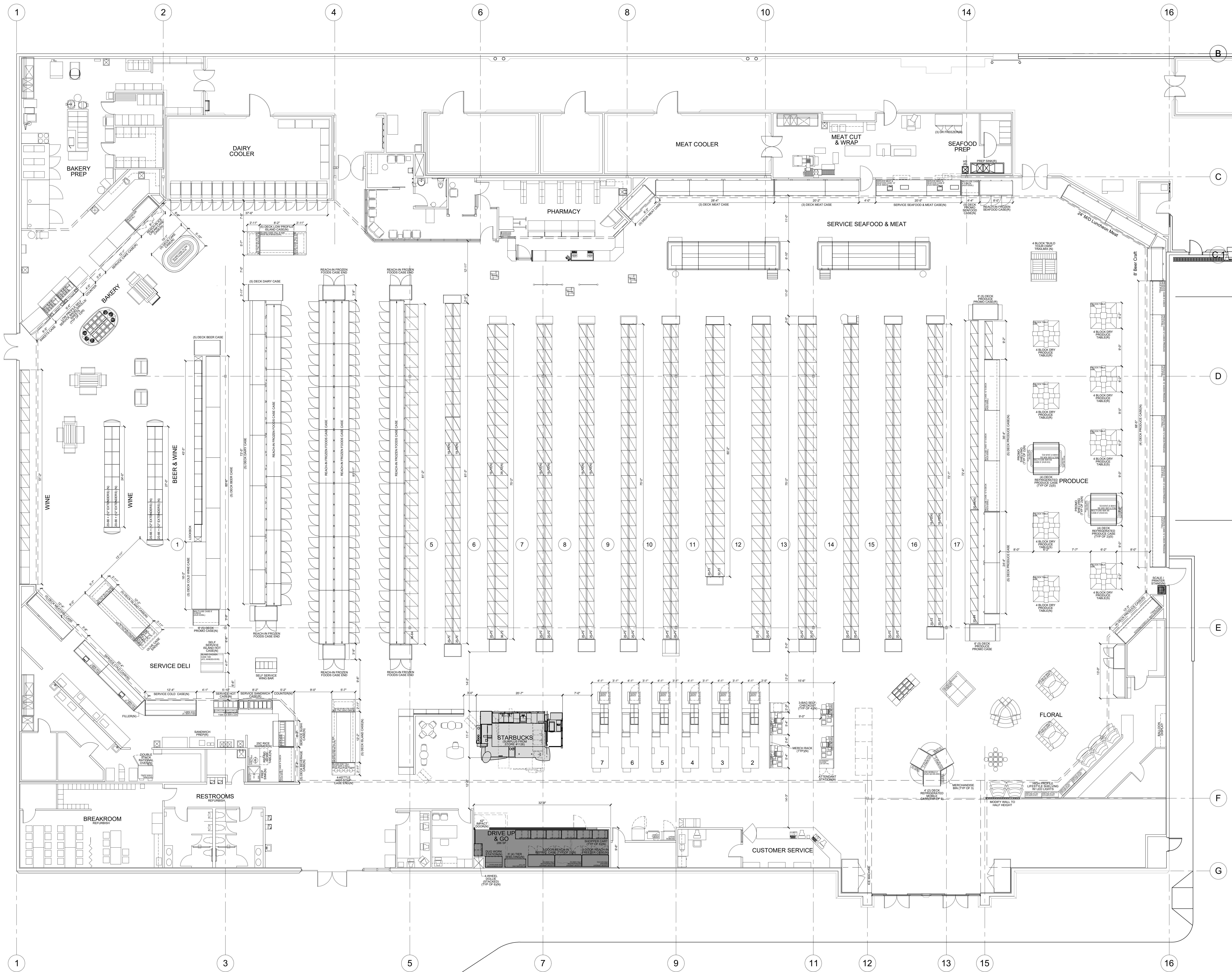


COMPARATIVE ANALYSIS					
		EXISTING	PROPOSED	VARATION	
PRODUCE	MULTI-DECK PRODUCE	LF	140	140	0
	DAIRY COOLER MEAT DELI	LF	24	24	0
DAIRY	MULTI-DECK DAIRY	LF	38	38	0
	MULTI-DECK DAIRY	LF	72	72	0
SEAFOOD & MEAT	SERVICE SEAFOOD & MEAT	LF	16	20	4
	MULTI-DECK MEAT	LF	56	56	0
TAB	MULTI-DECK BEER / WINE	LF	76	76	0
	BEER COOLER DOORS (DOOR QTY x 2.5)	LF	0	0	0
	WINE / LIQUOR SHELVING	LF	196	196	0
	MULTI-DECK FROZEN FOOD	DR	124	124	0
FROZEN FOOD	MULTI-DECK FROZEN SEAFOOD & MEAT	DR	3	3	0
	MULTI-DECK FROZEN PRODM	DR	10	10	0
	TOTAL FROZEN FOOD (NUMBER OF DOORS)	DR	137	137	0
SHELVING	CENTER STORE	LF	1939	1932	93
	WINE / LIQUOR SHELVING	LF	196	196	0
	TOTAL SHELVING	LF	2035	2128	93



REVISION NOTES

LEGEND

- NEW / SURPLUS
- RELOCATED
- EXISTING
- REMOVED

STATUS LABELS

- N NEW
- R RELOCATED
- S SURPLUS

**SAFeway**  
 1515 E. ELLIOT RD  
 TEMPE, AZ

STORE PLANNER: A. REYNOLDS  
 ISSUE DATE: 03/31/2011  
 BUILDING SIZE: 95,731 SF  
 SALES FLOOR SIZE: 38,493 SF  
 DRAWING SCALE: 1/8" = 1'-0"

