective action to gypsum board/drywall must be done by the drywall contractor prior to decorating.

D. Correct conditions detrimental to timely and proper completion of the Work.

E. Do not proceed until unsatisfactory conditions are corrected.

F. Beginning of installation means acceptance of conditions.

3.02 PROTECTION:

A. Protect previously installed work and materials, which may be affected by Work of this Section.

a. Protect prefinished surfaces, lawns, shrubbery and adjacent surfaces against paint and damage.

b. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or splatter from fouling surfaces not being painted.

c. Protect surfaces, equipment, and fixtures from damage resulting from use of fixed, movable and hanging scaffolding, planking, and staging.

B. Provide WET PAINT signs, barricades, and other devices required to protect newly finished surfaces. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.03 PREPARATION:

A. Perform preparation and cleaning procedures in strict accordance with coating manufacturer's instructions for each substrate condition.

B. Concrete and masonry surfaces shall be dry, clean, and free of dirt, efflorescence, encrustation, and other foreign matter. Glazed surfaces on concrete shall be roughened or etched to uniform texture.

C. Ferrous metal shall be cleaned of oil, grease, and foreign matter with solvent. Prime within 3 hours after preparation.

D. Sand and scrape metal to remove loose primer and rust.

E. Galvanized metal shall be chemically or solvent cleaned and then retreated with an etching-type solution if recommended by the finish manufacturer. Cleaned and retreated galvanized metal shall be primed the same day that cleaning has been performed.

F. Remove dust, grit and foreign matter from wood surfaces. Sand surfaces and dust clean. Spot coat knots, pitch streaks, and sappy section with pigmented stain sealer when surfaces are to be painted. Fill nail holes, cracks and other defects after priming and spot prime repairs when fully cured.

G. Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place and not-to-be-finish painted, or provide surface-applied protection. Reinstall removed items upon completion of work in each area.

H. Existing surfaces to be recoated shall be thoroughly cleaned and deglossed by sanding or other means prior to painting. Patched and bare areas shall be spot primed with same primer as specified for new work.

I. Thoroughly backpaint all surfaces of exterior and interior finish lumber and millwork, including doors and window frames, trim, cabinetwork, etc., which will be concealed after installation. Backpaint items to be painted or enameled with the priming coat. Use a clear sealer for backpriming where transparent finish is required.

J. Bar and covered pipes, ducts, hangers, exposed steel and ironwork, and primed metal surfaces of equipment installed under mechanical and electrical work shall be cleaned prior to priming.

K. Preparation of other surfaces shall be performed following specific recommendations of the coatings manufacturer.

L. Bond breakers and curing agents must be removed and the surface cleaned before primers, sealers or finish paints can be applied.

M. All drywall surfaces must be completely dry and dust free before painting. Skim coated drywall must be sealed with an alkyd based sealer or a waterborne sealer recommended by the paint manufacturer for this surface. Use the appropriate light or medium tack masking tape.

3.04 APPLICATION:

A. Apply painting and finishing materials in accordance with the manufacturer's submittals, as approved. Use applicators and techniques best suited for the material and surfaces to which applied.

1. The number of coats specified is the minimum that shall be applied. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.

2. All undercoats shall be tinted slightly to approximate the color of the finish coat.

B. Apply each material at not less than the manufacturer's recommended spreading rate:

1. Provide a total dry film thickness of not less than 1.2 mils for each required coat.

C. Apply prime coat to surface, which is required to be painted or finished.

D. Finish exterior doors on tops, bottoms, and edges same as exterior faces, after fitting.

E. Sand lightly and dust clean between succeeding coats.

3.05 CLEANING, TOUCH-UP AND REFINISHING:

A. Carefully remove all spattering, spots and blemishes caused by work under this section from surfaces throughout the project.

B. Upon completion of painting work remove all rubbish, paint cans, and accumulated materials resulting from work in each space or room. All areas shall be left in a clean, orderly condition.

C. Runs, sags, misses, holidays, stains and other defects in the painted surfaces, including inadequate coverage and mil thickness shall be satisfactorily touched up, or refinished, or repainted as necessary.

3.06 FINISH SCHEDULE

A. Apply the following finishes to the surfaces specified and/or as on the finish schedule on the Drawings. Apply all materials in accordance with manufacturer's instructions on properly prepared surfaces and foundation coats. All intermediate undercoats must be tinted to approximate the final color.

