

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

AIR HANDLING UNIT - COLD DECK

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
The HOA switch properly activates and deactivates the unit		
Fan rotation verified as correct		
Vibration within tolerances (report attached)		
Verify noise dB within tolerances		
Safeties installed and operating properly		
All valves and dampers stroke fully and smoothly		
TAB/Mechanical firm verified performance (report attached)		
Record full load running amps for fan. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached)		
VFD operation verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

AIR HANDLING UNIT - HOT DECK

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

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_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
The HOA switch properly activates and deactivates the unit		
Fan rotation verified as correct		
Vibration within tolerances (report attached)		
Verify noise dB within tolerances		
Safeties installed and operating properly		
All valves and dampers stroke fully and smoothly		
TAB/Mechanical firm verified performance (report attached)		
Record full load running amps for fan. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached)		
VFD operation verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

AIR COMPRESSOR PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Compressor

MFR: _____ Model: _____

Serial #: _____

Receiver capacity: _____ Regulator set pressure: _____ PSI

Static water pressure: _____ PSI Pressure switch set pressure: _____ PSI

Actual vacuum reading at gauge: _____ Inches HG

Approved	Cont.	UTH
Manufacturer product data sheet		
O&M Manual		
INSTALLATION		
Piping complete		
Drain piping complete		
Regulator adjusted		
Dryer station installed per contract documents		
Pressure switch adjusted		
Vibration isolation installed		
Housekeeping pad installed		
Controls complete		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

AIR HANDLING UNIT / COLD DECK

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Unit pressure leakage and deflection verified (report attached)		
Permanent labels affixed, including for fans		
Casing condition good: no dents, leaks, door gaskets installed		
Access doors close tightly - no leaks		
Boot between duct and unit tight and in good condition		
Vibration isolation equipment installed & released		
Maintenance access acceptable for unit and components		
Sound attenuation installed		
Thermal insulation properly installed and according to specification		
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)		
Clean up of equipment completed per contract documents		
Filters installed and construction filters in place		
Valves, Piping and Coils properly installed and flushed (reports attached)		
PolyChain or Vee Belt: Belt		
Sheave size/number _____		
Bearings lubricated		
SSTL lube lines installed		
Alignment check: Fan sheave to motor sheave: _____ degrees (0° ± 0°)		
Fan wheel to shaft-all bolts torque checked		
Interior lights and light switch operational		

Approved	Cont.	UTH
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Chilled water lines counter-flow connection verified		
All coils are clean and fins are combed		
All condensate drain pans clean and slope to drain, per spec		
Valves properly labeled		
OSAT, MAT, SAT, RAT, chilled water supply sensors properly located and secure (related OSAT sensor shielded)		
Sensors calibrated (report attached)		
P/T plugs and isolation valves installed per drawings		
Supply fan and motor alignment correct		
Supply fan belt tension & condition good		
Supply fan protective shrouds for belts in place and secure		
Supply fan area clean		
Supply fan and motor properly lubricated		
Smoke and fire dampers installed properly per contract docs		
All dampers close tightly		
All damper linkages have minimum play		
Low limit freeze stat sensor located to deal with stratification & bypass		
Sound attenuators installed		
No apparent severe duct restrictions		
Turning vanes in square elbows as per drawings		
OSA intakes located away from pollutant sources & exhaust outlets		
Ducts cleaned as per specifications		
ELECTRICAL AND CONTROLS		
Pilot lights are functioning		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for components and unit		
Safeties in place and operable		
Starter overload breakers installed and correct size		
Sensors calibrated (report attached)		
Control system interlocks hooked up and functional		
Smoke detectors in place		
All control devices, pneumatic tubing and wiring complete		
VFD connected and operational (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

AIR HANDLING UNIT / HOT DECK

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Unit pressure leakage and deflection verified (report attached)		
Permanent labels affixed, including for fans		
Casing condition good: no dents, leaks, door gaskets installed		
Access doors close tightly - no leaks		
Boot between duct and unit tight and in good condition		
Vibration isolation equipment installed & released		
Maintenance access acceptable for unit and components		
Sound attenuation installed		
Thermal insulation properly installed and according to specification		
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)		
Clean up of equipment completed per contract documents		
Filters installed and construction filters in place		
Valves, Piping and Coils properly installed and flushed (reports attached)		
PolyChain or Vee Belt: Belt		
Sheave size/number _____		
Bearings lubricated		
SSTL lube lines installed		
Alignment check: Fan sheave to motor sheave: _____ degrees (0° ± 0°)		
Fan wheel to shaft bolts torque checked		
Interior lights and light switch operational		

Approved	Cont.	UTH
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Steam supply line counter-flow connection verified		
All coils are clean and fins are combed		
All condensate drain pans clean and slope to drain, per spec		
Valves properly labeled		
OSAT, MAT, SAT, RAT, chilled water supply sensors properly located and secure (related OSAT sensor shielded)		
Sensors calibrated (report attached)		
P/T plugs and isolation valves installed per drawings		
Supply fan and motor alignment correct		
Supply fan belt tension & condition good		
Supply fan protective shrouds for belts in place and secure		
Supply fan area clean		
Supply fan and motor properly lubricated		
Smoke and fire dampers installed properly per contract docs		
All dampers close tightly		
All damper linkages have minimum play		
Low limit freeze stat sensor located to deal with stratification & bypass		
Sound attenuators installed		
No apparent severe duct restrictions		
Turning vanes in square elbows as per drawings		
OSA intakes located away from pollutant sources & exhaust outlets		
Ducts cleaned as per specifications		
ELECTRICAL AND CONTROLS		
Pilot lights are functioning		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for components and unit		
Safeties in place and operable		
Starter overload breakers installed and correct size		
Sensors calibrated (report attached)		
Control system interlocks hooked up and functional		
Smoke detectors in place		
All control devices, pneumatic tubing and wiring complete		
VFD connected and operational (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

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Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

AIR HANDLING UNIT

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

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___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer product data sheet		
O&M Manual		
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Unit pressure leakage and deflection verified (report attached)		
Permanent labels affixed, including for fans		
Casing condition good: no dents, leaks, door gaskets installed		
Access doors close tightly - no leaks		
Boot between duct and unit tight and in good condition		
Vibration isolation equipment installed & released from shipping locks		
Maintenance access acceptable for unit and components		
Sound attenuation installed		
Thermal insulation properly installed and according to specification		
Instrumentation installed according to specification		
Clean up of equipment completed per contract documents		
Filters installed and construction filters in place		
Valves, Piping and Coils properly installed and flushed (reports attached)		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Hot/cold supply line counter-flow connection verified		
All coils are clean and fins are in good condition		
All condensate drain pans clean and slope to drain, per spec		

Approved	Cont.	UTH
Valves properly labeled		
Valves installed in proper direction		
OSAT, MAT, SAT, RAT, chilled water supply sensors properly located and secure (related OSAT sensor shielded)		
Sensors calibrated (report attached)		
P/T plugs and isolation valves installed per drawings		
Supply fan and motor alignment correct		
Supply fan belt tension & condition good		
Supply fan protective shrouds for belts in place and secure		
Supply fan area clean		
Supply fan and motor properly lubricated		
Smoke and fire dampers installed properly per contract docs		
All dampers close tightly		
All damper linkages have minimum play		
Low limit freeze stat sensor located to deal with stratification & bypass		
Sound attenuators installed		
Duct joint sealant properly installed		
No apparent severe duct restrictions		
Turning vanes in square elbows as per drawings		
OSA intakes located away from pollutant sources & exhaust outlets		
Branch duct control dampers operable		
Ducts cleaned per specifications		
Balancing dampers installed as per shop drawings		
ELECTRICAL AND CONTROLS		
Pilot lights are functioning		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for components and unit		
Safeties in place and operable		
Starter overload breakers installed and correct size		
Sensors calibrated (report attached)		
Control system interlocks hooked up and functional		
Smoke detectors in place		
All control devices, pneumatic tubing and wiring complete		
VFD connected and operational (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

APPLIANCE – CLOTHES WASHER / DRYER

Location _____

Test # _____

Submittal / Approvals

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_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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CLOTHES WASHER

Appliance Location	Manufacturer	Model	Voltage	Cont.	UTH

Approved	Cont.	UTH
Hot & cold water connected:		
Each cycle operational		
Indicator lights operational		
Door closure latch functional		
All switch/adjustment handles installed		
Unit is leveled		

CLOTHES DRYER

Appliance Location	Manufacturer	Model	Voltage	Cont.	UTH

Approved	Cont.	UTH
Hot & cold water connected:		
Each cycle operational		
Indicator lights operational		
Door closure latch functional		
All switch/adjustment handles installed		
Ventilation duct installed		
Filter installed		
Unit is leveled		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

APPLIANCE – DISHWASHER

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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DISHWASHER

Appliance Location	Manufacturer	Model	Voltage	Cont.	UTH

Approved	Cont.	UTH
Record Submittal		
O&M manuals		
Hot & cold water connected:		
Each cycle operational		
Indicator lights operational		
Door closure latch functional		
All switch/adjustment handles installed		
Gas supply/valve line leak tested		
Unit is leveled		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

APPLIANCE – MICROWAVE

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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MICROWAVE

Appliance Location	Manufacturer	Model	Voltage	Cont.	UTH

Approved	Cont.	UTH
Record Submittal		
O&M manuals		
Ventilation fan operational		
Interior light operational		
All cooking modes operational		
Timer/clock operational		
Door "open" - Stops oven		
Door closure operational & sealed		
All tape and packing residue removed		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

APPLIANCE – REFRIGERATOR

Location _____

Test # _____

Submittal / Approvals

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___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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REFRIGERATOR

Appliance Location	Manufacturer	Model	Voltage	Cont.	UTH

Approved	Cont.	UTH
Record Submittal		
O&M manuals		
Hot & cold water connected:		
Interior light operational		
Icemaker operational		
Water dispenser operational		
Thermostat adjusted & operational		
Unit leveled for self closing doors		
Interior shelving installed		
All tape and packing residue removed		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

APPLIANCE – STOVE / OVEN

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

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_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

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STOVE / OVEN

Appliance Location	Manufacturer	Model	Voltage	Cont.	UTH

Approved	Cont.	UTH
Record Submittal		
O&M manuals		
Stove top elements operational		
Oven light operational		
Oven thermostat operational		
Clock / timer operational		
Broiler operational		
Gas supply line/valve leak tested		
Ventilation fan operational		
Oven door seal is operational		
Self-Cleaning feature operational		
Unit leveled		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

APPLIED FIREPROOFING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
INSTALLATION		
Application locations confirmed		
Environmental criteria is enforced		
Substrate suitable for application		
Reinforcement, if req'd, is in place		
Penetrating items in place before application		
Review temporary protection		
Mix and application rate per mfg. instructions		
Confirm primer application		
Adhesion and thickness verified (test report attached)		
Final		
Patch and repair material disturbed by subsequent work		
Spills removed, excess materials trimmed		
General cleaning		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

AUTOMATIC TRANSFER SWITCH

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
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Manf. _____

Model # _____

Serial # _____

Location _____

EQUIPMENT SERVED AND LOADS

Equipment # _____	Load _____	AMPS
Equipment # _____	Load _____	AMPS
Panel# _____	Load _____	AMPS
Transformer _____		
Panel# _____	Load _____	AMPS

Normal power source (panel#) _____			
Voltage _____	Rating _____		AMPS
Emergency power source (panel#) _____			
Voltage _____	Rating _____		AMPS

SETTINGS (Switch Supplier to complete upon acceptance)

Transfer to emergency source: _____ Minutes (Range: 0-_____ Minutes)

Retransfer to normal source: _____ Minutes (Range: 0 _____ -Minutes)

Overvoltage time delay: _____ Seconds (Range: _____ Seconds)

Frequency time delay: _____ Seconds (Range: _____ Seconds)

Pretransfer time delay: _____ Seconds (Range: _____ Seconds)

Transition time delay: _____ Seconds (Range: _____ Seconds)

Generator start time delay: _____ Seconds (Range: _____ Seconds)

Generator stop time delay: _____ Minutes (Range: _____ Minutes)

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Fittings complete and properly supported		
Connectors Torqued to specified Tolerances		
Properly labeled		
Conductors properly labeled / color-coded		
Properly Grounded		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

AUTOMATIC VALVE

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
O&M manuals		
Valve Schedule for all valves complete and attached		
INSTALLATION		
Valve properly installed		
Valve properly aligned		
Valve is accessible		
Pneumatic / electrical connections secure		
Lubrication points serviced		
Proper gasket installed		
Valve operation (open/close/shut-off) consistent with specifications and manufacturers data		
Free movement of actuator throughout range		
Permanent Valve Tag attached		

Sensor and Actuator Calibration

Field-installed valves with actuators shall be calibrated using the methods and tolerances given in the contract documents. All test instruments shall have had a certified calibration within the last 12 months: Y/N_____. Sensors installed in equipment at the factory with calibration certification provided by the manufacturer need not be field calibrated.

Sensor or Actuator & Location	Location OK	1st Gage or BAS Value	Instr. Meas'd Value	Final Gage or BAS Value	Pass Y/N?

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

BIOSAFETY CABINETS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
Verify air flow at face with sash opened at 18" (report attached)		
Verify duct static pressure control		
Verify exhaust static pressure		
Demonstrate alarms operate as designed		
Verify med/lab gas lines/labels are correct		
Vibration within tolerances (report attached)		
Verify noise dB within tolerances		
Mechanical sub/TAB firm verified performance (report attached)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached)		
VFD operation verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

BIOSAFETY CABINET

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Manf. _____

Model # _____

Serial # _____

CFM _____

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Liner as specified		
Work Surface as specified		
Cup Sink as specified		
Baffle Adjustment as specified		
Water fixture connected and operable		
Gas fixture connected and operable		
Vacuum fixture connected and operable		
Air fixture connected and operable		
Plumbing waste line connected		
Fire and balance dampers installed (if required)		
Backdraft dampers installed, per drawings, and operate freely		
Flow monitor installed		
Exhaust collar as specified		
Interior access panels w/ gaskets as specified		
Sash Stop as specified (manual and automatic reset)		
Sash Design as specified, including safety glass, horiz/vert w/ counter balance, (verify sash operation)		
ELECTRICAL		
Electrical connections complete		
Disconnect switch installed		
Fan overload heaters in place		
Hood Outlets as specified		
Interior Hood lighting as specified		
Alarm as specified and verified (report attached)		
Fan rotation correct		
Electrical interlocks verified		
Any fan status indicators functioning		
No unusual vibration or and noise		
Fuse Size _____		
Heater Size _____		

Approved	Cont.	UTH
Starter Size _____		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

Boiler

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
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Approved	Cont.	UTH
Record Submittal		
O&M Manuals		
Sequence of Operations verified		

Operational Checks			
Check if acceptable, provide comment if unacceptable	NA	Comments	
Measure line to line voltage phase imbalance for all three-phase motors: (%Imbalance = 100 x (avg. - lowest) / avg.) Record imbalance of compressor. Imbalance less than 2%?	<input type="checkbox"/>	<input type="checkbox"/>	
Record full load running amps for all three-phase motors: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	<input type="checkbox"/>	<input type="checkbox"/>	
No unusual noise and vibration when running	<input type="checkbox"/>	<input type="checkbox"/>	
Boiler safeties energized and tested	<input type="checkbox"/>	<input type="checkbox"/>	
Specified sequences of operation and operating schedules have been implemented with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	
Startup report completed with this checklist attached. (Includes full listing of all internal settings with notes as to which settings are BAS controlled or monitored and which are integral.)	<input type="checkbox"/>	<input type="checkbox"/>	
Startup report includes written certification from boiler manufacturer that all specified features, controls and safeties have been installed and are functioning properly and that the installation and application comply with the manufacturer's recommendations.	<input type="checkbox"/>	<input type="checkbox"/>	
Startup report includes optimal and actual percent CO ₂ , CO, O ₂ , stack temperature; combustion efficiency	<input type="checkbox"/>	<input type="checkbox"/>	
Piping gages, BAS and boiler temperature and pressure readouts match (see calibration section below)	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	

Sensor and Actuator Calibration

All field-installed sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated using the methods and tolerances given in the Calibration and Leak-by Test Procedures document. All test instruments shall have had a certified calibration within the last 12 months: Y/N_____. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Sensor or Actuator Tag & Location	Location OK	1 st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y / N

Comments:

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

Boiler

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding checklist items preclude safe and reliable testing and equipment operation activities.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date

_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date

_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Boiler 1 Information					
Make				Model Number	
Serial Number				Capacity	GPM
Volts/Phase		Function		Service Area	
Comments:					

Boiler 2 Information					
Make				Model Number	
Serial Number				Capacity	GPM
Volts/Phase		Function		Service Area	
Comments:					

Associated Checklists					
Heating Hot Water Pump	<input type="checkbox"/>	Heating Hot Water Piping	<input type="checkbox"/>	BAS	<input type="checkbox"/>
Other	<input type="checkbox"/>	Other	<input type="checkbox"/>	Other	<input type="checkbox"/>
Comments:					

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Performance data (pump curves, coil data, etc.)	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Installation Checks			
Check if acceptable, provide comment if unacceptable	NA	Comment	
General			
General appearance good, no apparent damage	<input type="checkbox"/>	<input type="checkbox"/>	
Installation is per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Seismic restraints in place	<input type="checkbox"/>	<input type="checkbox"/>	
Pipe fittings and accessories complete	<input type="checkbox"/>	<input type="checkbox"/>	
Hydronic system flushing complete and strainers cleaned	<input type="checkbox"/>	<input type="checkbox"/>	
Test plugs (P/T) installed near all control sensors and as per spec	<input type="checkbox"/>	<input type="checkbox"/>	
Flow switch installed as required	<input type="checkbox"/>	<input type="checkbox"/>	
Equipment labels affixed	<input type="checkbox"/>	<input type="checkbox"/>	
Tube pull and access door space adequate and to code	<input type="checkbox"/>	<input type="checkbox"/>	
Combustion air supply installed	<input type="checkbox"/>	<input type="checkbox"/>	
No leaking apparent	<input type="checkbox"/>	<input type="checkbox"/>	
Draft Fan (if applicable)			
Fan is installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Casing in good condition; no dents	<input type="checkbox"/>	<input type="checkbox"/>	
Mountings checked and shipping bolts removed	<input type="checkbox"/>	<input type="checkbox"/>	
Vibration isolators installed	<input type="checkbox"/>	<input type="checkbox"/>	
Plenums free of debris	<input type="checkbox"/>	<input type="checkbox"/>	
Fan rotates freely and in correct direction	<input type="checkbox"/>	<input type="checkbox"/>	
Bearings lubricated	<input type="checkbox"/>	<input type="checkbox"/>	
Equipment guards and safety devices installed	<input type="checkbox"/>	<input type="checkbox"/>	
Starter installed and size coordinated with motor	<input type="checkbox"/>	<input type="checkbox"/>	
Motor correctly aligned	<input type="checkbox"/>	<input type="checkbox"/>	
Gas Train			
Gas train Installed in accordance with NFPA, FM and IRI	<input type="checkbox"/>	<input type="checkbox"/>	
Gas train checked for leaks	<input type="checkbox"/>	<input type="checkbox"/>	
Gas piping installed and tested	<input type="checkbox"/>	<input type="checkbox"/>	
Gas train vents are terminated per code	<input type="checkbox"/>	<input type="checkbox"/>	
Gas train safety devices are operational	<input type="checkbox"/>	<input type="checkbox"/>	
Drip leg provided in gas main	<input type="checkbox"/>	<input type="checkbox"/>	
Gas cock valve orientation per manufacturers recommendations	<input type="checkbox"/>	<input type="checkbox"/>	
Gas cock valve accessible and travels freely	<input type="checkbox"/>	<input type="checkbox"/>	
Gas cock checked for leaks in closed position with the other gas train valves open	<input type="checkbox"/>	<input type="checkbox"/>	
Gas meter installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Gas meter properly located in non-turbulent section of pipe	<input type="checkbox"/>	<input type="checkbox"/>	

Installation Checks			
Check if acceptable, provide comment if unacceptable		NA	Comment
Smoke detectors in place	<input type="checkbox"/>	<input type="checkbox"/>	
Multiple boiler interlocks completed	<input type="checkbox"/>	<input type="checkbox"/>	
Flue			
Installed per manufacturers instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Sloped toward boiler	<input type="checkbox"/>	<input type="checkbox"/>	
Clearance to combustibles per code	<input type="checkbox"/>	<input type="checkbox"/>	
Protection in place to prevent burning hazard	<input type="checkbox"/>	<input type="checkbox"/>	
Discharge is protected from rain and blockage	<input type="checkbox"/>	<input type="checkbox"/>	
Provisions in place for expansion compensation	<input type="checkbox"/>	<input type="checkbox"/>	
Discharge is located to preclude re-entrainment back into the building	<input type="checkbox"/>	<input type="checkbox"/>	
Draft checked and meets minimum requirements of boiler manufacturer	<input type="checkbox"/>	<input type="checkbox"/>	
Low Water Cutoff			
Installed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Wire terminations checked and correct	<input type="checkbox"/>	<input type="checkbox"/>	
Sensors and Gages			
Temperature, pressure and flow gages and sensors installed	<input type="checkbox"/>	<input type="checkbox"/>	
Piping gages, BAS and associated panel temperature and pressure readouts match.	<input type="checkbox"/>	<input type="checkbox"/>	
TAB			
Installation of system and balancing devices allowed balancing to be completed following specified NEBB or AABC procedures and contract documents	<input type="checkbox"/>	<input type="checkbox"/>	

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

BTU METER

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Pipe fittings complete and pipes properly supported		
Pipes properly labeled		
Pipes properly insulated		
Control wiring connected and verified		
Isolation valves installed		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned and temporary piping removed (report attached)		
Unit Calibrated (report attached)		
Piping pressure tested per contract documents (report attached)		
Backflow preventer installed and functional (report attached)		
No leaking apparent around fittings		
FCMS link verified and calibrated		
Valve labels permanently affixed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

CABLE TRAY

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Cable Tray is type, size, and shape, for location and installation		
Properly labeled		
Cable Tray is properly supported and installed per specifications		
Access to tray is unobstructed		
Cable Tray does not obstruct access and required clearances to equipment above tray		
Properly Grounded / Bonded		
Joints are bonded using proper fittings		
Wall / floor penetrations are properly sealed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

CABLING AND TERMINATIONS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Verify cabling free of physical damage		
Verify that adequate insulating protection is provided on cable rack straps, stringers, threaded rods, auxiliary braces, and other metallic objects where power cable makes contact with sharp surfaces.		
Verify that all terminating wires and cables are properly tagged and designated at both ends on conductors.		
Verify that all cables are installed with correct type and size cable as specified.		
Verify that neutral conductors are not used for equipment grounding.		
Fittings complete and properly supported		
Connectors Torque to specified Tolerances		
Properly labeled		
Cable and wire insulation correct color based on color code standards		
Each individual Cable and wire has passed a continuity test		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

Calibration and Leak-by Test Procedures

Location _____

Test # _____

Equipment ID _____

Area Served _____

Equipment Description _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated pre-functional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).

- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

1. DESIGN INTENT AND DOCUMENTATION VERIFICATION

Commissioning Agent to verify that the design intent has been reviewed prior to observing required sample tests.

All field-installed RTD's, temperature, relative humidity, CO, CO₂, VOC, pressure sensors and gages, and all actuators (dampers and valves) on all equipment shall be calibrated using the methods described below. Alternate methods may be used, if approved by the Owner beforehand. All test instruments shall have had a certified calibration within the last 12 months. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

All procedures used shall be fully documented on the prefunctional checklists or other suitable forms, clearly referencing the procedures followed and written documentation of initial, intermediate and final results.

- ___ Review the design documents and the specifications.
- ___ Review Calibration Certification of test instruments.

Verify the following related items are on-site:

- ___ Device Description
- ___ Specifications
- ___ Material Testing Reports
- ___ Material Certificates

From the design documents determine:

Related Systems: _____

Sequence of Operation: _____

Safety Procedures: _____

2. SENSOR CALIBRATION METHODS

All Sensors: Verify that all sensor locations are appropriate and away from causes of erratic operation. Verify that sensors with shielded cable, are grounded only at one end. For sensor pairs that are used to determine a temperature or pressure difference, make sure they are reading within 0.2°F of each other for temperature and within a tolerance equal to 2% of the reading, of each other, for pressure. Tolerances for critical applications may be tighter.

- Sensors Without Transmitters--Standard Application. Make a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading (via the permanent thermostat, gage or building automation system (BAS)) is within the tolerances in the table below of the instrument-measured value. If not, install offset in BAS, calibrate or replace sensor.
- Sensors With Transmitters--Standard Application. Disconnect sensor. Connect a signal generator in place of sensor. Connect ammeter in series between transmitter and BAS control panel. Using manufacturer's resistance-temperature data, simulate minimum desired temperature. Adjust

transmitter potentiometer zero until 4 mA is read by the ammeter. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the BAS. Record all values and recalibrate controller as necessary to conform with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction. Reconnect sensor. Make a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading (via the permanent thermostat, gage or building automation system (BAS)) is within the tolerances in the table below of the instrument-measured value. If not, replace sensor and repeat. For pressure sensors, perform a similar process with a suitable signal generator.

- C. Critical Applications. For critical applications (process, manufacturing, etc.) more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

Tolerances, Standard Applications

<u>Sensor</u>	<u>Required Tolerance (+/-)</u>	<u>Sensor</u>	<u>Required Tolerance (+/-)</u>
Cooling coil, CHW and condenser water temps	0.4F	Flow rates, water	4% of design
AHU wet bulb or dew point	2.0F	Relative humidity	4% of design
Hot water coil and boiler water temp	1.5F	Combustion flue temps	5.0F
Outside air, space air, duct air temps	0.4F	Oxygen or CO ₂ monitor	0.1 % pts
Watt-hour, voltage & amperage	1% of design	CO monitor	0.01 % pts
Pressures, air, water and gas	3% of design	Natural gas and oil flow rate	1% of design
Flow rates, air	10% of design	Steam flow rate	3% of design
Volatile Organic Compound (VOC)	Per Mfg Spec	Barometric pressure	0.1 in. of Hg

NOTE: Required tolerances should be adjusted to coincide with the manufacturer specified accuracy for devices submitted and approved.