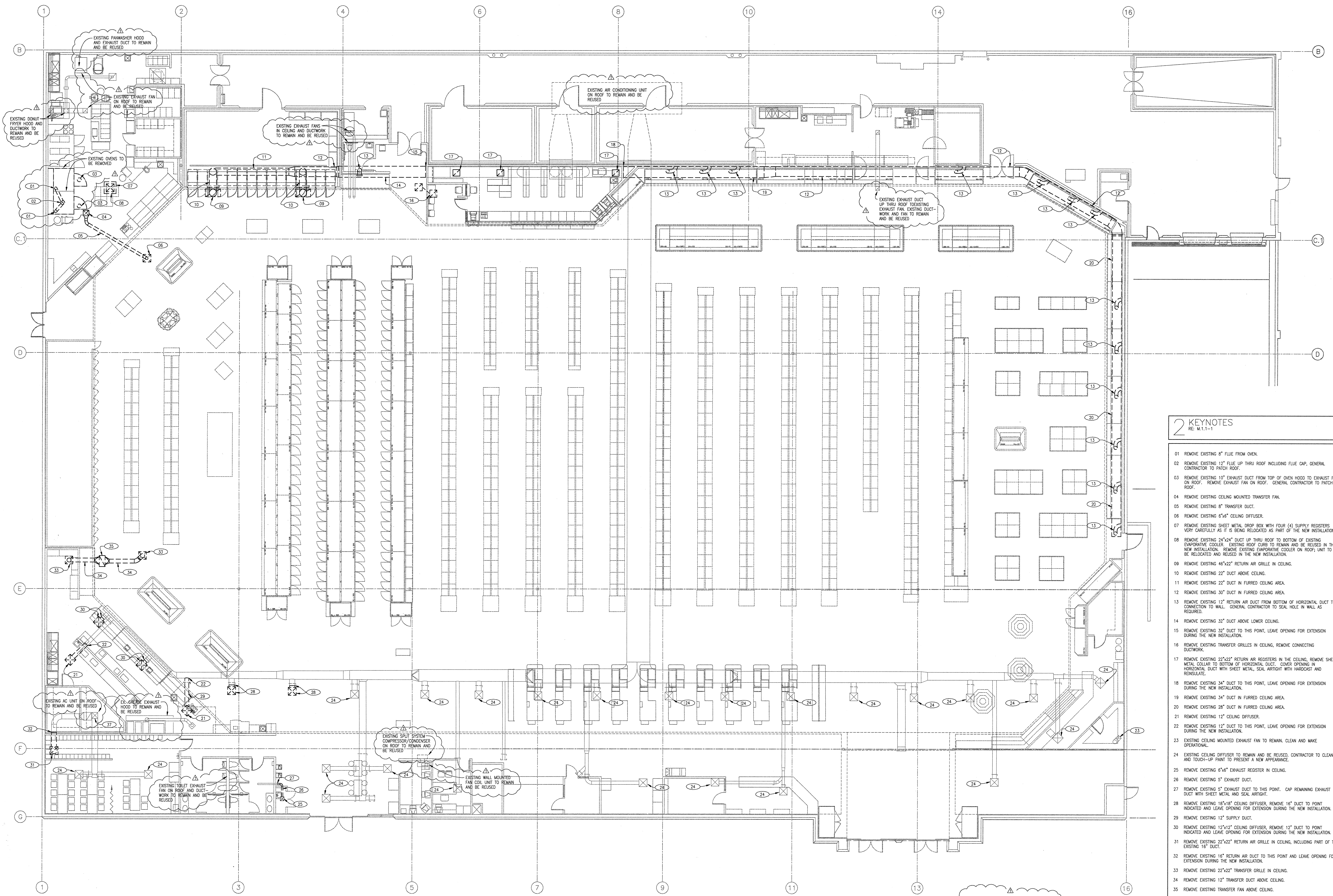
STORE NUMBER  
**01535**

SHEET TITLE  
**FIXTURE PLAN**

SHEET NO.  
**Q1.1**

FIELD VERIFY ALL CONDITIONS PRIOR TO INSTALLATION OF EQUIPMENT

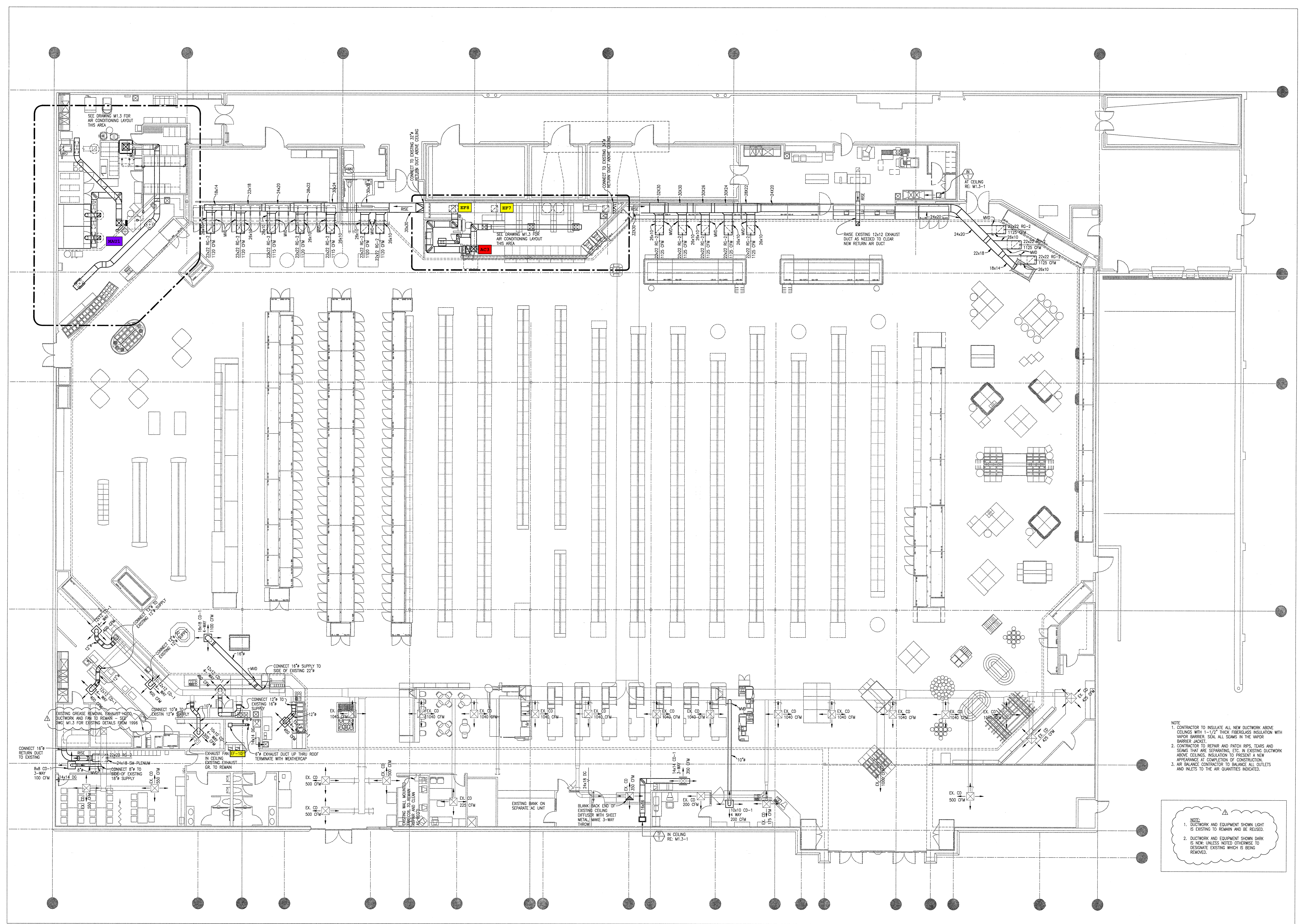
DECOR - <SELECT ONE>



- 2 KEYNOTES**  
RE: M1.1-1
- 01 REMOVE EXISTING 6" FLUE FROM OVEN.
  - 02 REMOVE EXISTING 12" BLUE UP THRU ROOF INCLUDING FLUE CAP, GENERAL CONTRACTOR TO PATCH ROOF.
  - 03 REMOVE EXISTING 10" EXHAUST DUCT FROM TOP OF OVEN HOOD TO EXHAUST FAN ON ROOF. REMOVE EXHAUST FAN ON ROOF. GENERAL CONTRACTOR TO PATCH ROOF.
  - 04 REMOVE EXISTING CEILING MOUNTED TRANSFER FAN.
  - 05 REMOVE EXISTING 8" TRANSFER DUCT.
  - 06 REMOVE EXISTING 8"x8" CEILING DIFFUSER.
  - 07 REMOVE EXISTING SHEET METAL DROP BOX WITH FOUR (4) SUPPLY REGISTERS VERY CAREFULLY AS IT IS BEING RELOCATED AS PART OF THE NEW INSTALLATION.
  - 08 REMOVE EXISTING 24"x24" DUCT UP THRU ROOF TO BOTTOM OF EXISTING MAKEUP COOLER. EXISTING COOLER TO REMAIN AND BE REUSED IN THE NEW INSTALLATION. REMOVE EXISTING EVAPORATIVE COOLER ON ROOF. UNIT TO BE RELOCATED AND REUSED IN THE NEW INSTALLATION.
  - 09 REMOVE EXISTING 48"x24" RETURN AIR GRILLE IN CEILING.
  - 10 REMOVE EXISTING 22" DUCT ABOVE CEILING.
  - 11 REMOVE EXISTING 22" DUCT IN FURRED CEILING AREA.
  - 12 REMOVE EXISTING 30" DUCT IN FURRED CEILING AREA.
  - 13 REMOVE EXISTING 12" RETURN AIR DUCT FROM BOTTOM OF HORIZONTAL DUCT TO CONNECTION TO WALL. GENERAL CONTRACTOR TO SEAL HOLE IN WALL AS REQUIRED.
  - 14 REMOVE EXISTING 32" DUCT ABOVE LOWER CEILING.
  - 15 REMOVE EXISTING 32" DUCT TO THIS POINT, LEAVE OPENING FOR EXTENSION DURING THE NEW INSTALLATION.
  - 16 REMOVE EXISTING TRANSFER GRILLES IN CEILING, REMOVE CONNECTING DUCTWORK.
  - 17 REMOVE EXISTING 22"x22" RETURN AIR REGISTERS IN THE CEILING, REMOVE SHEET METAL COLLARS TO BOTTOM OF HORIZONTAL DUCT, COVER OPENING IN HORIZONTAL DUCT WITH SHEET METAL, SEAL AIRTIGHT WITH HARDCAST AND REINFORCE.
  - 18 REMOVE EXISTING 34" DUCT TO THIS POINT, LEAVE OPENING FOR EXTENSION DURING THE NEW INSTALLATION.
  - 19 REMOVE EXISTING 34" DUCT IN FURRED CEILING AREA.
  - 20 REMOVE EXISTING 28" DUCT IN FURRED CEILING AREA.
  - 21 REMOVE EXISTING 12" CEILING DIFFUSER.
  - 22 REMOVE EXISTING 10" DUCT TO THIS POINT, LEAVE OPENING FOR EXTENSION DURING THE NEW INSTALLATION.
  - 23 EXISTING CEILING MOUNTED EXHAUST FAN TO REMAIN, CLEAN AND MAKE OPERATIONAL.
  - 24 EXISTING CEILING DIFFUSER TO REMAIN AND BE REUSED, CONTRACTOR TO CLEAN AND TOUCH-UP PAINT TO PRESENT A NEW APPEARANCE.
  - 25 REMOVE EXISTING 6"x8" EXHAUST REGISTER IN CEILING.
  - 26 REMOVE EXISTING 5" EXHAUST DUCT.
  - 27 REMOVE EXISTING 5" EXHAUST DUCT TO THIS POINT. CAP REMAINING EXHAUST DUCT WITH SHEET METAL AND SEAL AIRTIGHT.
  - 28 REMOVE EXISTING 16"x18" CEILING DIFFUSER, REMOVE 16" DUCT TO POINT INDICATED AND LEAVE OPENING FOR EXTENSION DURING THE NEW INSTALLATION.
  - 29 REMOVE EXISTING 12" SUPPLY DUCT.
  - 30 REMOVE EXISTING 12"x12" CEILING DIFFUSER, REMOVE 12" DUCT TO POINT INDICATED AND LEAVE OPENING FOR EXTENSION DURING THE NEW INSTALLATION.
  - 31 REMOVE EXISTING 22"x22" RETURN AIR GRILLE IN CEILING, INCLUDING PART OF THE EXISTING 16" DUCT.
  - 32 REMOVE EXISTING 16" RETURN AIR DUCT TO THIS POINT AND LEAVE OPENING FOR EXTENSION DURING THE NEW INSTALLATION.
  - 33 REMOVE EXISTING 22"x22" TRANSFER GRILLE IN CEILING.
  - 34 REMOVE EXISTING 12" TRANSFER DUCT ABOVE CEILING.
  - 35 REMOVE EXISTING TRANSFER FAN ABOVE CEILING.
  - 36 CONTRACTOR TO SERVICE EXISTING MAIN AIR HANDLER ON ROOF, PROVIDE RESTRAINTS AS REQUIRED TO FILE SYSTEM AS RECOMMENDED BY EQUIPMENT MANUFACTURER. CHECK CONTROL SYSTEMS, PROVIDE LETTER TO OWNER IF ANY COMPONENTS NEED REPAIR OR REPLACEMENT. PROVIDE CLEAN SET OF FILTERS PRIOR TO BALANCING CONTRACTOR STARTING HIS WORK.
  - 37 CONTRACTOR TO SERVICE SMALL EXISTING ROOFTOP PACKAGE AIR CONDITIONING UNIT, REPAIR OR REPLACE ANY DAMAGED OR NON-FUNCTIONING PARTS OR CONTROLS. PROVIDE CLEAN SET OF FILTERS.

NOTE:  
1. DUCTWORK AND EQUIPMENT SHOWN LIGHT IS EXISTING TO REMAIN AND BE REUSED.  
2. DUCTWORK AND EQUIPMENT SHOWN DARK IS NEW, UNLESS NOTED OTHERWISE TO DESIGNATE EXISTING WHICH IS BEING REMOVED.

**1 PARTIAL AIR CONDITIONING FLOOR PLAN - DEMOLITION**  
1/8" = 1'-0"  
RE: M1.1-2, M1.2-1 & M1.3

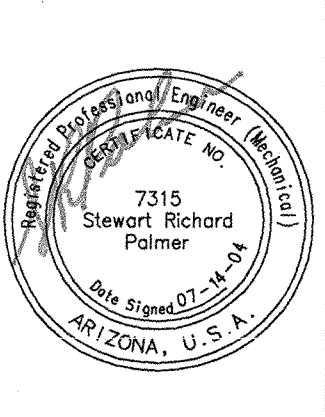


NOTE:  
1. CONTRACTOR TO INSULATE ALL NEW DUCTWORK ABOVE CEILING WITH 1-1/2" THICK FIBERGLASS INSULATION WITH VAPOR BARRIER. SEAL ALL SEAMS IN THE VAPOR BARRIER JACKET.  
2. CONTRACTOR TO REPAIR AND PATCH RIPS, TEARS AND SEAMS THAT ARE SEPARATING, ETC. IN EXISTING DUCTWORK ABOVE CEILING. INSULATION TO PRESENT A NEW APPEARANCE AT COMPLETION OF CONSTRUCTION.  
3. AIR BALANCE CONTRACTOR TO BALANCE ALL OUTLETS AND INLETS TO THE AIR QUANTITIES INDICATED.

NOTE:  
1. DUCTWORK AND EQUIPMENT SHOWN LIGHT IS EXISTING TO REMAIN AND BE REUSED.  
2. DUCTWORK AND EQUIPMENT SHOWN DARK IS NEW, UNLESS NOTED OTHERWISE TO DESIGNATE EXISTING WHICH IS BEING REMOVED.

1 PARTIAL AIR CONDITIONING FLOOR PLAN - NEW INSTALLATION  
1/8" = 1'-0"  
RE: M1.1-1 & M1.3





REVISIONS

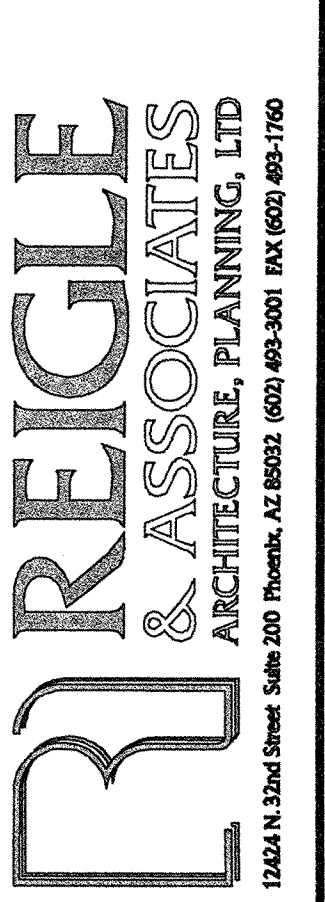
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SUBMITTAL DATES

OWNER:
AGENCY:
BID DATE:

PROJECT NO.

DRAWN BY:
SCALE:
AS NOTED
CAD SAVED NAME:



DATE: 6-11-04

AN EXISTING STORE REMODEL FOR SAFEMAY STORE #1535 1615 EAST ELLIOT ROAD TEMPE, ARIZONA

SHEET TITLE MECHANICAL & PLUMBING SPECIFICATIONS

SHEET NO.

MP1.1

3 AIR BALANCE
RE: M1.1, M1.2, M1.3

1.1 GENERAL:
A THE AIR BALANCING CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR...
1.2 QUALIFICATION:
A AIR BALANCING TO BE IN ACCORDANCE WITH ASHRAE OR NEBB GUIDE AND RECOMMENDATIONS.
1.3 COORDINATION:
A COORDINATE REQUIRED LOCATIONS OF DUCT TEST OPENINGS DURING CONSTRUCTION PERIOD.
1.4 PROCEDURES - ONGOING JOB SITE INSPECTIONS:
A DURING CONSTRUCTION THE BALANCING AGENCY SHALL INSPECT THE INSTALLATION OF SHEET METAL WORK, TEMPERATURE CONTROLS AND OTHER COMPONENT PARTS OF THE HVAC SYSTEMS.
1.5 AIR SYSTEM TEST & BALANCE PROCEDURES:
A FAN SPEEDS: TEST AND ADJUST RPM TO ACHIEVE DESIGN CFM REQUIREMENTS.
B CURRENT & VOLTAGE: MEASURE AND RECORD CURRENT AND VOLTAGE.
C PILOT TUBE TRAVERSE: MAN SUPPLY AND RETURN DUCTS TO OBTAIN TOTAL CFM. AN EXPLANATION OF WHY A TRAVERSE WAS NOT MADE MUST APPEAR ON APPROPRIATE DATA SHEET.
D OUTSIDE AIR: TEST AND ADJUST SYSTEM MINIMUM OUTSIDE AIR BY PILOT TUBE TRAVERSE.
E STATIC PRESSURE: TEST AND RECORD SYSTEM STATIC PRESSURE, INCLUDING SUCTION AND DISCHARGE STATIC PRESSURE PROFILE FOR FANS.
F BRANCH DUCTS: ADJUST BRANCH DUCTS TO WITHIN DESIGN CFM REQUIREMENTS.
G TOLERANCE: TEST AND BALANCE EACH DIFFUSER, GRILLE AND REGISTER TO WITHIN PLUS OR MINUS USE OF DESIGN REQUIREMENTS.
H IDENTIFICATION: IDENTIFY THE LOCATION AND AREA OF EACH GRILLE, DIFFUSER AND REGISTER. RECORD ON AIR OUTLET DATA SHEETS.
I DESCRIPTION: RECORD THE SIZE AND TYPE OF EACH DIFFUSER, GRILLE AND REGISTER ON AIR OUTLET DATA SHEETS.
J MINIMIZE DRAFTS: ADJUST ALL DIFFUSERS, GRILLES AND REGISTERS TO MINIMIZE DRAFTS BY THE TAB AGENCY.
K EXHAUST SUPPLY AND STATIC PRESSURES, TOTAL CFM, MAKE UP AND FAN RPM.
L MEASURE MOTOR OPERATING VOLTAGE AND AMPERAGE.
M BALANCE FLOW USING A PILOT TRAVERSE FOR EACH NEW HOOD. THE AIRFLOW SHALL BE SET TO DESIGN DESIGN AVERAGE VELOCITY AT HOOD AREA. AFTER FLOWS ARE SET, MEASURE HOOD FACE VELOCITIES WITH A 4-INCH WANE ANEMOMETER IN 4-INCH SPACES.
N RECORD THE SPECIFIED, AGAINST THE ACTUAL, SUPPLIED HORSEPOWER AND ELECTRICAL CHARACTERISTICS OF ALL MOTORS.
O VERIFY CAPACITIES OF AC SYSTEM AND EXHAUST FAN, AND COMPLETE SAFEMAY AIR BALANCE FORM NO. CDD-15.
1.6 CENTRAL SYSTEMS VERIFICATION:
A VERIFY THAT ALL CONTROL DEVICES ARE PROPERLY CONNECTED.
B VERIFY THAT ALL CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
C CHECK THE CALIBRATION OF ALL CONTROLLERS.
D CHECK THE LOCATION OF ALL THERMOSTATS FOR POTENTIAL ERRATIC OPERATION FROM OUTSIDE INFLUENCES SUCH AS SUNLIGHT, DRAFTS OR COLD RAISLES.
E CHECK THE LOCATION OF ALL SENSORS TO DETERMINE WHETHER THEIR POSITION WILL ALLOW THEM TO SENSE ONLY THE INTENDED TEMPERATURES OR PRESSURE OF THE MEDIA. CONTROL CONTRACTOR WILL RELOCATE AS DEMAND NECESSARY BY THE TAB AGENCY.
F CHECK THE SEQUENCE OF OPERATION THAT ANY CONTROL MODE IS IN ACCORDANCE WITH APPROVED SHOP DRAWINGS.
G VERIFY THAT ALL CONTROLLER SET POINTS MEET THE DESIGN INTENT.
H VERIFY THE OPERATION OF ALL INTERLOCK SYSTEMS.
1.7 SPECIAL SYSTEMS
A KITCHEN HOOD TESTING (BAKERY)
1 TURN ON EXHAUST FAN AND ADJUST AIR FLOW TO PROVIDE THE SPECIFIED AVERAGE HOOD FACE VELOCITY AT HOOD OPENING.
2 CALCULATE AND RECORD EXHAUST VOLUME (CFM) BY MEASURING AIR FLOW IN EXHAUST DUCT JUST UPSTREAM OF EXHAUST FAN.
3 MEASURE AIR FLOW USING PILOT TRAVERSE METHOD. MULTIPLY AVERAGE DUCT VELOCITY BY THE CROSS SECTIONAL AREA OF THE DUCT.
4 MEASURE AND RECORD EACH FAN VELOCITY READING TAKEN AT 4-INCH SPACES. RECORD TOTAL HORIZONTAL INCREMENTS SHALL BE DIVISIBLE BY 3 AND VERTICAL INCREMENTS DIVISIBLE BY 2 OVER THE ENTIRE HOOD HOOD OPENING.
5 USE AND ELECTRICALLY OPERATED ANEMOMETER DIRECT READING WITH GRADUATIONS FROM 0-200 FT/MINUTE. CALCULATE AND RECORD THE AVERAGE FACE VELOCITY (FPM) BY AVERAGING ALL VELOCITY READINGS.
6 VERIFY THE MAKE-UP AIR SYSTEM SUPPLIES THE PROPER AMOUNT OF AIR TO KEEP THE KITCHEN AT A CONSTANT PRESSURE WITH THE EXHAUST SYSTEM IN HIGH SPEED AND LOW SPEED WHERE APPLICABLE.
7 IF PRESSURE DIFFERENTIAL GAUGE IS PROVIDED WITH THE HOOD, VERIFY READINGS WITH GAUGE.
1.8 SYSTEM PERFORMANCE VERIFICATION:
A AT THE TIME OF FINAL INSPECTION, THE TEST AND BALANCE (TAB) AGENCY SHALL RECHECK IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE, SPECIFIC AND RANDOM SELECTION OF DATA, AIR QUANTITIES AND AIR MOTION RECORDED IN THE CERTIFIED REPORT.
B POINTS AND AREAS FOR RECHECK SHALL BE SELECTED BY THE OWNER'S REPRESENTATIVE.
C FOLLOWING SYSTEM VERIFICATION OF THE CERTIFIED REPORT BY THE OWNER'S REPRESENTATIVE, THE SETTING OF ALL DAMPERS AND OTHER ADJUSTMENT DEVICES SHALL BE PERMANENTLY MARKED BY THE TAB AGENCY. DEVICES SHALL NOT BE MARKED UNTIL AFTER SYSTEM VERIFICATION.
1.9 ADJUSTING
A ADJUST AIR QUANTITIES TO FOLLOWING TOLERANCE.
1 EACH OUTLET: PLUS OR MINUS 5%
2 EACH ROOM WITH MULTIPLE OUTLETS: 0% TO PLUS 5%
3 FANS: 0% TO PLUS 5%
4 ADJUST OR CHANGE FAN DRIVES AS REQUIRED TO ACCOMPLISH REQUIRED AIR QUANTITIES.
5 ALLOWANCE SHALL BE MADE FOR AIR FILTER RESISTANCE AT THE TIME OF TESTS. MAIN AIR SUPPLY TO BE AT DESIGN AIR QUANTITY AT PRESSURE DROP ACROSS FILTER BANKS MOVING BETWEEN PRESSURE DROP FOR CLEAN AND DIRTY FILTERS.
6 AFTER COMPLETION OF BALANCING, OPERATE ALL SYSTEMS AND EQUIPMENT UNDER NORMAL WORKING CONDITIONS FOR THREE (3) CONSECUTIVE DAYS AND SUBMIT AIR BALANCING REPORT.
1.10 RECORDS:
A KEEP CONTINUOUS RECORD OF ALL TEST READINGS AND SUBMIT THREE (3) COPIES OF TYPED/THE BALANCING REPORT UPON COMPLETION.