1. Architect will issue a color schedule prior to start of painting to designate the various colors and locations required for the work.

B. Exterior Systems:

1. Stucco & Plaster

Flat – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer (W 709) OR SUPER-LOC Two Component Waterborne Epoxy Masonry Sealer (W 718)
Second Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
Third Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
OR	
Second Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)
Third Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)

2. Concrete Tilt-Up

Flat – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer/Sealer (W 709) OR SUPER-LOC Two Component Waterborne Epoxy Masonry Sealer (W 718)
Second Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
Third Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
OR	
Second Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)
Third Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)

3. Brick Masonry

Flat – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer/Sealer (W 709) OR SUPER-LOC, Two Component Waterborne Epoxy Masonry Sealer (W 718)
Second Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
Third Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
OR	
Second Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)
Third Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)

4. Concrete Block

a. Flat – 100% Acrylic

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
Third Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
OR	
Second Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)
Third Coat	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)

b. Semi-Gloss – 100% Acrylic

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	PERMASHEEN, 100% Acrylic Semi-Gloss Enamel (W 901V)
Third Coat	PERMASHEEN, 100% Acrylic Semi-Gloss Enamel (W 901V)

c. Gloss – 100% Acrylic

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W 960V)
Third Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W 960V)

d. High Gloss, High Performance – Acrylic/Urethane

First Coat	RUST-OLEUM SIERRA GRIPTEC S30 Primer
Second Coat	RUST-OLEUM SIERRA BEYOND Multi-Purpose Acrylic Enamel
Third Coat	RUST-OLEUM SIERRA BEYOND Multi-Purpose Acrylic Enamel

5. Ferrous Metal

a. Flat – Alkyd/Acrylic

First Coat	BLOC-RUST, Red Oxide Alkyd Rust Preventative Primer (43-4)
OR	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)
Third Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701V)

b. Semi-Gloss – Alkyd/Acrylic

First Coat	BLOC-RUST, Red Oxide Alkyd Rust Preventative Primer (43-4)
OR	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	PERMASHEEN, Int/Ext. 100% Acrylic Semi-Gloss Enamel (W901V)
Third Coat	PERMASHEEN, Int/Ext. 100% Acrylic Semi-Gloss Enamel (W 901V)

c. Gloss – Alkyd/Acrylic

First Coat	BLOC-RUST, Red Oxide Alkyd Rust Preventative Primer (43-4)
OR	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W960V)
Third Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W960V)

d. Gloss – Rust Preventative Alkyd

First Coat	SYN-LUSTRO Rust-Preventative Acrylic Primer (W8)
Second Coat	SYN-LUSTRO Rust-Preventative Acrylic Gloss (W10)
Third Coat	SYN-LUSTRO Rust-Preventative Acrylic Gloss (W10)

e. Matte, Industrial High Performance – Inorganic Zinc/Epoxy/Acrylic

First Coat	CARBOLINE CARBOZINC 859 VOC
Second Coat	CARBOLINE CARBOGUARD 890 VOC
Third Coat	CARBOLINE CARBOCRYLIC 3359 MC

f. Matte, Industrial High Performance – Epoxy Primer/Epoxy/Acrylic

First Coat	CARBOLINE CARBOGUARD 890 VOC
Second Coat	CARBOLINE CARBOGUARD 890 VOC
Third Coat	CARBOLINE CARBOCRYLIC 3359 MC

g. High Gloss, Industrial High Performance – Inorganic Zinc/Epoxy/Urethane

First Coat	CARBOLINE CARBOZINC 859 VOC
Second Coat	CARBOLINE CARBOGUARD 890 VOC
Third Coat	CARBOLINE CARBOTHANE 134 VOC

h. High Gloss, Industrial High Performance – Epoxy Primer/Epoxy/Urethane

First Coat	CARBOLINE CARBOGUARD 890 VOC
Second Coat	CARBOLINE CARBOGUARD 890 VOC
Third Coat	CARBOLINE CARBOTHANE 134 VOC