3. VALVE AND DAMPER STROKE SETUP AND CHECK

- A. EMS Readout. For all valve and damper actuator positions checked, verify the actual position against the BAS readout.

Set pumps or fans to normal operating mode. Command valve or damper closed, visually verify that valve or damper is closed and adjust output zero signal as required. Command valve or damper open, verify position is full open and adjust output signal as required. Command valve or damper to a few intermediate positions. If actual valve or damper position doesn't reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

- B. Closure for heating coil valves (NO): Set heating setpoint 20°F above room temperature. Observe valve open. Remove control air or power from the valve and verify that the valve stem and actuator position do not change. Restore to normal. Set heating setpoint to 20°F below room temperature. Observe the valve close. For pneumatics, by override in the EMS, increase pressure to valve by 3 psi (do not exceed actuator pressure rating) and verify valve stem and actuator position does not change. Restore to normal.

- C. Closure for cooling coil valves (NC): Set cooling setpoint 20°F above room temperature. Observe the valve close. Remove control air or power from the valve and verify that the valve stem and actuator position do not change. Restore to normal. Set cooling setpoint to 20°F below room temperature. Observe valve open. For pneumatics, by override in the EMS, increase pressure to valve by 3 psi (do not exceed actuator pressure rating) and verify valve stem and actuator position does not change. Restore to normal.

4. COIL VALVE LEAK CHECK

- A. Method 1--Water Temperature With 2-Way Valve. Calibrate water temperature sensors on each side of coil to be within 0.2°F of each other. Turn off air handler fans, close OSA dampers; keep pump running. Make sure appropriate coil dampers are open. Normally closed valves will close. Override normally open valves to the closed position. After 10 minutes observe water delta T across coil. If it is greater than 2°F, leakage is probably occurring. Reset valve stroke to close tighter. Repeat test until compliance.
- B. Method 2--Air Temperature With 2 or 3-Way Valve. Calibrate air temperature sensors on each side of coil to be within 0.2°F of each other. Change mixed or discharge air setpoint, override values or bleed or squeeze bulb pneumatic controller to cause the valve to close. Air handler fans should be on. After 5 minutes observe air delta T across coil. If it is greater than 1°F, leakage is probably occurring. Reset valve stroke to close tighter. Repeat test until compliance. Water leak-by less than 10% will likely not be detected with this method.
- C. Method 3 Coil Drain Down (not for 3-way valves). Put systems in normal mode. If cooling coil valve, remove all call for cooling or if heating coil valve put system in full cooling. Close isolation valve on supply side of coil, open air bleed cap, open drain-down cock and drain water from coil. Water should stop draining, else there may be a leak through the control valve. Return all to normal when done.

5. ISOLATION VALVE OR SYSTEM VALVE LEAK CHECK (for valves not by coils).

- A. Method 1--Ultra-sonic flow meter. With full pressure in the system, command valve closed. Use an ultra-sonic flow meter to detect flow or leakage.

6. OUTSTANDING ITEMS

Note Outstanding items in table below. Use numbers referenced above.

<i>Resolved</i> (Initial / Date)	<i>Note</i>	<i>Description</i>
	1.	
	2.	
	3.	
	4.	
	5.	
	6.	
	7.	

END OF TEST

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

CHILLED WATER PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Welders certificates		
INSTALLATION		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Pipe ID tape installed in trench per contract documents		
Underground piping restraints coated per specifications		
Underground piping properly bedded and backfilled		
Underground thrust blocks properly placed		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipe roller supports installed		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Isolation valves installed		
Cleanouts installed		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned (report attached)		
10% of strainers and Owner selected low point drains opened and witnessed by Owner to be clean. (list points checked)		
Piping hydrostatically tested per specifications (report attached)		
Water treatment report submitted according to contract documents		
Heat tracing wire installed		
Valves checklists complete		
Valve labels permanently affixed		
Pipe painted / coated per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

CHILLED WATER PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer product data sheet		
INSTALLATION		
Label permanently affixed		
Housekeeping pads installed per contract documents		
Pumps in place and properly grouted		
Vibration isolation devices installed and functional		
Pressure and flow gages and sensors installed		
Pipe fittings complete and pipes properly supported		
Valves properly tagged		
Y-strainer baskets clean		
Suction strainers in place		
Block valves in place		
Check Valves installed (discharge side):		
Bearings lubricated		
Pump alignment checked (report attached)		
Impeller rotation: C / CCW (viewed from drive side).		
VFD/Starter/Transfer switch/Disconnects installed		
High/Temp safety installed		
Proper grounding installed for components and unit		
All control devices, pneumatic tubing and wiring complete		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted



Project Commissioning

Section 01 91 00

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

CHILLED WATER PUMPS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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Approved	Cont.	UTH
Record Submittal		
O&M Manuals		
Sequence of Operations verified		
OPERATION		
VFD operation verified (report attached)		
The HOA switch properly activates and deactivates the unit		
Pump rotation verified correct		
No unusual noise or vibration		
No leaking apparent around fittings		
Measure line to line voltage phase imbalance for each pump: (%Imbalance = 100 x (avg. - lowest) / avg.)		
Record imbalance of each pump (report attached)		
Record full load running amps for each pump. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented with all variations documented (Documentation attached)		
Specified point-to-point checks have been completed and documentation record submitted for this system		
Pump line pressure verified as compliant with contract		

Sensor and Actuator Calibration

All field-installed pressure sensors and gages on this piece of equipment shall be calibrated using the methods and tolerances given in the Calibration and Leak-by Test Procedures document. All test instruments shall have had a certified calibration within the last 12 months: Y/N _____. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Sensor or Actuator & Location	Location OK	1 st Gage or BAS Value	Instr. Meas'd Value	Final Gage or BAS Value	Pass Y/N?

Gage reading = reading of the permanent gage on the equipment. BAS = building automation system. Instr. = testing instrument. Visual = actual observation. The Contractor's own sensor check-out sheets may be used in lieu of the above, if the same recording fields are included and the referenced procedures are followed.

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

COMPRESSED AIR PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipes properly labeled		
Strainers in place and clean		
Isolation valves installed		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned (report attached)		
10% of strainers and Owner selected low point drains opened and witnessed by Owner to be clean. (list points checked)		
Dryer station installed per details		
Air quality verified as acceptable		
Piping pressure tested per specifications (report attached)		
Valves checklists complete		
Valve labels permanently affixed		
Pipe painted / coated per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

CONCRETE PRE/POST-POUR

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for pre-pour inspection. Prior inspection and compliance with the contract documents has been verified as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

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Approved	Cont.	OFPC.
Concrete mix design per contract documents		
Admixtures and water addition procedures reviewed for contract compliance		
Forms are clean of all debris		
Cleanouts and windows cut in with closures available		
Any and ALL rebar modifications have been approved in writing by the Structural Engineer of record.		
Embeds are properly located and supported		
Rebar grade as per plans / Structural Eng. review		
Post-tension cabling inspected (report attached)		
All rebar placed and supported per contract documents		
No rebar is burning formwork		
Keyways detailed per contract drawings		
Bulkhead locations approved by Structural Engineer		
Waterstops installed per contract documents		
All sleeves are properly located and supported		
Sleeves have additional rebar installed per contract documents		
Outside and inside corners both vertical and horizontal, have detail rebar per contract documents		
All penetrations are detailed per contract documents		
All column tops are level with bottom of beams forms		
Concrete truck washout has been located		
Additional vibrators on site		
Hot / Cold weather placement provisions in place		
Slab tolerance verification equipment on site		
Curing compound and application verified		
POST-POUR		
F _f – F _l verified as complying with contract documents		
Curing compound coverage verified		
Concrete cylinders taken as prescribed in contract		
Concrete strength verified at 7-day break		
Forms / shoring left in place until strength achieved per contract		
Any concrete deficiencies noted and any corrective action approved by Structural Engineer of record		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

CONDUIT, RACEWAYS & BOXES

One checklist per room

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Wiring boxes are proper type, size, shape, and depth for location and installation		
Conduit is type and size, for location and installation		
Boxes properly labeled / color-coded		
Conduit is properly supported and installed per specifications		
Conduit connectors per contract documents (compression / screw)		
Properly Grounded		
Cover plates are type, size, shape, color and depth for location and installation		
Flexible metal conduit is min 3'-0" and max 6'-0"		
All knockouts in boxes are plugged		
All wall penetrations sealed per contract documents		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DEIONIZED WATER PIPING

Location _____

Test # _____

Submittal / Approvals

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___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipe roller supports installed		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Isolation valves installed		
Piping system properly flushed and cleaned (report attached)		
Piping hydrostatically tested per specifications (report attached)		
Heat tracing wire installed		
Valves checklists complete		
Water treatment report submitted per contract documents (ohm)		
No leaking apparent around fittings		
Pressure Tank installed consistent with contract documents		
Level controller installed consistent with contract documents		
Valve labels permanently affixed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

DEIONIZED WATER PUMP

Location _____

Test # _____

Submittal / Approvals

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___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

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Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
Pump rotation verified correct		
Vibration within tolerances (report attached)		
Verify noise dB within tolerances		
No leaking apparent around fittings		
High level alarm operation		
Low level alarm operation		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached)		
VFD operation verified (report attached)		
Pump pressure verified as complying with contract		
Pressure at furthest fixture location in compliance with contract		
Purity of system verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

DEMO / TRAINING LOG

Specification Section _____

Date: _____

Per requirements of the above mentioned specification section, training is being provided and video documented (if required) for the following equipment/system:

Equipment/System: _____

Operation and Maintenance manuals (O&M) are provided for review of proper operation, maintenance and troubleshooting procedures. Any and all diagnostic equipment required by the contract documents shall be provided and demonstrated as part of this demo/training exercise. The equipment/system being demonstrated has been successfully commissioned and accepted by the Owner as being fully commissioned.

O&M Manual provided: Y / N Video Recording provided Y / N

Diagnostic Equipment Provided Y / N

ATTENDEE	COMPANY	PHONE NUMBER

General Contractor Date

Subcontractor providing Training Date

Owner Representative Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DOMESTIC HOT WATER GENERATOR

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

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- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Equipment Number: _____ Serial Number: _____
 Location: _____
 Manufacturer: _____ Model #: _____
 Heating Medium: _____ Steam Pressure: _____
 Nameplate Data: Volts _____ Phase _____ Watts _____
 Amps _____ Capacity: _____ gals

Circulation Pump

Equipment I.D.: _____ Manufacturer: _____
 Mounting Configuration: _____ Model #: _____
 (Vertical or Horizontal)

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____
 Motor Nameplate Data - Volt _____ FLA _____ HP _____
 RMP _____ SVC Factor _____ Class _____ Frame _____
Actual per phase Volt _____ FLA _____
 Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
Shop drawings		
INSTALLATION		
Pump body is accessible for service		
Lubrication oil added per manufacturer requirements		
Pump suction & discharge pressure gauges installed		
Thermometer installed downstream of circulation pump		
Impeller rotation verified		
Flushing of piping system complete		
Vacuum relief valve installed on cold water line		
Isolation (ball) valves installed		
Y-strainer installed in return: Strainer Cleaned		
Heater relief valve set at _____ PSI / Piped to drain with union		

Approved	Cont.	UTH
Solenoid operated relief valve piped to drain		
Drain valve installed with hose bib		
Steam trap installed		
Check valve installed in cold supply		
120 volt power supplied to unit controls		
All Piping on heater has unions for equipment removal		
Gas fuel line pressure tested per contract documents (report attached)		
Regulator pressure verified for correct operation		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

DOMESTIC WATER BOOSTER PUMP

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
O&M Manuals		
Sequence of Operations verified		
OPERATION		
VFD operation verified (report attached)		
The HOA switch properly activates and deactivates the unit		
Pump rotation verified correct		
No unusual noise or vibration		
No leaking apparent around fittings		
Measure line to line voltage phase imbalance for each pump: (%Imbalance = 100 x (avg. - lowest) / avg.)		
Record imbalance of each pump (report attached)		
Record full load running amps for each pump. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented with all variations documented		
Specified point-to-point checks have been completed and documentation record submitted for this system		
Pump pressure verified as complying with contract		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DOMESTIC WATER BOOSTER PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

PUMP

Equipment Number _____ Location: _____

Manufacturer: _____ Model #: _____

Medium Pumped: _____

Number of Pumps: _____

GPM: _____ @ _____ TDH per pump

Suction pressure: _____ PSI Discharge pressure: _____ PSI

Control Valves: Size: _____ MFR _____

Qty: _____ Tank: Size: _____ Capacity: _____ gals

Approved	Cont.	UTH
Manufacturer product data sheet		
O&M Manual		
INSTALLATION		
Flushing of piping system complete		
Sterilization of piping system complete		
Bearings lubricated		
Impeller rotation verified as correct		
Lag pump sequencing verified		
Tank: Air fill valve & gauge installed		
Drain lines installed		
Electrical connections verified		
All controls installed and operating properly		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____ UTH Project # _____

DOMESTIC WATER STERILIZATION & FLUSHING REPORT

Specific location of system being sterilized: _____

Type of material applied to the water system: _____

Amount of material being applied: _____(ppm)

Time of day/Date material injected into system: _____(am / pm)_____ (Date)

Time of day/Date flushing started: _____(am / pm)_____ (Date)

After flushing, measure residual material in system: _____(ppm)

Attach Health Department certification of cleanliness (bacterial contamination) for the water system. System cannot be accepted without this certification. A certified testing agency may be used in lieu of Health Dept.

Specify exact location within facility where samples were taken.

During sterilization, all valves are to be opened and closed several times to ensure complete cleansing of system. This operation was verified by General Contractor:

YES

NO

Comments: _____

Subcontractor: _____

Signature

Printed Name

Date

Contractor: _____

Signature

Printed Name

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

DOMESTIC WATER SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
Any and all punchlist items corrected		
Piping system properly flushed and cleaned (report attached)		
Coloform bacteria count report completed (report attached)		
Adequate pressure verified throughout all floors		
Hot water temperature at fixtures verified (report attached)		
Cross-contamination dye test performed (report attached)		
Pipe video inspected per specifications (report attached)		
Water purity verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DOOR HARDWARE & KEYS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Keying Schedule		
Manufacturer's product data, cut sheets		
Shop drawings		
Finish samples		
Maintenance instructions, parts lists, special tools		
Templates		
Certificate for hardware used on fire-rated door assemblies		
KEYS		
Keying Conference with Institution		
Keying Schedule confirmed		
Bitting Schedule		
Key blanks received by Institution (number. correct)		
Distribution receipts		
INSTALLATION		
Preinstallation meeting conducted		
Installed per mfg. instructions		
Confirm door and frame reinforcement in place		
Confirm mortise and cut-outs per templates		
Fasteners in place and fully set w/o splitting of wood		
Proper mounting heights		
FRAME		
Frame installed plumb and level		
No rust on frame		
Bumpers installed		
Confirm door-prep and pathways for security devices		
BUTTS		
Mortise type set flush		
Proper number of hinges for door size		
Steel with ball bearings at fire doors		
CLOSERS		
Proper type for function and swing		
Proper mounting plates; mounted with through-bolts		
Adjusted for proper, smooth operation, opening force		

Approved	Cont.	UTH
Proper swing range and backcheck		
LOCKSETS AND LATCHSETS		
Full latchbolt projection and strike engagement		
Proper cylinder core		
Faceplate set flush with door edge		
Strike box installed		
EXIT DEVICES		
Mounting level and plumb		
Full latchbolt projection and strike engagement		
UL/FM Label complies with door assembly rating		
Confirm dogging mechanism operates		
Confirm accessory items (coordinators, removable mullions)		
DOOR BOLTS		
Top and bottom bolts fully seated in strikes		
Smooth operation		
UL/FM Label complies with door assembly rating		
Dust proof strike cover retraction		
DOOR HOLDERS		
Smooth operation		
Proper swing range		
Armature alignment		
Proper electrical characteristics		
DOOR TRIM		
Set flush, level and plumb		
Correct placement on door, horiz. & vert.		
DOOR STOPS		
Proper (wall, floor) type for swing condition		
Set for proper door engagement		
Blocking back-up at wall stops		
DOOR SEALS		
Proper type per schedule		
Ensure full contact seal		
Verify acoustical performance		

Approved	Cont.	UTH
Threshold height meets accessibility req'mts.		
ELECTRIC LOCKS / STRIKES		
Securely mounted		
Covers in-place, secure		
Installed plumb and level		
Electrical connections tight		
Check voltage		
Verify smooth operation		
KNOX BOX		
Location per plans		
Keys provided		
AUTOMATIC DOOR OPERATOR		
Verify frame reinforcement installed		
Verify installation of control voltage transformer		
Location / operation of remote pushbutton		
Proper swing range and backcheck		
MAGNETIC LOCKS		
Verify frame reinforcement installed		
Ensure proper attachment to frame / door		
Alignment of armature		
Integration with fire alarm / security system		
FINAL		
Replacement of defective items		
Removal of protective film and labels		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DRINKING FOUNTAIN

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
O&M Manuals		
INSTALLATION		
Pipe fittings complete and pipes properly supported		
Pipes properly labeled		
Push-bar operates properly		
Inline flow regulator installed per contract documents		
Faucet handles secured and properly aligned		
Associated Trim/Accessories		
Fixture installation complies with TAS requirements		
P-Trap installed		
Fixture size and configuration per contract documents		
Water supply shut-off valve installed per contract documents		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DUCTBANK

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Welders certificates		
INSTALLATION		
Excavation shored in accordance with contract documents		
Conduit type size and location correct		
Conduit supports correct		
Reinforcing installed per contract		
Watertight seal at all joints		
Concrete color and strength correct		
Manhole termination correct		
Pull lines installed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DUCTWORK INSULATION

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Insulation Thickness consistent with contract documents		
Proper density material installed		
Insulation properly installed, mechanical fasteners, clean dry pipe, etc		
Duct reinforcing insulated and sealed.		
Insulation vapor barrier properly installed		
Access doors operable and accessible		
Valves operable throughout range of handle/actuator		
Gauges / instruments readable		
Hard insets at supports installed per specifications		
Shields at support points		
Fittings, valves, etc. properly insulated		
Insulation protective jacket per specifications		
Insulation primed and painted per specifications		
Proper sealant / firestopping at penetrations		
Labeling installed per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

DUCTWORK

Location _____

Test # _____

Submittal / Approvals

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___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Shop Drawings		
INSTALLATION		
Proper gauge sheetmetal verified		
Large ductwork stiffener plates installed per contract documents		
Duct properly supported		
Required vibration isolation installed		
Hard block insulation installed at duct supports		
Joints properly sealed per contract documents		
Ductwork pressure tested per contract documents (report attached)		
Access doors properly labeled and located correctly		
Ducts properly labeled		
Ducts properly insulated / verify density & thickness		
Duct clean of all debris and dust		
All openings in duct sealed to keep out dust		
Isolation dampers, fire dampers, balancing dampers, and misc dampers installed per contract documents		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

ELECTRICAL DISTRIBUTION PANEL

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

ELECTRICAL TRANSFORMER

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Fittings complete and properly supported		
Connectors Torqued to specified Tolerances		
Phase to Phase and Phase-to-Ground resistance test with switches or circuit breakers in opened and closed position prior to energizing equipment		
Properly labeled per contract documents		
Verify equipment is tested and calibrated per manufacturers guidelines prior to energizing equipment (report attached)		
Verify voltage taps are set		
Proper Ground Rod or Device installed per contract documents		
Grounding jumper installed		
Ground bushing with ground wire installed		
Transformer Turns Ratio (TTR) test complete (report attached)		
Vibration isolation installed		

Transformer # _____ Room # _____

KVA Rating: _____ Serial #: _____

TAP Settings: H₁ _____ H₂ _____ H₃ _____

Primary Side

MEGGER

Phase to Ground

Phase H₁ _____ Volts _____ Amps _____ OHMS

Phase H₂ _____ Volts _____ Amps _____ OHMS

Phase H₃ _____ Volts _____ Amps _____ OHMS

Secondary Side

Phase X₁ _____ Volts _____ Amps [for MEGGER readings

Phase X₂ _____ Volts _____ Amps see appropriate distribution

Phase X₃ _____ Volts _____ Amps panel.]

Grounding Check:

Neutral to ground (in volts): _____ volts (zero required)

Neutral (secondary side) grounded to case: Y N

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

ELEVATORS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Service / maintenance contract		
O&M Manuals		
Wiring diagrams		
Tools, parts lists, keys, extra materials		
Extended warranty		
OPERATION		
TDLR QEI inspection report attached		
Control and auxiliary station operation		
No unusual noise or vibration		
Car and hoistway door operation and control features		
Slack rope devices		
Normal and final terminal stopping devices		
Firefighting service		
Emergency power operation		
Broken rope switch		
Sequence of operation verified		
Smoke control operation verified		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

ELEVATOR

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer qualifications		
Installer qualifications		
Manufacturer's product data, performance criteria		
Shop drawings		
Cab finish samples		
INSTALLATION		
Proper operational clearance		
Proper casing installed (hyd.)		
Annular space between jack and casing filled with proper material per specifications		
Power disconnects in place and labeled		
Electrical connections tight		
Proper earth ground		
Proper voltage		
Lubrication points accessible		
Accessible mounting heights at devices and controls		
HOISTWAYS		
Patch any holes and clip any screws or other projections		
No pipe / conduit traveling through shaft		
Two (2) hour rated walls		
Shaft plumb, within tolerances		
Projections 4"+ beveled to 75°		
Hoistway floor numbers		
Penetrations firestopped		
Traveling cable, suspension rope clearances		
Verify shaft ventilation		
Verify refuge space at top of hoistway (43" min.)		
Smoke control installed		
HOISTWAY DOORS		
Opening assembly labeled for proper rating		
Functional locking devices		
Interlocks tested		
Properly anchored sills		
Floor numbering on frame		

Approved	Cont.	UTH
PITS		
Car and counterweight buffer		
GFCI convenience outlet 42" a.f.f.		
Sump pit grating in-place		
Sump pump piped to hose bib accessible from ladder		
Light switch and pump switch 42" a.f.f. at ladder.		
Pump powered by non GFI outlet 48" a.f.f.		
Pump high level alarm installed		
MACHINE ROOM		
Two (2) hour rated walls		
Class B-labeled door self-closing and self latching.		
No pipe / conduit travel through room		
Only elevator equipment in machine room		
Shunt trip installed		
IAQ maintained for equipment operation		
Verify fire alarm signal landed at controller		
CAB INTERIORS		
Control panel device operation		
Auxiliary (fan, emg. lighting, telephone) device operation		
Signage and symbols		
Accessible mounting heights		
Proper car leveling		
Protective mats and hooks		
Telephone connected and operational		
Finishes clean and undamaged		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

EMERGENCY GENERATOR

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Wiring diagrams		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
NFPA Emergency standby power systems acceptance test form complete (form attached)		
Full load test complete (report attached)		
No leaking hoses		
Vibration within tolerances		
Activation with automatic transfer switch verified		
Operating temperature air circulation verified as adequate		

OUTPUT VOLTAGE:

	A	B	C	NEUTRAL	
(Actual)					
A	_____	_____	_____	_____	Volts
B	_____	_____	_____	_____	Volts
C	_____	_____	_____	_____	Volts

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

INTEGRATED SYSTEM TEST REPORT

EMERGENCY GENERATOR

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this IST are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Wiring diagrams		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
NFPA Emergency standby power systems acceptance test form complete (form attached)		
Full load test complete (report attached) Y / N		
No leaking hoses		
Vibration within tolerances		
Activation with automatic transfer switch verified		
Operating temperature air circulation verified as adequate		

OUTPUT VOLTAGE:

	A	B	C	NEUTRAL	
(Actual)					
A	_____	_____	_____	_____	Volts
B	_____	_____	_____	_____	Volts
C	_____	_____	_____	_____	Volts

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

EMERGENCY GENERATOR

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

ENGINE:

Mfr.: _____ BHP: _____
 No. of Cylinders: V- _____ Cooling Medium: _____
 Fuel: _____ Fuel Rate: _____ CFH
 Fuel Pressure: _____
 Turbocharger MFR: _____
 Intercooler: Y / N
 Spark Plugs MFR: _____ Spark Plug #: _____

ALTERNATOR:

Drive Direct: _____ Belt Driven: _____
 RPM: _____ Type: _____ PF: _____
 Output Voltage: _____ / _____ / _____ (name plate)

HEATER SIZE AND VOLTAGE: _____ / _____ Volts

STARTING:

Batteries: _____ Volt Number of Batteries: _____
 MFR: _____ Battery Charger MFR: _____
 Location of Charger: _____

Approved	Cont.	UTH
Manufacturer product data sheet		
Shop drawings		
INSTALLATION		
Housekeeping pad per contract documents		
Regulator sufficient for engine		
Air circulation adequate		
Exhaust w/muffler per contract documents		
Electrical connections per contract documents		
Antifreeze installed in water-cooled engines		
Service access adequate		
Coolant installed		
Oil installed		
Oil filter installed		
Fuel strainer installed		
Fuel source adequate for operation		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

ENVIRONMENTAL ROOM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
O&M Manuals		
Sequence of Operations verified		
OPERATION		
HVAC control coordination verified		
Low / high temp alarms verified		
Vibration within tolerances (report attached)		
Verify noise dB within tolerances		
Safeties installed and operating properly		
TAB/Mechanical firm verified performance (report attached)		
Record full load running amps for fan. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached)		

Sensor and Actuator Calibration

All field-installed pressure sensors and gages on this piece of equipment shall be calibrated using the methods and tolerances given in the Calibration and Leak-by Test Procedures document. All test instruments shall have had a certified calibration within the last 12 months: Y/N _____. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Sensor or Actuator & Location	Location OK	1 st Gage or BAS Value	Instr. Meas'd Value	Final Gage or BAS Value	Pass Y/N?