2 HEATING, VENTILATING AND AIR CONDITIONING
RE: M1.1, M1.2, M1.3

1.20 INSTALLATION OF EQUIPMENT:
A INSTALLED ALL EQUIPMENT IN THE LOCATIONS INDICATED ON THE CONTRACTOR DOCUMENTS. VERIFY WITH ARCHITECT AND OTHER TRADES.
B AVOID INTERFERENCES WITH STRUCTURE AND WITH WORK OF OTHER TRADES.
C CHECK EACH PIECE OF EQUIPMENT IN THE SYSTEM FOR DEFECTS. VERIFY THAT ALL PARTS ARE PROPERLY FURNISHED AND INSTALLED, THAT ALL ITEMS FUNCTION PROPERLY AND THAT ALL ADJUSTMENTS HAVE BEEN MADE.
D SEAT AIR DISTRIBUTION SO THAT NO DRAFTS EXCEEDING 25 FPM ARE DIRECTED INTO OPEN ROOF STRUCTURES.
E ALL MECHANICAL EQUIPMENT WITH ROTATING PARTS SHALL BE MOUNTED WITH VIBRATION ISOLATOR AND SEISMIC RESTRAINTS.
F FABRICATE, WITH STEEL, SPECIAL MOUNTING BRACKETS AS REQUIRED TO CLEAR OTHER EQUIPMENT, DOORS AND TO SPAN FOR BEST STRUCTURAL SUPPORT OF MECHANICAL EQUIPMENT. SUBMIT DETAILS TO ARCHITECT FOR STRUCTURAL APPROVAL.
G FURNISH AND INSTALL FULL SIZE DRAIN LINE FROM MECHANICAL EQUIPMENT CONDENSATE DRAIN OR OTHER DRAIN CONNECTIONS TO A SAFE AND APPROVED WASTE.
H ALL PIPING, CONDUIT AND DUCT CONNECTIONS SHALL BE MADE THROUGH FLEXIBLE CONNECTORS.
I WHERE DIMENSIONS OR SPECIFIC INSTALLATION AND OPERATING INSTRUCTIONS OF EQUIPMENT ARE NOT PROVIDED IN THE MANUFACTURER'S SPECIFICATIONS, THE CONTRACTOR SHALL PERFORM THE WORK ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS. ANY MATERIALS AND WORK REQUIRED BY THESE MANUFACTURERS' RECOMMENDATIONS SHALL BE SUPPLIED AT NO ADDITIONAL COST.
J EQUIPMENT SHALL BE PLACED AND PIPING AND DUCT CONNECTIONS MADE IN SUCH A MANNER THAT ALL ROUTING ADJUSTMENTS AND MAINTENANCE RECOMMENDATIONS SHALL BE CARRIED OUT WITHOUT INCONVENIENCE AND SO THAT ALL CODE REQUIREMENTS FOR CLEARANCES ARE MAINTAINED.
K GUARDS: PROVIDE SECURELY MOUNTED METAL GUARD CONFORMING TO WORKERS COMPENSATION BOARD CODES OF INDUSTRIAL SAFETY CODES FOR ALL EXPOSED MOVING PARTS SUCH AS BELT DRIVES, ETC.
L PROVIDE ALL MATERIAL AND LABOR REQUIRED FOR EQUIPMENT SUPPORTS AND ANCHORAGE TO BUILDING STRUCTURE INCLUDING CURBS FOR ROOF MOUNTED EQUIPMENT WHERE NOT INDICATED ON THE DRAWINGS AS CARPENTRY WORK.
M PROVIDE SEISMIC RESTRAINTS WHERE APPLICABLE TO ALL SUSPENDED AND BASE MOUNTED EQUIPMENT.
1.16 FLASHING AND WATERPROOFING:
A ALL PIPE, EQUIPMENT CURBS AND DUCTS PENETRATING EXTERIOR WALLS OR ROOFS SHALL BE FLASHED AND WATERPROOFED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, WHERE OTHER MATERIALS ARE NOT SPECIFICALLY SHOWN OR SPECIFIED, FLASHING AND WATERPROOFING SHALL BE OF GALVANIZED STEEL.
1.17 OTHER MATERIALS:
A ALL OTHER MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND OPERATING FACILITY SHALL BE NEW, FIRST QUALITY OF THEIR RESPECTIVE KINDS, AND SUBJECT TO THE APPROVAL OF THE OWNER'S CONSTRUCTION DEPARTMENT AND LOCAL CODES.
1.18 APPROVAL LIST OF MANUFACTURERS (CONTRACTOR PROVIDED EQUIPMENT):
A MANUFACTURERS ARE LISTED IN ALPHABETICAL ORDER AND NOT IN ORDER OF PREFERENCE.
NOTE: THE FOLLOWING LIST IS PROVIDED FOR THE ITEMS WHICH ARE NOT SPECIFICALLY MENTIONED ON THE DRAWING BY MANUFACTURER'S NAMES. THE EQUIPMENT ALREADY SELECTED IS BEST FOR ITS CAPACITY AND EFFICIENCY AND SHALL ONLY BE SUBSTITUTED WITH THE WRITTEN PERMISSION FROM THE CONSULTING ENGINEER OR OWNER'S FACILITIES ENGINEER. IN CASE SUBSTITUTION IS RECOMMENDED, THE CONTRACTOR IS FULLY RESPONSIBLE TO REPLACE IT WITH ORIGINAL DESIGN AT HIS OWN COST AND WITHOUT DELAYING THE CONTRACT IF IT IS NOT ACCEPTABLE TO CONSULTING ENGINEER OR THE OWNER'S FACILITIES ENGINEER.
B REGISTER, GRILLES & DIFFUSERS
1 AIR GUIDE CORPORATION
2 KREUER
3 METALAIR
4 TITUS
5 PRICE
C DAMPERS
1 VOLUME CONTROL DAMPERS
a AIR GUIDE CORPORATION
b KRUEGER
c TITUS
d TITUS & BAILEY
e PRICE
D AIR FILTERS
1 AIR GUARD
2 AIR CONTROL
3 ECO-AIR
4 FARR
5 SERVOMECH
E INSULATION - DUCT
1 MANVILLE
2 OWENS-CORNING FIBERGLASS
F EXHAUST FANS
1 CEILING AND ROOF MOUNTED
a ACME
b COOK
c PENN VENTILATOR
d GREENHECK
G PACKAGED AIR CONDITIONING UNIT
1 CARRIER (ONLY)
H PIPE INSULATION
1 ARAMFLEX BY ARMSTRONG
2 FIBERGLASS
3 INCOA
I DUCTWORK (SHEET METAL DUCT SPIRAL)
1 METAL FAB
2 METAL MANUFACTURING
3 OWNS-DUCT SYSTEMS, ANNEHAW CA
4 SPIRAL SAFE DUCT SYSTEMS
5 UNITED SHEET METAL, UNITED WOOL CO. CORP.
J ROOF CURBS
1 A SEPARATE SUBMITTAL IS REQUIRED FOR ALL ROOF CURBS PER SECTION 07200 - ROOF ACCESSORIES. DO NOT SUBMIT CURBS AS PART OF MECHANICAL SUBMITTAL.
K PIPES
1 MUELLER
2 AMERICAN BRASS AND IRON FOUNDRY
L IONIZATION UNIT
1 RC ENTERPRISES
1.19 INSTALLATION OF DUCTWORK:
A FABRICATE AND INSTALL ALL DUCTWORK IN STRICT ACCORDANCE WITH THE REFERENCED STANDARDS.
B SHEET METAL DUCTWORK:
1 CROSS-BREAK ALL FLAT SURFACES TO PREVENT VIBRATION.
2 INSULATE ALL SUPPLY AND RETURN DUCTS, USING THE SPECIFIED MATERIAL AND SCREENING WITH THE SPECIFIED THE WIRES AT 12" ON-CENTER.
C ON ALL DUCTWORK:
1 WHEREVER OBSTRUCTIONS REQUIRE A CHANGE IN DUCT SHAPE, MAINTAIN EQUIVALENT AREA. ALL SIZES SHOWN ON THE DRAWINGS ARE NET DIMENSIONS.
2 ALL DUCT ELBOWS SHALL BE RIGHT ANGLE TYPE WITH ELBOW TURNS OR TURNING BLADES, OR SHALL HAVE A RADIUS OF 1-1/2 TIMES THE DUCT WIDTH.
3 FURNISH AND INSTALL SHEET METAL DOORS IN THE DUCTWORK WHERE SHOWN ON THE DRAWINGS AND/OR AS REQUIRED FOR ACCESS. MAKE ALL SUCH DOORS AIR-TIGHT WITH FELT STOPPING AND PROVIDE THEM WITH LABELS SO THEY CAN BE OPENED FROM INSIDE OR OUTSIDE. ALL SUCH DOORS SHALL BE PANEL TYPE OR A GAUGE TWICE THE THICKNESS OF THAT SPECIFIED FOR THE DUCT INTO WHICH IT IS INSTALLED.
D INSULATE AND MAKE ALL NECESSARY CONNECTIONS REQUIRED FOR THE COMPLETE SUPPLY, RECIRCULATING AND EXHAUST SYSTEMS INDICATED ON THE CONTRACT DOCUMENTS.
E INSTALL VOLUME DAMPERS IN ALL BRANCH DUCTS WHERE INDICATED.
F TYPE ALL LATERAL AND LONGITUDINAL DUCT SEAMS WITH CANALS AND LACING ADHESIVE (AR60). ADHESIVE TYPES AND CAULKING ADHESIVE ARE NOT ALLOWED ON THIS PROJECT.