6. Galvanized Metal

a. Flat – Alkyd/Acrylic

Pretreatment	GALVA-ETCH, Etching Liquid (GE 123)
First Coat	GALV-ALUM Epoxy Galvanized/Aluminum Metal Primer (43-7)
Second Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701**V**)
Third Coat	EVERSHIELD, 100% Acrylic Exterior Masonry Finish (W 701**V**)

b. Semi-Gloss – Alkyd/Acrylic

Pretreatment	GALVA-ETCH, Etching Liquid (GE 123)
First Coat	GALV-ALUM Epoxy Galvanized/Aluminum Metal Primer (43-7)
Second Coat	PERMASHEEN, 100% Acrylic Semi-Gloss Enamel (W 901V)
Third Coat	PERMASHEEN, 100% Acrylic Semi-Gloss Enamel (W 901V)

c. Gloss – Alkyd/Acrylic

Pretreatment	GALVA-ETCH, Etching Liquid (GE 123)
First Coat	GALV-ALUM Epoxy Galvanized/Aluminum Metal Primer (43-7)
Second Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W 960V)
Third Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W 960V)

d. Gloss – Rust Preventative Alkyd

Pretreatment	GALVA-ETCH, Etching Liquid (GE 123)
First Coat	SYN-LUSTRO Rust-Preventative Acrylic Primer (W8)
Second Coat	SYN-LUSTRO Rust-Preventative Acrylic Gloss (W10)
Third Coat	SYN-LUSTRO Rust-Preventative Acrylic Gloss (W10)

e. Matte, Industrial High Performance – Epoxy Primer/Acrylic

First Coat	CARBOLINE CARBOGUIDE 890 VOC
Second Coat	CARBOLINE CARBOCRYLIC 3359 MC
Third Coat	CARBOLINE CARBOCRYLIC 3359 MC

f. High Gloss, Industrial High Performance – Epoxy Primer/Urethane

First Coat	CARBOLINE CRABOGUARD 890 VOC
Second Coat	CARBOLINE CARBOTHANE 134 VOC
Third Coat	CARBOLINE CARBOTHANE 134 VOC

7. Wood – Paint Finish

a. Semi-Gloss – Acrylic

First Coat	E-Z PRIME, Ext. 100% Acrylic Wood Primer (W 708)
Second Coat	PERMASHEEN, 100% Acrylic Semi-Gloss Enamel (W 901V)
Third Coat	PERMASHEEN, 100% Acrylic Semi-Gloss Enamel (W 901V)

b. Gloss – Acrylic

First Coat	E-Z PRIME, Ext. 100% Acrylic Wood Primer (W 708)
Second Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W 960V)
Third Coat	PERMAGLOSS, 100% Acrylic Gloss Enamel (W 960V)

8. Wood – Stain Finish – Opaque:

Two Coats	ACRI-FLAT, Exterior 100% Acrylic Flat Finish (W 704V)

9. Wood – Stain Finish – Semi-Transparent:

One Coat	OKON Weather Pro Tinted (WPT-3)

C. Interior Systems:

1. Gypsum Board

a. Flat - Acrylic

First Coat	VINYLASTIC, Interior Pigmented Sealer (W 101)*
Second Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)
Third Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)

b. Low Sheen – Acrylic

First Coat	VINYLASTIC, Interior Pigmented Sealer (W 101V)*
Second Coat	SUPREMA, Latex Low Sheen Enamel (W411V)
Third Coat	SUPREMA, Latex Low Sheen Enamel (W411V)

c. Eggshell – Acrylic

First Coat	VINYLASTIC, Interior Pigmented Sealer (W 101V)*
Second Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)
Third Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)

d. Semi-Gloss - Acrylic

First Coat	VINYLASTIC, Interior Pigmented Sealer (W 101**V**)*
Second Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)
Third Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)

e. Gloss – Acrylic

First Coat	VINYLASTIC, Interior Pigmented Sealer (W 101**V**)*
Second Coat	PERMAGLOSS, Acrylic, Int. Gloss Enamel (W901V)
Third Coat	PERMAGLOSS, Acrylic, Int. Gloss Enamel (W901V)

f. Gloss– Industrial High Performance – Waterborne Epoxy

First Coat	RUST-OLEUM SIERRA S70 Industrial Epoxy Primer
Second Coat	RUST-OLEUM SIERRA S50 Industrial Epoxy Gloss Enamel
Third Coat	RUST-OLEUM SIERRA S50 Industrial Epoxy Gloss Enamel

g. High Gloss – Industrial High Performance – Waterborne Epoxy/Urethane

First Coat	CARBOLINE CARBOGUARD 890 VOC
Second Coat	CARBOLINE CARBOTHANE 134 VOC
Third Coat	CARBOLINE CARBOTHANE 134 VOC