Gage reading = reading of the permanent gage on the equipment. BAS = building automation system. Instr. = testing instrument. Visual = actual observation. The Contractor's own sensor check-out sheets may be used in lieu of the above, if the same recording fields are included and the referenced procedures are followed.

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

ENVIRONMENTAL ROOM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Manf. _____

Model # _____

Serial # _____

CFM _____

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Liner as specified		
Work Surface as specified		
AHU properly supported		
Compressor located on roof – verify air circulation for cooling		
Compressor located remote – verify refrigerant line sizing / distance		
Access panels per contract documents		
Verify shelving per contract documents		
Verify wall thickness per contract documents		
Verify door seal and latch		
Verify instrumentation per contract documents		
ELECTRICAL		
Electrical connections complete		
Disconnect switch installed		
Fan overload heaters in place		
Control connections complete		
Interior outlets verified		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

EQUIPMENT INSULATION

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Proper density material installed		
Proper thickness insulation installed		
Insulation properly installed, mechanical fasteners, clean dry pipe, etc		
Insulation vapor barrier properly installed		
Access doors operable and accessible		
Valves operable throughout range of handle		
Gauges / instruments readable		
Hard insets at supports installed per specifications		
Shields at support points		
Fittings, valves, etc. properly insulated		
Insulation protective jacket per specifications		
Insulation vapor stops per specifications and manufacturers data		
Insulation primed and painted consistent per specifications		
Proper sealant / firestopping at penetrations		
Labeling installed per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

EQUIPMENT or SYSTEM START-UP / Request for Inspection

Project: _____
Contract #: _____

Project #: _____

Identification of Equipment or System: _____

Location of Equipment or System: _____

Spec. Section: _____

Detail/Drawing Number: _____

Manufacturer / Supplier: _____

This Date: _____

Inspection Requested for (Date): _____

CONTRACTOR'S CERTIFICATION OF PERFORMANCE:

I hereby certify that the above described equipment, or system, has been energized, operated, adjusted, and balanced in accordance with the requirements of the Specifications and the manufacturer's recommendations for a sufficient period to confirm that operation complies in all respects with the contract requirements.

Signature: _____

Printed Name

Date

Installing Sub-Contractor: _____

Signature

Printed Name

Date

Manufacturer's Representative: *I hereby certify that I have been personally and actively involved with energizing, operational checkout, adjustments, and balancing of the above described equipment, or system; and that such has been accomplished in accordance with the manufacturer's recommendations and is operating correctly.*

Manufacturer's Representative

Printed Name

Date

Printed Name

CONFIRMATION or COMMENTS from UT Health or A/E:

Results of Test Acceptable? YES NO

Re-test Required? YES NO

Punch List: Attached To Follow N/A

Acceptable for "User Training"? Yes No

Signature

Printed Name

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

EXHAUST FAN

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

EXHAUST FAN

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date

_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date

_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Vibration isolators installed and adjusted		
Equipment guards installed		
Pulleys aligned		
PolyChain or Vee Belt: Belt		
Belt tension correct		
Sheave size/number _____		
Plenums clear of debri		
Fan wheel to shaft-all bolts torque checked		
Fans rotate freely		
Alignment check: Fan sheave to motor sheave: _____ degrees (0° ± 0°)		
Bearings lubricated		
SSTL lube lines installed		
Ductwork connected with flex connections		
Fire and balance dampers installed		
Backdraft dampers installed, per drawings, and operate freely		
Duct system complete (report attached)		
Interior lights and light switch operational		
Electrical connections complete		
Disconnect switch installed		
Overload heaters in place		

Approved	Cont.	UTH
Control connections complete		
VFD connected and operational (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

 Owner's Representative / Commissioning Authority

 Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

 Owner's Representative / Commissioning Authority

 Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

EXTERIOR LIGHT FIXTURES & LOADS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
O&M manuals		
INSTALLATION		
Fittings complete and properly supported		
Bulbs as specified		
Properly labeled		
Proper ballast installed		
Lens/globe as specified		
Pole base correctly installed		
Pole correctly installed		
Photoelectric switch operates properly		
Power switch operates properly		
Lights aligned per contract documents		
Nighttime verification of lighting complete		
Burn-in complete per contract documents		

Panel #	Circuit #	Load (amps)	Circuit #	Load (amps)
	1		28	
	2		29	
	3		30	
	4		31	
	5		32	
	6		33	
	7		34	
	8		35	
	9		36	
	10		37	
	11		38	
	12		39	
	13		40	
	14		41	
	15		42	
	16		43	
	17		44	
	18		45	
	19		46	
	20		47	
	21		48	
	22		49	
	23		50	
	24		51	
	25		52	
	26		53	
	27		54	

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

FAN COIL UNIT

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
The HOA switch properly activates and deactivates the unit		
Fan rotation verified as correct		
Vibration within tolerances (report attached)		
Verify noise dB within tolerances		
Safeties installed and operating properly		
All valves and dampers stroke fully and smoothly		
TAB/Mechanical firm verified performance (report attached)		
Record full load running amps for fan. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached)		
VFD operation verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FAN COIL UNIT

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Access doors close tightly - no leaks		
Boot between duct and unit tight and in good condition		
Vibration isolation equipment installed & released from shipping locks		
Maintenance access acceptable for unit and components		
Sound attenuation installed		
Thermal insulation properly installed according to specification		
Instrumentation installed according to specification		
Interior of unit cleaned		
Valves, Piping and Coils complete(reports attached)		
Dielectric union installed at coil supply / return		
Coil and lines flushed and clean (report attached)		
All coils are clean and fins are in good condition		
All condensate drain pans clean and slope to drain		
Valves properly labeled		
Sensors installed and calibrated (report attached)		
Supply fan and motor alignment correct		
Supply fan belt tension & condition good		
Supply fan protective shrouds for belts in place and secure		
Supply fan and motor properly lubricated		
Filters clean and tight fitting		
Filter pressure differential measuring device installed and functional		

Approved	Cont.	UTH
Smoke and fire dampers installed properly per contract docs (proper location, access doors, appropriate ratings verified)		
All dampers close tightly		
All damper linkages have minimum play		
Low limit freeze stat sensor located to deal with stratification & bypass		
No apparent severe duct restrictions		
Turning valves in square elbows as per drawings		
OSA intakes located away from pollutant sources & exhaust outlets		
Pressure leakage tests completed (report attached)		
Branch duct control dampers operable		
Ducts cleaned as per Specifications		
Balancing dampers installed per contract documents		
ELECTRICAL AND CONTROLS		
Pilot lights are functioning		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for components and unit		
Safeties in place and operable		
Starter overload breakers installed and correct size		
Sensors installed and calibrated (report attached)		
Control system interlocks hooked up and functional		
Smoke detectors in place		
All control devices, pneumatic tubing and wiring complete		
VFD connected and operational (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

FIRE ALARM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Wiring diagrams		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
Verify sequence of operations is identified and coordinated with installation of fire alarm system		
System has been tested in accordance with NFPA 72 (report attached)		
NFPA FA record of completion form completed and attached		
Verify correct operation of each notification/detection device		
Verify FA signal is landed at elevator controller		
Verify shunt trip operates for elevator		
Verify elevator recall brings elevator to designated floor		
Verify secondary floor designation for elevator recall		
Verify HVAC dampers operate properly		
Verify HVAC units are controlled by FA system correctly		
Verify magnetic door hold-opens operate properly		
Verify stairwell pressurization fans operate properly		
Verify loss of power operation (battery check report attached)		
Verify audible devices operate within specified db range		
Verify visual devices operate within specified range		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

INTEGRATED SYSTEM TEST

FIRE ALARM

Test # _____

All system associated with this test/demonstration have been completed and all Functional Test Checklists documenting this are attached. Prior integrated performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this IST are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Initiate a fire alarm signal from various devices throughout the facility and record the response. Minimally, this shall be executed using one device of each type on each floor to demonstrate proper operation. If any test fails, the number of devices shall be doubled and retested. If any failure occurs during retesting, the demonstration shall be cancelled and the Contractor shall retest the system to verify compliance before requesting the next demonstration.

Approved	Cont.	UTH
PERFORMANCE		
Verify elevator returns to designated recall floor		
Verify alternate recall floor for elevator return		
Verify shunt-trip operation with elevator		
Verify fire / smoke door hold-opens operate correctly		
Verify HVAC controls regulate HVAC equipment correctly		
Verify BAS controls regulate devices correctly		
Verify security system responds to alarm in open mode to allow exit from facility		
Verify remote annunciator operation		
Verify areas that require negative pressure differential remain negative after alarm initiated		
Verify start-up of fire pump / jockey pump		
Verify initiation of stairwell pressurization fan		
Verify initiation of any smoke control sequence operation		
Verify Smoke Purge initiation and operation		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

FIRE ALARM SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Sprinkler Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FIRE ALARM SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FIRE JOCKEY PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Equipment Number _____ Location: _____

Manufacturer: _____ Model # _____

Medium Pumped: _____ Serial # _____

Approved	Cont.	UTH
Manufacturer product data sheet		
Shop drawings		
INSTALLATION		
Tamper switches installed and adjusted		
Flow meter installed/calibrated		
Flushing piping system complete		
Y-strainer baskets clean		
Suction strainers in place		
Block valves in place		
Check Valves installed (discharge side)		
Bearings lubricated		
Pump alignment checked (report attached)		
Impeller rotation		
Pump gauges installed		
Flow switch installed		
Auto air relief valves installed/tested		

Controls Information:

Pump(s) are interlocked with _____
(Specify equipment # or device)

Performance: 10 GPM (design) Actual: _____ GPM

105 PSI (design) Actual: _____ PSI

Relief Valve Setting: _____ PSI

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

FIRE PUMP

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Wiring diagrams		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
NFPA Flow and Pressure record graph completed (graph attached)		
Operation verified as meeting specified performance		
Operation verified under normal and emergency power		

Controls Information:

Pump(s) are interlocked with _____
(Specify equipment # or device)

Performance: _____ GPM (design) Actual: _____ GPM

_____ PSI (design) Actual: _____ PSI

Main Relief Valve Setting: _____ PSI

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

 Owner's Representative / Commissioning Authority

 Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

 Owner's Representative / Commissioning Authority

 Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FIRE PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date

_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date

_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Equipment Number _____ Location: _____

Manufacturer: _____ Model # _____

Medium Pumped: _____ Serial # _____

Approved	Cont.	UTH
Manufacturer product data sheet		
Shop drawings		
INSTALLATION		
Tamper switches installed and adjusted		
Flow meter installed/calibrated		
Flushing piping system complete		
Y-strainer baskets clean		
Suction strainers in place		
Block valves in place		
Check Valves installed (discharge side)		
Bearings lubricated		
Pump alignment checked (report attached)		
Impeller rotation		
Pump gauges installed		
Flow switch installed		
Auto air relief valves installed/tested		

Controls Information:

Pump(s) are interlocked with _____
(Specify equipment # or device)

Performance: 1250 GPM (design) Actual: _____ GPM

105 PSI (design) Actual: _____ PSI

Main Relief Valve Setting: _____ PSI

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL TEST CHECKLIST

FIRE RATED ENCLOSURE

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's product data, performance criteria		
Shop drawings		
INSTALLATION		
Proper storage and handling		
Proper gauge stud installed		
Proper top track		
Proper blocking, bracing, accessories, fasteners		
Proper cut-out and opening framing		
Proper perimeter seals		
Confirm materials installed comply with contact documents		
Installed per UL/FM design requirements		
Proper thickness and type of gypsum board		
Proper fastener type and spacing		
Penetrations cut tight and sealed		
Verify continuity of enclosure at cut-outs		
Proper staggering of joints at multi-layer gypsum board		
Proper joint treatment		
Enclosure assembly marked for proper rating		
FINAL		
Patch and repair material disturbed by subsequent penetrations		
Integrity of perimeter seals		
Removal of excess sealant		
General cleaning		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FIRE RATED OPENING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's product data, performance criteria		
Shop drawings		
Finish samples		
Maintenance instructions		
Factory Test Reports		
INSTALLATION		
Fabrication, construction, workmanship		
Opening assembly labeled for proper rating		
Labeling requirements are not compromised		
Under / Overcuts do not exceed label requirements		
Glazing material type and glazing method per contract documents		
Proper clearance, anchorage, support, and installation		
Opening functionality and smoothness of operation		
Primers, sealers and finishes		
Operating resistance within tolerances		
Hardware installation integral with rating requirements		
Perimeter seal tight and continuous		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FIRE SPRINKLER PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Sprinkler Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Hydraulic Calculations approved		
Shop Drawings approved		
Welder certificate verified		
INSTALLATION		
All underground piping tested per specifications (report attached)		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Pipe ID tape installed in trench per contract documents		
All above ground piping tested per specifications (report attached)		
Pipe fittings and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipes properly labeled		
Pipes exposed to elements addressed via chemicals, dry pipe, insulation, etc.		
Sprinkler head types verified as correct		
Isolation valves installed, tested and verified		
Piping system properly flushed and cleaned and temporary piping removed (report attached)		
Backflow prevention device installed		
Water gong installed		
Flow switches installed		
Tamper switches installed		
Valves checklists (report attached)		
Fire valve cabinets installed		
Fire Department connections installed		
Roof manifolds installed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

FIRE SPRINKLER SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Copy of NFPA 25		
O&M Manuals		
Spare heads and wrench (Quantity Heads: _____ Wrenches: _____)		
As-built drawings		
Record Submittal		
PERFORMANCE		
Field installation as per approved shop drawings		
Standpipe Systems Pressure Test (report attached)		
Sprinkler Pipe Pressure Test (report attached)		
Fire Department Connections Pressure Test (report attached)		
Roof Manifold Pressure Test (report attached)		
Flow Sensor Test (report attached)		
Backflow prevention device tested (report attached)		
Tamper switches installed, tested and verified (report attached)		
Pressure reducing valves flow tested (report attached)		
Verify operation of dry-pipe / pre-action systems		
State Fire Marshal test forms complete and copies to OFPC		
Fire pump tested (report attached)		
Hydraulic Nameplate signage at risers		
NFPA Water-Based Fire Protection System final checklist complete (attached)		
Control / test connection valve identification tags installed		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FIRESTOPPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Applicator qualifications		
Manufacturer's product data, performance criteria		
Shop drawings		
Schedule opening types, UL/FM designs, proposed systems		
Installation instructions		
Maintenance instructions		
INSTALLATION		
Substrates cured, cleaned and prepared for application		
Installed per mfg. instructions and UL/FM design requirements		
Engineer approved non-standard detail attached		
Confirm materials installed comply with approvals for opening type		
Confirm environmental criteria is enforced		
Backing material installed correctly		
Proper width-to-depth application verified		
FINAL		
Firestop failure corrected		
Patch and repair material disturbed by subsequent penetrations		
Protection in place		
Spills removed, excess materials trimmed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FLOORING & FLOORING COATING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Substrate condition is acceptable for application		
Moisture tests performed (report attached)		
Substrate prep complete (sanding, fill, bead blasting, etc.)		
Temperature conditions verified for application		
Material climate acclimation complete		
Dust control verified for application of wet finishes		
Application fumes addressed for compliance with contract documents		
"No traffic" after application plan provided		
Protection plan for finished surface provided		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

FUME HOODS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below.. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
Verify air flow at face with sash opened at 18" (report attached)		
Verify duct static pressure control		
Verify exhaust static pressure		
Demonstrate alarms operate as designed		
Verify med/lab gas lines/labels are correct		
Vibration within tolerances (report attached)		
Verify noise dB within tolerances		
Mechanical sub/TAB firm verified performance (report attached)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached)		
VFD operation verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

FUME HOOD

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

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Manf. _____

Model # _____

Serial # _____

CFM _____

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Liner as specified		
Work Surface as specified		
Cup Sink as specified		
Baffle Adjustment as specified		
Water fixture connected and operable		
Gas fixture connected and operable		
Vacuum fixture connected and operable		
Air fixture connected and operable		
Plumbing waste line connected		
Fire and balance dampers installed (if required)		
Backdraft dampers installed, per drawings, and operate freely		
Flow monitor installed		
Exhaust collar as specified		
Interior access panels w/ gaskets as specified		
Sash Stop as specified (manual and automatic reset)		
Sash Design as specified, including safety glass, horiz/vert w/ counter balance, (verify sash operation)		
ELECTRICAL		
Electrical connections complete		
Disconnect switch installed		
Fan overload heaters in place		
Hood Outlets as specified		
Interior Hood lighting as specified		
Alarm as specified and verified (report attached)		
Fan rotation correct		
Electrical interlocks verified		
Any fan status indicators functioning		
No unusual vibration or and noise		
Fuse Size _____		
Heater Size _____		
Starter Size _____		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

GROUND FAULT INTERRUPTOR

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Visually inspect the components for damage and errors in polarity or conductor routing		
Verify that ground connection is made ahead of neutral disconnect link and on the line side of any ground fault sensor		
Verify that neutral sensors are connected with correct polarity on both primary and secondary.		
Verify that all phase conductors and the neutral pass through the sensor in the same direction for zero sequence systems		
Verify that grounding conductors do not pass through zero sequence sensors.		
Verify that the grounded conductor is solidly grounded.		
Fittings complete and properly supported		
Properly labeled		
Properly installed		
Reset tested		
Verify tightness of all electrical connections including control circuits.		
Verify correct operation of all functions of the self test panel		
Verify that the control power transformer has adequate capacity for the system		
Measure the system neutral-to-ground insulation resistance with the neutral disconnect link temporarily removed. Replace neutral disconnect link after testing.		
Measure insulation resistance of the control wiring at 1000 volts dc for one minute. Refer to manufacturer's instructions for devices with solid-state components		
Perform the following pickup test using primary injection: Verify that the relay does not operate at 90 percent of the pickup settings. Verify pickup is less than 125 percent of setting or 1200 amperes, whichever is smaller		

Approved	Cont.	UTH
For summation type systems utilizing phase and neutral current transformers, verify correct polarities by applying current to each phase neutral current transformer pair. This test also applies to molded case breakers utilizing an external neutral current transformer. Relay should operate when current direction is the same relative to polarity marks in the two current transformers. Relay should not operate when current direction is opposite relative to polarity marks in the two current transformers		
Measure time delay of the relay at 150 percent or greater of pickup (attach report)		
Verify reduced control voltage tripping capability: 55 percent for ac systems and 80 percent for dc systems.		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

 Owner's Representative / Commissioning Authority

 Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

 Owner's Representative / Commissioning Authority

 Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

GROUNDING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

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Approved	Cont.	UTH
INSTALLATION		
# 4/0 at service entrance		
Perimeter loop installed		
U/G water line bonded		
Loop part of lightning protection		

GROUND RODS

Location: _____

Length of Rod: _____ feet

GROUND ELECTRODES

Service Entrance Location: _____

List locations of any bonds made to interior water lines:

<u>Location</u>	<u>Equipment Grounded</u>
_____	_____
_____	_____
_____	_____

List locations of any bonds made to Structural Steel:

<u>Location</u>	<u>Column #</u>	<u>Location</u>	<u>Column #</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

GROUND TESTS

[NOTE: All resistance to ground readings shall be 25 OHMS or less.]

<u>Location</u>	<u>Measures Resistance (OHMS)</u>
Ground rods	_____
Service Entrance	_____
Ground bus @ switchgear	_____

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

GUTTERS AND DOWNSPOUTS

Location _____

Test # _____

Submittal / Approvals

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_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

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Approved	Cont.	UTH
INSTALLATION		
Mockup installed		
Proper storage and protection of materials		
Sections fabricated of proper material		
Sections formed to proper profile		
Proper finish for installation components		
Anchorage location and spacing		
Proper lock seams and end joints		
Allowance for and installation of expansion joints		
Proper bracket or strap size and spacing on gutters		
Proper alignment of gutter with roof edge		
Proper drainage		
Separator installed between sheet metal and substrate		
Internal joint seals		
Proper weld / solder joints		
Proper termination of downspout outfall		
Downspouts installed plumb without excessive offsets		
Splash blocks installed		
Water test completed and approved (test report attached)		
Final		
Integrity of joints and seals		
Replacement of defective and damaged materials		
Confirm accessory components installed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HEAT WHEEL

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

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Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

HEAT WHEEL

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Access doors close tightly - no leaks		
Boot between duct and unit tight and in good condition		
Vibration isolation equipment released from shipping locks		
Maintenance access acceptable for unit and components		
Copper Sampling tubes correctly installed in specified locations		
Copper Sampling tubes routed to central test station		
Test station complete with color graphic diagram		
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)		
Clean up of equipment completed per contract documents		
Filters installed and replacement type and efficiency permanently affixed to housing—construction filters removed		
HEAT RECOVERY WHEELS		
Wheel is of material specified		
Wheel spokes are coated		
Wheel hub is as specified		
Seals are as specified		
Drive is as specified		
Anti-rotation device in place		
Purge angle verified		
ELECTRICAL AND CONTROLS		
Pilot lights are functioning		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for components and unit		
Safeties in place and operable		
Starter overload breakers installed and correct size		
Sensors calibrated (report attached)		
Control system interlocks hooked up and functional		
Smoke detectors in place		
All control devices, pneumatic tubing and wiring complete		
VFD operation verified (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HEPA FILTERS

Location _____

Test # _____

Submittal / Approvals

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Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
HVAC controls coordination verified (report attached)		
Dirty filter annunciator functioning properly		
All doors and latches operate and seal properly		
TAB/Mechanical firm verified performance (report attached)		
Filter access and removal verified		
Leak test for unit verified (report attached)		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

HOIST

Location _____

Test # _____

Submittal / Approvals

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___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

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Approved	Cont.	UTH
Manufacturer's product data, performance criteria		
Shop drawings		
INSTALLATION		
Secure anchorage		
Proper operational clearance		
Installed plumb and level		
Power disconnects in place and labeled		
Electrical connections tight		
Safeties in place and operable		
Control station securely mounted and labeled		
Proper earth ground		
Check voltage		
Cabling verified as new w/o kinks, broken strands or other damage		
No leaking hydraulic seals		
Spill containment for hydraulic reservoir		
No obstruction within swing of boom		
Hoistway clear of penetrations		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HOIST

Location _____

Test # _____

Submittal / Approvals

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Approved	Cont.	UTH
O&M manuals		
Warranty		
Service / maintenance contract		
Spare parts		
OPERATION		
Startup report completed with checklist attached		
Control station activates and deactivates unit		
Full unobstructed rotation of boom		
Full unobstructed lift height of hoist		
Proper hoist motor speeds		
No unusual noise or vibration		
Load capacity test		
All lubrication points serviced		
Cable properly seated on reel		
Cablings verified as new w/o kinks, broken strands or other damage		
Carriage travel smooth		
Carriage brake operation smooth		
Door operation smooth		
Fire link operation verified		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

HORIZONTAL FEEDERS

Location _____

Test # _____

Submittal / Approvals

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___ List attached.

Mechanical Contractor	Date	Controls Contractor	Date
Electrical Contractor	Date	Plumbing Contractor	Date
Sprinkler Contractor	Date	General Contractor	Date

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Verify proper size conductors and conduit		
Verify proper routing and support of conduit		
Check for any breaks in insulation		

NOTES: Measure resistance of ground wire in conduit and the conduit itself from end to end. Measurements indicating more than 5 OHMS are to be brought to the attention of the Construction Inspector. Attach independent firm's testing report.