2 HEATING, VENTILATING AND AIR CONDITIONING
RE: M1.1, M1.2, M1.3

1.12 PACKAGED AIR CONDITIONING UNITS (LESS THAN 15 TONS):
A HVAC EQUIPMENT AS SCHEDULED ON DRAWINGS.
B ROOF TOP UNIT TO BE COMPLETELY WEATHERPROOFED FOR OUTDOOR USE. UNITS TO BE COMPLETELY PROTECTED AGAINST COMPRESSORS, CONDENSER COILS, FANS, COIL GUARDS, GAS FIRED HEATING SECTION, OPERATING AND SAFETY CONTROLS, EMERGENCY COILS BASES, REFRIGERANT, FLUE GAS PACKAGE AND APPURTENANCES REQUIRED TO MAKE A COMPLETE PACKAGE. COMPRESSORS TO HAVE THE (3) YEAR WARRANTY.
C UNIT SHALL BE INTERNALLY ISOLATED WITH VIBRATION ISOLATORS AND SEISMIC RESTRAINTS SO THAT NO NOTICEABLE NOISE OR VIBRATION IS TRANSMITTED TO THE STRUCTURE.
D UNIT TO BE FURNISHED WITH 2-INCH FLEATED DISPOSABLE FILTER 300% EFFICIENCY.
E WEATHERHOOD OR OUTDOOR AIR INTAKES TO BE FURNISHED WITH BRUSHSCREEN.
F DRAIN PANS SHALL DRAIN OUT OF THE BOTTOM AND NOT THE SIDE.
1.13 FLEXIBLE CONNECTIONS FOR FAN AND AHS:
A AT ALL POINTS WHERE DUCTS CONNECT TO FANS AND AHS, PROVIDE AND INSTALL FLEXIBLE CONNECTIONS. THESE FLEXIBLE CONNECTIONS SHALL BE MADE OF POLYURETHANE CANALS THAT HAVE BEEN CHEMICALLY TREATED TO MAKE IT FIRE RESISTANT, WATER-PROOF, MILDEW-RESISTANT AND PRACTICALLY AIRTIGHT AND SHALL WEIGH APPROXIMATELY 15 OZ. PER SQ. YD. (BEFORE TREATING).
1.14 CONDENSATE DRAIN PIPING:
A INSIDE BUILDING: ALL WATER CONDENSATE DRAIN PIPING SHALL BE PVC OR CAPED UNLESS CODES REQUIRE COPPER TYPE "M" OR DWV AND SHALL BE INSTALLED WITH 1/2-INCH ARAMFLEX.
B ABOVE ROOF: CONDENSATE DRAIN PIPING SHALL BE TYPE "M" HARD DRAIN COPPER.
1.15 EQUIPMENT SUPPORTS AND ANCHORAGE:
A PROVIDE ALL MATERIAL AND LABOR REQUIRED FOR EQUIPMENT SUPPORTS AND ANCHORAGE TO BUILDING STRUCTURE INCLUDING CURBS FOR ROOF MOUNTED EQUIPMENT WHERE NOT INDICATED ON THE DRAWINGS AS CARPENTRY WORK.
B PROVIDE SEISMIC RESTRAINTS WHERE APPLICABLE TO ALL SUSPENDED AND BASE MOUNTED EQUIPMENT.
1.16 FLASHING AND WATERPROOFING:
A ALL PIPE, EQUIPMENT CURBS AND DUCTS PENETRATING EXTERIOR WALLS OR ROOFS SHALL BE FLASHED AND WATERPROOFED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, WHERE OTHER MATERIALS ARE NOT SPECIFICALLY SHOWN OR SPECIFIED, FLASHING AND WATERPROOFING SHALL BE OF GALVANIZED STEEL.
1.17 OTHER MATERIALS:
A ALL OTHER MATERIALS, NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND OPERATING FACILITY SHALL BE NEW, FIRST QUALITY OF THEIR RESPECTIVE KINDS, AND SUBJECT TO THE APPROVAL OF THE OWNER'S CONSTRUCTION DEPARTMENT AND LOCAL CODES.
1.18 APPROVAL LIST OF MANUFACTURERS (CONTRACTOR PROVIDED EQUIPMENT):
A MANUFACTURERS ARE LISTED IN ALPHABETICAL ORDER AND NOT IN ORDER OF PREFERENCE.
NOTE: THE FOLLOWING LIST IS PROVIDED FOR THE ITEMS WHICH ARE NOT SPECIFICALLY MENTIONED ON THE DRAWING BY MANUFACTURER'S NAMES. THE EQUIPMENT ALREADY SELECTED IS BEST FOR ITS CAPACITY AND EFFICIENCY AND SHALL ONLY BE SUBSTITUTED WITH THE WRITTEN PERMISSION FROM THE CONSULTING ENGINEER OR OWNER'S FACILITIES ENGINEER. IN CASE SUBSTITUTION IS RECOMMENDED, THE CONTRACTOR IS FULLY RESPONSIBLE TO REPLACE IT WITH ORIGINAL DESIGN AT HIS OWN COST AND WITHOUT DELAYING THE CONTRACT IF IT IS NOT ACCEPTABLE TO CONSULTING ENGINEER OR THE OWNER'S FACILITIES ENGINEER.
B REGISTER, GRILLES & DIFFUSERS
1 AIR GUIDE CORPORATION
2 KREUER
3 METALAIR
4 TITUS
5 PRICE
C DAMPERS
1 VOLUME CONTROL DAMPERS
a AIR GUIDE CORPORATION
b KRUEGER
c TITUS
d TITUS & BAILEY
e PRICE
D AIR FILTERS
1 AIR GUARD
2 AIR CONTROL
3 ECO-AIR
4 FARR
5 SERVOMECH
E INSULATION - DUCT
1 MANVILLE
2 OWENS-CORNING FIBERGLASS
F EXHAUST FANS
1 CEILING AND ROOF MOUNTED
a ACME
b COOK
c PENN VENTILATOR
d GREENHECK
G PACKAGED AIR CONDITIONING UNIT
1 CARRIER (ONLY)
H PIPE INSULATION
1 ARAMFLEX BY ARMSTRONG
2 FIBERGLASS
3 INCOA
I DUCTWORK (SHEET METAL DUCT SPIRAL)
1 METAL FAB
2 METAL MANUFACTURING
3 OWNS-DUCT SYSTEMS, ANNEHAW CA
4 SPIRAL SAFE DUCT SYSTEMS
5 UNITED SHEET METAL, UNITED WOOL CO. CORP.
J ROOF CURBS
1 A SEPARATE SUBMITTAL IS REQUIRED FOR ALL ROOF CURBS PER SECTION 07200 - ROOF ACCESSORIES. DO NOT SUBMIT CURBS AS PART OF MECHANICAL SUBMITTAL.
K PIPES
1 MUELLER
2 AMERICAN BRASS AND IRON FOUNDRY
L IONIZATION UNIT
1 RC ENTERPRISES
1.19 INSTALLATION OF DUCTWORK:
A FABRICATE AND INSTALL ALL DUCTWORK IN STRICT ACCORDANCE WITH THE REFERENCED STANDARDS.
B SHEET METAL DUCTWORK:
1 CROSS-BREAK ALL FLAT SURFACES TO PREVENT VIBRATION.
2 INSULATE ALL SUPPLY AND RETURN DUCTS, USING THE SPECIFIED MATERIAL AND SCREENING WITH THE SPECIFIED THE WIRES AT 12" ON-CENTER.
C ON ALL DUCTWORK:
1 WHEREVER OBSTRUCTIONS REQUIRE A CHANGE IN DUCT SHAPE, MAINTAIN EQUIVALENT AREA. ALL SIZES SHOWN ON THE DRAWINGS ARE NET DIMENSIONS.
2 ALL DUCT ELBOWS SHALL BE RIGHT ANGLE TYPE WITH ELBOW TURNS OR TURNING BLADES, OR SHALL HAVE A RADIUS OF 1-1/2 TIMES THE DUCT WIDTH.
3 FURNISH AND INSTALL SHEET METAL DOORS IN THE DUCTWORK WHERE SHOWN ON THE DRAWINGS AND/OR AS REQUIRED FOR ACCESS. MAKE ALL SUCH DOORS AIR-TIGHT WITH FELT STOPPING AND PROVIDE THEM WITH LABELS SO THEY CAN BE OPENED FROM INSIDE OR OUTSIDE. ALL SUCH DOORS SHALL BE PANEL TYPE OR A GAUGE TWICE THE THICKNESS OF THAT SPECIFIED FOR THE DUCT INTO WHICH IT IS INSTALLED.
D INSULATE AND MAKE ALL NECESSARY CONNECTIONS REQUIRED FOR THE COMPLETE SUPPLY, RECIRCULATING AND EXHAUST SYSTEMS INDICATED ON THE CONTRACT DOCUMENTS.
E INSTALL VOLUME DAMPERS IN ALL BRANCH DUCTS WHERE INDICATED.
F TYPE ALL LATERAL AND LONGITUDINAL DUCT SEAMS WITH CANALS AND LACING ADHESIVE (AR60). ADHESIVE TYPES AND CAULKING ADHESIVE ARE NOT ALLOWED ON THIS PROJECT.

2 HEATING, VENTILATING AND AIR CONDITIONING
RE: M1.1, M1.2, M1.3

1.8 REGISTER, GRILLES AND DIFFUSERS:
A ALL GRILLES, REGISTERS, DIFFUSERS, ETC. SHALL BE LOUVERED FACE, OR EGGRATE, FURNISHED WITH OFF-WHITE ENAMEL FINISH AS LISTED IN SCHEDULE ON DRAWINGS TO SUIT ARCHITECTURAL REQUIREMENTS AND SHALL BE THE TYPE AND SIZE SHOWN ON THE DRAWINGS.
B ALL DUCT INTERIORS VISIBLE THROUGH REGISTERS, GRILLES, DIFFUSERS, ETC. SHALL BE PAINTED FLAT BLACK.
C COORDINATE THE LOCATION OF THE DIFFUSER REGISTERS, GRILLES, CEILING LIGHTS, SPRINKLERS AND ANY OTHER CEILING OUTLETS.
D INSTALL AND CONNECT ALL GRILLES, REGISTERS AND DIFFUSERS IN THE LOCATION INDICATED ON THE APPROVED SHOP DRAWINGS. SECURELY ANCHORING EACH ITEM IN PLACE AND SEALING WITH RUBBER GASKETS TO PREVENT LEAKAGE.
E RETURN AIR GRILLES SHALL BE HEAVY DUTY, 16-GAUGE BORDER, 14-GAUGE BLADES, 1/2 INCH SPACING, 38-DEGREE DEFLECTION, STRONG AND IMPACT RESISTANT.
F ANY DUCT, GRILLE, DIFFUSER OR REGISTER OBVIOUSLY INTERFERING WITH THE INTERIOR DECOR SHOULD BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE.
1.9 EXHAUST FAN:
A EXHAUST FANS SHALL BE OF THE CAPACITY INDICATED ON THE DRAWINGS. CONTRACTOR FURNISHED AND INSTALLED, UNLESS NOTED OTHERWISE.
B EXHAUST FAN SHALL BE CENTRIFUGAL TYPE, CEILING MOUNTED.
C ROOF MOUNTED EXHAUST FANS: FANS SHALL BE CENTRIFUGAL TYPE WITH CAPACITY AS SHOWN ON THE DRAWINGS. DIRECT DRIVE OR BELT DRIVE UNITS AS INDICATED WITH ALUMINUM BEARINGS COMPLETE WITH BALL BEARING MOTOR, 1/2-BELT DRIVE, ADJUSTABLE MOTOR SHIELDS, MOTOR AND FAN SHALL BE PROPERLY MOUNTED, ISOLATED FROM THE HOUSING. UNITS SHALL BE OPERATED WITH BRD SCREEN AND DISCONNECT SWITCH AND MOTOR SHALL HAVE AN INTERNAL OVERLOAD PROTECTION DEVICE.
1.10 CROSS-FIELD NEGATIVE IONIZATION DEVICE (SEAF000):
A THE MECHANICAL CONTRACTOR SHALL INSTALL THE UNIT PER MANUFACTURER'S RECOMMENDATION.
B THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL THE UNIT.
1.11 MAKE-UP AIR UNIT SPECIFICATION:
A EVAPORATIVE SECTION
1 THIS SECTION SHALL HAVE PLEATED HIGH EFFICIENCY EVAPORATIVE MEDIA OR MONTEL CELL BEK 8" PAD.
2 VELOCITY THROUGH CELL DEK SHALL NOT EXCEED 750 FPM.
B CABINETS PARTS SHALL BE CONSTRUCTED OF AT LEAST 20 GAUGE GALVANIZED STEEL AND FINISHED WITH HIGH-GLOSS ENAMEL.
C BLOWER WHEEL SHALL BE STATICALLY AND DYNAMICALLY BALANCED. FORWARD CURVED D.W.J.D. CLASS 1 CENTRIFUGAL WHEEL WITH SELF-ALIGNING BALL BEARING AND 1/2-BELT DRIVE THROUGH OVERCAST CAST IRON PULLEYS. DRIVE SHAFTS TO BE WANGLE PITCH MOTOR TO BE DRY-PROOF, PREMIUM EFFICIENCY, OVERLOAD PROTECTED AND MOUNTED ON AN ADJUSTABLE BASE.
D UNIT SHALL BE FURNISHED WITH A REMOTE PUSH-BUTTON CONTROL PANEL WITH INDICATOR LIGHTS. CONTROL PANEL SHALL HAVE A SINGLE TWO POSITION SWITCH MARKED EXHAUST HOOD ON AND OFF. THE COOL BUTTONS SHALL BE PROVIDED TO SWITCH ON PUMP FOR EVAPORATIVE COOLER.
E ONE INTERFACE CONTROL PANEL SHALL BE COMPLETE WITH MOTOR STARTERS, FUSES, SOLATING RELAYS, TRANSFORMERS, TERMINAL STRIPS, ETC.
F UNIT TO BE SUPPLIED WITH FACTORY INSTALLED TRANSFORMER AND DISCONNECT SWITCH.
G UNIT TO BE FURNISHED WITH SEISMIC RESTRAINTS, AND DOWN DISCHARGE FLEXION SECTION.
H MAKE-UP PIPE EXPOSED ON ROOF SHALL BE INSULATED.