2. Concrete & Plaster:

a. Flat – Acrylic Copolymer

First Coat	SUPER-LOC, Two Component Waterborne Epoxy Sealer (W718)
OR	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)
Third Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)

b. Low Sheen – Acrylic Copolymer

First Coat	SUPER-LOC, Two Component Waterborne Epoxy Sealer (W718)
OR	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	SUPREMA, Latex Low Sheen Enamel (W411V)
Third Coat	SUPREMA, Latex Low Gloss Enamel (W 411V)

c. Eggshell – 100% Acrylic

First Coat	SUPER-LOC, Two Component Waterborne Epoxy Sealer (W718)
OR	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)
Third Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)

d. Semi-Gloss – 100% Acrylic

First Coat	SUPER-LOC, Two Component Waterborne Epoxy Sealer (W718)
OR	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)
Third Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)

e. Gloss – 100% Acrylic

First Coat	SUPER-LOC, Two Component Waterborne Epoxy Sealer (W718)
OR	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	PERMAGLOSS, Acrylic, Int. Gloss Enamel (W960V)
Third Coat	PERMAGLOSS, Acrylic, Int. Gloss Enamel (W960V)

f. Gloss – Industrial High Performance - Waterborne Epoxy

First Coat	RUST-OLEUM SIERRA S70 Industrial Epoxy Primer
Second Coat	RUST-OLEUM SIERRA S50 Industrial Gloss Enamel
Third Coat	RUST-OLEUM SIERRA S50 Industrial Gloss Enamel

g. High Gloss- Industrial High Performance - Epoxy/Urethane

First Coat	CARBOLINE CARBOGUARD 890 VOC
Second Coat	CARBOLINE CARBOTHANE 134 VOC
Third Coat	CARBOLINE CARBOTHANE 134 VOC

3. Brick

a. Flat – Acrylic Copolymer

First Coat	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)
Third Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)

b. Low Sheen – Acrylic Copolymer

First Coat	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	SUPREMA, Latex Low Sheen Enamel (W411V)
Third Coat	SUPREMA, Latex Low Sheen Enamel (W411V)

c. Eggshell – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)
Third Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)

d. Semi-Gloss – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)
Third Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)

e. Gloss – 100% Acrylic

First Coat	EFF-STOP, Acrylic Masonry Primer (W 709)
Second Coat	PERMAGLOSS, Acrylic, Int. Gloss Enamel (W960V)
Third Coat	PERMAGLOSS, Acrylic, Int. Gloss Enamel (W960V)

f. Gloss – Industrial High Performance - Waterborne Epoxy

First Coat	RUST-OLEUM SIERRA S70 Industrial Epoxy Primer
Second Coat	RUST-OLEUM SIERRA S50 Industrial Gloss Enamel
Third Coat	RUST-OLEUM SIERRA S50 Industrial Gloss Enamel

g. Gloss – Industrial High Performance - Waterborne Epoxy

First Coat	RUST-OLEUM SIERRA S70 Industrial Epoxy Primer
Second Coat	RUST-OLEUM SIERRA S50 Industrial Gloss Enamel
Third Coat	RUST-OLEUM SIERRA S50 Industrial Gloss Enamel

h. High Gloss- Industrial High Performance - Epoxy/Urethane

First Coat	CARBOLINE CARBOGUARD 890 VOC
Second Coat	CARBOLINE CARBOTHANE 134 VOC
Third Coat	CARCOLINE CARBOTHANE 134 VOC