Feeder #	FROM	TO	Ground. WIRE ohms	CONDUIT ohms

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HUMIDIFIERS

Location _____

Test # _____

Submittal / Approvals

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Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
HVAC controls coordination verified (report attached)		
Safeties installed and operating properly		
All valves and dampers stroke fully and smoothly		
TAB/Mechanical firm verified performance (report attached)		
Record full load running amps for fan. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		

Parameter	Pre-Test Values	Returned to Pre-Test Values \checkmark
Humidity Setpoints		
Humidifier enable setpoint		
Humidifier disable setpoint		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

HUMIDIFIER PIPING

Location _____

Test # _____

Submittal / Approvals

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Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Piping connected to DI water system w/ float make-up valve and manual drain.		
Pipe fittings complete and pipes properly supported		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Vaporizing chamber per contract documents		
Isolation valves and balancing valves installed		
Heat exchanger is per contract documents		
Vaporizing chamber access easily removable for maint.		
Dispersion tube installed per contract documents		
Steam metering valve installed		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned and temporary piping removed (report attached)		
10% of strainers and Owner selected low point drains opened and witnessed by Owner to be clean. (list points checked below)		
Piping pressure tested per contract documents (report attached)		
No leaking apparent around fittings		
Valves		
Valve labels permanently affixed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HVAC CONTROLS II

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Wiring diagrams		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
All Temperature sensors/RTD's calibrated		
All Humidity sensors calibrated		
All CO/CO2/VOC sensors calibrated		
All actuators stroke full range and electric values documented		
All other analog inputs calibrated (4-20mA, 1-5V, 2-10V, etc.)		
All other analog outputs calibrated		

VFD's

MFR.: _____ (ATTACH START-UP REPORT)

Equipment # (SVC)	HP	Model Number	Serial Number
AHU # (cold deck)	_____	_____	_____
AHU # (cold deck)	_____	_____	_____
AHU # (cold deck)	_____	_____	_____
AHU # (hot deck)	_____	_____	_____
AHU # (hot deck)	_____	_____	_____
AHU # (hot deck)	_____	_____	_____
Chilled Water Pump#	_____	_____	_____
Chilled Water Pump#	_____	_____	_____

DUCT PRESSURE TAPS

Equipment#	Floor #	Tap Location
AHU #	_____	_____
AHU #	_____	_____
AHU #	_____	_____
AHU #	_____	_____
AHU #	_____	_____
AHU #	_____	_____
AHU #	_____	_____
AHU #	_____	_____

TEMPERATURE CONTROLS

AHU# (cold deck)

Transmitters and Safeties	Model #	Installed	Gauge	Set Point
Low Temp. safety	_____	_____	_____	_____
Hi Temp. safety	_____	_____	_____	_____
Low Pressure safety	_____	_____	_____	_____
Hi pressure safety	_____	_____	_____	_____
Bearing Hi temp. safety	_____	_____	_____	_____
Bearing Low temp safety	_____	_____	_____	_____

AHU# (cold deck)

Transmitters and Safeties	Model #	Installed	Gauge	Set Point
Low Temp. safety	_____	_____	_____	_____
Hi Temp. safety	_____	_____	_____	_____
Low Pressure safety	_____	_____	_____	_____
Hi pressure safety	_____	_____	_____	_____
Bearing Hi temp. safety	_____	_____	_____	_____
Bearing Low temp safety	_____	_____	_____	_____

Chilled Water Valve Model# _____ Valve Size: _____ Pipe Size: _____
 Action: N/O / N/C
 Pilot Positioner w/gauges Y N
 Electric Actuator Y N

Miscellaneous:

	Location	Installed	Range °F
Thermometers	Between filters and coils	Y N	_____
	Between coils	Y N	_____
	Fan Discharge	Y N	_____

Duct Pressure Gauges

Upstream of filters	Y	N	_____ "WC
Across filters	Y	N	_____ "WC
Between coils	Y	N	_____ "WC
Fan plenum	Y	N	_____ "WC
Fan Discharge	Y	N	_____ "WC

TEMPERATURE CONTROLS

RAF # (return air fan) _____

Transmitters and Safeties	Model #	Installed	Gauge	Set Point
Low Temp. safety	_____	_____	_____	_____
Hi pressure safety	_____	_____	_____	_____
Bearing Hi temp. safety	_____	_____	_____	_____
Bearing Hi temp safety	_____	_____	_____	_____

RAF # (return air fan) _____

Transmitters and Safeties	Model #	Installed	Gauge	Set Point
Low Temp. safety	_____	_____	_____	_____
Hi pressure safety	_____	_____	_____	_____
Bearing Hi temp. safety	_____	_____	_____	_____
Bearing Hi temp safety	_____	_____	_____	_____

Miscellaneous:

	Location	Installed		Range
Duct pressure gauges	Up stream of fans	Y	N	_____ "WC
	Downstream of fans	Y	N	_____ "WC

BAROMETRIC DAMPERS

Location: _____

Ste Point: _____ "WC
 Ste Point: _____ "WC
 Ste Point: _____ "WC
 Ste Point: _____ "WC

ANNUNCIATOR PANEL & FAN SAFETIES VERIFICATION

Each safety shall be checked to verify shutdown prior to building climatization

AHU# (cold deck)

	Light off		Fan Shut down	
Bearing #1	Y	N	Y	N
Bearing #2	Y	N	Y	N
Hi pressure	Y	N	Y	N
Low pressure	Y	N	Y	N
Smoke	Y	N	Y	N
Hi Temp	Y	N	Y	N
Low Temp	Y	N	Y	N

AHU# (hot deck)

	Light off		Fan Shut down	
Bearing #1	Y	N	Y	N
Bearing #2	Y	N	Y	N
Hi pressure	Y	N	Y	N
Low pressure	Y	N	Y	N
Smoke	Y	N	Y	N
Hi Temp	Y	N	Y	N
Low Temp	Y	N	Y	N

RAF# (return air fan)

	Light off		Fan Shut down	
Bearing #1	Y	N	Y	N
Bearing #2	Y	N	Y	N
Hi pressure	Y	N	Y	N
Low pressure	Y	N	Y	N
Smoke	Y	N	Y	N

STRATER WIRING (Note: in the off position the annunciator panel is de-energized)

Verify "on/off" is wired per detail _____

AHU# (CD) _____	Y	N
AHU# (HD) _____	Y	N
RAF# _____	Y	N

CONTROL DAMPERS

RA – return air HA – hot air
 CA – cold air MA – Mixed air

Function	Room #	SAV/EP #	Damper installed		Access door installed	
			Y	N	Y	N
Outside air			Y	N	Y	N
Relief air (room)			Y	N	Y	N
Relief air (duct)			Y	N	Y	N
RA cold deck			Y	N	Y	N
RA hot deck			Y	N	Y	N
OA hot deck			Y	N	Y	N
RA floor #			Y	N	Y	N
RA floor #			Y	N	Y	N
RA floor #			Y	N	Y	N
RA floor #			Y	N	Y	N
RA floor #			Y	N	Y	N
RA floor #			Y	N	Y	N
RA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
CA floor #			Y	N	Y	N
MA floor #			Y	N	Y	N
MA floor #			Y	N	Y	N
MA floor #			Y	N	Y	N
MA floor #			Y	N	Y	N
HA floor #			Y	N	Y	N
HA floor #			Y	N	Y	N
HA floor #			Y	N	Y	N
HA floor #			Y	N	Y	N
HA floor #			Y	N	Y	N
HA floor #			Y	N	Y	N

Comments:

Test Failure / Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HVAC CONTROLS (COLD DECK)

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Wiring diagrams		
Sequences and control strategies		
O&M manuals		

Verify the following devices and corresponding operation:

DEVICE	OPEN	CLOSED	MOD	Cont	UTH
OUTSIDE AIR BELOW 55°F					
Chilled water valve					
Relief damper					
Dormer damper					
Outside air damper					
RA damper to cold deck					
RA damper by floor					
1 st					
2 nd					
3 rd					
4 th					
5 th					
6 th					
7 th					
8 th					
9 th					
10 th					

RA temperature _____

Chiller ON / OFF

Chilled Water Pumps #1 #2

ON / OFF

DEVICE	OPEN	CLOSED	MOD	Cont	UTH
OUTSIDE AIR ABOVE 55°F					
Chilled water valve					
Relief damper					
Dormer damper					
Outside air damper					
RA damper to cold deck					
RA damper by floor					
1 st					
2 nd					
3 rd					
4 th					
5 th					
6 th					
7 th					
8 th					
9 th					
10 th					

RA temperature _____

Chiller ON / OFF

Chilled Water Pumps #1 #2

ON / OFF

Chiller PE switch _____ °F set point

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HVAC CONTROLS (HOT DECK)

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Wiring diagrams		
Sequences and control strategies		
O&M manuals		

Verify the following devices and corresponding operation:

DEVICE	OPEN	CLOSED	MOD	Cont	UTH
OUTSIDE AIR BELOW 55°F					
Chilled water valve					
Relief damper					
Dormer damper					
Outside air damper					
RA damper to cold deck					
RA damper by floor					
1 st					
2 nd					
3 rd					
4 th					
5 th					
6 th					
7 th					
8 th					
9 th					
10 th					

RA temperature _____

Boiler ON / OFF

Hot Water Pumps #1 #2

ON / OFF

Boiler PE switch _____ °F set point

DEVICE	OPEN	CLOSED	MOD	Cont	UTH
OUTSIDE AIR ABOVE 55°F					
Chilled water valve					
Relief damper					
Dormer damper					
Outside air damper					
RA damper to cold deck					
RA damper by floor					
1 st					
2 nd					
3 rd					
4 th					
5 th					
6 th					
7 th					
8 th					
9 th					
10 th					

RA temperature _____

Boiler ON / OFF

Hot Water Pumps #1 #2

ON / OFF

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

HVAC DUCTWORK FIRE DAMPERS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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Approved	Cont.	UTH
Record Submittal		
O&M manuals		
Verify proper temperature rating for fused link		
Dampers located per contract documents		
Verify flanges are NOT sealed at wall/floor penetration (exception is when the manufacturer specifically requires sealing with a specific sealant)		
Verify NO firestopping, mineral wool, packing is installed in space between damper and wall cavity.		
Physically release the damper curtain to verify proper operation Damper must operate quickly and shut completely without assistance		
Verify properly labeled access doors installed		
Verify damper can be accessed through door		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Use of the UT Health Commissioning and Closeout Manual

Commissioning is a process that starts at the conception of a project and continues through the entire life-cycle of the facility. During the construction phase, the commissioning process ensures that the design intent expressed in the contract documents is executed in the field. The contract requires the Contractor to develop a commissioning plan specific to the project. This manual provides the template documentation required to ensure a thorough demonstration of the commissioning process. By following the requirements defined in the commissioning specification (01 91 00), our client will receive a facility that has been demonstrated to perform predictably and as designed.

The construction commissioning process is really quite simple following this basic order:

1. Recognize commissioning requirements and develop a plan (Owner may provide a Cx Plan for Contractor's review, potential modification and use.
2. Provide the approved device/system
3. Ensure that the device/system is installed correctly
4. Ensure that the device/system is ready to operate
5. Verify that the device/system functions correctly
6. Demonstrate that operable systems are fully integrated within the completed facility.

By using the templates in this manual, the process will be well documented. The process is explained in the commissioning specification (01 91 00) and follows the same basic logical sequence as outlined above:

1. Commissioning Plan
 - a. Responsibility Matrix
 - b. Equipment Matrix
 - c. Commissioning Schedule
2. Approved submittal
3. PreFunctional Checklist
4. Equipment Start-up Plan

5. Functional Testing
6. Integrated System Testing
7. Entire Facility Integration Testing

We have provided additional test/checklist documents and certifications to supplement this process. The manual includes forms from the National Fire Protection Association (NFPA) for use on life safety systems as well as forms required by the Texas State Fire Marshal for fire alarm and fire sprinkler systems.

Additionally, we have included pre-installation meeting agenda templates to facilitate these critical construction steps. Decades of construction experience has taught us that discussions in these meetings can save the project team both time and money.

We have provided required matrices for equipment, commissioning responsibility and closeout tracking. Each matrix will require modification to conform to the specifics of the project.

Training attendance sheets are included to document required training for Institution personnel. Spare parts and required record data forms are provided to support the documentation requirements.

To summarize:

- 1) Read specifications and develop a commissioning plan
 - a) Complete the responsibility matrix
 - b) Populate the equipment matrix
 - c) Develop a commissioning schedule
- 2) Provide approved device/system
 - a) Document via submittal
- 3) Review installation requirements and coordination
 - a) Conduct Preinstallation meeting using provided agendas as guide
- 4) Install device/system correctly
 - a) Document with PFC
- 5) Verify device/system is ready to operate
 - a) Document with PFC
 - b) Document with Startup Plan

- 6) Confirm correct device/system operation
 - a) Document using FT
- 7) Demonstrate integrated systems operate and perform as designed
 - a) Document with IST
- 8) Demonstrate the entire facility operates as designed with fully integrated systems
 - a) Document with EFIT

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

INTERIOR LIGHT FIXTURES & LOADS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of _____ the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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Approved	Cont.	UTH
Record Submittal		
O&M manuals		
INSTALLATION		
Fittings complete and properly supported		
Bulbs as specified		
Properly labeled		
Proper ballast installed		
Lens/globe as specified		
Occupancy switch operates properly		
Lights aligned per contract documents		
Nighttime verification of lighting complete		
Burn-in complete per contract documents		
Power switch operates properly		

Panel #	Circuit #	Load (amps)	Circuit #	Load (amps)
	1		28	
	2		29	
	3		30	
	4		31	
	5		32	
	6		33	
	7		34	
	8		35	
	9		36	
	10		37	
	11		38	
	12		39	
	13		40	
	14		41	
	15		42	
	16		43	
	17		44	
	18		45	
	19		46	
	20		47	
	21		48	
	22		49	
	23		50	
	24		51	
	25		52	
	26		53	
	27		54	

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

IRRIGATION INSTALLATION

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be approved by Owners' Representative prior to backfilling pipe and preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
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- Tests performed with this PFT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
INSTALLATION		
System layout complete		
Graded as required		
Proper schedule pipe installed		
Pipe pressure tests completed, approved and attached		
Pipe installed at proper depth		
Underground piping properly bedded and backfilled		
Sleeves installed using correct material		
Visual observation of each section complete		
Sprinkler head adjustment complete		
Backflow Certification complete and attached		
Valves and valve box installed		
Automatic controller set		
FCMS connection completed and verified		
ELECTRICAL		
Control wiring installed as specified		
Breaker sizes and type verified		
Moisture sensor installed		

Test Failure/Retest Required: The installation has not met the specified performance criteria and will require reinspection before backfilling.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

IRRIGATION SYSTEM

Location _____

Test # _____

Submittal / Approvals

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___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Manufacturer's cut sheets		
Performance data		
Service / maintenance contract		
Sequences and control strategies Seq. of Operation Attached: Yes / No		
O&M manuals		
Irrigation System		
System PFT completed, approved and attached		
Backfill using proper materials completed		
Flushing and cleaning of piping completed		
No leaking apparent around fittings		
All sprinkler heads operational		
Heads demonstrate proper spray pattern		
Proper drainage demonstrated		
Controller operation verified		
Valve operation verified		
Valve labels affixed		

Comments:

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

JOINT SEALANTS

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's product data		
Schedule, type & location		
Samples		
Installation instructions		
Color Selections		
INSTALLATION		
Preinstallation meeting conducted		
Substrate cured		
Cleaning of joint		
Primer application		
Joint shape and bond breaker placement		
Proper width/depth ratio		
Proper mixing		
Proper environmental conditions		
Joint tooling		
Free of air pockets, foreign matter, ridging, sagging		
Proper color		
Proper material for joint type		
Adhesion / Cohesion test performed		
Cleanup		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

LABORATORY / MEDICAL GAS PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Piping purged with dry nitrogen during assembly		
Piping sealed and charged with nitrogen between jointing operations		
Pipe fittings complete and pipes properly supported		
Isolation valves installed		
Piping system properly flushed, cleaned and temporary piping removed (report attached)		
Piping pressure tested to per to contract documents (report attached)		
No leaks apparent around fittings		
Piping system sealed and filled with nitrogen		
Service Outlets consistent with contract documents		
Pipes properly labeled		
Valve labels permanently affixed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

LAB WASTE PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Underground piping restraints coated per specifications		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Pipe ID tape installed in trench per contract documents		
Connection to acid neutralization device		
Pipe fittings complete and pipes properly supported		
Pipes properly labeled		
Cleanouts installed and accessible		
Piping system properly flushed and cleaned (report attached)		
Cross-contamination dye test performed (report attached)		
Piping water tested per specifications (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

LABORATORY WASTE VIDEO INSPECTION REPORT

Date _____ Project _____ A Nearby Building is _____

Camera Entrance Manhole # _____ MH Depth _____ MH Material _____

MH Condition _____ Start Time _____

Pipe Size _____ Pipe Type _____ Pipe Condition _____

Depth of Flow (inches) _____ Direction of Pull is _____ stream

Camera Exit Manhole # _____ MH Depth _____ MH Material _____

MH Condition _____ Start Time _____

Measurements Begin at MH # _____ Skid Size _____ inch

Tape Counter # Begin _____ End _____

Operator _____ Crew _____, _____,

Company _____

General Remarks _____

Tape Counter	Feet														Remarks		
		Tic-In (R-L-T)	Circle Break (1-4)	Long Break (1-4)	Multiple Break (1-4)	Missing Pipe (1-4)	Roots (1-4)	Grease (1-4)	Sediment (1-4)	Infiltration (1-4)	Offset Joint (1-4)	Separated Joint (1-4)	Pipe Wall Failure (1-4)	Sag Depth (inches)		Other (1-4)	

REPORT LEGEND

NOTE: Use letters / numbers to indicate status of issue in columns.

Tie-in (branch line Tie-in direction)

- R -Right
- L - Left
- T - Top

Indicate approximate size of branch line in remarks column

Breaks

Circle Break

- 1=circle crack
- 2=open circle break
- 3=bad circle break, pipe is separate or offset
- 4=severe circle break, pipe is separate and offset

Long Break

- 1=long crack
- 2=open long break
- 3=bad, separate long break
- 4=severe, separate and offset long break. Pipe is collapsible

Multiple Breaks

- 1=multiple cracks
- 2=open multiple breaks
- 3=bad multiple breaks, but stable
- 4=severe multiple breaks, pipe is collapsible or collapsed

Missing Pipe

- 1=small hole in pipe, small piece of pipe is missing
- 2=medium piece (less than ¼ of the circumference of the pipe)
- 3=missing a large piece of pipe, with soil exposed
- 4=missing a whole section of pipe

Roots

- 1=light roots
- 2=medium roots
- 3=heavy roots (example: enough roots to block more than half of a 6" or 8" line)
- 4=severe root problem, camera cannot pass

Grease

- 1=light grease
- 2=medium grease
- 3=heavy grease
- 4=severe grease problem, camera cannot pass

Sediment

- 1=light sediment, sand and rocks
- 2=medium sediment, sand and rocks
- 3=heavy sediment, sand and rocks
- 4=severe sediment problem, camera cannot pass

Infiltration

- 1=dripping infiltration
- 2=continuous infiltration
- 3=heavy, bad infiltration
- 4=severe, pouring infiltration

Offset Joint

- 1=joint slightly offset
- 2=joint is moderately offset
- 3=joint is severely offset, but camera can pass
- 4=camera cannot pass offset joint

Separated Joint

- 1=joint is slightly separated
- 2=joint is moderately separated
- 3=joint is severely separated
- 4=camera cannot pass separated joint

Pipe Wall Failure

- 1=light corrosion or aggregate visible in pipe wall
- 2=medium corrosion or aggregate visible in pipe wall
- 3=heavy corrosion or aggregate visible in pipe wall
- 4=severely deteriorated pipe, wall is worn out with soil exposed

Other

- 1=obstruction in pipe
- 2=concrete in pipe
- 3=branch line protruding into pipe
- 4=gasket hanging into pipe

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

LIGHTNING PROTECTION

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Sprinkler Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Shop Drawings approved		
Master Label applied for (copy of letter)		
INSTALLATION		
Specified cable (copper / alum) installed		
Fittings complete and properly supported		
Connectors Torque to specified Tolerances		
Properly labeled		
Properly Grounded		
Exterior spikes properly installed, connected, and supported		
Each individual Cable and wire has passed a continuity test		
Roof top equipment bonded into system		
Path to ground verified		
Roof membrane penetrations sealed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

LIQUID FILLED TRANSFORMER

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Fittings complete and properly supported		
Manually operate all switches, circuit breakers, and other mechanical mechanisms prior to energizing equipment		
Connectors Torqued to specified Tolerances		
Phase to Phase and Phase-to-Ground resistance test with switches or circuit breakers in opened and closed position prior to energizing equipment		
Properly labeled per contract documents		
Verify equipment is tested and calibrated per manufacturers guidelines prior to energizing equipment		
Properly installed and documented with OEM installation checklist		
Verify voltage taps are set		
Proper Ground Rod or Device installed per contract documents		
All grounds interconnected to single system		
Transformer Turns Ratio (TTR) test complete (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

INTEGRATED SYSTEM TEST REPORT

LOSS OF POWER

Test # _____

All system associated with this test/demonstration have been completed and all Functional Test Checklists documenting this are attached. Prior integrated performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this IST are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
PERFORMANCE		
Simulate loss of facility power and demonstrate the following actions are in compliance with the contract documents: NOTE: Verify contract requirements for testing under load (0%, 50% & 100%)		
At loss of power, ATS engages		
Verify time delay until start of generator _____ seconds		
Verify time delay until E-power is at required voltage/frequency _____ seconds		
Verify restart sequence for all high current draw equipment		
Verify all emergency lighting and power devices to facility are active (report attached)		
Verify FA panel switches from batteries to facility power		
Verify elevator emergency power operation		
Verify security system operates under emergency power		
Verify negative pressure areas within facility remain negative during ATS transfer and emergency power operation		
Verify tele/comm system operate under emergency power		
Verify any environmental rooms operate under emergency power		
Verify HVAC systems maintain IAQ under emergency power		
Verify transfer back to normal power		
Record time for transfer _____ seconds		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

MAIN DISTRIBUTION PANEL

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

MANUAL VALVE

Location _____ Test # _____

Valve ID _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
O&M manuals		
Valve Schedule for all valves complete and attached		
INSTALLATION		
Valve properly installed		
Valve properly aligned		
Valve is accessible		
Chain fall installed per specifications		
Lubrication points serviced		
Proper gasket installed		
Valve operation (open/close/shut-off) consistent with specifications and manufacturers data		
Free movement of handle throughout range		
Permanent Valve Tag installed per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

MASONRY

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	OFPC.
INSTALLATION		
Preinstallation meeting conducted prior to start of work		
Mockup installed		
Damp / waterproofing installation complete		
Flashing installation complete		
Cavity drainage material placement		
Cavity clean of mortar dropping and debris		
Shelf angle NOT welded continuous around building		
Lintels installed		
UL label CMU placement		
CMU reinforcement placement		
Proper masonry material installed		
Proper lines and levels, joint width		
Face brick blend consistency		
Masonry isolation, joint filler placement		
Wall tie anchorage and spacing		
Joint reinforcement placement		
Mortar strength verified (cube / prism report attached)		
Mortar color consistency		
Full head and bed mortar joints		
Control joint location and continuity		
Weep tube placement		
Any exposed rebar in cut precast stone treated before placement		
Any broken units replaced and chips repaired		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

METAL ENCLOSED SWITCHGEAR (MEDIUM VOLTAGE)

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Sprinkler Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Shop Drawings approved		
INSTALLATION		
Verify that all switchgear is factory tested after fabrication and before shipment, including simulation of all control and relay functions, complete operation of breakers (report attached)		
Manufacturer representative has performed checkout of the equipment prior to energizing equipment (report attached)		
Phase to Phase and Phase-to-Ground resistance test with switches or circuit breakers in opened and closed position prior to energizing equipment		
All relays, meters and instrumentation has been checked to determine all connections are made		
Fittings complete and properly supported		
Manually operate all switches, circuit breakers, and other mechanical mechanisms prior to energizing equipment		
Equipment properly labeled		
Equipment mounted to housekeeping slabs		
Verify proper size conductors installed		
As a minimum, verify that the following procedures are performed at the site before the bus is energized:		
All electrically operated circuit breakers and other mechanisms are electrically exercised (not under load) to determine proper function		
Verify that all adjustable current and voltage trip mechanisms have been set to their proper values in accordance with the site coordination study		
All field wiring is clear of any live bus and physically secured to withstand the effects of fault currents		
All scrap wire, boxes, spare parts, and other debris is removed from the switchgear interior		
All bus connections and control wiring connections are verified to be tight and property torqued, if required		
Verify the ground fault protection system has been tested per manufacturer recommendations		
Verify that all breakers (electrical and manual) can be manually opened or closed without opening the door to the breaker compartment.		
Verify that all breakers visibly indicate open, closed, and tripped positions without opening the door to the breaker compartment		

Approved	Cont.	UTH
Verify that all over-current devices have the capability of being locked-out in compliance with OSHA Standard 1910-147.		
Verify that all medium and low-voltage tie connections (between buses) contain high-speed differential relays sensitive to both phase and ground faults.		
Properly Grounded		
Correct Circuit Breaker sizes and types installed per contract documents		
Short Circuit Device Calibrated		
Verify proper installation of stress cones		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

MOTORIZED WINDOW SHADES

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor	Date	Controls Contractor	Date
Electrical Contractor	Date	Plumbing Contractor	Date
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer product data sheet		
O&M Manual		
INSTALLATION		
Adequate motor access for maintenance		
Motorized operation smooth		
Shade full retraction / extension		
Light blocking per specifications		
Auto-reverse/pressure sensor verified		
Bottom edge gasket		
Lubrication completed		
Wall switch operation		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

NATURAL GAS PIPING SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Welders certificates		
INSTALLATION		
Underground piping coated per specifications		
Underground piping properly bedded and backfilled		
Pipe fittings and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Drip leg pipes installed		
Pipes properly labeled		
Isolation valve installed		
Emergency shut-off valves installed		
Pressure regulators verified operational		
Piping hydrostatically tested per specifications (report attached)		
Interior pipe sleeving tested and vented		
Valves checklists complete		
Valve labels permanently affixed		
Chemical odorant added to system		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

DRY CHEMICAL EXTINGUISHING SYSTEMS ACCEPTANCE INSPECTION

Project Name _____

Date _____ **Inspector** _____

System _____

Y = Satisfactory **N** = Unsatisfactory (explain) **N/A** = Not applicable

Note: Pressures and weights are satisfactory if equal to or greater than minimums in Form 9B

	Acceptance?	If N, Explanation
Dry chemical cylinder pressure _____ psi (bar)		
Expellant gas cartridge:		
Pressure of nitrogen, psi (bar)		
Weight of carbon dioxide, lb (kg)		
Check dry chemical agent for lumping or caking in cartridge-operated-type systems.		
Check to ensure that hazard is as defined on approved plans.		
Check detectors and fusible links for damage or obstruction.		
Check expellant gas containers for proper installation.		
Check agent containers for proper installation.		
Check manual releases for proper installation.		
Check piping for proper installation and changes.		
Check hand-hose assemblies for proper installation.		
Check discharge nozzles for proper installation.		
Check local signal devices for proper installation.		
Check auxiliary equipment for proper installation.		
Check that fusible link is installed.		

Notes _____

DRY CHEMICAL EXTINGUISHING SYSTEMS ACCEPTANCE INSPECTION

Project Name _____

Date _____ **Inspector** _____

System _____

Y = Satisfactory **N** = Unsatisfactory (explain) **N/A** = Not applicable

Note: Pressures and weights are satisfactory if equal to or greater than minimums in Form 9B

	Acceptance?	If N, Explanation
Dry chemical cylinder pressure _____ psi (bar)		
Expellant gas cartridge:		
Pressure of nitrogen, psi (bar)		
Weight of carbon dioxide, lb (kg)		
Check dry chemical agent for lumping or caking in cartridge-operated-type systems.		
Check to ensure that hazard is as defined on approved plans.		
Check detectors and fusible links for damage or obstruction.		
Check expellant gas containers for proper installation.		
Check agent containers for proper installation.		
Check manual releases for proper installation.		
Check piping for proper installation and changes.		
Check hand-hose assemblies for proper installation.		
Check discharge nozzles for proper installation.		
Check local signal devices for proper installation.		
Check auxiliary equipment for proper installation.		
Check that fusible link is installed.		