2 HEATING, VENTILATING AND AIR CONDITIONING
RE: M1.1, M1.2, M1.3

1.1 GENERAL CONDITIONS AND SPECIAL CONDITIONS:
A DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.
B REQUIREMENTS OF MECHANICAL GENERAL PROVISIONS AS INDICATED ON THIS DRAWING govern the WORK INDICATED ON THE MECHANICAL DRAWINGS.
1.2 DESCRIPTION:
A FURNISH ALL LABOR, TOOLS, EQUIPMENT, APPLIANCES, MATERIALS AND SERVICES NECESSARY FOR AND PROPERLY INCIDENTAL TO THE FURNISHING AND INSTALLING OF ALL HEATING, VENTILATING AND AIR CONDITIONING WORK (HVAC) AND RELATED ITEMS AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.
B THE WORK TO BE PERFORMED UNDER THIS SECTION SHALL INCLUDE, BUT IS NOT NECESSARILY LIMITED TO THE FOLLOWING:
1 EXHAUST AND TRANSFER FANS.
2 SMALL HVAC SYSTEMS AS SHOWN ON DRAWINGS.
3 AUTOMATIC TEMPERATURE CONTROL SYSTEMS AS SHOWN ON THE DRAWINGS.
4 MODIFY EXISTING HVAC SYSTEM AS SHOWN ON DRAWINGS.
5 BAKERY OVEN EXHAUST HOODS AND MAKE-UP AIR SYSTEM.
C COOPERATE AS REQUIRED WITH THE OTHER TRADES TO ENSURE PROPER AND ACCURATE PROVISIONS FOR THE INTERFACE OF THEIR WORK WITH THE HEATING, VENTILATING AND AIR CONDITIONING SYSTEM.
1.3 CODES AND STANDARDS:
A CODES WITH ALL PERTINENT CODES AND REGULATIONS, COMPLY WITH THE RECOMMENDATIONS CONTAINED IN THE LOCAL BUILDING CODE AND THE LATEST EDITION OF THE NATIONAL MECHANICAL CODES AND THE NATIONAL MECHANICAL CODES FOR HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS PUBLISHED BY THE SHEET METAL AIR CONDITIONING NATIONAL ASSOCIATION (SMACNA).
B NOTHING IN THESE CONTRACT DOCUMENTS IS TO BE CONSIDERED TO PERMIT WORK NOT CONFORMING TO THESE CODES. ANY EXTRA WORK OR MATERIALS REQUIRED TO COMPLY WITH THESE LAWS OR RULES AND REGULATIONS SHALL BE FURNISHED WHETHER OR NOT SPECIFICALLY SHOWN OR SPECIFIED AT NO EXTRA COST.
C COMPLY WITH AND INSTALL IN ACCORDANCE WITH ANY AND ALL APPLICABLE PROVISIONS OF THE LEGALLY CONSTITUTED AUTHORITIES HAVING JURISDICTION.
1 LOCAL BUILDING BY-LAWS
2 WORKER'S COMPENSATION BOARD.
3 CITY, STATE OR COUNTY BUILDING CODE.
4 INTERNATIONAL OR UNIFORM MECHANICAL CODE OR CODES AS ADOPTED BY THE LOCAL JURISDICTION.
5 ASHRAE STANDARDS.
6 STATE INDUSTRIAL ACCIDENT COMMISSION.
7 NATIONAL BOARD OF FIRE UNDERWRITERS.
1.4 SUBMITTALS:
A PRIOR TO THE ORDERING OF ANY MATERIALS AND EQUIPMENT AND WITHIN FIFTEEN (15) DAYS AFTER THE ORDERING, THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR APPROVAL SIX (6) COPIES OF MANUFACTURER'S BROCHURE CONTAINING COMPLETE DIMENSIONS AND PERFORMANCE CHARACTERISTICS, WIRING DIAGRAMS, INSTALLATION AND OPERATION INSTRUCTIONS, ETC.
B THE EXHAUST FAN AND AIR CONDITIONING UNITS ARE BEING INSTALLED BY THE CONTRACTOR.
C THE BAKERY OVEN EXHAUST HOODS FURNISHED BY SAFEMAY AND INSTALLED BY CONTRACTOR AND EXHAUST FAN FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
D AS-BUILT DRAWINGS:
1 DURING PROGRESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF THE SYSTEM, LOCATING EACH ITEM OF DUCTWORK AND EQUIPMENT PRECISELY BY DIMENSIONS. UPON COMPLETION OF THE INSTALLATION, TRANSFER ALL RECORD DATA TO BLUE-LINE PRINTS OF THE ORIGINAL DESIGN DRAWINGS.
E MANUAL:
1 UPON COMPLETION OF THE INSTALLATION AND AS A CONDITION OF ITS ACCEPTANCE, COMPLETE A MANUAL IN THREE (3) COPIES TO BE SUBMITTED TO THE ARCHITECT FOR APPROVAL. THE ARCHITECT WILL DISTRIBUTE THE APPROVED SUBMITTALS TO THE OWNER, SUPPLIER AND CONTRACTOR.
1.5 SAFEMAY PROVIDED EQUIPMENT:
A EQUIPMENT DIRECTLY PURCHASED BY SAFEMAY INC. TO BE INSTALLED, HOOD-UP AND COMPAUNDED BY THE CONTRACTOR. THE CONTRACTOR SHALL ALLOW IN THEIR BID THE LABOR AND COST FOR RECEIVING, ON-SITE HANDLING, STORAGE, CRANE HIRE, COORDINATION OF DELIVERY, INSTALLATION, HOOD-UP, START-UP AND COMMISSIONING OF ALL SAFEMAY PROVIDED EQUIPMENT. CONTRACTOR SHALL EXAMINE SAFEMAY PROVIDED EQUIPMENT FOR DAMAGES, DEFECTS OR MISSING COMPONENTS AND REPORT SAME TO THE ARCHITECT FOR AUTHORIZATION OF ADDITIONAL SERVICES FOR REPAIR OR REPLACEMENT OF MISSING PARTS. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF DAMAGES AND REPLACEMENT OF MISSING PARTS UNDER HIS GENERAL CONTRACT. THE EQUIPMENT NOT LISTED IN THIS ARTICLE IS CONTRACTOR FURNISHED.
1 PROVIDE ONE-YEAR WARRANTY AND SERVICING OF SAFEMAY PROVIDED EQUIPMENT FROM DATE OF SUBSTANTIAL COMPLETION OF THE PROJECT.
B THE OWNER WILL SEND THE DRAWINGS AND SPECIFICATIONS TO THEIR APPROPRIATE SUPPLIER DURING THE BIDDING PROCESS. THE OWNER WILL SEND THE SUBMITTAL INFORMATION FOR THE ABOVE LISTED EQUIPMENT TO THE ARCHITECT FOR APPROVAL. THE ARCHITECT WILL DISTRIBUTE THE APPROVED SUBMITTALS TO THE OWNER, SUPPLIER AND CONTRACTOR.
1.6 DUCTWORK:
A GALVANIZED STEEL SHALL BE USED. FABRICATED AND INSTALLED SO THAT NO VIBRATION OR NOISE RESULTS. DUCTS SHALL BE MADE FROM THE BEST GRADE OF MILD STEEL SHEETS OF THE US STANDARD GAUGE AS RECOMMENDED IN THE LATEST EDITION OF ASHRAE GUIDE OR THE SMACNA STANDARDS.
B DUCTMATE SYSTEM MAY BE USED AT CONTRACTOR'S OPTION.
C FLEXIBLE DUCT, FIBERGLASS DUCT BOARD OR DUCT LINING ARE NOT ALLOWED.
D DUCT AND FITTINGS:
1 SQUARE OR RECTANGULAR DUCT WIDTH ALL GAGE
UP TO 12 INCHES WIDE 26
12 INCHES TO 30 INCHES WIDE 24
30 INCHES TO 34 INCHES WIDE 22
E ROUND DUCTS: PREFABRICATED SPIRAL DUCT AND FITTINGS:
1 METAL FAB DIAMETER IN INCHES ALL GAGE
DUCT 3 TO 8 26
DUCT 9 TO 22 24
DUCT 23 TO 30 22
FITTINGS 3 TO 36 20
F BRANCH DUCT LATERAL FITTINGS: REDUCING BODY 45-DEGREE CONICAL TAP FOR ROUND DUCT.
G TURNING VANES SINGLE THICKNESS WITH A TRAILING EDGE SHALL BE RIGIDLY FASTENED TO THE DUCTWORK AND INSTALLED IN ALL TURNS OF 45 DEGREES AND GREATER. TRANSFORMATIONS SHALL BE MADE BY UNIFORM TAPERING SECTIONS, AT NOT MORE THAN 30 DEGREES TAPER. DESIGN, SIZE AND LOCATION OF THE HANGERS SHALL BE AS PER SECTION 1, SMACNA DUCT MANUAL.
H WHERE NECESSARY PROVIDE ANGLE IRON SUPPORTS FROM WHICH TO HANG DUCTWORK. SUCH BLOCKING SHALL BE OF SUFFICIENT SIZE TO CARRY THE WEIGHT OF THE DUCT AND INSULATION, NO DUCTS, EQUIPMENT, ETC. SHALL BE SUPPORTED FROM 2X ROOF SUB PURLINS. SEE STRUCTURAL DRAWINGS FOR SUPPORT REQUIREMENTS.
I VOLUME DAMPERS SHALL BE INSTALLED AT POINTS AS SHOWN OR AS REQUIRED. ALL DAMPERS TO HAVE OPERABLE BLADES.
J ALL DAMPER CONTROLS MUST BE INSTALLED WITH HANDLE ON BOTTOM OF DUCT. CUT OUT INSULATION AND TAG DAMPER. MAKE FULLY VISIBLE. VERIFY MECHANICAL FUNCTION OF ALL EXPOSED AND CONCEALED DAMPERS.
K ALL DUCT CONNECTIONS TO FANS SHALL BE WITH NON-RESISTANT FLEXIBLE CONNECTION CONSISTING OF VENTILATION. SUCH CONNECTIONS SHALL BE AT LEAST FOUR INCHES (4") LONG.
L DOUBLE TURNING VANES SHALL NOT BE USED.
M ACCESS DOOR IN DUCTS - SINGLE WALL INSULATED GASKETED DOOR. PANO HINGE. SCREWBORNER OPERATED CAM TYPE LATCH. FLANGE MOUNTED TO DUCT AND SEALED.
1.7 DUCT INSULATION:
A ALL INSULATION TO BE FIBERGLASS.
B DUCT ACUSTICAL LININGS SHALL NOT BE USED.
C ALL CONCEALED SUPPLY AND RETURN DUCTS SHALL BE EXTERNALLY WRAPPED WITH DUCT WRAP AND VAPOR BARRER.
D DUCT WRAP: FIBERGLASS TYPE FRK25 FACED DUCT WRAP WITH FACTORY APPLIED VAPOR BARRIER, 0.75 P.C., 1 1/2" THICK UNLESS NOTED OTHERWISE. ON DRAWINGS 4-INCH (25.4) AT 12" INTERVALS TO ADHERE WITH 4" TYPICAL ADHESIVE AT 8" OC. ADDITIONALLY SECURE TO BOTTOM OF RECTANGULAR DUCTS WITH TUFF-WELD NYLON PINS AT 18" OC.
E DUCT JOINT TAPES TO BE CANALS AND LACING ADHESIVE OR 0.75-TAPE WITH FT-20 (INDOOR) AND FT-20 (OUTDOOR) BY HARGREAVES, INC. ALL OTHER TYPES OF ADHESIVE TAPES OR CAULKING ADHESIVE ARE NOT ACCEPTABLE.
F FIBERGLASS DUCT BOARD SHALL NOT BE USED.

1 MECHANICAL GENERAL PROVISIONS
RE: M1.1, M1.2, M1.3, P1.1, P1.2, P1.3, P1.4, P1.5, P1.6 & P1.7

1.1 PERMITS AND FEES:
A OBTAIN AND PAY FOR ALL LICENSES NECESSARY TO THE PROSECUTION AND COMPLETING OF THE WORK.
1.2 DRAWINGS:
A LAYOUT OF PIPING, DUCTS AND EQUIPMENT SHOWN IS GENERALLY DIAGRAMMATIC UNLESS SPECIFICALLY DIMENSIONED. DIMENSIONS OF DOORS, PARTITIONS, ETC. FOR THE LOCATIONS OF PIPING, DUCTWORK, AND EQUIPMENT SHALL BE TAKEN FROM THE ARCHITECTURAL DRAWINGS.
1.3 REFERENCES:
A SEISMIC RESTRAINTS SHALL BE PROVIDED AS REQUIRED BY STATE AND LOCAL CODES AND ORDINANCES BUT MUST CONFORM TO THE 2000 INTERNATIONAL BUILDING CODE. WHEN LOCAL CODE HAS NO STANDARDS, SEISMIC RESTRAINTS SHALL BE DESIGNED AND INSTALLED PER SMACNA STANDARDS TO MEET SEISMIC ZONE.
1.4 GUARANTEES:
A DELIVER ALL GUARANTEES AND WARRANTIES ON THIS PORTION OF THE WORK TO THE OWNER'S CONSTRUCTION DEPARTMENT. ALL EQUIPMENT, MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED TO BE FREE FROM DEFECTS FOR A PERIOD OF AT LEAST ONE YEAR FOLLOWING DATE OF ACCEPTANCE BY THE OWNER. REPLACE ALL PARTS PROVED DEFECTIVE DURING THAT TIME, INCLUDING THE REPLACEMENT OF LOST RESTRAINTS AND RETURN OF LINKS, TO THE APPROVAL OF THE OWNER'S CONSTRUCTION DEPARTMENT AND AT NO ADDITIONAL COST TO THE OWNER.
1.5 COORDINATION:
A COORDINATE THE WORK WITH THAT OF ALL OTHER TRADES; CHECK ALL CONTRACT DOCUMENTS FOR POSSIBLE CONFLICTS BETWEEN THE VARIOUS TRADES IN EQUIPMENT LOCATION, PIPE, DUCT AND CONDUIT RUNS, ELECTRICAL OUTLETS AND PIPING, LIGHTING DIFFUSERS, RETURN AIR GRILLES, EXHAUST GRILLES, FIRE SPRINKLERS, STRUCTURAL AND ARCHITECTURAL FEATURES, ETC. SHOULD IT BE FOUND NECESSARY TO DEVIATE FROM THE CONTRACT DOCUMENTS FOR ANY REASON WHATSOEVER, THE ENGINEER'S WRITTEN APPROVAL WILL BE REQUIRED.
B SPACES RESERVED FOR DUCTS, PIPING AND LIGHTS ABOVE THE FURRED CEILING ARE IN SOME CASES QUITE CRITICAL. LOCATION OF LIGHT FIXTURES SHALL NOT BE CHANGED. ANY WORK INSTALLED WITHOUT REGARD FOR THE WORK OF OTHER CRAFTS WHICH MUST, IN THE OPINION OF THE ARCHITECT, BE MOVED TO PERMIT THE INSTALLATION OF OTHER WORK, SHALL BE MOVED WITHOUT EXTRA CHARGE.
C SPACES ARE PROVIDED IN THE DESIGN OF THE BUILDING, TO CONCEAL THE HEATING, AND AIR CONDITIONING AND VENTILATING WORK. KEEP ALL PIPES AND DUCTS WITHIN THE FURRED LINES ESTABLISHED ON THE ARCHITECTURAL DRAWINGS.
1.6 EXAMINATION OF SITE:
A EXAMINE THE SITE, VERIFY DIMENSIONS AND LOCATIONS AGAINST THE DRAWINGS, AND BE INFORMED OF ALL CONDITIONS UNDER WHICH WORK IS TO BE DONE BEFORE SUBMITTING PROPOSAL. NO ALLOWANCE WILL BE MADE FOR EXTRA EXPENSE ON ACCOUNT OF ERROR.
B INFORMATION SHOWN RELATIVE TO EXISTING SERVICES IS BASED UPON AVAILABLE RECORDS AND DATA DURING PREPARATION OF DRAWINGS BUT SHALL BE RECHECKED AS APPROXIMATE ONLY. MAKE VERIFIATIONS FOUND NECESSARY TO CONFORM WITH ACTUAL LOCATIONS AND CONDITIONS WITHOUT EXTRA COST.
1.7 MATERIALS AND SUBSTITUTIONS:
A NUMBERS IN THE DRAWINGS AND IN THE MATERIAL LISTS ARE TAKEN FROM THE CATALOG OF THE MANUFACTURERS NAMED.
B WHEN SPECIFIC NAMES ARE USED IN CONNECTION WITH MATERIAL HEREIN MENTIONED, THEY ARE MENTIONED AS STANDARDS, BUT THIS IMPLIES NO RIGHT TO USE OTHER MATERIALS OR METHODS UNLESS APPROVED AS EQUAL IN QUALITY AND UTILITY BY THE CONSULTING ENGINEER OR THE OWNER. THE DESIGN OF THE ENGINEER SHALL GOVERN AS TO WHAT MATERIAL IS EQUAL TO THAT NAMED, BUT THE BURDEN OF PROOF AS TO THE QUALITY OF ANY PROPOSED MATERIAL SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
C ALL MATERIALS SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER ANY WORK INSTALLED WHICH IS IN THE OPINION OF THE ENGINEER, NOT INDICATIVE OF GOOD WORKMANSHIP SHALL BE REMOVED AND REPLACED IN A MANNER SATISFACTORY TO THE ENGINEER. ALL EXPENSES INCIDENTAL THERE TO SHALL BE BORNE BY THE INSTALLING CONTRACTOR.
D WHERE MORE THAN ONE SPECIFIC NAME IS USED, IT IS TO BE UNDERSTOOD THAT THE NAME MENTIONED FIRST REPRESENTS THE MANUFACTURER WHOSE EQUIPMENT HAS BEEN USED AS THE BASIS OF DESIGN. ANY REVISIONS, ADDITIONS OR DELETIONS INVOLVING THE WORK OF OTHER TRADES ARE THE RESULT OF SUBSTITUTING OTHER MANUFACTURER'S EQUIPMENT SHALL BE THE CONTRACTOR'S RESPONSIBILITY. ALL SUCH CHANGES SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
E WHERE THE CONTRACT DOCUMENTS REQUIRE HIGHER STANDARDS THAN APPLICABLE ORDINANCES OR STATUTES, CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE. WHERE CONTRACT DOCUMENTS VIOLATE APPLICABLE ORDINANCES OR STATUTES, THE LATTER SHALL TAKE PRECEDENCE.
1.8 CLOSING IN UNINSPECTED WORK:
A WORK SHALL NOT BE COVERED OR ENCLOSED UNTIL IT HAS BEEN INSPECTED, TESTED AND APPROVED BY THE ENGINEER AND AUTHORITIES HAVING JURISDICTION OVER THE WORK.
1.9 CUTTING AND PATCHING:
A ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, PARTITIONS, CEILING, ETC. AS REQUIRED FOR THE PROPER INSTALLATION OF WORK UNDER THIS SECTION SHALL BE DONE UNDER THIS SECTION. NO CUTTING OF STRUCTURAL MEMBERS WILL BE PERMITTED WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT.
B ANY EXISTING WORK OR EQUIPMENT DAMAGED DURING THE PROCESS OF CONSTRUCTION OR TESTING SHALL BE REPLACED WITH LIKE MATERIAL, FREE OF CHARGE TO THE OWNER OR OTHER TRADES.
1.10 PRODUCT HANDLING:
A USE ALL MEANS NECESSARY TO PROTECT PLUMBING, HEATING, VENTILATING AND AIR CONDITIONING MATERIAL AND EQUIPMENT BEFORE, DURING AND AFTER INSTALLATION AND TO PROTECT THE INSTALLED WORK OF OTHER TRADES. IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE APPROVAL OF THE ARCHITECT AND AT NO ADDITIONAL COST TO THE OWNER.
1.11 ADDITIONAL NOTES:
A CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ACCURATE SHOP DRAWING INFORMATION, SUCH AS WEIGHT, SIZE, ROOF OPENING LOCATION, HEIGHT DISTRIBUTION, ETC. FOR HVAC UNITS AND EXHAUST FANS AND SUBMIT THEM TO THE ARCHITECT FOR APPROVAL. ANY CORRECTIVE MEASURE ARISING FROM A LACK OF THIS SUBMITTAL COORDINATION EFFORT WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR IS FURTHER CAUTIONED TO USE THE ARCHITECT/ENGINEER'S DRAWINGS FOR GENERAL ARRANGEMENT PURPOSES ONLY; IN NO CASE SHALL THEY BE TREATED AS DETAILED SHOP DRAWINGS FOR FABRICATION AND INSTALLATION PURPOSES.
B SEISMIC RESTRAINTS SHALL BE PROVIDED AS REQUIRED BY LOCAL CODE. WHEN LOCAL CODE HAS NO STANDARDS, SEISMIC RESTRAINTS SHALL BE PROVIDED AND INSTALLED PER SMACNA STANDARDS.
1.12 RECORD DRAWINGS:
A IN ADDITION TO OTHER REQUIREMENTS, MARK UP A CLEAN SET OF DRAWINGS AS THE WORK PROGRESSES; TO SHOW THE DIMENSIONED LOCATION AND ROUTING OF ALL ELECTRICAL WORK WHICH WILL BECOME PERMANENTLY CONCEALED. SHOW ROUTING AND LOCATION OF CONCRETE OR BURRED UNDERGROUND, SHOW ROUTING OF WORK IN PERMANENTLY CONCEALED BUND SPACES WITHIN THE BUILDING. SHOW COMPLETE ROUTING AND SIZING OF ANY SIGNIFICANT RUNS TO THE SYSTEMS. SHOW INDICATE TERMINATION LOCATION OF ALL SPARE CONDUITS AND ALL ITEMS ADDED BY ADDENDUM OF CHANGE ORDER.
B MAINTAIN "RECORD DOCUMENT" DRAWINGS IN AN UP-TO-DATE FASHION IN CONJUNCTION WITH THE ACTUAL PROGRESS OF INSTALLATION. THIS SET OF FIELD DRAWINGS SHALL BE KEPT UP ON A DAILY BASIS. ACCURATE PROGRESS MARK-UPS SHALL BE AVAILABLE ON-SITE FOR EXAMINATION BY THE OWNER REPRESENTATIVE, ARCHITECT, OR MECHANICAL ENGINEER AT ALL TIMES.
1.13 RECORD DOCUMENT SUBMITTALS:
A REFER TO DIVISION 1, CONTRACT CLOSE-OUT FOR PROCEDURES AND QUANTITIES OF RECORD DRAWINGS.