4. Concrete Block

a. Flat – Acrylic Copolymer

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)
Third Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)

b. Low Sheen – Acrylic Copolymer

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	SUPREMA, Latex Low Sheen Enamel (W411V)
Third Coat	SUPREMA, Latex Low Sheen Enamel (W411V)

c. Eggshell – 100% Acrylic

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)
Third Coat	DECOSHEEN, Acrylic Eggshell Enamel ((W 440V)

d. Semi-Gloss – 100% Acrylic

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)
Third Coat	PERMASHEEN, Acrylic, Int. Semi-Gloss Enamel (W901V)

e. Gloss – 100% Acrylic

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	PERMAGLOSS, Acrylic Int. Gloss Enamel (W960V)
Third Coat	PERMAGLOSS, Acrylic Int. Gloss Enamel (W960V)

f. Gloss – Industrial High Performance - Waterborne Epoxy

First Coat	BLOCFIL, Concrete Block Filler, Smooth (W 305)
Second Coat	RUST-OLEUM SIERRA S50 Industrial Epoxy Gloss Enamel
Third Coat	RUST-OLEUM SIERRA S50 Industrial Epoxy Gloss Enamel

g. High Gloss- Industrial High Performance – Acrylic/Urethane

First Coat	CARBOLINE SANITILE 100
Second Coat	CARBOLINE CARBOTHANE 134 VOC
Third Coat	CARBOLINE CARBOTHANE 134 VOC

5. Ferrous Metal

a. Flat – Acrylic Copolymer

First Coat	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)
Third Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)

b. Low Sheen – Alkyd/Acrylic Copolymer

First Coat	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	SUPREMA, Int. Latex Low Sheen Enamel (W411V)
Third Coat	SUPREMA, Int. Latex Low Sheen Enamel (W411V)

c. Eggshell – Alkyd/100% Acrylic

First Coat	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	DECOSHEEN, Int. Acrylic Eggshell Enamel ((W 440V)
Third Coat	DECOSHEEN, Int. Acrylic Eggshell Enamel ((W 440V)

d. Semi-Gloss – Alkyd/100% Acrylic

First Coat	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	PERMASHEEN, Acrylic Semi-Gloss Enamel (W901V)
Third Coat	PERMASHEEN, Acrylic Semi-Gloss Enamel (W901V)

e. Semi-Gloss –Rust Preventative Alkyd

First Coat	SYN-LUSTRO W8 Rust-Preventative Acrylic Primer
Second Coat	SYN-LUSTRO, W9 Rust-Preventative Acrylic Semi-Gloss Enamel

Third Coat	SYN-LUSTRO, W9 Rust-Preventative Acrylic Semi-Gloss Enamel

f. Gloss – Alkyd/100% Acrylic

First Coat	CORROBAR, White Alkyd Rust Preventative Primer (43-5)
Second Coat	PERMAGLOSS, Acrylic Gloss Enamel (W960V)
Third Coat	PERMAGLOSS, Acrylic Gloss Enamel (W960V)

g. Gloss –Rust Preventative Alkyd

First Coat	SYN-LUSTRO W8 Rust-Preventative Acrylic Primer
Second Coat	SYN-LUSTRO, W10 Rust-Preventative Acrylic Gloss Enamel
Third Coat	SYN-LUSTRO, W10 Rust-Preventative Acrylic Gloss Enamel

h. Gloss – Industrial High Performance - Waterborne Epoxy

First Coat	RUST-OLEUM SIERRA S70 Industrial Epoxy Primer
Second Coat	RUST-OLEUM SIERRA S50 Industrial Epoxy Gloss Enamel
Third Coat	RUST-OLEUM SIERRA S50 Industrial Epoxy Gloss Enamel

i. High Gloss – Industrial High Performance - Epoxy/Urethane

First Coat	CARBOLINE CARBOGUARD 890 VOC
Second Coat	CARBOLINE CARBOTHANE 134 VOC
Third Coat	CARBOLINE CARBOTHANE 134 VOC

6. Wood – Paint Finish

a. Flat – Acrylic Copolymer

First Coat	UNIKOTE, Int. Acrylic Enamel Undercoater (W707)
Second Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)
Third Coat	DECOVEL, Interior Velvet Flat Wall Finish (W 401V)

b. Low Sheen – Alkyd/Acrylic Copolymer

First Coat	UNIKOTE, Int. Acrylic Enamel Undercoater (W707)
Second Coat	SUPREMA, Int. Latex Low Sheen Enamel (W411V)
Third Coat	SUPREMA, Int. Latex Low Sheen Enamel (W411V)

c. Eggshell – Alkyd/100% Acrylic

First Coat	UNIKOTE, Int. Acrylic Enamel Undercoater (W707)
Second Coat	DECOSHEEN, Int. Acrylic Eggshell Enamel ((W 440V)
Third Coat	DECOSHEEN, Int. Acrylic Eggshell Enamel ((W 440V)