Notes _____

DRY CHEMICAL EXTINGUISHING SYSTEMS ACCEPTANCE TESTS

Project Name _____

Date _____ **Inspector** _____

System _____

Date of acceptance test _____

Manual release Satisfactory Unsatisfactory

Fusible link Satisfactory Unsatisfactory

Connection to fire alarm system? Yes No

Results Satisfactory Unsatisfactory

Connection to shut off power to cooking equipment? Yes No

Results Satisfactory Unsatisfactory

Fusible link replaced? Yes No

Connection to shut down supply air to exhaust hood?

Results Satisfactory Unsatisfactory

Grease exhaust fan Continues to run Stops

Connection to shut off electric power to receptacles under hood?

Results Satisfactory Unsatisfactory

Hydrostatic test performed on:

Pressure cylinders Yes No

Dry chemical chambers Yes No

Auxiliary pressure containers Yes No

Valve assemblies Yes No

Hoses and fittings Yes No

Check valves Yes No

Directional valves Yes No

Manifolds Yes No

Notes _____

DRY CHEMICAL EXTINGUISHING SYSTEMS ACCEPTANCE TESTS

Project Name _____

Date _____ **Inspector** _____

System _____

Date of acceptance test _____

Manual release Satisfactory Unsatisfactory

Fusible link Satisfactory Unsatisfactory

Connection to fire alarm system? Yes No

Results Satisfactory Unsatisfactory

Connection to shut off power to cooking equipment? Yes No

Results Satisfactory Unsatisfactory

Fusible link replaced? Yes No

Connection to shut down supply air to exhaust hood?

Results Satisfactory Unsatisfactory

Grease exhaust fan Continues to run Stops

Connection to shut off electric power to receptacles under hood?

Results Satisfactory Unsatisfactory

Hydrostatic test performed on:

Pressure cylinders Yes No

Dry chemical chambers Yes No

Auxiliary pressure containers Yes No

Valve assemblies Yes No

Hoses and fittings Yes No

Check valves Yes No

Directional valves Yes No

Manifolds Yes No

Notes _____

EMERGENCY GENERATOR ACCEPTANCE INSPECTION

Project Name _____

Date _____ **Inspector** _____

System _____

Y = Satisfactory N = Unsatisfactory (explain) N/A = Not applicable

	Acceptance?	If N, Explanation
Check fuel tank fuel supply level.		
Inspect dry tank level.		
Inspect and operate dry tank float switch.		
Inspect and operate supply or transfer pump.		
Inspect and operate solenoid valve.		
Check for water in fuel system.		
Check flexible hose and connectors.		
Check oil level in the engine.		
Check lube oil heater for operation.		
Check level of cooling system for engine.		
Check cooling water to heat exchanger for adequacy.		
Check adequacy of fresh air through radiator.		
Check water pump.		
Check flexible hoses and connections.		
Check water-jacket heater.		
Check exhaust system for leakage.		
Check the drain condensate trap.		
Check electrolyte level in the batteries.		
Check electrical system.		
Inspect engine.		
Check housekeeping in generator room and fuel supply tanks.		
Inspect generator.		

EMERGENCY STANDBY POWER SYSTEMS ACCEPTANCE TESTS

Project Name _____

Date _____ **Inspector** _____

System _____

Y = Satisfactory N = Unsatisfactory (explain)

	Acceptance?	If N, Explanation
Test each battery-powered unit so that laps operate for 30 seconds.		
Test emergency generator batteries for specific gravity or state of charge.		
Operate emergency generator with no load.		
Test antifreeze protection level.		
Test operation of safeties and alarms.		
Test tank vents and overflow piping.		
Test louver motors and controls.		
Test exhaust system for excessive backpressure.		
Test ignition system—plugs, points, cap, rotor, secondary wire insulation.		
Test injector pump and injectors.		
Measure and record resistance readings of windings with insulation tester (Megger).		
Test each battery-powered unit for 90 minutes.		
Test emergency generator under full load or under bank-load full load.		

Notes _____

FIRE ALARM SYSTEMS INSPECTION AND TESTING FORM

Date _____

Time _____

SERVICE ORGANIZATION

Name _____

Address _____

Representative _____

License No. _____

Telephone _____

PROPERTY NAME (USER)

Name _____

Address _____

Owner contact _____

Telephone _____

MONITORING ENTITY

Contact _____

Telephone _____

Monitoring Account Ref. No. _____

APPROVING AGENCY

Contact _____

Telephone _____

TYPE TRANSMISSION

McCulloh

Multiplex

Digital

Reverse Priority

RF

Other (specify) _____

SERVICE

Weekly

Monthly

Quarterly

Semiannually

Annually

Other (specify) _____

Control unit manufacturer _____

Model No. _____

Circuit styles _____

Number of circuits _____

Software revised _____

Last date system had any service performed _____

Last date that any software or configuration was revised _____

ALARM-INITIATING DEVICES AND CIRCUIT INFORMATION

Quantity	Circuit Style	
_____	_____	Manual fire alarm boxes
_____	_____	Ion detectors
_____	_____	Photo detectors
_____	_____	Duct detectors
_____	_____	Heat detectors
_____	_____	Waterflow switches
_____	_____	Supervisory switches
_____	_____	Other (specify) _____

Alarm verification feature is disabled _____ enabled _____.

ALARM NOTIFICATION APPLIANCES AND CIRCUIT INFORMATION

Quantity	Circuit Style	
_____	_____	Bells
_____	_____	Horns
_____	_____	Chimes
_____	_____	Strobes
_____	_____	Speakers
_____	_____	Other (specify) _____

Number of alarm notification appliance circuits _____
 Are circuits monitored for integrity? Yes No

SUPERVISORY SIGNAL-INITIATING DEVICES AND CIRCUIT INFORMATION

Quantity	Circuit Style	
_____	_____	Building temperature
_____	_____	Site water temperature
_____	_____	Site water level
_____	_____	Fire pump power
_____	_____	Fire pump running
_____	_____	Fire pump auto position
_____	_____	Fire pump or pump controller trouble
_____	_____	Fire pump running
_____	_____	Generator in auto position
_____	_____	Generator or controller trouble
_____	_____	Switch transfer
_____	_____	Generator engine running
_____	_____	Other _____

SIGNALING LINE CIRCUITS

Quantity and style of signaling line circuits connected to system (see NFPA 72, Table 6.6.1):
 Quantity _____ Style(s) _____

SYSTEM POWER SUPPLIES

(a) Primary (main): Nominal voltage _____ Amps _____
 Overcurrent protection: Type _____ Amps _____
 Location (of primary supply panelboard) _____
 Disconnecting means location _____

(b) Secondary (standby):
 _____ Storage battery: Amp-hr. rating _____
 Calculated capacity to operate system, in hours: _____ 24 _____ 60
 _____ Engine-driven generator dedicated to fire alarm system:
 Location of fuel storage _____

TYPE BATTERY

Dry cell
 Nickel-cadmium
 Sealed lead-acid
 Lead-acid
 Other (specify) _____

(c) Emergency or standby system used as a backup to primary power supply, instead of using a secondary power supply:
 _____ Emergency system described in NFPA 70, Article 700
 _____ Legally required standby described in NFPA 70, Article 701
 _____ Optional standby system described in NFPA 70, Article 702, which also meets the performance requirements of Article 700 or 701.

PRIOR TO ANY TESTING

NOTIFICATIONS ARE MADE

	Yes	No	Who	Time
Monitoring entity	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Building occupants	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Building management	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Other (specify)	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
AHJ notified of any impairments	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

SYSTEM TESTS AND INSPECTIONS

TYPE	Visual	Functional	Comments
Control unit	<input type="checkbox"/>	<input type="checkbox"/>	_____
Interface equipment	<input type="checkbox"/>	<input type="checkbox"/>	_____
Lamps/LEDS	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fuses	<input type="checkbox"/>	<input type="checkbox"/>	_____
Primary power supply	<input type="checkbox"/>	<input type="checkbox"/>	_____
Trouble signals	<input type="checkbox"/>	<input type="checkbox"/>	_____
Disconnect switches	<input type="checkbox"/>	<input type="checkbox"/>	_____
Ground-fault monitoring	<input type="checkbox"/>	<input type="checkbox"/>	_____

SECONDARY POWER

Type	Visual	Functional	Comments
Battery condition	<input type="checkbox"/>		_____
Load voltage		<input type="checkbox"/>	_____
Discharge test		<input type="checkbox"/>	_____
Charger test		<input type="checkbox"/>	_____
Specific gravity		<input type="checkbox"/>	_____
Transient Suppressors	<input type="checkbox"/>		_____
Remote Annunciators	<input type="checkbox"/>	<input type="checkbox"/>	_____
Notification Appliances			_____
Audible	<input type="checkbox"/>	<input type="checkbox"/>	_____
Visible	<input type="checkbox"/>	<input type="checkbox"/>	_____
Speakers	<input type="checkbox"/>	<input type="checkbox"/>	_____
Voice clarity		<input type="checkbox"/>	_____

INITIATING AND SUPERVISORY DEVICE TESTS AND INSPECTIONS

Loc. & S/N	Device Type	Visual Check	Functional Test	Factory Setting	Measured Setting	Pass	Fail
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>

Comments _____

EMERGENCY COMMUNICATIONS EQUIPMENT

	Visual	Functional	Comments
Phone set	<input type="checkbox"/>	<input type="checkbox"/>	_____
Phone jacks	<input type="checkbox"/>	<input type="checkbox"/>	_____
Off-hook indicator	<input type="checkbox"/>	<input type="checkbox"/>	_____
Amplifier(s)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Tone generator(s)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Call-in signal	<input type="checkbox"/>	<input type="checkbox"/>	_____
System performance	<input type="checkbox"/>	<input type="checkbox"/>	_____

INTERFACE EQUIPMENT

	Visual	Device Operation	Simulated Operation
(Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SPECIAL HAZARD SYSTEMS

(Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Special procedures _____

Comments _____

SUPERVISING STATION MONITORING

	Yes	No	Time	Comments
Alarm signal	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Alarm restoration	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Trouble signal	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Supervisory signal	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Supervisory restoration	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

NOTIFICATIONS THAT TESTING IS COMPLETE

	Yes	No	Who	Time
Building management	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Monitoring agency	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Building occupants	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Other (specify)	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

The following did not operate correctly _____

System restored to normal operation: Date _____ Time _____

THIS TESTING WAS PERFORMED IN ACCORDANCE WITH APPLICABLE NFPA STANDARDS.

Name of inspector _____ Date _____ Time _____

Signature _____

Name of owner or representative _____

Date _____ Time _____

Signature _____

FIRE ALARM SYSTEM RECORD OF COMPLETION

Name of protected property _____
Address _____
Representative of protected property (name/phone) _____
Authority having jurisdiction _____
Address/telephone number _____

Organization name / phone

Representative name / phone

Installer _____
Supplier _____
Service organization _____
Location of record (as-built) drawings _____
Location of operation and maintenance manuals _____
Location of test reports _____
A contract for test and inspection in accordance with NFPA standard(s)
Contract number(s) _____ Effective date _____ Expiration date _____

System Software

(a) Operating system (executive) software revision level(s) _____
(b) Site-specific software revision date _____
(c) Revision completed by _____
(Name) *(Firm)*

1. TYPE(S) OF SYSTEM OR SERVICE

_____ *NFPA 72*[®], *National Fire Alarm Code*[®], Chapter 6 — Local
If alarm is transmitted to location(s) off premises, list where received _____

_____ *NFPA 72*, Chapter 8 — Remote Station
Telephone numbers of the organization receiving alarm:
Alarm _____
Supervisory _____
Trouble _____
If alarms are retransmitted to public fire service communications centers or others, indicate location and telephone numbers of the organization receiving alarm _____

Indicate how alarm is retransmitted _____

_____ *NFPA 72*, Chapter 8 — Proprietary
Telephone numbers of the organization receiving alarm:
Alarm _____
Supervisory _____
Trouble _____
If alarms are retransmitted to public fire service communications centers or others, indicate location and telephone numbers of the organization receiving alarm _____

Indicate how alarm is retransmitted _____

_____ *NFPA 72*, Chapter 8 — Central Station
Prime contractor _____
Central station location _____

Means of transmission of signals from the protected premises to the central station

McCulloh Multiplex One-way radio
 Digital alarm communicator Two-way radio Others

Means of transmission of alarms to the public fire service communications center

(a) _____

(b) _____

System location _____

NFPA 72, Chapter 9 — Auxillary

Type of connection: Local energy Shunt Parallel telephone

Location of telephone number for receipt of signals _____

2. RECORD OF SYSTEM INSTALLATION

(Fill out after installation is complete and wiring is checked for opens, shorts, ground faults, and improper branching but prior to conducting operational acceptance tests.)

This system has been installed in accordance with the NFPA standards as shown below and was inspected by _____ on _____, includes the devices shown in items 5 and 6, and has been in service since _____.

NFPA 72, Chapters 1 2 3 4 5 6 7 8 9 10 11 (circle all that apply)

NFPA 70, National Electrical Code®, Article 760

Manufacturer's instructions

Other (specify) _____

Signed _____ Date _____

Organization _____

3. RECORD OF SYSTEM OPERATION

Documentation in accordance with NFPA 72, Inspection Testing Form, Figure 10.6.2.3, is attached _____.

All operational features and functions of this system were tested by _____ date _____ and found to be operating properly in accordance with the requirements of:

NFPA 72, Chapters 1 2 3 4 5 6 7 8 9 10 11 (circle all that apply)

NFPA 70, National Electrical Code, Article 760

Manufacturer's instructions

Other (specify) _____

Signed _____ Date _____

Organization _____

4. SIGNALING LINE CIRCUITS

Quantity and class of signaling line circuits connected to system (see NFPA 72, Table 6.6.1):

Quantity _____ Style _____ Class _____

5. ALARM-INITIATING DEVICES AND CIRCUITS

Quantity and class of initiating device circuits (see NFPA 72, Table 6.5)

Quantity _____ Style _____ Class _____

MANUAL

(a) Manual stations Noncoded _____ Transmitters _____ Coded _____ Addressable _____

(b) Combination manual fire alarm and guard's tour coded stations _____

AUTOMATIC

Coverage: Complete _____ Partial _____
Selective _____ Nonrequired _____

(a) Smoke detectors _____ Ion _____ Photo _____ Addressable _____

(b) Duct detectors _____ Ion _____ Photo _____ Addressable _____

(c) Heat detectors _____ FT _____ RR _____ FT/RR _____ RC _____ Addressable _____

(d) Sprinkler waterflow indicators: Transmitters _____ Noncoded _____ Coded _____ Addressable _____

(e) The alarm verification feature is disabled _____ or enabled _____, changed from _____ seconds to _____ seconds.

(f) Other (list) _____

6. SUPERVISORY SIGNAL-INITIATING DEVICES AND CIRCUITS (use blanks to indicate quantity of devices)

GUARD'S TOUR

(a) _____ Coded stations

(b) _____ Noncoded stations

(c) _____ Compulsory guard's tour system comprised of _____ transmitter stations and intermediate stations

Note: Combination devices are recorded under 5(b), Manual, and 6(a), Guard's Tour.

SPRINKLER SYSTEM

Check if provided

(a) _____ Valve supervisory switches

(b) _____ Building temperature points

(c) _____ Site water temperature points

(d) _____ Site water supply level points

Electric fire pump

(e) _____ Fire pump power

(f) _____ Fire pump running

(g) _____ Phase reversal

Engine-driven fire pump

(h) _____ Selector in auto position

(i) _____ Engine or control panel trouble

(j) _____ Fire pump running

ENGINE-DRIVEN GENERATOR

(a) _____ Selector in auto position

(b) _____ Control panel trouble

(c) _____ Transfer switches

(d) _____ Engine running

Other supervisory function(s) (specify) _____

7. ANNUNCIATOR(S)

Number _____ Type _____ Location _____

8. ALARM NOTIFICATION APPLIANCES AND CIRCUITS

NFPA 72, Chapter 6 — Emergency Voice/Alarm Service

Quantity of voice/alarm channels _____ Single _____ Multiple _____

Quantity of speakers installed _____ Quantity of speaker zones _____

Quantity of telephones or telephone jacks included in system _____

Quantity and the class of notification appliance circuits connected to system (see NFPA 72, Table 6.7):

Quantity _____ Style _____ Class _____

Types and quantities of notification appliances installed

(a) Bells _____ With Visible _____

(b) Speakers _____ With Visible _____

(c) Horns _____ With Visible _____

(d) Chimes _____ With Visible _____

(e) Other: _____ With Visible _____

(f) Visible appliances without audible _____

9. SYSTEM POWER SUPPLIES

(a) Fire Alarm Control Panel Nominal voltage _____ Current rating _____
Overcurrent protection Type _____ Current rating _____
Location _____

(b) Secondary (standby)
Storage battery _____ Amp-hour rating _____
Calculated capacity to drive system, in hours _____
Engine-driven generator dedicated to fire alarm system _____
Location of fuel storage _____

(c) Emergency system used as backup to primary power supply _____
Emergency system described in NFPA 70, Article 700 _____

10. COMMENTS

Frequency of routine tests and inspections, if other than in accordance with the referenced NFPA standard(s)

System deviations from the referenced NFPA standard(s) _____

(signed) for installation contractor/supplier (title) (date)

(signed) for alarm service company (title) (date)

(signed) for central station (title) (date)

Upon completion of the system(s) satisfactory test(s) witnessed (if required by the authority having jurisdiction)

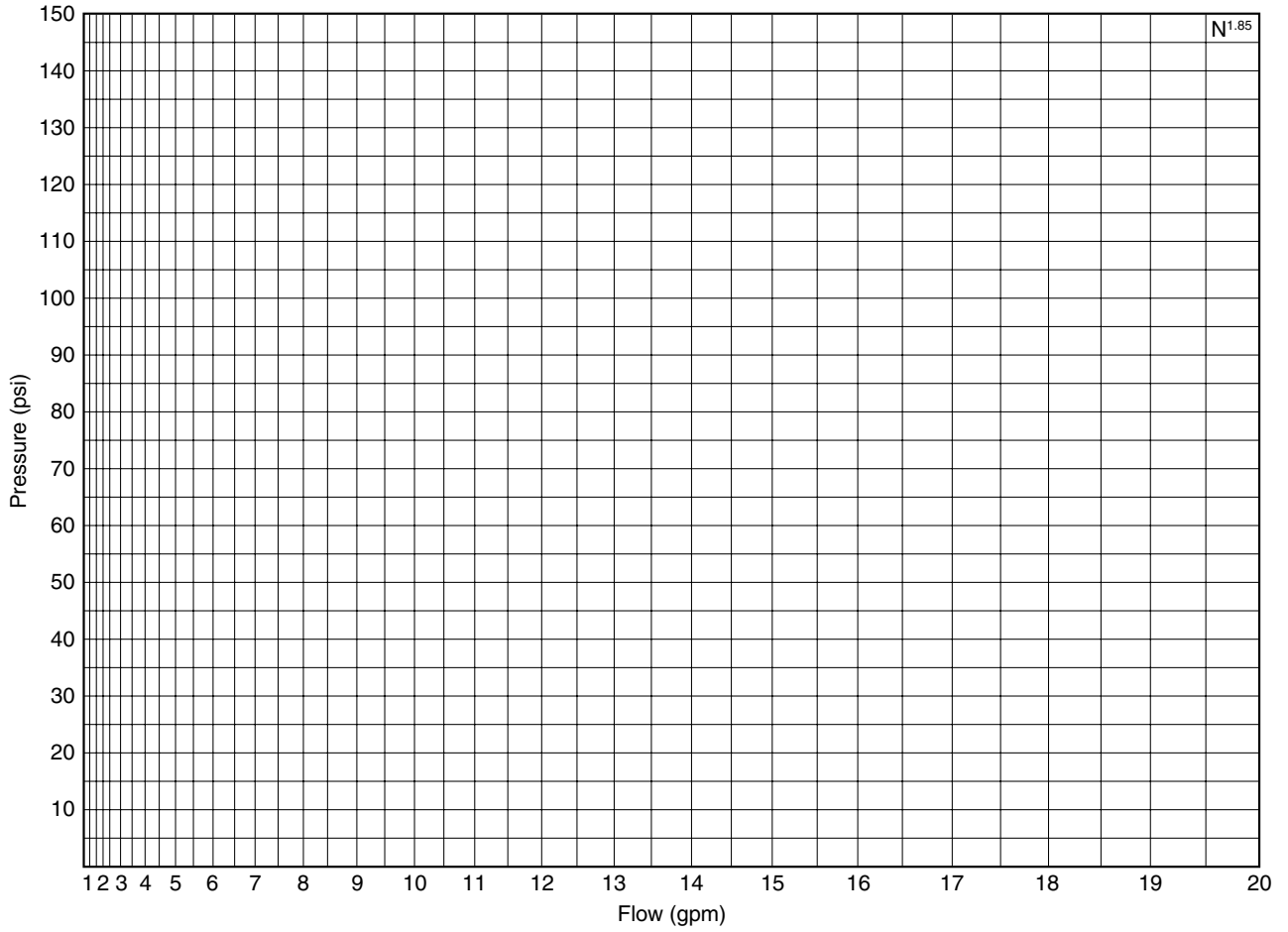
(signed) representative of the authority having jurisdiction (title) (date)

FIRE PUMPS FLOW AND PRESSURE RECORD

Project Name _____

Date _____ Inspector _____

System _____



Notes _____

HIGH-RISE STAIR TOWER SMOKE-CONTROL ACCEPTANCE TEST

Building name and address _____

Date _____

STAIR TOWER AND SYSTEM DESCRIPTION, EQUIPMENT AND DESIGN FEATURES

Stair tower identification _____ Location _____

Number of floors accessible by stair tower _____

Fan, equipment, and control location _____

Fan type _____ HP RPM CFM

Fan equipment circuit breaker and/or disconnect location _____

Fan supply air-intake location _____

Emergency power transfer switch location _____

Number of system injection points _____ Location _____

Number of system dampers _____ Type _____ Location _____

Number of system static sensors _____ Location _____

Number of system status indicators _____ Location _____

STAIR PRESSURIZATION SYSTEM OPERATION, METHOD OF ACTIVATION

Standpipe and/or sprinkler system main water flow Yes No FST* N/A

Standpipe riser (wet) system water flow Yes No FST N/A

Sprinkler (wet) system floor and/or areas/zones water flow Yes No FST N/A

Sprinkler (dry pipe) system water flow Yes No FST N/A

Sprinkler (preaction) system detection device Yes No FST N/A

Sprinkler (preaction) system water flow Yes No FST N/A

Smoke (area detection) detector Yes No FST N/A

Smoke (stair tower) detector Yes No FST N/A

Smoke (HVAC supply air) detector Yes No FST N/A

Smoke (HVAC return air) detector Yes No FST N/A

Smoke (stair pressurization supply air fan) detector Yes No FST N/A

Heat detector Yes No FST N/A

Kitchen hood suppression system Yes No FST N/A

Fire suppression system Yes No FST N/A

Manual pull boxes Yes No FST N/A

Manual control Yes No FST N/A

System fan control equipment circuitry (impairment) supervision Yes No FST N/A

*FST = Time it takes to start fan on actuation of initiation device.

Comments _____

HYDRANT FLOW TEST REPORT

Location _____ Date _____

Test made by _____ Time _____

Representative of _____

Witness _____

Purpose of test _____

Consumption rate during test _____

If pumps affected test, indicate pumps operating _____

Flow hydrants: _____ **A₁** _____ **A₂** _____ **A₃** _____ **A₄** _____

Size nozzle _____

Pitot reading _____

Discharge coefficient _____ Total gpm

gpm _____

Static B _____ psi Residual B _____ psi

Projected results: @20 psi residual _____ gpm or @ _____ psi residual _____ gpm

Remarks _____

Location map: Show line sizes and distance to next cross-connected line. Show valves and hydrant branch size. Indicate north. Show flowing hydrants and label as A1, A2, A3, A4. Show location of static and residual and label as B.

Indicate B: Hydrant _____ Sprinkler _____ Other (identify) _____

HYDRANT FLOW TEST REPORT

Location _____ Date _____

Test made by _____ Time _____

Representative of _____

Witness _____

Purpose of test _____

Consumption rate during test _____

If pumps affected test, indicate pumps operating _____

Flow hydrants: _____ **A₁** _____ **A₂** _____ **A₃** _____ **A₄** _____

Size nozzle _____

Pitot reading _____

Discharge coefficient _____ Total gpm

gpm _____

Static B _____ psi Residual B _____ psi

Projected results: @20 psi residual _____ gpm or @ _____ psi residual _____ gpm

Remarks _____

Location map: Show line sizes and distance to next cross-connected line. Show valves and hydrant branch size. Indicate north. Show flowing hydrants and label as A1, A2, A3, A4. Show location of static and residual and label as B.

Indicate B: Hydrant _____ Sprinkler _____ Other (identify) _____

SMOKE-CONTROL SYSTEMS PERFORMANCE TEST

Project Name _____

Date _____ **Inspector** _____

System _____

Y = Satisfactory N = Unsatisfactory (explain) N/A = Not applicable

	Record Information	Notes
Ensure that system is in normal mode.		
Measure and record:		
Wind speed		
Wind direction		
Outside temperature		
Test system normal power.		
Test system emergency power.		
Confirm that for each input there is a designated output.		
Demonstrate complete smoke-control system sequence:		
Normal mode		
Automatic smoke control from first alarm		
Manual override of normal and automatic modes		
Return to normal		
Confirm that fire alarm inputs produce correct outputs.		
Establish consistent method for recording pressure differences.		
Confirm that introduction of untempered air will not damage equipment.		
Confirm that weather conditions (freezing temperatures) will not damage equipment.		