**4 PLUMBING**  
RE: P1.1, P1.2, P1.3, P1.4, P1.5, P1.6, P1.7

1.1 GENERAL CONDITIONS AND SPECIAL CONDITIONS:  
 A DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL CONDITIONS AND DIVISION SPECIFICATIONS SECTIONS, APPLY TO THIS SECTION.  
 B REQUIREMENTS OF MECHANICAL GENERAL PROVISIONS AS INDICATED ON DRAWING MP1.1, GOVERN THE WORK INDICATED ON THE DRAWINGS.  
 1.2 DESCRIPTION:  
 A FURNISH ALL PLANT, LABOR, TOOLS, EQUIPMENT, APPLIANCES, MATERIALS AND SERVICES NECESSARY FOR AND PROPERLY INCIDENTAL TO THE FURNISHING AND INSTALLING OF ALL PLUMBING WORK AND RELATED ITEMS AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.  
 B THE WORK TO BE PERFORMED UNDER THIS SECTION SHALL INCLUDE, BUT IS NOT NECESSARILY LIMITED TO THE FOLLOWING:  
 1 DRAINAGE, WASTE AND VENT SYSTEM COMPLETE INCLUDING CONNECTION TO ON-SITE WASTE PIPING INSIDE THE BUILDING.  
 2 HOT WATER SUPPLY AND RETURN PIPING, INCLUDING WATER HEATER RELOCATION.  
 3 COLD WATER SUPPLY PIPING.  
 4 CHEMICAL FEED AT FLORAL KIOSK.  
 5 NATURAL GAS PIPING.  
 6 HELIUM PIPING FROM CILINDER TO BALLON FILL AT FLORAL KIOSK.  
 7 KITCHEN-FOR EQUIPMENT FURNISHED AND INSTALLED BY THE OWNER WHERE SPECIFICALLY MENTIONED OR SHOWN.  
 8 CONNECTION TO EQUIPMENT FURNISHED BY THE OWNER WHERE SPECIFICALLY MENTIONED OR SHOWN.  
 9 EXCAVATION AND BACKFILLING NECESSARY FOR THE INSTALLATION OF THE WORK UNDER THIS SECTION, FLASHING OF ALL PIPE WHEIE THEY PENETRE THE ROOF OR OTHER WATERPROOF MEMBRANES AND ALL REQUIRED CUTTING AND PATCHING NECESSARY TO COMPLETE THE WORK.  
 10 CONDENSATE DRAIN PIPING COOLING SYSTEM AND WATER SUPPLY AND WASTE PIPING AND ACCESSORY EQUIPMENT SPECIFICALLY MENTIONED OR SHOWN.  
 1.3 CODE AND STANDARDS:  
 A ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH THE LATEST APPLICABLE STATE, COUNTY AND LOCAL REGULATIONS AND ORDINANCES. NOTHING IN THESE CONTRACT DOCUMENTS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES. ANY EXTRA WORK OR MATERIALS REQUIRED TO COMPLY WITH THESE LAWS OR RULES AND REGULATIONS SHALL BE FURNISHED WHETHER OR NOT SPECIFICALLY SHOWN OR SPECIFIED.  
 1.4 SUBMITTALS:  
 A PRIOR TO ORDERING OF ANY MATERIALS AND EQUIPMENT AND WITHIN FIFTEEN (15) DAYS OF CONTRACT AWARD, THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR APPROVAL SIX (6) COPIES OF MANUFACTURER'S BROCHURES CONTAINING COMPLETE DIMENSIONAL AND PERFORMANCE CHARACTERISTICS, WIRING DIAGRAMS, INSTALLATION AND OPERATION INSTRUCTIONS, ETC.  
 B IF THE ITEM IS A SUBSTITUTION, IT MUST HAVE BEEN APPROVED AT THE TIME OF SUBMITTING THE BID. OTHERWISE, SUBSTITUTIONS WILL ONLY BE CONSIDERED BY FORMAL REQUEST. A COMPLETE SUBMITTAL AS DESCRIBED IN PARAGRAPH A ABOVE, SHALL BE PROVIDED FOR ALL SUBSTITUTED EQUAL ITEMS.  
 C WHENEVER REQUIRED DURING PROGRESS OF WORK AND AFTER COMPLETION OF CONSTRUCTION, IMMEDIATELY FURNISH PROOF ACCEPTABLE TO THE OWNER'S CONSTRUCTION DEPARTMENT AND THE ARCHITECT THAT ALL ITEMS OF PLUMBING INSTALLED EQUAL OR EXCEED THE REQUIREMENTS SPECIFIED FOR THIS WORK. IN THE EVENT SUCH PROOF IS NOT AVAILABLE OR IS NOT ACCEPTABLE TO THE OWNER'S CONSTRUCTION DEPARTMENT OR THE ARCHITECT, THE OWNER MAY REQUIRE THE CONTRACTOR TO REMOVE THE ITEM AND REPLACE WITH AN ITEM MEETING THE SPECIFIED REQUIREMENTS AND TO REPAIR ALL DAMAGE CAUSED BY THE REMOVAL AND REPLACEMENT ALL AT NO ADDITIONAL COST TO THE OWNER.  
 D PLUMBER SHALL FURNISH A REPRODUCIBLE DRAWING (FURNISHED BY ARCHITECT) SHOWING AN ACCURATE RECORD OF THE PLUMBING UNDERGROUND AND INSTALLATION. LOCATE ALL LINES, DEPTHS OF LINES, SLOPE OF LINES AND OTHER PERTINENT DATA SUCH AS CLEANOUTS SERVING THE REMODELED BUILDING.  
 E COMPLETION OF PLUMBING INSTALLATION:  
 1 UPON COMPLETION OF THE PLUMBING INSTALLATION, AND AS A CONDITION OF ITS ACCEPTANCE, COMPLETE MANUALS OF THREE (3) COPIES EACH AND DELIVER ALL COPIES TO THE ARCHITECT. THE MANUALS SHALL CONTAIN:  
 2 IDENTIFICATION READABLE FROM THE OUTSIDE OF THE COVER, STATING "PLUMBING INSTALLATION SAFETY STORE NUMBER 1535, AND NAME OF INSTALLATION COMPANY".  
 3 COMPLETE INSTRUCTIONS REGARDING THE OPERATION AND MAINTENANCE OF ALL EQUIPMENT INVOLVED.  
 4 COMPLETE NOMENCLATURE OF ALL REPLACEMENT PARTS, THEIR PART NUMBERS, CURRENT COST AND NAME, ADDRESS AND PHONE NUMBER OF THE NEAREST VENDORS OF REPLACEMENT PARTS.  
 5 COPY OF ALL WARRANTIES AND WARRANTIES ISSUED ON THE INSTALLATION.  
 6 COPY OF THE RECORD DRAWINGS DESCRIBED ABOVE.  
 7 COPY OF ALL TEST REPORTS.  
 1.5 QUALIFICATION OF WORKMEN:  
 A USE SUFFICIENT NUMBER OF JOURNEMEN PLUMBERS AND COMPETENT SUPERVISORS IN THE EXECUTION OF THIS PORTION OF THE WORK TO ENSURE PROPER AND ADEQUATE PLUMBING INSTALLATION THROUGHOUT IN THE CONSTRUCTION AREA ALLOWING FOR ACCEPTANCE OR REJECTION OF THE INSTALLED PLUMBING. NO ALLOWANCE WILL BE MADE FOR LACK OF SKILL IN THE PART OF WORKMEN.  
 1.6 PIPE AND FITTINGS:  
 A DRAINAGE, WASTE AND VENT (DWV) PIPING, EXCEPT FOR FIXTURE CONNECTIONS AND VENTS 2" AND LARGER, ALL PIPE AND FITTINGS SHALL BE STANDARD WEIGHT CAST IRON PIPE, UNLESS OTHERWISE NOTED ON THE DRAWINGS. ALL PIPE AND FITTINGS SHALL CONFORM TO ANSI A21.1. SOIL PIPE AT CONTRACTOR'S OPTION NO-HUB OR CALKED HUB AND SPOUT PIPE MAY BE USED. WASTE AND VENT PIPING 1-1/2" INCH SIZE AND SMALLER ABOVE FLOOR, SHALL BE SCHEDULE 40 GALVANIZED STEEL, THREADED, MADE UP WITH CAST IRON DRAINAGE FITTINGS. NO GALVANIZED DWV PIPE SHALL BE BURIED IN THE GROUND. AT CONTRACTOR'S OPTION, WHEN PERMITTED BY CODE, USE SCHEDULE 40, ASTM D-2661 WITH SOLVENT WELD FITTINGS, MAY BE USED FOR UNDERGROUND WASTE AND VENT PIPES AND WHEN CONCEALED INSIDE THE BUILDING, ABS PIPING SHALL NOT BE INSTALLED BETWEEN THE FIXTURE AND THE GREASE TRAP WHEN THE FIXTURE MUST DISCHARGE THROUGH A GREASE TRAP BY CODE.  
 B DOMESTIC WATER PIPING: ALL ABOVE GRADE HOT AND COLD WATER PIPING, UNLESS OTHERWISE NOTED ON THE DRAWINGS SHALL BE HARD-DRAWN COPPER TUBE, TYPE "M", "MILWAUKEE", "JENKINS" OR "STOCKHAM" MADE-UP WITH WROUGHT OR FORGED COPPER FITTINGS, AND 95-5 TIN-ANTIMONY SOLDER.  
 C GAS PIPING: SCHEDULE 40 BLACK STEEL PIPE, THREADED WITH MALLEABLE IRON FITTINGS. PIPING EXPOSED TO WEATHER SHALL BE GALVANIZED. UNDERGROUND PIPING SHALL NOT BE PERMITTED WITHIN THE BUILDING.  
 D HELIUM PIPING: TYPE "L" HARD-DRAWN COPPER PIPE WITH WROUGHT OR FORGED COPPER FITTINGS SOLDERED ON. SOLDERED FITTINGS SHALL BE SOLDERED ON USING SILVER SOLDER AND FLUX AS RECOMMENDED BY THE MANUFACTURER OF THE FITTING FOR THE INTENDED SERVICE. PIPING BELOW FLOOR SHALL BE TYPE "L" SOFT-DRAWN COPPER TUBE WITHOUT FITTINGS OR JOINTS IN A PVC CONDUIT WITH BOTH ENDS TERMINATED AT THE FINISHED FLOOR.  
 E CONDENSATE DRAIN PIPES: PIPES TO BE COPPER TYPE "M" TUBING. PLASTIC PIPES PVC SCHEDULE 40 MAY BE USED IF ALLOWED BY LOCAL PLUMBING CODES.  
 F REVERSE OSMOIS: PIPE TO BE SCHEDULE 40 CPVC WITH SOLVENT WELD TYPE FITTINGS.  
 G GASATRON DISCHARGE PIPING TO OUTLET AT KIOSK, SCHEDULE 80 CPVC WITH SOCKET-SOLVENT WELD FITTINGS.  
 H FITTINGS: STANDARD PRODUCTS AS MANUFACTURED BY "CRANE" OR THE RESPECTIVE MANUFACTURER OF THE PIPING AS HEREINAFTER SPECIFIED.  
 I UNIONS:  
 1 FOR STEEL PIPING 2" AND SMALLER: "GRINNELL" FIG 554 OR "CRANE" 250 LB. GROUND JOINT.  
 2 COPPER PIPING: "MUELLER" NO. WC-407.  
 3 DIELECTRIC UNIONS, 2" AND SMALLER: 250 #KKS, WITH STANDARD GASKETS FOR PLUMBING AND HIGH TEMPERATURE GASKETS FOR HEATING.  
 J CAST-IRON HUBLESS "AMERICAN-BRASS" OR "KODOWOOD" FOUNDRY, FITTINGS AND COUPLINGS IN ACCORDANCE WITH CAST IRON SOIL PIPE INSTITUTION STANDARDS, WITH STAINLESS STEEL SHIELD COUPLING WITH NORM-DRIVE LOCKING BANDS.  
 K PLASTIC PIPING SHALL BE JOINED WITH SOLVENTS COMPATIBLE WITH THE PIPING INSTALLED AS RECOMMENDED BY THE PIPING MANUFACTURER.  
 1.7 VALVES:  
 A "WALWORTH", "NECO", "MILWAUKEE", "JENKINS", "CRANE", "SYMMONS", "WATTS" AND "STOCKHAM", THE FOLLOWING MODELS ARE "WALWORTH":  