d. Semi-Gloss – 100% Acrylic

First Coat	UNIKOTE, Int. Acrylic Enamel Undercoater (W707)
Second Coat	PERMASHEEN, Acrylic Semi-Gloss Enamel (W901V)
Third Coat	PERMASHEEN, Acrylic Semi-Gloss Enamel (W901V)

e. Semi-Gloss – Alkyd – Class A Fire Retardant

First Coat	SUPER U-365, Int. Alkyd Enamel Undercoater (E22-1V)
Second Coat	ARISTOGLO, Int. Alkyd Semi-Gloss Fire Retardant Enamel (74)**
Third Coat	ARISTOGLO, Int. Alkyd Semi-Gloss Fire Retardant Enamel (74)**

f. Gloss – 100% Acrylic

First Coat	UNIKOTE, Int. Acrylic Enamel Undercoater (W707)
Second Coat	PERMAGLOSS, Acrylic Gloss Enamel (W960V)
Third Coat	PERMAGLOSS, Acrylic Gloss Enamel (W960V)

7. Wood – Stain & Lacquer

a. Flat

First Coat	STAINSEAL, Interior Wiping Oil Stain V-YBQ
Filler	PASTE WOOD FILLER (PWF 2703)
Second Coat	550 CONTRACTORS EDGE High Solids Lacquer Sanding Sealer, Clear CE550PRO-SS
Third Coat	DECOLAC, High Solid Flat Lacquer, Clear N/A
Fourth Coat	DECOLAC, High Solid Flat Lacquer, Clear N/A

b. Semi-Gloss

First Coat	STAINSEAL, Interior Wiping Oil Stain V-YBQ
Filler	PASTE WOOD FILLER (PWF 2703)
Second Coat	550 CONTRACTORS EDGE High Solids Lacquer Sanding Sealer, Clear CE550PRO-SS
Third Coat	550 CONTRACTORS EDGE, High Solids Semi-Gloss Lacquer, Clear CE550PRO60
Fourth Coat	550 CONTRACTORS EDGE, High Solids Semi-Gloss Lacquer, Clear CE550PRO60

c. Gloss

First Coat OR	STAINSEAL, Interior Wiping Oil Stain V-YQB
Filler	PASTE WOOD FILLER (PWF 2703)
Second Coat	550 DECOLAC, High Solids Lacquer Sanding Sealer, Clear CE550PRO-SS
Third Coat	550 DECOLAC, High Solids Gloss Lacquer, Clear CE550PRO90
Fourth Coat	550 DECOLAC, High Solids Gloss Lacquer, Clear CE550PRO90

* Dunn-Edwards does not recommend VINYLASTIC, Interior Pigmented Sealer (W 101) on drywall where "Prep Coat", "First Coat", or other skim coat type materials have been applied. For enamel finishes, use WALLTONE, Flat Wall Finish (W 420) for the first coat. For flat finishes, use two coats of the flat finish material only.

**Yellowing of white and off-white alkyd enamels may occur because of government regulatory limits on solvent content. Substitution of latex enamels would avoid this problem, but may not provide comparable performance.

*****END OF SECTION*****

SECTION 13070

BULLET-RESISTANT BAFFLE DESIGN TRANSACTION BARRIERS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 REFERENCE

A. The publication below forms a part of this specification:

1. Underwriters Laboratory UL 752 9th Edition dated January 27, 1995 Standard for Bullet Resistant Equipment.

1.03 DESIGN

Through the design, manufacturing technique and material application, this assembly shall provide single or multiple transaction positions utilizing the "natural voice" baffle configuration. This design shall employ offset vertical standing vision panels and 5" baffles to complete the "natural voice" design as well as to protect against angled ballistic penetrations. Each transaction position shall have a stainless steel dip tray as shown on the drawings. Components must be manufactured in strict accordance with the specifications, design and details. All vision panels and baffles shall be cut to size with all exposed edges polished. Necessary holes shall be pre drilled and tapped where required. Stainless Steel assembly screws and acrylic spacers shall be provided. Clear anodized angles and channels shall be provided in field lengths. Anchor screws shall be provided by the installer. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect. Standard manufacturing tolerances shall be +/- 1/16".