Notes _____

CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR ABOVEGROUND PIPING

Standpipe System NFPA 14

PROCEDURE

Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners, and contractor. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authority's requirements or local ordinances.

Property name	Date
---------------	------

Property address _____

Plans	Accepted by approving authorities (names) _____		
	Address _____		
	Installation conforms to accepted plans?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Equipment used is approved or listed? If no, explain deviations.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Type of System	Automatic-dry <input type="checkbox"/> Yes
	Automatic-wet <input type="checkbox"/> Yes
	Semiautomatic-dry <input type="checkbox"/> Yes
	Manual-dry <input type="checkbox"/> Yes
	Manual-wet <input type="checkbox"/> Yes
	Combination standpipe/sprinkler <input type="checkbox"/> Yes
	Other (if yes, explain) <input type="checkbox"/> Yes

Water Supply Data Used for Design and As Shown on Plans	Fire pump date _____		
	Manufacturer _____ Model _____		
	Type: <input type="checkbox"/> Electric <input type="checkbox"/> Diesel <input type="checkbox"/> Other (explain) _____		
	Rated, gpm _____	Rated, psi _____	Shutoff, psi _____

Water Supply Source Capacity, Gallons	<input type="checkbox"/> Public waterworks system <input type="checkbox"/> Storage tank <input type="checkbox"/> Gravity tank <input type="checkbox"/> Open reservoir
	<input type="checkbox"/> Other (explain) _____

If Public Waterworks System:	Static, psi _____ Residual, psi _____ Flow in, gpm _____		
-------------------------------------	--	--	--

Have Copies of the Following Been Left on the Premises?	<input type="checkbox"/> System components instructions <input type="checkbox"/> Care and maintenance of system <input type="checkbox"/> NFPA 25		
	<input type="checkbox"/> Copy of accepted plans <input type="checkbox"/> Hydraulic data/calculations		

Supplies Building(s)	Main waterflow shutoff location _____	
	Number of standpipe risers _____	
	Do all standpipe risers have base of riser shutoff valves? <input type="checkbox"/> Yes <input type="checkbox"/> No	

Valve Supervision	<input type="checkbox"/> Locked open <input type="checkbox"/> Sealed and tagged <input type="checkbox"/> Tamperproof switch <input type="checkbox"/> Other		
	If other, explain. _____		

Pipe and Fittings	Type of pipe _____	
	Type of fittings _____	

Backflow Preventor	<input type="checkbox"/> Double check assembly Size _____ Make and model _____	
	<input type="checkbox"/> Reduced-pressure device	

CONTROL VALVE DEVICE

Type	Size	Make	Model

Time to trip through remote hose valve _____ Min _____ Sec Water pressure _____ Air pressure _____
 Time water reached remote hose valve outlet _____ Min _____ Sec Trip point air pressure _____ psi
 Alarm operated properly? Yes No If no, explain. _____

Time water reached remote hose valve outlet _____ Min _____ Sec
 Hydraulic activation Yes
 Electric activation Yes
 Pneumatic activation Yes
 Make and model of activation device _____
 Each activation device tested? Yes No If no, explain. _____

Each activation device operated properly? Yes No If no, explain. _____

PRESSURE-REGULATING DEVICE

Location & Floor	Model	Nonflowing (psi)		Flowing (psi)		gpm
		Inlet	Outlet	Inlet	Outlet	

All hose valves on system operated properly? Yes No If no, explain. _____

Test Description	<p><i>Hydrostatic:</i> Hydrostatic tests shall be made at not less than 200 psi (13.6 bar) for 2 hours or 50 psi (3.4 bar) above static pressure in excess of 150 psi (10.2 bar) for 2 hours. Differential dry pipe valve clappers shall be left open during test to prevent damage. All aboveground piping leakage shall be stopped.</p> <p><i>Pneumatic:</i> Establish 40 psi (2.7 bar) air pressure and measure drop, which shall not exceed 1 psi (0.1 bar) in 24 hours. Test pressure tanks at normal water level and air pressure and measure air pressure drop, which shall not exceed 1 psi (0.1 bar) in 24 hours.</p>		
Tests	All piping hydrostatically tested at _____ psi (____ bar) for _____ hr		If no, state reason.
	Dry piping pneumatically tested? <input type="checkbox"/> Yes <input type="checkbox"/> No		
	Equipment operates properly? <input type="checkbox"/> Yes <input type="checkbox"/> No		
	Do you certify as the standpipe contractor that additives and corrosive chemicals, sodium silicate, or derivatives of sodium silicate, brine, or other corrosive chemicals were not used for testing systems or stopping leaks? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Drain test	Reading of gauge located near water supply test connection _____ psi (____ bar)		Residual pressure with valve in test connection open wide _____ psi (____ bar)
	Underground mains and lead-in connections to system risers flushed before connection made to standpipe piping.		
Verified by copy of the U form no. 85b? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other Explain:			
Flushed by installer of underground standpipe piping? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Blank Testing	Number used	Locations	Number removed
Welding	Welded piping <input type="checkbox"/> Yes <input type="checkbox"/> No		
	If yes . . .		
	Do you certify as the standpipe contractor that welding procedures comply with the requirements of at least AWS D10.9, Level AR-3?		<input type="checkbox"/> Yes <input type="checkbox"/> No
	Do you certify that the welding was performed by welders qualified in compliance with the requirements of at least AWS D10.9, Level AR-3?		<input type="checkbox"/> Yes <input type="checkbox"/> No
Do you certify that welding was carried out in compliance with a documented quality control procedure to ensure that all discs are retrieved, that openings in piping are smooth, that slag and other welding residue are removed, and that the internal diameters of piping are not penetrated?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Cutouts (Discs)	Do you certify that you have a control feature to ensure that all cutouts (discs) are retrieved?		<input type="checkbox"/> Yes <input type="checkbox"/> No
Hydraulic Data Nameplate	Nameplate provided? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, explain.		
Remarks	Date left in service with all control valves open:		
Name of Sprinkler/Standpipe Contractor	Name of contractor _____		
	Address _____		
	State license number (if applicable) _____		
System Operating Test Witnessed by	Property owner _____	Title _____	Date _____
	Sprinkler/standpipe contractor _____	Title _____	Date _____
	Approving authorities _____	Title _____	Date _____
Additional Explanation and Notes			

WET CHEMICAL EXTINGUISHING SYSTEMS ACCEPTANCE INSPECTION

Project Name _____

Date _____ **Inspector** _____

System _____

Y = Satisfactory **N** = Unsatisfactory (explain) **N/A** = Not applicable

Note: Pressures and weights are satisfactory if equal to or greater than minimums in Form 9E

	Acceptance?	If N, Explanation
Wet chemical cylinder pressure, psi (bar) (if stored-pressure type)		
Expellant gas cartridge (if expellant gas type):		
Pressure of nitrogen, psi (bar)		
Weight of carbon dioxide, lb (kg)		
Components are undamaged:		
Detectors or fusible links		
Expellant gas cylinder(s)		
Wet chemical containers		
Releasing devices		
Piping		
Nozzles		
Alarms		
Auxiliary equipment		
Damaged components replaced or hydrostatically tested		
System piping tested for obstructions		
System piping not obstructed		
Fusible link installed		

Notes _____

WET CHEMICAL EXTINGUISHING SYSTEMS ACCEPTANCE INSPECTION

Project Name _____

Date _____ **Inspector** _____

System _____

Y = Satisfactory **N** = Unsatisfactory (explain) **N/A** = Not applicable

Note: Pressures and weights are satisfactory if equal to or greater than minimums in Form 9E

	Acceptance?	If N, Explanation
Wet chemical cylinder pressure, psi (bar) (if stored-pressure type)		
Expellant gas cartridge (if expellant gas type):		
Pressure of nitrogen, psi (bar)		
Weight of carbon dioxide, lb (kg)		
Components are undamaged:		
Detectors or fusible links		
Expellant gas cylinder(s)		
Wet chemical containers		
Releasing devices		
Piping		
Nozzles		
Alarms		
Auxiliary equipment		
Damaged components replaced or hydrostatically tested		
System piping tested for obstructions		
System piping not obstructed		
Fusible link installed		

Notes _____

WATER-BASED FIRE PROTECTION SYSTEMS FINAL CHECKLIST

Project Name _____

Contract Number _____

Date and time of Acceptance Tests _____

AHJ notified of testing time _____ (Print name.)

Owner's rep notified of testing time _____ (Print name.)

Others notified of testing times _____ (Print name(s).)

Complete and sign:

Contractor's Material and Test Certificate for Aboveground Piping Yes No N/A

Contractor's Material and Test Certificate for Underground Piping Yes No N/A

- Design information matches design on plans and as-built drawings.
- Adequate heat is supplied in all riser rooms to maintain 40°.
- Deviations from standard acceptance testing and/or problems were corrected during acceptance testing (list): _____

- Interface between system activation and building automatic systems is successful. List systems: _____

- Numbered test blanks, if used, were removed and each is accounted for.
- NFPA 25 was reviewed with owner's rep. and copy given to: _____
- Training class was scheduled.
Date _____ Time _____ Location _____
- First-year inspection, testing, and maintenance timeline was given to: _____

SPRINKLER SYSTEM PUNCH LIST

- Hydraulic design information is posted at riser.
- Riser information indicates area of building protected by each riser.
- Multiple risers are numbered and numbering is consistent with inspection forms.
- Signs are located on all control valves, auxiliary drains, and inspector's test connections.
- All low-point drains are clearly indicated and accessible.
- Information at riser includes number and location of all sectional valves and auxiliary/low-point drains.
- Spare heads are located in cabinet at riser; sprinkler wrench is included.
- Sprinkler guards are where needed.
- Pipe identification is provided where required.
- Escutcheons are provided where needed and are secured properly.
- All wall and/or floor penetrations by pipe are properly packed.
- A set of as-built drawings was given to owner's rep.

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

OVEN DRYER

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date

_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date

_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer product data sheet		
INSTALLATION		
Label permanently affixed		
Temperature, pressure, gages and sensors installed		
Equipment power requirements verified and installed		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for components and unit		
Safeties in place and operable		
Control system interlocks hooked up and functional		
All control devices and wiring complete		
Door latch / seal verified		
Tray slide function verified		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

PIPE INSULATION

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Pipe coated per specifications		
Proper density material installed		
Proper thickness insulation installed		
Insulation properly installed, mechanical fasteners, clean dry pipe, etc		
Insulation vapor barrier properly installed		
Hard insets at supports installed per specifications		
Shields at support points		
Fittings, valves, etc. properly insulated		
Insulation protective jacket per specifications		
Insulation vapor stops per specifications and manufacturers data		
Insulation primed and painted consistent per specifications		
Proper sealant / firestopping at penetrations		
Labeling installed per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PIPE PRESSURE TEST REPORT

Pipe Test No. _____

Identification of System Tested: _____

Actual Location of Portion(s) of System Tested: _____

Spec. Section: _____ Detail/Drawing Number: _____

Specified Performance Criteria: _____

Description of Test Procedure: _____

CONTRACTOR CERTIFICATION OF PERFORMANCE:

Actual Performance Confirmed by Test: _____

Prime / General Contractor

I hereby certify that the above described system, or identified portion of the system, has been tested as indicated above and found to comply with the contract documents.

Signature of Contractor

Printed Name

Date

Signature of Subcontractor

Printed Name

Date

Test Witnessed by UT Health:

Results of Test Acceptable? YES NO Retest Required? YES NO

Owners Representative

Printed Name

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

PLASTER

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's product data, performance criteria		
Finish & color samples		
Mockup installed		
INSTALLATION		
Above soffit / in-wall work complete		
Blocking installed		
Proper metal framing and lath placement		
Installation of control joints		
Flashing installation		
Isolation from control/expansion joints		
Edge trim placement and alignment		
Proper placement of, plaster rings, access panels, etc.		
Uniform plaster mix		
Protection of adjacent work		
Keying of scratch coat		
Proper thickness of brown coat within tolerances		
Uniform finish coat coloration, uniform texture		
Verify finish plaster within true plane tolerances		
FINAL		
Cleaning		
Removal of finish coat overspray		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

PLUMBING FIXTURE – Dom. Hot Water Temperature

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

PLUMBING FIXTURE TEST

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

PLUMBING PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Welders certificates		
INSTALLATION		
Underground piping restraints coated per specifications		
Underground thrust blocks properly placed		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Pipe ID tape installed in trench per contract documents		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipe roller supports installed		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Isolation valves installed		
Cleanouts installed		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned (report attached)		
10% of strainers and Owner selected low point drains opened and witnessed by Owner to be clean. (list points checked)		
Piping hydrostatically tested per specifications (report attached)		
Water treatment report submitted according to contract documents		
Heat tracing wire installed		
Valves checklists complete		
Valve labels permanently affixed		
Pipe painted / coated per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

PROJECTION SCREEN

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Unit secured / supported per contract documents		
Limit switches set and adjusted		
Operation (smooth)-up		
Operation (smooth) down		
Motor/drive accessible		
Lubrication completed		
Motor access verified		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

PUMP

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
O&M Manuals		
Sequence of Operations verified		
OPERATION		
VFD operation verified (report attached)		
The HOA switch properly activates and deactivates the unit		
Pump rotation verified correct		
No unusual noise or vibration		
No leaking apparent around fittings		
Measure line to line voltage phase imbalance for each pump: (%Imbalance = 100 x (avg. - lowest) / avg.)		
Record imbalance of each pump (report attached)		
Record full load running amps for each pump. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented with all variations documented		
Specified point-to-point checks have been completed and documentation record submitted for this system		
<u>Pump speed.</u> Check the amperage of the circulating pumps. Amperage should be less than the rated amps. Rated = _____ SP-1[_____] SP-2[_____]		
Change the schedule so the pumps should be OFF. Pumps turn OFF.		
Schedule the pumps to be ON. Return schedule to normal. Pumps start. Schedule returned to normal		

Sensor and Actuator Calibration

All field-installed pressure sensors and gages on this piece of equipment shall be calibrated using the methods and tolerances given in the Calibration and Leak-by Test Procedures document.

All test instruments shall have certified calibration during past 12 months: **Y/N**____. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Sensor or Actuator & Location	Location OK	1 st Gage or BAS Value	Instr. Meas'd Value	Final Gage or BAS Value	Pass Y/N?

Gage reading = reading of the permanent gage on the equipment. BAS = building automation system. Instr. = testing instrument. Visual = actual observation. The Contractor’s own sensor check-out sheets may be used in lieu of the above, if the same recording fields are included and the referenced procedures are followed.

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner’s Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner’s Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date

_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date

_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer product data sheet		
INSTALLATION		
Label permanently affixed		
Pumps in place and properly grouted		
Vibration isolation devices installed and functional		
Pressure and flow gages and sensors installed		
Pipe fittings complete and pipes properly supported		
Valves properly tagged		
Y-strainer baskets clean		
Suction strainers in place		
Block valves in place		
Drain lines to floor drain installed		
Check Valves installed (discharge side):		
Bearings lubricated		
Pump alignment verified (report attached)		
Impeller rotation: C / CCW (viewed from drive side).		
VFD/Starter/Transfer switch/Disconnects installed		
High/Temp safety installed		
All control devices, pneumatic tubing and wiring complete		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

RADIO ISOTOPE FUME HOOD

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Manf. _____

Model # _____

Serial # _____

CFM _____

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Liner as specified		
Work Surface as specified		
Cup Sink as specified		
Baffle Adjustment as specified		
Water fixture connected and operable		
Gas fixture connected and operable		
Vacuum fixture connected and operable		
Air fixture connected and operable		
Plumbing waste line connected		
Fire and balance dampers installed (if required)		
Backdraft dampers installed, per drawings, and operate freely		
Flow monitor installed		
Exhaust collar as specified		
Interior access panels w/ gaskets as specified		
Sash Stop as specified (manual and automatic reset)		
Sash Design as specified, including safety glass, horiz/vert w/ counter balance, (verify sash operation)		
ELECTRICAL		
Electrical connections complete		
Disconnect switch installed		
Fan overload heaters in place		
Hood Outlets as specified		
Interior Hood lighting as specified		
Alarm as specified and verified (report attached)		
Fan rotation correct		
Electrical interlocks verified		
Any fan status indicators functioning		
No unusual vibration or and noise		
Fuse Size _____		
Heater Size _____		
Starter Size _____		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

RECOVERED WATER PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Underground thrust blocks properly placed		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Pipe ID tape installed in trench per contract documents		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Isolation valves installed		
Cleanouts installed		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned (report attached)		
Piping hydrostatically tested per specifications (report attached)		
Heat tracing wire installed		
Valves checklists complete		
Valve labels permanently affixed		
Pipe painted / coated per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

RECOVERED WATER PIPING SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
Any and all punchlist items corrected		
Piping system properly flushed and cleaned (report attached) Y / N		
Cross-contamination dye test performed (report attached) Y / N		
Pipe video inspected per specifications (report attached) Y / N		
Water purity verified (report attached) Y / N		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

REFRIGERANT PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Flushing and cleaning plan, including staging of multiple floors		
INSTALLATION		
Pipe fittings complete and pipes properly supported		
Pipe Size consistent with contract documents		
Pipes properly labeled		
Wall/Floor penetrations sealed in accordance with contract documents		
Pipes properly insulated		
Suction risers and traps installed per manufacturers recommendations		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned and temporary piping removed (report attached)		
Piping joints brazed with "Stay-Silv" or approved equal (95-5 prohibited)		
Piping pressure tested per specifications (report attached)		
Suction Line Filters installed		
No leaking apparent around fittings		
Isolation Valves installed		
Valve labels permanently affixed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

ROLL UP DOOR

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Manual operation (option) included		
Manual operation verified		
Auto-reverse/pressure sensor verified		
Bottom edge gasket		
Unit secured / supported per contract documents		
Limit switches set and adjusted		
Operation (smooth)-up		
Operation (smooth) down		
Motor/drive accessible		
Lubrication completed		
Fused fire link proper temperature rating		
Motor access verified		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

SANITARY SEWER INSPECTION REPORT

Date _____ Project _____ A Nearby Building is _____

Camera Entrance Manhole # _____ MH Depth _____ MH Material _____

MH Condition _____ Start Time _____

Pipe Size _____ Pipe Type _____ Pipe Condition _____

Depth of Flow (inches) _____ Direction of Pull is _____ stream

Camera Exit Manhole # _____ MH Depth _____ MH Material _____

MH Condition _____ Start Time _____

Measurements Begin at MH # _____ Skid Size _____ inch

Tape Counter # Begin _____ End _____

Operator _____ Crew _____, _____

Company _____

General Remarks _____

Tape Counter	Feet	Tie-In (R-L-T)	Circle Break (1-4)	Long Break (1-4)	Multiple Break (1-4)	Missing Pipe (1-4)	Roots (1-4)	Grease (1-4)	Sediment (1-4)	Infiltration (1-4)	Offset Joint (1-4)	Separated Joint (1-4)	Pipe Wall Failure (1-4)	Sag Depth (inches)	Other (1-4)	Remarks

REPORT LEGEND

NOTE: Use letters / numbers to indicate status of issue in columns.

Tie-in (branch line Tie-in direction)

- R -Right
- L - Left
- T - Top

Indicate approximate size of branch line in remarks column

Breaks

Circle Break

- 1=circle crack
- 2=open circle break
- 3=bad circle break, pipe is separate or offset
- 4=severe circle break, pipe is separate and offset

Long Break

- 1=long crack
- 2=open long break
- 3=bad, separate long break
- 4=severe, separate and offset long break. Pipe is collapsible

Multiple Breaks

- 1=multiple cracks
- 2=open multiple breaks
- 3=bad multiple breaks, but stable
- 4=severe multiple breaks, pipe is collapsible or collapsed

Missing Pipe

- 1=small hole in pipe, small piece of pipe is missing
- 2=medium piece (less than ¼ of the circumference of the pipe)
- 3=missing a large piece of pipe, with soil exposed
- 4=missing a whole section of pipe

Roots

- 1=light roots
- 2=medium roots
- 3=heavy roots (example: enough roots to block more than half of a 6" or 8" line)
- 4=severe root problem, camera cannot pass

Grease

- 1=light grease
- 2=medium grease
- 3=heavy grease
- 4=severe grease problem, camera cannot pass

Sediment

- 1=light sediment, sand and rocks
- 2=medium sediment, sand and rocks
- 3=heavy sediment, sand and rocks
- 4=severe sediment problem, camera cannot pass

Infiltration

- 1=dripping infiltration
- 2=continuous infiltration
- 3=heavy, bad infiltration
- 4=severe, pouring infiltration

Offset Joint

- 1=joint slightly offset
- 2=joint is moderately offset
- 3=joint is severely offset, but camera can pass
- 4=camera cannot pass offset joint

Separated Joint

- 1=joint is slightly separated
- 2=joint is moderately separated
- 3=joint is severely separated
- 4=camera cannot pass separated joint

Pipe Wall Failure

- 1=light corrosion or aggregate visible in pipe wall
- 2=medium corrosion or aggregate visible in pipe wall
- 3=heavy corrosion or aggregate visible in pipe wall
- 4=severely deteriorated pipe, wall is worn out with soil exposed

Other

- 1=obstruction in pipe
- 2=concrete in pipe
- 3=branch line protruding into pipe
- 4=gasket hanging into pipe

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

SANITARY WASTE PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Underground piping restraints coated per specifications		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Manhole connections verified as correct		
Drain line profile verified		
Pipe ID tape installed in trench per contract documents		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipes properly labeled		
Cleanouts installed and accessible		
Flushing and cleaning plan submitted and approved		
Piping pressure tested per specifications (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

SANITARY WASTE PIPING SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
Any and all punchlist items corrected		
Piping system properly flushed and cleaned (report attached) Y / N		
Cross-contamination dye test performed (report attached) Y / N		
Pipe video inspected per specifications (report attached) Y / N		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

INTEGRATED SYSTEM TEST REPORT

SMOKE EVACUATION SYSTEM

Test # _____

All system associated with this test/demonstration have been completed and all Functional Test Checklists documenting this are attached. Prior integrated performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Tests performed with this IST are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
All smoke dampers installed		
Air/Signal provided to all damper motors		
Duct access doors installed at each damper		
An SAV (with pressure gauge) installed in control cabinet for each of the following		
One for each set of cold deck dampers per floor		
One for each set of hot deck and mixed air dampers per floor		
Two for each set of return air dampers per floor at chase		
One for each return air beyond chase		
One for all T-Stats per floor		
Outside air		
One for return air & smoke purge OA to hot deck		
Relief air		
All SAV's wired to Fire Alarm System		
All duct detectors installed and wired to AHU and Fan equipment annunciator panels and fire alarm		
Hot deck "Smoke purge/Freeze override" wired to F/A relay per detail		
Verify areas requiring negative pressure differential are maintained during smoke evac operation.		
Verify all exit doors from all rooms comply with opening force requirements during smoke evac operation		

Typical system operation (Verify with project specifications)

Upon activation of the fire sprinkler or smoke detection system the F/A system will identify the affected floor (**Alarm Floor**), and initiate the following:

- 1) Enable AHU_____ (hot deck) and RAF_____ (return air) fans to run. In addition, the cold deck AHU_____ shall be shut-down.
- 2) Open" the return air smoke dampers on the **Alarm Floor**.
- 3) "Close" the hot & cold supply air smoke dampers on the **Alarm Floor**.
- 4) "Close" the return air and cold supply air smoke dampers on the **Floor Above** the **Alarm Floor**.
- 5) "Close" the return air and cold supply air smoke dampers on the **Floor Below** the **Alarm Floor**.

- 6) “Open” the hot supply air smoke dampers and enable the T-stat SAV’s on the **Floor Above the Alarm Floor.**
- 7) “Open” the hot supply air smoke dampers and enable the T-stat SAV’s on the **Floor Below the Alarm Floor.**
- 8) “Open” the smoke purge outside air damper to allow fresh air to the hot deck AHU ____.
- 9) “Close” all other outside air and return air dampers. (These are usually in the air handler mechanical room). NOTE: This will cause relief damper to “open” for smoke ventilation of **Alarm Floor.**

Verify correct operation of the smoke evacuation system by performing the following demonstration on each floor of the facility. Contractor shall provide staff to visually verify each device activation and record same on this form.

SMOKE DAMPERS/SAV/FACP OPERATIONAL CHECK:

Upon Fire Alarm activation visually verify the following:

AHU_____ (cold deck) “shuts down”: Y N
 F/A relay energized Y N (NC)

AHU_____ (hot deck) “speeds up”: Y N
 F/A relay (no change) Y N (NC)

RA (return air) “speeds up” Y N
 F/A relay (no change) Y N (NC)

Hot Deck “smoke purge/freeze override”

F/A relay energized: Y N (NO)

NC Outside air damper “closes”: Y N

NO Return air damper to AHU (cold deck) “closes”: Y N

NC Return air damper to AHU (hot deck) “closes” **AND**

NO Outside air damper (smoke purge air to hot deck) “opens” Y N

F/A relay energized: Y N (NC)

NC Relief damper “opens”: Y N

Stairwell pressurization fan #_____ “starts”: Y N Damper “opens”: Y N

F/A relay energized: Y N (NO)

Stairwell pressurization fan #_____ “starts”: Y N Damper “opens”: Y N

F/A relay energized: Y N (NO)

Exhaust Fan # _____ “stops”: Y N (Interlocked with SPF-1)

ALARM FLOOR

Simulate a fire alarm activation on this floor # _____

All RA dampers are "OPEN" on this floor Y N

SAV-1 de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

SAV-2 [no change] Y N (EP #: _____)

F/A relay [no change] Y N (NC)

All SA cold dampers are "CLOSED" on this floor_ Y N

SAV de-energized_ Y N (EP #: _____)

F/A relay energized_ Y N (NC)

All SA hot & MA dampers are "CLOSED" on this floor_ Y N

SAV energized Y N (EP #: _____)

F/A relay energized Y N (NC)

FLOOR # ABOVE = _____

All RA dampers are "CLOSED" on this floor Y N

SAV-1 de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

SAV-2 de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

All SA cold dampers are "CLOSED" on this floor Y N

SAV de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

All SA hot & MA dampers are "OPEN" on this floor Y N

SAV [no change] Y N (EP #: _____)

F/A relay [no change] Y N (NC)

T-Stat SAV de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

FLOOR # BELOW = _____

All RA dampers are “CLOSED” on this floor Y N

SAV-1 de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

SAV-2 de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

All SA cold dampers are “CLOSED” on this floor Y N

SAV de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

All SA hot dampers are “OPEN” on this floor Y N

SAV [no change] Y N

F/A relay [no change] Y N (NC)

T-Stat SAV de-energized Y N (EP #: _____)

F/A relay energized Y N (NC)

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner’s Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner’s Representative / Commissioning Authority

Date

Project Name _____

OFPC Project # _____

SPARE KEY SCHEDULE

<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>DATE RECEIVED</u>
Irrigation Controller	_____	_____
Access Doors: Ceiling:	_____	_____
Wall:	_____	_____
Waste Paper Disposal:	_____	_____
Paper Towel Dispenser:	_____	_____
Sanitary Napkin Dispenser:	_____	_____
Millwork: Doors:	_____	_____
Drawers:	_____	_____
Master:	_____	_____

[Provide supplemental list if more than one type of key is required for the millwork in the building. Indicate room number and east, west, north or south location within the room or piece mark number if applicable.]