TYPE	SIZE RANGE	PART NUMBERS	PSI/WOG
GATE	1/2" TO 3/4"	2	125
GATE	1" TO 3"	4	125
GAS COCK	1" AND SMALLER	557	125
GAS COCK	1-1/2" AND LARGER	554 WITH WRENCH	125
CHECK	3" AND SMALLER	570	150

 B VALVES: STANDARD PRODUCTS AS MANUFACTURED BY "CRANE" OR THE RESPECTIVE MANUFACTURER OF THE PIPING AS HEREINAFTER SPECIFIED.  
 1.8 PIPE SLEEVES AND ESCUTCHEONS:  
 A ALL PIPE SLEEVES AND ESCUTCHEONS SHALL BE "ADJUST-CRETE" SLEEVES, WITH MINLE CLEARANCE FOR PIPE AND COVERING AND "TRIXION & CORBIN" CHROME PLATED WALL AND FLOOR ESCUTCHEONS OVER PIPE IN FINISHED AREAS.  
 1 "TRITEDICH", "SMITH", "EMPOCCO", "ANCO", "JOSAM", "ZURN" AS SPECIFIED AND/OR REQUIRED.  
 2 BOLT CHAIR CARRIERS TO BE USED.  
 3 PROVIDE 1/4" STEEL BACKING PLATES FOR FIXTURE SUPPORT WHERE REQUIRED AND ATTACH TO CARRIERS.  
 E MOUNTING HEIGHTS:  
 1 MANUFACTURER'S STANDARD HEIGHTS UNLESS INDICATED OTHERWISE.  
 2 HANGCAPED FIXTURES MOUNTED PER BUILDING CODE AND ADA REQUIREMENTS.  
 F FIXTURES: SEE SCHEDULE ON DRAWING.

**4 PLUMBING**  
RE: P1.1, P1.2, P1.3, P1.4, P1.5, P1.6, P1.7

1.9 HANGER AND SUPPORTS:  
 A ALL ELECTROCHROMATED HANGERS AND SUPPORTS, UNLESS OTHERWISE NOTED ON THE DRAWINGS SHALL BE THE FOLLOWING MANUFACTURERS AND MODELS:  

ITEM	MANUFACTURER AND NUMBER
PIPE RING HANGER	SUPERSTRUT C-710
SIDE BEAM CLAMP FOR WOOD JOIST	SUPERSTRUT M-750
TRAPEZIE HANGERS	SUPERSTRUT A-1200
PIPE SADDLES (INSULATED PIPE)	INSUL-SHIELD
PIPE SADDLE (NON-INSULATED)	THROSSALLO

 NOTE: MICHIGAN HANGERS, B-LINE MAY BE SUBSTITUTED FOR THE ABOVE.  
 1 HANGER ROOFS SHALL CONFORM TO THE FOLLOWING TABLE:  

PIPE SIZE	ROOF DIAMETER
1/2" TO 2"	3/8"
2-1/2" TO 3-1/2"	1/2"
4" TO 5"	5/8"

 2 AT THE CONTRACTOR'S OPTION, TRAPEZIE HANGERS MAY BE USED WHERE PARALLEL RUNS OF PIPE OCCUR. ALL ROOFS ON TRAPEZIE HANGERS SHALL BE 1/2" MINIMUM SIZE.  
 B DO NOT EXCEED THE FOLLOWING SPACING, ON CENTERS:  

TIE-BE PIPES	SIZING
CAST IRON	5 FEET
COPPER OR STEEL	6 FEET
1 1/2" AND SMALLER	7' AND LARGER
2" AND LARGER	10 FEET
CHRS	4 FEET

 C USE A SEPARATE HANGER FOR EACH BRANCH.  
 D WHENEVER INSULATED PIPE IS SUPPORTED BY RING HANGERS, THE RINGS SHALL PASS FREELY AROUND THE INSULATION, PROTECT THE INSULATION AT POINT OF CONTACT WITH THE RING HANGER OR TRAPEZIE BAR BY MEANS OF "INSULSHIELD" PIPE SADDLES.  
 1.10 VENT FLASHING:  
 A VENT FLASHING AT EACH VENT THROUGH THE ROOF SHALL BE "STONEMAN" NO. 1100 5lb LEAD FLASHING AND 5lb LEAD COUNTERFLASHING, TURN FLASHING INTO PIPES.  
 1.11 CLEANOUTS:  
 A "SMITH", "ZURN", "JOSAM", "WADE", "ROTOTECH", "EMPOCCO" OR "ANCO".  
 B CLEANOUTS MANUFACTURED BY "ZURN" AS SHOWN ON THE DRAWINGS. DO NOT USE PVC CLEANOUTS.  
 1.12 DIELECTRIC UNIONS:  
 A ISOLATE ALL DISSIMILAR METALS WITH DIELECTRIC UNIONS.  
 1.13 FLOOR DRAINS AND FLOOR SINKS:  
 A SEE SCHEDULE ON DRAWINGS. ACCEPTABLE MANUFACTURERS ARE AS FOLLOWS:  

1	ANCON
2	EMPOCCO
3	JOSAM MFG. CO.
4	J. R. SMITH
5	ROTOTECH
6	WADE
7	ZURN

 B FLOOR SINKS ARE TO HAVE ENAMELED INTERIOR WITH CAST ALUMINUM STRAINERS AND THE EDGES OF FLOOR SINK EXPOSED TO THE GRATES FOR ALL FLOOR SINKS ARE TO BE EPOXY GRADE FINISH TOP OF GRATE AND UNDER GRATE.  
 1.14 HOSE BIBBS:  
 A SEE SCHEDULE ON DRAWINGS.  
 B ACCEPTABLE MANUFACTURERS ARE AS FOLLOWS:  

1	ANCON
2	JOSAM
3	J.R. SMITH
4	ZURN

 1.15 TRAP PRIMERS:  
 A ZURN, PRESSURE ACTUATED WITH VACUUM BREAKER. TRAP PRIMERS SHALL BE ISOLATED WITH A 1/2-INCH GATE VALVE, WHERE CONCEALED, VALVE AND TRAP PRIMERS SHALL BE ACCESSIBLE THROUGH A WALL ACCESS PANEL. TRAP PRIMERS TO BE INSTALLED FOR FLOOR DRAINS AS REQUIRED BY LOCAL PLUMBING CODES.  
 1.16 PIPE INSULATION:  
 A INSULATE ALL HOT WATER AND HOT WATER RETURN PIPING WITH FIBERGLAS 25 LBS. 1" THICK INSULATE ALL FITTINGS WITH FIBERGLAS AND "STENO" PREFORMED PVC COVERS.  
 B ALL PIPE INSULATION SHALL COMPLY WITH LOCAL AND STATELY CODES.  
 1.17 ACCESS PANELS:  
 A "MILCOR".  
 B 12"x17" ACCESS PANELS FOR ALL CONCEALED VALVES, TRAP PRIMERS, SHOCK ABSORBERS, CLEANOUTS, ETC.  
 C CONCEALED HINGES AND FLUSH, ALLEN KEY LOCKING DEVICE.  
 D STYLE TO SUIT WALL OR CEILING CONSTRUCTION.  
 E STYLE W/ WITH 1/4 GAUGE PANEL FOR MASONRY AND TILE, SHEET ROCK AND WOOD SURFACES.  
 F INCLUDED MEANS OF SECUREMENT TO WALLS AND CEILINGS.  
 1.18 BACK FLOW PREVENTION (SEE DRAWINGS FOR SIZE)  
 A ATMOSPHERE TYPE VACUUM BREAKER, WATTS NO. 288A.  
 B PRESSURE TYPE VACUUM BREAKER, WATTS NO. 800 WITH GATE VALVES.  
 C DOUBLE CHECK VALVE ASSEMBLY, WATTS NO. 709 DOC GATE VALVES.  
 D REDUCED PRESSURE TYPE VACUUM BREAKER-WATTS NO. 909 OR 009 GATE VALVES.  
 E FEEDO, WATTS  
 1.19 SHOCK ELIMINATORS:  
 A "ROTOTECH", "EMPOCCO", "ANCON", "JOSAM", "J.R. SMITH", "ZURN SCHOCKSTOP", STAINLESS STEEL BELLOWS PDI APPROVED, INSTAL WITH ACCESS DOOR. INSTAL PER MANUFACTURER'S RECOMMENDATIONS.  
 1.20 GROUND JOINT WASTE CONNECTION:  
 A "SPEEDWAY" #1960, INSTAL AT ALL TRAP CONNECTIONS TO WASTE OUTLETS.  
 1.21 OTHER MATERIALS:  
 A ALL OTHER MATERIALS NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND OPERATING FACILITY, SHALL BE NEW, FIRST QUALITY OF THEIR RESPECTIVE KINDS, AND SUBJECT TO THE APPROVAL OF THE OWNER'S CONSTRUCTION DEPARTMENT.  
 1.22 PLUMBING FIXTURES:  
 A GENERAL: PROVIDE COMPLETE FIXTURE ASSEMBLY, INCLUDING ALL TRIM AND APPURTENANCES FOR PROPER OPERATION AND NEAT, FINISHED APPEARANCE. PROCURE ALL KITCHEN-SINK FROM MANUFACTURER AND ROUGH-IN AND CONNECT TO FIXTURES AS REQUIRED.  
 1 VITREOUS CHINAWARE FIXTURES SHALL BE WHITE, UNLESS OTHERWISE NOTED, VITREOUS CHINA ENAMELWARE SHALL BE STEEL WITH ACID RESISTANT ENAMEL, INCLUDE CHINA SINK CAPS.  
 2 FACTORY GRIND BACKS AND BASE OF FIXTURES SMOOTH. POINT UP AT JOINTS WITH WALLS AND FLOORS WITH NON-HARDENING SILICONE.  
 B SUBMISSIONS:  
 1 INCLUDE BROCHURE COMPLETE WITH DESCRIPTION OF ALL FIXTURES AND TRIM.  
 C TRIM:  
 1 EXPOSED TRIM, INCLUDING STOPS, TUBING, TRAPS, WASTE PIECES AND ESCUTCHEONS SHALL BE POLISHED CHROME PLATED.  
 2 PROVIDE SEPARATE CONTROL STOPS FOR EACH FIXTURE.  
 3 GASKET FLOOR OUTLET FIXTURES.  
 4 PROVIDE SKAL-GARD OR INSL. TECH AT ALL P-TRAPS AND ANGLE STOP PROTECTOR FOR ADA COMPLIANCE.  
 D CARRIERS:  
 1 "TRITEDICH", "SMITH", "EMPOCCO", "ANCO", "JOSAM", "ZURN" AS SPECIFIED AND/OR REQUIRED.  
 2 BOLT CHAIR CARRIERS TO BE USED.  
 3 PROVIDE 1/4" STEEL BACKING PLATES FOR FIXTURE SUPPORT WHERE REQUIRED AND ATTACH TO CARRIERS.  
 E MOUNTING HEIGHTS:  
 1 MANUFACTURER'S STANDARD HEIGHTS UNLESS INDICATED OTHERWISE.  
 2 HANGCAPED FIXTURES MOUNTED PER BUILDING CODE AND ADA REQUIREMENTS.  
 F FIXTURES: SEE SCHEDULE ON DRAWING.

**4 PLUMBING**  
RE: P1.1, P1.2, P1.3, P1.4, P1.5, P1.6, P1.7

1.23 APPROVAL LIST OF MANUFACTURERS:  
 A MANUFACTURERS ARE LISTED IN ALPHABETICAL ORDER AND NOT IN ORDER OF PREFERENCE. "AMERICAN STANDARD" OR "CRANE" FIXTURES ARE PREFERRED.  
 B WATER CLOSETS, LAVATOIRES, SERVICE SINKS AND FITTINGS:  

1	AMERICAN STANDARD
2	CRANE
3	ELLER
4	KOHLER

 C FAUCETS:  

1	AMERICAN STANDARD
2	CRANE
3	CHICAGO
4	KOHLER
5	ZURN
6	J.R. SMITH
7	JOSAM MFG CO

 D DRAINAGE EQUIPMENT (CLEANOUTS, ETC.)  

1	ZURN
2	J.R. SMITH
3	JOSAM MFG CO

 E HOSE BIBBS - WALL HYDRANT  

1	ANCON
2	ZURN

 F PIPE ACCESSORIES AND SPECIALTIES PIPE HANGERS, SUPPORTS AND ISOLATORS.  