1.04 SUBMITTALS

The follow shall be submitted in accordance with ((coordinate)) and the SPECIAL CONTRACT REQUIREMENTS. ((if any)) Submit for approval prior to fabrication: Catalog cuts, shop drawings, specifications, and printed data in sufficient detail to indicate compliance with the contract documents. Provide proof of possession of PRODUCT LIABILITY INSURANCE in an amount not less than five million U.S. dollars. Manufacturer's instructions for installation and cleaning. Baffle window assemblies shall be manufactured by Armortex® of Schertz, Texas. Phone: 210-661-8306, 800-880-8306, Fax: 210-661-8308.

1.05 WARRANTY

All materials and workmanship shall be warranted against defects for a period of one (1) year from date of receipt at job site.

PART 2 – PRODUCTS

2.01 GLAZING PANELS – BAFFLES

Glazing panels and baffles Level 3 laminated polycarbonate as shown on drawings

2.02 DIP TRAY

Model RMDT1016 constructed of 16 ga. Stainless steel, # 3 finish 10" x 16" from the outside edge of flanges with a clear open depth under the glazing of 1 5/8".

2.03 FINISH

Stainless steel with #3 finish.

PART 3 -- EXECUTION

3.01 INSTALLATION

Set components in accordance with manufacturer's instructions and contract drawings (if approved by the manufacturer and the architect) or replace with new items.

3.02 PROTECTION

Properly store all items in a dry location and covered to protect from damage before and after installation.

3.03 CLEANING

Upon completion, clean exposed surfaces thoroughly in accordance with manufacturer's instructions.

*****END OF SECTION****

SECTION 13071

BULLET RESISTANT TRANSACTION DRAWER

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 REFERENCE

The publication below forms a part of this specification

UNDERWRITERS LABORATORY UL 752 11th Edition

Standard for Bullet Resisting Equipment dated Sept. 5, 2005

1.03 DESIGN

The unit shall consist of a sliding drawer assembly consisting of a dip tray and full capacity bin. This assembly is actuated by a locking handle which prohibits the opening of the drawer from the outside. The dip tray or full capacity bin can be covered by a sliding lid if desired during periods of inactivity. An integral speaker grill shall be part of the front flange assembly to provide for an optional audio system if desired. Units must be manufactured in strict accordance with the specifications, design and details. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the architect. All welds shall be in accordance with the requirements and standard practices of the American Welding Society. All exposed welds shall be ground flush and finished smooth.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5 of the General Conditions.

1.07 SUBMITTALS

In accordance with Article 5 of the General Conditions.

PART 2 – PRODUCTS

2.01 MANUFACTURER

Transaction Drawer unit to be model 6003 as indicated on the contract drawings and manufactured by Armortex, Schertz, Texas. Phone: 210-661-8306, 800-880-8306, Fax: 210-661-8308.

2.02 FRAME

The side and rear of frame to be manufactured of 12 ga. hot rolled steel and the top surface shall be no less than 16 ga. stainless steel, with a # 3 finish. The front flange assembly shall be 12 ga. stainless steel with a #3 finish with the dip tray and bin assembly no less than 22 ga. stainless steel with a #3 finish.

2.03 WINDOW LEDGE

Provide a window ledge not less than 5" deep. The ledge to be full width of the complete drawer housing.

2.04 BULLET-RESISTANT PROTECTION

Provide a bullet resistant barrier in the main frame housing offering UL Level 3

PART 3 -- EXECUTION

3.1 INSTALLATION

Set drawer in accordance with the manufacturer's printed recommendations. Installation of the interior frame may be accomplished by bolting or welding as desired.

3.2 PROTECTION

It shall be the responsibility of the contractor to see that the unit is properly stored in a dry location and covered to protect them from damage before and after installation.

3.3 CLEANING

Upon completion, clean exposed surfaces of assemblies thoroughly in accordance with manufacturer's instructions.

***** END OF SECTION *****

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(2010, 2015.5 C.C.P.)

Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: NIB Jurupa Sheriff's Evidence

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper of general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673 and under date of August 25, 1995, Case Number 267864; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

05-12-11
05-19-11

I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: May. 19, 2011
At: Riverside, California

BOARD OF SUPERVISORS

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COUNTY OF RIVERSIDE
RIVERSIDE CA 92502

Ad #: 10651756

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Ad Copy:

NOTICE INVITING BIDS

The Redevelopment Agency for the County of Riverside, herein called Owner, invites sealed proposals for the construction of:

JURUPA SHERIFF'S EVIDENCE WAREHOUSE

This Project consists of a new approximately 10, 000 square foot secured warehouse including offices, restrooms, security cameras, solar system, parking lot improvements and lighting. In addition, the project includes the expansion and security of the visitor's counter in the existing station's front lobby. Project is located in Riverside off Mission Boulevard behind the existing Sheriff's facility. Architect's construction estimate is $3,800,000.

Proposals shall be delivered to the Clerk of the Board of Supervisors, on the 1st floor of the County Administrative Center located at 4080 Lemon Street, Riverside, CA 92501 **no later than 10:00 am on Wednesday, June 15th 2011** and will be promptly opened in public at said address.

Each Proposal shall be in accordance with the Plans, Specifications, and other Contract Documents dated April 2011 and prepared by Holt Architects. Plans and Specifications may be obtained from PlanIT Reprographics, 3398 Mission Inn Avenue Riverside, CA 92501, 951-683-2600. A nonrefundable fee will be charged for each set of Plans and Specifications furnished to Contractors. An additional nonrefundable fee will be charged for each set of Plans and Specifications furnished that are requested to be mailed to Contractors.

Pursuant to the Labor Code, the Governing Board of the Owner has obtained from the Director of the Department of Industrial Relations, State of California, his determination of general prevailing rates of per diem wages applicable to the work, and for holiday and overtime work, including employer payments for health and welfare, pension, vacation, and similar purposes, as set forth on the schedule which is on file at the principal office of the Owner, and which will be made available to any interested person upon request.

The Contract General Conditions for this project will contain provisions allowing successful contractor to substitute securities for monies withheld by the Agency to ensure performance (Public Contract Code 22300).

A Performance Bond and Payment Bond shall be required for this Project.

The Contractor will be required, per Public Contracts Code, Section 3300 and for this contract, to have a State of California contractor's license classification B - General Building Contractor. **A mandatory pre-bid job walk will be held on May 24, 2011 at 10:00 a.m., meeting at the project site located at 7477 Mission Blvd, Riverside, California 92509. No bids will be accepted from bidders who have not attended the pre-bid job walk.**

Request For Information deadline is June 2nd 2011 at 10:00 AM.

For further information, contact Rebecca Tsagris at the Redevelopment Agency for the County of Riverside, located at 3403 10th Street, Ste. 400, Riverside, CA 92501 whose telephone number is (951) 955-8764.

Dated: May 10, 2011
KECIA HARPER-IHEM, Clerk of the Board
By: Cecilia Gil, Board Assistant

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(2015.5 C.C.P.)

County of Riverside

State of California

Catherine Sypin-Barnes, being first duly sworn, deposes and says: T
all times hereinafter, mentioned that she was a citizen of the United S
over the age of eighteen years, and a resident of said County, and w
and during all said times the principal clerk of the printer and publisl
The Riverside County Record-News, a newspaper of general circul
adjudicated by court decree, printed and published weekly in said C
of Riverside, State of California, that said Riverside County Record-
is and was at all times herein mentioned, a newspaper of general circu
as that term is defined in section 4460 of the Political Code, and, as pro
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news and intelligence of a general character, having a bona fide subscr
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entertainment or instruction of a particular class, profession, trade, ca
race of denominations; that at all said time said newspaper has been
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more than one year preceding the date of publication of the notice herei
mentioned; that said notice was set in type not smaller than nonpareil an
preceded with words printed in black face type not smaller than non
describing and expressing in general terms the purport and character
notice intended to be given; that the

RIVERSIDE COUNTY RECORD NEWSPAPER

of which the annexed is a printed copy, published and printed in said newspaper in at least 2 weekly issues, as follows:

May 12, 19, 2011

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

Dated: May 19, 2011 at
Riverside, California

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Dated: May 10, 2011
KECIA HARPER-IHEM, Clerk of the Board
By: Cecilia Gil, Board Assistant
Pub: May 12, 19, 2011 RCR0385