Operable partitions:	_____	_____
Knox Box:	_____	_____
Elevator: Fireman:	_____	_____
Cab Panel:	_____	_____
Access Door:	_____	_____
VFD's:	_____	_____
Electrical Panels:	_____	_____
Electrical Switchgear:	_____	_____
Doors:	_____	_____
Electrical Switches:	_____	_____
Fire Alarm Control Panel:	_____	_____
Fire Alarm Power Supply	_____	_____
Panels:	_____	_____
Security Panels:	_____	_____
Telecommunication Panels:	_____	_____
BAS Panels:	_____	_____
<u>Miscellaneous:</u>	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

<u>Miscellaneous</u>	<u>QUANTITY</u>	<u>DATE RECEIVED</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

All of the above listed keys have been verified as correct in quality and quantity. All keys have been transmitted to the Owner.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

STAIRWELL PRESSURIZATION FAN

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

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_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
The HOA switch properly activates and deactivates the unit		
Fan rotation verified as correct		
Vibration within tolerances (report attached) Y / N		
Verify noise dB within tolerances		
Verified door pull/push force is within tolerances		
TAB firm verified pressure delta (report attached) Y / N		
Record full load running amps for fan. rated FL amps x srvc factor = (Max amps)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached) Y / N		
VFD operation verified (report attached) Y / N		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

STAIRWELL PRESSURIZATION FAN

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Vibration isolators installed – shipping blocks removed		
Equipment guards installed		
Pulleys aligned		
PolyChain or Vee Belt: Belt		
Belt tension correct		
Sheave size/number _____		
Plenums clear of debri		
Fan wheel to shaft bolts torque properly		
Fans rotate freely		
Alignment check: Fan sheave to motor sheave: _____ degrees (0° ± 0°)		
Bearings lubricated		
SSTL lube lines installed		
Ductwork connected with flex connections		
Backdraft dampers installed, per drawings, and operate freely		
Duct system complete (report attached)		
Electrical connections complete		
Disconnect switch installed		
Overload heaters in place		
Control connections complete		
VFD connected and operational (report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

STEAM AUTOCLAVE

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

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- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
Air gap at floor drain		
Verify noise dB within tolerances		
No leaking apparent around fittings		
Internal operating temperature within tolerances		
Door seal correct		
Door and shelving - proper operation		
Specified sequences of operation and operating schedules have been implemented and verified (report attached)		
Specified point-to-point checks have been completed (report attached) Y / N		
Equipment instrumentation functions properly		
Purity of system verified (report attached) Y / N		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

STEAM / CONDENSATE PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Underground piping restraints coated per specifications		
Underground thrust blocks properly placed		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Pipe ID tape installed in trench per contract documents		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
Pipe roller supports installed		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
Traps installed per contract documents		
Isolation valves installed		
Schedule 80 pipe installed for high pressure steam		
PRV station installed per contract documents		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned (report attached)		
10% of strainers and Owner selected low point drains opened and witnessed by Owner to be clean. (list points checked)		
Piping hydrostatically tested per specifications (report attached)		
Water treatment report submitted according to contract documents		
Heat tracing wire installed		
Valves checklists complete		
Valve labels permanently affixed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

STORM SEWER INSPECTION REPORT

Date _____ Project _____ A Nearby Building is _____

Camera Entrance Manhole # _____ MH Depth _____ MH Material _____

MH Condition _____ Start Time _____

Pipe Size _____ Pipe Type _____ Pipe Condition _____

Depth of Flow (inches) _____ Direction of Pull is _____ stream

Camera Exit Manhole # _____ MH Depth _____ MH Material _____

MH Condition _____ Start Time _____

Measurements Begin at MH # _____ Skid Size _____ inch

Tape Counter # Begin _____ End _____

Operator _____ Crew _____, _____

Company _____

General Remarks _____

Tape Counter	Feet	Tie-In (R-L-T)	Circle Break (1-4)	Long Break (1-4)	Multiple Break (1-4)	Missing Pipe (1-4)	Roots (1-4)	Grease (1-4)	Sediment (1-4)	Infiltration (1-4)	Offset Joint (1-4)	Separated Joint (1-4)	Pipe Wall Failure (1-4)	Sag Depth (inches)	Other (1-4)	Remarks

REPORT LEGEND

NOTE: Use letters / numbers to indicate status of issue in columns.

Tie-in (branch line Tie-in direction)

- R -Right
- L - Left
- T - Top

Indicate approximate size of branch line in remarks column

Breaks

Circle Break

- 1=circle crack
- 2=open circle break
- 3=bad circle break, pipe is separate or offset
- 4=severe circle break, pipe is separate and offset

Long Break

- 1=long crack
- 2=open long break
- 3=bad, separate long break
- 4=severe, separate and offset long break. Pipe is collapsible

Multiple Breaks

- 1=multiple cracks
- 2=open multiple breaks
- 3=bad multiple breaks, but stable
- 4=severe multiple breaks, pipe is collapsible or collapsed

Missing Pipe

- 1=small hole in pipe, small piece of pipe is missing
- 2=medium piece (less than ¼ of the circumference of the pipe)
- 3=missing a large piece of pipe, with soil exposed
- 4=missing a whole section of pipe

Roots

- 1=light roots
- 2=medium roots
- 3=heavy roots (example: enough roots to block more than half of a 6" or 8" line)
- 4=severe root problem, camera cannot pass

Grease

- 1=light grease
- 2=medium grease
- 3=heavy grease
- 4=severe grease problem, camera cannot pass

Sediment

- 1=light sediment, sand and rocks
- 2=medium sediment, sand and rocks
- 3=heavy sediment, sand and rocks
- 4=severe sediment problem, camera cannot pass

Infiltration

- 1=dripping infiltration
- 2=continuous infiltration
- 3=heavy, bad infiltration
- 4=severe, pouring infiltration

Offset Joint

- 1=joint slightly offset
- 2=joint is moderately offset
- 3=joint is severely offset, but camera can pass
- 4=camera cannot pass offset joint

Separated Joint

- 1=joint is slightly separated
- 2=joint is moderately separated
- 3=joint is severely separated
- 4=camera cannot pass separated joint

Pipe Wall Failure

- 1=light corrosion or aggregate visible in pipe wall
- 2=medium corrosion or aggregate visible in pipe wall
- 3=heavy corrosion or aggregate visible in pipe wall
- 4=severely deteriorated pipe, wall is worn out with soil exposed

Other

- 1=obstruction in pipe
- 2=concrete in pipe
- 3=branch line protruding into pipe
- 4=gasket hanging into pipe

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

STORM WATER PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Welders certifications		
INSTALLATION		
Underground piping restraints coated per specifications		
Trench bedding material per contract documents		
Backfill placed in lifts and compacted per contract documents		
Pipe ID tape installed in trench per contract documents		
Drain line profile verified		
Manhole connections verified as correct		
Pipe fittings complete and pipes properly supported		
Pipe hangers type, size and coating per contract documents		
All welded pipe 50 ft. below roof drains		
Pipes properly labeled		
Cleanouts installed and accessible		
Pipe insulated per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

STORM WATER PIPING SYSTEM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
Any and all punchlist items corrected		
Piping system properly flushed and cleaned (report attached) Y / N		
Cross-contamination dye test performed (report attached) Y / N		
Pipe video inspected per specifications (report attached) Y / N		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

SUBMERSIBLE PUMP

Location _____

Test # _____

Pump ID: _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Record Submittal		
O&M Manuals		
Sequence of Operations verified		
OPERATION		
VFD operation verified (report attached) Y / N		
The HOA switch properly activates and deactivates the unit		
Pump rotation verified correct		
No unusual noise or vibration		
No leaking apparent around fittings		
Measure line to line voltage phase imbalance for each pump: (%Imbalance = 100 x (avg. - lowest) / avg.)		
Record imbalance of each pump (report attached) Y / N		
Record full load running amps for each pump. _____ rated FL amps x _____ srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented with all variations documented		
Specified point-to-point checks have been completed and documentation record submitted for this system		
<u>Pump speed.</u> Check the amperage of the circulating pumps. Amperage should be less than the rated amps. Rated = _____ SP-1[_____] SP-2[_____]		
Change the schedule so the pumps should be OFF. Pumps turn OFF.		
Schedule the pumps to be ON. Return schedule to normal. Pumps start. Schedule returned to normal		

Sensor and Actuator Calibration

All field-installed pressure sensors and gages on this piece of equipment shall be calibrated using the methods and tolerances given in the Calibration and Leak-by Test Procedures document.

All test instruments shall have certified calibration during past 12 months: Y/N _____.
Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Sensor or Actuator & Location	Location OK	1 st Gage or BAS Value	Instr. Meas'd Value	Final Gage or BAS Value	Pass Y/N?

Gage reading = reading of the permanent gage on the equipment.

BAS = building automation system.

Instr. = testing instrument.

Visual = actual observation.

The Contractor's sensor check-out sheets may be used in lieu of the above, if the same recording fields are included and the referenced procedures are followed.

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

SUBMERSIBLE SUMP PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Pump assembly securely attached / supported		
Magnesium Anode installed		
Pickup strainer installed		
Flushing piping system complete (report attached)		
Gate & Check Valves installed (discharge side)		
Bearings lubricated		
Impeller rotation: _____ C / CCW _____ (viewed from drive side)		
Power conductors sealed per contract documents		
Alarm light & bell operate correctly		
Alarm "silence" & "test" switches operator correctly		
"Lead" - "lag" operation confirmed		
Low level switch "shuts off" operating pump		
High level switch "starts" lead pump		
Hi-Hi level switch "starts" lag pump		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

SUMP PUMP

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below.. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
The HOA switch properly activates and deactivates the unit		
Pump rotation verified correct		
Vibration within tolerances (report attached) Y / N		
Verify noise dB within tolerances		
No leaking apparent around fittings		
Measure line to line voltage phase imbalance for each pump: (%Imbalance = 100 x (avg. - lowest) / avg.) Imbalance :		
Record full load running amps for each pump. _____ rated FL amps x srvc factor = _____ (Max amps)		
Specified sequences of operation and operating schedules have been implemented and verified (report attached) Y / N		
Specified point-to-point checks have been completed (report attached) Y / N		
VFD operation verified (report attached) Y / N		
High level alarm operates		
Float switch operates		
Discharge location verified		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

SUMP PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date
_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date
_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer product data sheet		
INSTALLATION		
Label permanently affixed		
Pumps in place and properly grouted		
Vibration isolation devices installed and functional		
Pressure and flow gages and sensors installed		
Pipe fittings complete and pipes properly supported		
Valves properly tagged		
Y-strainer baskets clean		
Suction strainers in place		
Block valves in place		
Check Valves installed (discharge side):		
Bearings lubricated		
Pump alignment checked (report attached)		
Impeller rotation: <u>C / CCW</u> (viewed from drive side).		
VFD/Starter/Transfer switch/Disconnects installed		
High/Temp safety installed		
Proper grounding installed for components and unit		
All control devices, pneumatic tubing and wiring complete		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

Equipment Designation

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Exceptions Noted:	

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

Equipment Designation

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Sensor and Actuator Calibration

All field-installed sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated using the methods and tolerances given in the Calibration and Leak-by Test Procedures document. All test instruments shall have had a certified calibration within the last 12 months: Y/N_____. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Sensor or Actuator Tag & Location	Location OK	1 st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y / N

Comments:

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner’s Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner’s Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

Equipment Designation

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding checklist items preclude safe and reliable equipment testing and operation.

___ List attached.

_____	_____	_____	_____
Mechanical Contractor	Date	Controls Contractor	Date

_____	_____	_____	_____
Electrical Contractor	Date	Plumbing Contractor	Date

_____	_____	_____	_____
Other Contractor	Date	General Contractor	Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Exceptions Noted:	

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

Equipment Designation

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding checklist items preclude safe and reliable equipment testing and operation.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

[NOTE: Insert/replace sections below with applicable submittal and checklist information]

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ **FLA** _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Approved Submittals		
Warranty Certificate		
DELIVERY CONDITION - STAGING		
General appearance good, no apparent damage		
Equipment protected/sealed from elements for staging		
INSTALLATION		
Permanent labels/tags affixed		
Physical condition good: no dents, damage, leaks, etc.		
Maintenance access acceptable for unit and components		
Thermal insulation properly installed and according to specification		
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)		
Clean up of equipment completed per contract documents		
Equipment components labeled per specifications		
BAS/EMS control points labeled per specifications		

Approved	Cont.	UTH
ELECTRICAL AND CONTROLS		
Pilot lights are functioning		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for equipment and components		
Safeties in place and operable		
All control devices, pneumatic tubing and wiring complete		
Exceptions Noted:		
1.		
2.		
3.		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

TILE ROOFING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
INSTALLATION		
Preinstallation meeting conducted prior to start of work		
Mockup installed		
Roofing materials stored properly		
Substrate work complete		
Roof penetrations complete		
Clean substrate		
Grid layout for proper edge alignment		
Flashing placement		
Tiles wired at valley flashing		
Underlayment placement, proper laps		
Underlayment fasteners		
Guidelines established		
Treated wood blocking placement		
Uniform blending of tiles		
Roof accessories (bird blocks, finials, ridge caps, etc. per plans)		
Fastener type, number and penetration depth		
Uniform mortar coloration		
Proper tile lap		
Cementing of ridge hip and end tiles		
Final		
Cleaning		
Replacement of damaged units		
Open joints sealed		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

TRAINING PROPOSAL

System/Equipment Designation	Specification Reference(s)

The Contractor is required to provide training on equipment and systems provided and/or installed. The Contractor shall provide a training plan, for review and approval, prior to conducting training. Separate Learning Objectives will be required for each training format (e.g. Lecture, Demonstration, Participatory, etc.). The training plan shall include the following documents:

- Trainer/Instructor Qualifications or Resume'
- Training Agenda
- System/Equipment Specific Learning Objectives
- Copies of Materials and Visual Aides used in Training
- Duration of training session & number of sessions provided (provide on checklist below)
- Proposed date(s), time(s), location(s) for training session(s)

Complete the Training Proposal Checklist below. Attach the training plan documents itemized above to the completed Training Proposal form. Each Training Request shall be routed through the Commissioning Coordinator to UT Health for scheduling and approval. The Cx Coordinator shall update the C&C Manual with approved Training Proposals, training plans and the Training Attendance/Verification form (attached).

Training Proposal Checklist

Trainer/Instructor				✓	Training Plan Documents		
Name					Trainer Qualifications/Resume'		
Employer					Training Agenda		
Title					Learning Objectives (may be in agenda)		
Phone					Training Materials/Vis. Aides/Handouts		
Email							
#	Training Format	# of Sessions	Duration	Location			
1							
2							

Proposed Training Session Dates/Times

#	Primary Date	Primary Time	Approved		Alt. Date	Alt. Time	Approved

Project Name _____

UTH Project # _____

Training Attendance Roster

System/Equipment Designation	Specification References
Instructor/Trainer	Date

Each Attendee to print Full Name, Title, and provide Signature

#	Print Name	Title	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

The Trainees listed above (continued on page 3 if necessary) have been provided training on equipment listed above, and received the information and training as indicated on the approved Training Agenda.

Comments:

UTH/CxA Printed Name:	Signature:	Date:
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Project Name _____ UTH Project # _____

Training Attendance Roster (Cont'd)

#	Print Name	Title	Signature
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
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FIRE ALARM INSTALLATION CERTIFICATE

Property name _____

Address _____
(street) (city)

Name of installing/certifying firm _____

Certificate of registration (C of R) number **ACR-** _____

A service contract for inspection and testing of the alarm system, dated _____

and in force for _____ years, with:

_____ **ACR-** _____
(registered alarm firm) (C of R number)

Authority having jurisdiction _____

Address _____

Systems installed in accordance with NFPA Standards (list numbers and editions) _____

Installation includes the following devices _____

which have been in service since (date) _____

Building(s) - Name or No. _____

Manual Fire Alarm Service:

Number of coded stations _____ Non-coded stations _____

Activating _____

Number of combination manual fire alarm, combination devices, and guard tour coded stations _____ Local annunciator: Yes _____ No _____

Guard's Tour Supervisory Service:

Number of coded stations _____ Non-coded stations _____

Activating _____ transmitters. Compulsory guard-tour system comprised of _____ transmitter stations and _____ intermediate stations.

Automatic Fire Detection and Alarm Service:

Coverage: Complete _____ Partial _____ If partial, indicate locations _____

Types of detectors and number of each (for line type, indicate number of circuits) _____

1. Local annunciator: Yes _____ No _____
2. Local alarm: Yes _____ No _____
3. Number of coded fire signals _____
4. Coded trouble signals _____

Sprinkler System Waterflow Alarm & Supervisory Service:

1. Number of coded waterflow signaling attachments _____
Number of waterflow switches _____ activating _____ transmitters.

2. Number of coded valve supervisory signaling attachments _____
Number of valve switches _____ activating _____ transmitters.

3. Other supervisory service provided:
Pressure: Water _____ Air _____ Temperature: Water _____ Room _____
Water level _____ Fire pump: Running _____ Power _____

4. Other fire service provided _____

Frequency of routine tests and inspections, if other than in accordance with the referenced NFPA Standards _____

I hereby certify that this fire alarm system has been tested and complies with requirements of Article 5.43-2 of the Texas Insurance Code, as amended, and the Fire Alarm Rules and with adopted NFPA Standards.

Signature of licensee _____

Fire alarm license number _____ Date signed _____

Printed or typed name of person signing _____

DISTRIBUTION: Original posted at control panel on site. Copy 1 to certifying company.
Copy 2 to authority having jurisdiction. Copy 3 to State Fire Marshal.

Texas State Fire Marshal's Office

P. O. Box 149221, MC: 112-FM

Austin, Texas 78714-9221

Contractor's Material and Test Certificate for Aboveground Piping

PROCEDURE

Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners, contractor, and the State Fire Marshal. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authorities requirements or local ordinances.

Property Name						Date								
Property Address						City			State		Zip			
PLANS	Accepted by approving authorities(names)													
	Address													
	Installation conforms to accepted plans						<input type="checkbox"/> Yes		<input type="checkbox"/> No					
Equipment used is approved?						<input type="checkbox"/> Yes		<input type="checkbox"/> No						
If no, explain deviations														
INSTRUCTIONS	Has person in charge of fire equipment been instructed as to location of control valves and care and maintenance of this new equipment? If no, explain													
							<input type="checkbox"/> Yes		<input type="checkbox"/> No					
Have copies of the following been left on the premises?														
1. System Components Instructions						<input type="checkbox"/> Yes		<input type="checkbox"/> No						
2. Care and Maintenance Instructions						<input type="checkbox"/> Yes		<input type="checkbox"/> No						
3. NFPA 25						<input type="checkbox"/> Yes		<input type="checkbox"/> No						
LOCATION OF SYSTEM	Supplies buildings													
SPRINKLERS	Make		Model		Year of Manufacture		Orifice Size		Quantity		Temperature Rating			
PIPE AND FITTINGS	Type of pipe													
	Type of fittings													
ALARM VALVE OR FLOW INDICATOR	ALARM DEVICES						Maximum time to operate through test connection							
	Type		Make		Model		Minutes			Seconds				
DRY PIPE OPERATING TEST	DRY VALVE				Q.O.D.									
	Make		Model		Serial No.		Make		Model		Serial No.			
			Time to trip through test connection ^{1,2}		Water Pressure		Air Pressure		Trip Point Air Pressure		Time water reached test outlet ^{1,2}		Alarm operated properly	
			Minutes	Seconds	psi		psi		psi		Minutes	Seconds	Yes	No
	Without Q.O.D.													
With Q.O.D.														
If no, explain														
DELUGE & PREACTION VALVES	Operation						<input type="checkbox"/> Pneumatic		<input type="checkbox"/> Electric		<input type="checkbox"/> Hydraulic			
	Piping supervised						<input type="checkbox"/> Yes		<input type="checkbox"/> No		Detection media supervised			
							<input type="checkbox"/> Yes		<input type="checkbox"/> No					
	Does valve operate from the manual trip, remote, or both control stations?													
							<input type="checkbox"/> Yes		<input type="checkbox"/> No					
	Is there an accessible facility in each circuit for testing?						<input type="checkbox"/> Yes		<input type="checkbox"/> No		If no, explain			
Make		Model		Does each circuit operate supervision loss alarm?		Does each circuit operate valve release?		Maximum time to operate release?						
				Yes		No		Yes		No		Minutes		Seconds

¹ Measured from time inspector's test connection is opened.

² NFPA 13 only requires the 60-second limitation in specific sections

PRESSURE REDUCING VALVE TEST	Location & Floor	Make & Model	Setting	STATIC PRESSURE		RESIDUAL PRESSURE (flowing)		FLOW RATE
				Inlet (psi)	Outlet (psi)	Inlet (psi)	Outlet (psi)	Flow (GPM)
TEST DESCRIPTION	<p>HYDROSTATIC: Hydrostatic tests shall be made at not less than 200 psi (13.6 bars) for two hours or 50 psi (3.4 bars) above static pressure in excess of 150 psi (10.2 bars) for two hours. Differential Dry-Pipe Valve clappers shall be left open during test to prevent damage. All aboveground piping leakage shall be stopped.</p> <p>PNEUMATIC: Establish 40 psi (2.7 bars) air pressure and measure drop, which shall not exceed 1-1/2 psi (0.1 bars) in 24 hours. Test pressure tanks at normal water level and air pressure and measure air pressure drop, which shall not exceed 1-1/2 psi (0.1 bars) in 24 hours.</p>							
TESTS	All pipe hydraulically tested at: _____ psi (_____ bar) for _____ hrs			If no, state reason				
	Dry Pipe pneumatically tested <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Equipment operates properly <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Do you certify as the sprinkler contractor that additives and corrosive chemicals, sodium silicate or derivatives of sodium silicate, brine, or other corrosive chemicals were not used for testing systems or stopping leaks? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	DRAIN TEST	Reading of gage located near water supply test connection: _____ psi (_____ bar)			Residual pressure with valve in test connection open wide. _____ psi (_____ bar)			
Underground mains and lead in connections to system risers flushed before connection made to sprinkler piping								
Verified by copy of the Contractor's Material & Test Certificate for Underground Piping. <input type="checkbox"/> Yes <input type="checkbox"/> No								
Flushed by installer of underground sprinkler piping. <input type="checkbox"/> Yes <input type="checkbox"/> No								
If powder driven fasteners are used in concrete, has representative sample testing been satisfactorily completed? <input type="checkbox"/> Yes <input type="checkbox"/> No								
If no, explain _____								
BLANK TESTING GASKETS	Number used		Locations				Number removed	
WELDING	Welded piping <input type="checkbox"/> Yes <input type="checkbox"/> No							
	If yes...							
	Do you certify as the sprinkler contractor that welding procedures comply with the requirements of at least AWS B2.1? <input type="checkbox"/> Yes <input type="checkbox"/> No							
	Do you certify that the welding was performed by welders qualified in compliance with the requirements of at least AWS B2.1? <input type="checkbox"/> Yes <input type="checkbox"/> No							
Do you certify that the welding was carried out in compliance with a documented quality control procedure to ensure that all discs are retrieved, that openings in piping are smooth, that slag and other welding residue are removed, and that the internal diameters of piping are not penetrated? <input type="checkbox"/> Yes <input type="checkbox"/> No								
CUTOUTS (DISCS)	Do you certify that you have a control feature to ensure that all cutouts (disks) are retrieved? <input type="checkbox"/> Yes <input type="checkbox"/> No							
HYDRAULIC DATA NAMEPLATE	Nameplate provided? <input type="checkbox"/> Yes <input type="checkbox"/> No			If no, explain _____				
REMARKS	DATE left in service with all control valves open: _____							
Signature	Name of sprinkler contractor					C of R No. SCR-		
	Contractor's Address				City		State	Zip
	Tests witnessed by							
	For property owner (signed)				Title		Date	
	For sprinkler contractor (signed)				Title		Date	
Additional explanation and notes								

RME CERTIFICATION	I certify that the information herein is true and that this sprinkler system was installed in accordance with Article 5.43-3, Texas Insurance Code and the rules and standards adopted by the State Fire Marshal's Office.							
	Responsible Managing Employee (signature)							
	Responsible Managing Employee (print or type name)							
RME License Number				Date				

DISTRIBUTION: Original COPY 1 posted at site. COPY 3 for approving authority.
 COPY 2 for the installing firm. COPY 4 for the Texas State Fire Marshal's Office.

Texas State Fire Marshal's Office

P. O. Box 149221, MC: 112-FM

Austin, Texas 78714-9221

Contractor's Material and Test Certificate for **U**nderground Piping

PROCEDURE

Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners, contractor, and the State Fire Marshal. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authority's requirements or local ordinances.