1	GRINNELL
2	SUPERSTRUT

 G WATER CLOSET SEAT  

1	BENECKE
2	CHURCH
3	OLSONITE

 H VALVES:  

1	CRANE
2	JENKINS
3	MILWAUKEE
4	ROCKWELL
5	STOCKHAM
6	SYMMONS
7	WALWORTH

 I FLUSH VALVES  

1	DELANEY
2	SLDAN VALVE CO. (ROYAL)
3	ZURN INDUSTRIES

 J WATER COOLER DRINKING FOUNTAIN  

1	ELKAY
2	HALSEY TAYLOR
3	HAMS
4	QASIS
5	SUNROC

 K STAINLESS STEEL COUNTER MOUNTED SINK  

1	ELKAY
2	JUST
3	DAYTON
4	POLAR

 1.24 PLUMBING SYSTEM LAYOUT:  
 A FOLLOW THE GENERAL LAYOUT SHOWN ON THE DRAWINGS IN ALL CASES EXCEPT WHERE OTHER WORK MAY INTERFERE. LAY OUT ALL PIPE TO FALL WITHIN PARTITION, CEILING OR ROOF CAVITIES AND DO NOT REQUIRE FURNISHING MORE THAN THAT SHOWN ON THE DRAWINGS. PIPING SHALL NOT BE INSTALLED IN MASONRY WALLS.  
 1.25 TRENCHING AND BACKFILLING:  
 A DIG TRENCHES STRAIGHT AND TRUE TO LINE AND GRADE WITH BOTTOM OF TRENCH FREE FROM ROCK POINTS AND WITH PIPE CUSHION CONSISTING OF UNDISTURBED MATERIAL, SOIL ON A COMPACTED BED OF FINE SAND OF MINIMUM 1" DEPTH. BACKFILL PROMPTLY UPON RECEIPT OF ALL NECESSARY APPROVALS. ALL FILL MATERIAL SHALL BE FREE FROM ROCKS, LARGE CLUMBS, ROOTS AND OTHER FOREIGN SUBSTANCES. REMOVE ALL EXCESS MATERIAL FROM SITE.  
 1.26 INSTALLATION OF PIPING EQUIPMENT:  
 A INSTALL ALL PIPING PROMPTLY CAPPING OR PLUGGING ALL OPEN ENDS.  
 B INSTALL ALL PIPING GENERALLY LEVEL AND PLUMB, FREE FROM TRAPS, AND IN A MANNER TO CONSERVE SPACE FOR OTHER WORK.  
 C CUSHION ALL TRAPS AND BEARING TO MINIMIZE TRANSFER OF SOUND. FIRMLY ANCHOR ALL PIPES IN POSITION. PROVIDE COMPLETE ISOLATION OF DISSIMILAR METALS.  
 D PROVIDE UNIFORM PITCH OF AT LEAST 1/4-INCH PER FOOT FOR ALL HORIZONTAL WASTE AND SOIL PIPING WITHIN THE BUILDING. AT NO TIME SHALL THE SLOPE BE LESS THAN 1/8-INCH PER FOOT.  
 E CONCEAL ALL PIPING UNLESS OTHERWISE INDICATED ON THE DRAWINGS.  
 F INSPECT EACH PIECE OF PIPE, TUBING FITTINGS AND EQUIPMENT FOR DEFECTS AND OBSTRUCTIONS. PROMPTLY REMOVE ALL DEFECTIVE MATERIAL FROM THE SITE.  
 G INSTALL PIPES TO CLEAR ALL BEAMS AND OBSTRUCTIONS. DO NOT CUT INTO OR REDUCE THE SIZE OF ANY LOAD-CARRYING MEMBERS.  
 H PIPING SHALL BE ARRANGED TO MAINTAIN HEADROOM AND KEEP PASSAGEWAYS CLEAR AND WHERE NECESSARY, SHALL BE OFFSET TO MAINTAIN THE REQUIRED CLEARANCE AND CONFORM WITH STRUCTURAL FEATURES OF THE BUILDING. ALL PIPING SHALL BE RUN PARALLEL AND STRAIGHT WITH ADJACENT WALLS OR CEILING, SHALL PRESENT A UNIFORM APPEARANCE AND SHALL BE GROUPED TOGETHER IN LOW RUNS.  
 I WHERE TWO OR MORE PIPES ARE BACKED VERTICALLY, THE PIPES SHALL BE SUPPORTED BY SUPERSTRUT OR EQUIVALENT CHANNELS AND CLAMPS.  
 J ISOLATE PIPES AT HANGARS WITH SPECIFIED PIPE SADDLES. CUSHION AGAINST VIBRATION NOISE WITH SPRING ISOLATORS OR NEOPRENE GASKETING.  
 K FIXTURE TRIM AND EXPOSED METAL ITEMS SHALL BE CHROME PLATED, UNLESS OTHERWISE NOTED, AND PIPES PASSING THROUGH WALLS SHALL HAVE CHROME PLATED ESCUTCHEON PLATES.  
 L UNOCCUPIED FIXTURE FAUCET HOLES SHALL BE COVERED WITH CHROME PLATED FAUCET HOLE COVERS.  
 M PROVIDE 1/4-INCH STEEL BACKING PLATES, 35-INCH BY 12-INCH HIGH MINIMUM SIZE, SECURED TO A MINIMUM OF THREE STUDS WITH 1/4-INCH x 2-1/2-INCH U&S SCREWS FOR ALL WALL HUNG FIXTURES FOR WHICH OTHER MEANS OF SUPPORT IS NOT SPECIFIED.  
 N ALL EQUIPMENT SHALL BE FITTED WITH SHUTOFF VALVES WITH CONNECTION UNIONS OR FLANGE BETWEEN EQUIPMENT AND WALL, UNLESS OTHERWISE INDICATED. STRAINERS, SHUTOFF VALVES AND CHECK VALVES SHALL BE GATE VALVES, EXCEPT WHERE DROTTLING CONTROL OR FREQUENT OPERATION IS REQUIRED. GLOBE OR ANGLE VALVES SHALL BE USED. GLOBE VALVES INSTALLED IN HORIZONTAL LINES SHALL BE PLACED WITH STEM HORIZONTAL SO THAT THE LINES DRAIN. ALL GLOBE AND ANGLE VALVES SHALL BE INSTALLED TO CLOSE AGAINST THE PRESSURE. VALVES SHALL HAVE DISCS SUITED FOR THE SERVICES FOR WHICH THE VALVES ARE USED.  
 O WHENEVER CHANGES IN SIZES OF PIPES OCCUR, THE CHANGES SHALL BE MADE WITH REDUCING FITTINGS; THE USE OF BUSHINGS WILL NOT BE PERMITTED.  
 P PROVIDE DIRT POCKETS ON BOTTOM OF ALL VERTICAL GAS PIPES.  
 Q GROUND JOINT WASTE CONNECTIONS SHALL BE INSTALLED ON ALL TRAP CONNECTIONS TO WASTE OUTLETS.  
 R ALL PIPING SUBJECT TO EXPANSION AND CONTRACTION SHALL BE ARRANGED WITH FLEXIBILITY TO PREVENT EXCESSIVE ALLOWABLE STRESSES IN PIPES, VALVES, OR CONNECTED EQUIPMENT.  
 S ALL DOMESTIC WATER PIPING SHALL BE KEPT CLEAR OF THE BUILDING STRUCTURE, WHERE IT IS WITHIN 1-INCH OF THE BUILDING STRUCTURE, IT SHALL BE PADDED WITH HARD FELT MATERIAL FOR ITS ENTIRE LENGTH.  
 T ALL PIPES AND DUCTS PENETRATING EXTERIOR WALLS OR ROOFS SHALL BE FLASHED AND COUNTER FLASHED WATERTIGHT, WHERE OTHER MATERIALS ARE NOT SPECIFICALLY SHOWN OR SPECIFIED, FLASHING AND COUNTER FLASHING SHALL BE 24-GAUGE GALVANIZED STEEL.  
 U ALL PIPING SHALL BE LOCATED OVER COOLER BOXES, KEEP CLOSE TO CEILING.  
 V WHERE DIMENSIONS OR SPECIFIC INSTALLATION AND OPERATING INSTRUCTIONS OF EQUIPMENT ARE NOT PROVIDED IN THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL PERFORM THE WORK ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS. ANY MATERIALS AND WORK REQUIRED BY THESE MANUFACTURER'S RECOMMENDATIONS SHALL BE SUPPLIED AT NO ADDITIONAL COST.  
 W PROVIDE ALL MATERIAL AND LABOR REQUIRED FOR EQUIPMENT SUPPORTS AND ANCHORAGE TO BUILDING STRUCTURE INCLUDING SLEEVES FOR ROOF MOUNTED EQUIPMENT AND SEISMIC RESTRAINTS.  
 X SLEEVE ALL PIPING THROUGH CONCRETE OR MASONRY WALLS. SLEEVES SHALL BE 1-INCH LARGER THEN PIPES. SLEEVES ARE NOT REQUIRED FOR CORE DRILLED HOLES.

**4 PLUMBING**  
RE: P1.1, P1.2, P1.3, P1.4, P1.5, P1.6, P1.7

1.27 JOINTS AND CONNECTIONS:  
 A PROPERLY BEAM ALL CUT PIPE, CUT ALL THREADS STRAIGHT AND TRUE, APPLY BEST QUALITY TEFELON TAPE TO ALL MALE PIPE THREADS BUT DO NOT INSIDE THE FITTINGS. USE GRAPHITE ON ALL CLEANOUT FLANGES.  
 B CAST IRON SOIL AND WASTE PIPE AND FITTINGS, NO-HUB PIPE AND FITTINGS AND JOINTS WITH STAINLESS STEEL SHIELD COUPLING WITH NORM-DRIVE LOCKING BANDS. HEAT DIFFUSION METHODS ARE PREFERRED FOR PLASTIC PIPE JOINTS.  
 C MAKE ALL JOINTS IN COPPER TUBE FOR PORTABLE WATER WITH 95-5 TIN-ANTIMONY SOLDER APPLIED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. 50-50 SOLDER SHALL NOT BE USED ON JOB SITE.  
 1.28 STERILIZATION OF PIPES:  
 A AFTER PRELIMINARY PURGING OF THE SYSTEM, CHLORINATE THE PORTABLE WATER SYSTEM IN ACCORDANCE WITH AMERICAN WATER WORKS ASSOCIATION PLUMBING CODE PROCEDURES FOR FLASHING AND DISINFECTING WATER MAINS, AND IN ACCORDANCE WITH ALL OTHER PERTINENT CODES AND REGULATIONS.  
 B UPON COMPLETION OF THE STERILIZATION, THOROUGHLY FLUSH THE PORTABLE WATER SYSTEM.  
 C CHLORINATE ONLY WHEN BUILDING IS UNOCCUPIED.  
 D DELIVER CERTIFICATION OF COMPLETION OF CHLORINATION TO THE ARCHITECT.  
 E AFTER CHLORINATION, FLUSH SYSTEM.  
 1.29 TESTS:  
 A ALL PLUMBING TESTS SHALL BE MADE IN THE PRESENCE OF THE LOCAL INSPECTOR AND/OR THE ARCHITECT'S REPRESENTATIVE.  
 B FURNISH ALL TEST PUMPS, GAUGES, EQUIPMENT AND PERSONNEL REQUIRED TO DEMONSTRATE THE INTEGRITY OF THE FINISHED PLUMBING INSTALLATION TO THE APPROVAL OF PERTINENT AUTHORITIES AND THE OWNER'S CONSTRUCTION DEPARTMENT.  

SERVICE	TEST MEDIA	TEST PRESSURE	DURATION
SWAIFTARY WASTE, SEWER & VENT	WATER	10' OF HEAD	1 HOUR
WATER	WATER	150 PSI	2 HOURS
GAS	AIR	100 PSI	2 HOURS
HELIUM	AIR	100 PSI	2 HOURS

 PROE TIGHT WITH NO LOSS OF MEDIA, IF TEST FAILS, REPAIR THE LEAK AND RE-TEST.  
 C VALVES: TEST ALL VALVE BONNETS FOR TIGHTNESS, TEST OPERATE ALL VALVES AT LEAST ONCE FROM CLOSED-TO-OPEN-TO-CLOSED POSITION WHILE VALVE IS UNDER TEST PRESSURE. TEST ALL AUTOMATIC VALVES FOR PROPER OPERATION AT THE SETTINGS INDICATED. TEST PRESSURE RELIEF VALVES AT LEAST (3) THREE TIMES.  
 D PIPING SPECIALTIES: TEST ALL PIPING SPECIALTIES FOR PROPER OPERATION. TEST ALL AIR VENT POINTS TO ENSURE THAT AIR HAS BEEN VENTED.  
 E INCLUDE TEST REPORTS WITH CLOSOUT DOCUMENTS.  
 1.30 CLEANING:  
 A UPON COMPLETION OF ALL WORK OF THIS SECTION, THOROUGHLY CLEAN ALL EXPOSED PORTIONS OF THE PLUMBING INSTALLATION REMOVING ALL TRACES OF SOIL, LABELS, GREASE, OIL AND OTHER FOREIGN MATTER AND USING ONLY THE TYPE OF CLEANER RECOMMENDED BY THE MANUFACTURER.  
 B CONTRACTOR TO REMOVE ALL DEBRIS AND FLUSH THE DEVICE SYSTEM TO BE FREE OF DEBRIS.  
 C PRIOR TO PROJECT OPENING, THOROUGHLY TRAIN STORE PLUMBER IN ALL ASPECTS OF MAINTENANCE AND OPERATION OF THE PLUMBING SYSTEMS.

**SAFEMAY**

7315 Street View  
Phoenix, AZ 85041

REVISIONS

SUBMITTAL DATES

OWNER:

AGENCY:

BID DATE:

PROJECT NO.

DRAWN BY:

SCALE:

CAD SAVED NAME:

DATE:

AN EXISTING STORE REMODEL FOR  
**SAFEMAY STORE #1535**  
 1515 EAST ELLIOT ROAD  
 TEMPE, ARIZONA  
 SAFEMAY INC. PHOENIX RETAIL DIVISION CONSTRUCTION DEPARTMENT  
 SAFEMAY JOB NO. 17-1535-00-0001  
 2750 S. PRIEST DR., TEMPE, ARIZONA SAFEMAY JOB NO. 17-1535-00-0001

SHEET TITLE  
 MECHANICAL & PLUMBING SPECIFICATIONS

SHEET NO.  
 MP1.2

**PALMER**  
 ENGINEERS, INC.  
 100 S. COUNTY CLUB, TUCSON, ARIZONA 85718-1911  
 TELEPHONE: 520-228-4331 FAX: 520-228-8121  
 CONSULTING MECHANICAL ENGINEERS