Property Name	Date
---------------	------

Property Address	City	State	Zip
------------------	------	-------	-----

PLANS	Accepted by approving authorities (names)		
	Address		
	Installation conforms to accepted plans	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Equipment used is approved	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If no, state deviations		

INSTRUCTIONS	Has person in charge of fire equipment been instructed as to location of control valves and care and maintenance of this new equipment? If no, explain			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Have copies of appropriate instructions and care and maintenance charts been left on premises? If no, explain			<input type="checkbox"/> Yes	<input type="checkbox"/> No

LOCATION	Supplies buildings
-----------------	--------------------

UNDERGROUND PIPES AND JOINTS	Pipe types and class		Type joints		
	Pipe conforms to _____ Standard	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
	Fittings conform to _____ Standard	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
	If no, explain				
	Joints needed anchorage clamped, strapped or blocked in accordance with _____ standard			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If no, explain				

TEST DESCRIPTION	FLUSHING: Flow the required rate until water is clear as indicated by no collection of foreign material in burlap bags at outlets such as hydrants and blow-offs. Flush at flows not less than 390 GPM (1476 L/min) for 4-inch pipe, 880 GPM (3331 L/min) for 6-inch pipe, 1560 GPM (5905 L/min) for 8-inch pipe, 2440 GPM (9235 L/min) for 10-inch pipe, and 3520 GPM (13323 L/min) for 12-inch pipe. When supply cannot produce stipulated flow rates, obtain maximum available.				
	HYDROSTATIC: Hydrostatic tests shall be made at not less than 200 psi (13.8 bars) for two hours or 50 psi (3.4 bars) above static pressure in excess of 150 psi (10.3 bars) for two hours.				
	LEAKAGE: New pipe laid with rubber gasketed joints shall, if the workmanship is satisfactory, have little or no leakage at the joints. The amount of leakage at the joints shall not exceed 2 quarts per hour (1.89 L/hr) per 100 joints irrespective of pipe diameter. The leakage shall be distributed over all joints. If such leakage occurs at a few joints, the installation shall be considered unsatisfactory and necessary repairs made. The amount of allowable leakage specified above can be increased by 1 fl oz per inch valve diameter per hour (30 mL/25 mm/hr) for each metal seated valve isolating the test section. If dry barrel hydrants are tested with the main valve open so the hydrants are under pressure, an additional 5 oz per minute (150 mL/min) leakage is permitted for hydrant.				

FLUSHING TESTS	New underground piping flushed according to _____ standard by (company)			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If no, explain				
	How flushing flow was obtained		Through what type of opening		
	<input type="checkbox"/> Public water	<input type="checkbox"/> Tank or reservoir	<input type="checkbox"/> Fire pump	<input type="checkbox"/> Hydrant butt	<input type="checkbox"/> Open pipe
	Lead-ins flushed according to _____ standard by (company)			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If no, explain				
	How flushing flow was obtained		Through what type of opening		
<input type="checkbox"/> Public water	<input type="checkbox"/> Tank or reservoir	<input type="checkbox"/> Fire pump	<input type="checkbox"/> Y connection to flange spigot	<input type="checkbox"/> Open pipe	

HYDROSTATIC TEST	All new underground piping hydrostatically tested at _____ psi for _____ hours		Joints covered <input type="checkbox"/> Yes <input type="checkbox"/> No		
LEAKAGE TEST	Total amount of leakage measured _____ gallons _____ hours				
	Allowable leakage _____ gallons _____ hours				
HYDRANTS	Number installed _____	Type and make _____	All operate satisfactorily <input type="checkbox"/> Yes <input type="checkbox"/> No		
CONTROL VALVES	Water control valves left wide open If no, state reason _____		<input type="checkbox"/> Yes <input type="checkbox"/> No		
	Hose threads of fire department connections and hydrants interchangeable with those of the fire department answering alarm _____		<input type="checkbox"/> Yes <input type="checkbox"/> No		
REMARKS	Date left in service _____ _____				
Signature	Name of installing contractor _____		C of R No. SCR-		
	Contractor's Address _____		City _____	State _____	Zip _____
	Tests witnessed by				
	For property owner (signed) _____		Title _____	Date _____	
	For installing contractor (signed) _____		Title _____	Date _____	
Additional explanation and notes _____					

RME CERTIFICATION	I certify that the information herein is true and that this portion of the sprinkler system was installed in accordance with Article 5.43-3, Texas Insurance Code and the rules and standards adopted by the State Fire Marshal's Office.	
	Responsible Managing Employee (signature) _____	
	Responsible Managing Employee (print or type name) _____	
	RME License Number _____	Date _____

DISTRIBUTION: Original COPY 1 posted at site. COPY 2 for the installing firm. COPY 3 for approving authority. COPY 4 for the Texas State Fire Marshal's Office.

UTILITY SHUTDOWN REQUEST FORM

Project # & Name: _____

Utility System(s) to Be Shutdown: _____

Requested Time/Date for Shutdown: _____ Thru: _____

*It is requested that the noted **building system(s)** be "shutdown" by the Owner to allow for our tie-in of services for the Project as enumerated below. We note that three (3) weeks advance notice is required as a minimum for medical and/or research facilities, and that all such shutdowns are to occur during other than regular working hours. I hereby certify that the required work has been coordinated and scheduled to achieve completion within the requested time-period.*

Subcontractor performing work

General Contractor

Spec. Section Ref: Detail/Drawing Number: _____

Description of work to be done: _____

Emergency Phone contacts after-hours: General Contractor : _____

Subcontractor performing work : _____

Physical Plant Remarks _____

Approved / Disapproved _____ **Date** _____

Signature: _____ **Title:** _____

Check with control room before starting work and when finished? _____ *Control Phone #* _____

Coordination Meeting Required prior to shutdown? _____

Date/Time Proposed for mtg. _____

Date Response to Contractor/CM/DB

Construction Inspector's Signature

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

VACUUM PIPING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Sprinkler Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
INSTALLATION		
Pipe fittings complete and pipes properly supported		
Pipes properly labeled		
Strainers in place and clean		
Isolation valves installed		
Flushing and cleaning plan submitted and approved		
Piping system properly flushed and cleaned (report attached)		
10% of strainers and Owner selected low point drains opened and witnessed by Owner to be clean. (list points checked)		
Piping pressure tested per specifications (report attached)		
Valves checklists complete		
Valve labels permanently affixed		
Pipe painted / coated per specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

VACUUM PUMP

Location _____

Test # _____

Pump ID: _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
Pump rotation verified correct		
Vibration within tolerances (report attached) Y / N		
Verify noise dB within tolerances		
No leaking apparent around fittings		
Bleed off vacuum – pump start at set point		
Low pressure alarm functions		
Specified sequences of operation and operating schedules have been implemented and verified (report attached) Y / N		
Specified point-to-point checks have been completed (report attached) Y / N		
VFD operation verified (report attached) Y / N		
Purity of system verified (report attached) Y / N		

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

VACUUM PUMP

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Compressor

MFR: _____ Model: _____

Serial #: _____

Receiver capacity: _____ Regulator set pressure: _____ PSI

Static water pressure: _____ PSI Pressure switch set pressure: _____ PSI

Actual vacuum reading at gauge: _____ Inches HG

Approved	Cont.	UTH
Manufacturer product data sheet		
O&M Manual		
INSTALLATION		
Piping complete		
Drain piping complete		
Regulator adjusted		
Pressure switch adjusted		
Vibration isolation installed		
Lead/Lag operation verified		
Controls complete		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

FUNCTIONAL TEST CHECKLIST

VAV BOX

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The system is complete and ready for functional testing. All associated prefunctional checklists are complete, approved and attached to this FT. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. Any outstanding items are noted as requiring correction / completion on attached list. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable functional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Functional checklist items are to be completed and approved before placing equipment into operation.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Tests performed with this FT are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
DELIVERABLES		
Record Submittal		
Performance data		
Service / maintenance contract		
Sequences and control strategies		
O&M manuals		
PERFORMANCE		
HVAC controls point-to-point verified (report attached) Y / N		
Control Panel/Enclosure access verified		
All actuators / valves operate smoothly throughout range		
All doors and latches operate and seal properly		
TAB/Mechanical firm verified performance (report attached) Y / N		
Filter access and removal verified		
Leak test for unit verified (report attached) Y / N		
Seq. of Operation testing procedures complete and attached Y / N		

Comments:

Test Failure/Retest Required: The Test performed has not met the specified performance criteria and will require retesting before approval.

Owner's Representative / Commissioning Authority

Date

Approval: The test has been witnessed as meeting the performance requirements of the contract documents with any exceptions noted.

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

Variable Air Volume Terminal Box

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer’s recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Variable Air Volume PreFunctional Checklist

Submittal / Approvals

Submittal. The above equipment and systems integral to them are complete and ready for functional testing. The checklist items are complete and have been checked off only by parties having direct knowledge of the event, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable equipment testing and operation.

___ List attached.

Mechanical Contractor	Date	Controls Contractor	Date
		Sheet Metal Contractor	Date
TAB Contractor	Date	General Contractor	Date

VAV Information					
Make		Model Number			
Serial Number		Function		Service Area	
GPM		MBH			
Comments:					

Associated Checklists					
AHU	<input type="checkbox"/>	Heating Hot Water Piping	<input type="checkbox"/>	BAS	<input type="checkbox"/>
Ductwork	<input type="checkbox"/>	Other	<input type="checkbox"/>	Other	<input type="checkbox"/>
Comments:					

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Performance data (pump curves, coil data, etc.)	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Installation Checks		
Check if Acceptable; Provide comment if unacceptable	NA	Comment
General		
General appearance good, no apparent damage	<input type="checkbox"/>	<input type="checkbox"/>
Installation is per manufacturers instructions	<input type="checkbox"/>	<input type="checkbox"/>
Permanent labels affixed	<input type="checkbox"/>	<input type="checkbox"/>
Casing condition good: no dents, leaks, door gaskets installed	<input type="checkbox"/>	<input type="checkbox"/>
Record drawings updated to reflect the actual installation	<input type="checkbox"/>	<input type="checkbox"/>
Access doors close tightly - no leaks	<input type="checkbox"/>	<input type="checkbox"/>
Connection between duct and unit tight and in good condition	<input type="checkbox"/>	<input type="checkbox"/>
Vibration isolation equipment installed & released from shipping locks	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance access acceptable for unit and components	<input type="checkbox"/>	<input type="checkbox"/>
Sound attenuation installed	<input type="checkbox"/>	<input type="checkbox"/>
Thermal insulation properly installed and according to specification	<input type="checkbox"/>	<input type="checkbox"/>
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
Clean up of equipment completed per contract documents	<input type="checkbox"/>	<input type="checkbox"/>
Verify that inlet conditions are OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor and 3 to 5 diameters for single point electronic sensors, else airflow straighteners	<input type="checkbox"/>	<input type="checkbox"/>
Verify that outlet conditions are OK, per manufacturer's recommendations	<input type="checkbox"/>	<input type="checkbox"/>
Valves, Piping and Coils		
Pipe fittings complete and pipes properly supported	<input type="checkbox"/>	<input type="checkbox"/>
Pipes properly labeled	<input type="checkbox"/>	<input type="checkbox"/>
Pipes properly insulated	<input type="checkbox"/>	<input type="checkbox"/>
Strainers in place and clean; blowdown installed	<input type="checkbox"/>	<input type="checkbox"/>
Piping system properly flushed	<input type="checkbox"/>	<input type="checkbox"/>

Installation Checks		
Check if Acceptable; Provide comment if unacceptable	NA	Comment
No leaking apparent around fittings	<input type="checkbox"/>	<input type="checkbox"/>
All coils are clean and fins are in good condition	<input type="checkbox"/>	<input type="checkbox"/>
All condensate drain pans clean and slope to drain, per spec	<input type="checkbox"/>	<input type="checkbox"/>
Valves properly labeled	<input type="checkbox"/>	<input type="checkbox"/>
Valves installed in proper direction	<input type="checkbox"/>	<input type="checkbox"/>
OSAT, MAT, SAT, RAT, chilled water supply sensors properly located and secure (related OSAT sensor shielded)	<input type="checkbox"/>	<input type="checkbox"/>
Sensors calibrated	<input type="checkbox"/>	<input type="checkbox"/>
P/T plugs and isolation valves installed per drawings	<input type="checkbox"/>	<input type="checkbox"/>
Dampers		
Smoke and fire dampers installed properly per contract docs (proper location, access doors, appropriate ratings verified)	<input type="checkbox"/>	<input type="checkbox"/>
All dampers open fully (Hot Duct ____, Cold Duct ____)	<input type="checkbox"/>	<input type="checkbox"/>
All dampers close tightly (Hot Duct ____, Cold Duct ____)	<input type="checkbox"/>	<input type="checkbox"/>
All damper actuators installed (Hot Duct ____, Cold Duct ____)	<input type="checkbox"/>	<input type="checkbox"/>
Ducts		
Sound attenuators installed	<input type="checkbox"/>	<input type="checkbox"/>
Duct joint sealant properly installed	<input type="checkbox"/>	<input type="checkbox"/>
No apparent severe duct restrictions	<input type="checkbox"/>	<input type="checkbox"/>
Turning vanes in square elbows as per drawings	<input type="checkbox"/>	<input type="checkbox"/>
Branch duct control dampers operable	<input type="checkbox"/>	<input type="checkbox"/>
Ducts cleaned as per specifications	<input type="checkbox"/>	<input type="checkbox"/>
Balancing dampers installed as per drawings and TAB's site visit	<input type="checkbox"/>	<input type="checkbox"/>
Electrical and Controls		
All electric connections tight	<input type="checkbox"/>	<input type="checkbox"/>
Proper grounding installed for components and unit	<input type="checkbox"/>	<input type="checkbox"/>
Safeties in place and operable	<input type="checkbox"/>	<input type="checkbox"/>
Control system interlocks hooked up and functional	<input type="checkbox"/>	<input type="checkbox"/>
All control devices and wiring complete	<input type="checkbox"/>	<input type="checkbox"/>
Sensors and Gages		
Temperature, pressure and flow gages and sensors installed	<input type="checkbox"/>	<input type="checkbox"/>
Piping gages, BAS and associated panel temperature and pressure readouts match	<input type="checkbox"/>	<input type="checkbox"/>
TAB		
	<input type="checkbox"/>	<input type="checkbox"/>

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

VAV TERMINAL UNIT

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor Date Controls Contractor Date

Electrical Contractor Date Plumbing Contractor Date

Other Contractor Date General Contractor Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
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MOTOR/ELECTRICAL:

Motor Manufacturer: _____ Serial # _____

Motor Nameplate Data - Volt _____ FLA _____ HP _____

RMP _____ SVC Factor _____ Class _____ Frame _____

Actual per phase Volt _____ FLA _____

Starter Size _____ Fuse Size _____ Heater Size _____

Approved	Cont.	UTH
INSTALLATION		
Manufacturer's cut sheets		
Performance data		
Installation and startup manual and plan		
Shop drawings		
INSTALLATION		
TAB testing of sample boxes complete (report attached)		
Permanent labels affixed		
Casing condition good: no dents, leaks, door gaskets installed		
Access doors close tightly - no leaks		
Boot between duct and unit tight and in good condition		
Vibration isolation equipment installed & released from shipping locks		
Maintenance access acceptable for unit and components		
Sound attenuation installed		
Thermal insulation properly installed and according to specification		
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)		
Clean up of equipment completed per contract documents		
Filters installed and replacement type and efficiency permanently affixed to housing		
Valves, Piping and Coils installed and flushed(report attached))		
Pipe fittings complete and pipes properly supported		
Pipes properly labeled		
Pipes properly insulated		
Strainers in place and clean		
No leaking apparent around fittings		
All coils are clean and fins are combed		
All condensate drain pans clean and slope to drain, per specs.		

Approved	Cont.	UTH
Valves properly labeled		
Valves installed in proper direction		
Sensors calibrated (See calibration section above)		
P/T plugs and isolation valve installed per drawings		
Pilot lights are functioning		
Power disconnects in place and labeled		
All electric connections tight		
Proper grounding installed for components and unit		
Safeties in place and operable		
Sensors calibrated (report attached)		
Control system interlocks hooked up and functional		
Smoke detectors in place		
All control devices, pneumatic tubing and wiring complete		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

Variable Frequency Drive

Location _____

Test # _____

Make _____

Model# _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable equipment testing and operation.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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VFD Information			
Make		Model Number	
Serial Number		Service Area	
Volts/Phase		Function	
Motor HP		Motor Amps	
		Drive Max Amps	
Comments:			

Associated Checklists			
Cooling Tower	<input type="checkbox"/>	Air Handling Unit	<input type="checkbox"/>
Pump	<input type="checkbox"/>	BAS	<input type="checkbox"/>
		Exhaust Fan	<input type="checkbox"/>
		Other	<input type="checkbox"/>
Comments:			

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Performance data (pump curves, coil data, etc.)	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		

Installation Checks		
Check if Acceptable; Provide comment if unacceptable	NA	Comment
General		
Installation per manufacturer's requirements	<input type="checkbox"/>	<input type="checkbox"/>
Permanent label affixed and UL stamp approved	<input type="checkbox"/>	<input type="checkbox"/>
Drive location not subject to excessive moisture or dirt	<input type="checkbox"/>	<input type="checkbox"/>
Drive location not subject to excessive temperatures	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate Volts vs. Hz curve is being used	<input type="checkbox"/>	<input type="checkbox"/>
Drive size matches motor size	<input type="checkbox"/>	<input type="checkbox"/>
Drive independently mounted	<input type="checkbox"/>	<input type="checkbox"/>
Cooling air flow path clean and unobstructed	<input type="checkbox"/>	<input type="checkbox"/>
VFD interlocked to control system	<input type="checkbox"/>	<input type="checkbox"/>

Installation Checks			
Check if Acceptable; Provide comment if unacceptable		NA	Comment
Unit is programmed with full written programming record on site	<input type="checkbox"/>	<input type="checkbox"/>	
Accel time set to _____ and Decel time set to _____	<input type="checkbox"/>	<input type="checkbox"/>	
Coordinated with BAS for all interface ranges and signal isolation	<input type="checkbox"/>	<input type="checkbox"/>	
Restart on Power Failure parameter set to auto	<input type="checkbox"/>	<input type="checkbox"/>	
Drive min and max speed set to _____ Hz min and 60 Hz max	<input type="checkbox"/>	<input type="checkbox"/>	
Security settings set per owner direction and Password documented for owner	<input type="checkbox"/>	<input type="checkbox"/>	
Drive response to loss of signal set to _____	<input type="checkbox"/>	<input type="checkbox"/>	
Output pulse resolution set to _____ MHz. (This is coordinated with the application to minimize audible noise and coordinated with driven bearing allowances.)	<input type="checkbox"/>	<input type="checkbox"/>	
Input of motor FLA represents 100% to 105% of motor FLA rating	<input type="checkbox"/>	<input type="checkbox"/>	
Upper frequency limit set at 100%, unless explained otherwise	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical and Controls			
Power disconnect is located within site of the unit it controls and labeled	<input type="checkbox"/>	<input type="checkbox"/>	
All electric connections tight	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding installed for components and unit	<input type="checkbox"/>	<input type="checkbox"/>	
Safeties installed and operational	<input type="checkbox"/>	<input type="checkbox"/>	
Overload breakers installed and correct size	<input type="checkbox"/>	<input type="checkbox"/>	
All control devices and wiring complete	<input type="checkbox"/>	<input type="checkbox"/>	
Control system interlocks connected and functional	<input type="checkbox"/>	<input type="checkbox"/>	
Installation per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Rotates in the correct direction (for VFD, check Inverter and BYPASS modes)	<input type="checkbox"/>	<input type="checkbox"/>	
Checked the input voltage with drive disconnected	<input type="checkbox"/>	<input type="checkbox"/>	

Operational Checks			
Check if Acceptable; Provide comment if unacceptable		NA	Comment
Operation checked in HAND, OFF, and AUTO. As applicable operation also checked in BYPASS. Where applicable, ensure safeties are active in all modes	<input type="checkbox"/>	<input type="checkbox"/>	
Specified sequences of operation and operating schedules have been provided with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	
Start-up complete	<input type="checkbox"/>	<input type="checkbox"/>	

Sensor and Actuator Calibration

All field-installed sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated in accordance with Specification Section 01810. All test instruments shall have had a certified calibration within the last 12 months: **Y/N**_____. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Exceptions Noted:	

Sensor or Actuator Tag & Location	Location OK	1 st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y / N

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

 Owner's Representative / Commissioning Authority _____
Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

 Owner's Representative / Commissioning Authority _____
Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

VIBRATION ISOLATION

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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- Items on this checklist are to be verified by the Contractor as meeting the performance criteria of the contract documents before contacting Owner to witness.

Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
Manufacturer's cut sheets		
INSTALLATION		
Isolators properly installed - Shipping Bolts removed		
Embedded Anchors and Inserts in proper location		
Electrical Flex-connector length and size consistent with contract documents		
Duct Flex-connector		
Piping Flex-connector		
Isolator Base consistent with contract documents		
Housekeeping Pad Correct size and Location		
Proper hanger rod size		
Isolator deflection consistent with specifications and manufacturers data		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date



**Visitors General Waiver and Release
University of Texas System (Owner)**

Project Name: _____

Project Number: _____ Location: _____

General Contractor: _____

UT Health ODR _____

Project Safety Coordinator: _____

On behalf of the University of Texas System (Owner) and the General Contractor / Construction Manager we welcome you to the project. Construction projects can be dangerous and hazardous to employees and visitors, alike. Upon entering the site you must exercise extra care to adhere to safety protocols and instructions from knowledgeable construction professionals.

Initials _____ I acknowledge that I will observe and follow all safety procedures, including any warning signs or safety instructions posted on or about the premises. In addition, I acknowledge that proper safety vests, hard hats and safety glasses have been provided to me for my visit. I am wearing closed toed shoes that the Project Safety Coordinator has acknowledged will be appropriate for my visit.

Initials _____ I hereby waive, release and hold harmless, as well as forever discharge, the University of Texas System, the General Contractor / Construction Manager and all subcontractors, their agents and employees from all claims which I, or my heirs, executors or administrators shall or may have, because of bodily injury, or death to me or damage to my property resulting from any act or omission of the Released Parties. I AM NOT AGREEING, HOWEVER, TO RELEASE THE RELEASED PARTIES FROM GROSS NEGLIGENCE.

Initials: _____ I HEREBY agree to indemnify, defend and hold harmless the Released Parties for any bodily injury, or death or damage to other persons or property caused by my acts or omissions while visiting the project.

Initials: _____ I, the undersigned, acknowledge that I: (1) have requested permission from the Owner and General Contractor / Construction Manager to visit the Project Site; 2) have executed this Waiver and Release as a condition of and in consideration for being permitted by Owner and General Contractor / Construction Manager to visit the project Site; 3) and, agree to exercise extreme care while on the Project Site and to comply with all safety rules and requirements of the Owner and General Contractor.

Date: _____ Visitor Signature: _____

Number in Visiting Party: _____ Group Affiliation: _____

Project Safety Coordinator Signature: _____

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

WATER DETECTION ALARM

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's cut sheets		
Performance data		
O&M manuals		
Point Schedule for all zones complete and attached		
INSTALLATION		
Detector properly installed		
Detector properly aligned		
Detector operation by zone consistent with specifications and manufacturers data		
Water test properly activates alarm		
Water removal deactivates alarm when reset		
BAS Graphics indicate location of alarm		
Manual/Auto reset (indicate one)		
Water Detector labeled according to specifications		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

WATERPROOFING

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Plumbing Contractor	_____ Date
_____ Other Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
INSTALLATION		
Preinstallation meeting conducted prior to start of work		
Proper storage and protection of materials		
Substrate condition acceptable		
Primer installed at proper rate		
Pretreated detail conditions (corners, joints, cracks, penetrations)		
Proper detail treatment at drains and penetrations		
Waterproofing material maintained at proper temperature		
Proper membrane placement, full contact without bubbles		
Verify interstitial moisture is not present		
Proper seam and end laps		
Term bar installed with appropriate fastener spacing		
Terminations sealed properly		
Properly placed drainage matting		
Properly installed protection board		
Backfill installed w/o damage to waterproofing		
Water test performed and approved (test report attached)		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date

Project Name _____

UTH Project # _____

PREFUNCTIONAL CHECKLIST

WINDOW INSTALLATION

Location _____

Test # _____

Submittal / Approvals

Submittal. All components of the work being installed have been submitted, reviewed and approved for use on this project. The components are complete and ready for prefunctional testing. Prior performance has been verified as complying with the contract documents as attested by the appropriate Contractor / Subcontractor signatures below. This prefunctional checklist is submitted for approval / witness, subject to an attached list of outstanding items yet to be completed. Any outstanding items will require completion before approval of this form can be executed. None of the outstanding items preclude safe and reliable prefunctional tests being performed.

___ List attached.

Mechanical Contractor

Date

Controls Contractor

Date

Electrical Contractor

Date

Plumbing Contractor

Date

Other Contractor

Date

General Contractor

Date

Prefunctional checklist items are to be completed as part of installation verification, preparatory to functional testing.

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Approved	Cont.	UTH
Manufacturer's product data, performance criteria		
Shop drawings		
INSTALLATION		
Head, jamb and sill details installed per contract documents		
Proper anchorage		
Assembly alignment		
Perimeter joint width uniformity		
Proper flashing and seals		
Clear drainage paths, adequate weeps		
Thermal barrier continuity		
Unblemished finish		
Proper sealant joint bond breaker/backer rod installed		
Proper sealant application		
Sash operates smoothly		
Sash lock operates properly		

Installation/application Rejected: The installation/application has not met the specified performance criteria and will require reinspection before approval.

Owner's Representative / Commissioning Authority

Date

Approval: This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted

Owner's Representative / Commissioning Authority

Date